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

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

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

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

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

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

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SECTION 1

Project Information

Sales and Service

14 September 2026

Bill of Material

Feature Code	Description	Qty
C3500D6E	**C3500D6E, Diesel Genset, 60Hz, 3500kW-Standby Rating**	**10**
C3500 D6E	C3500D6E, Diesel Genset, 60Hz, 3500kW-Standby Rating	
Install-US-Stat	U.S. EPA, Stationary Emergency Application	
Dependency_Check_Engine		
BE11-2	125C Temperature Rise	
A331-2	Duty Rating - Standby Power (ESP)	
L170-2	Emission Certification, EPA, Tier 2, NSPS CI Stationary Emergency	
L090-2	Listing - UL 2200	
L225-2	HCAI (formerly OSHPD) Seismic Pre-Approval Certification	
L239-2	Auxiliary Supply Voltage - 120V, 1 Phase, 2W	
R002-2	Voltage - 277/480, 3 Phase, Wye, 4 Wire	
E170-2	40C/104F Ambient Temperature	
B801-2	ALT-60Hz, 3Phase, 480Volt, 125/105/80C-StbyPrmCont	
A416-2	Alternator Heater, 110/220 (120/240) Volt AC	
B225-2	Stator Winding Temperature Sensors, 2 RTD per Phase	
B244-2	Bearing Temperature Sensor RTDs	
C127-2	Fuel Water Separator	
H609-2	Control Mounting - Left Facing	
KX21-2	Generator Set Control - PowerCommand 3.3, Paralleling with MLD	
A362-2	Control Cabinet Heater, 120 Volt AC	
H244-2	Gauge - Exhaust Gas Temperature	
H678-2	LCD Control Display	
H731-2	Display - Exhaust Port Temp, Exhaust gas temperature sensors (EGTS) are mounted in each cylinder head of the engine for improved diagnostic capability	
KA08-2	Alarm - Audible, Engine Shutdown	
H536-2	Control Display Language - English	
K028-2	Circuit Breaker - None	
KS58-2	Terminal Housing - Top Entrance, Medium/High Volts	
A334-2	Engine Starter - 24 Volt DC Motor	
D041-2	Engine Air Cleaner - Normal Duty	
A333-2	Battery Charging Alternator	
E128-2	Engine Cooling - Radiator, High Ambient Air Temperature, Ship Loose	
H527-2	Warning - Low Coolant Level	
H737-2	Coolant Heater - 400/480 Volts AC, 40F Minimum Ambient Temperature	
H268-2	Extension - Oil Drain	
H663-2	Priming - Engine Lube Oil, Starting Only	
H607-2	Engine Oil Filters, Full Flow with Bypass	
H729-2	Open Crankcase Breather - Impactor	
L028-2	Genset Warranty - 2 Years Base	
L050-2	Literature - English	
A358-2	Packing - Standard. This is the standard packing for domestic over-the-road deliveries	
A063H823-FRD	Accessories Kit_ Radiator Installation - Package B	

SECTION 2

Generator Specifications

Specification Sheet

Diesel Generator Set QSK95 Series Engine



2500 kW-3500 kW 60 Hz

EPA Tier 2 Emissions Regulated

Description

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

Features

Cummins Heavy-Duty Engine - Rugged 4-cycle, industrial diesel delivers reliable power, low emissions and fast response to load changes.

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

Control System - The PowerCommand® digital control is standard equipment and provides total genset system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry™ protective relay, output metering and auto-shutdown.

Cooling System - Standard and enhanced integral set-mounted radiator systems, designed and tested for rated ambient temperatures, simplifies facility design requirements for rejected heat. Also optional remote cooled configuration for non-factory supplied cooling systems.

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

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

ISO8528-5 - refer to factory for site and configuration specific transient performance classification

	Standby Rating	Prime Rating	Continuous Rating	Emissions Compliance	Data Sheets
Model	60 Hz kW (kVA)	60 Hz kW (kVA)	60 Hz kW (kVA)	EPA	60 Hz
C3000 D6e	3000 (3750)	2750 (3438)	2500 (3125)	EPA Tier 2	NAD-5942-EN
C3250 D6e	3250 (4063)	3000 (3750)	2500 (3125)	EPA Tier 2	NAD-3527-EN
C3500 D6e	3500 (4375)	3000 (3750)	2750 (3438)	EPA Tier 2	NAD-5917-EN

Note: All ratings include radiator fan losses.

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Generator Set Specifications

Performance Class	Genset models have been tested in accordance with ISO 8528-5. Consult factory for transient performance information.
Voltage regulation, no load to full load	± 0.5%
Random voltage variation	± 0.5%
Frequency regulation	Isochronous
Random frequency variation	± 0.25%
Electromagnet Compatibility Performance	Emissions to EN 61000-6-2:2005 Immunity to EN 61000-6-4:2007+A1:2011

Engine Specifications

Bore	190 mm (7.48 in)
Stroke	210 mm (8.27 in)
Displacement	95.3 litres (5816 in^3)
Configuration	Cast iron, V 16 cylinder
Battery capacity	6 x 1400 amps minimum at ambient temperature of -18 °C (0 °F)
Battery charging alternator	145 amps
Starting voltage	24 volt, negative ground
Fuel system	Cummins modular common rail system
Fuel filter	On engine triple element, 5 micron primary filtration with water separators, 3 micron/2 micron (filter in filter design) secondary filtration.
Fuel transfer pump	Electronic variable speed priming and lift pump
Breather	Cummins impactor breather system
Air cleaner type	Unhoused dry replaceable element
Lube oil filter type(s)	Spin-on combination full flow filter and bypass filters
Standard cooling system	High ambient compact cooling system (ship loose) High ambient cooling system (ship loose)

Alternator Specifications

Design	Brushless, 4 pole, drip proof, revolving field
Stator	Optimal
Rotor	Two bearing, flexible coupling
Insulation system	Class H throughout
Standard temperature rise	125 ºC Standby/105 ºC Prime
Exciter type	Optimal
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower fan
AC waveform Total Harmonic Distortion (THDV)	< 5% no load to full linear load, < 3% for any single harmonic
Anti-condensation heater	1400 watt

Available Voltages

60 Hz Line – Neutral/Line – Line

- 220/380
- 240/416
- 230/400
- 7200/12470
- 277/480
- 347/600
- 2400/4160
- 7620/13200
- 7970/13800

Note: Consult factory for other voltages.

Generator Set Options and Accessories

Engine

- 480 V thermostatically controlled coolant heater for ambient above 4.5 °C (40 °F)
- Redundant fuel filter
- Air starter
- Redundant electric starting
- Eliminator oil filter system
- Lube oil make up
- Coalescing breather filter

Alternator

- 80 °C rise
- 105 °C rise
- 125 °C rise
- 150 °C rise
- Differential current transformers

Cooling System

- Enhanced high ambient cooling system (ship loose)
- High ambient compact cooling system (ship loose)
- High ambient cooling system (ship loose)
- Remote cooled configuration

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Generator Set Options and Accessories (continued)

Control Panel

- Multiple language support
- Ground fault indication
- Remote annunciator panel
- Paralleling and shutdown alarm relay package
- Floor mounted pedestal installed control panel

Generator Set

- Battery
- Battery charger
- LV and MV entrance box
- Spring isolators
- Factory witness tests
- IBC, HCAI and IEEE certification

Warranty 2 year base

- 3, 5, or 10 years for Standby including parts (labor and travel optional)
- 2 or 3 years for Prime including parts, labor and travel

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

PowerCommand 3.3 – Control System



An integrated microprocessor based generator set control system providing voltage regulation, engine protection, alternator protection, operator interface and isochronous governing. Refer to document S-1570 for more detailed information on the control.

AmpSentry – Includes integral AmpSentry protection, which provides a full range of alternator protection functions that are matched to the alternator provided.

Power Management – Control function provides battery monitoring and testing features and smart starting control system.

Advanced Control Methodology – Three phase sensing, full wave rectified voltage regulation, with a PWM output for stable operation with all load types.

Communications Interface – Control comes standard with PCCNet and Modbus interface.

Service - InPower™ PC-based service tool available for detailed diagnostics, setup, data logging and fault simulation.

Easily Upgradeable – PowerCommand controls are designed with common control interfaces.

Reliable Design – The control system is designed for reliable operation in harsh environment.

Multi-Language Support

Operator Panel Features

Operator/Display Functions

- Displays paralleling breaker status
- Provides direct control of the paralleling breaker
- 320 x 240 pixels graphic LED backlight LCD
- Auto, manual, start, stop, fault reset and lamp test/panel lamp switches
- Alpha-numeric display with pushbuttons
- LED lamps indicating genset running, remote start, not in auto, common shutdown, common warning, manual run mode, auto mode and stop

Paralleling Control Functions

- First Start Sensor™ system selects first genset to close to bus
- Phase lock loop synchronizer with voltage matching
- Sync check relay
- Isochronous kW and kVar load sharing
- Load govern control for utility paralleling
- Extended paralleling (base load/peak shave) mode
- Digital power transfer control, for use with a breaker pair to provide open transition, closed transition, ramping closed transition, peaking and base load functions.

Other Control Features

- 150 watt anti-condensation heater
- DC distribution panel
- AC auxiliary distribution panel

Alternator Data

- Line-to-Neutral and Line-to-Line AC volts
- 3-phase AC current
- Frequency
- kW, kVar, power factor kVA (three phase and total)
- Winding temperature
- Bearing temperature

Engine Data

- DC voltage
- Engine speed
- Lube oil pressure and temperature
- Coolant temperature
- Comprehensive FAE data (where applicable)

Other Data

- Genset model data
- Start attempts, starts, running hours, kW hours
- Load profile (operating hours at % load in 5% increments)
- Fault history
- Data logging and fault simulation (requires InPower)
- Air cleaner restriction indication
- Exhaust temperature in each cylinder

Standard Control Functions

Digital Governing

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

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Standard Control Functions (continued)

Digital Voltage Regulation

- Integrated digital electronic voltage regulator
- 3-phase, 4-wire Line-to-Line sensing
- Configurable torque matching

AmpSentry AC protection

- AmpSentry protective relay
- Over current and short circuit shutdown
- Over current warning
- Single and three phase fault regulation
- Over and under voltage shutdown
- Over and under frequency shutdown
- Overload warning with alarm contact
- Reverse power and reverse Var shutdown
- Field overload shutdown

Engine Protection

- Battery voltage monitoring, protection and testing
- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Cranking lockout
- Sensor failure indication
- Low fuel level warning or shutdown
- Fuel-in-rupture-basin warning or shutdown
- Full authority electronic engine protection

Control Functions

- Time delay start and cool down
- Real time clock for fault and event time stamping
- Exerciser clock and time of day start/stop
- Data logging
- Cycle cranking
- Load shed
- Configurable inputs and outputs (20)
- Remote emergency stop

Ratings Definitions

Emergency Standby Power (ESP):

Applicable for supplying power continuously to varying electrical loads for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528 and ISO 3046-1, obtained and corrected in accordance with ISO 15550).

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.

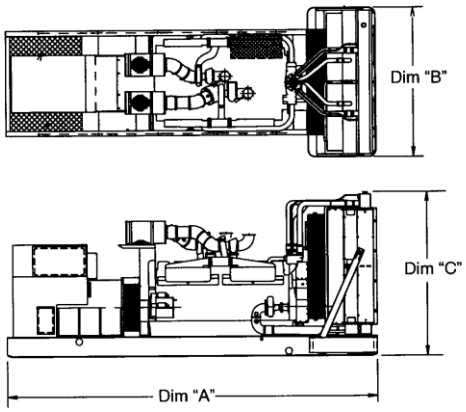
Prime Power (PRP):

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 3046-1. Data shown above represents gross engine performance and capabilities as per ISO 3046-1, obtained and corrected in accordance with ISO 15550.

Base Load (Continuous) Power (COP):

Applicable for supplying power continuously to a constant load up to the full output rating for unlimited hours. No sustained overload capability is available for this rating. Consult authorized distributor for rating. (Equivalent to Continuous Power in accordance with ISO 8528 and ISO 3046-1, obtained and corrected in accordance with ISO 15550).

This rating is not applicable to all generator set models.



This outline drawing is for reference only. See PowerSuite library 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* dry kg (lbs)	Set weight* wet kg (lbs)
C3000 D6e	8009 (3	Refer to drawings for specific weights and dimensions		29370 (64750)	30100 (66359)
C3250 D6e	8009 (3			29370 (64750)	30100 (66359)
C3500 D6e	8294 (327)	3172 (125)	3791 (149)	30005 (66150)	30800 (67902)

* Weights and dimensions represent a set with standard features and alternator frame S9.
See outline drawing for weights and dimensions of other configurations.

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Codes and standards

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

ISO 9001 ISO 14001 ISO 45001	This product was manufactured in a facility whose quality management system is certified to ISO 9001 and its Health Safety Environmental Management Systems certified to ISO 14001 and ISO 45001.	c UL us LISTED	This product is listed to UL 2200, Stationary Engine Generator Assemblies for all 60 Hz low voltage models.
	The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.	IBC	The generator set package is available certified for seismic application in accordance with International Building Code.
	All genset models are available as CSA certified to CSA C22.2 No.100		Engine certified to Stationary Emergency U.S. EPA New Source Performance Standards, 40 CFR 60 subpart IIII Tier 2 exhaust emission levels. U.S. applications must be applied per this EPA regulation.
	The generator meets or exceeds the limits specified in Eurocode 8, certificate available upon request.	**ISO 8528**	This generator set has been designed to comply with ISO 8528 standards.

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

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Generator set data sheet

Model: C3500 D6e
Frequency: 60 Hz
Fuel type: Diesel
kVA rating: 3500 Standby
3000 Prime
2750 Continuous
Emissions level: EPA NSPS Stationary Emergency Tier 2

Fuel consumption

	Standby				Prime				Continuous			
	kW (kVA)				kW (kVA)				kW (kVA)			
Ratings	3500 (4375) †				3000 (3750)				2750 (3438)			
Ratings without fan[1]	3611 (4514)				3111 (3889)				2861 (3576)			
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
US gph	74	131	183	240	65	115	158	205	62	107	147	190
L/hr	280	496	693	908	246	435	598	776	235	405	556	719

[1]Ratings for reference with the optional remote radiator cooling configuration. See note 1 under “Alternator data” section.
†DCC available at standby power subject to Cummins’ site-specific assessment. Please contact your Cummins Distributor.

Engine

	Standby rating	Prime rating	Continuous rating
Engine model	QSK95-G9		
Configuration	Cast iron, vee, 16 cylinder		
Aspiration	Turbocharged and after-cooled		
Gross engine power output, kWm (bhp)	3768 (5051)	3215 (4309)	2956 (3963)
BMEP at set rated load, kPa (psi)	2634 (382)	2248 (326)	2068 (300)
Bore, mm (in)	190.0 (7.48)		
Stroke, mm (in)	210.1 (8.27)		
Rated speed, rpm	1800		
Piston speed, m/s (ft/min)	12.6 (2480)		
Compression ratio	15.5:1		
Lube oil capacity, L (qt)	647 (684)		
Overspeed limit, rpm	2070		
Regenerative power, kW	321		

Fuel flow

Maximum fuel flow, L/hr (US gph)	1601.1 (423)
Maximum fuel inlet restriction with clean filter, kPa (in Hg)	30.48 (9)
Maximum fuel return line restriction kPa (in Hg)	34 (10)
Maximum fuel inlet temperature, °C (°F)	71.1 (160)
Maximum fuel outlet temperature, °C (°F)	92.2 (198)

Air

Combustion air, m^3/min (scfm)	283 (9979)	274 (9649)	268 (9441)
Maximum air cleaner restriction with clean filter, mm H_2O (in H_2O)	508 (20)		
Alternator cooling air, m^3/min (cfm)	255 (9005)		

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Exhaust	Standby rating	Prime rating	Continuous rating
Exhaust flow at set rated load, m^3/min (cfm)	720 (25408)	650 (22925)	619 (21829)
Exhaust temperature at set rated load, °C (°F)	495 (923)	443 (828)	423 (792)
Maximum back pressure, kPa (in H_2O)	7 (28)		

Set-mounted radiator cooling	High Ambient
Ambient design, °C (°F)	47 (117)
Fan load, kW_m (HP)	111 (149)
Coolant capacity (with radiator), L (US gal)	1120 (296)
Cooling system air flow, m^3/min (scfm)	4098 (144710)
Maximum cooling air flow static restriction, kPa (in H_2O)	0.12 (0.5)

~~Set-mounted radiator cooling~~	~~Enhanced High Ambient~~
Ambient design, °C (°F)	53 (127)
Fan load, kW_m (HP)	111 (149)
Coolant capacity (with radiator), L (US gal)	1196 (316)
Cooling system air flow, m^3/min (scfm)	4098 (144710)
Maximum cooling air flow static restriction, kPa (in H_2O)	0.12 (0.5)

~~Optional remote radiator cooling~~			
~~Engine coolant capacity, L (US gal)~~	~~379 (100)~~		
~~Max flow rate at max friction head, jacket water circuit, L/min (US gal/min)~~	~~2907 (768)~~		
~~Max flow rate at max friction head, aftercooler circuit, L/min (US gal/min)~~	~~697 (184)~~		
~~Heat rejected, jacket water circuit, MJ/min (Btu/min)~~	~~107.8 (102092)~~	~~93.1 (88171)~~	~~85.4 (80943)~~
~~Heat rejected, aftercooler circuit, MJ/min (Btu/min)~~	~~25.1 (23731)~~	~~21.7 (20491)~~	~~20.9 (19753)~~
~~Heat rejected, fuel circuit, MJ/min (Btu/min)~~	~~0.6 (513)~~	~~0.6 (513)~~	~~0.6 (513)~~
~~Total heat radiated to room, MJ/min (Btu/min)~~	~~30.3 (28716)~~	~~26.0 (24565)~~	~~24.0 (22696)~~
~~Maximum friction head, jacket water circuit, kPa (psi)~~	~~83 (12)~~		
~~Maximum friction head, aftercooler circuit, kPa (psi)~~	~~83 (12)~~		
~~Maximum static head above engine crank centerline, jacket water circuit, m (ft)~~	~~18 (60)~~		
~~Maximum static head above engine crank centerline, aftercooler circuit, m (ft)~~	~~18 (60)~~		
~~Maximum jacket water outlet temp, °C (°F)~~	~~110 (230)~~	~~100 (212)~~	~~100 (212)~~
~~Maximum aftercooler inlet temp, °C (°F)~~	~~71 (160)~~	~~68 (155)~~	~~68 (155)~~
~~Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)~~	~~46 (115)~~		

~~**Note:** For non-standard remote installations contact your local Cummins representative.~~

Weights

Unit dry weight kgs (lbs)	30005 (66150)
Unit wet weight kgs (lbs)	30800 (67902)

Refer to drawings for specific weights and dimensions

Note: Weights represent a set with standard features and alternator frame S9. See outline drawing for weights of other configurations.

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Derating factors

Standby	**High Ambient Cooling System:** Full genset power available up to 767 m (2516 ft) at ambient temperatures up to 40 °C (104 °F). Above these conditions, derate at 5.2% per 305 m (1000 ft) and 12.5% per 10 °C (18 °F). **Enhanced High Ambient Cooling System:** Full genset power available up to 789 m (2590 ft) at ambient temperatures up to 40 °C (104 °F) and 457 m (1500 ft) at ambient temperatures up to 50 °C (122 °F). Above these conditions, derate at 5.1% per 305 m (1000 ft) and 12.4% per 10 °C (18 °F).
Prime	**High Ambient Cooling System:** Full genset power available up to 1056 m (3464 ft) at ambient temperatures up to 40 °C (104 °F). Above these conditions, derate at 5.3% per 305 m (1000 ft) and 14.4% per 10 °C (18 °F). **Enhanced High Ambient Cooling System:** Full genset power available up to 1079 m (3540 ft) at ambient temperatures up to 40 °C (104 °F) and 683 m (2242 ft) at ambient temperatures up to 50 °C (122 °F). Above these conditions, derate at 5.3% per 305 m (1000 ft) and 13.2% per 10 °C (18 °F).
Continuous	**High Ambient Cooling System:** Full genset power available up to 744 m (2442 ft) at ambient temperatures up to 40 °C (104 °F). Above these conditions, derate at 5.4% per 305 m (1000 ft) and 10.3% per 10 °C (18 °F). **Enhanced High Ambient Cooling System:** Full genset power available up to 779 m (2555 ft) at ambient temperatures up to 40 °C (104 °F) and 301 m (988 ft) at ambient temperatures up to 50 °C (122 °F). Above these conditions, derate at 5.4% per 305 m (1000 ft) and 8.5% per 10 °C (18 °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 data shown above represents gross engine performance and capabilities as per ISO 3046-1, obtained and corrected in accordance with ISO 15550.	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 3046-1, obtained and corrected in accordance with ISO 15550.	Applicable for supplying power continuously to a constant load up to the full output rating for unlimited hours. No sustained overload capability is available for this rating. Consult authorized distributor for rating. (Equivalent to Continuous Power in accordance with ISO 8528 and ISO 3046-1, obtained and corrected in accordance with ISO 15550). This rating is not applicable to all generator set models.

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Alternator data[1]

Voltage	Connection	Temp rise ºC	Duty2	Ambient temp C	Max surge kVA	Winding No.	Alternator	Feature code
600	Wye, 3 phase	125C	S	40	14343	607	ADS-683	B465-2
600	Wye, 3 phase	105C	P	40	14343	607	ADS-683	B465-2
600	Wye, 3 phase	80C	C	40	14343	607	ADS-683	B465-2
480	Wye, 3 phase	125C	S	40	14310	312	ADS-683	B801-2
480	Wye, 3 phase	150C	S	40	13290	312	ADS-682	B682-2
480	Wye, 3 phase	125C	P	40	13290	312	ADS-682	B682-2
480	Wye, 3 phase	125C	S	50	15825	312	ADS-684	B801-2
600	Wye, 3 phase	125C	S	50	15300	607	ADS-684	B465-2
600	Wye, 3 phase	105C	P	50	15300	607	ADS-684	B465-2
600	Wye, 3 phase	80C	C	50	15300	607	ADS-684	B465-2
480	Wye, 3 phase	125C	P	50	14310	312	ADS-683	B682-2
4160	Wye, 3-phase	105/80	S/P	40/50	17127	851	ADS-653	B937-2
4160	Wye, 3-phase	125/105/80	S/P/C	40	14835	851	ADS-652	B467-2
4160	Wye, 3-phase	105	P	50	14835	851	ADS-652	B467-2
4160	Wye, 3-phase	125/80	S/C	50	17127	851	ADS-653	B467-2
4160	Wye, 3-phase	150	S	40/50	14835	851	ADS-652	BE31-2

Notes:

[1] Alternator data is configured for a set with ratings including engine cooling fan losses and standard features at 40 °C ambient temperature. For non-standard configurations, including remote radiator applications, check appropriate alternator data sheets or contact your local Cummins representative.

[2] Standby (S), Prime (P) and Continuous ratings (C).

[3] Maximum rated starting kVA that results in a minimum of 90% of rated sustained voltage during starting.

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Alternator data[1] (continued)

Voltage	Connection	Temp rise ºC	Duty[2]	Ambient temp C	Max surge kVA	Winding No.	Alternator	Feature code
12470	Wye, 3-phase	105/80	S/P	40	N/A	8030	ADS-590	B567-2
12470	Wye, 3-phase	105	C	40	13908	991	ADS-660	B569-2
12470	Wye, 3-phase	105	C	50	15180	991	ADS-661	B569-2
13.2-13.8	Wye, 3-phase	105	C	40/50	13908	991	ADS-660	B657-2
13800	Wye, 3-phase	105	S	40	16688	8029	ADS-589	B895-2
13800	Wye, 3-phase	125	S	40	15180	991	ADS-661	B820-2
13800	Wye, 3-phase	80	P	40	16688	8029	ADS-589	B809-2
13800	Wye, 3-phase	105	P	40	13908	991	ADS-660	B821-2
13800	Wye, 3-phase	105	P	50	15180	991	ADS-661	B821-2

Notes:

[1] Alternator data is configured for a set with ratings including engine cooling fan losses and standard features at 40 °C ambient temperature. For non-standard configurations, including remote radiator applications, check appropriate alternator data sheets or contact your local Cummins representative.

[2] Standby (S), Prime (P) and Continuous ratings (C).

[3] Maximum rated starting kVA that results in a minimum of 90% of rated sustained voltage during starting.

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

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NAD-5917-EN (12/25)

Specification Sheet

PowerCommand® 3.3 Generator Set Digital Integrated Control System



Bargraph Optional

Introduction

The PowerCommand® 3.3 control system is a microprocessor-based generator set monitoring, metering, and control system, which is comprised of PowerCommand® Control 3300 and the Human Machine Interface 320. PCC3300 supports multiple operation modes including:

- Standalone,
- Synchronization only,
- Isolated bus paralleling,
- Utility single generator set paralleling,
- Utility multiple generator set paralleling,
- Utility single generator set paralleling with power transfer control (automatic mains failure),
- Isolated bus paralleling with Masterless Load Demand

PowerCommand® Control 3300 is designed to meet the exacting demands of the harsh and diverse environments of today's typical power generation applications for Full Authority Electronic or Hydromechanical engine power generator sets.

Offering enhanced reliability and performance over more conventional generator set controls via the integration of all generator control functions into a single system, PCC3300 is your Power of One generator set control solution.

Benefits and Features

- 320 x 240 pixels graphical LED backlit LCD
- Multiple languages supported
- AmpSentry™ protection provides industry-leading generator overcurrent protection
- Digital Power Transfer Control (Automatic Mains Failure) provides load transfer operation in open transition, closed transition, or soft (ramping) transfer modes
- Extended Paralleling (Peak Shave/Base Load) regulates the genset real and reactive power output while paralleled to the utility. Power can be regulated at either the genset or utility bus monitoring point
- Digital frequency synchronization and voltage matching
- Isochronous Load Sharing
- Droop kW and kVAr control
- Real time clock for fault and event time stamping
- Exerciser clock and time of day start/stop initiate a test with or without load, or a Base Load or Peak Shave session
- Digital automatic voltage regulation is provided using three phase sensing and full wave FET type regulator, which is compatible with either shunt or PMG excited systems with a standard AUX103 AVR or an option for a more powerful high-current field drive capability AUX106 AVR
- Digital engine speed governing is provided on applicable platforms
- Generator set monitoring (including metering) and protection with PCC3300 measuring voltage, current, kW and kVAr offering a measurement accuracy of 1%
- Utility / AC Bus metering and protection with PCC3300 voltage, current, kW and kVAr offering a measurement accuracy of 1%
- 12 V (DC) and 24 V (DC) battery operation
- RS-485 Modbus® interface for interconnecting to customer equipment
- Warranty and service – Cummins Power Generation offers a comprehensive warranty and worldwide distributor service network
- Global regulatory certification and compliance: PCC3300 is suitable for use on gensets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., UKCA, and CE standards

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PowerCommand® Generator Set Digital Control System PCC 3300



Introduction

PCC3300 is an industry-leading digital generator set control suitable for usage on a wide range of diesel and lean burn natural gas generator sets in both standalone as well as paralleling applications.

PowerCommand® is compatible with either shunt or PMG excitation, and is suitable for usage with reconnectable or non-reconnectable generators. Configuration for any frequency, voltage and power connection from 120 V (AC) to 600 V (AC) line-to-line or 601 V (AC) to 45k V (AC) with an external PT is supported. The PCC3300 derives its own power from the generator set starting batteries and functions over a voltage range of 8 V (DC) to 30 V (DC).

