RECORD ONLY SUBMITTAL PACKAGE

CSDG - 4815

Prepared for:

Central States Diesel Generators
2001 South Prairie
Waukesha, Wisconsin 53189

THIS SUBMITTAL IS BEING PREPARED FOR RECORD PURPOSES ONLY

8 Sep 2025 Rev _

Serving Cummins Customers

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

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

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

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

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

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

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

Sales and Service

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SECTION 1

PROJECT INFORMATION

Sales and Service

Bill of Material

Feature Code	Description	Qty
DQDAC	**DQDAC, Genset, Configurable Diesel**	**1**
Install-US-Stat	U.S. EPA, Stationary Emergency Application	
300DQDAC	300DQDAC, Diesel Genset, 60Hz, 300kW	
A331-2	Duty Rating - Standby Power (ESP)	
L169-2	Emission Certification, EPA, Tier 3, NSPS CI Stationary Emergency	
L090-2	Listing - UL 2200	
R098-2	Voltage - 120/208, 3 Phase, Wye, 4 Wire	
B252-2	Alternator - 60Hz, 12 Lead, Broad Range, 125/105C	
B184-2	Exciter/Regulator - Permanent Magnet Generator, 3 Phase Sensor	
F183-2	Steel Weather Protective Enclosure, with Exhaust System, Residential Muffler	
P175-2	Enclosure Color - Green, Steel	
C127-2	Fuel Water Separator	
H679-2	Control Mounting - Front Facing	
H703-2	PowerCommand 2.3 Controller	
K796-2	Stop Switch - Emergency	
H536-2	Control Display Language - English	
KU93-2	Circuit Breaker or Entrance Box or Terminal Box - Left Only	
KU17-2	Circuit Breaker - 1200A, Left, 3P, 600/415V, SS RMS, 80%UL/IEC	
4790	Terminal Box - Low Voltage, Right - None	
KB73-2	Circuit Breaker or Entrance Box - Bottom Entry,Left Side	
5110	Circuit Breaker or Entrance Box or Terminal Box, Top Entry, Right - None	
A366-2	Engine Governor - Electronic, Isochronous	
A334-2	Engine Starter - 24 Volt DC Motor	
D041-2	Engine Air Cleaner - Normal Duty	
A333-2	Battery Charging Alternator	
E125-2	Engine Cooling - Radiator, High Ambient Air Temperature, Ship Fitted	
H389-2	Shutdown - Low Coolant Level	
H669-2	Engine Coolant - 50% Antifreeze, 50% Water Mixture	
H036-2	Coolant Heater - 120V, Single Phase	
H706-2	Engine Oil	
L028-2	Genset Warranty - 2 Years Base	
L050-2	Literature - English	
A322-2	Packing - Skid, Poly Bag	
A048G602	**Battery Charger-10Amp, 120/208/240VAC, 12/24V, 50/60Hz**	**1**
0179-4621-04	**Fuel Tank Kit-550 Gallon**	**1**
A030H466	**Circuit Breaker Rating Plug**	**1**

NOTES:

Proposal is for equipment only, offloading, rigging, and installation by others.
Fuel and permits, unless listed above, is not included.
Cummins Standard Start-up and testing is included. Additional tests, such as NETA testing, if required, is by others
Coordination Study not provided.

SECTION 2

GENERATOR SPECIFICATIONS

Specification Sheet

Diesel Generator Set QSL9-G7 Series Engine

250 kW - 300 kW Standby

Description

Cummins® commercial generator sets are fully integrated power generation systems providing optimum performance, reliability and versatility for stationary Standby and Prime 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 2/3 pitch windings, low waveform distortion with non-linear loads and fault clearing short-circuit capability.

Control system - The PowerCommand® 2.3 electronic control is standard equipment and provides total generator set system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, output metering, auto-shutdown at fault detection and NFPA 110 Level 1 compliance. The PowerCommand® 3.3 control is also available as an option.

Cooling system - Standard cooling package provides reliable running at the rated power level.

Enclosures - Optional weather protective and sound attenuated enclosures are available.

Fuel tanks - Dual wall sub-base fuel tanks are also available.

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

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

	Standby rating		Prime rating		Continuous rating		Data sheets	
Model	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz	50 Hz
DQDAA	250 (313)		225 (281)				D-3442	
DQDAB	275 (344)		250 (313)				D-3443	
DQDAC	300 (375)		270 (338)				D-3444	

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Generator Set Specifications

Governor regulation class	ISO 8528 Part 1 Class G3
Voltage regulation, no load to full load	± 0.5%
Random voltage variation	± 0.5%
Frequency regulation	Isochronous
Random frequency variation	± 0.5%
Radio frequency emissions compliance	IEC 801.2 through IEC 801.5; MIL-STD-461C, Part 9

Engine Specifications

Bore	114.0 mm (4.49 in)
Stroke	145 mm (5.69 in)
Displacement	8.9 L (543 in^3)
Configuration	Cast iron, in-line 6 cylinder
Battery capacity	750 amps minimum at ambient temperature of -18 ℃ (-0.4 ℉) and above
Battery charging alternator	70 amps
Starting voltage	24 volt, negative ground
Fuel system	Direct injection: number 2 diesel fuel, fuel filter, automatic electric fuel shutoff
Fuel filter	Dual element with water separator
Air cleaner type	Normal duty
Lube oil filter type(s)	Single spin-on, combination full flow and bypass filters
Standard cooling system	High ambient radiator

Alternator Specifications

Design	Brushless, 4 pole, drip proof revolving field
Stator	2/3 pitch
Rotor	Single bearing, flexible discs
Insulation system	Class H
Standard temperature rise	125 ℃ Standby, 105 ºC Prime
Exciter type	Permanent Magnet Generator (PMG)
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower
AC waveform Total Harmonic Distortion (THDV)	< 5% no load to full linear load, < 3% for any single harmonic
Telephone Influence Factor (TIF)	< 50 per NEMA MG1-22.43
Telephone Harmonic Factor (THF)	< 3

Available Voltages

60 Hz 3-phase			**50 Hz** 3-phase	
Reconnectable		Non-Reconnectable	Reconnectable	Non-Reconnectable
• 110/90 • 139/240 • 240/416	• 120/208 • 120/240 • 254/440	• 277/480 • 347/600		

Note: Consult factory for other voltages.

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Generator Set Options and Accessories

Engine

- 120/240 V 1500 W coolant heater
- 120/240 V 150 W lube oil heater
- Heavy duty air cleaner
- Engine oil temperature

Control panel

- 120/240 V 100 W control anti-condensation heater
- Exhaust pyrometer
- Ground fault indication
- Remote fault signal package
- Run relay package
- Paralleling configuration

Alternator

- 105 ℃ rise
- 125 ℃ rise
- 120/240 V 100 W anti-condensation heater
- PMG excitation
- Single phase

Exhaust system

- Genset mounted muffler
- Heavy duty exhaust elbow
- Slip on exhaust connection
- NPT exhaust connection

Fuel system

- 1022 L (270 gal) sub-base tank
- 1136 L (300 gal) sub-base tank
- 1514 L (400 gal) sub-base tank
- 1893 L (500 gal) sub-base tank
- 2271 L (600 gal) sub-base tank
- 2498 L (660 gal) sub-base tank
- 2725 L (720 gal) sub-base tank
- 5565 L (1470 gal) sub-base tank

Generator set

- AC entrance box
- Battery
- Battery charger
- Export box packaging
- UL 2200 Listed
- Main line circuit breaker
- PowerCommand network
- Communications Module (NCM)
- Remote annunciator panel
- Spring isolators
- Enclosure: aluminum, steel, weather protective or sound attenuated
- 2 year Standby power warranty
- 2 year Prime power warranty
- 5 year Basic power warranty
- 10 year major components warranty

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

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Control system 2.3

The PowerCommand 2.3 control system - An integrated generator set control system providing voltage regulation, engine protection, generator protection, operator interface and isochronous governing (optional).

Control – Provides battery monitoring and testing features and smart-starting control system.

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

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

Control boards – Potted for environmental protection.

Ambient operation – Suitable for operation in ambient temperatures from -40 ℃ to +70 ℃ and altitudes to 13,000 feet (5000 meters). Prototype tested - UL, CSA and CE compliant.

AC protection

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

Engine protection

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

Operator/display panel

- Manual off switch
- 128 x 128 Alpha-numeric display with push button access for viewing engine and alternator data and providing setup, controls and adjustments (English or international symbols)
- LED lamps indicating genset running, not in auto, common warning, common shutdown, manual run mode and remote start
- Suitable for operation in ambient temperatures from -20 ºC to +70 ºC

Alternator data

- Line-to-Neutral AC volts
- Line-to-Line AC volts
- 3-phase AC current
- Frequency
- kVA, kW, power factor

Engine data

- DC voltage
- Lube oil pressure
- Coolant temperature

Control functions

- Time delay start and cool down
- Glow plug control (some models)
- Cycle cranking
- PCCNet interface
- (4) Configurable inputs
- (4) Configurable outputs
- Remote emergency stop
- Battle short mode
- Load shed
- Real time clock with exerciser
- Derate

Digital governing (optional)

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

- Integrated digital electronic voltage regulator
- 3-phase Line-to-Line sensing
- Configurable torque matching
- Fault current regulation under single or three phase fault conditions

Other data

- Genset model data
- Start attempts, starts, running hours
- Fault history
- RS485 Modbus® interface
- Data logging and fault simulation (requires InPower service tool)
- Total kilowatt hours
- Load profile

Options

- Auxiliary output relays (2)
- 120/240 V, 100 W anti-condensation heater
- Remote annunciator with (3) configurable inputs and (4) configurable outputs
- PMG alternator excitation
- PowerCommand for Windows® remote monitoring software (direct connect)
- AC output analogue meters
- PowerCommand 2.3 and 3.3 control with AmpSentry protection

For further detail on PC 2.3 see document S-1569.

For further detail on PC 3.3 see document S-1570.

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Ratings Definitions

Emergency Standby Power (ESP):

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

Limited-Time Running Power (LTP):

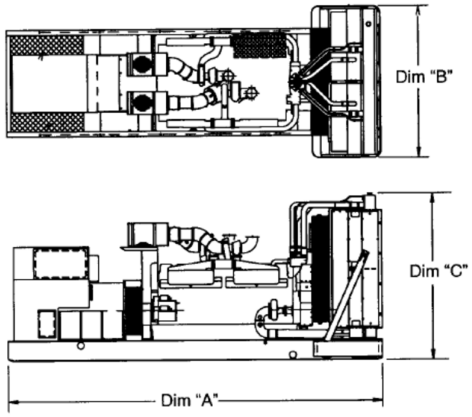
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime Power (PRP):

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

Base Load (Continuous) Power (COP):

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



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

Do not use for installation design

Dimensions and weights with standard cooling system

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Estimated set weight* dry kg (lbs)	Estimated set weight* wet kg (lbs)
DQDAA	3023 (119.0)	1270 (50.0)	1617 (64.0)	2184 (4814)	2234 (4926)
DQDAB	3023 (119.0)	1270 (50.0)	1617 (64.0)	2184 (4814)	2234 (4926)
DQDAC	3023 (119.0)	1270 (50.0)	1617 (64.0)	2319 (5113)	2370 (5225)

Dimensions and weights with optional cooling system with seismic feature codes L228-2 and/or L225-2

Refer to drawings for specific weights and dimensions

Model	Dim "A" mm (in.)	(in.)	(in.)	weight* dry kg (lbs)	Estimated set weight* wet kg (lbs)
DQDAA	3023 (119.0)	1270 (50.0)	1676 (66.0)	2184 (4814)	2234 (4926)
DQDAB	3023 (119.0)	1270 (50.0)	1676 (66.0)	2184 (4814)	2234 (4926)
DQDAC	3023 (119.0)	1270 (50.0)	1676 (66.0)	2319 (5113)	2370 (5225)

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

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Codes and Standards

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

	This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.		The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage.
	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.	**U.S. EPA**	Engine certified to Stationary Emergency U.S. EPA New Source Performance Standards,40 CFR 60 subpart IIII Tier 3 exhaust emission levels. U.S. applications must be applied per this EPA regulation.
	All low voltage models are CSA certified to product class 4215-01.	**International Building Code**	The generator set package is available certified for seismic application in accordance with the following International Building Code: IBC2000, IBC2003, IBC2006, IBC2009 and IBC2012.

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

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

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Generator set data sheet

Model: DQDAC
Frequency: 60 Hz
Fuel type: Diesel
kW rating: 300 Standby
270 Prime
Emissions level: EPA NSPS Stationary Emergency Tier 3

Exhaust emission data sheet:	**EDS-1073**
Exhaust emission compliance sheet:	**EPA-1101**
Sound performance data sheet:	**MSP-1030**
Cooling performance data sheet:	**MCP-150**
Prototype test summary data sheet:	**PTS-164**
Standard set-mounted radiator cooling outline:	**A048R355**
Optional set-mounted radiator cooling outline with seismic feature codes L228-2 (IBC) or L225-2 (OSHPD):	**A041F591**

Fuel consumption	**Standby**				**Prime**				**Continuous**
	kW (kVA)				**kW (kVA)**				**kW (kVA)**
Ratings	300 (375)				270 (338)				
Load	**1/4**	**1/2**	**3/4**	**Full**	**1/4**	**1/2**	**3/4**	**Full**	**Full**
US gph	6.8	12.2	17.7	23.1	6.3	11.1	15.9	20.8	
L/hr	25.8	46.3	66.8	87.3	23.6	42.0	60.3	78.7	

Engine	**Standby rating**	**Prime rating**	**Continuous rating**
Engine manufacturer	Cummins Inc.		
Engine model	QSL9-G7		
Configuration	Cast iron, in-line 6 cylinder		
Aspiration	Turbocharged and CAC		
Gross engine power output, kW_m (bhp)	346 (464)	312 (419)	
BMEP at set rated load, kPa (psi)	2606 (378)	2351 (341)	
Bore, mm (in.)	114.0 (4.49)		
Stroke, mm (in.)	145 (5.69)		
Rated speed, rpm	1800		
Piston speed, m/s (ft/min)	8.7 (1707.0)		
Compression ratio	16.1:1		
Lube oil capacity, L (qt)	30.0 (31.7)		
Overspeed limit, rpm	2070 ± 50		
Regenerative power, kW	35.00		

Fuel flow

Maximum fuel flow, L/hr (US gph)	156.7 (41.4)	
Maximum fuel inlet restriction, mm Hg (in Hg)	152.4 (6.0)	
Maximum return restriction, mm Hg (in Hg)	254.0 (10.0)	

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Air	Standby rating	Prime rating	Continuous rating
Combustion air, m^3/min (scfm)	25.1 (885.8)	23.2 (820.7)	
Maximum air cleaner restriction, kPa (in H_2O)	6.2 (25.0)		
Alternator cooling air, m^3/min (cfm)	59.4 (2100.0)		

Exhaust

Exhaust flow at set rated load, m^3/min (cfm)	65.0 (2296)	60.5 (2137)	
Exhaust temperature, °C (°F)	551.8 (1025)	515.9 (961)	
Maximum back pressure, kPa (in H_2O)	10.2 (41.0)		

Standard set-mounted radiator cooling (non-seismic)

Ambient design, °C (°F)	50 (122)		
Fan load, kW_m (HP)	26.09 (35)		
Coolant capacity (with radiator), L (US gal)	34.29 (9.06)		
Cooling system air flow, m^3/min (scfm)	427.58 (15100)		
Total heat rejection, MJ/min (Btu/min)	10.5 (9924.0)	9.3 (8727.0)	
Maximum cooling air flow static restriction, kPa (in H_2O)	0.12 (0.5)		

Optional set-mounted radiator cooling (with seismic feature codes L228-2 (IBC) and/or L225-2 (OSHPD)

Ambient design, °C (°F)	40 (104)		
Fan load, kW_m (HP)	27.8 (37.2)		
Coolant capacity (with radiator), L (US gal)	30.3 (8.0)		
Cooling system air flow, m^3/min (scfm)	568.1 (20075.0)		
Total heat rejection, MJ/min (Btu/min)	10.5 (9924.0)	9.3 (8727.0)	
Maximum cooling air flow static restriction, kPa (in H_2O)	0.12 (0.5)		

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Weights[2]

Unit dry weight kgs (lbs)	Refer to drawings for specific weights and dimensions
Unit wet weight kgs (lbs)	

Notes:
[1] For non-standard remote installations contact your local Cummins representative.
[2] Weights represent a set with standard features. See outline drawing for weights of other configurations.

Derating factors

Standby	Engine power available up to 549 m (1800 ft) at ambient temperature up to 40 °C (104 °F). Above these elevations, derate at 7% per 400 m (1312 ft). Above 40 °C (104 °F) derate 7% per 10 deg C (18 deg F). Derates must be combined when both altitude of 549 m (1800 ft) and temperature of 40 °C (104 °F) are exceeded.
Prime	Engine power available up to 500 m (1640 ft) at ambient temperature up to 40 °C (104 °F). Above these elevations, derate at 7% per 400 m (1312 ft). Above 40 °C (104 °F), derate 5.5% per 10 °C (18 °F). Derates must be combined when both altitude of 500 m (1640 ft) and temperature of 40 °C (104 °F) are exceeded.
Continuous	

Ratings definitions

Emergency Standby Power (ESP):	**Limited-Time Running Power (LTP):**	**Prime Power (PRP):**	**Base Load (Continuous) Power (COP):**
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power to a constant electrical load for limited hours. Limited-Time Running Power (LTP) is in accordance with ISO 8528.	Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) is in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.

Alternator data

Three phase table[1]		**80 °C**	**80 °C**	**105 °C**	**105 °C**	**105 °C**	**125 °C**	**125 °C**	**125 °C**	**125 °C**	**125 °C**		
Feature code		B251	B302	B259	B256	B301	B258	B252	B246	B247	B300		
Alternator data sheet number		342	342	342	342	341	342	341	341	341	341		
Voltage ranges		277/480	347/600	110/190 thru 139/240 220/380 thru 277/480	120/208 thru 139/240 240/416 thru 277/480	347/600	110/190 thru 139/240 220/380 thru 277/480	120/208 thru 139/240 240/416 thru 277/480	277/480	277/480	347/600		
Surge kW		322	322	322	322	322	322	322	322	322	322		
Motor starting kVA (at 90% sustained voltage)	Shunt												
	PMG	1372	1372	1372	1372	1210	1372	1210	1210	1210	1210		

Full load current - amps at Standby rating	120/208 1042	127/220 985	139/240 903	220/380 570	240/416 521	254/440 483	277/480 452	347/600 361

Note:
[1] Single phase power can be taken from a three phase generator set at up to 40% of the generator set nameplate kW rating at unity power factor.

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Formulas for calculating full load currents:

Three phase output

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

Single phase output

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

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

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

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D-3444 (10/17)

Specification Sheet

PowerCommand®
2.3 Control System

Control System Description

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

Features

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

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PowerCommand Digital Genset Control PCC 2300

Description

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

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

Features

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

Base Control Functions

HMI Capability

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

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

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

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

Alternator data

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

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

Engine data

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

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

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Service adjustments (continued)

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

Engine Control

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

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

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

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

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

Remote start mode - It accepts a ground signal from remote devices to automatically start the generator set and immediately accelerate to rated speed and voltage. The remote start signal will also wake up the control from sleep mode. The control can incorporate a time delay start and stop.

Remote and local emergency stop - The control accepts a ground signal from a local (genset mounted) or remote (facility mounted) emergency stop switch to cause the generator set to immediately shut down. The generator set is prevented from running or cranking with the switch engaged. If in sleep mode, activation of either emergency stop switch will wakeup the control.

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

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

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

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

Alternator Control

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

Major system features include:

Digital output voltage regulation - Capable of regulating output voltage to within +/-1.0% for any loads between no load and full load. Voltage drift will not exceed +/- 1.5% for a 40 ºC (104 ºF) change in temperature in an eight hour period. On engine starting or sudden load acceptance, voltage is controlled to a maximum of 5% overshoot over nominal level. The automatic voltage regulator feature can be disabled to allow the use of an external voltage regulator.

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

Torque-matched V/Hz overload control - The voltage roll-off set point and rate of decay (i.e. the slope of the V/Hz curve) is adjustable in the control.

Fault current regulation - PowerCommand will regulate the output current on any phase to a maximum of three times rated current under fault conditions for both single phase and three phase faults. In conjunction with a permanent magnet generator, it will provide three times rated current on all phases for motor starting and short circuit coordination purpose.

Protective Functions

On operation of a protective function the control will indicate a fault by illuminating the appropriate status LED on the HMI, as well as display the fault code and fault description on the LCD. The nature of the fault and time of occurrence are logged in the control. The service manual and InPower service tool provide service keys and procedures based on the service codes provided.

Protective functions include:

Battle Short Mode

When enabled and the *battle short* switch is active, the control will allow some shutdown faults to be bypassed. If a bypassed shutdown fault occurs, the fault code and description will still be annunciated, but the genset will not shutdown. This will be followed by a *fail to shutdown* fault. Emergency stop shutdowns and others that are critical for proper operation are not bypassed. Please refer to the control application guide or manual for list of these faults.

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Derate

The derate function reduces output power of the genset in response to a fault condition. If a derate command occurs while operating on an isolated bus, the control will issue commands to reduce the load on the genset via contact closures or modbus.

Configurable Alarm and Status Inputs

The control accepts up to four alarm or status inputs (configurable contact closed to ground or open) to indicate a configurable (customer-specified) condition.

The control is programmable for warning, shutdown or status indication and for labeling the input.

Emergency Stop

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

Full Authority Electronic Engine Protection

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

General Engine Protection

Low and high battery voltage warning - Indicates status of battery charging system (failure) by continuously monitoring battery voltage.

Weak battery warning - The control system will test the battery each time the generator set is signaled to start and indicate a warning if the battery indicates impending failure.

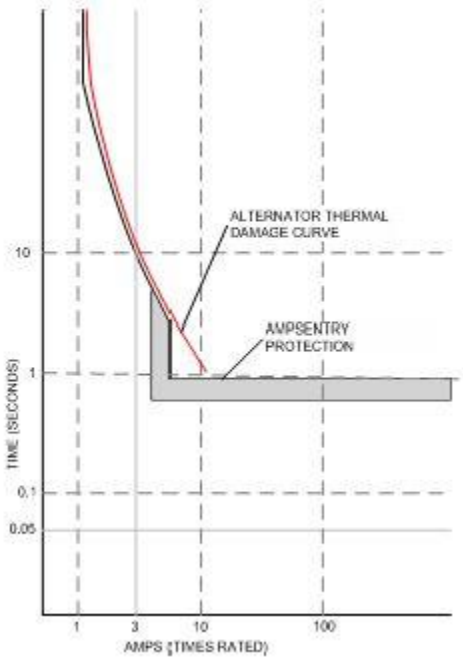
Fail to start (overcrank) shutdown - The control system will indicate a fault if the generator set fails to start by the completion of the engine crack sequence.