Features

- PCC3300 supports configurable control features via software download using InPower PC-compatible software
- 12 V (DC) and 24 V (DC) battery operation
- Digital automatic voltage regulation is provided using three phase sensing and full wave FET type regulator, which is compatible with either shunt or PMG excited systems with a standard AUX103 AVR or an option for a more powerful high-current field drive capability AUX106 AVR
- Digital engine speed governing on applicable platform is provided, which is capable of providing isochronous frequency regulation
- Full authority J1939 CANBus® prime mover communications and control is provided for platforms with an Engine 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 due to thermal overload or electrical faults by inverse time protection
- Generator set monitoring offers status information for all critical prime mover and generator functions
- AC and DC digital generator set metering is provided. AC measurements are configurable for single or three phase sensing with PCC3300 measuring voltage, current, kW and kVAr offering a measurement accuracy of 1%
- Battery monitoring system continually monitors the battery output and warns of the potential occurrence of a weak battery condition
- Relay drivers for prime mover starter, fuel shutoff (FSO), glow plug/spark ignition power and switched B+ applications are provided
- Integrated generator set protection is offered to protect the prime mover and generator
- Real time clock for fault and event time stamping
- Exerciser clock and time of day start/stop initiate a test with or without load, or a Base Load or Peak Shave session
- Digital Power Transfer Control (Automatic Mains Failure) provides load transfer operation in open transition, closed transition, or soft (ramping) transfer modes
- Extended Paralleling (Peak Shave/Base Load) regulates the genset real and reactive power output while paralleled to the utility. Power can be regulated at either the genset or utility bus monitoring point
- Digital frequency synchronization and voltage matching
- Isochronous Load Sharing
- Droop kW and kVAr Control
- The synchronization check function provides adjustments for phase angle window, voltage window, frequency window and time delay
- Utility / AC Bus metering and protection with PCC3300 voltage, current, kW and kVAr offering a measurement accuracy of 1%
- Advanced serviceability is offered via InPower™, a PC-based software service tool
- PCC3300 is designed for reliable operation in harsh environments with the unit itself being a fully encapsulated module
- RS-485 ModBus interface for interconnecting to customer equipment
- Native on PCC3300: Four discrete inputs, two dry contact relay outputs and two low-side driver outputs are provided and are all configurable.
  - Optional extra PCC3300 input and output capability available via AUX101
- Warranty and service – Cummins Power Generation offers a comprehensive warranty and worldwide distributor service network
- Global regulatory certification and compliance: PCC3300 is suitable for use on gensets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., UKCA and CE standards

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Base Control Functions

HMI capability

Options: Local and remote HMI320 options are available

Operator adjustments: The HMI320 includes provisions for many set up and adjustment functions.

Genset hardware data: Access to the control and software part number, genset rating in kVA and genset model number is provided from the HMI320 or InPower.

Data logs: Information concerning all of the following parameters is periodically logged and available for viewing; engine run time, controller on time, number of start attempts, total kilowatt hours, 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

For Lean Burn Natural Gas Engine applications:

- Alternator heater status
- Alternator winding temperature (per phase) as well as alternator drive end and non-drive end bearing

Utility/AC bus data

- Voltage (three phase line-to-line and line-to-neutral)
- Current (three phase and total)
- 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
- Coolant temperature
- Comprehensive Full Authority Engine (FAE) data (where applicable)

Lean Burn Natural Gas (LBNG) application parameters include:

- Safety shutoff valve status
- Valve proving status
- Downstream gas pressure
- Gas inlet pressure
- Gas mass flow rate
- Control valve position
- Gas outlet pressure
- Manifold pressure and temperature
- Throttle position
- Compressor outlet pressure
- Turbo speed
- Compressor bypass position
- Cylinder configuration (e.g., drive end and non-drive end configurations)
- Coolant pressure 1 and 2 as well as coolant temperature 1 and 2 for both HT/LT respectively
- Exhaust port temperature (up to 18 cylinders)
- Pre-filter oil pressure
- Exhaust back pressure
- Parent ECM internal temperature and isolated battery voltage
- Speed bias
- Child ECM internal temperature and isolated battery voltage
- Knock level, spark advance, and knock count (for up to 18 cylinders)
- Auxiliary supply disconnector status
- Engine heater status
- Coolant circulating pump status
- Lube oil priming pump status
- Lube oil status
- Oil heater status
- Derate authorization status
- Start system status
- Ventilator fan status
- Ventilation louvre status
- Radiator fan status
- DC PSU status
- Start inhibit/enable status and setup

Service adjustments – The HMI320 includes provisions for adjustment and calibration of genset control functions. Adjustments are protected by a password. Functions include:

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

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Prime Mover Control

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

12 V (DC) or 24 V (DC) nominal battery voltage is supported by PCC3300 for normal operation.

Temperature dependant prime mover governing dynamics: This function is supported enabling the engine to be responsive when warm and more stable when operating at lower temperature via providing control and modification over electronic governing parameters as a function of engine temperature.

Isochronous governing is provided in order to control prime mover speed within ±0.25% of nominal rated speed for any steady state load from no load to full load. During operation frequency drift should not exceed ±0.5% of nominal frequency given a 33ºC (or 60ºF) chance in ambient temperature within an eight-hour period.

Droop electronic speed is governing capability is natively offered by PCC3300 to permit droop from 0% to 10% between no load to full load.

Remote start capability is built into the PCC3300 as the unit accepts a ground signal from remote devices to automatically command the starting of the generator set as well as the reaching of rated speed, voltage and frequency or otherwise run at idle speed until prime mover temperature is adequate. The presence of a remote start signal shall cause the PCC3300 to leave sleep mode and return to normal power mode. PCC3300 supports an option for delayed start or stop.

Remote Start Integrity: In compliance with NEC2017 Start Signal Integrity standard – NFPA70 Article 700.10(D)(3), the remote start circuit from ATS to PCC3300 is continuously monitored for signal disturbance due to broken, disconnected or shorted wires via a configurable input. Loss of signal integrity results in activation of a remote start signal.

Remote and local emergency stopping capability: PCC3300 accepts ground signal from a locally or remoted mounted emergency stop switch to cause the generator set to immediately shutdown. The generator set is prevented from either running or cranking with the emergency stop switch engaged. If PCC3300 is in sleep mode, then the activation of any emergency stop switch shall return PCC3300 is normal powered state along with the activation of the corresponding shutdown and run-prevention states.

Sleep mode: PowerCommand 3.3 supports a configurable low current draw state, which is design with consideration to the needs of prime applications or others application without a battery charger (in order to minimize battery current drain).

Automatic prime mover starting: Any generator set controlled by PCC3300 is capable of automatic starting achieved via either magnetic pickup or main alternator output frequency. PCC3300 additionally supports configurable glow plug control where applicable.

Prime mover cycle cranking: PCC3300 supports configurable starting cycles and rest periods. Built in starter protection are incorporated to prevent the operator from specifying a starting sequence that may be damaging.

Configurable time delay functionality: PCC3300 supports time delayed generator set starting and stopping (for cooldown). Permissible time delays are as follows (noting a default setting is 0 seconds):

1. Start delay: 0 seconds to 300 seconds prior to starting after receiving a remote start signal.
2. Stop delay: 0 seconds to 600 seconds prior to shut down after receiving a signal to stop in normal operation modes.

Lean Burn Natural Gas application specific parameters

PCC3300 supports prime mover inhibiting in order to permit application-specific processes (i.e. Auxiliaries) to be started first.

Generator Control

PCC3300 performs both Genset voltage sensing and Genset voltage regulation as follows:

- Voltage sensing is integrated into PCC3300 via three phase line-to-line sensing that is compatible with shunt or PMG excitation systems
- Automatic voltage regulation is accomplished by using a three phase fully rectified input and has a FET output for good motor starting capability.

Major features of generator control 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.

Cylinder Cut-off System (CCS): PCC 3300 supports Cylinder Cut-off System which is used to operate the engines on half bank at no load and light load conditions. CCS has below benefits on engine

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performance- improved emission standards, improved fuel efficiency, reduced hydrocarbons, reduced white smoke, reduced wet stacking and higher exhaust temperature at light loads to improve turbocharger operations and catalyst performance.

Step Timing Control (STC): PCC 3300 supports STC functionality which is used to advance the engine timing of a hydro-mechanical engine during start up and light load conditions. During ADVANCED injection timing, it:

- Improves cold weather idling characteristics
- Reduces cold weather white smoke
- Improves light load fuel economy
- Reduces injector carboning

Paralleling Functions

First Start Sensor™ system – PowerCommand® provides a unique control function that positively prevents multiple gensets from simultaneously closing to an isolated bus under black start conditions. The First Start Sensor system is a communication system between the gensets that allows the gensets to work together to determine which genset is a system should be the first to close to the bus. The system includes an independent backup function, so that if the primary system is disabled the required functions are still performed.

Synchronizing – Control incorporates a digital synchronizing function to force the genset to match the frequency, phase and voltage of another source such as a utility grid. The synchronizer includes provisions to provide proper operation even with highly distorted bus voltage waveforms. The synchronizer can match other sources over a range of 60-110% of nominal voltage and -24 to +6 hertz. The synchronizer function is configurable for slip frequency synchronizing for applications requiring a known direction of power flow at instant of breaker closure or for applications where phase synchronization performance is otherwise inadequate.

Load sharing control – The genset control includes an integrated load sharing control system for both real (kW) and reactive (kVar) loads when the genset(s) are operating on an isolated bus. The control system determines kW load on the engine and kVar load on the alternator as a percent of genset capacity, and then regulates fuel and excitation systems to maintain system and genset at the same percent of load without impacting voltage or frequency regulation. The control can also be configured for operation in droop mode for kW or Kvar load sharing.

Load govern control– When PowerCommand® receives a signal indicating that the genset is paralleled with an infinite source such as a utility (mains) service, the genset will operate in load govern mode. In this mode the genset will synchronize and close to the bus, ramp to a pre-programmed kW and kVar load level, and then operate at that point. Control is adjustable for kW values from 0-100% of standby rating, and 0.7-1.0 power factor (lagging). Default setting is 80% of standby and 1.0 power factor. The control includes inputs to allow independent control of kW and kVar load level by a remote device while in the load govern mode. The rate of load increase and decrease is also adjustable in the control. In addition, the control can be configured for operation in kW or kVAR load govern droop.

Load demand control – The control system includes the ability to respond to an external signal to initiate load demand operation. On command, the genset will ramp to no load, open its paralleling breaker, cool down, and shut down. On removal of the command, the genset will immediately start, synchronize, connect, and ramp to its share of the total load on the system.

Sync check – The sync check function decides when permissive conditions have been met to allow breaker closure. Adjustable criteria are: phase difference from 0.1-20 deg, frequency difference from 0.001-1.0 Hz, voltage difference from 0.5-10%, and a dwell time from 0.5-5.0 sec. Internally the sync check is used to perform closed transition operations. An external sync check output is also available.

Genset and utility/AC bus source AC metering – The control provides comprehensive three phase AC metering functions for both monitored sources, including: 3-phase voltage (L-L and L-N) and current, frequency, phase rotation, individual phase and totalized values of kW, kVAR, kVA and Power Factor; totalized positive and negative kW-hours, kVAR-hours, and kVA-hours. Three wire or four wire voltage connection with direct sensing of voltages to 600V, and up to 45kV with external transformers. Current sensing is accomplished with either 5 amp or 1 CT secondaries and with up to 10,000 amp primary. Maximum power readings are 32,000kW/kVAR/kVA.

Power transfer control – provides integrated automatic power transfer functions including source availability sensing, genset start/stop and transfer pair monitoring and control. The transfer/retransfer is configurable for open transition, fast closed transition (less than 100msec interconnect time), or soft closed transition (load ramping) sequences of operation. Utility source failure will automatically start genset and transfer load, retransferring when utility source returns. Test will start gensets and transfer load if test with load is enabled. Sensors and timers include:

Under voltage sensor: 3-phase L-N or L-L under voltage sensing adjustable for pickup from 85-100% of nominal. Dropout adjustable from 75-98% of pickup. Dropout delay adjustable from 0.1-30 sec.

Over voltage sensor: 3-phase L-N or L-L over voltage sensing adjustable for pickup from 95-99% of dropout. Dropout adjustable from 105-135% of nominal. Dropout delay adjustable from 0.5-120 sec. Standard configuration is disabled and is configurable to enabled in the field using the HMI or InPower service tools.

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Over/Under frequency sensor: Center frequency adjustable from 45-65 Hz. Dropout bandwidth adjustable from 0.3-5% of center frequency beyond pickup bandwidth. Pickup bandwidth adjustable from 0.3-20% of center frequency. Field configurable to enable.

Loss of phase sensor: Detects out of range voltage phase angle relationship. Field configurable to enable.

Phase rotation sensor: Checks for valid phase rotation of source. Field configurable to enable.

Breaker tripped: If the breaker tripped input is active, the associated source will be considered as unavailable.

Timers: Control provides adjustable start delay from 0 - 300sec, stop delay from 0 - 800sec, transfer delay from 0-120sec, retransfer delay from 0-1800sec, programmed transition delay from 0-60sec, and maximum parallel time from 0-1800sec.

Negative Sequence Current Protection: PCC3300 supports this protection natively in order to determine if the generator is at any point was running subject to negative phase sequencing.

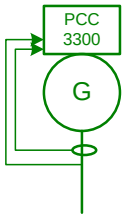
Breaker control – Utility and Genset breaker interfaces include separate relays for opening and closing breaker, as well as inputs for both 'a' and 'b' breaker position contacts and tripped status. Breaker diagnostics include Contact Failure, Fail to Close, Fail to Open, Fail to Disconnect, and Tripped. Upon breaker failure, appropriate control action is taken to maintain system integrity.

Exerciser clock –The exerciser clock (when enabled) allows the system to be operated at preset times in either test without load, test with load, or extended parallel mode. A Real Time Clock is built in. Up to 12 different programs can be set for day of week, time of day, duration, repeat interval, and mode. For example, a test with load for 1 hour every Tuesday at 2AM can be programmed. Up to 6 different exceptions can also be set up to block a program from running during a specific date and time period.

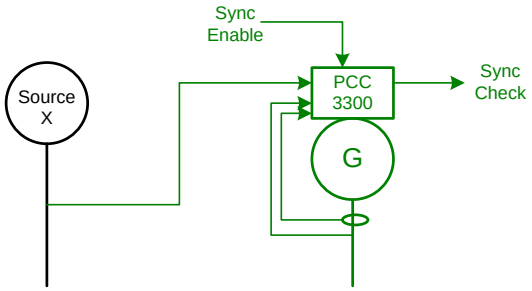
Extended paralleling – In extended paralleling mode (when enabled) the controller will start the genset and parallel to a utility source and then govern the real and reactive power output of the genset based on the desired control point. The control point for the real power (kW) can be configured for either the genset metering point ("Base Load") or the utility metering point ("Peak Shave"). The control point for the reactive power (kVAR or Power Factor) can also be independently configured for either the genset metering point or the utility metering point. This flexibility would allow base kW load from the genset while maintaining the utility power factor at a reasonable value to avoid penalties due to low power factor. The System always operates within genset ratings. The control point can be changed while the system is in operation. Set points can be adjusted via hardwired analog input or adjusted through an operator panel display or service tool.

Application types – Controller is configured to operating in one of six possible application types. These topologies are often used in combinations in larger systems, with coordination of the controllers in the system either by external device or by interlocks provided in the control. Topologies that may be selected in the control include:

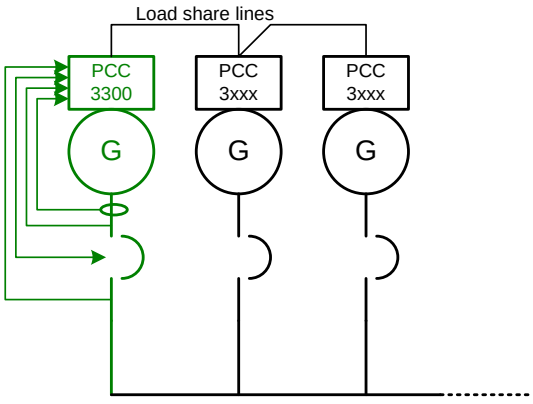
Standalone: Control provides monitoring, protection and control in a non-paralleling application.



Synchronizer only: control will synchronize the genset to other source when commanded to either via a hardwired or Modbus driven input.

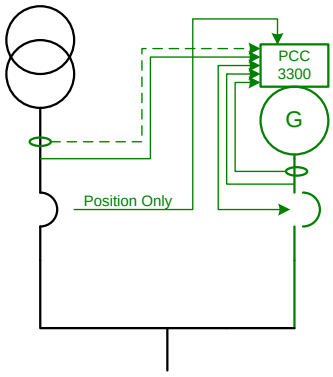


Isolated Bus: allows the genset to perform a dead bus closure or synchronize to the bus and isochronously share kW and kVAR loads with other gensets.

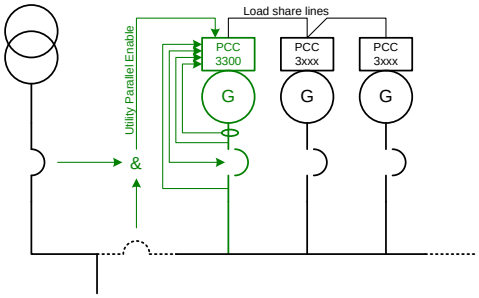


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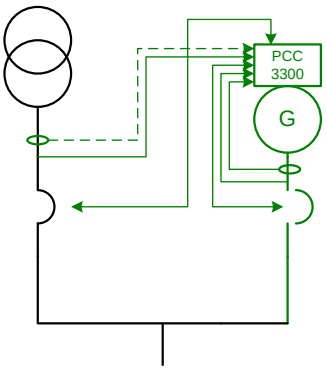
Utility Single: Control monitors one genset and utility. The control will automatically start and provide power to a load if the utility fails. The control will also resynchronize the genset back to the utility and provides extended paralleling capabilities.



Utility Multiple: Supports all functionality of Isolated Bus and provides extended paralleling to the utility. Extended paralleling load set points follow a constant setting; dynamically follow an analog input, Modbus register or HMI.

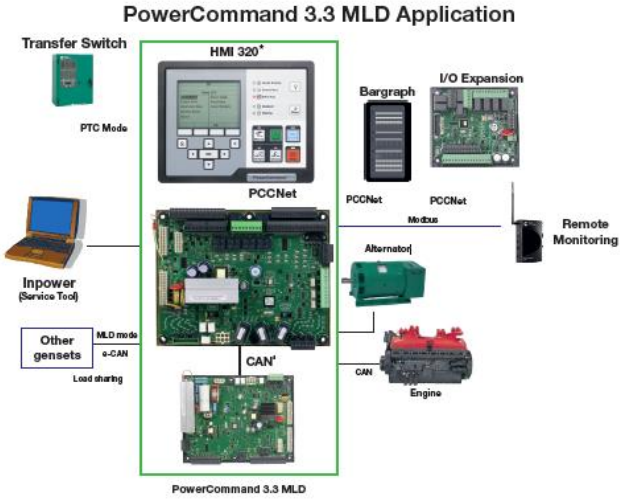


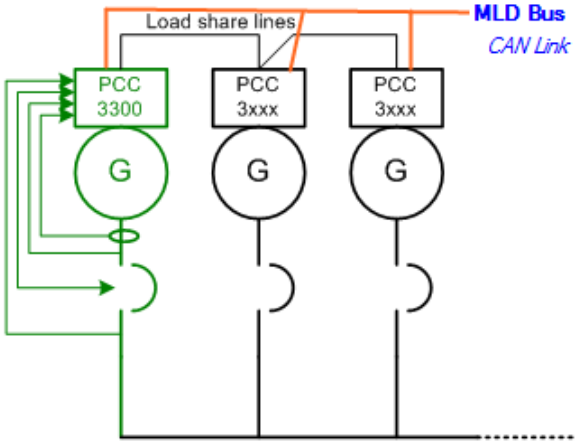
Power Transfer Control: Control operates a single genset/single utility transfer pair in open transition, fast closed transition, or soft closed transition. Extended paralleling functionality also provides base load and peak shave options.



Masterless Load Demand (Optional Feature):

PowerCommand® 3.3 with Masterless Load Demand (MLD) technology enables generator sets to start/stop automatically based on load demand. Masterless Load Demand-capable generators are equipped with an additional s-CAN network connection that allows sharing of information amongst paralleled generator sets. MLD has been designed for hassle-free installation, commissioning and operation. MLD functionality. Integrated on-board system logic provides the MLD topology control without the need for any additional system.





PCC3300 External Voltage and Frequency Biasing Inputs

PCC3300 supports externally driven voltage and frequency biasing capability in order to permit external paralleling (if intending to use this feature please contact your local distributor for further information).

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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 (or are handled by the engine ECM) 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. If a Derate command occurs while in utility parallel mode, the control will actively reduce power by lowering the base load kW to the derated target kW.

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, derate, shutdown, shutdown with cooldown or status indication and for labeling the input.

Emergency stop

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

General prime mover 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 genset is signaled to start and indicate a warning if the battery indicates impending failure.

Low coolant level warning – Can be set up to be a warning or shutdown.

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

Fail to start (overcrank) shutdown - The control system will indicate a fault if the genset 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.

Fault simulation –The control in conjunction with InPower software, will accept commands to allow a technician to verify the proper operation of the control and its interface by simulating failure modes or by forcing the control to operate outside of its normal operating ranges. InPower also provides a complete list of faults and settings for the protective functions provided by the controller.

For Lean Burn Natural Gas Engine applications:

Off load running (protection) – This feature protects the engine in the event the genset is being called to go off load for too long.

Hydro Mechanical fuel system engine protection:

Overspeed shutdown – Default setting is 115% of nominal

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

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

High engine temperature warning/shutdown – Level is preset (configurable with InPower or HMI) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

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

High intake manifold temperature shutdown – Level is preset (configurable with InPower or HMI) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

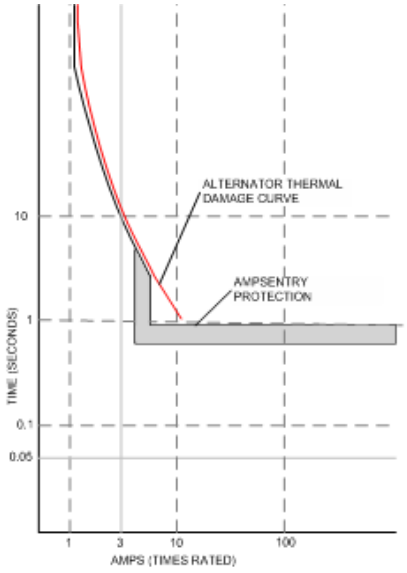
Full authority electronic engine protection:

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

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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 genset or in the load. It also provides single and three phase fault current regulation (3x Current) 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 (2sec for 1P short, 5sec for 2P short). See document R1053 for a full-size time over current curve. The control does not included protection required for interconnection to a utility (mains) service.



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 or synchronizing.

Under frequency shutdown (81 u) - Genset 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 (81o) - Genset 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 (51) - 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 genset will occur on loss of voltage sensing inputs to the control.

Field overload shutdown - Monitors field voltage to shutdown genset 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 (40) - 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.

Negative sequence overcurrent warning (46) – Control protects the generator from damage due to excessive imbalances in the three phase load currents and/or power factors.

Custom overcurrent warning/shutdown (51) – Control provides the ability to have a custom time overcurrent protection curve in addition to the AmpSentry protective relay function.

Ground fault overcurrent (51G) – Control detects a ground fault either by an external ground fault relay via a contact input or the control can measure the ground current from an external current transformer. Associated time delays and thresholds are adjustable via InPower or HMI.

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Paralleling Protection

Breaker fail to close Warning: When the control signals a circuit breaker to close, it will monitor the breaker auxiliary contacts and verify that the breaker has closed. If the control does not sense a breaker closure within an adjustable time period after the close signal, the fail to close warning will be initiated.

Breaker fail to open warning: The control system monitors the operation of breakers that have been signaled to open. If the breaker does not open within and adjustable time delay, a Breaker Fail to Open warning is initiated.

Breaker position contact warning: The controller will monitor both 'a' and 'b' position contacts from the breaker. If the contacts disagree as to the breaker position, the breaker position contact warning will be initiated.

Breaker tripped warning: The control accepts inputs to monitor breaker trip / bell alarm contact and will initiate a breaker tripped warning if it should activate.

Fail to disconnect warning: In the controller is unable to open either breaker, a fail to disconnect warning is initiated. Typically, this would be mapped to a configurable output, allowing an external device to trip a breaker.

Fail to synchronize warning: Indicates that the genset could not be brought to synchronization with the bus. Configurable for adjustable time delay of 10 -900 seconds, 120 default.

Phase sequence sensing warning: Verifies that the genset phase sequence matches the bus prior to allowing the paralleling breaker to close.

Maximum parallel time warning (power transfer control mode only): During closed transition load transfers, control independently monitors paralleled time. If time is exceeded, warning is initiated and genset is disconnected.

Bus or genset PT input calibration warning: The control system monitors the sensed voltage from the bus and genset output voltage potential transformers. When the paralleling breaker is closed, it will indicate a warning condition if the read values are different.

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
- Rupture basin
- Start type signal
- Battle short
- Load demand stop
- Synchronize enable
- Genset circuit breaker inhibit
- Utility circuit breaker inhibit
- Single mode verify
- Transfer inhibit – prevent transfer to utility (in power transfer control mode)
- Retransfer inhibit – prevent retransfer to genset (in power transfer control mode)
- kW and kVAR load setpoints

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

Input signals for Lean Burn Natural Gas Engine applications:

- Gearbox oil pressure/temperature protection
- Fire fault
- Earth fault support as a discrete input via an appropriate secondary detection device
- Differential fault
- DC power supply fault
- Genset Interface Box (GIB) isolator open fault
- Start inhibit/enable (x3)
- Radiator fan trip
- Ventilator fan trip
- Ventilation louvers closed
- Start system trip
- Alternator heater trip
- Alternator heater status
- Alternator winding temperature (PT100 RTDx3)
- Alternator drive end bearing temperature (PT100 RTD)
- Alternator non-drive end bearing temperature (PT100 RTD)

Output signals from the PowerCommand® control include:

- Load dump signal: Operates when the genset 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.

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- Configurable relay outputs: Control includes (4) relay output contacts (3 A, 30VDC). 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 (genset running) signal: Operates when the genset has reached 90% of rated speed and voltage and latches until genset is switched to off or idle mode.
- Paralleling circuit breaker relays outputs: Control includes (4) relay output contacts (3.5A, 30 VDC) for opening and closing of the genset and utility breakers.

Output Signals for Lean Burn Natural Gas Engine applications:

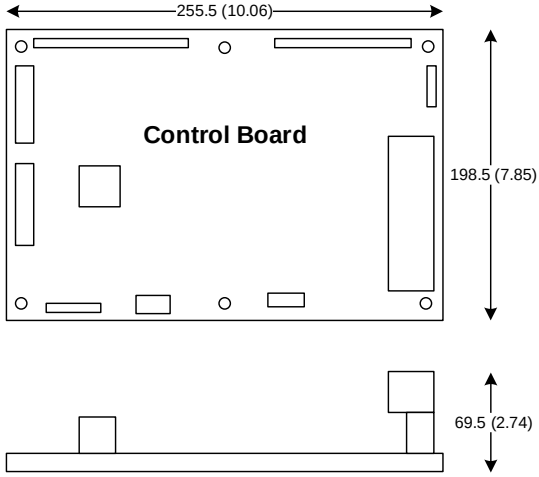
- Start inhibit/enable event
- Emergency stop event
- Ventilator fan run control
- Louvre control
- Radiator fan control
- Alternator heater control
- Engine at idle speed event

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 Power Generation products.

Mechanical Drawing



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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.

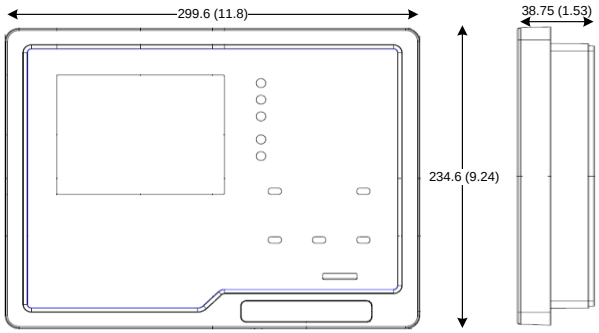
Features:

- LED indicating lamps
  - genset running
  - remote start
  - not in auto
  - shutdown
  - warning
  - auto
  - manual and stop
  - Circuit breaker open (if equipped)
  - Circuit breaker closed (if equipped)
- 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 gensets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., UKCA and CE standards.
- Languages supported: English, Spanish, French, German, Italian, Greek, Portuguese, Finnish, Norwegian, Danish, Russian (Cyrillic), Chinese, Hungarian, Japanese, Polish, Korean, Romanian, Brazilian Portuguese, Turkish, Dutch, and Czech

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



HMI

Dimensions: mm (inches)

Software

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

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Environment

The control is designed for proper operation without recalibration in ambient temperatures from -40 ºC (-40 ºF) to +70º C (158 ºF), and for storage from -55 ºC (-67 ºF) to +80 ºC (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 (-4 ºF) to +70 ºC (158 ºF), and for storage from -30 ºC (-22 ºF) to +80 ºC (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 genset. 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 8528-4:2005 compliance, controls and switchgear (second edition)
- 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.
- EN 61000-6-3,4 residential/light industrial emissions or industrial emissions.
- EN 50082-1,2 residential/light industrial or industrial susceptibility.
- ISO 7637-2, level 2; DC supply surge voltage test.
- Mil Std 202C, Method 101 and ASTM B117: Salt fog test.
- UL 6200 recognized, 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.
- ROHS (Restriction of Hazardous substance) complaint both for HMI 320 & PCC3300v2.

Reference Documents

Please refer to the following reference documents available in the PowerSuite library:

- PowerCommand™ 3.3. Application Guide
- T-037: PowerCommand Control Application Manual (ANSI Protective Functions)
- T-040: PowerCommand 3.3 Paralleling Application Guide

Please refer to the following reference documents available on Cummins Quickserve:

- Service Manuals for PC3.3 (non-MLD) and PC3.3 (MLD)
- Modbus Register Mapping

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

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Alternator Data Sheet
Frame Size: S9L1D-F4

Characteristics

	No of Bearings:	1-bearing		2-bearing	
Weights:	Stator assembly:	N/A	N/A	8245 lb	3740 kg
	Rotor assembly:	N/A	N/A	5765 lb	2615 kg
	Complete assembly:	N/A	N/A	16424 lb	7450 kg
Maximum speed:		2250 rpm			
Excitation current:	Full load:	Wdg 312: 3.9; Wdg 607: 3.6			
	No load:	Wdg 312: 0.8; Wdg 607: 0.8			
Insulation system:	Class H throughout				

3 Ø Ratings (0.8 power factor)			**60 Hz** (winding no)				
			416 (312)	440 (312)	460 (312)	480 (312)	600 (607)
150° C rise ratings	@ 40° C	kW	3304	3496	3657	3816	3825
		kVA	4130	4370	4571	4770	4781
125° C rise ratings	@ 40° C	kW	3096	3272	3422	3571	3575
		kVA	3870	4090	4278	4464	4469
105° C rise ratings	@ 40° C	kW	2892	3056	3198	3338	3350
		kVA	3615	3820	3998	4172	4187
80° C rise ratings	@ 40° C	kW	2512	2640	2779	2900	2900
		kVA	3140	3300	3474	2900	3625

Reactances (per unit ± 10%)	416 (312)	440 (312)	460 (312)	480 (312)	600 (607)
(Based on full load at 125° C rise rating)					
Synchronous	2.997	2.831	2.710	2.597	2.470
Transient	0.237	0.224	0.214	0.205	0.180
Subtransient	0.128	0.121	0.116	0.111	0.127
Negative sequence	0.242	0.228	0.218	0.209	0.190
Zero sequence	0.087	0.082	0.078	0.075	0.075

Motor starting	416 (312)	440 (312)	460 (312)	480 (312)	600 (607)
Maximum kVA (90% sustained voltage)	12390	13110	13713	14310	14343

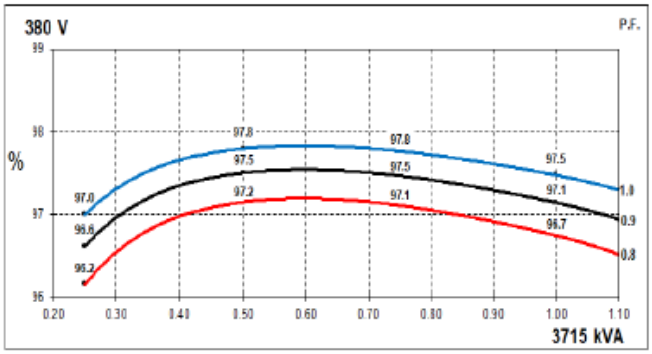
Time constants (sec)	416 (312)	440 (312)	460 (312)	480 (312)	600 (607)
Transient	0.243	0.243	0.243	0.243	0.230
Subtransient	0.016	0.016	0.016	0.016	0.019
Open circuit	4.8	4.8	4.8	4.8	4.95
DC	0.04	0.04	0.04	0.04	0.04

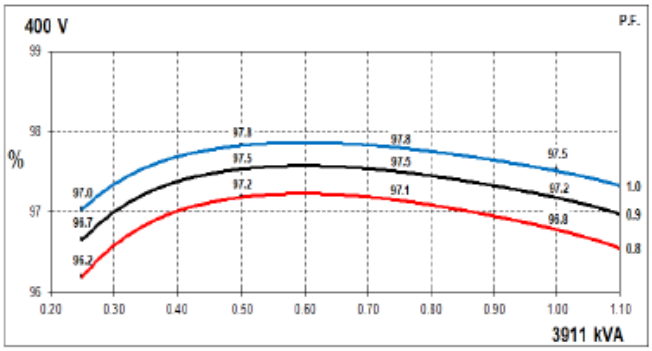
Windings (@22° C)		416 (312)	440 (312)	460 (312)	480 (312)	600 (607)
Stator resistance	(L-L Ohms)	0.0006	0.0006	0.0006	0.0006	0.0010
Rotor resistance	(Ohms)	0.741	0.741	0.741	0.741	0.741
Number of leads		6	6	6	6	6

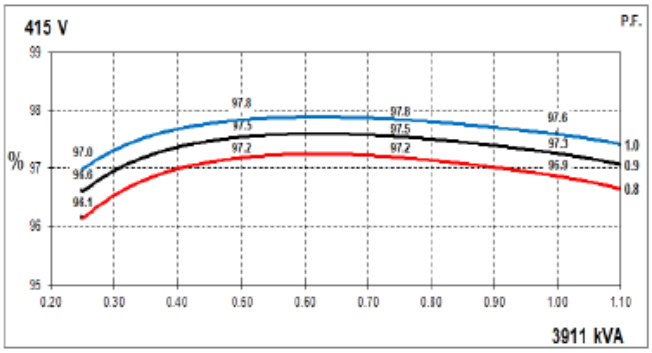
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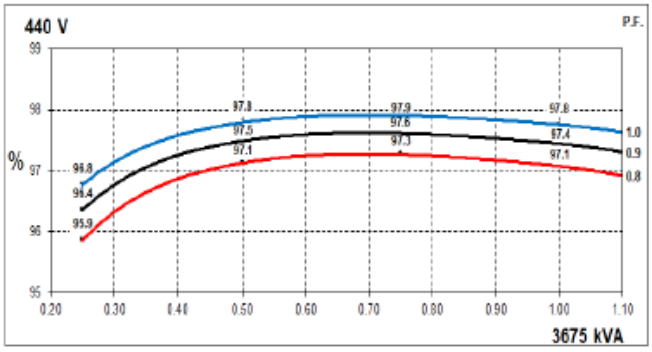
THREE PHASE EFFICIENCY CURVES

50Hz

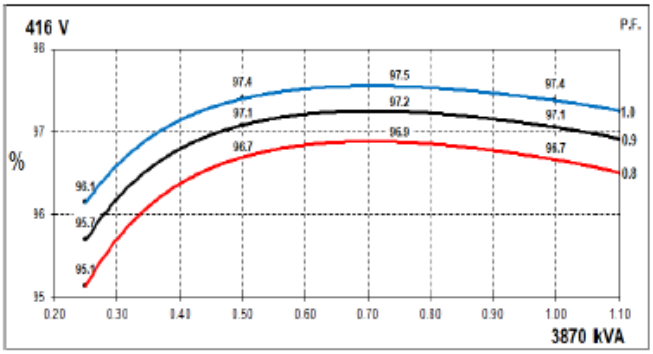


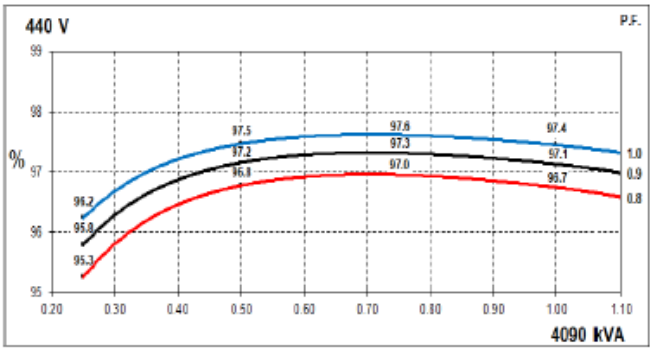


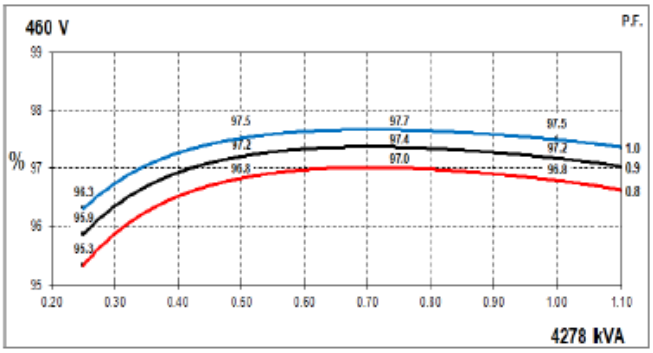


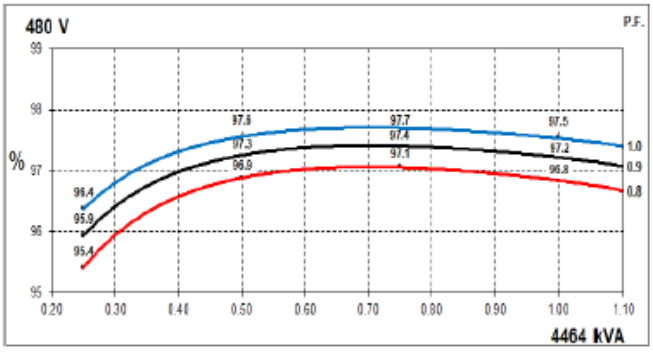


60Hz





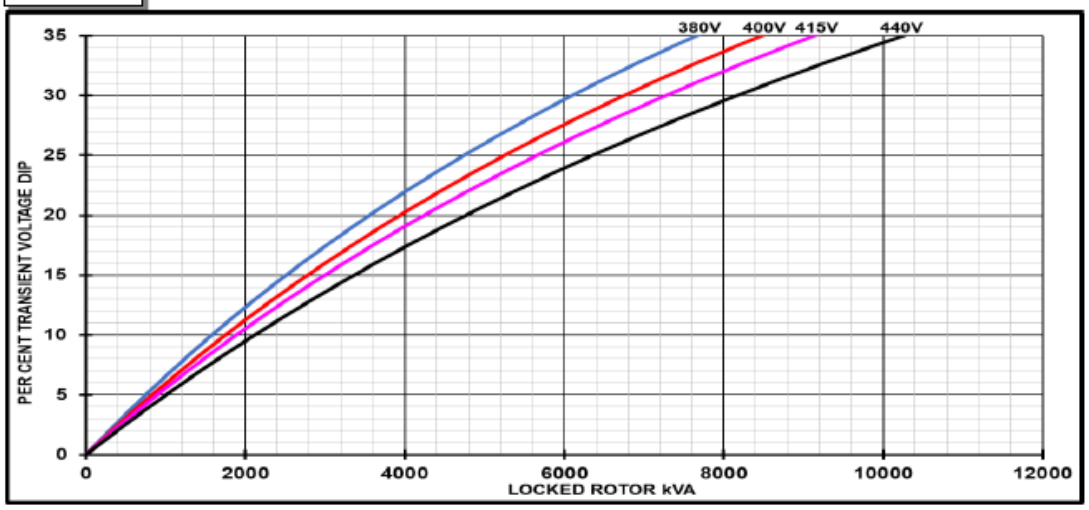




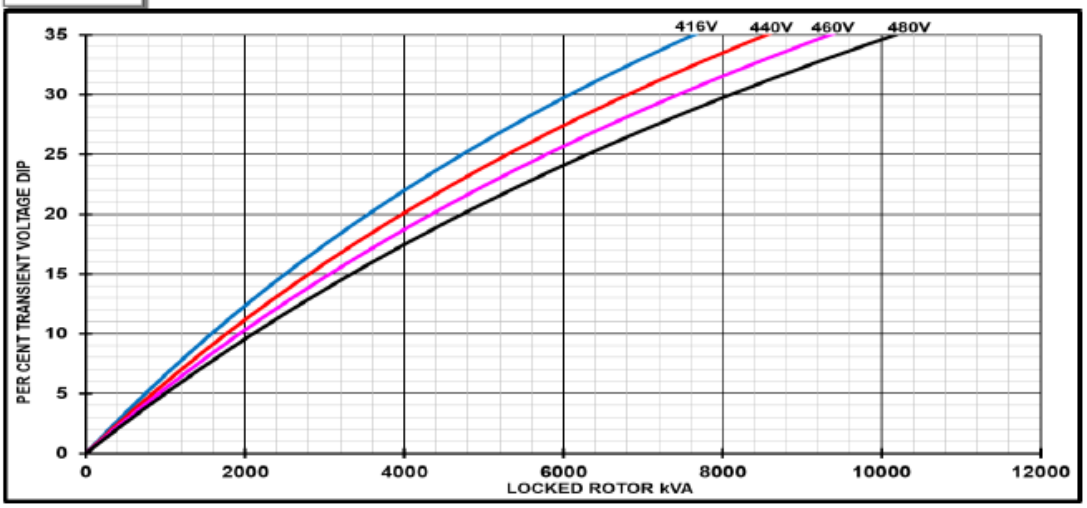
S9L1D-F4 Wdg.312

Locked Rotor Motor Starting Curves - Separately Excited

50Hz



60Hz



Transient Voltage Dip Scaling Factor	
Lagging PF	Scaling Factor
<= 0.4	1.00
0.5	0.95
0.6	0.90
0.7	0.86
0.8	0.83
0.9	0.75
0.95	0.70
1	0.65

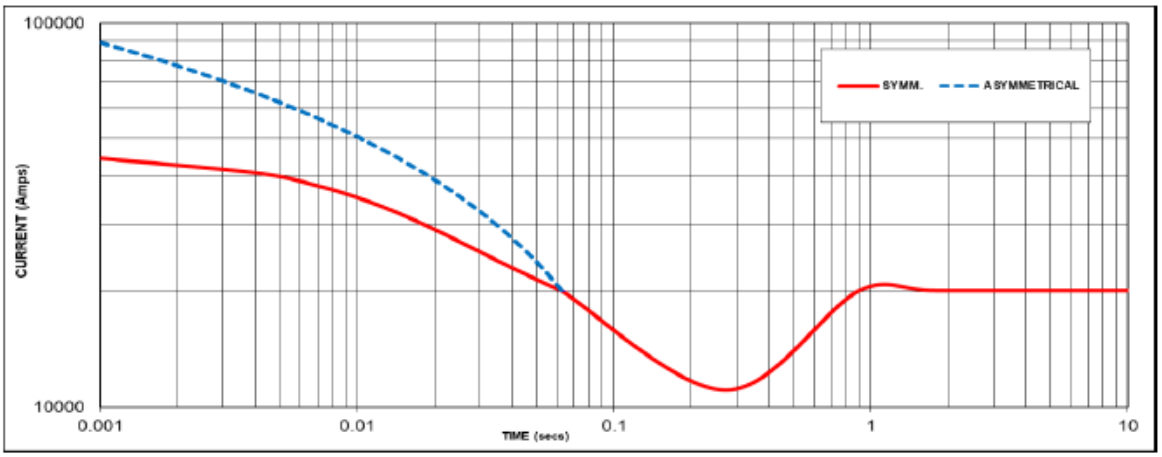
Transient Voltage Rise Scaling Factor	
Lagging PF	Scaling Factor
<= 0.4	1.25
0.5	1.20
0.6	1.15
0.7	1.10
> 0.7	1.00

Note: To determine % Transient Voltage Dip or Voltage Rise at various PF, multiply the % Voltage Dip from the curve directly by the Scaling Factor.

S9L1D-F4 Wdg.312

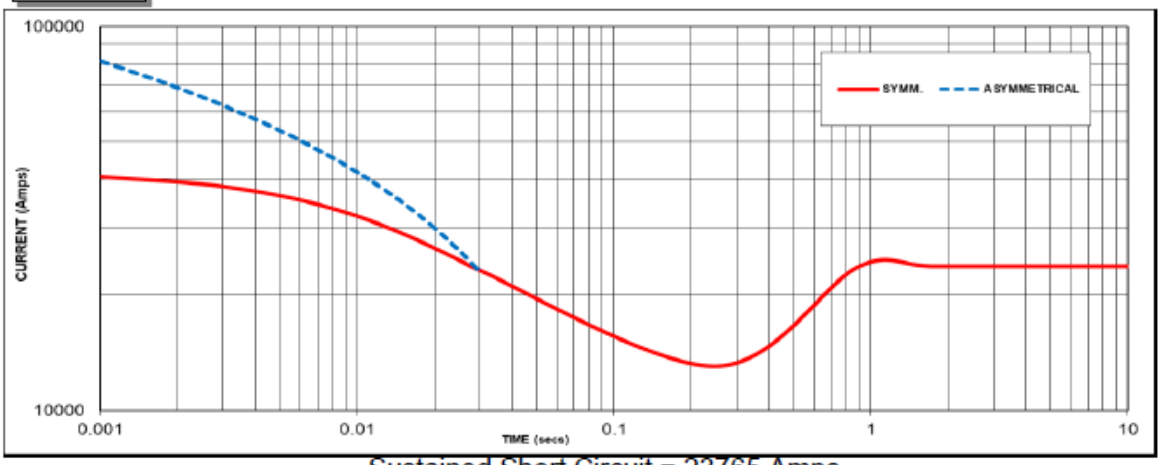
Three-phase Short Circuit Decrement Curve - Separately Excited

50Hz



Sustained Short Circuit = 20112 Amps

60Hz



Sustained Short Circuit = 23765 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 1.06
415V	X 1.09	460V	X 1.11
440V	X 1.16	480V	X 1.15

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 connections under no-load excitation at rated speeds. For other connection (where applicable) 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

Sound Data
C3500 D6e
QSK95-G9 60Hz Diesel

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 (Remote Cooling)	Infinite Exhaust	0% Standby	91.6	95.8	94.9	94.4	91.8	96.2	95.9	94.8	94.7
		50% Standby	93.0	97.6	95.6	95.8	93.6	97.7	97.7	97.2	96.3
		75% Standby	93.3	98.4	96.5	97.0	94.7	98.8	98.7	98.0	97.3
		100% Standby	94.5	100.2	98.2	98.9	95.3	100.5	100.5	99.2	98.9
Standard – Unhoused (High Ambient)	Infinite Exhaust	0% Standby	93.0	96.8	97.4	97.4	96.7	98.1	97.5	99.3	97.3
		50% Standby	93.3	97.8	98.0	97.9	96.4	98.7	98.0	100.1	97.9
		75% Standby	94.0	99.0	98.9	98.5	96.3	99.5	98.7	100.7	98.6
		100% Standby	94.6	101.0	101.0	100.6	96.4	101.2	100.0	102.5	100.2
Standard – Unhoused (Enhanced High Ambient)	Infinite Exhaust	0% Standby	95.1	98.8	98.7	98.9	99.9	99.1	100.9	98.7	99.0
		50% Standby	95.2	99.6	99.1	99.3	99.4	99.5	101.2	99.4	99.3
		75% Standby	95.5	100.2	99.6	99.7	99.3	100.0	101.6	99.8	99.7
		100% Standby	96.4	101.9	101.1	101.4	99.7	101.8	103.1	100.9	101.1
Standard – Unhoused (Compact High Ambient)	Infinite Exhaust	0% Prime	92.3	98.1	98.0	98.1	98.0	98.9	99.0	96.7	97.8
		50% Prime	93.2	98.6	98.6	98.4	97.9	99.3	100.0	97.4	98.3
		75% Prime	93.5	99.1	99.2	99.0	97.7	99.6	100.5	97.8	98.7
		100% Prime	94.0	100.4	100.5	100.3	97.7	100.5	101.4	98.7	99.7

Sound Data
C3500 D6e
QSK95-G9 60Hz Diesel

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 (Remote Cooling)	Infinite Exhaust	0% Standby	N/A	47.5	66.2	83.6	90.5	96.9	98.1	95.6	92.5	84.1	70.9	102.6
		50% Standby	N/A	48.7	66.7	84.5	89.9	96.8	98.4	98.3	94.9	98.7	80.4	104.8
		75% Standby	N/A	48.2	66.6	84.9	90.3	97.0	98.8	99.3	96.2	100.6	79.5	105.8
		100% Standby	N/A	46.6	66.3	86.3	90.1	97.5	99.1	100.0	98.3	103.8	80.1	107.5
Standard – Unhoused (High Ambient)	Infinite Exhaust	0% Standby	N/A	50.2	64.8	90.6	95.2	98.1	98.6	95.3	90.3	81.5	68.6	103.6
		50% Standby	N/A	50.8	65.8	90.3	95.2	98.1	98.5	97.2	92.0	90.8	72.6	104.1
		75% Standby	N/A	50.3	67.3	90.5	95.4	98.3	98.9	98.4	93.4	93.8	73.9	104.9
		100% Standby	N/A	49.8	67.1	90.7	95.6	98.5	99.2	99.0	96.0	101.2	76.5	106.6
Standard – Unhoused (Enhanced High Ambient)	Infinite Exhaust	0% Standby	N/A	49.3	65.7	93.1	96.8	100.2	99.5	95.6	91.5	82.3	69.3	105.0
		50% Standby	N/A	49.5	66.6	93.0	96.6	100.0	99.3	97.1	92.9	95.1	76.5	105.5
		75% Standby	N/A	49.6	66.8	93.0	96.6	99.9	99.5	98.0	94.1	97.2	76.1	106.0
		100% Standby	N/A	49.4	67.0	93.4	97.0	100.3	99.8	99.1	96.6	101.3	78.2	107.3
Standard – Unhoused (Compact High Ambient)	Infinite Exhaust	0% Prime	N/A	53.6	67.8	87.1	94.5	98.7	99.8	97.2	93.7	86.0	72.5	104.5
		50% Prime	N/A	53.7	68.8	87.8	94.6	99.0	99.9	98.3	94.6	92.9	75.6	105.2
		75% Prime	N/A	54.3	69.6	88.1	94.6	98.8	100.0	98.9	95.4	96.0	77.4	105.6
		100% Prime	N/A	54.1	69.5	88.2	94.6	98.9	100.2	99.7	97.6	100.9	78.7	106.9

Sound Data
C3500 D6e
QSK95-G9 60Hz Diesel

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 (Remote Cooling)	Infinite Exhaust	75% Standby	N/A	50.1	69.6	85.8	89.7	97.5	99.0	98.0	95.0	97.2	76.8	104.7
		100% Standby	N/A	48.7	69.8	86.9	91.7	97.6	99.1	98.2	96.9	100.6	79.2	105.9
Standard – Unhoused (High Ambient)	Infinite Exhaust	75% Standby	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		100% Standby	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Standard – Unhoused (Enhanced High Ambient)	Infinite Exhaust	75% Standby	N/A	48.8	67.5	88.2	94.8	98.5	98.4	98.1	93.4	95.8	73.8	104.8
		100% Standby	N/A	48.9	67.8	89.7	96.3	98.9	98.7	98.5	95.3	99.5	76.5	106.0
Standard – Unhoused (Compact High Ambient)	Infinite Exhaust	75% Prime	N/A	52.3	70.6	87.5	92.0	99.3	100.4	98.8	93.6	94.0	75.0	105.3
		100% Prime	N/A	51.8	70.7	87.5	91.7	99.2	100.5	99.5	94.6	95.9	74.7	105.7

Sound Data
C3500 D6e
QSK95-G9 60Hz Diesel

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 (Remote Cooling)	Infinite Exhaust	0% Standby	N/A	68.0	86.8	104.2	111.1	117.5	118.7	116.2	113.1	104.7	91.5	123.2
		50% Standby	N/A	69.2	87.3	105.1	110.5	117.4	119.0	118.9	115.5	119.3	101.0	125.4
		75% Standby	N/A	68.7	87.1	105.5	110.9	117.6	119.4	119.9	116.8	121.2	100.1	126.4
		100% Standby	N/A	67.2	86.9	106.9	110.7	118.1	119.7	120.6	118.9	124.4	100.7	128.1
Standard – Unhoused (High Ambient)	Infinite Exhaust	0% Standby	N/A	72.9	87.6	113.4	117.9	120.9	121.3	118.1	113.1	104.2	91.4	126.4
		50% Standby	N/A	73.6	88.6	113.1	118.0	120.9	121.3	120.0	114.8	113.6	95.4	126.9
		75% Standby	N/A	73.0	90.1	113.3	118.2	121.1	121.7	121.1	116.2	116.6	96.6	127.6
		100% Standby	N/A	72.5	89.9	113.5	118.4	121.2	122.0	121.8	118.7	124.0	99.3	129.4
Standard – Unhoused (Enhanced High Ambient)	Infinite Exhaust	0% Standby	N/A	72.3	88.7	116.1	119.9	123.3	122.5	118.7	114.5	105.4	92.4	128.0
		50% Standby	N/A	72.5	89.7	116.0	119.7	123.0	122.4	120.2	116.0	118.2	99.5	128.6
		75% Standby	N/A	72.6	89.8	116.1	119.6	123.0	122.5	121.1	117.1	120.3	99.2	129.0
		100% Standby	N/A	72.4	90.0	116.4	120.0	123.3	122.9	122.1	119.7	124.3	101.2	130.3
Standard – Unhoused (Compact High Ambient)	Infinite Exhaust	0% Prime	N/A	76.0	90.3	109.5	117.0	121.2	122.2	119.7	116.2	108.5	95.0	127.0
		50% Prime	N/A	76.2	91.3	110.2	117.0	121.4	122.3	120.8	117.1	115.3	98.1	127.6
		75% Prime	N/A	76.8	92.0	110.5	117.1	121.3	122.4	121.4	117.8	118.5	99.8	128.1
		100% Prime	N/A	76.6	92.0	110.6	117.0	121.3	122.7	122.2	120.0	123.3	101.1	129.4

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 (With Tailpipe)	0% Standby	N/A	60.4	85.4	95.6	109.2	109.7	109.9	107.9	104.6	96.3	82.5	115.7
	50% Standby	N/A	65.5	94.1	102.1	118.4	117.2	118.1	118.0	115.9	110.5	97.6	124.8
	75% Standby	N/A	68.5	98.2	107.0	122.6	120.7	120.5	120.5	119.8	115.6	99.9	128.2
	100% Standby	N/A	71.0	101.1	110.2	123.0	124.9	124.6	124.6	125.2	123.7	104.1	132.2

Sound Data
C3500 D6e
QSK95-G9 60Hz Diesel

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. Fan noise is not included for the configuration with remote cooling system. Fan noise is included for the configurations with a specific cooling system.
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 at 1 meter 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 1.5 height.