Fail to crank shutdown - Control has signaled starter to crank engine but engine does not rotate.

Cranking lockout - The control will not allow the starter to attempt to engage or to crank the engine when the engine is rotating.

Alternator Protection

AmpSentry protective relay - A comprehensive monitoring and control system integral to the PowerCommand Control System that guards the electrical integrity of the alternator and power system by providing protection against a wide array of fault conditions in the generator set or in the load. It also provides single and three phase fault current regulation so that downstream protective devices have the maximum current available to quickly clear fault conditions without subjecting the alternator to potentially catastrophic failure conditions. Thermal damage curve (3-Phase short) or fixed timer (2 sec for 1-Phase short, 5 sec for 2-Phase short). See document R1053 for a full-size time over current curve.



AmpSentry Maintenance Mode (AMM) - Instantaneous tripping, if AmpSentry Maintenance mode is active (50mS response to turn off AVR excitation/shutdown genset) for arc flash reduction when personnel are near genset.

High AC voltage shutdown (59) - Output voltage on any phase exceeds preset values. Time to trip is inversely proportional to amount above threshold. Values adjustable from 105-125% of nominal voltage, with time delay adjustable from 0.1-10 seconds. Default value is 110% for 10 seconds.

Low AC voltage shutdown (27) - Voltage on any phase has dropped below a preset value. Adjustable over a range of 50-95% of reference voltage, time delay 2-20 seconds. Default value is 85% for 10 seconds. Function tracks reference voltage. Control does not nuisance trip when voltage varies due to the control directing voltage to drop, such as during a V/Hz roll-off during synchronizing.

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

Under frequency protection is disabled when excitation is switched off, such as when engine is operating in idle speed mode.

Over frequency shutdown/warning (81 o) - Generator set is operating at a potentially damaging frequency level. Settings are adjustable from 2-10 Hz above nominal governor set point for a 1-20 second time delay. Default: 6 Hz,
20 seconds, disabled.

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

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

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

Over load (kW) warning - Provides a warning indication when engine is operating at a load level over a set point.

Adjustment range: 80-140% of application rated kW, 0-120 second delay. Defaults: 105%, 60 seconds.

Reverse power shutdown (32) - Adjustment range: 5-20% of standby kW rating, delay 1-15 seconds. Default: 10%, 3 seconds.

Reverse Var shutdown - Shutdown level is adjustable: 15-50% of rated Var output, delay 10-60 seconds. Default: 20%, 10 seconds.

Short circuit protection - Output current on any phase is more than 175% of rating and approaching the thermal damage point of the alternator. Control includes algorithms to protect alternator from repeated over current conditions over a short period of time.

Field Control Interface

Input signals to the PowerCommand control include:

- Coolant level (where applicable)
- Fuel level (where applicable)
- Remote emergency stop
- Remote fault reset
- Remote start
- Battleshort
- Rupture basin
- Start type signal
- Configurable inputs - Control includes (4) input signals from customer discrete devices that are configurable for warning, shutdown or status indication, as well as message displayed

Output signals from the PowerCommand control include:

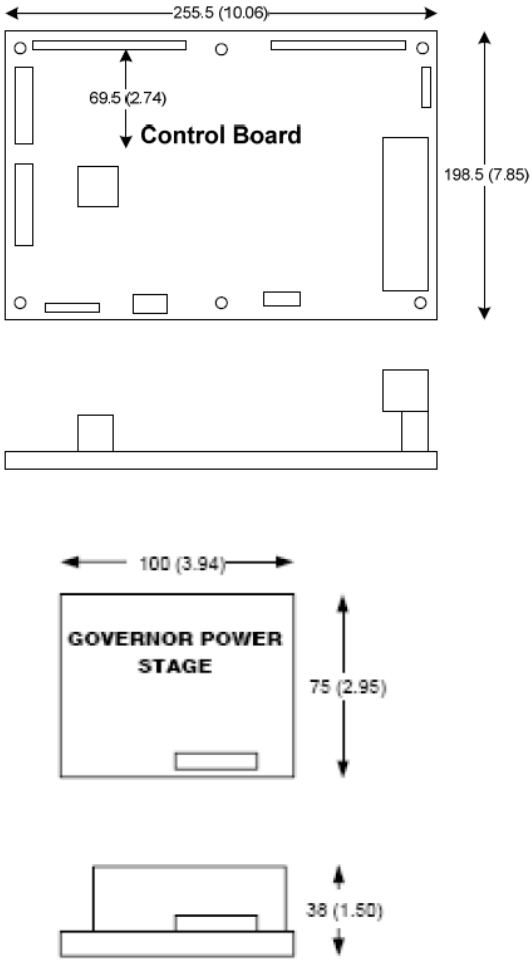
- Load dump signal: Operates when the generator set is in an overload condition.
- Delayed off signal: Time delay based output which will continue to remain active after the control has removed the run command. Adjustment range: 0 – 120 seconds. Default: 0 seconds.
- Configurable relay outputs: Control includes (4) relay output contacts (3 A, 30 VDC). These outputs can be configured to activate on any control warning or shutdown fault as well as ready to load, not in auto, common alarm, common warning and common shutdown.
- Ready to load (generator set running) signal: Operates when the generator set has reached 90% of rated speed and voltage and latches until generator set is switched to off or idle mode.

Communications Connections Include:

- PC tool interface: This RS-485 communication port allows the control to communicate with a personal computer running InPower software.
- Modbus RS-485 port: Allows the control to communicate with external devices such as PLCs using Modbus protocol.

  Note - An RS-232 or USB to RS-485 converter is required for communication between PC and control.
- Networking: This RS-485 communication port allows connection from the control to the other Cummins products.

Mechanical Drawings



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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.

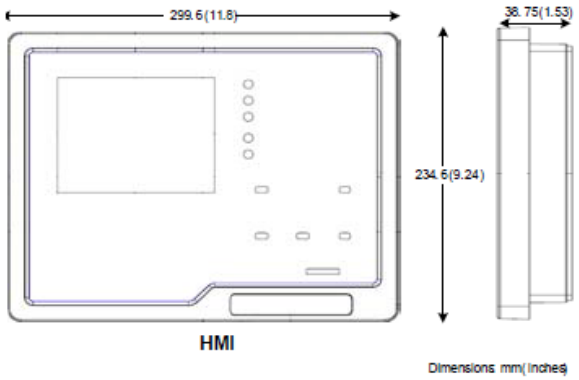
Features

- LED indicating lamps:
  - Genset running
  - Remote start
  - Not in auto
  - Shutdown
  - Warning
  - Auto
  - Manual and stop
- 320 x 240 pixels graphic LED backlight LCD.
- Four tactile feel membrane switches for LCD defined operation. The functions of these switches are defined dynamically on the LCD.
- Seven tactile feel membrane switches dedicated screen navigation buttons for up, down, left, right, ok, home and cancel.
- Six tactile feel membrane switches dedicated to control for auto, stop, manual, manual start, fault reset and lamp test/panel lamps.
- Two tactile feel membrane switches dedicated to control of circuit breaker (where applicable).
- Allows for complete genset control setup.
- Certifications: Suitable for use on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., CE and CSA standards.
- LCD languages supported: English, Spanish, French, German, Italian, Greek, Dutch, Portuguese, Finnish, Norwegian, Danish, Russian and Chinese Characters.

Communications connections include:

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

Mechanical Drawing



Software

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

Environment

The control is designed for proper operation without recalibration in ambient temperatures from -40 ºC to +70º C (-40 ºF to 158 ºF) and for storage from -55 ºC to +80 ºC (-67 ºF to 176 ºF). Control will operate with humidity up to 95%, non-condensing.

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

The control board is fully encapsulated to provide superior resistance to dust and moisture. Display panel has a single membrane surface, which is impervious to effects of dust, moisture, oil and exhaust fumes. This panel uses a sealed membrane to provide long reliable service life in harsh environments.

The control system is specifically designed and tested for resistance to RFI/EMI and to resist effects of vibration to provide a long reliable life when mounted on a generator set. The control includes transient voltage surge suppression to provide compliance to referenced standards.

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Certifications

PowerCommand meets or exceeds the requirements of the following codes and standards:

- NFPA 110 for level 1 and 2 systems.
- ISO 8528-4: 1993 compliance, controls and switchgear.
- CE marking: The CE marking is only valid when equipment is used in a fixed installation application. Material compliance declaration is available upon request.
- UKCA marking: The UKCA marking is only valid when equipment is used in a fixed installation application. Material compliance declaration is available upon request.
- EN50081-1,2 residential/light industrial emissions or industrial emissions.
- EN50082-1,2 residential/light industrial or industrial susceptibility.
- ISO 7637-2, level 2; DC supply surge voltage test.
- Mil Std 202C, Method 101 and ASTM B117: Salt fog test.
- UL 6200 recognized and suitable for use on UL 2200 Listed generator sets.
- CSA C282-M1999 compliance
- CSA 22.2 No. 14 M91 industrial controls.
- PowerCommand control systems and generator sets are designed and manufactured in ISO 9001 certified facilities.

Warranty

All components and subsystems are covered by an express limited one year warranty. Other optional and extended factory warranties and local distributor maintenance agreements are available.

PCCNet COMPATIBLE

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

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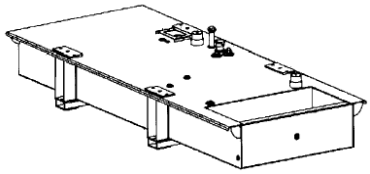
Specification Sheet

Fuel Tanks, 230-500 kW, Dual Wall, Sub-base



Description

Cummins® dual wall diesel fuel tanks are rectangular steel tanks with a sealed, separately vented, integral fuel containment basin.

They carry a dual UL listing for the United States (UL 142) and Canada (CAN/ULC-S601-07) under the category of a secondary containment generator base tank. Inner and outer tanks are pressurized at 3 psi and leak checked to ensure integrity of weld seams per these UL standards prior to shipment.

Tanks are constructed of heavy gauge steel and include a reinforced steel box channel for generator support. Full height gussets are provided at generator set mounting holes. Tanks are load rated at 5,000 pounds per generator set mounting point. The design has been tested extensively under conditions far in excess of normal use to ensure that it can safely support the full weight of the generator set.

All tanks are pressure washed with an iron phosphate solution and then finished with an acrylic primer and black enamel paint. The interior is coated with a solvent-based rust preventative.

Tanks with local code approvals share the same construction features of standard sub-base tanks and are configured with additional options necessary to meet requirements of the city of Chicago Department of Inspectional Services, the Florida Department of Environmental Protection (FDEP) and Department of Environmental Resource Management (DERM) or the city of Los Angeles Bureau of Fire Prevention.

Reference instruction sheet - **G478** for installation.

Note: Pre-drilled mounting pads accept Cummins accessories spring vibration isolators (0402-0220, 0402-0222, 0402- 0234, 0402-0427, 0402-0431, 0402-0750-01) between tank and genset but will not accept 0402-0690 or 0402-0691 series isolators.

Features

UL Listed for USA - Secondary containment generator sub-base tank meets UL requirements.

Designed to meet requirements of NFPA – NFPA 30, NFPA 37 and NFPA 110.

Emergency pressure relief vent cap - Meets or exceeds UL requirements - insures adequate venting and pressure relief for inner and outer tank under extreme temperature and emergency conditions.

Atmospheric vent cap - Accommodates normal venting (oversized 2" vent is raised above the fuel fill).

Raised fuel fill - Includes lockable flip top to prevent tampering and/or fuel contamination.

Fuel level gauge - Provides direct reading, top mounted.

Low fuel level switch - Annunciates a 50% low fuel level condition at generator set control panel.

Leak detection switch - Side mounted, annunciates a contained primary tank fuel leak at generator set control.

Modular tank design - Genset support and mounting design accepts multiple Cummins generator sets within designated genset groupings.

Enclosure compatible - Accepts drop-over weather protective and sound attenuated enclosures.

Tank to foundation ground clearance - Allows for visual secondary containment leak detection.

Tank top mounting bracket - Provides mounting for (optional) pump and control for day tank operation.

Removable panel/channel - Provides access to a full width, electrical stub-up area.

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Specifications - Standard, Chicago, and Los Angeles tanks (continued)

Model	Kit 0159-1486-xx Std	Chicago	LA	Full load operating hours (60 Hz)	Tank capacity usable Gal (L)	Tank dimensions Length in (mm)	Width In (mm)	Height in (mm)	Dry tank weight Lb (Kg)
DQAF	-21	-41	-61	9.8	210 (795)	134.0 (3404)	54.0 (1372)	15.25 (387)	1300 (590)
	-22	-42	-62	19.6	420 (1590)	134.0 (3404)	54.0 (1372)	26.75 (679)	1700 (771)
	-32	-52	-72	11.6	248 (939)	134.0 (3404)	54.0 (1372)	18.25 (464)	1390 (632)
	-33	-53	-73	23.5	502 (1900)	134.0 (3404)	54.0 (1372)	32.25 (819)	1860 (845)
DQBA	-23	-43	-63	16.8	350 (1325)	142.0 (3607)	54.0 (1372)	21.25 (540)	1575 (714)
	-24	-44	-64	24.0	500 (1893)	142.0 (3607)	54.0 (1372)	28.75 (730)	1850 (840)
	-25	-45	-65	28.8	600 (2271)	142.0 (3607)	54.0 (1372)	34.25 (870)	2025 (919)
	-26	-46	-66	33.7	700 (2650)	142.0 (3607)	54.0 (1372)	38.25 (972)	2175 (987)

Model	Kit 0179-4621-xx Std	Chicago	LA	Full load operating hours (60 Hz)	Tank capacity usable Gal (L)	Tank dimensions Length in (mm)	Width In (mm)	Height in (mm)	Dry tank weight Lb (Kg)
DQDAA	-03	N/A	N/A	16.9	300 (1136)	119.0 (3027)	54.0 (1372)	22.25 (565)	1723 (783)
	-04	N/A	N/A	30.9	550 (2082)	119.0 (3027)	54.0 (1372)	38.25 (972)	2233 (1015)
DQDAB	-03	N/A	N/A	15.2	300 (1136)	119.0 (3027)	54.0 (1372)	22.25 (565)	1723 (783)
	-04	N/A	N/A	27.8	550 (2082)	119.0 (3027)	54.0 (1372)	38.25 (972)	2233 (1015)
DQDAC	-03	N/A	N/A	13.8	300 (1136)	119.0 (3027)	54.0 (1372)	22.25 (565)	1723 (783)
	-04	N/A	N/A	25.2	550 (2082)	119.0 (3027)	54.0 (1372)	38.25 (972)	2233 (1015)
DQHAA	A026J345	N/A	N/A	13.8	300 (1136)	136.0 (3454)	60.0 (1524)	17.0 (432)	1800 (816)
	A026J348	N/A	N/A	27.5	600 (2271)	136.0 (3454)	60.0 (1524)	31.0 (787)	2230 (1012)
DQHAB	A026J345	N/A	N/A	13.0	300 (1136)	136.0 (3454)	60.0 (1524)	17.0 (432)	1800 (816)
	A026J348	N/A	N/A	25.9	600 (2271)	136.0 (3454)	60.0 (1524)	31.0 (787)	2230 (1012)

Specifications - Florida tanks

Model	Kit 0159-1486-xx Std	Full load operating hours (60 Hz)	Tank capacity usable Gal (L)	Tank dimensions Length in (mm)	Width In (mm)	Height in (mm)	Dry tank weight Lb (Kg))
DFAB	-92	15.9	248 (939)	154.0 (3912)	54.0 (1372)	15.75 (400)	1400 (636)
	-93	32.2	502 (1900)	154.0 (3912)	54.0 (1372)	27.25 (692)	1800 (818)
DFAC	-92	14.8	248 (939)	154.0 (3912)	54.0 (1372)	15.75 (400)	1400 (636)
	-93	29.9	502 (1900)	154.0 (3912)	54.0 (1372)	27.25 (692)	1800 (818)
DFBF	-83	17.2	350 (1325)	162.0 (4115)	54.0 (1372)	18.75 (476)	1650 (750)
	-84	24.5	500 (1893)	162.0 (4115)	54.0 (1372)	25.25 (641)	1890 (859)
	-85	34.8	710 (2688)	162.0 (4115)	50.0 (1270)	34.20 (868)	2282 (1037)
	-86	39.2	800 (3028)	162.0 (4115)	50.0 (1270)	38.20 (970)	2460 (1116)
DFCB	-83	15.6	350 (1325)	162.0 (4115)	54.0 (1372)	18.75 (476)	1650 (750)
	-84	22.2	500 (1893)	162.0 (4115)	54.0 (1372)	25.25 (641)	1890 (859)
	-85	31.6	710 (2688)	162.0 (4115)	50.0 (1270)	34.20 (868)	2282 (1037)
	-86	35.6	800 (3028)	162.0 (4115)	50.0 (1270)	38.20 (970)	2460 (1116)
DFCC	-85	29.1	710 (2688)	162.0 (4115)	50.0 (1270)	34.20 (868)	2282 (1037)
	-86	32.8	800 (3028)	162.0 (4115)	50.0 (1270)	38.20 (970)	2460 (1116)
DFCE	-83	12	350 (1325)	162.0 (4115)	54.0 (1372)	18.75 (476)	1650 (750)
	-84	17.2	500 (1893)	162.0 (4115)	54.0 (1372)	25.25 (641)	1890 (859)
	-85	24.4	710 (2688)	162.0 (4115)	50.0 (1270)	34.20 (868)	2282 (1037)
	-86	27.5	800 (3028)	162.0 (4115)	50.0 (1270)	38.20 (970)	2460 (1116)
DFEB	-87	14.7	425 (1609)	176.0 (4470)	60.0 (1524)	18.80 (476)	2250 (1023)
	-88	31.1	900 (3407)	176.0 (4470)	60.0 (1524)	34.80 (883)	3090 (1402)
DFEC	-87	13.7	425 (1609)	176.0 (4470)	60.0 (1524)	18.80 (476)	2250 (1023)
	-88	29	900 (3407)	176.0 (4470)	60.0 (1524)	34.80 (883)	3090 (1402)
DFED	-87	12.5	425 (1609)	176.0 (4470)	60.0 (1524)	18.80 (476)	2250 (1023)
	-88	26.5	900 (3407)	176.0 (4470)	60.0 (1524)	34.80 (883)	3090 (1402)

(continued)

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Specifications - Florida tanks (continued)

Model	Kit 0159-1486-xx Std	Full load operating hours (60 Hz)	Tank capacity usable Gal (L)	Tank dimensions Length in (mm)	Width In (mm)	Height in (mm)	Dry tank weight Lb (Kg))
DFEG	-90	17.6	425 (1609)	176.0 (4470)	60.0 (1524)	18.80 (476)	2250 (1023)
	-91	37.3	900 (3407)	176.0 (4470)	60.0 (1524)	34.80 (883)	3090 (1402)
DFEH	-90	15.6	425 (1609)	176.0 (4470)	60.0 (1524)	18.80 (476)	2250 (1023)
	-91	33.0	900 (3407)	176.0 (4470)	60.0 (1524)	34.80 (883)	3090 (1402)
DFEJ	-90	14.1	425 (1609)	176.0 (4470)	60.0 (1524)	18.80 (476)	2250 (1023)
	-91	29.9	900 (3407)	176.0 (4470)	60.0 (1524)	34.80 (883)	3090 (1402)
DFEK	-90	12.4	425 (1609)	176.0 (4470)	60.0 (1524)	18.80 (476)	2250 (1023)
	-91	26.2	900 (3407)	176.0 (4470)	60.0 (1524)	34.80 (883)	3090 (1402)
DQAB	-92	14.5	248 (939)	154.0 (3912)	54.0 (1372)	15.75 (400)	1400 (636)
	-93	29.4	502 (1900)	154.0 (3912)	54.0 (1372)	27.25 (692)	1800 (818)
DQAD	-92	14.3	248 (939)	154.0 (3912)	54.0 (1372)	15.75 (400)	1400 (636)
	-93	29.0	502 (1900)	154.0 (3912)	54.0 (1372)	27.25 (692)	1800 (818)
DQAE	-92	12.8	248 (939)	154.0 (3912)	54.0 (1372)	15.75 (400)	1400 (636)
	-93	25.9	502 (1900)	154.0 (3912)	54.0 (1372)	27.25 (692)	1800 (818)
DQAF	-92	11.6	248 (939)	154.0 (3912)	54.0 (1372)	15.75 (400)	1400 (636)
	-93	23.5	502 (1900)	154.0 (3912)	54.0 (1372)	27.25 (692)	1800 (818)
DQBA	-83	16.8	350 (1325)	162.0 (4115)	54.0 (1372)	18.75 (476)	1650 (750)
	-84	24.0	500 (1893)	162.0 (4115)	54.0 (1372)	25.25 (641)	1890 (859)
	-85	34.1	710 (2688)	162.0 (4115)	50.0 (1270)	34.20 (868)	2282 (1037)
	-86	38.5	800 (3028)	162.0 (4115)	50.0 (1270)	38.20 (970)	2460 (1116)
DQDAA	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DQDAB	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DQDAC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DQHAA	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DQHAB	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Additional unique features by local approval

Chicago

- Tank approval indicated by the city of Chicago, Department of Inspectional Services, Plan No. 0451.
- Low fuel level switch (95% high and 50%) - Wired to a terminal block for local/remote annunciation within an electrical junction box.
- Leak detection switch (top-mount) - Wired to a terminal block for local/remote annunciation within an electrical junction box.
- No bottom fittings - Meets requirement that all tank fittings are to be located above the fuel level of the tank.

Los Angeles

- Tank approval indicated by the Los Angeles Bureau of Fire Prevention, Tag No. 2-94-1 for a sub-base tank.
- Tank design meets seismic requirements when appropriate vibration isolators are installed beneath the tank.
- Normal atmospheric and emergency vents must be exhausted out of a building (indoor applications) at a safe location by a qualified service technician.
- Additional options required when the “tank fill” location does not allow the fuel level gauge to be supervised.

Florida

- Tank approval by the Florida Department of Environmental Protection.
- Florida Department of Environmental Protection (FDEP) approval for:
  - FDEP approval is required for capacities greater than 550 gallon. Approval listed within FDEP File #EQ-662 (manufactured by Tramont Corporation).
  - 90% high fuel level sensor manufactured by INCON subsidiary of Franklin Fueling Systems). FDEP approval listed within File #EQ-456.
  - Leak detection switch approval listed within FDEP File #EQ-456.
  - Aboveground spill container, contains fuel overfill spills that may occur during fill-up (5-gallon capacity).
  - FDEP tanks are 20” longer on the radiator end of the genset to accommodate the above ground spill container, listed with the tank FDEP File #EQ-662.
  - Additional options required when the “tank fill” location does not allow the fuel level gauge to be supervised.
- Department of Environmental Resource Management (DERM) as required by Dade and Broward counties. Tank to foundation ground clearance for visual secondary leak detection (support channels located beneath tank).

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Options

Fuel transfer control and pump kit - Enables field upgrade of standard tank to a day tank. Must purchase through Tramont 414-906-2040.

Standards and certifications/codes

Dual United States and Canadian Underwriter's Laboratories (UL)

Listing – US listing is filed under the Special Purpose Tank Category of UL 142 and the Canadian listing is pursuant CAN/ULC-S601- 07 Standard for Shop Fabricated Steel Aboveground Tanks and Combustible Liquids. C UL and US UL listing is under UL File No. MH17470 as a "Secondary Containment Generator Base Tank."

NFPA – Cummins tanks are designed to be installed in accordance with all applicable NFPA codes:

- NFPA 30 - Flammable and Combustible Liquids Code
- NFPA 37 - Standard for Installation and use of Stationary Combustible Engine and Gas Turbines
- NFPA 110 - Standard for Emergency and Standby Power Systems

Chicago Local Approval

Optional City of Chicago local approval - Meets the local code required for approval by the Chicago Department of Inspectional Services - Plan No. 0451

L.A. Local Approval

Optional local approval - Meets the local code required for approval by the City of Los Angeles Bureau of Fire Prevention

Florida Local Approval

Optional local approval - Meets the local code required for approval by the Florida Department of Environmental Protection

ISO9001 - This product was designed and manufactured in facilities certified to ISO9001

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.
Warning: For professional use only. Must be installed by a qualified service technician. Improper installation presents hazards of electrical shock and improper operation, resulting in severe personal injury and/or property damage.

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

Our energy working for you.™

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S-1391 PDA059Y482 (03/22)

2025 EPA Tier 3 Exhaust Emission Compliance Statement

300DQDAC

Stationary Emergency

60 Hz Diesel Generator Set

Compliance Information:

The engine used in this generator set complies with Tier 3 emissions limit of U.S. EPA New Source Performance Standards for stationary emergency engines under the provisions of 40 CFR 60 Subpart IIII.

Engine Manufacturer:	Cummins Inc.
EPA Certificate Number:	SCEXL0540AAB-035
Effective Date:	1/22/2025
Date Issued:	1/22/2025
EPA Engine Family (Cummins Emissions Family):	SCEXL0540AAB

Engine Information:

Model:	QSL/QSL9/QSL9-G7 NR3	Bore:	4.49 in. (114 mm)
Engine Nameplate HP:	464	Stroke:	5.69 in. (145 mm)
Type:	4 Cycle, In-line, 6 Cylinder Diesel	Displacement:	543 cu. in. (8.9 liters)
Aspiration:	Turbocharged and CAC	Compression ratio:	16.1:1
Emission Control Device:		Exhaust stack diameter:	6 in. (152 mm)

Diesel Fuel Emission Limits

D2 Cycle Exhaust Emissions

	Grams per BHP-hr			Grams per kWm-hr		
	NO_X + NMHC	CO	PM	NO_X + NMHC	CO	PM
EPA Emissions Limit	3.0	2.6	0.15	4.0	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, 300-500 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

300DQDAC

60 Hz Diesel generator set

EPA NSPS Stationary emergency

Engine information:

Model:	Cummins Inc. QSL9-G7 NR3	Bore:	4.49 in. (114 mm)
Type:	4 cycle, in-line, 6 cylinder diesel	Stroke:	5.69 in. (145 mm)
Aspiration:	Turbocharged and CAC	Displacement:	543 cu. in. (8.9 liters)
Compression ratio:	16.1:1		
Emission control device:	Turbocharger and CAC		

Performance data	1/4 Standby	1/2 Standby	3/4 Standby	Full Standby	Full Prime
Engine HP @ Stated load (1800 RPM)	113.75	227.5	341.25	455	407
Fuel consumption (gal/Hr)	6.82	12.23	17.65	23.07	20.78
Exhaust gas flow (CFM)	1099.6	1714.8	2118.6	2279.4	N/A
Exhaust gas temperature (°F)	678	785	915	990	945
Exhaust emission data					
HC (Total unburned hydrocarbons)	0.25	0.129	0.052	0.046	0.042
NOx (Oxides of nitrogen as NO2)	1.60	1.70	2.65	5.25	3.98
CO (Carbon monoxide)	3.20	3.17	0.73	0.30	N/A
PM (Particular Matter)	0.20	0.14	0.04	0.03	N/A
SO2 (Sulfur dioxide)	0.14	0.13	0.12	0.11	0.119
Smoke (Bosch)	0.396	0.462	0.299	0.399	0.160

All values are Grams per HP-Hour

Test conditions

Data was recorded during steady-state rated engine speed (± 25 RPM) with full load (± 2%). Pressures, temperatures, and emission rates were stabilized.

Fuel specification:	46.5 Cetane Number, 0.035 Wt.% Sulfur; Reference ISO8178-5, 40 CFR86. 1313-98 Type 2-D and ASTM D975 No. 2-D.
Fuel temperature	99 ± 9 °F (at fuel pump inlet)
Intake air temperature:	77 ± 9 °F
Barometric pressure:	29.6 ± 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H2O/lb dry air
Reference standard:	ISO 8178

The NOx, HC, CO and PM emission data tabulated here were 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.

Sound data

300DQDAC **60 Hz**

Sound pressure level @ 7 meters, dB(A)

See notes 1-8 listed below

Configuration		Measurement location number								Average
		1	2	3	4	5	6	7	8	
Standard – unhoused	Infinite exhaust	87	91	89	93	89	95	91	90	91
F183 – skin tight weather	Mounted muffler	88	91	91	94	90	95	91	92	92
F201 – quiet site II first stage	Mounted muffler	80	81	83	91	91	92	84	83	88
F202 – quiet site II second stage	Mounted muffler	73	75	74	72	74	73	70	71	73

Sound power level, dB(A)

See notes 2-6, 9, 10 listed below

Configuration		Octave band center frequency (Hz)								Overall sound power level
		63	125	250	500	1000	2000	4000	8000	
Standard – unhoused	Infinite exhaust	80	94	108	111	113	111	107	108	118
F183 – skin tight weather	Mounted muffler	96	105	112	113	114	113	109	104	120
F201 – quiet site II first stage	Mounted muffler	105	112	108	110	110	108	104	98	117
F202 – quiet site II second stage	Mounted muffler	85	94	93	96	98	98	94	87	104

Exhaust sound pressure level @ 1 meter, dB(A)

Open exhaust (no muffler) @ rated load	Octave band center frequency (Hz)								Sound pressure level
	63	125	250	500	1000	2000	4000	8000	
	99	110	119	122	125	127	127	126	133.1

Note:

1. Position 1 faces the engine front. The positions proceed around the generator set in a counter-clockwise direction in 45° increments. All positions are at 7 m (23 ft) from the surface of the generator set and 1.2 m (48 in.) from floor level.
2. Sound levels are subject to instrumentation, measurement, installation and manufacturing variability.
3. Sound data with remote-cooled generator sets are based on rated loads without cooling fan noise.
4. Sound levels for aluminum enclosures are approximately 2 dB(A)s higher than listed sound levels for steel enclosures.
5. Sound data for generator set with infinite exhaust do not include exhaust noise.
6. Data is based on full rated load with standard radiator-cooling fan package.
7. Sound pressure levels are measured per ANSI S1.13 and ANSI S12.18, as applicable.
8. Reference sound pressure is 20 µPa.
9. Sound power levels per ISO 3744 and ISO 8528-10, as applicable.
10. Reference power = 1 pw (10^{-12} W).
11. Exhaust sound power levels are per ISO 6798, as applicable.

Prototype Test Support (PTS)
60 Hz test summary

Generator set models

250DQDAA 275DQDAB
300DQDAC

Representative prototype

Model: 300DQDAC
Alternator: HC4F
Engine: QSL9-G5

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: 315 kW

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

Maximum motor starting: 1372 kVA

The generator set was tested to simulate motor starting by applying the specified kVA load at low lagging power factor (0.4 or lower). With this load applied, the generator set recovered to a minimum of 90% rated voltage.

Torsional analysis and testing:

The generator set was tested to verify that the design is not subjected to harmful torsional stresses. A spectrum analysis of the transducer output was conducted over the speed range of 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 in elevated ambient temperature under static restriction conditions.

Durability:

The generator set was subjected to a minimum 500 hour endurance test operating at variable load up to the Standby rating based upon MIL-STD-705 to verify structural soundness and durability of the design.

Electrical and mechanical strength:

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

Steady state performance:

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

Voltage regulation:	± 0.50%
Random voltage variation:	± 0.50%
Frequency regulation:	Isochronous
Random frequency variation:	± 0.25%

Transient performance:

The generator set was tested with the standard 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:

Full load acceptance:

Voltage dip:	30.5%
Recovery time:	2.1 seconds
Frequency dip:	12.8%
Recovery time:	2.6 seconds

Full load rejection:

Voltage rise:	15.8%
Recovery time:	0.7 seconds
Frequency rise:	3.5%
Recovery time:	2.8 seconds

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	0.09	0.035	0.16	0.054
5	0.62	1.95	0.66	2
7	0.58	0.73	0.6	0.72
9	0.028	0.029	0.058	0.098
11	0.7	0.37	0.7	0.36
13	0.13	0.32	0.33	0.36
15	0.05	0.016	0.08	0.076

High Ambient Air Temperature Radiator Cooling System with Seismic (L228-2 or L225-2)

	Fuel Type	Duty	Rating (kW)	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
				Maximum allowable ambient temperature, degree C							
60 Hz	Diesel	Standby	300	47	46	45	44	43	40	N/A	N/A
		Prime	270	55	54	54	52	52	48	N/A	N/A

High Ambient Air Temperature Radiator Cooling System

	Fuel Type	Duty	Rating (kW)	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
				Maximum allowable ambient temperature, degree C							
60 Hz	Diesel	Standby	300	55	55	54	52	49	49	N/A	N/A
		Prime	270	55	55	54	52	50	50	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.

Alternator data sheet

Frame size: HCI434E

Characteristics		1-brg w/coupling adapter	
Weights:	Stator assembly:	1014 lb	460 kg
	Rotor assembly:	906 lb	411 kg
	Complete assembly:	2284 lb	1036 kg
Maximum speed:		2250 rpm	
Excitation current:	Full load:	2.00 Amps	
	No load:	0.50 Amps	
Insulation system:	Class H throughout		

3 Ø Ratings (0.8 power factor)		**60 Hz** (winding no)				**50 Hz** (winding no)			
(Based on specific temperature rise at 40° C ambient temperature)		110/190 220/380 (311)	120/208 240/416 (311)	139/240 277/480 (311)	347/600 (17)	110/190 220/380 (311)	115/200 230/400 (311)	120/208 240/415 (311)	127/220 254/440 (311)
150° C rise ratings	kW	292	336	368	368	296	296	296	296
	kVA	365	420	460	460	370	370	370	370
125° C rise ratings	kW	290	320	352	352	280	280	280	280
	kVA	363	400	440	440	350	350	350	350
105° C rise ratings	kW	265	292	320	320	256	256	256	256
	kVA	331	365	400	400	320	320	320	320
80° C rise ratings	kW	230.4	252	277.6	280	220	220	220	212
	kVA	288	315	347	350	275	275	275	265
Reactances (per unit ± 10%) (Based on full load at 125° C rise rating)		110/190 220/380 (311)	120/208 240/416 (311)	139/240 277/480 (311)	347/600 (07)	110/190 220/380 (311)	115/200 230/400 (311)	120/208 240/415 (311)	127/220 254/440 (311)
Synchronous		3.77	3.47	2.87	2.89	3.01	2.71	2.52	2.24
Transient		0.22	0.21	0.17	0.19	0.20	0.18	0.17	0.15
Subtransient		0.16	0.15	0.12	0.14	0.15	0.13	0.12	0.11
Negative sequence		0.30	0.28	0.23	0.23	0.24	0.22	0.20	0.18
Zero sequence		0.11	0.10	0.08	0.08	0.10	0.09	0.08	0.07
Motor starting Maximum kVA (90% sustained voltage)			Broad Range 1210		600 1210		Broad Range 912		
Time constants (sec)			Broad Range		600		Broad Range		
Transient			0.080		0.080		0.080		
Subtransient			0.019		0.019		0.019		
Open circuit			1.700		1.700		1.700		
DC			0.018		0.018		0.018		

Alternator data sheet

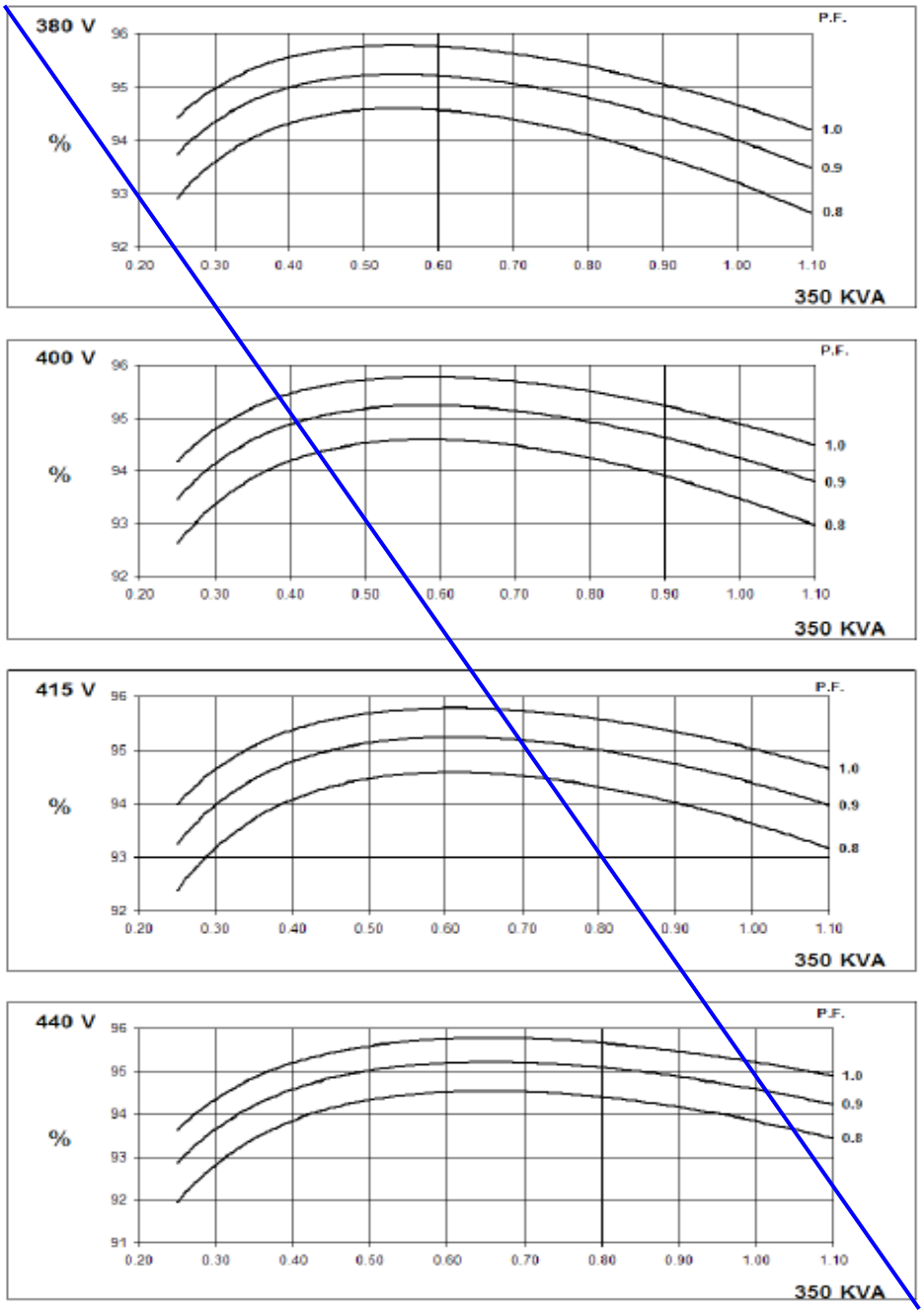
Frame size: HCI434E

Windings	(@ 20° C)	Broad Range	600	Broad Range
Stator resistance	(Line to Line, Ohms)	0.0200	0.0300	0.0200
Rotor resistance	(Ohms)	1.1700	1.1700	1.1700
Number of leads		12	6	12

Single phase power can be taken up to 50% of 3 phase-ratings

Winding 311
THREE PHASE EFFICIENCY CURVES

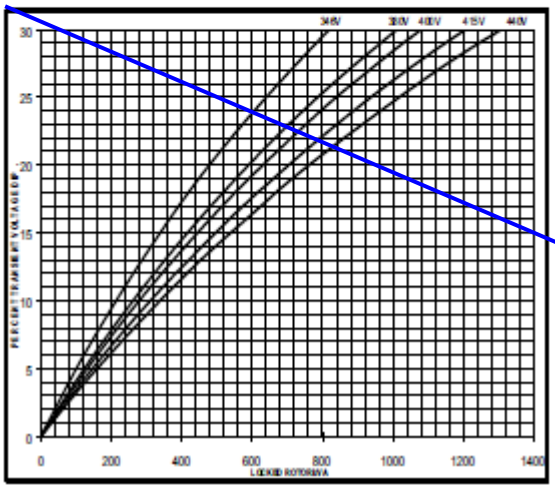
50 Hz



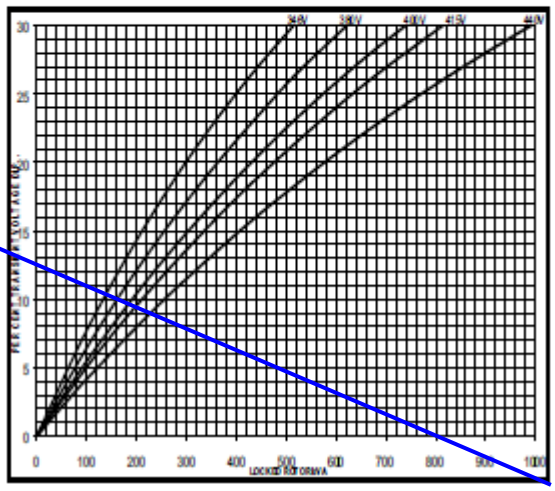
Winding 311
Locked Rotor Motor Starting Curve

50 Hz

MX

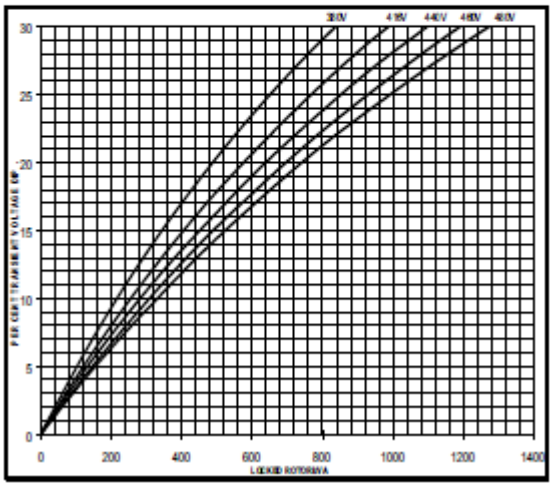


SX

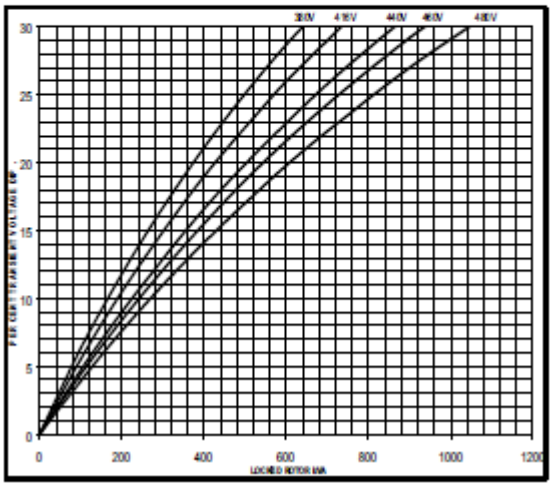


60 Hz

MX

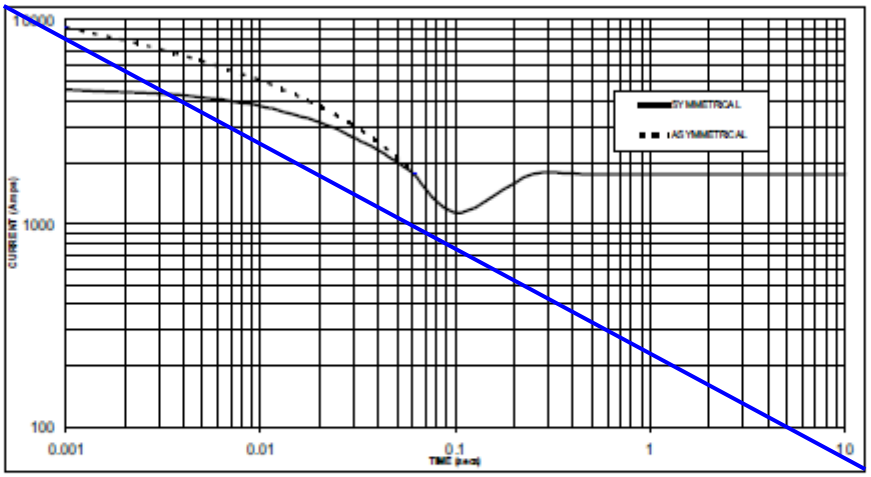


SX



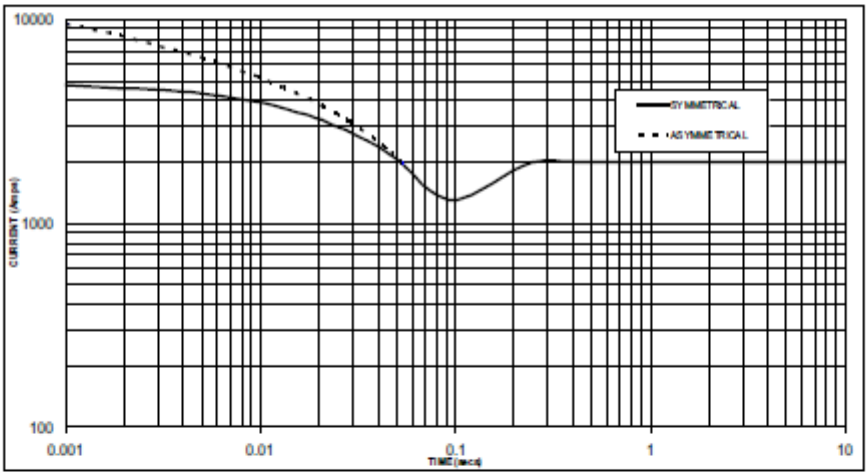
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.