Cooling System Data
C3500 D6e

High Ambient Air Temperature Radiator Cooling System												
				Max cooling @ air flow static restriction, unhoused (inches water/mm water)					Housed in free air, no air discharge restriction		
				0.0/0.0	0.25/6.4	0.5/12.7	0.75/19.1	1.0/25.4	Weather	Sound level 1	Sound level 2
	Fuel Type	Duty	Rating (kW)	Maximum allowable ambient temperature, degree C							
60 Hz	Diesel	Standby	3500	50	48	47	44	42	N/A	N/A	N/A
		Prime	3000	52	51	49	46	44	N/A	N/A	N/A
		Continuous	2750	55	53	51	49	47	N/A	N/A	N/A
		DCC	3350	52	50	48	46	44	N/A	N/A	N/A
				Airflow (m^3/s) – Actual @ Fan							
				75.4	72.7	70	68.5	67	N/A	N/A	N/A

Enhanced High Ambient Air Temperature Radiator Cooling System												
				Max cooling @ air flow static restriction, unhoused (inches water/mm water)					Housed in free air, no air discharge restriction		
				0.0/0.0	0.25/6.4	0.5/12.7	0.75/19.1	1.0/25.4	Weather	Sound level 1	Sound level 2
	Fuel Type	Duty	Rating (kW)	Maximum allowable ambient temperature, degree C							
60 Hz	Diesel	Standby	3500	54	54	53	51	49	N/A	N/A	N/A
		Prime	3000	54	52	50	48	46	N/A	N/A	N/A
		Continuous	2750	55	54	53	51	49	N/A	N/A	N/A
		DCC	3350	55	54	53	51	49	N/A	N/A	N/A
				Airflow (m^3/s) – Actual @ Fan							
				75.4	72.7	70	68.5	67	N/A	N/A	N/A

Notes:

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

2026 EPA Tier 2 Exhaust Emission Compliance Statement C3500 D6e Stationary Emergency

60 Hz Diesel Generator Set

Compliance Information:

The engine used in this generator set complies with Tier 2 emissions limit of U.S. EPA New Source Performance Standards for stationary emergency engines under the provisions of 40 CFR 60 Subpart IIII when tested per ISO8178 D2.

Engine Manufacturer:	Cummins Inc.
EPA Certificate Number:	TCEXL95.0AAA-029
Effective Date:	10/09/2025
Date Issued:	10/09/2025
EPA Engine Family (Cummins Emissions Family):	TCEXL95.0AAA

Engine Information:

Model:	QSK95-G9	Bore:	7.48 in. (190 mm)
Engine Nameplate HP:	5051	Stroke:	8.27 in. (210 mm)
Type:	4 cycle, Vee, 16 Cylinder Diesel	Displacement:	5816 cu. in. (95.3 liters)
Aspiration:	Turbocharged and Aftercooled	Compression Ratio:	15.5:1
Emission Control Device:	Turbocharged and Aftercooled	Exhaust Stack Diameter:	14 in.

Diesel Fuel Emissions Limits

D2 Cycle Exhaust Emissions

	Grams per BHP-hr			Grams per kW_m-hr		
	NO_X + NMHC	CO	PM	NO_X + NMHC	CO	PM
EPA Emissions Limit	4.8	2.6	0.15	6.4	3.5	0.20

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

Diesel fuel specifications: Cetane number: 40-50. Reference: ASTM D975 No. 2-D, 7-15 ppm Sulfur

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

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

Exhaust Emission Data Sheet
C3500 D6e
60 Hz Diesel Generator Set
EPA Tier 2

Engine Information:

Model:	Cummins Inc. QSK95-G9	Bore:	7.48 in. (190 mm)
Type:	4 Cycle, VEE, 16 cylinder diesel	Stroke:	8.27 in. (210 mm)
Aspiration:	Turbocharged and Aftercooled	Displacement:	5816 cu. in. (95.3 liters)
Compression Ratio:	15.5:1		
Emission Control Device:	Turbocharged and Aftercooled		
Emission Level:	Stationary Emergency		

Performance Data	1/4 Standby	1/2 Standby	3/4 Standby	Full Standby	Full Prime	Full Continuous
Engine BHP @ 1800 RPM (60 Hz)	1263	2526	3788	5051	4309	3963
Fuel Consumption L/Hr (US Gal/Hr)	278 (74)	494 (131)	691 (183)	908 (240)	776 (205)	719 (190)
Exhaust Gas Flow m³/min (CFM)	308 (10876)	486 (17154)	603 (21298)	719 (25408)	649 (22925)	618 (21829)
Exhaust Gas Temperature °C (°F)	348 (658)	366 (691)	413 (776)	495 (923)	442 (828)	422 (792)
Exhaust Emission Data						
HC (Total Unburned Hydrocarbons)	0.27 (103)	0.16 (70)	0.09 (41)	0.05 (24)	0.07 (33)	0.08 (37)
NOx (Oxides of Nitrogen as NO_2)	3.15 (1197)	3.34 (1440)	4.53 (2086)	5.90 (2785)	5.21 (2438)	4.81 (2228)
CO (Carbon Monoxide)	0.47 (178)	0.22 (97)	0.19 (86)	0.34 (160)	0.21 (99)	0.19 (87)
PM (Particulate Matter)	0.16 (53)	0.08 (31)	0.04 (17)	0.02 (9)	0.03 (13)	0.04 (15)
SO_2 (Sulfur Dioxide)	0.005 (1.8)	0.005 (1.8)	0.005 (1.8)	0.004 (1.7)	0.004 (1.8)	0.004 (1.8)
Smoke (FSN)	0.78	0.57	0.41	0.28	0.34	0.37

All values (except smoke) are cited: g/BHP-hr (mg/Nm³ @ 5% O2)

Test Conditions

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

Fuel Specification:	40-48 Cetane Number, 0.0015 Wt.% Sulfur; Reference ISO8178-5, 40 CFR 86, 1313—98 Type 2-D and ASTM D975 No. 2-D. Fuel Density at 0.85 Kg/L (7.1 lbs/US Gal)
Air Inlet Temperature	25 °C (77 °F)
Fuel Inlet Temperature:	40 °C (104 °F)
Barometric Pressure:	100 kPa (29.53 in Hg)
Humidity:	NOx measurement corrected to 10.7 g/kg (75 grains H_2O/lb) of dry air
Intake Restriction:	Set to 18 in of H_2O as measured from compressor inlet
Exhaust Back Pressure:	Set to 1.5 in Hg
Note:	mg/m³ values are measured dry, corrected to 5% O_2 and normalized to standard temperature and pressure (0°C, 101.325 kPa)

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. Data for the other components are estimated. 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	
C3500 D6e	C3500 D6	Model:	C3500 D6
C3250 D6e	C3250 D6	Engine:	QSK95-G9
C3000 D6e	C3000 D6	Alternator:	S9H1D-H4

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: N/A 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

Torsional analysis and testing:

The generator set on S9H1D-H4 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 1350 to 1950 RPM.

Cooling system: 50°C ambient
0.5 in H2O restriction

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

Durabilty:

The generator set was subjected to 130 hour of endurance testing replicating field duty cycles operating at variable load up to the standby rating based on 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:	± 0.5%
Random voltage variation:	± 0.5%
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:	27.9%
Recovery time:	3.8 seconds
Frequency dip:	9.9%
Recovery time:	4.6 seconds

Full load rejection:

Voltage rise:	19.5%
Recovery time:	3.7 seconds
Frequency rise:	8.0%
Recovery time:	4.5 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	0.007	0.18	0.016	0.18
5	1.098	0.30	1.083	0.30
7	1.002	0.42	0.982	0.42
9	0.017	0.54	0.010	0.54
11	0.050	0.66	0.051	0.66
13	0.176	0.78	0.183	0.78
15	0.006	0.90	0.003	0.90

VMC GROUP
THE POWER OF TOGETHER™

CERTIFICATE OF COMPLIANCE
SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certification No.

VMA-49625-01C (Revision 8)

Expiration Date: 6/30/2027

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 2021, 2018, 2015, 2012; EC8 2004

The following model designations, options, and accessories are included in this certification. Reference report number VMA-49625-01 as issued by The VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

Cummins Power Generation, Inc.; Diesel Gensets
QSK95 Series; 3000 kW - 3500 kW

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 CERL (US Army Corp. of Engineers) Laboratory under the witness of the ISO Accredited Product Certification Agency, the VMC Group.

Certified Seismic Design Levels[8]			
Certified **IBC**	**Importance $I_p \le 1.5$** Soil Classes A-E Risk Categories I-IV Design Categories A-F	z/h ≤ 1.0 $S_{DS} \le 2.000$ g	z/h = 0.0 $S_{DS} \le 2.400$ g
Certified **EC8**[9]	**Importance $Y_a \le 1.5$** Soil Classes A-E, Type I-II	$a_g \le 0.165$ g	$a_g \le 0.374$ g

The qualified seismic design level stated is the highest for all series this certificate covers. For more information, see the certified product tables on page 2.

Certified Seismic Installation Methods
External Isolation 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
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CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certified Product Table:

Model	Frequency (Hz)	Max kW Rating	Max kVA Rating	Length (in.)	Width (in.)	Height (in.)	Max Weight (lbs.)
C3500 D5	50	N/A	3500	311	119	144	76566
C3500 D5e							
C3750 D5			3750				78947
C3750 D5e							
C3000 D6	60	3000	N/A				74060
C3000 D6e							
C3250 D6		3500					79807
C3250 D6e							
C3500 D6e							
C3500 D6							

Type	Model	S_{DS} (z/h=0)	S_{DS} (z/h=1)	A_{Flex-H}	A_{Rig-H}	A_{Flex-V}	A_{Rig-V}	F_p/W_p
AC156	All models not using MFTP Fuel Filter	2.40	2.00	3.20	2.40	1.61	0.65	4.50
	Any models using MFTP Fuel Filter	2.10	1.94	3.10	2.33	1.41	0.57	4.37

This certification includes the open generator set and included factory supplied options. This certification only covers accessoriesand options directly mounted to the genset. The genset and applicable options shall be installed per the manufacturer supplied seismic installation instructions. For a list of certified configurations and options please directly contact the manufacturer. This certification excludes all non-factory supplied accessories and options, including but not limited toisolation/restraint devices, other electrical/mechanical components and all connections for electrical, fuel, heating or cooling fluid, or otherpipe/conduit connections and configurations not detailed in the above charts. Flexibility in the connections must be maintained as to not transmitload into the equipment. Fuel tanks, enclosures, and design specials are outside the scope of this certification.

IBC® CERTIFIED VMC GROUP

VMA-49625-01C (Revision 8)
Issue Date: Friday, April 17, 2015
Revision Date: Tuesday, June 4, 2024
Expiration Date: Wednesday, June 30, 2027

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CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Cross-Code Compliance:

EC8 Approved Equivalent a_g							
Earthquake Type	Install Height	f_1/f_a					
		0.01	0.10	0.50	1.0	2.0	100.0
Type 2 Only	z/h = 0.0	0.701	0.614	0.374	0.284	0.711	0.711
Type 1 Only		0.596	0.596	0.481	0.366	0.596	0.596
Type 1 and Type 2				0.374	0.284		
Type 2 Only	z/h = 1.0	0.281	0.253	0.165	0.129	0.284	0.711
Type 1 Only		0.361	0.325	0.213	0.166	0.366	0.596
Type 1 and Type 2		0.281	0.253	0.165	0.129	0.284	

* The type of earthquake to use per country/region is listed in the national annex
* The f_1/f_a is fundamental frequency of the building divided by that of the component
* The column for f_1/f_a can be used as the most conservative approved ground motion

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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 tested units 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 2021 referencing ASCE7-16 and ICC-ES AC-156
   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
   EC8 2004 full reference Eurocode EN-1998 2004
   Italian Eurocode 8 Annex Published 2007 (Building Code Annex)

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 makes no statements of compliance in regards to NEMA, IP, UL, CSA, or other relevant standards after a seismic event. For compliance to other relevant standards, please contact the manufacturer.

6. This certificate applies to units manufactured at:
   1400 73rd Ave NE, Fridley, MN 55432

7. This certification follows the VMC Group's ISO-17065 Scheme.

8. The qualified seismic design level stated is the highest for all series this certificate covers. For more information, see the certified product tables on page 2.

9. The Eurocode 8 maximum ground motion for equipment installed at grade or roof listed assumes that the fundamental frequency of the component is exactly twice that of the building (approximately 5 times more stiff compared to the building). If the frequency of the building or equipment is not known for a particular project, the cross-code table for EC8 may be used after the certified product table for the value of f_1/f_a as it represents the worst case amplification (and thus approves the lowest most conservative maximum ground motion).

John P. Giuliano, PE
President, VMC Group

IAS ACCREDITED Product Certification Agency

VMA-49625-01C (Revision 8)
Issue Date: Friday, April 17, 2015
Revision Date: Tuesday, June 4, 2024
Expiration Date: Wednesday, June 30, 2027

IBC CERTIFIED VMC GROUP

SECTION 3

Generator Drawings and Interconnects

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS WITH IMPERIAL INCH CONVERSIONS IN "[ ]".

   1.1 IN EVENT OF A DISCREPANCY BETWEEN METRIC AND IMPERIAL DIMENSIONS, THE METRIC DIMENSIONS CONTROL.

2. ALL DIMENSIONS ARE REFERENCE, UNLESS SPECIFICALLY TOLERANCED..

3. WEIGHT: REFER TO TABLE FOR STANDARD GENSET.

   *3.1 INCLUDES WEIGHT OF 606 LITERS [160 GALLONS] SUPPLIED ENGINE OIL.(530 KG/1168 LBS)

   **3.2 DOES NOT INCLUDE NON-SUPPLIED 378.5 LITERS [100 GALLONS] OF ENGINE COOLANT CAPACITY.

4. LARGEST REMOTE COOLED GENSET DIMENSIONS:
   4.1 LENGTH: 6415 [252.6]
   4.2 WIDTH: 2594 [102.1]
   4.3 HEIGHT: 3009 [118.5]
   4.4 DOES NOT INCLUDE THE HEIGHT OF VIBRATION ISOLATOR

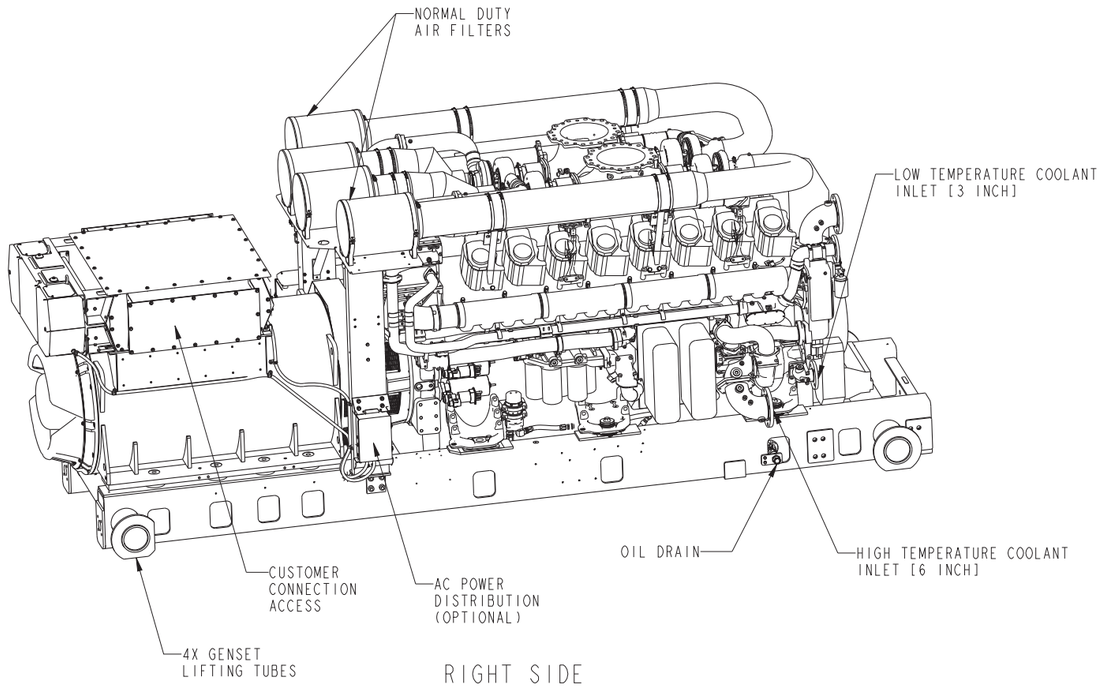
△5 LIFTING INSTRUCTIONS: REFER TO GENSET INSTALLATION MANUAL AND LIFTING LABEL.

   NOTE: GENSET SHALL NOT BE LIFTED USING THE LIFTING TUBES WHEN ATTACHED TO THE RADIATOR. RADIATOR AND GENSET SHALL ALWAYS BE LIFTED SEPARATELY PER INSTALLATION MANUAL AND LIFTING DIAGRAMS.

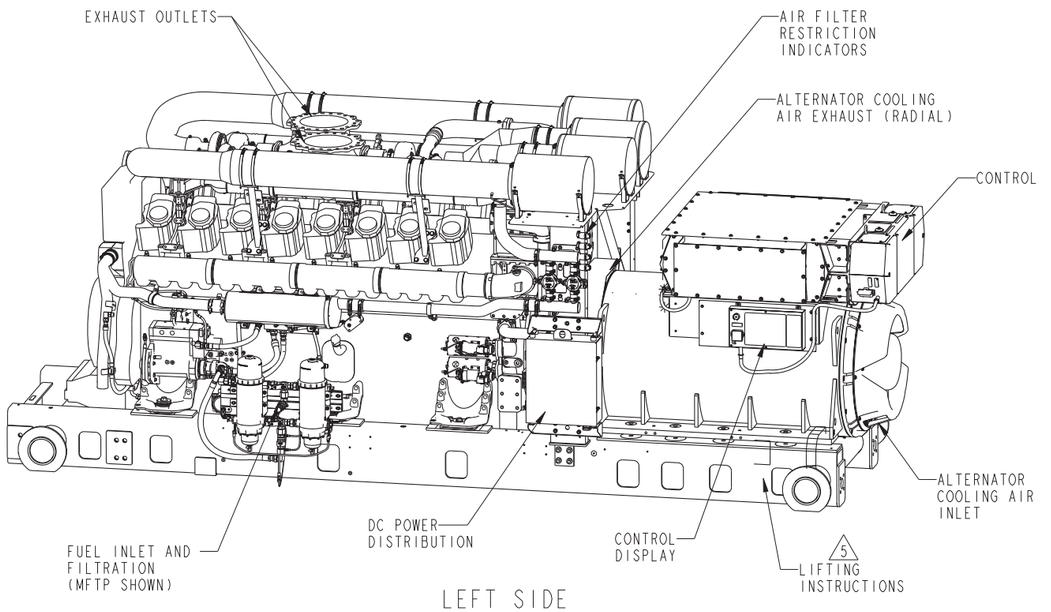
6. ALLOW 1 METER OF SPACE AROUND THE GENSET FOR SERVICE.

△7 ISOLATORS ARE MODELED IN THEIR UNCOMPRESSED STATE AND THEIR HEIGHT CHANGE UNDER LOAD MUST BE CONSIDERED FOR SITE CONNECTIONS. WHEN PROPERLY INSTALLED, STANDARD GENESET ISOLATORS WILL DEFLECT APPROXIMATELY 13 mm FROM THEIR UNCOMPRESSED HEIGHT. RESTRAINED ISOLATORS WILL INCREASE IN HEIGHT BY APPROXIMATELY 5 mm. CUSTOMER EXHAUST AND SITE CONNECTIONS SHALL BE CAPABLE OF ACCOMMODATING THIS RANGE.

8. SEE NOTES ON SHEET 7, 8, 11, 13, 14, 17 AND 20.



RIGHT SIDE



LEFT SIDE

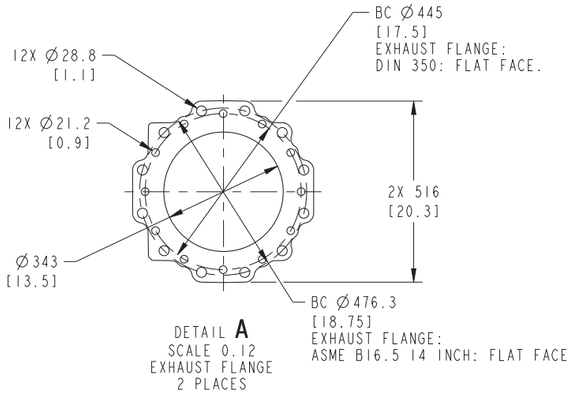
STANDARD GENSET WITH S9HID-H42 ALTERNATOR AND NORMAL DUTY AIR INDUCTION CONFIGURATION SHOWN

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 1 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

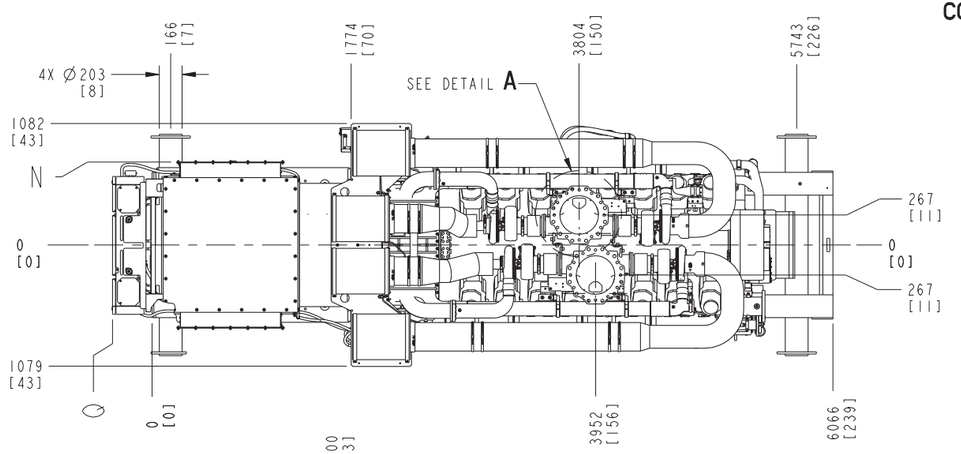
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LAST DATUM LETTER USED: .	LAST REFERENCE LETTER USED: W
MODEL/PLATFORM: C3250D6	THIS PART IS SIMILAR TO: A049P698
Cummins Inc.	
DIMENSIONS ARE IN: MILLIMETERS [ ] ARE IN: INCHES	SIZE: A1 SCALE:13/320
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009	THIRD ANGLE PROJECTION
	CAD SYSTEM PTC® Creo® Parametric

GENSET DIMENSIONAL AND LIFTING DETAILS INCLUDE C OF G, COOLING SYSTEM DETAILS, EXHAUST FLANGE CONNECTIONS.

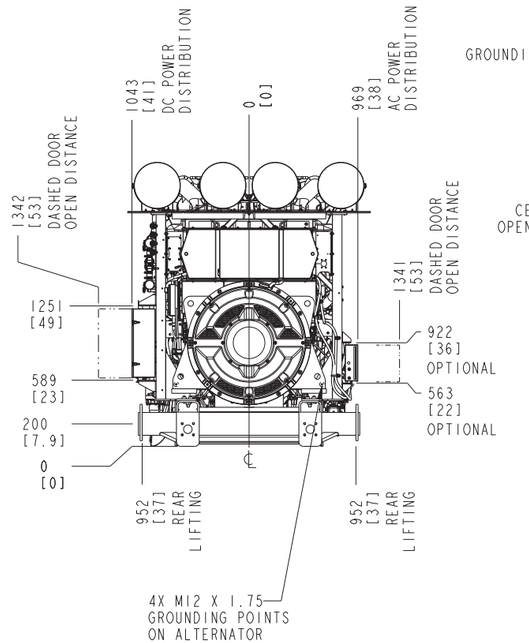


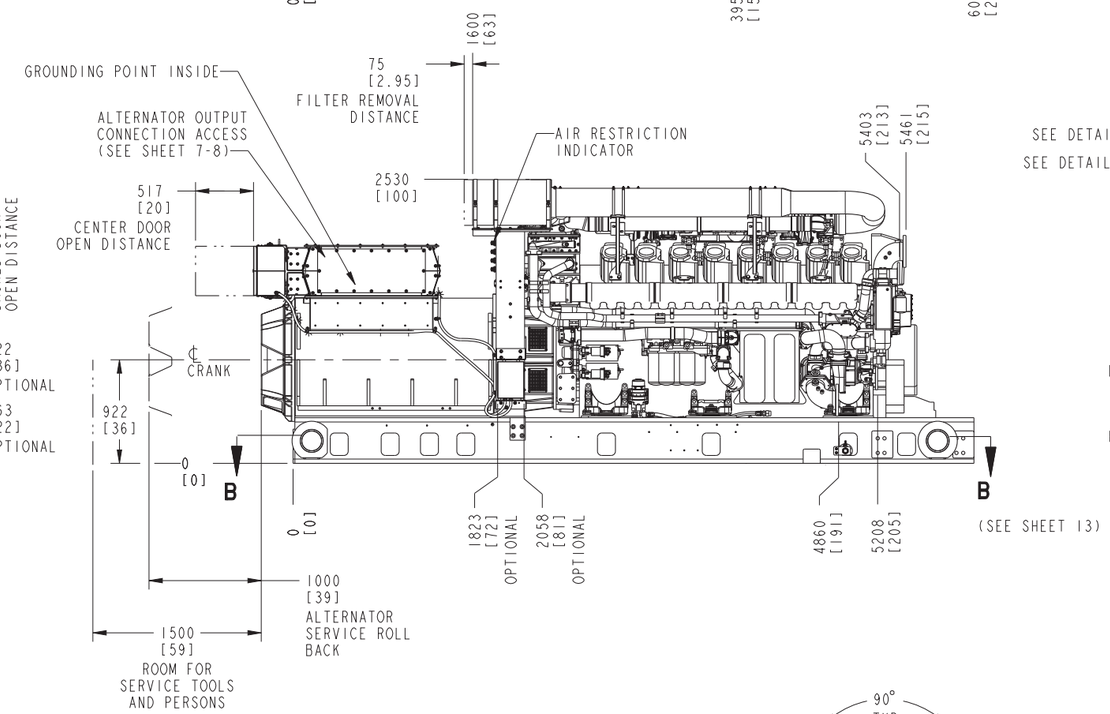
DETAIL **A**
SCALE 0.12
EXHAUST FLANGE
2 PLACES

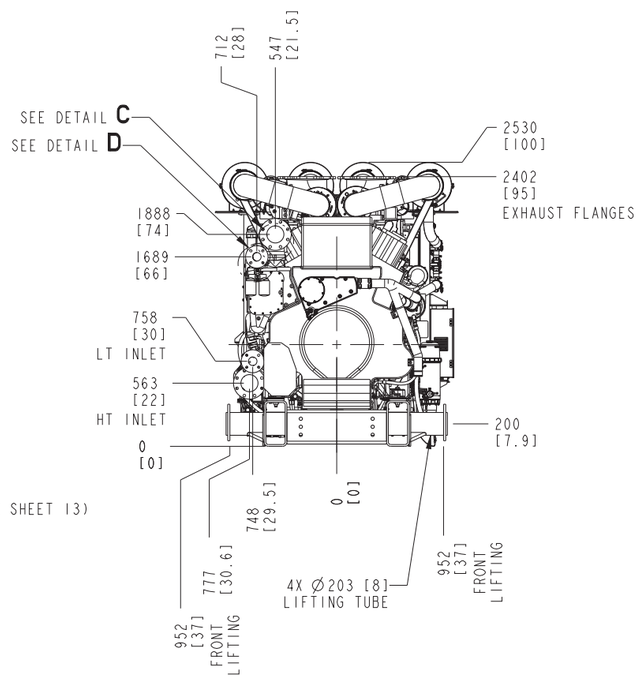


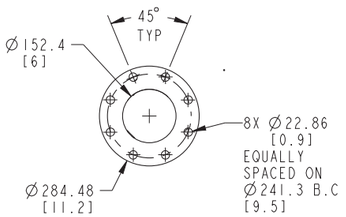
	MV AND HV CORE			
DIMENSION	E	F	G	H
N	739	739	739	739
Q	166	166	352	352

	LV CORE		
DIMENSION	E	F	G
N	611	611	611
Q	161	231	351

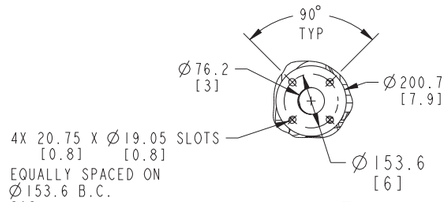








DETAIL **C**
HT COOLANT INLET AND
OUTLET CONNECTIONS
SCALE 0.13



DETAIL **D**
LT COOLANT INLET AND
OUTLET CONNECTIONS
SCALE 1/8

STANDARD GENSET WITH NORMAL DUTY
AIR INDUCTION CONFIGURATION SHOWN

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 2 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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Cummins Inc.