50 Hz



Sustained Short Circuit = 1,750 Amps

60 Hz



Sustained Short Circuit = 2,000 Amps

Note 1
The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
380v	X 1.00	416v	X 1.00
400v	X 1.05	440v	X 1.06
415v	X 1.09	460v	X 1.10
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 (Wye) connected machines. For other connection the following multipliers should be applied to current values as shown :
Parallel Star = Curve current value X 2
Series Delta = Curve current value X 1.732

SECTION 3

GENERATOR ACCESSORIES

Specification Sheet

Battery Charger

A048G602 10 A 50/60 Hz
A051H785 20 A 50/60 Hz

Description

Cummins® fully automatic battery chargers are constant voltage/constant current chargers incorporating a 4-stage charging algorithm. Designed for use in applications where battery life and reliability are important; these chargers, complete with built-in equalize charge capability, are ideal for stationary or portable starting battery charging service.

To achieve optimum battery life, a 4-stage charging cycle is implemented. The four charging stages are constant current, high-rate taper charge, finishing charge, and maintaining charge. During the constant current cycle, the charger operates at maximum possible output in the fast charge mode. During the high-rate taper charge cycle the charger stays at fast charge voltage level until battery current acceptance falls to a portion of the chargers rated output. During the finishing charge cycle the charger operates at the float voltage and completes the battery charge. During the maintaining charge cycle the charger supplies only a few milliamps required by the battery to stay at peak capability.

An optional temperature sensor (A043D534) may be used to adjust charging voltage based on temperature of the battery. Use of a battery temperature sensor helps to increase battery life by preventing over or under charging. The battery temperature sensor also protects the battery from overheating. Temperature compensation sensor is required for all applications when battery charger and battery are located in different temperature or battery heater is being used.

Battery chargers are field-configurable for charging either 12 or 24 VDC battery systems at 50/60 Hz operation. Simple jumper selectors enable selection of output voltage and battery type.

Features

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

Easy Installation – Clearly marked terminal blocks and panel knockouts provide convenient connections of input and output leads.

User Display – Output voltage and current, fault information and status are indicated on the front panel. Includes precision ammeter and voltmeter.

Monitoring – Status LED indicators are provided to show the condition of the charger. LED's on the right side of the monitor indicate operational functions for Temperature Compensation active (Green), AC on (Green), Float (Green) or Boost (Amber) mode, as well as Battery Fault (Red). LED's on the left side of the monitor illuminate (in Red) when Charger fail, High or Low VDC or AC fail occur.

Adjustable Float Voltage – Float voltage can be set, using easy to understand jumpers, for optimum battery performance and life.

Construction – NEMA-1 (IP20) corrosion resistant aluminium enclosure designed for wall mounting.

Faults – The charger senses and annunciates the following fault conditions: AC power loss, battery overvoltage, battery under voltage, battery fault conditions and charger failure. Includes an individual 30 volt/2-amp isolated contact for each alarm.

Vibration Resistant Design – complies with UL991 class B vibration resistance requirements.

Listed – C-UL listed to UL 1236 CSA standard 22.2 No 107.2-M89. Suited for flooded and AGM lead acid and NiCd batteries in generator set installations.

Warranty – 5 year CPG warranty.

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Status and Fault LED

Field Selectable Jumper

Specifications

Performance and Physical Characteristics

Output:	Nominal voltage	12VDC* or 24VDC
	Float voltage – 12VDC batteries	12.87, 13.08, 13.31, 13.50*, 13.62, 14.30
	Float voltage – 24VDC batteries	25.74, 26.16, 26.62, 27.00*, 27.24, 28.60
	Equalize-voltage	6.5% above float voltage sensing
	Output voltage regulation	±0.5% (1/2%) line and load regulation
	Maximum output current	10 or 20 amps nominal
	Equalize charging	Battery interactive auto-boost
Input:	Voltage AC	120, 208, 240 ±10%
	Frequency	60/50 Hz +5%
Approximate net weight:		10A: 25 lbs. (11.36 Kg) 20A: 50 lbs. (22.68 Kg)
Approximate dimensions: height x width x depth-in		10A: 12.50" x 7.66" x 6.50"(318 x 195 x 165 mm) 20A: 13.06" x 13.95" x 6.83"(332 x 354 x1 73 mm)
Ambient temperature operation: At full rated output -		- 4 °F to 104 °F (-20 °C to 40 °C)

Note:

1. Battery charger comes with default settings of 12VDC and 13.50/27.00VDC float voltage and can be changed to the battery manufacture recommendations. Replacement printed circuit board and f uses are identified in the Owner's Manual (10A: A050S537 and 20A: A051X126) which resides in Quick Serve On-Line. Service parts can be purchased through the Memphis Distribution Center. The PC board replacement instruction sheet (10A: A052N073, 20A: A053W929) and service manual (A050D829) is also available.
2. Installation and application must comply with "section 4.5.3 batteries and battery charger" of application guide T-030 (Liquid Cooled Generator Set Application Manual A040S369).

Caution:

1. Higher input voltages (i.e. 480VAC or 600VAC) can be applied if a transformer with a 120VAC-240VAC output is installed. Higher input voltages (i.e. 480VAC or 600VAC) can be applied if a transformer with a 120VAC-240VAC output is installed. For voltages higher than 240 VAC, stepdown transformer must be used. Review the respective Owner/Installation manual A050S537 for 10Amp and A051X126 20A chargers for supplier recommended stepdown transformer requirements.
2. 10Amp battery charger is recommended for genset applications with 1 or 2 factory provided batteries. 20Amp battery charger is recommended for Cummins Genset applications with 3 or 4 factory provided batteries. Please consider the auxiliary DC loads connected to the genset batteries and size this charger as per the T-030 application guide to prevent misapplication issues.
3. Back feed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.
4. For professional use only. Must be installed by a qualified service technician. Improper installation presents hazards of electrical shock and improper operation, resulting in severe personal injury and/or property damage.
5. Use this charger for charging LEAD-ACID or LIQUID ELECTROLYTE NICKEL-CADMIUM batteries only. Do not use this battery charger for charging dry cells, alkaline, lithium, nickel-metal hydride, or sealed nickel-cadmium batteries that are commonly used with home appliances. These batteries may burst and cause injuries to persons and damage to property.
6. Do not parallel these battery chargers with any other charging system.

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

Our energy working for you.™

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NAAC-5602-EN (06/21) PDA059Y464

Product data sheet
Characteristics

PJL36120U31E
MOLDED CASE CIRCUIT BREAKER 600V 1200A

Main

Product or Component Type	Circuit breaker
Range	PowerPact P
Current Sensor Rating Range	1200 A
Rated Current	1200 A
Breaking Capacity	100 KA 240 V AC 65 KA 480 V AC 25 kA 600 V AC
Trip Unit Technology	Electronic, standard, Micrologic 3.0, LI
AWG Gauge	AWG 3/0...500 kcmil aluminium/copper)4

Complementary

Device Short Name	A
Certifications	CSA IEC UL Listed
Rated operatioal Voltage	600 V AC
Module Type	P-Frame
Mounting Location	Bolt-on
Mounting Mode	Unit mount
Poles Description	3P
Circuit Breaker Rating Code	J

Electrical Connection	Lugs load Lugs line
Tightening Torque	442.54 Lbf.In (50 N.m) 0.15…0.37 in² (95…240 mm²) AWG 3/0...500 kcmil) 8.85…11.51 lbf.in (1.0…1.3 N.m)
Height	16.16 in (410.46 mm)
Width	8.27 in (210.06 mm)
Depth	8.05 in (204.47 mm)

Ordering and shipping details

Category	01215-PG,H,J,K,L,N UNIT MT BREAKERS
Discount Schedule	DE2
GTIN	00785901854425
Package weight(Lbs)	32.00 lb(US) (14.515 kg)
Returnability	Yes
Country of origin	US

Offer Sustainability

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

Micrologic™ 3.0 Electronic Trip Unit

ENGLISH

Instruction Bulletin

48049-207-05
Rev. 01, 07/2012

Retain for future use.

Schneider Electric™

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Section 1—General Information

Introduction

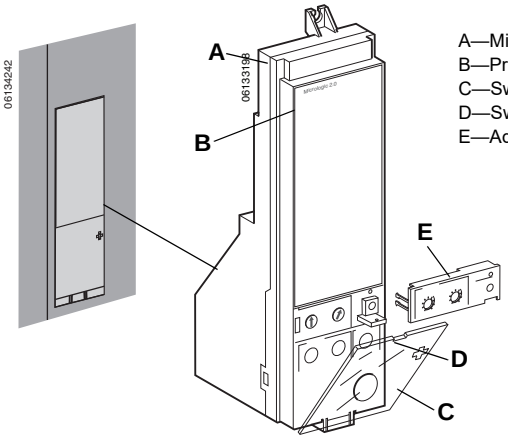
Micrologic™ trip units (A) provide adjustable tripping functions on electronic trip circuit breakers. The product name (B) specifies the level of protection provided by the trip unit.

Micrologic 3.0 Trip Unit

- Type of protection
  - 2—Basic IEC protection (LS0)
  - 3—Basic UL protection (LI)
  - 5—Selective protection (LSI)
- Trip unit series
  - 0—Indicates the first version

Micrologic trip units are field replaceable to allow for upgrading of the trip unit in the field. For complete information on available circuit breaker models, frame sizes, interrupting ratings, sensor plugs, rating plugs and trip units, see the product catalog.

Figure 1: Micrologic Trip Unit



Trip Unit Settings

On the face of the trip unit are adjustable switches to allow changing of trip characteristics. Trip units are shipped with the long-time pickup switch set at 1.0 and all other trip unit adjustments set at their lowest settings.

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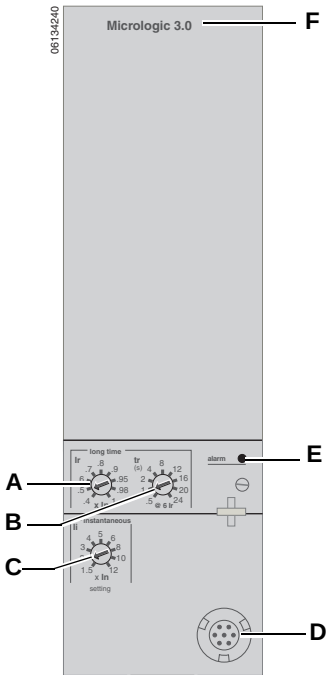
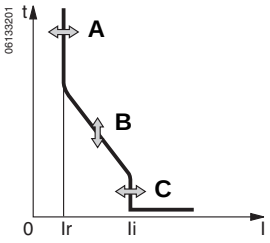
Micrologic 3.0 Trip Unit

The Micrologic 3.0 trip unit provides basic (LI) protection.

A. Long-time pickup (Ir) switch
B. Long-time delay (tr) switch
C. Instantaneous pickup (Ii) switch
D. Test plug receptacle
E. Overload indicator light
F. Trip unit name

Figure 3: Micrologic 3.0 Trip Unit





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Trip Unit Switches

Long-Time Protection

Long-time protection protects equipment against overloads.

- Long-time protection is standard on all trip units.
- The long-time pickup (Ir) (A) sets maximum current level (based on sensor plug rating In) which circuit breaker will carry continuously. If current exceeds this value, circuit breaker will trip after the preset time delay. The long-time pickup (Ir) is adjustable from 0.4–1.0 times the sensor plug rating (In).
- The long-time delay (tr) (B) sets the length of time that the circuit breaker will carry an overcurrent below the short-time or instantaneous pickup current level before tripping. See Table 1 for long-time delay settings.
- The overload indicator light (C) indicates that the Ir long-time pickup threshold has been exceeded.
- Both long-time pickup and long-time delay are on the field-replaceable adjustable rating plug. To change settings to more precisely match the application, various rating plugs are available. For instructions on replacing the rating plug, see Section 4—Adjustable Rating Plug Replacement.
- The In value can be changed by replacing the sensor plug below the trip unit. For further information, see the instructions packed with the sensor plug replacement kit.
- Long-time protection uses true RMS measurement.

Thermal imaging provides continuous temperature rise status of the wiring, both before and after the device trips. This allows the circuit breaker to respond to a series of overload conditions which could cause conductor overheating, but would go undetected if the long-time circuit was cleared every time the load dropped below the pickup setting or after every tripping event.

NOTE: If checking trip times, wait a minimum of 15 minutes after circuit breaker trips before resetting to allow the thermal imaging to reset completely to zero.

Figure 5: Long-Time Protection Switches

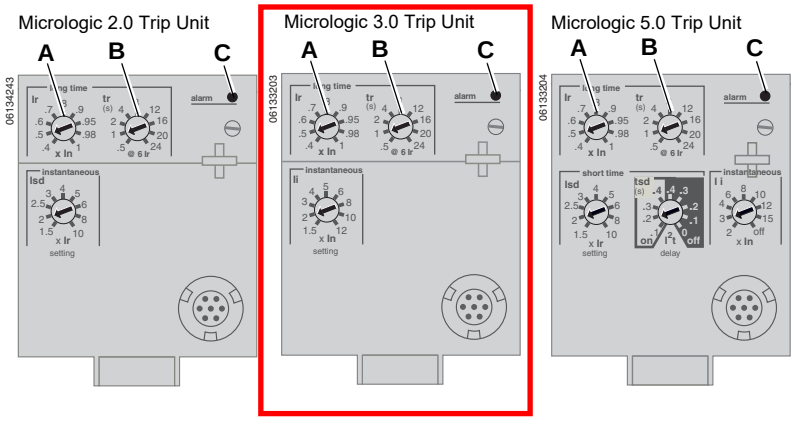

Table 1: Micrologic Trip Unit Long-Time Delay Values

Setting[1]	Long-Time Delay in Seconds[2]								
tr at 1.5 x Ir	12.5	25	50	100	200	300	400	500	600
tr at 6 x Ir	0.5	1	2	4	8	12	16	20	24
tr at 7.2 x Ir	0.34[3]	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6

[1]In = sensor rating. Ir = In x long-time pickup. Trip threshold between 1.05 and 1.20 Ir.
[2]Time-delay accuracy +0/-20%
[3]For Micrologic 5.0 trip units, when tsd is set to 0.4 off or 0.4 on, then tr = 0.5 instead of 0.34.

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Instantaneous Protection

Instantaneous protection protects equipment against short circuits with no intentional time delay.

- Instantaneous protection (Ii) (A) is standard on 3.0 and 5.0 trip units.*
- Instantaneous protection for 2.0 trip units is based on the circuit breaker sensor rating (Ir).
- Instantaneous protection for 3.0 and 5.0 trip units is based on the long-time delay pickup (In).
- Circuit breaker open command is issued as soon as threshold current is exceeded.
- Instantaneous protection for 3.0 and 5.0 trip units use peak current measurement. Instantaneous protection for 2.0 trip units use RMS current measurement.
- When instantaneous protection switch is set to off, the instantaneous protection is disabled.

*Instantaneous protection on 2.0 trip units is achieved by using short-time protection (Isd) with short-time delay factory set to 0 (zero).

Figure 7: Instantaneous Protection Switches

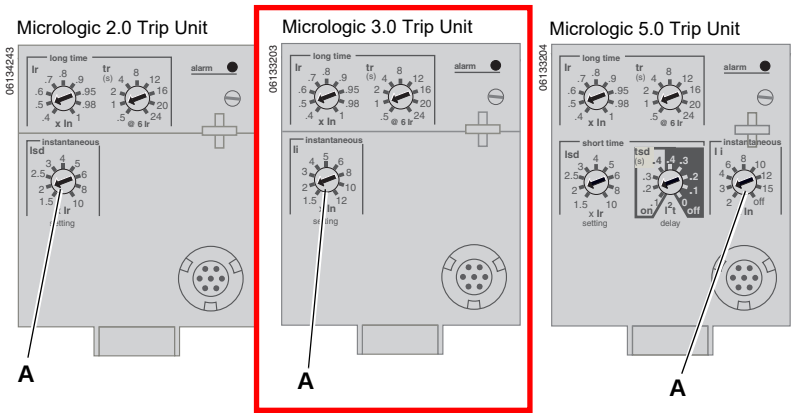


Table 3: Micrologic Instantaneous Values

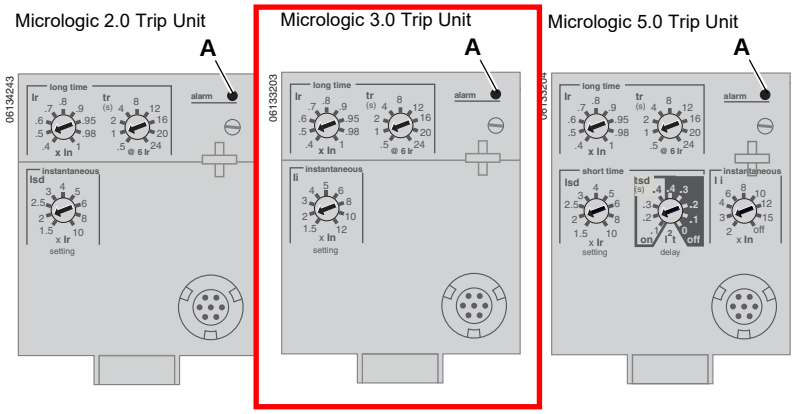
Setting	Interruption Current								
2.0 Isd (= Ir x..)	1.5	2	2.5	3	4	5	6	8	10
3.0 Ii (= In x..)	1.5	2	3	4	5	6	8	10	12
5.0 Ii (= In x..)	2	3	4	6	8	10	12	15	off

Ii = UL and ANSI instantaneous
Isd = IEC instantaneous (short-time with zero delay)
In = sensor rating
Ir = long-time pickup

Overload Indicator Light

The overload indicator light (A) lights when the Ir long-time pickup level has been exceeded.

Figure 8: Overload Indicator Lights



Trip Unit Testing

Trip unit functions can be tested using primary injection testing or secondary injection testing.

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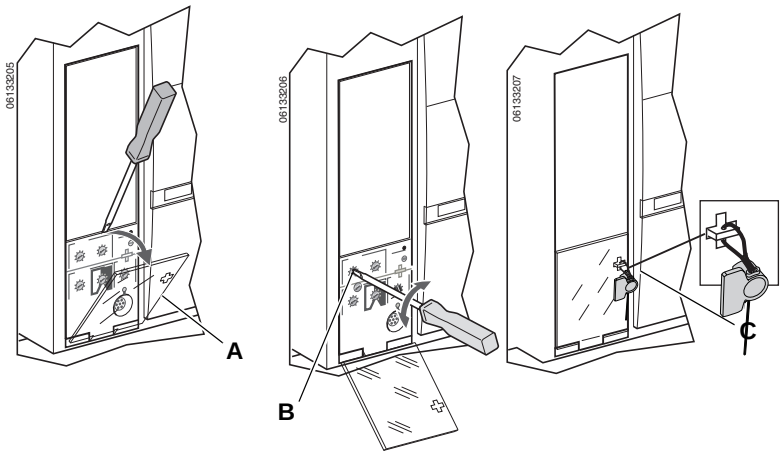
Section 2—Operation

Switch Adjustment

1. Open switch cover (A).
2. Adjust the appropriate switches (B) to desired values.
3. Replace switch cover. Use wire seal MICROTUSEAL (C), if necessary, to provide tamper evidence.

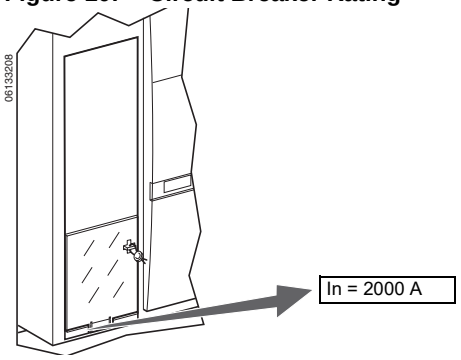
Figure 9: Adjust Switch Settings



Examples

Circuit breaker is rated 2000 A.

Figure 10: Circuit Breaker Rating



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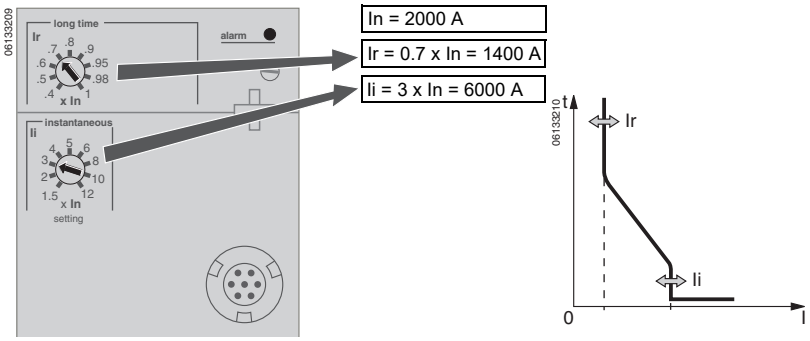
Micrologic 3.0 Trip Unit

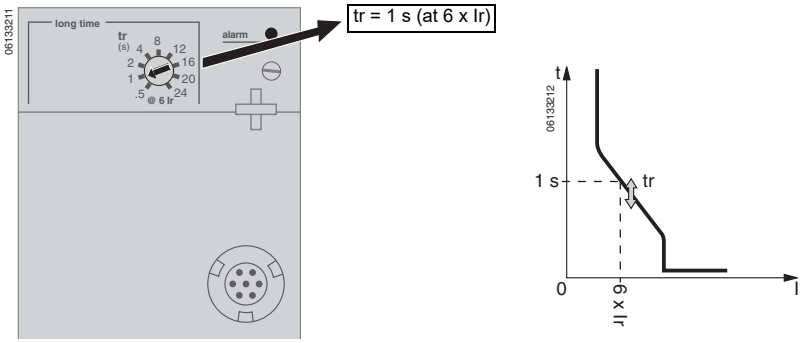
1. Set pickup levels.

Figure 13: Set Pickup Levels



2. Set time delay.

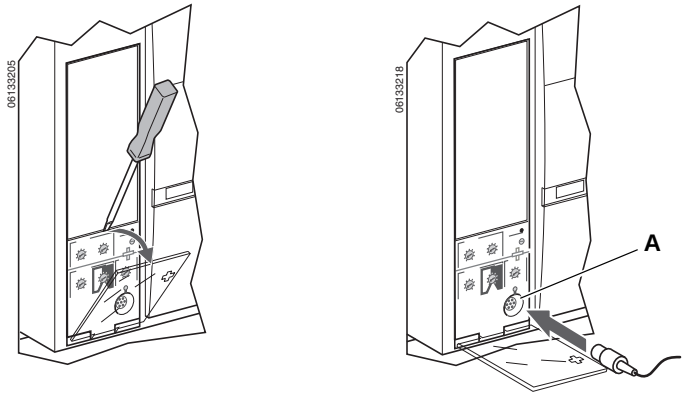
Figure 14: Set Time Delay



Trip Unit Operation Verification

Use a test kit connected to the trip unit test plug receptacle (A) to verify trip unit is functioning as desired. See instructions shipped with test kit to perform verification tests.

Figure 17: Verify Trip Unit Operation



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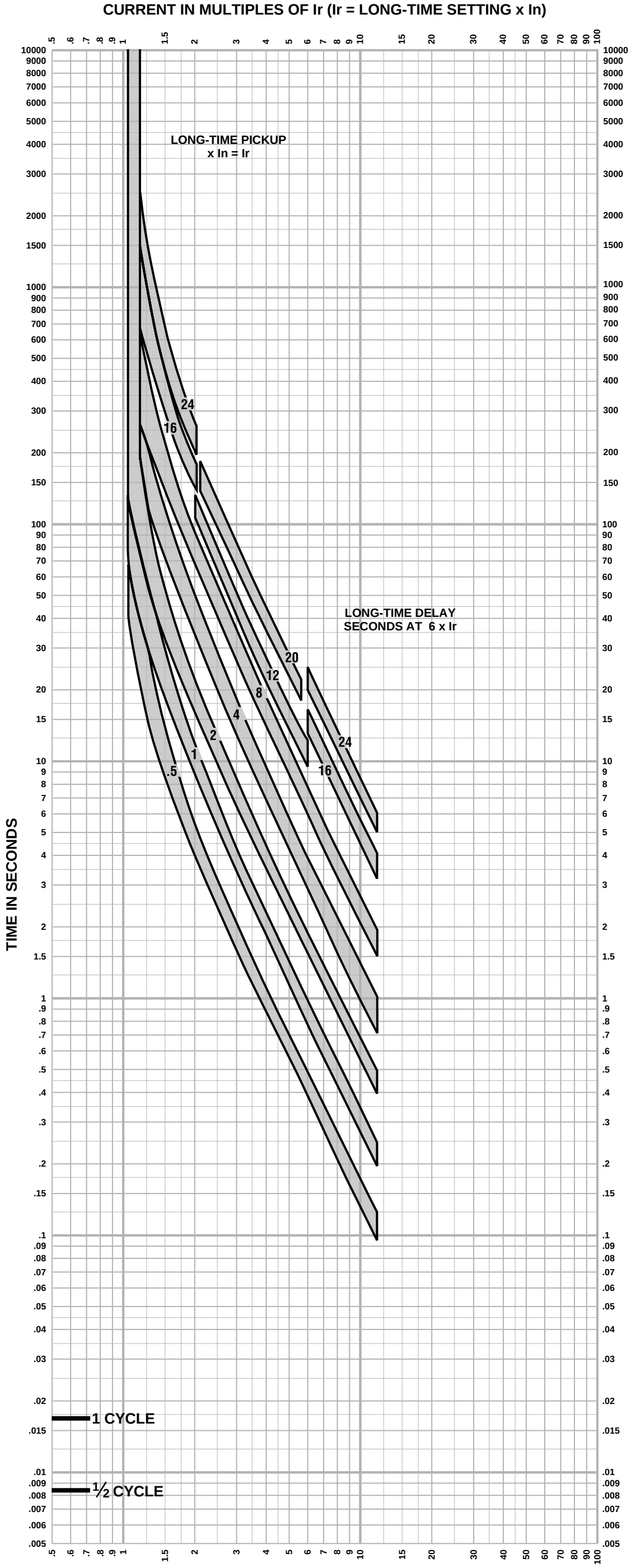

MICROLOGIC® 3.0 A TRIP UNIT CHARACTERISTIC TRIP CURVE NO. 613-6

Long-time Pickup and Delay

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

Curves apply from -30°C to +60°C ambient temperature.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal-imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the instantaneous setting.
3. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
4. See 613-8 for instantaneous pickup trip curve.

Merlin Gerin
Modicon
Square D
Telemecanique
Federal Pioneer
Federal Pacific
Schneider Electric Brands

Schneider Electric

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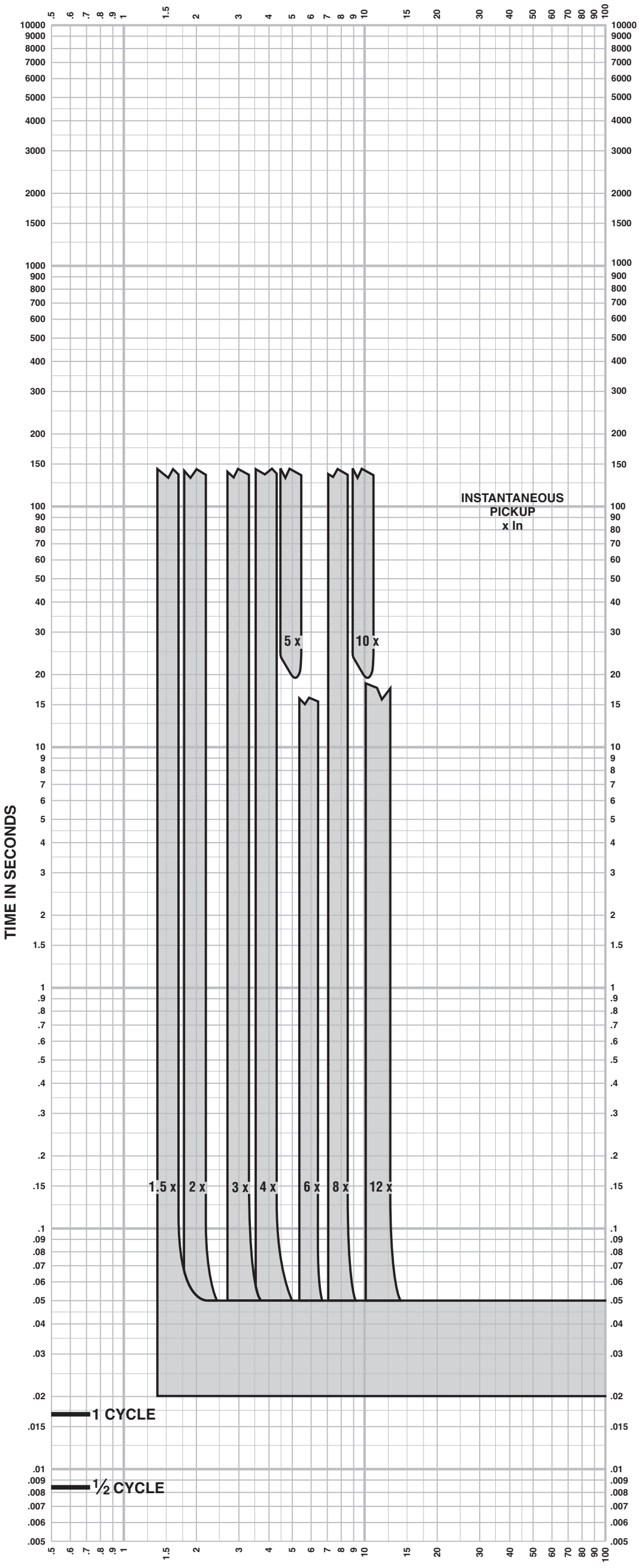
Curve No. 0613TC0006
December 2000
Drawing No. B48095-613-06



MICROLOGIC® 3.0 A TRIP UNIT CHARACTERISTIC TRIP CURVE NO. 613-8

Instantaneous Pickup
1.5x-12x

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

Curves apply from -30° to +60°C ambient temperature.

Instantaneous override values are given on 613-10.

Notes:

1. The end of the curve is determined by the interrupting rating of the circuit breaker.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. The instantaneous region of the trip curve shows maximum total clearing times. Actual clearing times in this region can vary depending on the circuit breaker mechanism design and other factors. The actual clearing time can be considerably faster than indicated. Contact your local Sales Office for additional information.
4. See 613-6 for long-time pickup and delay trip curves.

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Square D
Telemecanique

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Curve No. 0613TC0808
January 2008
Drawing No. 48095-0613-08
(Replaces 0613TC0008)

INSTANTANEOUS OVERRIDE VALUES NO. 613-10

MASTERPACT NW/NT

ANSI CB Model No.	Inst. Override (kA RMS) +/- 10%
NW08N1 ★	24
NW08N1	None
NW16N1	None
NW08H1 ★	24
NW08H1	None
NW16H1	None
NW20H1	None
NW32H1	None
NW08H2 ★	24
NW08H2	None
NW16H2	None
NW20H2	None
NW32H2	None
NW40H2	None
NW50H2	None
NW08H3 ★	24
NW08H3	85
NW16H3	85
NW20H3	85
NW32H3	85
NW40H3	85
NW50H3	85
NW08L1 ★	24
NW08L1	35
NW08L1F	24
NW16L1	35
NW16L1F	24
NW20L1	35
NW20L1F	24
NW32L1	117
NW40L1	117
NW50L1	117
NW08HA	None
NW16HA	None
NW20HA	None
NW32HA	None
NW40HA	None
NW50HA	None
NW08HF	85
NW16HF	85
NW20HF	85
NW32HF	85
NW40HF	85
NW50HF	85
NW08HC	35
NW16HC	35
NW20HC	35
NW32HC	117
NW40HC	117
NW50HC	117
NT08N1 ★	24
NT08N1	None
NT08H1 ★	24
NT08H1	None
NT08L1F	10
NT08NA	None

MASTERPACT NW/NT

UL CB Model No.	Inst. Override (kA RMS) +/- 10%
NW08N ★	24
NW08N	40
NW12N	40
NW16N	40
NW20N	40
NW08H ★	24
NW08H	40
NW12H	40
NW16H	40
NW20H	40
NW25H	65
NW30H	65
NW40H	75
NW50H	75
NW60H	75
NW08L ★	24
NW08L	35
NW08LF	24
NW12L	35
NW12LF	24
NW16L	35
NW16LF	24
NW20L	65
NW20LF	24
NW25L	65
NW30L	65
NW40L	75
NW50L	75
NW60L	75
NW08HF	40
NW12HF	40
NW16HF	40
NW20HF	40
NW25HF	65
NW30HF	65
NW40HF	75
NW50HF	75
NW60HF	75
NW08HB	35
NW12HB	35
NW16HB	35
NW20HB	65
NW25HB	65
NW30HB	65
NW40HB	75
NW50HB	75
NW60HB	75
NT08N ★	24
NT08N	40
NT12N	40
NT16N	40
NT08H ★	24
NT08H	40
NT12H	40
NT16H	40
NT08L1	10
NT12L1	10
NT16L1	10
NT08L	10
NT08LF	10
NT12L	10
NT16L	10
NT12LF	10
NT08HF	40
NT12HF	40

★ Maximum sensor plug 250 A

MASTERPACT NW/NT

IEC CB Model No.	Inst. Override (kA RMS) +/- 10%
NW08N1	None
NW10N1	None
NW12N1	None
NW16N1	None
NW08H1	None
NW10H1	None
NW12H1	None
NW16H1	None
NW20H1	None
NW25H1	None
NW32H1	None
NW40H1	None
NW50H1	None
NW63H1	None
NW08H2 ★	24
NW08H2	85
NW10H2	85
NW16H2	85
NW20H2	85
NW25H2	85
NW32H2	85
NW40H2	85
NW50H2	117
NW63H2	117
NW20H3	65
NW25H3	65
NW32H3	65
NW40H3	65
NW08L1 ★	24
NW08L1	35
NW10L1	35
NW12L1	35
NW16L1	35
NW20L1	35
NW08H10	None
NW10H10	None
NW12H10	None
NW16H10	None
NW20H10	None
NW25H10	None
NW32H10	None
NW40H10	None
NW08NA	None
NW10NA	None
NW16NA	None
NW08HA	None
NW10HA	None
NW12HA	None
NW16HA	None
NW20HA	None
NW25HA	None
NW32HA	None
NW40HA	None
NW50HA	None
NW63HA	None
NW08HF	85
NW10HF	85
NW12HF	85
NW16HF	85
NW20HF	85
NW25HF	85
NW32HF	85
NW40HF	85
NW08HA10	None
NW10HA10	None
NW12HA10	None
NW16HA10	None
NW20HA10	None
NW25HA10	None
NW32HA10	None
NW40HA10	None
NT08H1	None
NT10H1	None
NT12H1	None
NT16H1	None
NT08L1	10
NT08H10	None
NT10H10	None
NT12H10	None
NT16H10	None
NT08HA	None
NT10HA	None
NT12HA	None
NT16HA	None
NT08HA10	None
NT10HA10	None
NT12HA10	None
NT16HA10	None

POWERPACT / HORIZON / SELECT / COMPACT

UL/IEC CB Model No.	Inst. Override (kA RMS) +/- 10%
RG 600	57
RG 800	57
RG 1000	57
RG 1200	57
RG 1600	57
RG 2000	57
RG 2500	57
RJ 600	48▲
RJ 800	48▲
RJ 1000	48▲
RJ 1200	48▲
RJ 1600	48▲
RJ 2000	48▲
RJ 2500	48▲
RK 600	57
RK 800	57
RK 1000	57
RK 1200	57
RK 1600	57
RK 2000	57
RK 2500	57
RL 600	48▲
RL 800	48▲
RL 1000	48▲
RL 1200	48▲
RL 1600	48▲
RL 2000	48▲
RL 2500	48▲
PG 250	24
PG 400	24
PG 600	24
PG 800	24
PG 1000	24
PG 1200	24
PJ 250	7
PJ 400	10
PJ 600	10
PJ 800	10
PJ 1000	10
PJ 1200	10
PK 250	24
PK 400	24
PK 600	24
PK 800	24
PK 1000	24
PK 1200	24
PL 250	7
PL 400	10
PL 600	10
PL 800	10
PL 1000	10
PL 1200	10
MG 300	12▲
MG 350	12▲
MG 400	12▲
MG 450	12▲
MG 500	12▲
MG 600	12▲
MG 700	12▲
MG 800	12▲
MJ 300	12▲
MJ 350	12▲
MJ 400	12▲
MJ 450	12▲
MJ 500	12▲
MJ 600	12▲
MJ 700	12▲
MJ 800	12▲

IEC CB Model No.	Inst. Override (kA RMS) +/- 10%
NS 800b N	57
NS 1000b N	57
NS 1250b N	57
NS 1600b N	57
NS 2000 N	57
NS 2500 N	57
NS 3200 N	57
NS 800b H	48▲
NS 1000b H	48▲
NS 1250b H	48▲
NS 1600b H	48▲
NS 2000 H	48▲
NS 2500 H	48▲
NS 3200 H	48▲
NS 630b N	24
NS 800 N	24
NS 1000 N	24
NS 1250 N	24
NS 1600 N	24
NS 630b H	24
NS 800 H	24
NS 1000 H	24
NS 1250 H	24
NS 1600 H	24
NS 630b L	24
NS 800 L	24
NS 1000 L	24
NS 1250 L	24
NS 1600 L	24

▲ Tolerance +/- 15%

Note:

Faults at or above instantaneous override value will be cleared at 25 msec or less.

brands of Schneider Electric

Merlin Gerin
Square D
Telemecanique

Schneider Electric

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Curve No. 0613TC0610
February 2006
Drawing No. 48095-0613-10
(Replaces 0613TC0410)

Specification Sheet

Circuit Breaker Assemblies Application Guide

Alternator frame sizes 2, 3, 4, 5, and YD

Description

Cummins® circuit breakers are designed to provide a selection of protection methods for over-current and short-current conditions. Our breaker line provides for a wide range of standards with the latest design methods. The range includes dual UL/IEC rated breakers as well as dedicated IEC rated models for International markets. The UL ratings comply with UL489; "Branch Circuit and Service Circuit Breakers" and meet NEMA Standard AB-1.

Circuit Breaker Specifications

NL-Solid state - (0611CT1001) LSI Sensor Micrologic 3.3 Strip Unit.

Settings 400 amp breaker (125amp-400amp)
Settings 600 amp breaker (200amp-600amp)
Optional NL lugs - (400 frame amps breaker only)
Two conductors per phase 2/0-500mcm

- Aluminum wire A049G946
- Copper wire A049G947

PJ-Solid state - (0612CT0101) LI Sensor Micrologic 3.0

Type F (84%-100%) (800Amp)/Type E (60%-100%) (1200Amp) Adjusting Plug

Optional PJ adjusting plug

- Type A (40%-100%) A030H466

Optional PJ lugs

- 800Amp 3/0-600 KCMIL 0332-4278
- 1200Amp 350-600 KCMIL 0332-4279

HG-Thermo-magnetic - (0611CT1001) Notrip Unit
JG-Thermo-magnetic - (0611CT1001) Notrip Unit
QD-Thermo-magnetic - (0601CT9101) Notrip Unit
QO-Thermo-magnetic - (0720CT9401) Notrip Unit
Q4-Thermo-magnetic - (0601CT9101) Notrip Unit

Features

Enclosure - Sheet steel finished with green epoxy e-coat paint providing a superior all weather finish.

Mounting - Mounts directly on either side of the generator set control box and fits within standard skid rails for use with Cummins enclosures.

Removable panels.

- Front removable panels provide ease of circuit breaker installation and load cable connection.
- Top and bottom panels are for ease of making required conduit holes and provide a vertical adjustment to aid in conduit installation.

Conduit - May be run through the top, bottom and side of the enclosure.

Connection leads- Generator to breaker type XLPE insulation, highly flexible, cut-to-length wire. Wire Size varies with circuit breaker amperages.

Abbreviations:

- A = Amperage
- Aux = Auxiliary
- CSA = Canadian Standards Association
- IEC = International Electromechanical Commission
- P = Pole
- RMS = Root Mean Square
- SS = Solid State
- TM =thermal Magnetic
- UL = Underwriters Laboratory
- V = Volts
- VAC = Volts Alternating Current

Optional lead-freetrip sealing kit

A026M166: the MICROTUSEAL lead-free trip unit seal is designed as RoHS-compliant replacement for lead seals. It may be used to seal Micrologic trip units and other devices.