DIMENSIONS ARE IN: MILLIMETERS
[ ] ARE IN: INCHES

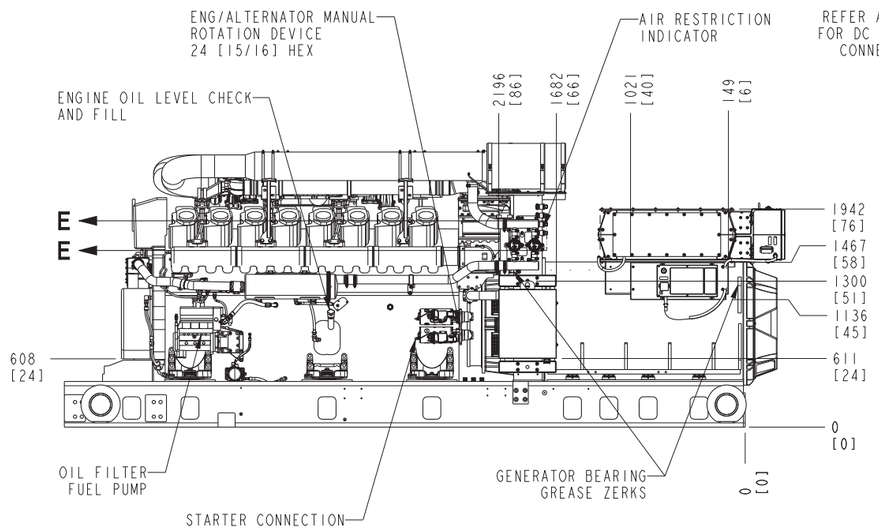
SIZE: A1 SCALE:13/320

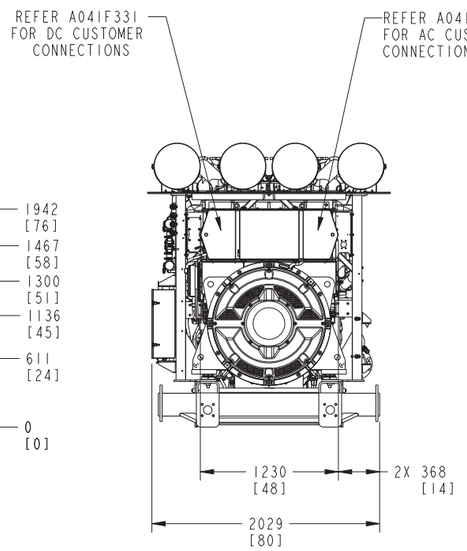
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009

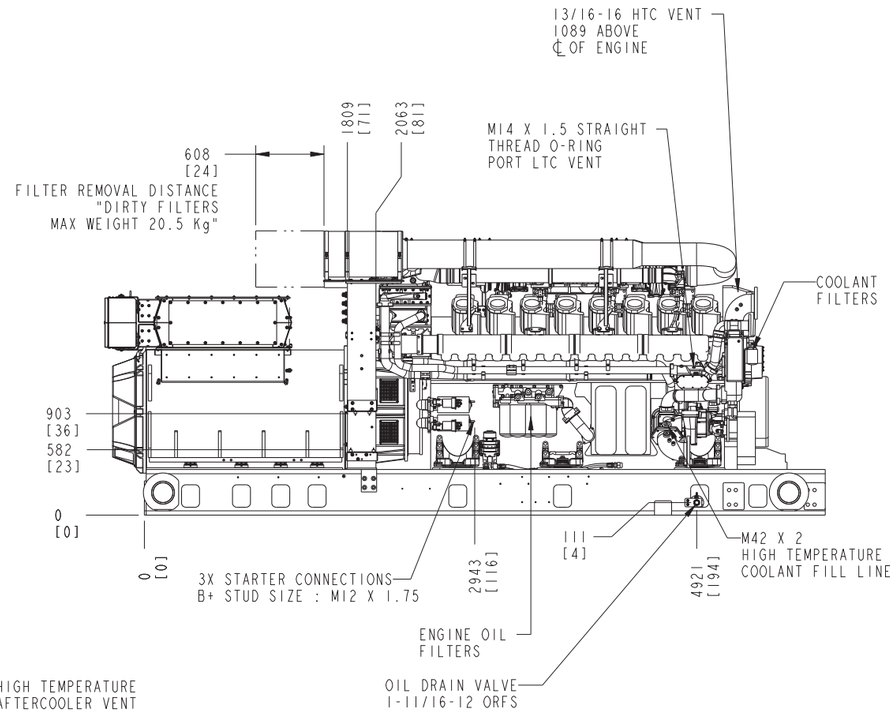
THIRD ANGLE PROJECTION

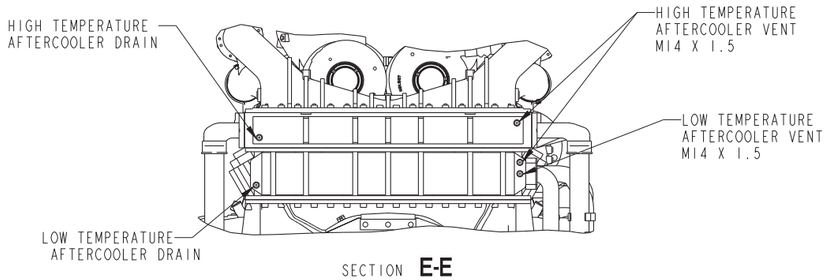
CAD SYSTEM
PTC® Creo® Parametric

GENSET SERVICE DETAILS









SECTION **E-E**
ON ENGINE COOLANT DRAIN AND VENT PORTS
SCALE 29/320

STANDARD GENSET WITH NORMAL DUTY AIR INDUCTION CONFIGURATION SHOWN

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 3 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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DIMENSIONS ARE IN: MILLIMETERS
[ ] ARE IN: INCHES

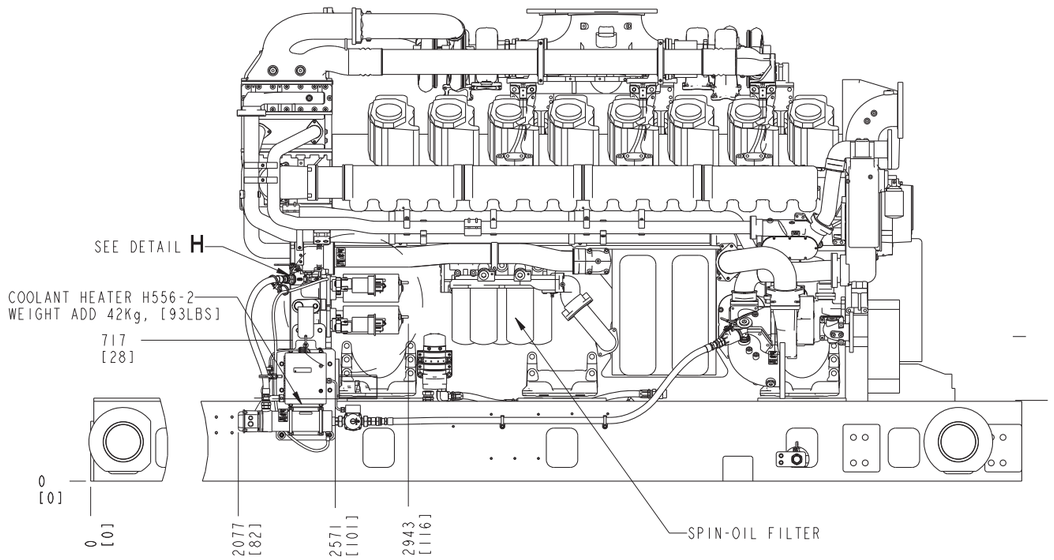
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DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009

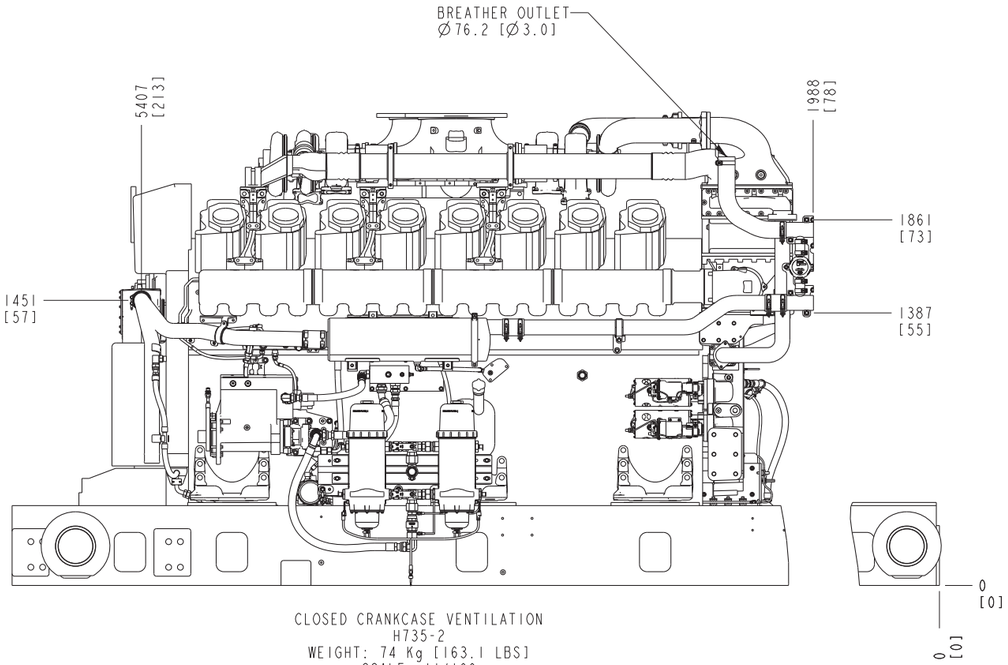
THIRD ANGLE PROJECTION

CAD SYSTEM
PTC® Creo® Parametric

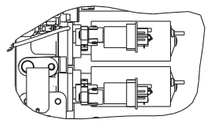
GENSET OPTION DETAILS: COOLANT HEATER, CCV, AIR START AND COALESCER BREATHER



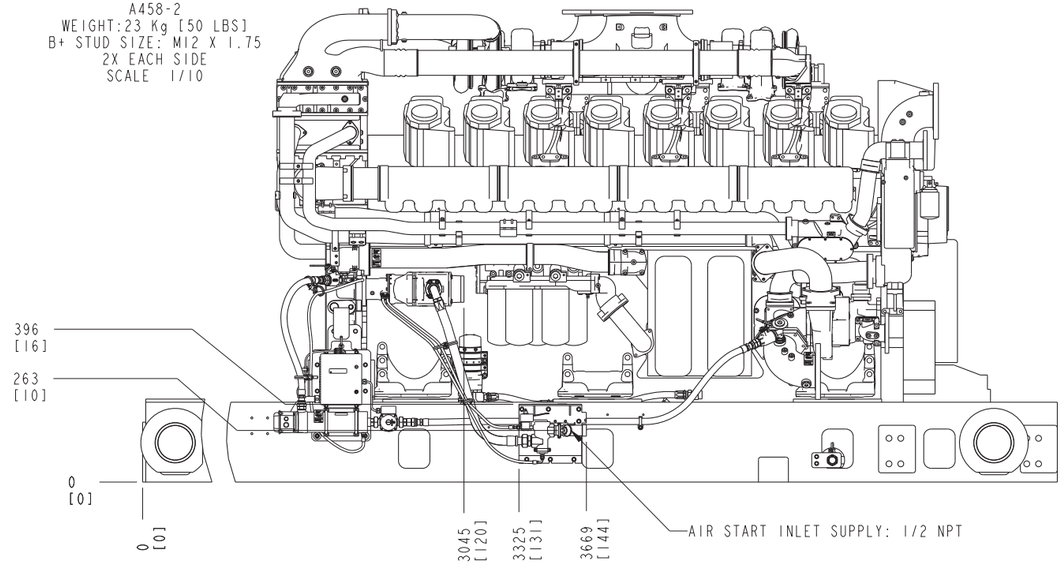
SCALE 1:160



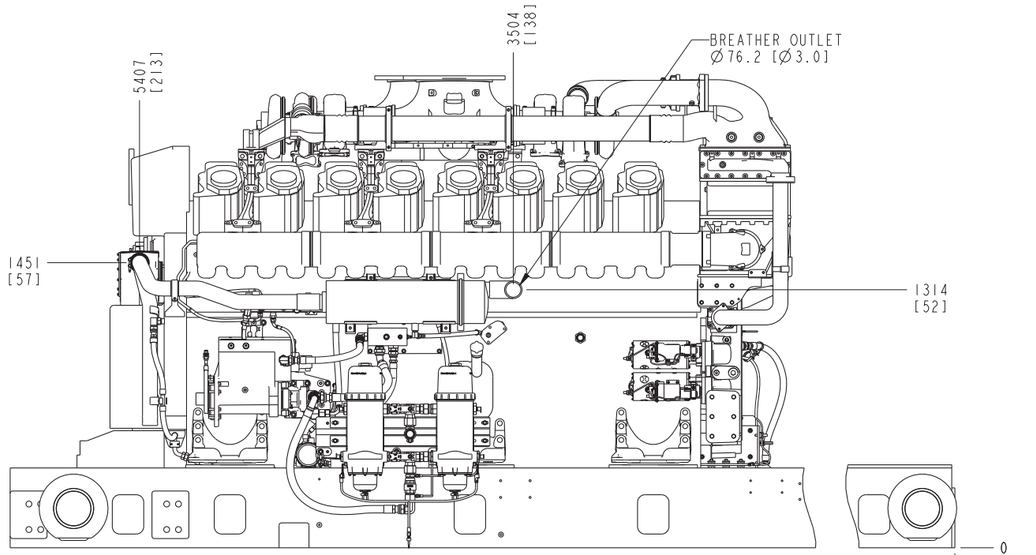
CLOSED CRANKCASE VENTILATION
H735-2
WEIGHT: 74 Kg [163.1 LBS]
SCALE 1:160



DETAIL H
REDUNDANT STARTERS
A458-2
WEIGHT:23 Kg [50 LBS]
B+ STUD SIZE: M12 X 1.75
2X EACH SIDE
SCALE 1:10



AIR STARTER
A300-2
WEIGHT:38 Kg [83.7 LBS]
SCALE 1:160



COALESCER BREATHER
H732-2
WEIGHT: 56.8 Kg [125.2 LBS]
SCALE 1:160

OPTIONS - FEATURE CODES WEIGHTS ARE ADJUSTMENTS TO NOTE 3

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 5 OF 23
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[ ] ARE IN: INCHES

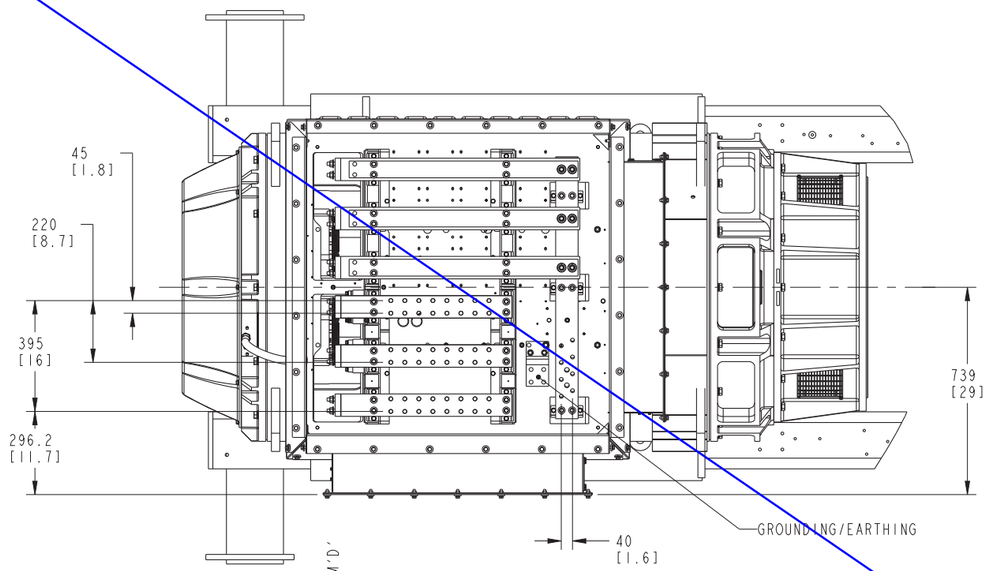
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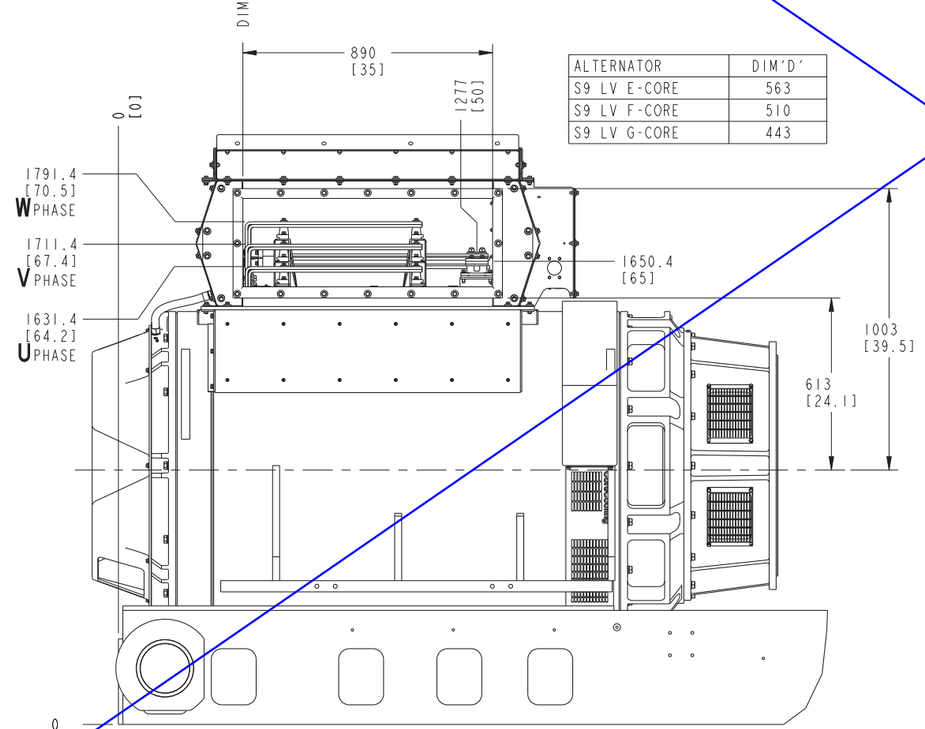
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009

THIRD ANGLE PROJECTION

CAD SYSTEM
PTC® Creo® Parametric

S9 LV TERMINAL BOX INTERNAL

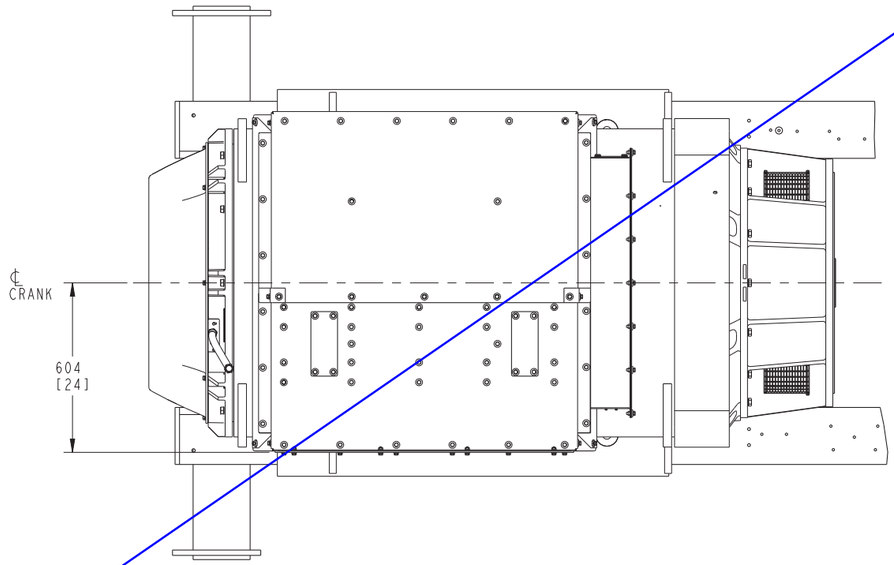


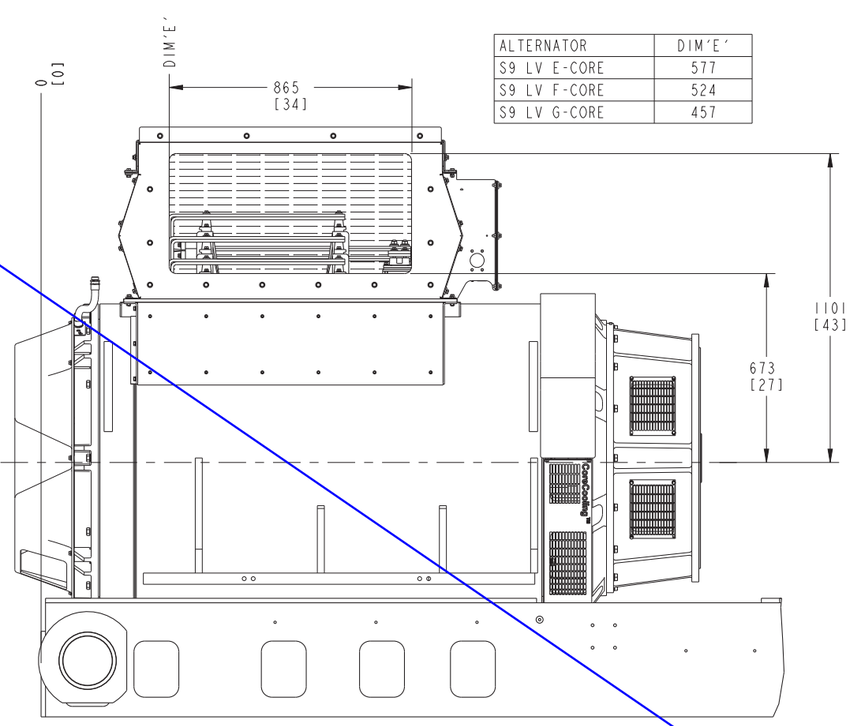


ALTERNATOR	DIM'D'
S9 LV E-CORE	563
S9 LV F-CORE	510
S9 LV G-CORE	443

SCALE 1/10

S9 LV FLAT SIDE PANEL OPTION





ALTERNATOR	DIM'E'
S9 LV E-CORE	577
S9 LV F-CORE	524
S9 LV G-CORE	457

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 6 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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[ ] ARE IN: INCHES