Optional circuit breaker locks

0406-1143: Fixed padlock for H- and J-frame breakers

0406-1234: Removable padlock for H-,J-,L- and D-frame breakers OFF position

0406-1145: Fixed padlock for L-,M-,P- and R-frame breakers ON/OFF position

A030B471: Q4 breakers with handle extension

A030B782: Q4 breakers w/o handle extension

A030B780: QD breakers

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Frame 4-5 Alternators (continued)

DFEG/DFEH/DFEJ/DFEK, DQDAA/DQDAB/DQDAC, DQHAB

Feature code	Breaker description	Circuit breaker	Breaker model	Lead kit	Qty	Breaker box kit	Inst sheet	Cup (ref) (PDC)	Brkr box instl (ref)	Shunt trip	Auxiliary contact trip alarm
KU14-2	800A,Right,3P,600/415V,SS RMS,80%UL/IEC	0320-2261-02	PJL36080U31F	0320-2405-04	1	A048T261	A034R976	A040Z235	NA	0320-2196-02	0320-2196-01
KU15-2	800A,Left,3P,600/415V,SS RMS,80%UL/IEC	0320-2261-02	PJL36080U31F	0320-2405-04	1	A048T263	A034R962	A040Z235	NA	0320-2196-02	0320-2196-01
KU16-2	1200A,Right,3P,600/415V,SS RMS,80%UL/IEC	0320-2262-02	PJL36120U31E	0320-2405-08	1	A048T261	A034R976	A040Z235	NA	0320-2196-02	0320-2196-01
KU17-2	1200A,Left,3P,600/415V,SS RMS,80%UL/IEC	0320-2262-02	PJL36120U31E	0320-2405-08	1	A048T263	A034R962	A040Z235	NA	0320-2196-02	0320-2196-01
KX14-2	250A,Left,3P,600/690V,SS RMS,80%,UL/IEC	A045U177	NLRL36400U33X	0320-2405-03	1	A048T263	A034R974	A040Z233	NA	0320-1981-03	0320-1981-01
KX15-2	250A,Right,3P,600/690V,SS RMS,80%,UL/IEC	A045U177	NLRL36400U33X	0320-2405-03	1	A048T261	A034R960	A040Z233	NA	0320-1981-03	0320-1981-01

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Feature code	Description (continued)
KU03-2	400 Ampere, 2-Pole, molded case, thermal-magnetic trip circuit breaker, UL listed at 80% duty for rated operational voltage up to 240 VAC. Mounted on the left side of the generator set as viewed from the alternator end.
KU04-2	400 Ampere, 3-Pole, molded case, thermal-magnetic trip circuit breaker, UL listed at 80% duty for rated operational voltage up to 240 VAC. Mounted on the right side of the generator set as viewed from the alternator end.
KU05-2	400 Ampere, 3-Pole, molded case, thermal-magnetic trip circuit breaker, UL listed at 80% duty for rated operational voltage up to 240 VAC. Mounted on the left side of the generator set as viewed from the alternator end.
KU06-2	400 Ampere, 3-Pole, molded case, solid state true RMS electronic trip circuit breaker, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 690 VAC. Mounted on the right side of the generator set as viewed from the alternator end.
KU07-2	400 Ampere, 3-Pole, molded case, solid state true RMS electronic trip circuit breaker, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 690 VAC. Mounted on the left side of the generator set as viewed from the alternator end.
KU08-2	450 Ampere, 3-Pole, molded case, solid state true RMS electronic trip circuit breaker, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 690 VAC. Mounted on the right side of the generator set as viewed from the alternator end.
KU09-2	450 Ampere, 3-Pole, molded case, solid state true RMS electronic trip circuit breaker, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 690 VAC. Mounted on the left side of the generator set as viewed from the alternator end.
KU10-2	500 Ampere, 3-Pole, molded case, solid state true RMS electronic trip circuit breaker, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 690 VAC. Mounted on the right side of the generator set as viewed from the alternator end.
KU11-2	500 Ampere, 3-Pole, molded case, solid state true RMS electronic trip circuit breaker, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 690 VAC. Mounted on the left side of the generator set as viewed from the alternator end.
KU12-2	600 Ampere, 3-Pole, molded case, solid state true RMS electronic trip circuit breaker, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 690 VAC. Mounted on the right side of the generator set as viewed from the alternator end.
KU14-2	800 Ampere, 3-Pole, molded case, solid state true RMS adjustable electronic trip circuit breaker with a range of 672 to 800 Amperes, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 415 VAC. Mounted on the right side of the generator as viewed from the alternator end.
KU15-2	800 Ampere, 3-Pole, molded case, solid state true RMS adjustable electronic trip circuit breaker with a range of 672 to 800 Amperes, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 415 VAC. Mounted on the left side of the generator as viewed from the alternator end.
KU16-2	1200 Ampere, 3-Pole, molded case, solid state true RMS adjustable electronic trip circuit breaker with a range of 720 to 1200 Amperes, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 415 VAC. Mounted on the right side of the generator as viewed from the alternator end.
KU17-2	1200 Ampere, 3-Pole, molded case, solid state true RMS adjustable electronic trip circuit breaker with a range of 720 to 1200 Amperes, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 415 VAC. Mounted on the left side of the generator as viewed from the alternator end.
KU29-2	25 Ampere, 3-pole, molded case, thermal-magnetic trip, line circuit breaker is mounted on the right side when viewed from the alternator end of the generator set. The circuit breaker is UL listed at 80% duty for 600 Volts AC.
KU30-2	25 Ampere, 3-pole, molded case, thermal-magnetic trip, line circuit breaker is mounted on the left side when viewed from the alternator end of the generator set. The circuit breaker is UL listed at 80% duty for 600 Volts AC.
KX14-2	250 Ampere, 3-Pole, molded case, solid state true RMS electronic trip circuit breaker, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 690 VAC. Mounted on the left side of the generator set as viewed from the alternator end.
KX15-2	250 Ampere, 3-Pole, molded case, solid state true RMS electronic trip circuit breaker, UL listed at 80% duty for up to 600 Volts, IEC standards for rated operational voltage up to 690 VAC. Mounted on the right side of the generator set as viewed from the alternator end.
KX54-2	800 Ampere, 3-pole, electrically-operated circuit breaker, mounted on the right side of a generator set. The circuit breaker has true RMS current sensing, adjustable rating plugs and thermal imaging, LED long-time pickup indication, micrologic trip unit with a range of settings from 672 to 800 amperes. The circuit breaker is UL listed at 100% of the frame rating for Continuous duty. UL listed, CSA certified, IEC rated.
KX55-2	1200 Ampere, 3-pole, electrically-operated circuit breaker, mounted on the right side of a generator set. The circuit breaker has true RMS current sensing, adjustable rating plugs and thermal imaging, LED long-time pickup indication, micrologic trip unit with a range of settings from 720 to 1200 amperes. The circuit breaker is UL listed at 80% of the frame rating for Continuous duty, UL listed, CSA certified, IEC rated.

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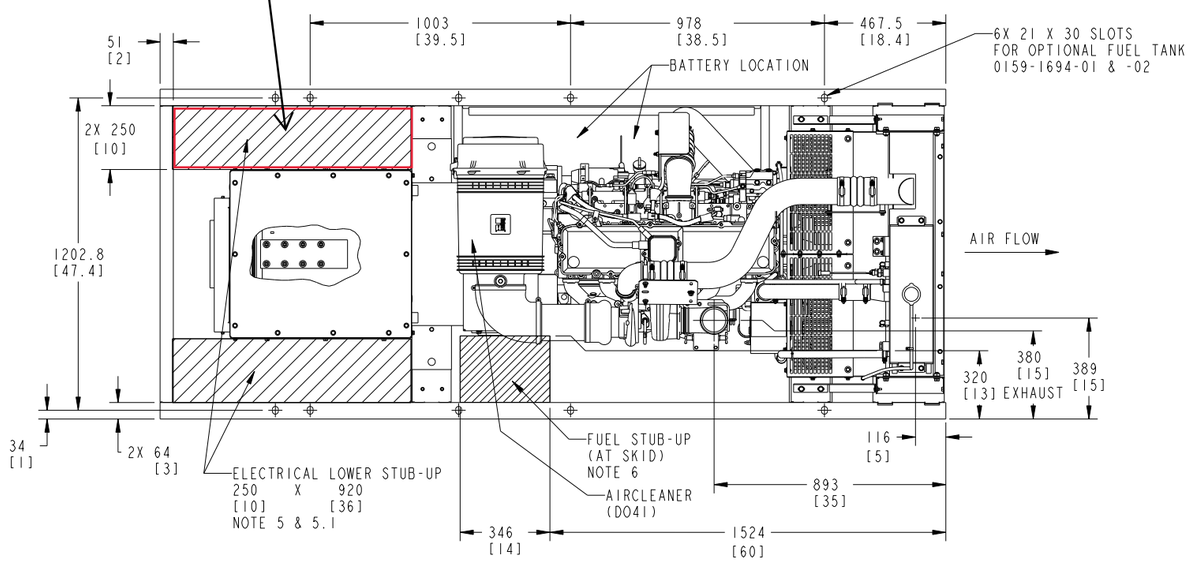
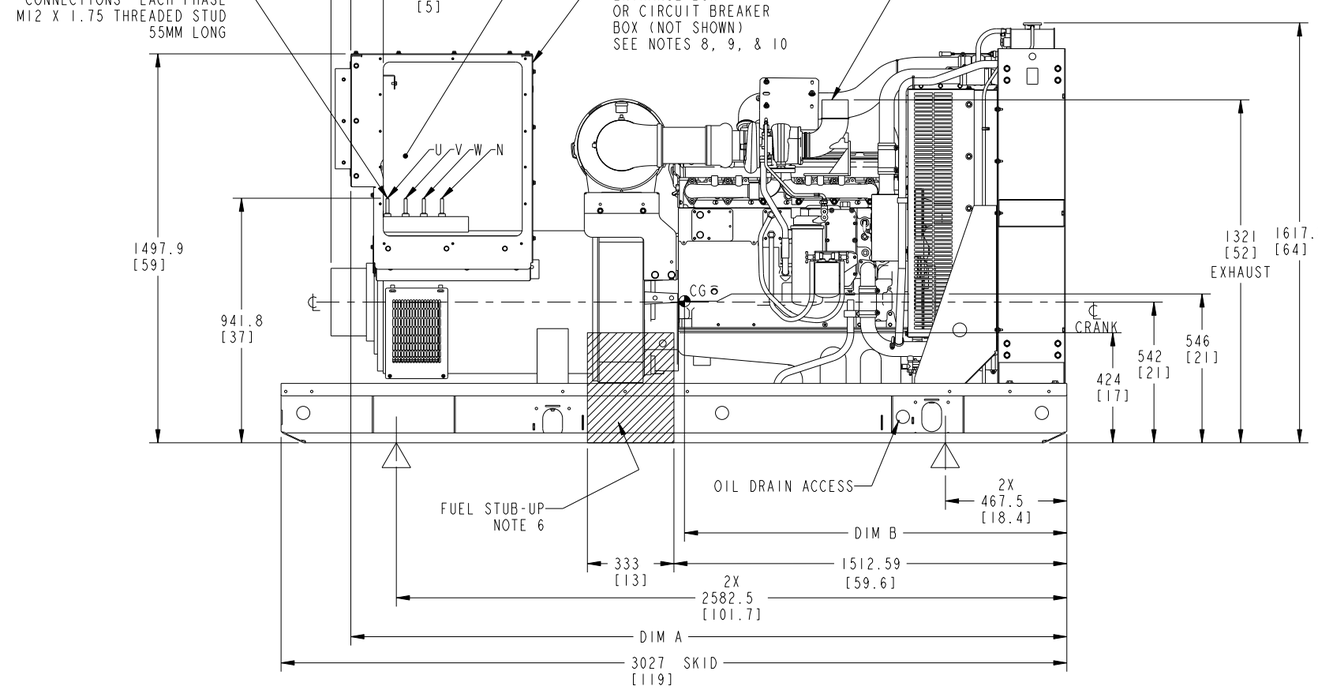
SECTION 4

GENERATOR DRAWINGS
&
INTERCONNECTS

PTC® Creo® Parametric 1200 amp breaker

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
ECO-14902I	C	I	DRAWING HAS BEEN PICTORIALLY UPDATED	AM	SV	S.VENKATESAN	I8MAR15



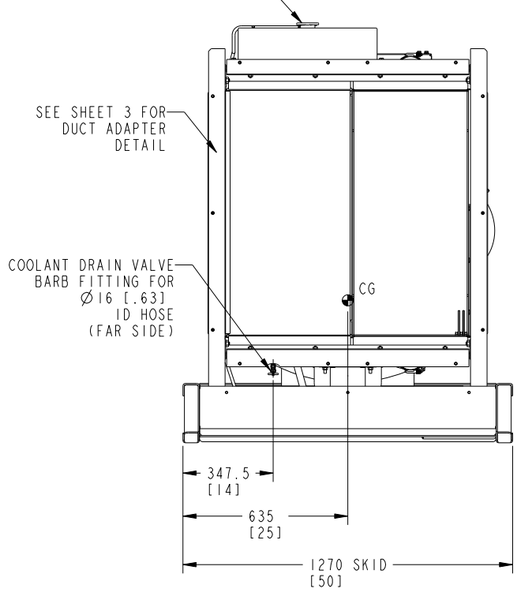


NOTES:

1. DIMENSIONS SHOWN IN [ ] ARE INCH.
2. 23 X 30 SLOTS MARKED BY △ FOR 4 POINT ISOLATION MOUNTING OR SECURING TO MOUNTING SURFACE.
3. GENSET SUPPLIED WITH FLEXIBLE FUEL LINES THAT CAN BE CONNECTED TO GENERATOR SET INTERFACE POINTS.
   3.1 FUEL SUPPLY LINE: 1525 [60] LONG WITH 1/2-14 NPT (MALE) TERMINATIONS.
   FUEL RETURN LINE: 1780 [70] LONG WITH 3/8-18 NPT (MALE) TERMINATIONS.
4. TABULATED WEIGHT AND CG IS FOR GENERATOR SET WITH NO OPTIONS.
5. REFER TO CIRCUIT BREAKER OUTLINE DRAWING FOR ELECTRICAL STUB-UP AREA FOR SPECIFIC BREAKERS.
   5.1 REFER TO SUBBASE FUEL TANK OUTLINE DRAWING FOR ELECTRICAL STUB-UP AREA AVAILABLE WITH FUEL TANKS.
6. FUEL STUB-UP AREA IS NOT AVAILABLE WITH SUBBASE FUEL TANK.
7. CONTROL INTERFACE CONNECTIONS SHOULD BE MADE WITH FLEXIBLE CONNECTIONS, NOT RIGID CONDUIT.
8. FOR ENTRANCE BOX APPLICATIONS SEE APPLICABLE ENTRANCE BOX OUTLINE DRAWING.
9. OPTIONAL ENTRANCE BOX (NOT SHOWN) WILL BE MOUNTED ON THE RIGHT SIDE AS VIEWED FROM THE CONTROL.
10. OPTIONAL BREAKER BOX (NOT SHOWN) WILL BE MOUNTED ON THE LEFT SIDE AS VIEWED FROM THE CONTROL UNLESS OTHERWISE SPECIFIED.

TABULATION

ALT. DATA SHT #	DIM. A MM	DIM. A INCH	DIM. B MM	DIM. B INCH	ESTIMATED GENSET DRY WT. KGS.	ESTIMATED GENSET DRY WT. LBS.	ESTIMATED GENSET WET WT. KGS.	ESTIMATED GENSET WET WT. LBS.
ADS339	2758	[109]	1470	[57.9]	2009	[4430]	2060	[4542]
ADS340	2758	[109]	1504	[59.2]	2099	[4628]	2150	[4740]
ADS341	2758	[109]	1535	[60.4]	2184	[4814]	2234	[4926]
ADS342	2848	[112]	1581	[62.2]	2319	[5113]	2370	[5225]



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: 3/32

SIM TO A041F591
DO NOT SCALE PRINT
- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP

DRN M_LEHR
CKD S_SARIDE
APVD S_SARIDE
DATE 08JAN14
FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994
FIRST USED ON DQDAA,AB,AC

CUMMINS POWER GENERATION
OUTLINE,GENSET
SITE CODE PGF
DWG SIZE D A048R355 SHEET 1 of 3 DWG REV C

PTC® Creo® Parametric

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
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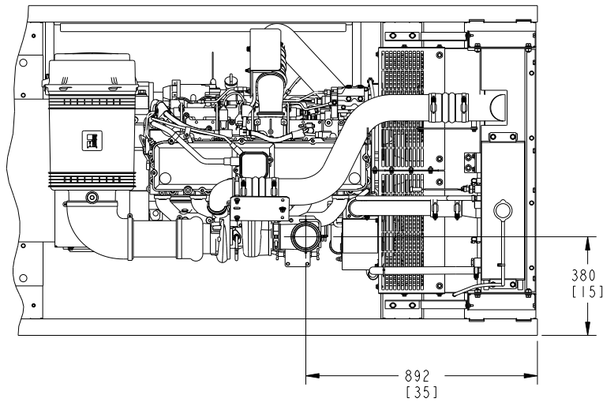
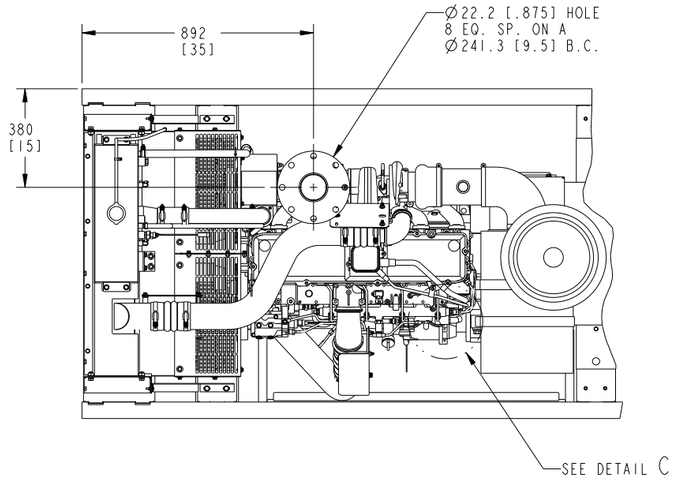
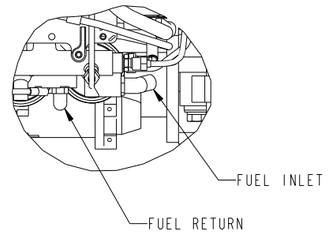
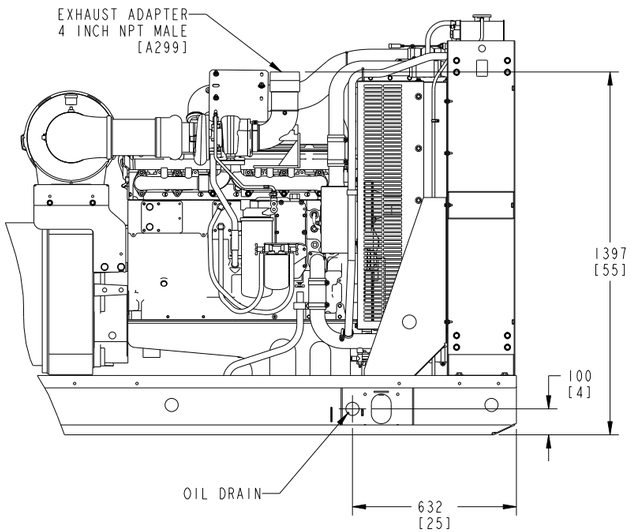
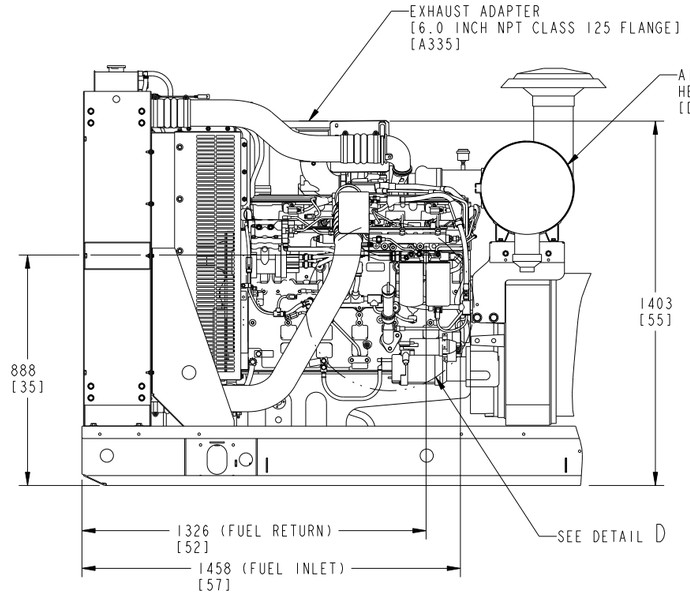


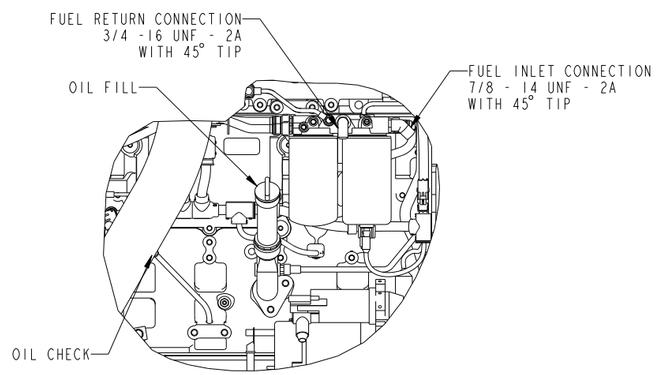




DETAIL C
SCALE 1/4





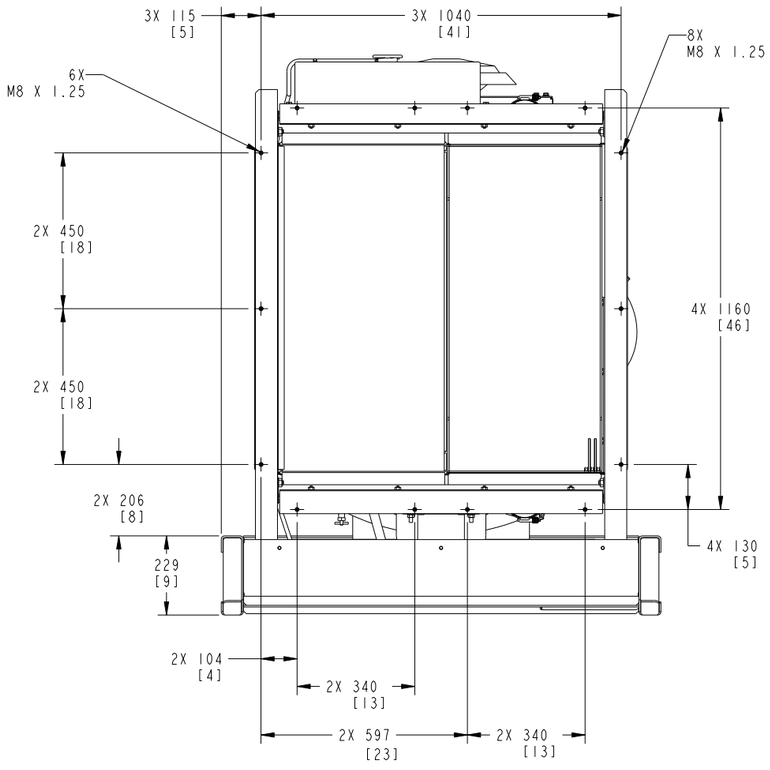


DETAIL D
SCALE 3/16

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS				SIM TO A041F591	DRN M_LEHR		CUMMINS POWER GENERATION
DIM: X ±1, .X ±0.8, .XX± 0.38	HOLE: 0.00- 4.99 +0.15/-0.08; 5.00- 9.99 +0.20/-0.10; 10.00-17.49 +0.25/-0.13; 17.50-24.99 +0.30/-0.13			DO NOT SCALE PRINT	CKD S_SARIDE		OUTLINE,GENSET
ANG TOL: ± 1.0°	SCALE: 3/32			- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP	APVD S_SARIDE	SITE CODE ·	
				FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994	DATE 08JAN14	PGF	DWG SIZE D A048R355 SHEET 2 of 3 DWG REV C
					FIRST USED ON DQDAA,AB,AC		

PTC® Creo® Parametric

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
ECO-149021	C	1	DRAWING HAS BEEN PICTORIALLY UPDATED	AM	SV	S.VENKATESAN	18MAR15



MOUNTING DIMENSIONS
FOR DUCT ADAPTER
SCALE 1/8

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: 3/32

SIM TO A041F591

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DWN M_LEHR
CKD S_SARIDE
APVD S_SARIDE
DATE 08JAN14

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994

FIRST USED ON DODAA,AB,AC

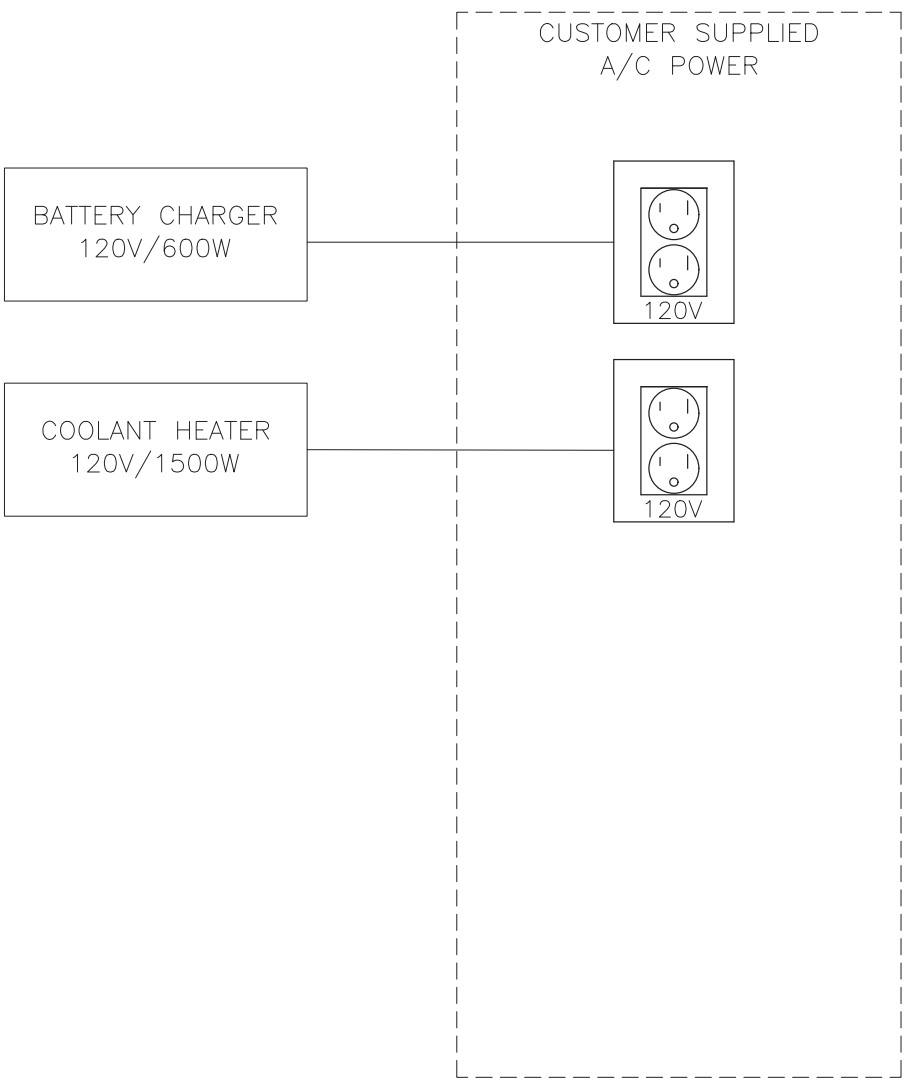
SITE CODE PGF

CUMMINS POWER GENERATION

OUTLINE,GENSET

DWG SIZE D | A048R355 | SHEET 3 of 3 | DWG REV C

UNLESS OTHERWISE SPECIFIED,
ALL DIMENSIONS ARE IN INCHES



NOTES:
1. FOLLOW REGIONAL REGULATIONS AND APPLICABLE ELECTRIC CODES FOR INSTALLATION.
2. INSTALLER TO PROVIDE BRANCH CIRCUITS TO POWER ALL ACCESSORIES.
3. OUTLETS SHOWN FOR REFERENCE ONLY. ALL OUTLETS AND ASSOCIATED DASHED WIRING ARE THE RESPONSIBILITY OF THE INSTALLER.