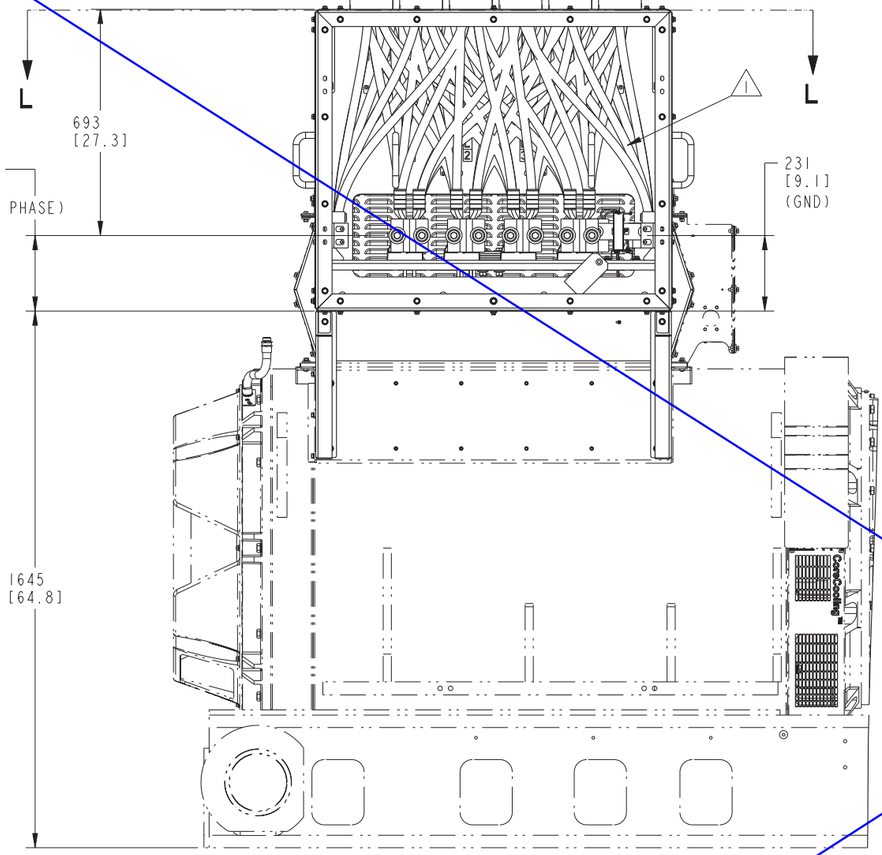
SIZE: A1 SCALE:1/10

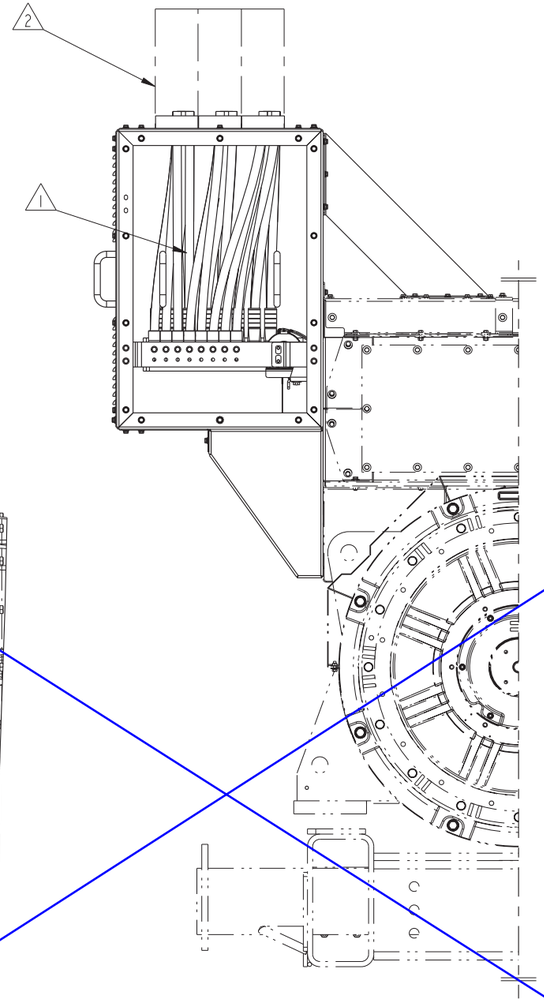
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009

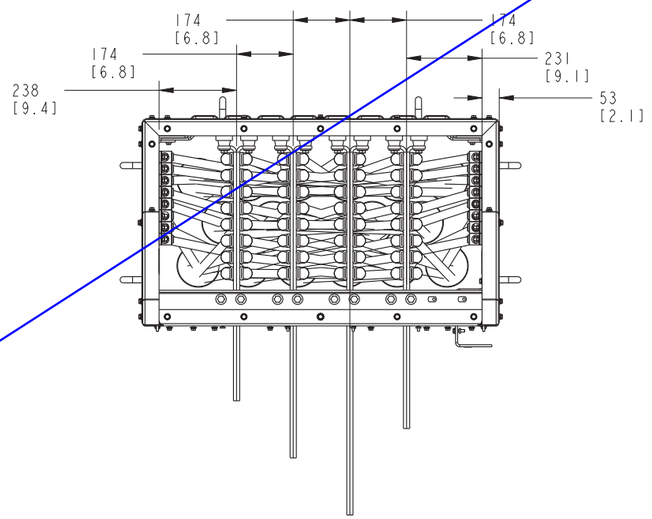
THIRD ANGLE PROJECTION

CAD SYSTEM: PTC® Creo® Parametric™

S9 LV TOP ENTRY ALTERNATOR ENTRANCE BOX DETAILS







TOP ENTRY LV ENTRANCE BOX

ALTERNATOR	DIM'G'
S9 LV E-CORE	393
S9 LV F-CORE	326
S9 LV G-CORE	206

NOTES:

1. ELECTRICAL CONDUITS MUST BE:

   -FLEXIBLE, FOR EXAMPLE, LIQUIDTIGHT METAL CONDUIT - LFMC.

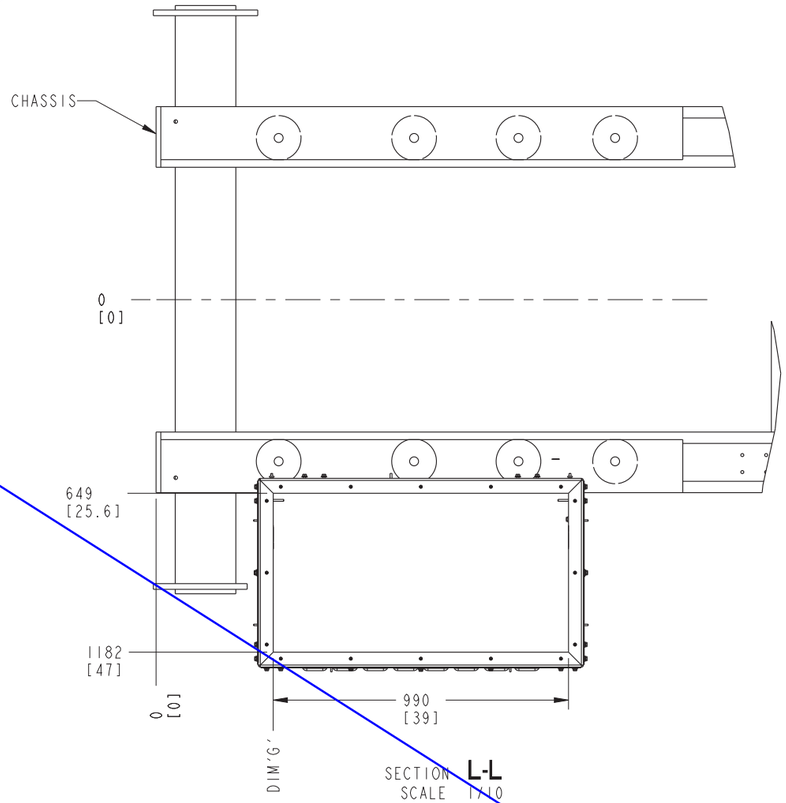
   -INSTALLED IN A WAY THAT WILL ABSORB OR REDUCE VIBRATION EFFECTS, FOR EXAMPLE, ADD OFFSET BENDS BETWEEN THE MOUNTING SURFACE OF THE ENTRANCE BOX ENCLOSURE AND THE STUB UP ENTRANCE AREA. (FLEX-CONDUIT ENTRY AREA).

2. OPTIONAL INSTALLATION OF ELECTRIC CONDUIT AND POWER LEADS FOR MULTIPLE POWER LEADS RUNNING IN PARALLEL. LOCATION SHOWN IS FOR REFERENCE ONLY.

3. FLEXIBLE CONDUITS MUST ALLOW FOR GENERATOR SET MOVEMENT AS MUCH AS ±2 INCHES IN THE VERTICAL DIRECTION.

4. AREA SHOWN INDICATES APPROXIMATE PLACEMENT OF THE ELECTRICAL FLEXIBLE CONDUIT AREA (STUP-UP AREA), ORIGINATING IN CONCRETE OR OTHER TYPE OF BASE FLOORING REVATIVE TO OUTPUT BOX LOCATION AND BOTTOM ENTRY SHEET METAL ENCLOSURE. ELECTRICAL CONDUITS MUST BE TERMINATED AND POWER CABLES ROUTED INTO THE OUTPUT BOX AS ILLUSTRATED TYPICAL POWER LEAD CONNECTIONS.

5. USE COPPER CABLE ONLY.



SECTION **L-L**
SCALE 1/10

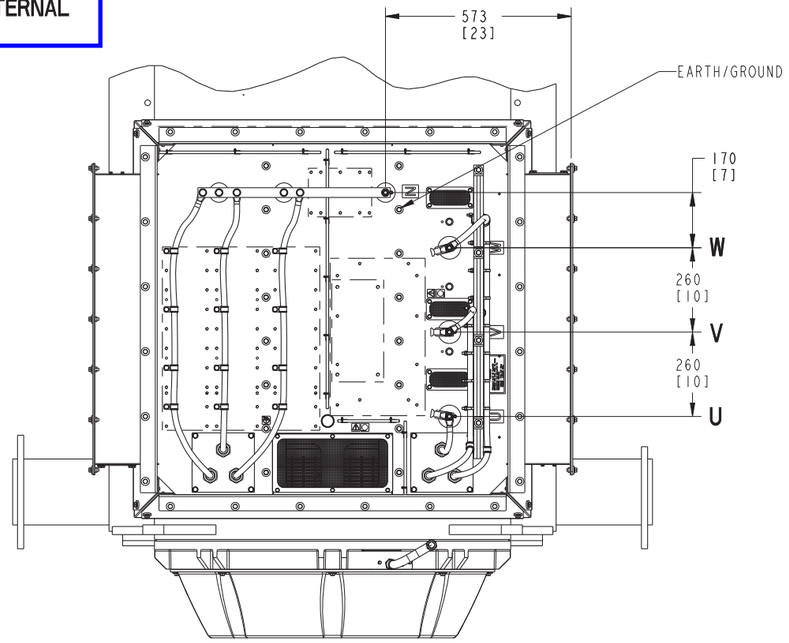
PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 8 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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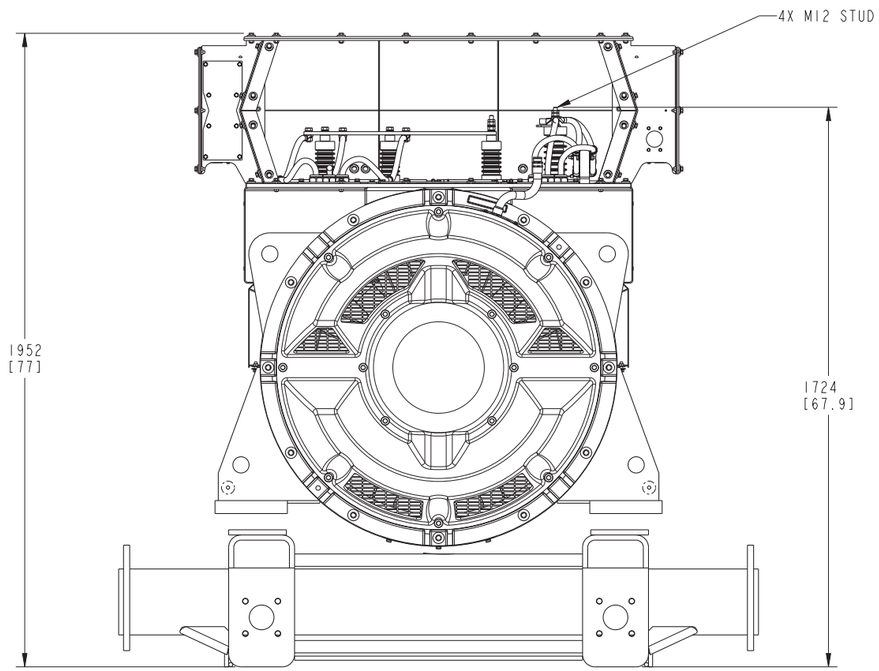
Cummins Inc.

DIMENSIONS ARE IN: MILLIMETERS [ ] ARE IN: INCHES	SIZE: D	SCALE:0.04
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009	THIRD ANGLE PROJECTION	CAD SYSTEM: PTC® Creo® Parametric

MV/HV TERMINAL BOX INTERNAL



TOP VIEW
COVER REMOVED



FRONT VIEW
S9 MV/HV TERMINAL BOX
SOME COMPONENTS REMOVED FOR CLARITY
SCALE 37/320

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 9 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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Cummins Inc.

DIMENSIONS ARE IN: MILLIMETERS
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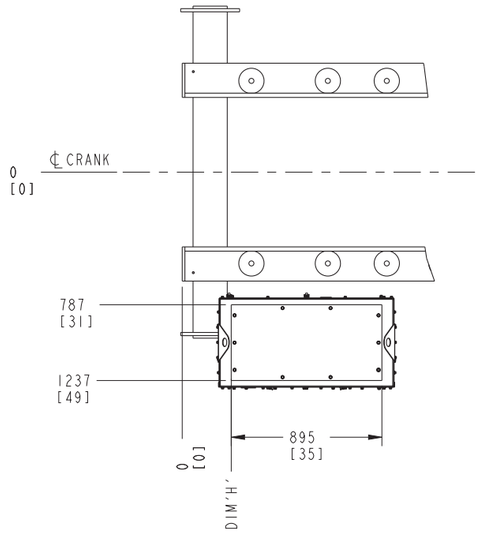
SIZE: A1 SCALE:13/320

DIMENSIONING AND TOLERANCING PER:
ASME Y14.5-2009

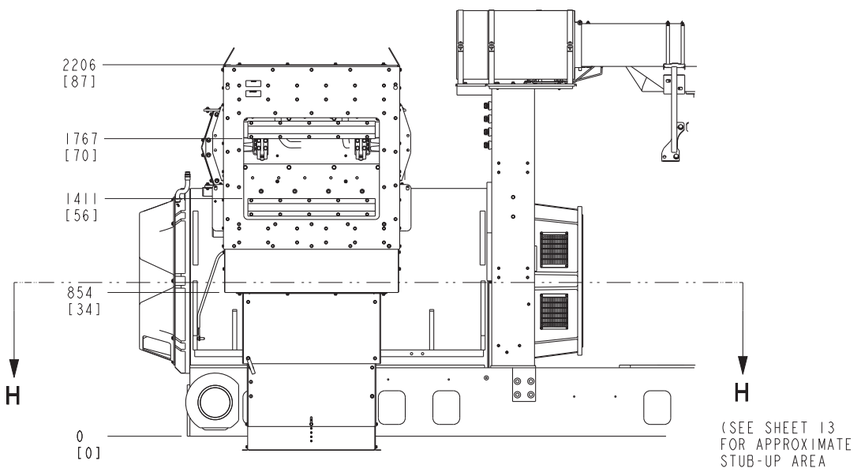
THIRD ANGLE PROJECTION

CAD SYSTEM
PTC® Creo® Parametric

S9 MV/HV ALTERNATOR TERMINAL BOX DETAILS



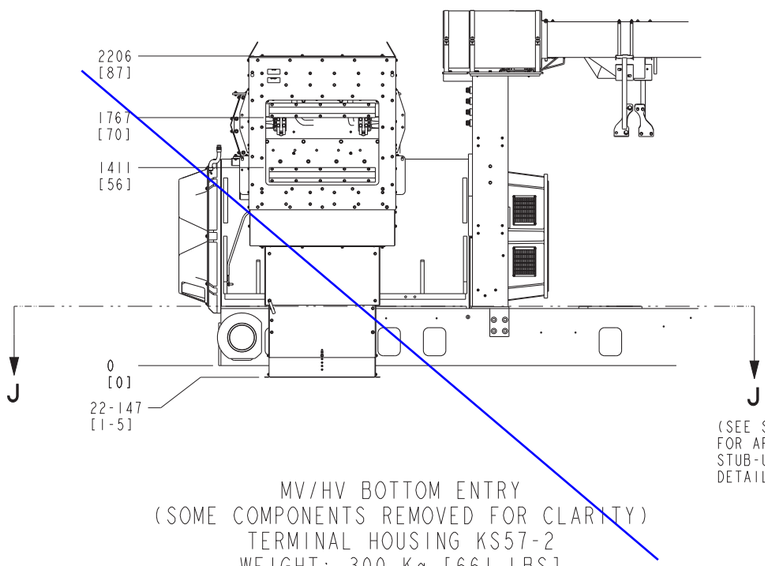
ALTERNATOR	DIM'H'
S9 MV/HV E-CORE	440
S9 MV/HV F-CORE	440
S9 MV/HV G-CORE	250.5
S9 MV/HV H-CORE	250.5



SCALE 19/320

(SEE SHEET 13 FOR APPROXIMATE STUB-UP AREA DETAILS)

MV/HV TOP ENTRY
(SOME COMPONENTS REMOVED FOR CLARITY)
TERMINAL HOUSING KS58-2
WEIGHT: 300 Kg [661 LBS]
SCALE 0.05



(SEE SHEET 13 FOR APPROXIMATE STUB-UP AREA DETAILS)

MV/HV BOTTOM ENTRY
(SOME COMPONENTS REMOVED FOR CLARITY)
TERMINAL HOUSING KS57-2
WEIGHT: 300 Kg [661 LBS]
SCALE 0.05

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 10 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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[ ] ARE IN: INCHES

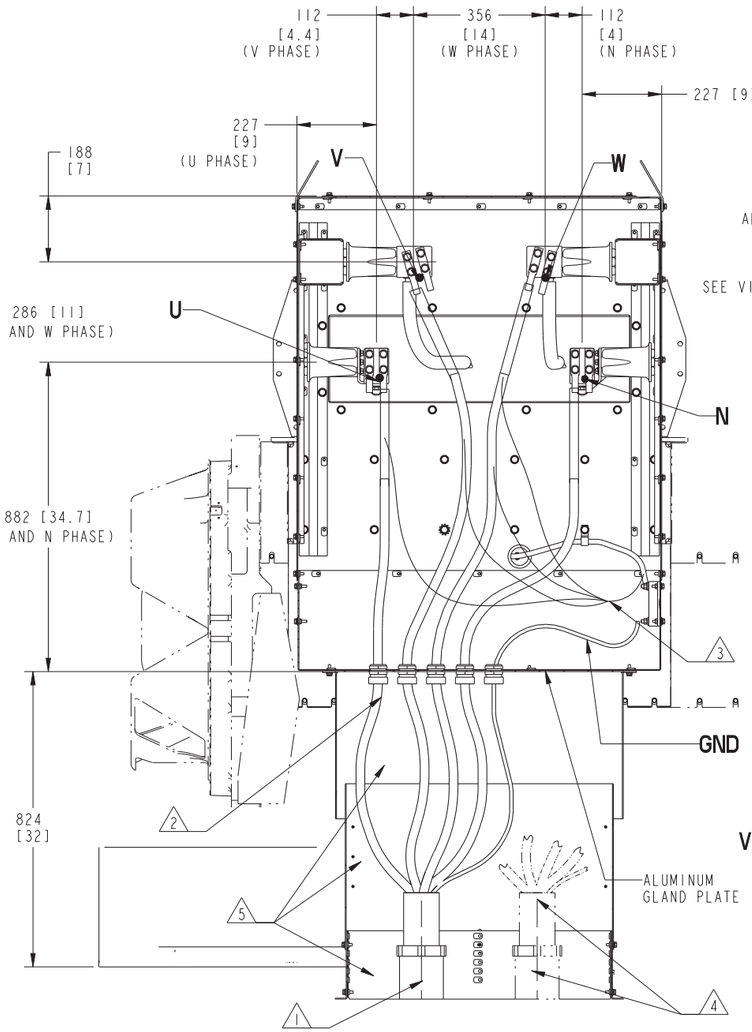
SIZE: A1 SCALE:13/320

DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009

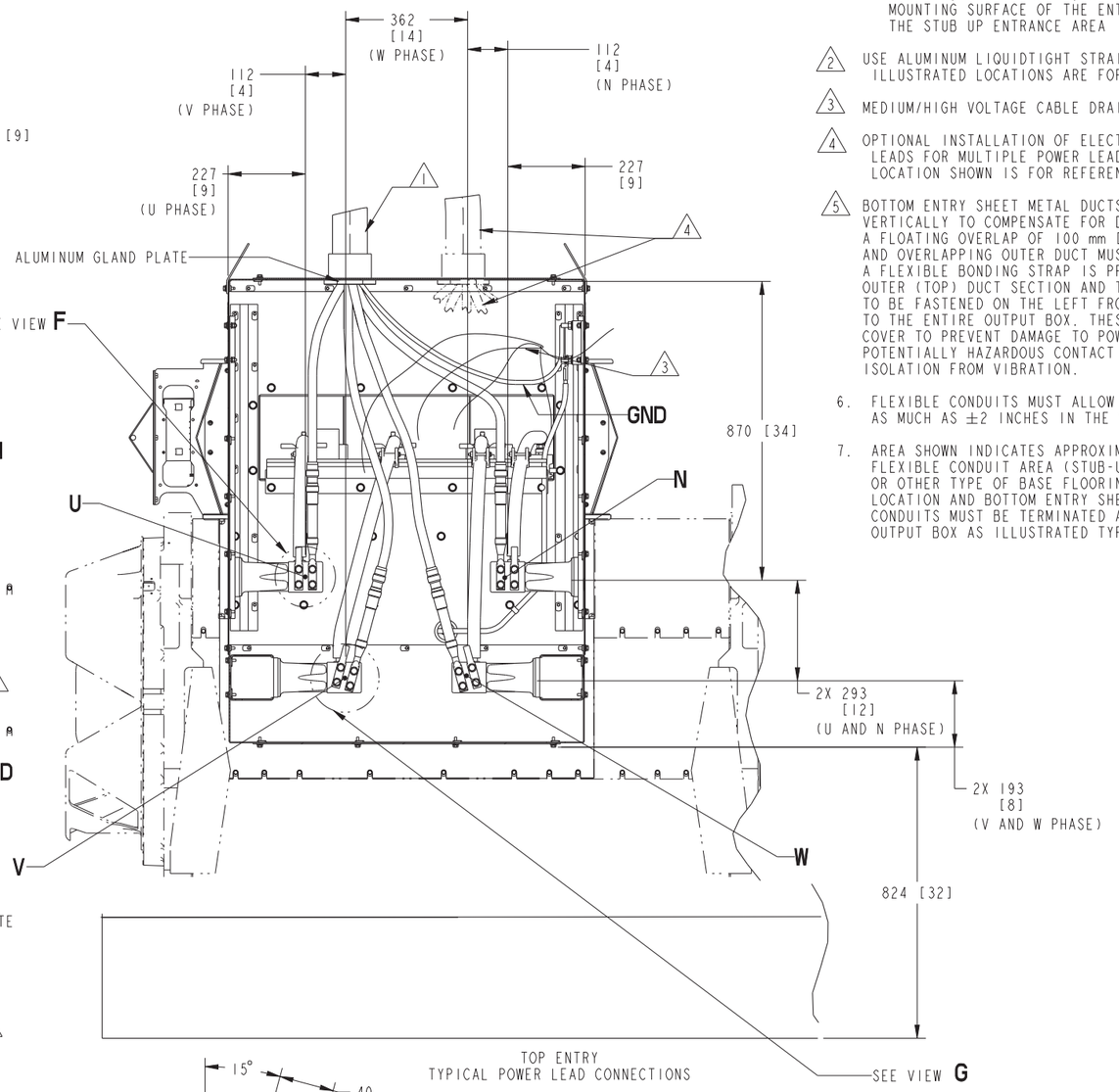
THIRD ANGLE PROJECTION

CAD SYSTEM
PTC® Creo® Parametric

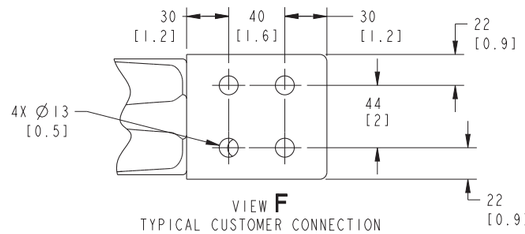
S9 MV/HV ALTERNATOR TERMINAL BOX DETAILS



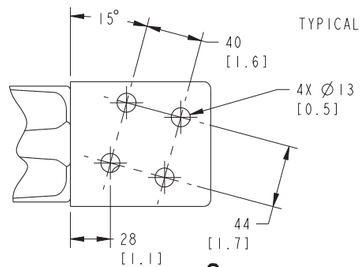
BOTTOM ENTRY
TYPICAL POWER LEAD CONNECTIONS



TOP ENTRY
TYPICAL POWER LEAD CONNECTIONS



VIEW F
TYPICAL CUSTOMER CONNECTION



VIEW G
TYPICAL CUSTOMER CONNECTION

NOTES:

1. ELECTRICAL CONDUITS MUST BE:
   - -FLEXIBLE, FOR EXAMPLE, LIQUIDTIGHT METAL CONDUIT - LFMC.
   - -INSTALLED IN A WAY THAT WILL ABSORB OR REDUCE VIBRATION EFFECTS, FOR EXAMPLE, ADD OFFSET BENDS BETWEEN THE MOUNTING SURFACE OF THE ENTRANCE BOX ENCLOSURE AND THE STUB UP ENTRANCE AREA (FLEX-CONDUIT ENTRY AREA).
2. USE ALUMINUM LIQUIDTIGHT STRAIN RELIEF CONNECTORS. ILLUSTRATED LOCATIONS ARE FOR REFERENCE ONLY.
3. MEDIUM/HIGH VOLTAGE CABLE DRAIN WIRE (SHIELD).
4. OPTIONAL INSTALLATION OF ELECTRIC CONDUIT AND POWER LEADS FOR MULTIPLE POWER LEADS RUNNING IN PARALLEL. LOCATION SHOWN IS FOR REFERENCE ONLY.
5. BOTTOM ENTRY SHEET METAL DUCTS ARE ADJUSTABLE 522 mm VERTICALLY TO COMPENSATE FOR DIMENSIONAL VARIATION. A FLOATING OVERLAP OF 100 mm [4.00] BETWEEN THE INNER DUCT AND OVERLAPPING OUTER DUCT MUST BE MAINTAINED WHEN INSTALLED. A FLEXIBLE BONDING STRAP IS PROVIDED TO CONNECT BETWEEN THE OUTER (TOP) DUCT SECTION AND THE INNER (BOTTOM) DUCT SECTION TO BE FASTENED ON THE LEFT FRONT SURFACE AND PROVIDE BONDING TO THE ENTIRE OUTPUT BOX. THESE DUCTS ARE INTENDED TO PROVIDE COVER TO PREVENT DAMAGE TO POWER LEADS AND PROTECTION FROM POTENTIALLY HAZARDOUS CONTACT WITH POWER LEADS AS WELL AS ISOLATION FROM VIBRATION.
6. FLEXIBLE CONDUITS MUST ALLOW FOR GENERATOR SET MOVEMENT AS MUCH AS ±2 INCHES IN THE VERTICAL DIRECTION.
7. AREA SHOWN INDICATES APPROXIMATE PLACEMENT OF THE ELECTRICAL FLEXIBLE CONDUIT AREA (STUB-UP AREA), ORIGINATING IN CONCRETE OR OTHER TYPE OF BASE FLOORING RELATIVE TO OUTPUT BOX LOCATION AND BOTTOM ENTRY SHEET METAL ENCLOSURE. ELECTRICAL CONDUITS MUST BE TERMINATED AND POWER CABLES ROUTED INTO THE OUTPUT BOX AS ILLUSTRATED TYPICAL POWER LEAD CONNECTIONS.

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 11 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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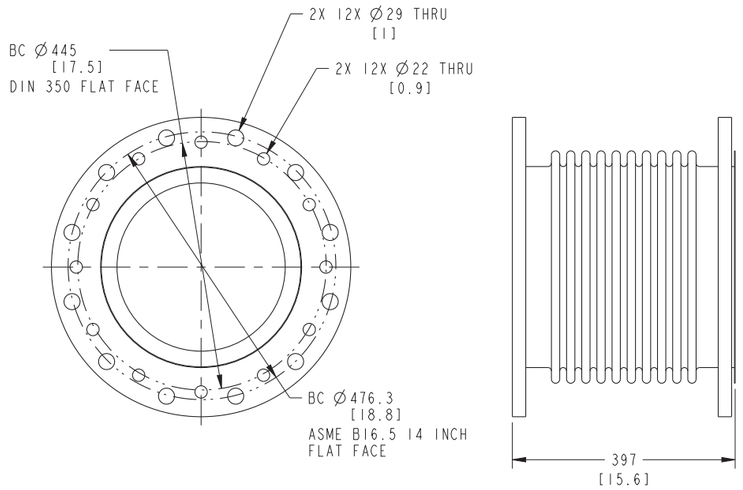
Cummins Inc.

DIMENSIONS ARE IN: MILLIMETERS [ ] ARE IN: INCHES | SIZE: A1 | SCALE:13/320

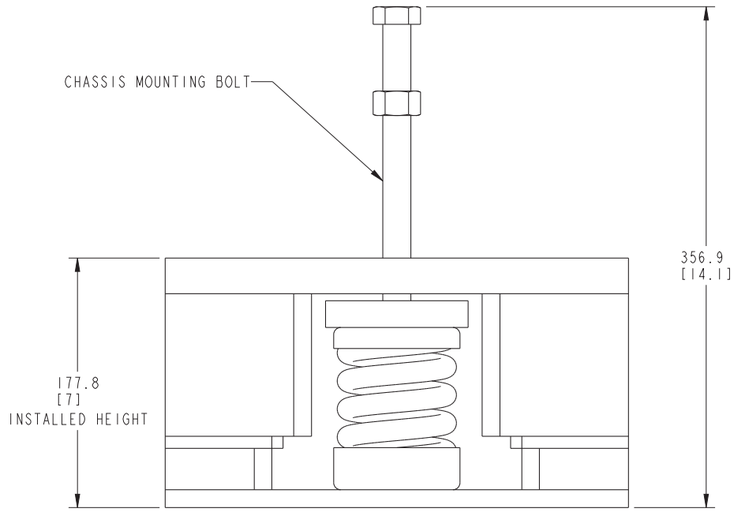
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009 | THIRD ANGLE PROJECTION

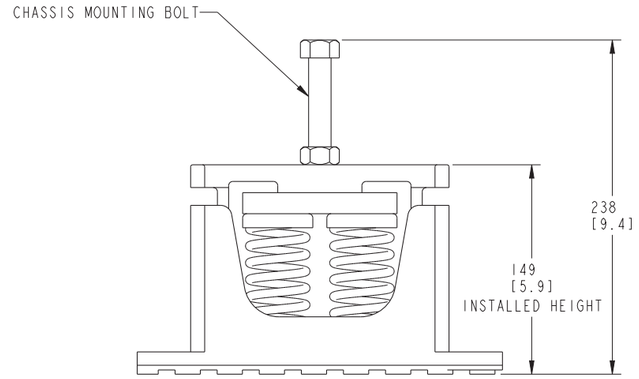
CAD SYSTEM: PTC® Creo® Parametric

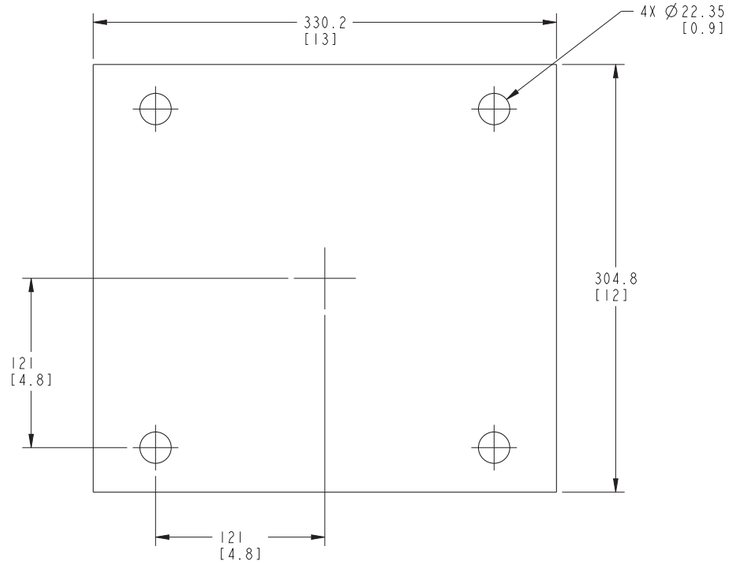
SHIP-LOOSE GENSET ACCESSORY DETAILS



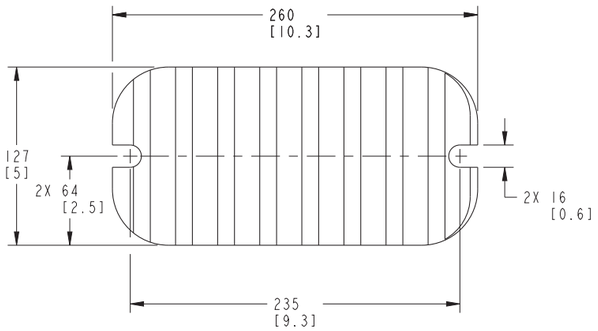
EXHAUST BELLOWS
QTY 2
WEIGHT: 52 Kg [115 LBS] EACH







VIBRATION ISOLATORS RESTRAINED
WEIGHT: 22.6 Kg [50 LBS] EACH



VIBRATION ISOLATORS NON-RESTRAINED
WEIGHT: 10 Kg [22.5 LBS] EACH

ACCESSORIES

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 12 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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DIMENSIONS ARE IN: MILLIMETERS
[ ] ARE IN: INCHES

SIZE: A1 SCALE:13/320

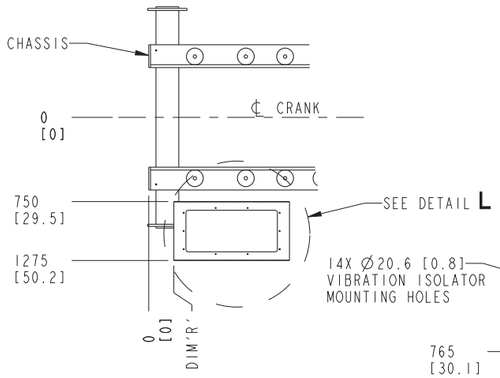
DIMENSIONING AND TOLERANCING PER:
ASME Y14.5-2009

THIRD ANGLE PROJECTION

CAD SYSTEM
PTC® Creo® Parametric

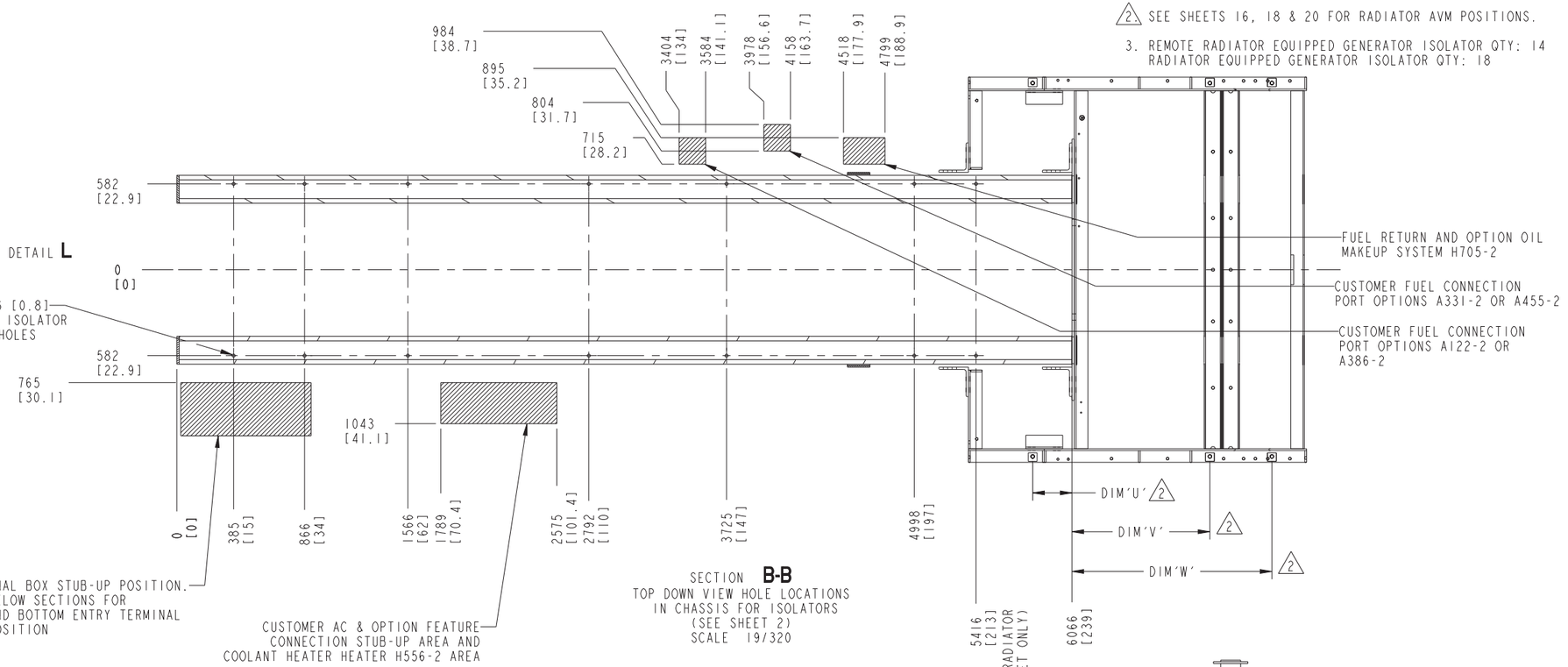
GENSET ISOLATOR (AVM) DETAILS AND LOCATIONS.
APPROXIMATE SPACE CLAIM FOR GENSET OPTIONS AND CUSTOMER AC LOAD CABLES

NOTE:
1. THE TERMINAL BOX STUB UP IS DESIGNED FOR LOAD POWER CONDUCTORS ONLY, NO OTHER WIRES/CABLES ALLOWED.
2. SEE SHEETS 16, 18 & 20 FOR RADIATOR AVM POSITIONS.
3. REMOTE RADIATOR EQUIPPED GENERATOR ISOLATOR QTY: 14
   RADIATOR EQUIPPED GENERATOR ISOLATOR QTY: 18



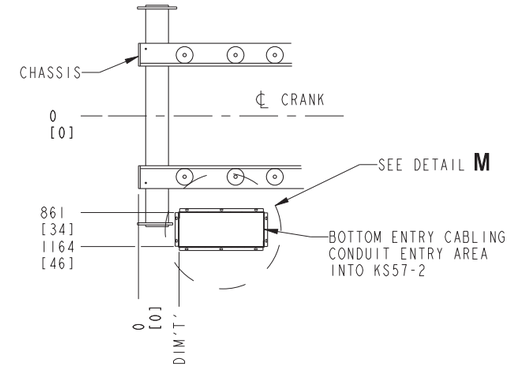
SECTION **H-H**
MV/HV TERMINAL ENTRY
TOP ENTRY
(SOME COMPONENTS REMOVED FOR CLARITY)
(SEE SHEET 9)

ALTERNATOR	DIM'R'	DIM'T'
S9 MV E-CORE	367	511
S9 MV/HV F-CORE	367	511
S9 MV/HV G-CORE	177	321
S9 MV/HV H-CORE	177	321

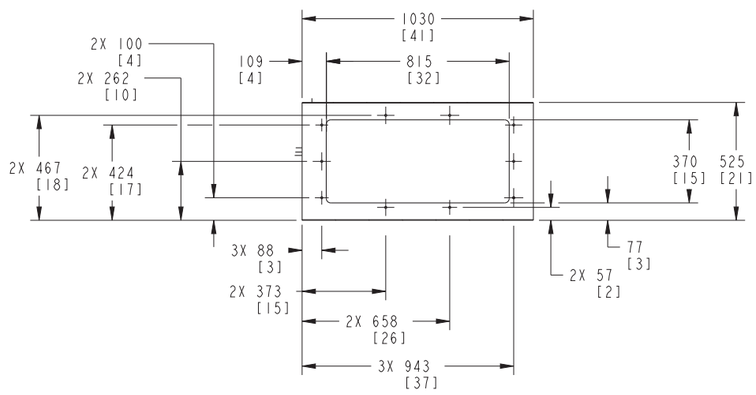


SECTION **B-B**
TOP DOWN VIEW HOLE LOCATIONS
IN CHASSIS FOR ISOLATORS
(SEE SHEET 2)
SCALE 19/320

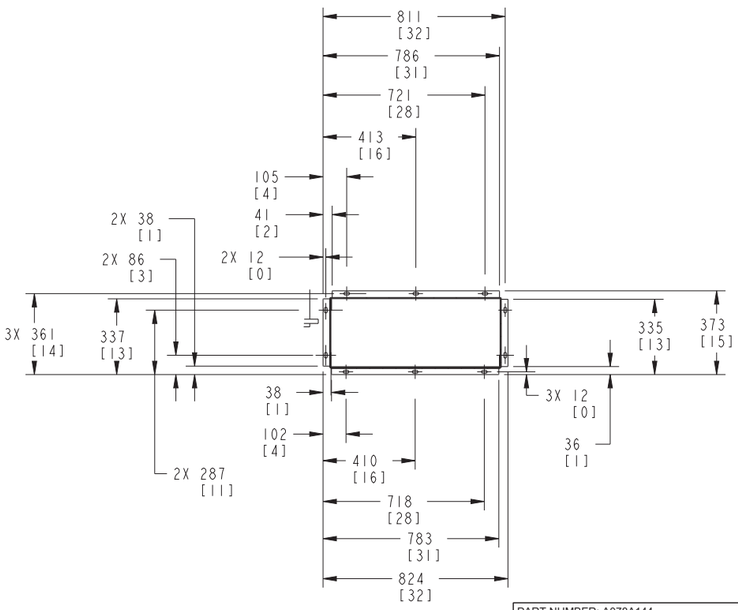
(REMOTE RADIATOR GENSET ONLY)



SECTION **J-J**
MV/HV TERMINAL ENTRY
BOTTOM ENTRY
(SOME COMPONENTS REMOVED FOR CLARITY)
(SEE SHEET 9)



DETAIL **L**
SCALE 13/160



DETAIL **M**
SCALE 13/160

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 13 OF 23
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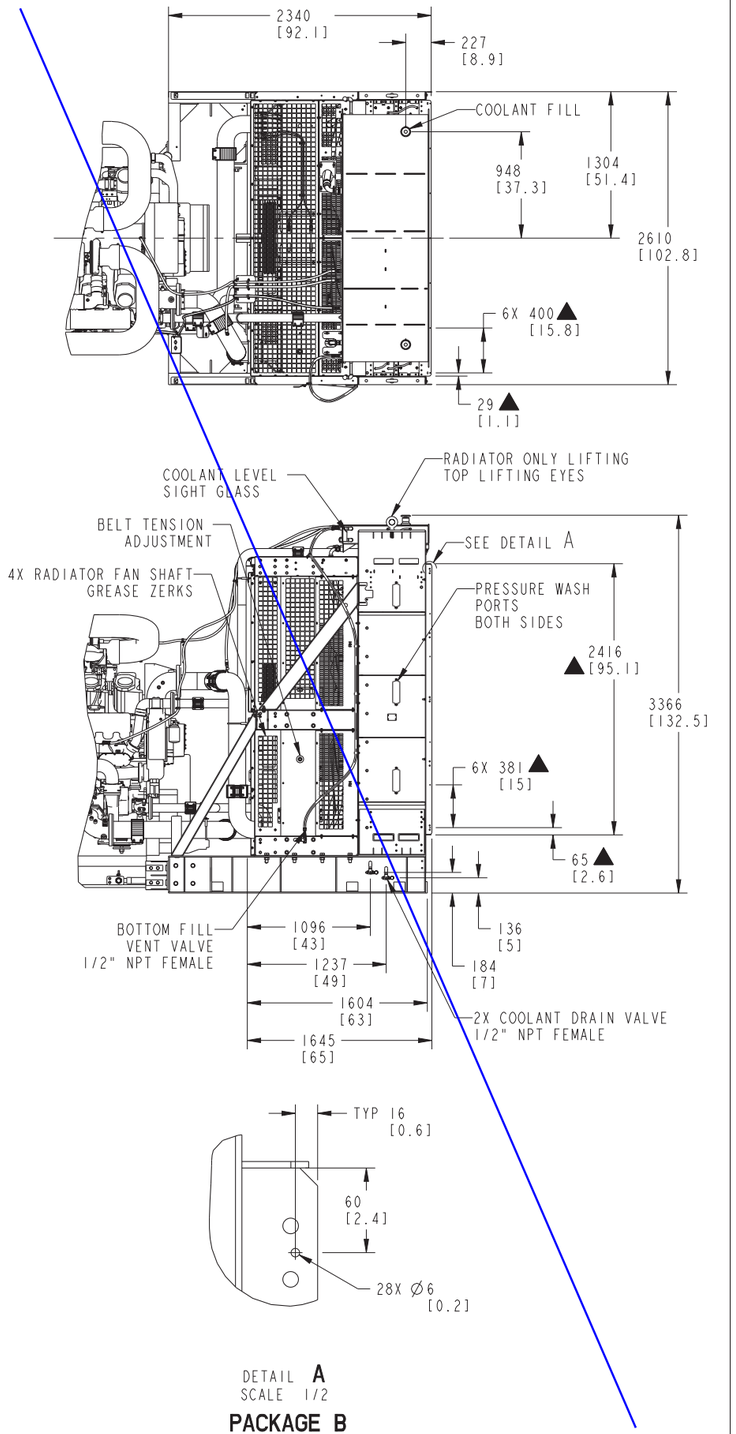
DIMENSIONS ARE IN: MILLIMETERS
[ ] ARE IN: INCHES

SIZE: A1 SCALE: 13/320

DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009

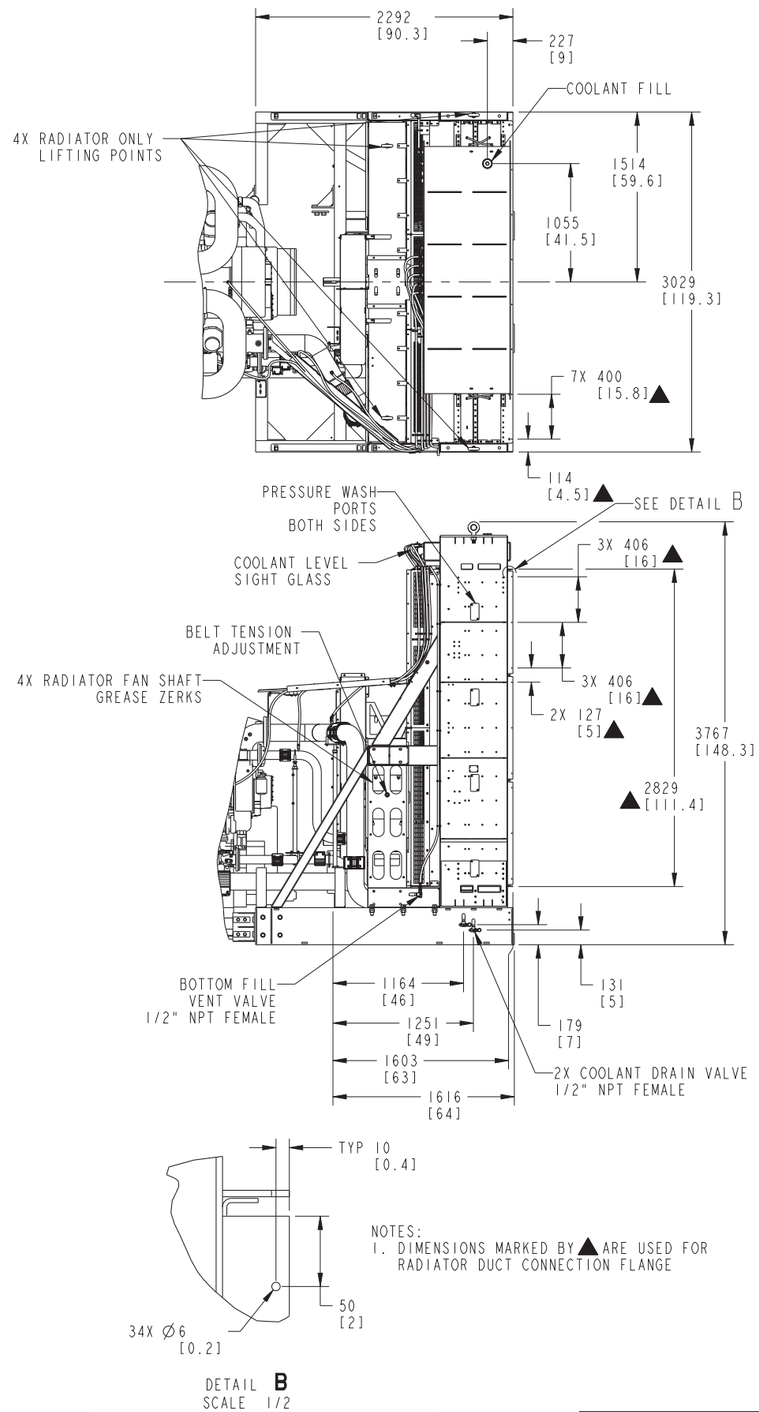
THIRD ANGLE PROJECTION

CAD SYSTEM
PTC® Creo® Parametric



DETAIL A
SCALE 1/2

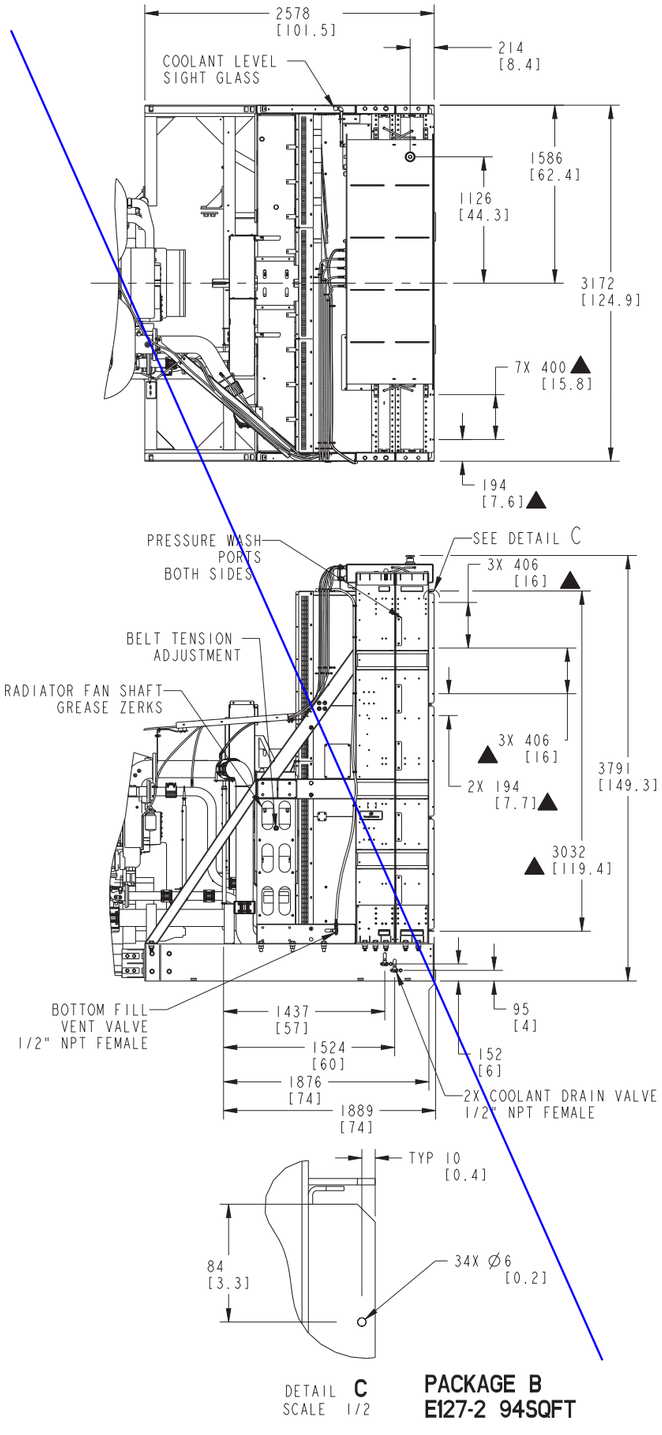
PACKAGE B
E165-2 61 SQFT



NOTES:
1. DIMENSIONS MARKED BY ▲ ARE USED FOR RADIATOR DUCT CONNECTION FLANGE

DETAIL B
SCALE 1/2

PACKAGE B
E127-2/128-2 84 SQFT



DETAIL C
SCALE 1/2

PACKAGE B
E127-2 94SQFT

PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 20 OF 23
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Cummins Inc.