PREP. BY:	JPK
	5/1/2024

CSSNA POWER GEN

TITLE: 230–1000kW AC LOAD TABLE

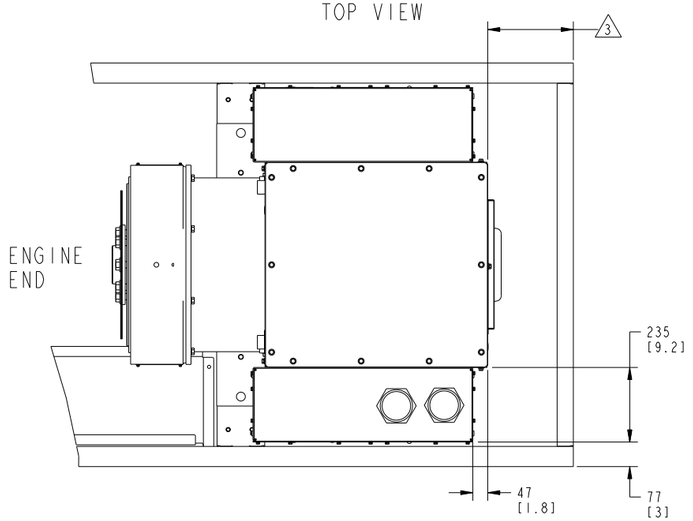
SIZE: B | DWG NO: JPK–THOR | REV 0

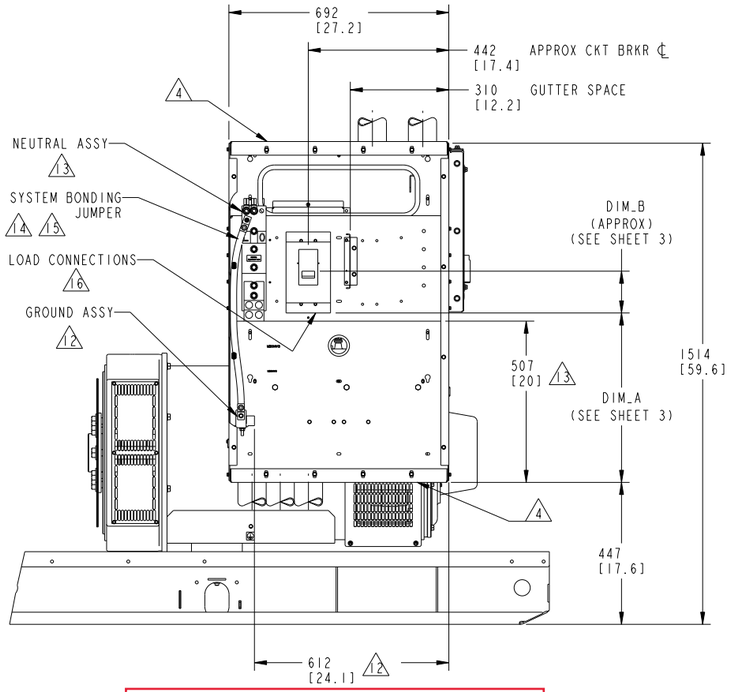
SCALE: DO NOT SCALE PRINT | SHEET 1 OF 1

Creo Parametric

REL NO	LTR	NO	REVISION	DRN	CKD	APVD	DATE
ECO-138680	C	1	SEE SHEET 3	MAH	BG	K.KISHORE	22OCT13

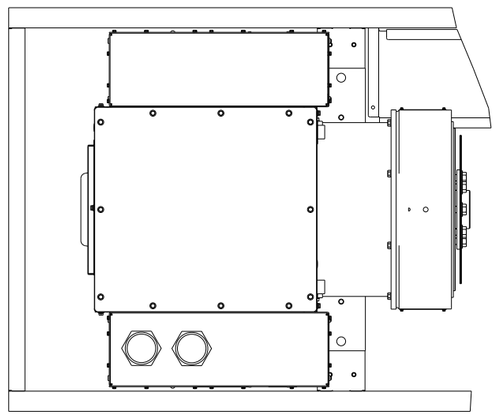
TOP VIEW

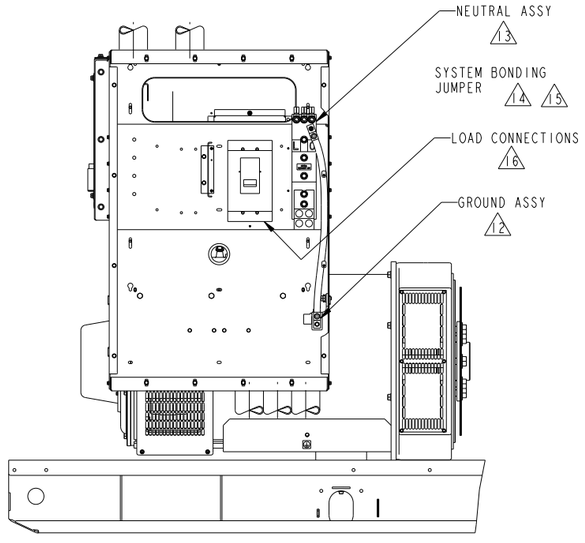




DQDAA/DQDAB/DQDAC
CIRCUIT BREAKER BOX
(LEFT HAND CONFIGURATION SHOWN)

TOP VIEW





DQDAA/DQDAB/DQDAC
CIRCUIT BREAKER BOX
(RIGHT HAND CONFIGURATION SHOWN)

NOTES:

1. ALL DIMENSIONS ARE FOR REFERENCE ONLY.
2. DIMENSIONS SHOWN IN [ ] ARE IN INCHES.
3. _____ DIMENSION IS GENERATOR FRAME SPECIFIC (REFER TO SET OUTLINE DRAWING).
4. TOP AND BOTTOM COVERS ARE ADJUSTABLE VERTICALLY PLUS OR MINUS .25" [6] TO EASE CONDUIT ATTACHMENT.
5. THESE WIRE-CONDUIT COMBINATIONS MEET NEC AND CEC. TO USE OTHER COMBINATIONS, REFER TO APPLICABLE CODES TO ENSURE THAT WIRE AMPACITY, BEND SPACE AND GUTTER SPACE MEET THE REQUIREMENTS.
6. "NS/NLG" SHUNT TRIP HAS NO INTERNAL CONTACTS, IT MUST BE USED IN CONJUNCTION WITH AUXILIARY CONTACTS TO ACCEPT CONTINUOUS APPLIED VOLTAGE. IT CAN OPERATE AT 75% OF NOMINAL VOLTAGE.
7. THE SHUNT TRIP CAN OPERATE AT 70% TO 100% OF NORMAL VOLTAGE AND WILL ACCEPT MOMENTARY OR CONTINUOUS APPLIED VOLTAGE
8. 800 AMP BREAKER:
   A LUG ACCEPTING (2) 3/0-600 kcmil CONDUCTORS IS AVAILABLE THRU ACCESSORIES. PGA PART NUMBER 0332-4278
9. 1200 AMP BREAKER:
   A LUG ACCEPTING (3) 3/0-600 kcmil CONDUCTORS IS AVAILABLE THRU ACCESSORIES. PGA PART NUMBER 0332-427
10. ON FLORIDA UNITS WITH TANKS (FEATURE CODE L116) ADD 106 [4.2] FOR RISER BEAMS THAT ARE REQUIRED ON THE UNDERSIDE OF THE TANK
11. BOX DIMENSIONS AND CONDUIT LOCATIONS ARE THE SAME FOR ENTRANCE BOX WITHOUT CONDUITS
12. EQUIPMENT GROUND & GROUNDING ELECTRODE LUG IS MECHANICAL TYPE,
    COPPER 400 MCM-6 AWG
    SCREW 11/16"-16 UN-2B
    5/16" HEX WRENCH
    RECOMMENDED TORQUES:
    250 MCM-1 AWG - 375 IN-LBS
    2-6 AWG - 275 IN-LBS
13. NEUTRAL LUG IS MECHANICAL TYPE,
    COPPER #2-600 MCM
    SCREW 15/16"-16 UN-2B
    3/8" HEX WRENCH
    RECOMMENDED TORQUES:
    600 MCM-4 AWG - 500 IN-LBS
14. TORQUE TO 9.8-11.9 Nm [7.2-8.8 FT-LBS] HARDWARE IS PROVIDED WITH BONDING JUMPER.
15. 250 MCM SYSTEM BONDING JUMPER SIZED PER NEC TABLE 250.122 USING COPPER CABLE FOR A MAXIMUM AMPACITY RATING OF 2000 AMPS.
16. CIRCUIT BREAKER LUGS - REFER TO RECOMMENDED TORQUE ON LABEL.
17. MINIMUM WIRE BENDING SPACE AT BREAKER TERMINALS CALCULATED PER NEC TABLE 312.6(B) USING 500 MCM CABLES (2 WIRES PER TERMINAL), MECHANICAL LUGS USED AS TERMINALS.

    NUMBER OF CONDUCTORS PER PHASE CALCULATED PER TABLE 310.16 USING COPPER CABLES RATED AT 75° C ON A MAXIMUM AMBIENT TEMP OF 40° C.
18. MINIMUM WIRE BENDING SPACE AT GROUND TERMINALS CALCULATED PER NEC TABLE 312.6(A) USING [3/0-14] CABLES (1 WIRE PER TERMINAL), MECHANICAL LUGS USED AS TERMINALS.

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS

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

ANG TOL: ± 1.0° SCALE: 1/8

SIM TO: DO NOT SCALE PRINT

- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP

DRN D_CRANE
CKD H_TRUONG
APVD H_TRUONG
DATE 27MAY11

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994

FIRST USED ON: DQDAA,AB,AC

SITE CODE: PGF

CUMMINS POWER GENERATION

OUTLINE,CIRCUIT BREAKER

DWG SIZE D | A040J333 | SHEET 1 OF 3 | DWG REV C

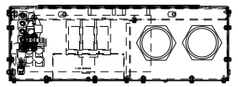
Drawing Name: A040J334 Revision: C
Part Name: A040J333 Revision: C
Sheet 1 of 4

Creo Parametric

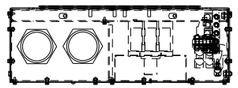
REL NO	LTR	NO	REVISION	DRN	CKD	APVD	DATE
ECO-138680	C	-	------	MAH	BG	K.KISHORE	22OCT13

RECOMMENDED LOCATIONS FOR
ONE, TWO, THREE OR FOUR CONDUITS

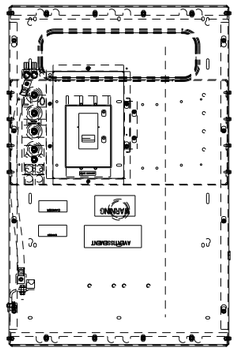
TOP ENTRANCE BOX



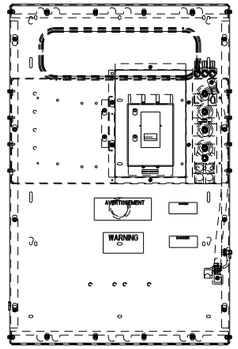
TWO CONDUITS



TWO CONDUITS

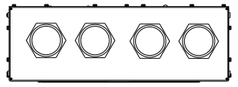


LEFT HAND

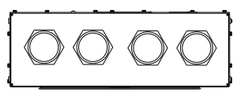


RIGHT HAND

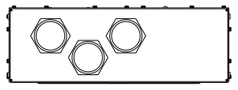
BOTTOM ENTRANCE BOX



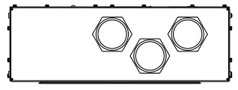
FOUR CONDUITS



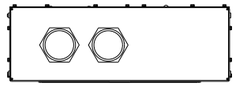
FOUR CONDUITS



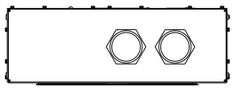
THREE CONDUITS



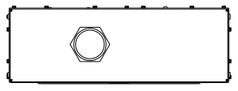
THREE CONDUITS



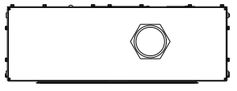
TWO CONDUITS



TWO CONDUITS



ONE CONDUIT



ONE CONDUIT

TYPICAL CONDUIT AND WIRE SIZE BASED ON NEC 2008, ARTICLE 310.15 AT 75°C TEMPURATURE RATED CONDUCTOR AT 40°C AMBIENT AND ANNEX C (LIQUID TIGHT FLEXIBLE METAL CONDUIT - LFCM)

△5

MAX BRKR AMPS	WIRE (COPPER)		CONDUIT	
	QTY	SIZE	QTY	SIZE
1200	4	500 KCMIL	4	4"
800	3	350 KCMIL	3	3 1/2"
600	2	350 KCMIL	2	3 1/2"
500	2	300 KCMIL	2	3 1/2"
450	2	300 KCMIL	2	3 1/2"
400	1	600 KCMIL	1	4"
350	1	600 KCMIL	1	4"
300	1	500 KCMIL	1	4"

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: 1/8

SIM TO: DO NOT SCALE PRINT

- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP

DRN D_CRANE | CKD H_TRUONG | APVD H_TRUONG | DATE 27MAY11

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994 | FIRST USED ON DQDAA,AB,AC

SITE CODE: PGF

CUMMINS POWER GENERATION

OUTLINE,CIRCUIT BREAKER

DWG SIZE: D | A040J333 | SHEET 2 OF 3 | DWG REV: C

Drawing Name: A040J334 Revision: C
Part Name: A040J333 Revision: C
Sheet 2 of 4

Creo Parametric

REL NO	LTR	NO	REVISION	DRN	CKD	APVD	DATE
ECO-138680	C	1	ZONE D4: CHANGE 400 AMP WIRE RANGE	MAH	BG	K.KISHORE	22OCT13
		2	ZONE D4: CHANGE 600 AMP WIRE RANGE	MAH	BG	K.KISHORE	22OCT13

UL/IEC LUGS						ACCESSORY SPECIFICATIONS			
LUG	FRAME	MAX AMPS	WIRE RANGE COPPER	DIM_A	DIM_B	ACCESSORY DESCRIPTION	CONTACT RATING	INRUSH CURRENT	CONNECTION TYPE
	NSJ/NLG	400A 3 OR 4 POLE	#2-600 KCMIL (NSJ/NLG)	533 [21]	132 [5.2]	24 VDC SHUNT TRIP	-	10A 6	COMPRESSION TERMINALS #20-16 AWG OR SMALLER TORQUE: 1.13 Nm [10 IN-LB]
		600A 3-POLE 630A 4-POLE	2/0-350 KCMIL (NSJ) 2/0-500 KCMIL (NLG)			1 EA. FORM C 1 AUX CONTACT + 1 TRIP ALARM	6A AT 690 VAC 2.5A AT 48 VDC, 0.3A AT 250 VDC	-	
 8	P	800A 3-POLE	3/0-500 KCMIL	502 [19.8]	99 [3.9]	24 VDC SHUNT TRIP	-	200VA 7	COMPRESSION TERMINALS FOR 1 OR 2 #18-16 AWG. TORQUE: 1.13 Nm [10 IN-LB]
						1 EA. FORM C 4 AUX CONTACTS + 1 TRIP ALARM	6A AT 240 VAC, 6A AT 480 VAC, 3A AT 600 VAC, 2.5A AT 48 VDC, 0.8A AT 125 VDC, 0.3A AT 250 VDC	-	
 9	P	1200A 3-POLE	3/0-500 KCMIL	502 [19.8]	99 [3.9]	24 VDC SHUNT TRIP	-	200VA 7	COMPRESSION TERMINALS FOR 1 OR 2 #18-16 AWG. TORQUE: 1.13 Nm [10 IN-LB]
						1 EA. FORM C 4 AUX CONTACTS + 1 TRIP ALARM	6A AT 240 VAC, 6A AT 480 VAC, 3A AT 600 VAC, 2.5A AT 48 VDC, 0.8A AT 125 VDC, 0.3A AT 250 VAC	-	