DIMENSIONS ARE IN: MILLIMETERS
[ ] ARE IN: INCHES

SIZE: A1 SCALE: 13/320

DIMENSIONING AND TOLERANCING PER:
ASME Y14.5-2009

THIRD ANGLE PROJECTION

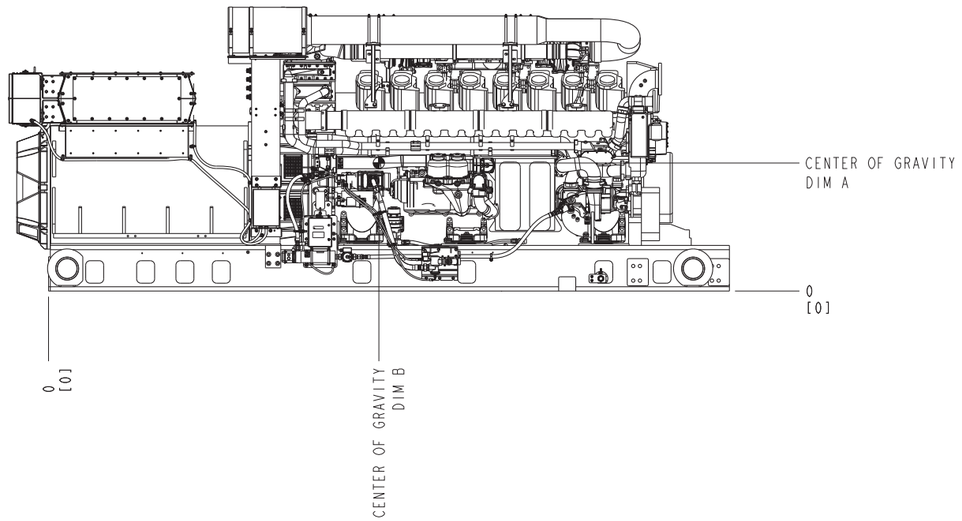
CAD SYSTEM
PTC® Creo® Parametric

ALTERNATOR		PACKAGE B E165-2 61 SQFT		
ALTERNATOR	ALTERNATOR WEIGHT Kg [LBS]	GENSET WEIGHT WITH RADIATOR* Kg [lbs]	C OF G WITH RADIATOR DIM A (SHOWN)* mm [Inch]	C OF G WITH RADIATOR DIM B (SHOWN)* mm [Inch]
S9LID-E42	7500 [16600]	29500 [65100]	1160 [46]	3712 [146]
S9LID-F42	7900 [17500]	30000 [66200]	1157 [46]	3666 [144]
S9LID-G42	8800 [19500]	30800 [68000]	1150 [45]	3575 [141]
S9MID-E42	6600 [14600]	28600 [63100]	1164 [46]	3786 [149]
S9MID-F42	7000 [15500]	29100 [64200]	1161 [46]	3738 [147]
S9MID-G42	7800 [17200]	29800 [65700]	1154 [45]	3651 [144]
S9MID-H42	8200 [18100]	30300 [66800]	1150 [45]	3604 [142]
S9HID-E42	6600 [14600]	28600 [63100]	1164 [46]	3786 [149]
S9HID-F42	7000 [15500]	29100 [64200]	1161 [46]	3738 [147]
S9HID-G42	7800 [17200]	29800 [65700]	1154 [45]	3651 [144]
S9HID-H42	8200 [18100]	30300 [66800]	1150 [45]	3604 [142]

ALTERNATOR		PACKAGE B E127-2/128-2 84 SQFT		
ALTERNATOR	ALTERNATOR WEIGHT Kg [LBS]	GENSET WEIGHT WITH RADIATOR* Kg [lbs]	C OF G WITH RADIATOR DIM A (SHOWN)* mm [Inch]	C OF G WITH RADIATOR DIM B (SHOWN)* mm [Inch]
S9LID-E42	7500 [16600]	29500 [65100]	1143 [45]	3687 [145]
S9LID-F42	7900 [17500]	29900 [66000]	1140 [45]	3642 [143]
S9LID-G42	8800 [19500]	30800 [68000]	1133 [45]	3552 [140]
S9MID-E42	6600 [14600]	28600 [63100]	1146 [45]	3761 [148]
S9MID-F42	7000 [15500]	29000 [64000]	1143 [45]	3713 [146]
S9MID-G42	7800 [17200]	29800 [65700]	1136 [45]	3627 [143]
S9MID-H42	8200 [18100]	30200 [66600]	1133 [45]	3580 [141]
S9HID-E42	6600 [14600]	28600 [63100]	1146 [45]	3761 [148]
S9HID-F42	7000 [15500]	29000 [64000]	1143 [45]	3713 [146]
S9HID-G42	7800 [17200]	29800 [65700]	1136 [45]	3627 [143]
S9HID-H42	8200 [18100]	30200 [66600]	1133 [45]	3580 [141]

ALTERNATOR		PACKAGE B E127-2 94 SQFT		
ALTERNATOR	ALTERNATOR WEIGHT Kg [LBS]	GENSET WEIGHT WITH RADIATOR* Kg [lbs]	C OF G WITH RADIATOR DIM A (SHOWN)* mm [Inch]	C OF G WITH RADIATOR DIM B (SHOWN)* mm [Inch]
S9LID-E42	7500 [16600]	30200 [66600]	1181 [46]	3885 [153]
S9LID-F42	7900 [17500]	30700 [67700]	1177 [46]	3837 [151]
S9LID-G42	8800 [19500]	31500 [69500]	1170 [46]	3744 [147]
S9MID-E42	6600 [14600]	29300 [64600]	1185 [47]	3962 [156]
S9MID-F42	7000 [15500]	29800 [65700]	1181 [46]	3913 [154]
S9MID-G42	7800 [17200]	30500 [67300]	1174 [46]	3824 [151]
S9MID-H42	8200 [18100]	31000 [68400]	1170 [45]	3775 [149]
S9HID-E42	6600 [14600]	29300 [64600]	1185 [47]	3962 [156]
S9HID-F42	7000 [15500]	29800 [65700]	1181 [46]	3913 [154]
S9HID-G42	7800 [17200]	30500 [67300]	1174 [46]	3824 [151]
S9HID-H42	8200 [18100]	31000 [68400]	1170 [46]	3775 [149]

ALTERNATOR		REMOTE COOLED		
ALTERNATOR	ALTERNATOR WEIGHT Kg [LBS]	GENSET WEIGHT WITH NO RADIATOR* Kg [lbs]	C OF G WITHOUT RADIATOR DIM A (SHOWN)* mm [Inch]	C OF G WITHOUT RADIATOR DIM B (SHOWN)* mm [Inch]
S9LID-E42	7400 [16400]	23900 [52700]	1027 [40]	2916 [115]
S9LID-F42	7900 [17300]	24300 [53600]	1025 [40]	2874 [113]
S9LID-G42	8700 [19200]	25200 [55500]	1022 [40]	2790 [110]
S9MID-E42	6600 [14400]	23000 [50700]	1027 [40]	2978 [117]
S9MID-F42	7000 [15400]	23500 [51700]	1025 [40]	2934 [115]
S9MID-G42	7800 [17100]	24200 [53400]	1021 [40]	2852 [112]
S9MID-H42	8200 [18100]	24700 [54300]	1019 [40]	2809 [111]
S9HID-E42	6600 [14400]	23000 [50700]	1027 [40]	2978 [117]
S9HID-F42	7000 [15400]	23500 [51700]	1025 [40]	2934 [115]
S9HID-G42	7800 [17100]	24200 [53400]	1021 [40]	2852 [112]
S9HID-H42	8200 [18100]	24700 [54300]	1019 [40]	2809 [111]



PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 21 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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Cummins Inc.

DIMENSIONS ARE IN: MILLIMETERS
[ ] ARE IN: INCHES

SIZE: A1 SCALE:13/320

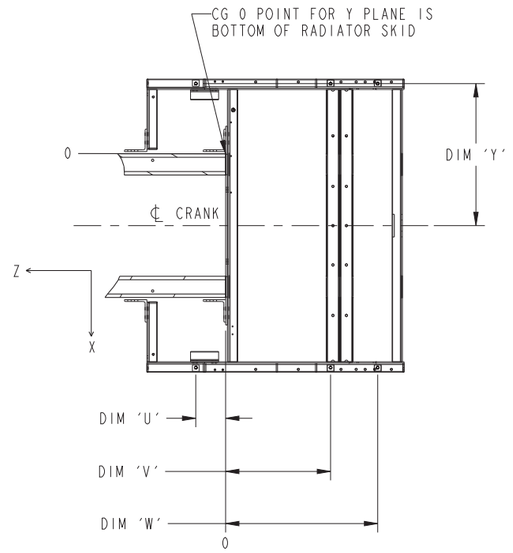
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009

THIRD ANGLE PROJECTION

CAD SYSTEM
PTC® Creo® Parametric

RADIATOR VARIATON	CORE SIZE	FREQUENCY	COOLANT VOLUME L [GAL]			RAD DRY WEIGHT [LBS]	RAD WET WEIGHT [LBS]	RAD X-AXIS CG [INCHES]	RAD Y-AXIS CG [INCHES]	RAD Z-AXIS CG [INCHES]	ALTERNATOR	GENSET O/A LENGTH [INCHES]	GENSET O/A WIDTH [INCHES]	GENSET O/A HEIGHT [INCHES]
			HT (CT1)	LT (CT1)	SURGE TANK									
PACKAGE B E165-2	61 SQFT	50/60	388 [103]	321 [84.8]	183 [40.2]	4647 [10245]	5610 [12368]	665 [26]	1542 [61]	-1053 [-41]	S9 MV/HV E & F CORE	7878 [310]	2610 [103]	3366 [133]
											S9 MV/HV G & H CORE	8064 [317]	2610 [103]	3366 [133]
											S9 LV E CORE	7873 [310]	2610 [103]	3366 [133]
											S9 LV F CORE	7943 [313]	2610 [103]	3366 [133]
											S9 LV G CORE	8063 [317]	2610 [103]	3366 [133]
PACKAGE B E127-2 /128-2	84 SQFT	50/60	546 [120.1]	204 [44.8]	179 [39.4]	4772 [10520]	5561 [12260]	672 [26]	1677 [66]	-969 [-38]	S9 MV/HV E & F CORE	7823 [308]	3029 [119]	3767 [148]
											S9 MV/HV G & H CORE	8009 [315]	3029 [119]	3767 [148]
											S9 LV E CORE	7818 [308]	3029 [119]	3767 [148]
											S9 LV F CORE	7888 [311]	3029 [119]	3767 [148]
											S9 LV G CORE	8008 [315]	3029 [119]	3767 [148]
PACKAGE B E127-2	94 SQFT	60	584 [128.4]	217 [47.7]	179 [39.4]	5321 [11730]	6309 [13908]	680 [27]	1536 [61]	-1203 [-47]	S9 MV/HV E & F CORE	8108 [319]	3172 [125]	3791 [149]
											S9 MV/HV G & H CORE	8294 [327]	3172 [125]	3791 [149]
											S9 LV E CORE	8103 [319]	3172 [125]	3791 [149]
											S9 LV F CORE	8173 [322]	3172 [125]	3791 [149]
											S9 LV G CORE	8293 [327]	3172 [125]	3791 [149]

RADIATOR AVM POSITIONS				
RADIATOR VARIATION	DIM 'U'	DIM 'V'	DIM 'W'	DIM 'Y'
PACKAGE B E165-2	266	935	1355	1265
PACKAGE B E127-2/128-2	266	935	1355	1464
PACKAGE B E127-2	266	1221	1641	1535



PART NUMBER: A078A144	PART REVISION: C
PART NAME: OUTLINE,GENSET	
DRAWING CATEGORY: OUTLINE	
STATE: RELEASED	SHEET: 22 OF 23
CUMMINS DATA CLASSIFICATION: CUMMINS CONFIDENTIAL	

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[ ] ARE IN: INCHES

SIZE: A1 SCALE:13/320

DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009

THIRD ANGLE PROJECTION

CAD SYSTEM PTC® Creo® Parametric

CTB		POWERCOMMAND CONTROL PCC3.3
CTB1–2	PCC NET A (+)	
CTB2–2	PCC NET B (–)	
CTB3–2	GROUND B–(SHIELD)	
CTB5–2	POWER B+	
CTB19–2	REMOTE E–STOP RETURN	
CTB20–2	REMOTE E–STOP INPUT	
CTB6–4	POWER B+	
CTB10–4	POWER B–	
CTB11–4	POWER B–	
CTB24–4	LOAD DUMP DRIVER	
CTB13–2	REMOTE START RETURN	
CTB14–2	REMOTE START INPUT	
MODBUS RTU		
TB15–1	RS485 (SHIELD)	
TB15–3	RS485 (+)	
TB15–4	RS485 (–)	

- ALL INTERCONNECT WIRING AND DATA CABLING IS TO BE DONE WITH STRANDED WIRE PER NFPA 37.
- PCC NET CABLE: BELDEN 9729. (24 AWG, STRANDED, SHIELDED, TWISTED PAIR)
- MODBUS RS485 CABLE: BELDEN 3106A. (22 AWG, STRANDED, SHIELDED, TWISTED PAIR)
- TOTAL NETWORK LENGTH NOT TO EXCEED 4000 FT.
- ATS LOAD SHED WIRING IS SHOWN FOR REF.–––––

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES

TOLERANCES:
FRACTIONAL:
.X: .06
.XX: .03
.XXX: .01
ANGLES: .5°

FINISH: N/A

GENERIC ATS

REFERENCES	
A041F331	–
GENERIC ATS	–
–	–

PREP. BY:	KDU	09/10/24
CHKD BY:	–	–
MODIFIED BY:	–	–

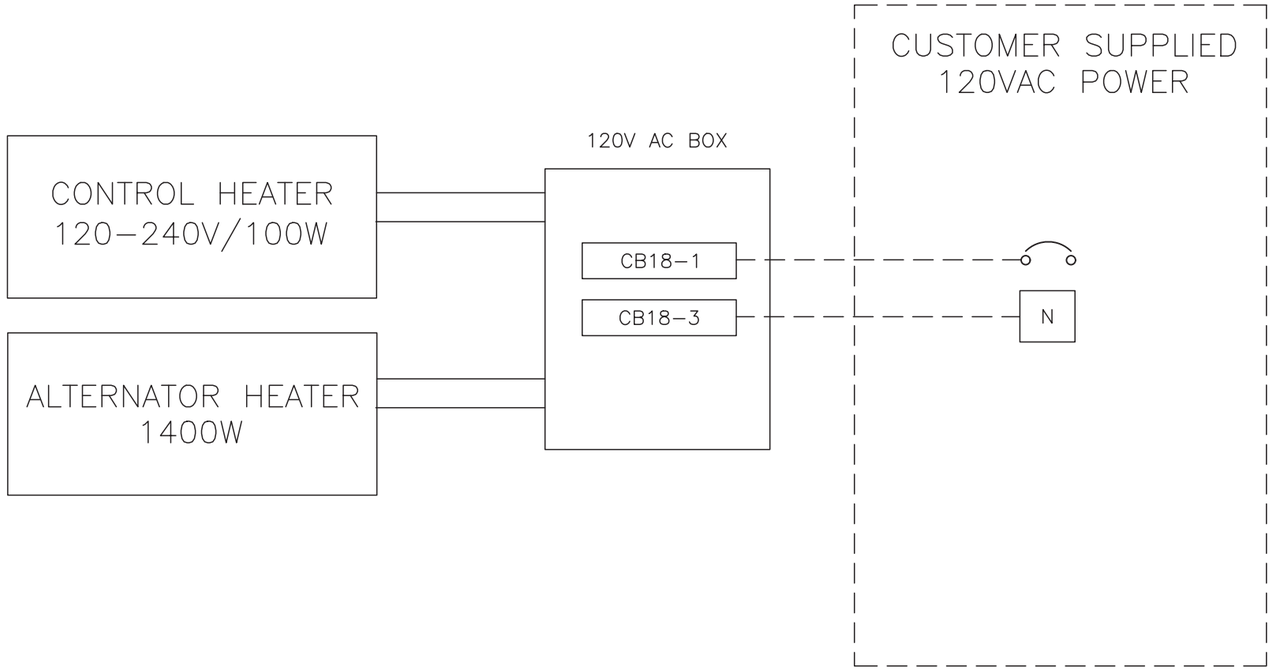
ENGINE FAMILY: PCC3300

CSSNA POWER GEN

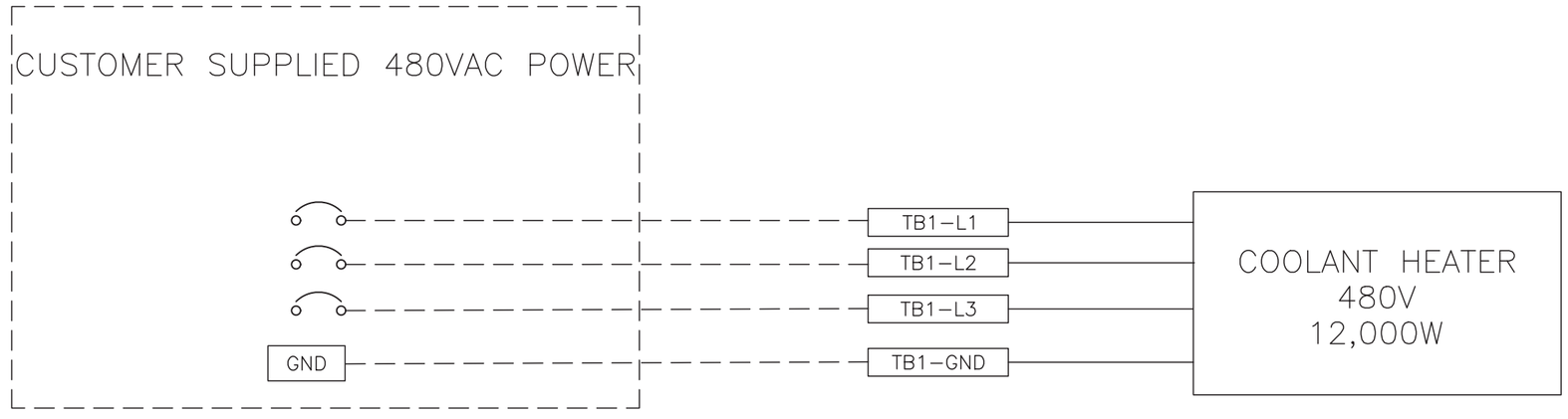
SITE NAME: – –	CONTACT NAME: –	CUSTOMER PROJECT NO: –	TITLE: PCC3.3 CONTROL / ~~GENERIC ATS~~ QSK95
CONTRACTOR NAME: –	CONTACT NO: –	CSSNA PROJECT NO: –	SIZE: B DWG NO: PCC3.3 INTERCONNECT REV: –
			SCALE: NONE DO NOT SCALE PRINT SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED,
ALL DIMENSIONS ARE IN INCHES

PREP. BY:	JPK
	5/7/2024



NOTES:
1. FOLLOW REGIONAL REGULATIONS AND APPLICABLE ELECTRIC CODES FOR INSTALLATION.
2. INSTALLER TO PROVIDE BRANCH CIRCUITS TO POWER ALL ACCESSORIES.



CSSNA POWER GEN

TITLE:	DQGAx–QSK95 AC HEATER TABLE	
SIZE: B	DWG NO: –	REV 0
SCALE:	DO NOT SCALE PRINT	SHEET 1 OF 1

PTC® Creo® Parametric

REL NO	LTR	NO	REVISION	DRW	CKD	APVD	DATE
ECO-156288	A	1	PRODUCTION_RELEASE	GK	SR	C_KNEALING	28OCT15

SPRING-ISOLATED GENERATOR SETS: GROUND LEVEL INSTALLATIONS

CUMMINS GENSET MODEL	CONFIGURATION	SEISMIC ISOLATOR		ATTACHMENT TO STEEL		ATTACHMENT TO CONCRETE					
		MODEL	QTY	SEISMIC LEVEL	ISOLATOR ATTACHMENT TO STEEL	SEISMIC LEVEL	ISOLATOR ATTACHMENT TO CONCRETE	ANCHOR EMBEDMENT	MINIMUM EDGE DISTANCE (FROM ANCHOR LOCATION)	CONCRETE COMPRESSIVE STRENGTH	SLAB THICKNESS
C3000 D6, C3000 D6e, C3250 D6, C3250 D6e, C3500 D6, C3500 D6e, C3500 D5, C3500 D5e, C3750 D5, C3750 D5e	SET MOUNTED COOLING; P80 ALTERNATOR FRAME	A053L607 (VMC M2SSHX-IE)	18	SDS <=2.4 Z/H = 0	4 PER ISOLATOR (72 TOTAL) Ø 3/4" GRADE 8/ASTM A490 BOLTS	SDS <=2.4 Z/H = 0	4 PER ISOLATOR (72 TOTAL) HIT-HY 200 + HIT-Z 3/4	7.1" MIN	12.0" MIN	4000 PSI N.W.C.	14.0" MIN
	REMOTELY COOLED; P80 ALTERNATOR FRAME		14	SDS <=2.4 Z/H = 0	4 PER ISOLATOR (56 TOTAL) Ø 3/4" GRADE 8/ASTM A490 BOLTS	SDS <=2.4 Z/H = 0	4 PER ISOLATOR (56 TOTAL) HIT-HY 200 + HIT-Z 3/4	7.1" MIN	12.0" MIN	4000 PSI N.W.C.	14.0" MIN
	SET MOUNTED COOLING; DIG ALTERNATOR FRAME	A050T776 (CALDYN RJEHD)	20	SDS <=2.4 Z/H = 0	4 PER ISOLATOR (80 TOTAL) Ø 3/4" GRADE 8/ASTM A490 BOLTS	SDS <=2.4 Z/H = 0	4 PER ISOLATOR (80 TOTAL) HIT-HY 200 + HAS 7/8	8.9" MIN	12.0" MIN	4000 PSI N.W.C.	14.0" MIN
	REMOTELY COOLED; DIG ALTERNATOR FRAME		16	SDS <=2.4 Z/H = 0	4 PER ISOLATOR (64 TOTAL) Ø 3/4" GRADE 8/ASTM A490 BOLTS	SDS <=2.4 Z/H = 0	4 PER ISOLATOR (64 TOTAL) HIT-HY 200 + HAS 7/8	8.9" MIN	12.0" MIN	4000 PSI N.W.C.	14.0" MIN

SPRING-ISOLATED GENERATOR SETS: ROOF LEVEL INSTALLATIONS

CUMMINS GENSET MODEL	CONFIGURATION	SEISMIC ISOLATOR		ATTACHMENT TO STEEL		ATTACHMENT TO CONCRETE					
		MODEL	QTY	SEISMIC LEVEL	ISOLATOR ATTACHMENT TO STEEL	SEISMIC LEVEL	ISOLATOR ATTACHMENT TO CONCRETE	ANCHOR EMBEDMENT	MINIMUM EDGE DISTANCE (FROM ANCHOR LOCATION)	CONCRETE COMPRESSIVE STRENGTH	SLAB THICKNESS
C3000 D6, C3000 D6e, C3250 D6, C3250 D6e, C3500 D6, C3500 D6e, C3500 D5, C3500 D5e, C3750 D5, C3750 D5e	SET MOUNTED COOLING; P80 ALTERNATOR FRAME	A053L607 (VMC M2SSHX-IE)	18	SDS <=2.0 Z/H = 1	4 PER ISOLATOR (72 TOTAL) Ø 3/4" GRADE 8/ASTM A490 BOLTS	SDS <=1.4 Z/H = 1	4 PER ISOLATOR (72 TOTAL) HIT-HY 200 + HAS 7/8	13.9" MIN	18.0" MIN	5000 PSI N.W.C.	24.0" MIN
	REMOTELY COOLED; P80 ALTERNATOR FRAME		14	SDS <=2.0 Z/H = 1	4 PER ISOLATOR (72 TOTAL) Ø 3/4" GRADE 8/ASTM A490 BOLTS	SDS <=1.4 Z/H = 1	4 PER ISOLATOR (72 TOTAL) HIT-HY 200 + HAS 7/8	13.9" MIN	18.0" MIN	5000 PSI N.W.C.	24.0" MIN
	SET MOUNTED COOLING; DIG ALTERNATOR FRAME	A050T776 (CALDYN RJEHD)	20	SDS <=2.0 Z/H = 1	4 PER ISOLATOR (80 TOTAL) Ø 3/4" GRADE 8/ASTM A490 BOLTS	SDS <=1.4 Z/H = 1	4 PER ISOLATOR (80 TOTAL) HIT-HY 200 + HAS 7/8	13.9" MIN	20.0" MIN	5000 PSI N.W.C.	24.0" MIN
	REMOTELY COOLED; DIG ALTERNATOR FRAME		16	SDS <=2.0 Z/H = 1	4 PER ISOLATOR (80 TOTAL) Ø 3/4" GRADE 8/ASTM A490 BOLTS	SDS <=1.4 Z/H = 1	4 PER ISOLATOR (80 TOTAL) HIT-HY 200 + HAS 7/8	13.9" MIN	20.0" MIN	5000 PSI N.W.C.	24.0" MIN

-THIS IS A CONTROLLED ITEM-
PER CPG PROCEDURE FRE-1002

TO MAINTAIN COMPLIANCE WITH REQUIREMENTS OF THE CODES, STANDARDS, OR AGENCIES LISTED BELOW

☐ CSA ☐ UL ☐ CE ☐ PVAA ☐ ABYC
☒ IBC ☐ OTHER _____ ☐ OTHER _____

CHANGES, DEVIATIONS, OR SUBSTITUTIONS OF MATERIAL, PROCESS, OR PERFORMANCE FOR THIS ITEM MUST BE APPROVED BY THE FOLLOWING CONTROLLED ITEM APPROVER

RESPONSIBLE C/A ROLE STATIONARY GENSET C/A
RESPONSIBLE C/A ROLE _____
RESPONSIBLE C/A ROLE _____

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

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DRN G_KHOT
CKD S_RAJAN
APVD C_KNEALING
DATE 28OCT15

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009

FIRST USED ON C3250D6

SITE CODE PGF

CUMMINS POWER GENERATION

INSTALLATION, GENSET
SEISMIC REQUIREMENTS

DWG SIZE D | A053Y944 | SHEET 1 OF 2 | DWG REV A

Drawing Name: A053Y945 Revision: A
Part Name: A053Y944 Revision: A
Sheet 1 of 3

PTC® Creo® Parametric

REL NO	LTR	NO	REVISION	DRN	CKD	APVD	DATE
ECO-156288	A	1	PRODUCTION_RELEASE	GK	SR	C_KNEALING	28OCT15

SEISMIC INSTALLATION NOTES:

1. THE INSTALLATION GUIDELINES IN THIS DRAWING ARE RECOMMENDATIONS FROM THE VMC GROUP AND SHOULD BE CONTACTED IF IN DOUBT.

2. EQUIPMENT ANCHORAGE MUST BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.

3. ANCHORS MUST BE INSTALLED TO THE TORQUE SPECIFICATION AS RECOMMENDED BY THE ANCHOR MANUFACTURER TO OBTAIN MAXIMUM LOADING.

4. ISOLATORS AND ANCHORS MUST BE INSTALLED IN THE LOCATIONS SPECIFIED BY THE PRODUCT INSTALLATION DRAWING.

5. ATTACHING SEISMIC CERTIFIED EQUIPMENT TO ANY FLOOR OR WALL OTHER THAN THOSE CONSTRUCTED OF STRUCTUAL CONCRETE AND DESIGNED TO ACCEPT THE SEISMIC LOADS FROM SAID EQUIPMENT IS NOT PERMITTED BY THIS SPECIFICATION AND BEYOUND THE SCOPE OF THIS CERTIFICATION.

6. ALL ACCESSORY ATTACHMENTS (PIPE, CONUIT, ETC.) TO THE EQUIPMENT SHALL BE ATTACHED IN A MANNER THAT ALLOWS RELATIVE MOTION (FLEX, SWING, JOIN/ELBOX, ETC) TO PREVENT FAILURE DUE TO DIFFERENTIAL MOVEMENT BETWEEN THE EQUIPMENT AND ATTACHED ACCESSORY CAUSED BY SEISMIC LOADING ON THE SYSTEM.

7. REFER TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR ANCHOR REQUIREMENTS AND MOUNTING CONSIDERATIONS FOR SEISMIC APPLICATIONS. MOUNTING REQUIREMENT DETAILS SUCH AS BRAND, TYPE, EMBEDMENT DEPTH, EDGE SPACING, ANCHOR SPACING, CONCRETE STRENGTH, WALL BRACING, AND SPECIAL INSPECTION MUST BE OUTLINED AND APPROVED BY THE PROJECT STRUCTURAL ENGINEER OF RECORD. THE INSTALLING CONTRACTOR IS RESPONIBLE FOR THE PROPER INSTALLATION OF ALL ANCHORS AND MOUNTING HARDWARE, OBSERVING THE MOUNTING REQUIREMNT DETAILS OUTLINED BY THE ENGINEER OF RECORD. CONTACT THE MANUFACTURE'S REPRESENTATIVE IF A DETAILED SEISMIC INSTALLATION CALCULATION PACKAGE IS REQUIRED.

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

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DRN G_KHOT

CKD S_RAJAN

APVD C_KNEALING

DATE 28OCT15

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009

FIRST USED ON C3250D6

SITE CODE PGF

CUMMINS POWER GENERATION

INSTALLATION, GENSET SEISMIC REQUIREMENTS

DWG SIZE D | A053Y944 | SHEET 2 OF 2 | DWG REV A

Drawing Name: A053Y945 Revision: A
Part Name: A053Y944 Revision: A
Sheet 2 of 3

SECTION 4

Warranty

Warranty Statement

Global Commercial Warranty Statement

Generator Set

English
Original Instructions

7-2017

A028U870 (Issue 5)

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

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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:_____