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: 3/32

SIM TO: DO NOT SCALE PRINT

- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP

DRN D_CRANE
CKD H_TRUONG
APVD H_TRUONG
DATE 27MAY11

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994

FIRST USED ON DODAA, AB, AC

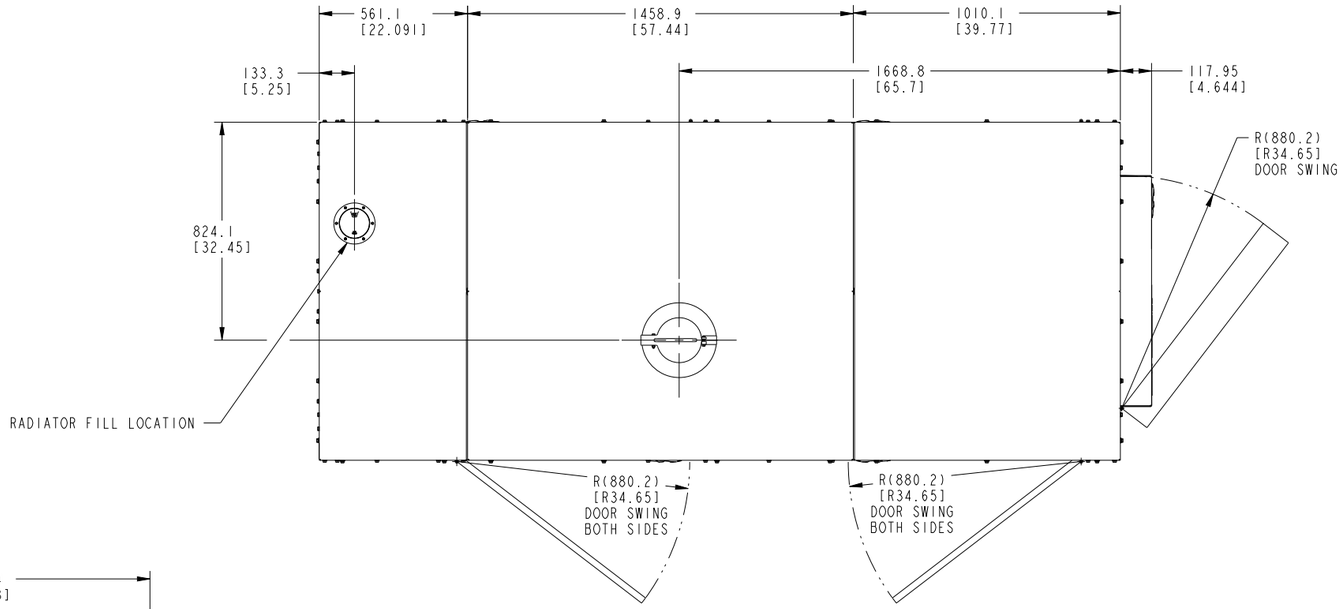
SITE CODE PGF

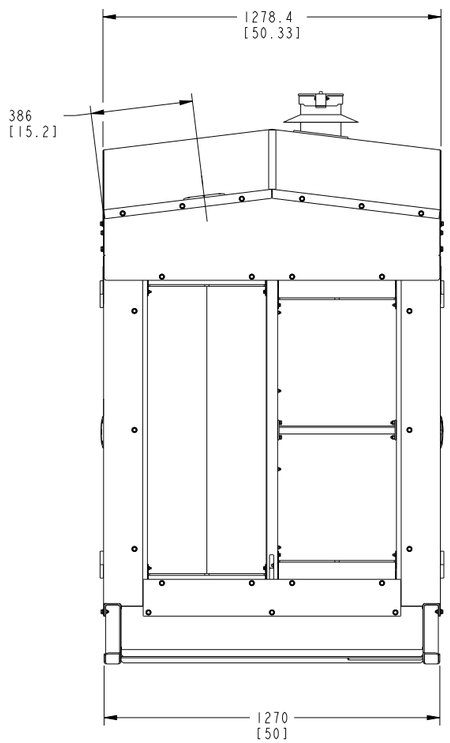
CUMMINS POWER GENERATION

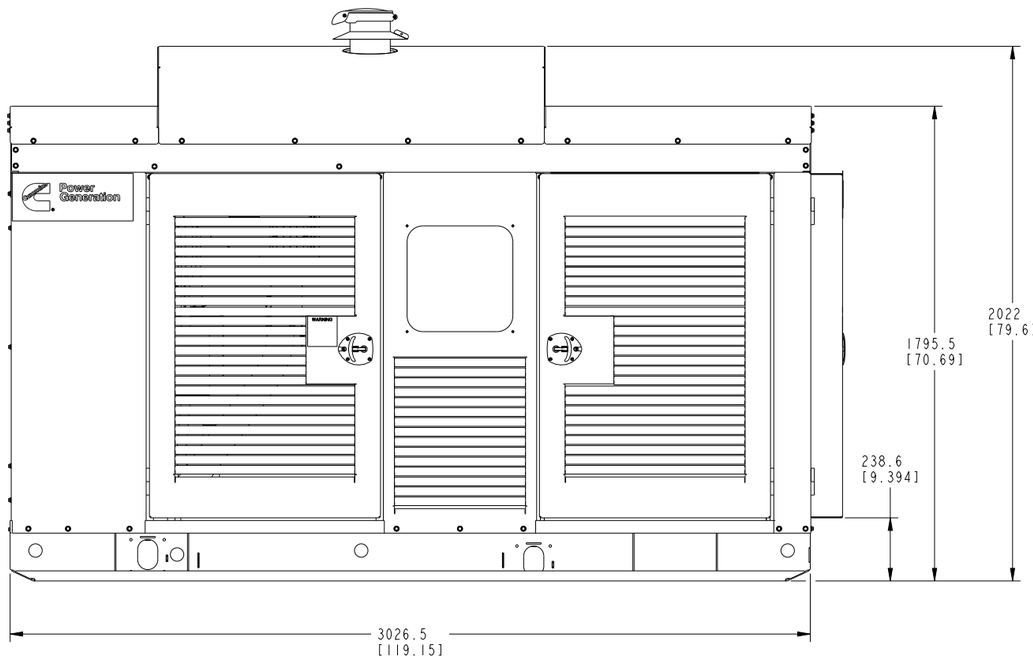
OUTLINE, CIRCUIT BREAKER

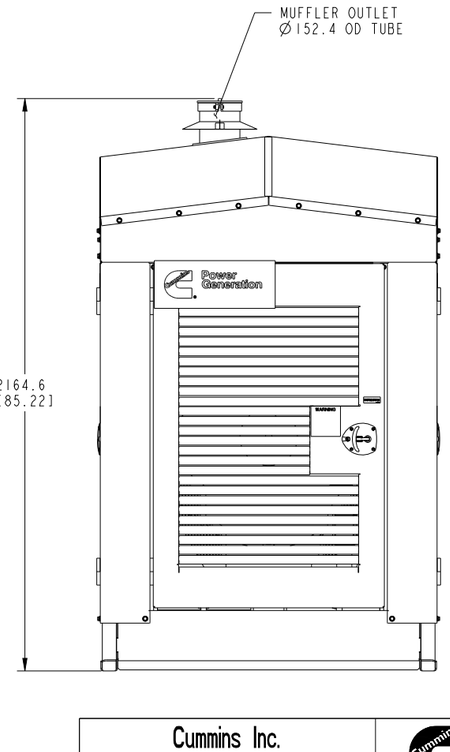
DWG SIZE D | A040J333 | SHEET 3 of 3 | DWG REV C

Drawing Name: A040J334 Revision: C
Part Name: A040J333 Revision: C
Sheet 3 of 4









FOR PCC 2300 AND PCC 3300 CONTROL CONFIGURATION

Cummins Inc.			
DIMENSIONS ARE IN: MILLIMETERS [ ] ARE IN: -	SIZE: D	SCALE:0.1	
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009	THIRD ANGLE PROJECTION	CAD SYSTEM PTC® Creo® Parametric	

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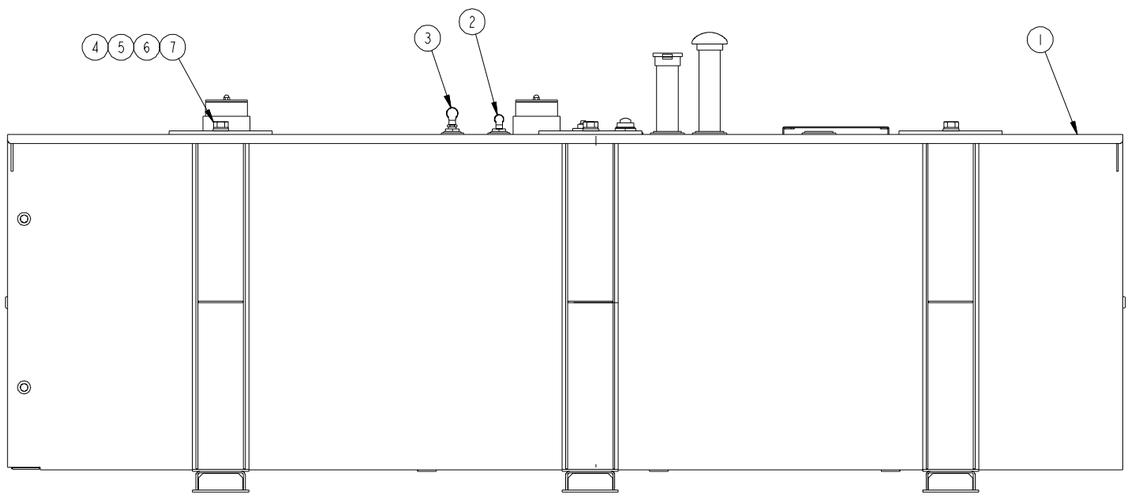
Part Number: **A040E884** Part Revision: **C**
Part Name: **OUTLINE,ENCLOSURE**
Drawing Category: **Detail** State: **Released**

0179_4621	D	Pro/ENGINEER	METRIC DWG

REL NO	LTR	NO	REVISION	ZONE	DR	CHKR	APPROVED	DATE
FRD23155	A	1	PRODUCTION_RELEASE	-	DC	DG	DG	07-13-05

NOTE:

1. USE THREAD SEALANT (ITEM 8) ON ALL PIPE THREADS.



TABULATION

PART NO.	CURRENT ER	GALLONS	DESCRIPTION
0179_4621_01	FRD23155	300	PRODUCTION
0179_4621_02	FRD23155	550	PRODUCTION
0179_4621_03	FRD23155	300	KIT
0179_4621_04	FRD23155	550	KIT

REF	REF	-	-	10	0179_4621	D	TANK INSTL FUEL (DRAWING ONLY)
1	1	-	-	9	0518_0601	A	PIPE SEALANT (6ML)
-	-	AR	AR	8	0518_0391	A	SEALANT-THREAD
6	6	6	6	7	0862_0026_58	D	NUT-HEX (M16 X 2)
6	6	6	6	6	0850_0114_57	C	WASHER-LOCK (M16)
6	6	6	6	5	0800_3017_73	D	SCREW-HHC (M16 X 2 X 45 LG)
6	6	6	6	4	0526_0399_66	D	WASHER-FLAT (M16) (18 ID X 30 OD X 3 THK)
1	1	1	1	3	0505_0050	-	ELBOW-BLACK STREET (1 1/2 X 90)
1	1	1	1	2	0505_0120	-	ELBOW-STREET (3/8 X 90)
1	-	1	-	1	0159_1694_02	D	TANK-FUEL
-	1	-	1	1	0159_1694_01	D	TANK-FUEL
QTY -04	QTY -03	QTY -02	QTY -01	ITEM	PART NO	DWG SIZE	DESCRIPTION OR MATERIAL	REF DES

DO NOT SCALE PRINT

ANG TOL± 1.0°

DRAWN TO SCALE OF 1/1

TOLERANCE UNLESS OTHERWISE SPECIFIED

DIM	mm	inch
	X ±1 .X ±0.8 .XX ±0.38	.X ± .XX ± .XXX±
HOLE	0.99- 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	.004-.200 +.006/-.003 .201-.421 +.008/-.004 .422-.703 +.010/-.005 .704-.999 +.012/-.005

S/# 0179_0773 D

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THIRD ANGLE PROJECTION

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	NAME	DATE
DR	D_CRANE	07-13-05
CHKR ☒ MFG ☐	D_GILLETT	07-13-05
APPROVED	D_GILLETT	07-13-05

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ANSI Y14.5M-1982

MODEL FIRST USED ON: DQDAA,AB,AC

SITE CODE: PGA

CUMMINS POWER GENERATION
1400 73RD AVE NE
MINNEAPOLIS, MINNESOTA 55432

TITLE: TANK INSTL (FUEL)

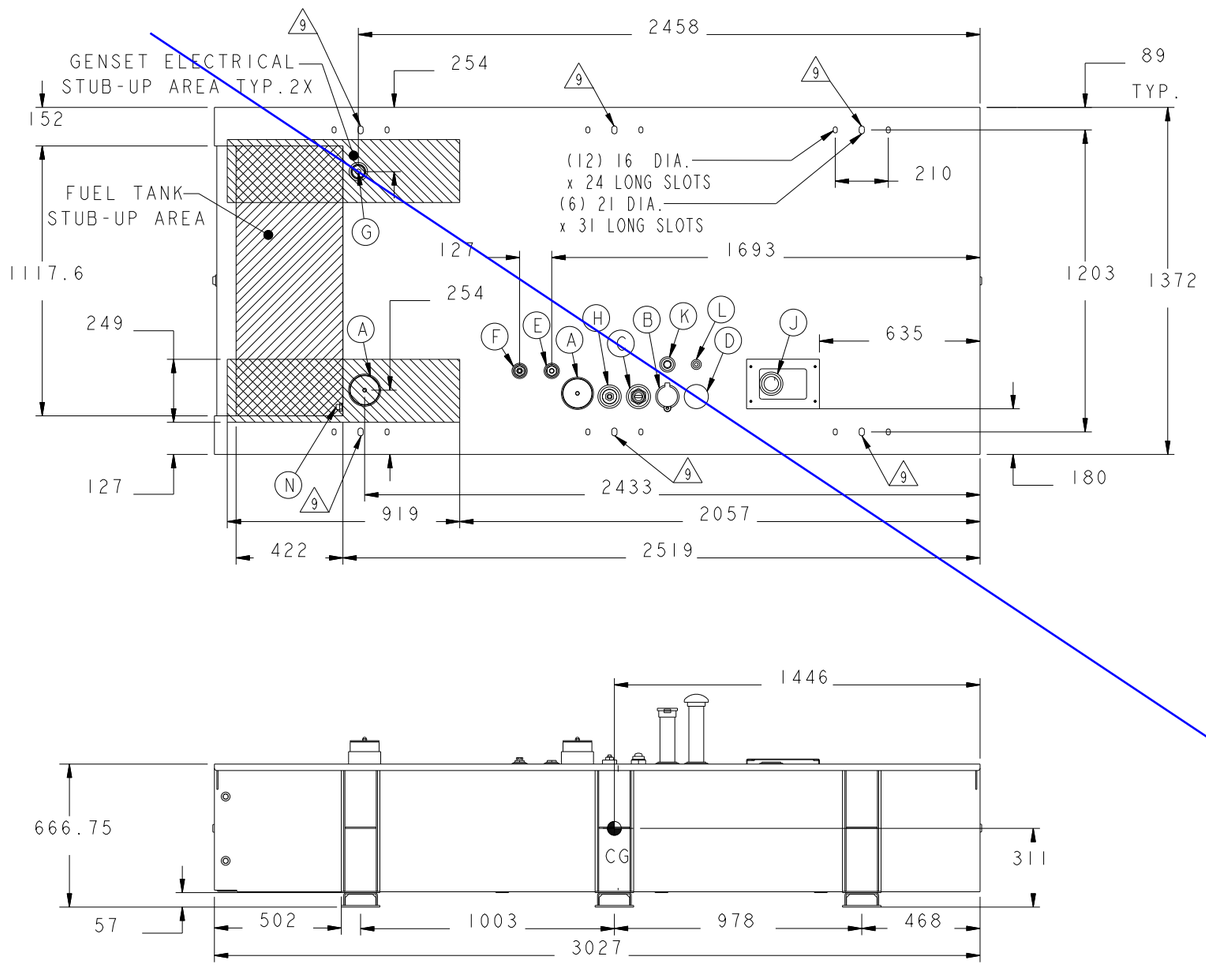
DRG NO: 0179_4621

SHEET: 1 of 1

DRG SIZE: D

PTC® Creo® Parametric

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
ECO-167245	F	1	PART 0159-1694-01,-02	--	--	--	--
			ADD TO DDA LIBRARY	PPP	JBP	K.KISHORE	17JAN17



NOTES:

1. THIS SUBTANK IS UL-142/ULC-S601-07 LISTED UNDER THE SPECIAL TANKS CATEGORY AS A SECONDARY CONTAINMENT GENERATOR BASE TANK. REFER TO TANK LABELS AND LOCAL CODE TO DETERMINE VENTING REQUIREMENTS FOR BOTH COMPARTMENTS.
2. FITTINGS ARE AS FOLLOWS:
   - A. (2) EMERGENCY VENT (4" NPT)
   - B. RAISED (8") LOCKABLE FUEL FILL (2" NPT)
   - C. FUEL LEVEL GAUGE (1-1/2" NPT)
   - D. RAISED (10") NORMAL VENT (2" NPT)
   - E. FUEL RETURN (3/8" NPT DIP TUBE IN 1" NPT)
   - F. FUEL SUPPLY (1/2" NPT DIP TUBE IN 1" NPT)
   - G. LEAK DETECTION SWITCH (1/2" NPT)
   - H. FUEL LEVEL SWITCH (2" NPT)
   - J. OPTIONAL SENSOR/PUMP CONTROL FLOAT (2" NPT W/ PIPE PLUG)
   - K. OPTIONAL OVERFLOW (3/4" NPT W/ PIPE PLUG
   - L. OPTIONAL TANK FILL (3/8" NPT W/ PIPE PLUG)
   - N. DRAIN (1/2" NPT W/ STEEL PLUG)
3. DIMENSIONS IN ( ) ARE IN INCHES.
4. TANK VOLUME IS 1,136 LITERS (300 GALLONS.)
5. TANK WEIGHT IS 783 KILOGRAMS (1723 LBS.)
6. INITIAL TANK DESIGN AND ARTWORK CREATED BY TRAMONT BASED ON GENERATOR SET DETAILS PROVIDED.
7. UL LISTING TO BE THE RESPONSIBILITY OF THE TANK SUPPLIER.
8. THIS PART IS MANUFACTURER SOURCE CONTROLLED.

9. EACH GENSET MOUNTING POINT IS UL RATED FOR 8346.1 KG DISTRIBUTED OVER AN AREA OF 76.2 BY 152.4 AT EACH POINT.

10. APPLY RUST INHIBITOR OR PAINT OVER THREADED FITTINGS ONCE INSTALLED.

0159-1694-01

TABULATION

PART NUMBER	CURRENT ECO	TANK VOLUME	TANK WEIGHT	SHEET
0159_1694_01	ECO-167245	1,136 LITERS (300 GAL)	783 Kg	SEE SHEET 1
0159_1694_02	ECO-167245	2,083 LITERS (550 GAL)	1015 Kg	SEE SHEET 2

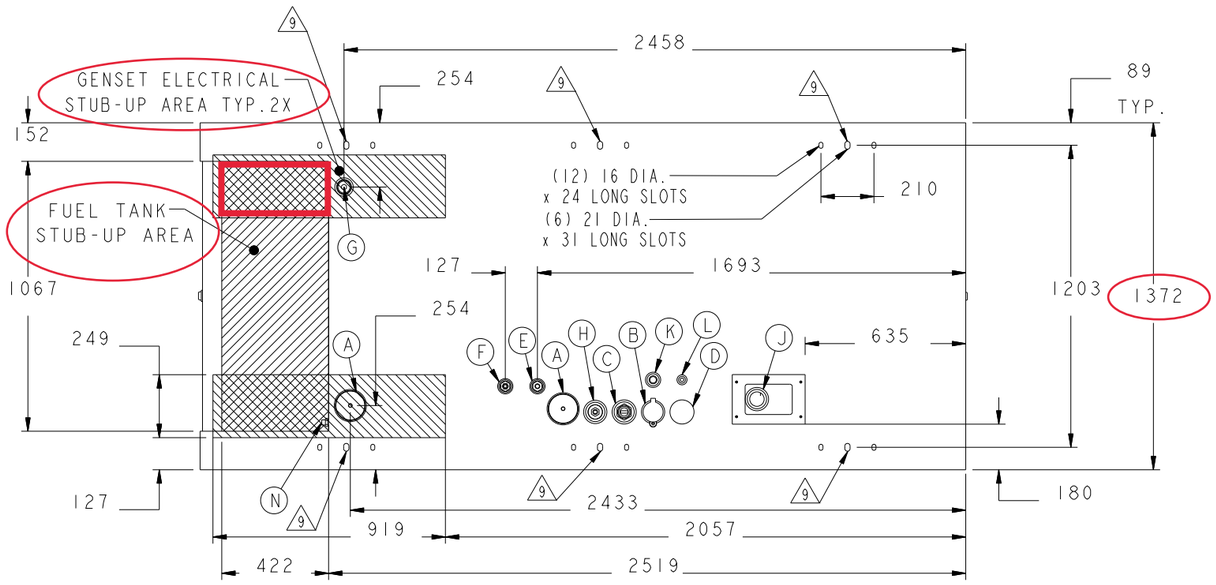
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS
DIM: X ±1; .X ±0.8; .XX± 0.38
HOLE: 0.00- 4.99 +0.15/-0.08; 5.00- 9.99 +0.20/-0.10; 10.00-17.49 +0.25/-0.13; 17.50-24.99 +0.30/-0.13
ANG TOL: ± 1.0° SCALE: 1/1
SIM TO .
DO NOT SCALE PRINT
- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP
DWN D_CRANE
CKD D_GILLETT
APVD D_GILLETT
DATE 07-13-05
FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994
FIRST USED ON DODAA,AB,AC
Cummins
CUMMINS POWER GENERATION
TANK,FUEL
SITE CODE .
CPG
DWG SIZE D
0159_1694
SHEET 1 OF 2
DWG REV F

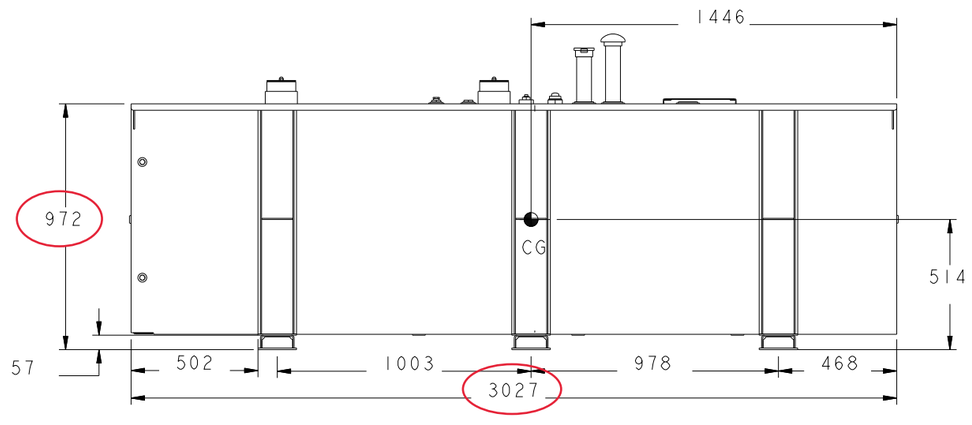
Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: UL,CUL

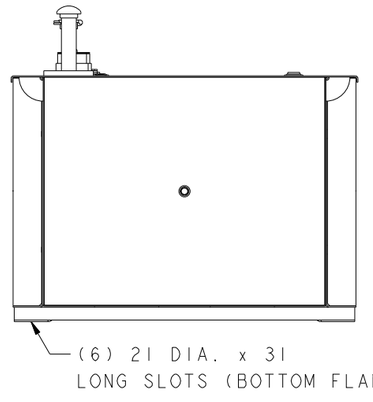
Drawing Name: 0159-1694 Revision: F
Part Name: 0159-1694-02 Revision: F
ECO-167245 Sheet 1 of 3

PTC® Creo® Parametric

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
ECO-167245	F	--	--	--	JBP	K.KISHORE	17JAN17







0159-1694-02

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS			SIM TO -	DWN D_CRANE	CUMMINS POWER GENERATION
DIM: X ±1, .X ±0.8, .XX± 0.38	HOLE: 0.00- 4.99 +0.15/-0.08, 5.00- 9.99 +0.20/-0.10, 10.00-17.49 +0.25/-0.13, 17.50-24.99 +0.30/-0.13		DO NOT SCALE PRINT	CKD D_GILLETT	
				APVD D_GILLETT	TANK,FUEL
				DATE 07-13-05	SITE CODE -
ANG TOL: ± 1.0°	SCALE: 1/1		- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP	FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994	FIRST USED ON DQDAA,AB,AC	CPG	DWG SIZE D	0159_1694	SHEET 2 OF 2	DWG REV F

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

Drawing Name: 0159-1694 Revision: F
Part Name: 0159-1694-02 Revision: F
ECO-167245 Sheet 2 of 3

SECTION 5

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

THE WARRANTIES SET FORTH HEREIN ARE THE SOLE WARRANTIES MADE BY CUMMINS POWER GENERATION ® IN REGARD TO THE PRODUCT. CUMMINS POWER GENERATION® MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT IS CUMMINS POWER GENERATION® LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

This limited warranty shall be enforced to the maximum extent permitted by applicable law. This limited warranty gives the owner specific rights that may vary from state to state or from jurisdiction to jurisdiction.

Product Model Number:_____
Product Serial Number:_____
Date in Service:_____

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