

SUBMITTAL PACKAGE



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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

October 5, 2024

Bill of Material

Feature Code	Description	Qty
DQDAC Install-US-Stat DQDAC_300DQDAC C DQDAC_A331-2 DQDAC_L169-2 DQDAC_R002-2 DQDAC_B246-2 DQDAC_B184-2 DQDAC_F183-2 DQDAC_P175-2 DQDAC_2280 DQDAC_C127-2 DQDAC_H679-2 DQDAC_H703-2 DQDAC_K796-2 DQDAC_H536-2 DQDAC_KU93-2 DQDAC_KU09-2 DQDAC_4790 DQDAC_KB73-2 DQDAC_5110 DQDAC_A366-2 DQDAC_A334-2 DQDAC_D041-2 DQDAC_A333-2 DQDAC_E125-2 DQDAC_H389-2 DQDAC_H669-2 DQDAC_H706-2 DQDAC_L028-2 DQDAC_L050-2 DQDAC_A322-2	DQDAC, Genset, Configurable Diesel U.S. EPA, Stationary Emergency Application 300DQDAC, Diesel Genset, 60Hz, 300kW Duty Rating - Standby Power (ESP) Emission Certification, EPA, Tier 3, NSPS CI Stationary Emergency Voltage - 277/480, 3 Phase, Wye, 4 Wire Alternator - 60Hz, 12 Lead, Limited Range, 125/105C Exciter/Regulator - Permanent Magnet Generator, 3 Phase Sensor Steel Weather Protective Enclosure, with Exhaust System, Residential Muffler Enclosure Color - Green, Steel Fuel Tank - None Fuel Water Separator Control Mounting - Front Facing PowerCommand 2.3 Controller Stop Switch - Emergency Control Display Language - English Circuit Breaker or Entrance Box or Terminal Box - Left Only Circuit Breaker - 450A, Left, 3P, 600/690V, SS RMS, 80%, UL/IEC Terminal Box - Low Voltage, Right - None Bottom Entry, Left Circuit Breaker or Entrance Box or Terminal Box, Top Entry, Right - None Engine Governor - Electronic, Isochronous Engine Starter - 24 Volt DC Motor Engine Air Cleaner - Normal Duty Battery Charging Alternator Engine Cooling - Radiator, High Ambient Air Temperature, Ship Fitted Shutdown - Low Coolant Level Engine Coolant - 50% Antifreeze, 50% Water Mixture Engine Oil Genset Warranty - 2 Years Base Literature - English Packing - Skid, Poly Bag	1
DQDAC Install-US-Stat DQDAC_300DQDAC C DQDAC_A331-2 DQDAC_L169-2 DQDAC_R002-2 DQDAC_B246-2 DQDAC_B184-2 DQDAC_F183-2 DQDAC_P175-2	DQDAC, Genset, Configurable Diesel U.S. EPA, Stationary Emergency Application 300DQDAC, Diesel Genset, 60Hz, 300kW Duty Rating - Standby Power (ESP) Emission Certification, EPA, Tier 3, NSPS CI Stationary Emergency Voltage - 277/480, 3 Phase, Wye, 4 Wire Alternator - 60Hz, 12 Lead, Limited Range, 125/105C Exciter/Regulator - Permanent Magnet Generator, 3 Phase Sensor Steel Weather Protective Enclosure, with Exhaust System, Residential Muffler Enclosure Color - Green, Steel	1

DQDAC_2280	Fuel Tank - None	
DQDAC_C127-2	Fuel Water Separator	
DQDAC_H679-2	Control Mounting - Front Facing	
DQDAC_H703-2	PowerCommand 2.3 Controller	
DQDAC_K796-2	Stop Switch - Emergency	
DQDAC_H536-2	Control Display Language - English	
DQDAC_KU93-2	Circuit Breaker or Entrance Box or Terminal Box - Left Only	
DQDAC_KU09-2	Circuit Breaker - 450A, Left, 3P, 600/690V, SS RMS, 80%, UL/IEC	
DQDAC_4790	Terminal Box - Low Voltage, Right - None	
DQDAC_KB73-2	Bottom Entry, Left	
DQDAC_5110	Circuit Breaker or Entrance Box or Terminal Box, Top Entry, Right - None	
DQDAC_A366-2	Engine Governor - Electronic, Isochronous	
DQDAC_A334-2	Engine Starter - 24 Volt DC Motor	
DQDAC_D041-2	Engine Air Cleaner - Normal Duty	
DQDAC_A333-2	Battery Charging Alternator	
DQDAC_E125-2	Engine Cooling - Radiator, High Ambient Air Temperature, Ship Fitted	
DQDAC_H389-2	Shutdown - Low Coolant Level	
DQDAC_H669-2	Engine Coolant - 50% Antifreeze, 50% Water Mixture	
DQDAC_H706-2	Engine Oil	
DQDAC_L028-2	Genset Warranty - 2 Years Base	
DQDAC_L050-2	Literature - English	
DQDAC_A322-2	Packing - Skid, Poly Bag	
0179-4621-04	Fuel Tank Kit-550 Gallon	2
A048G602	Battery Charger-10Amp, 120/208/240VAC, 12/24V, 50/60Hz	2

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 Spec Sheets



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.

Model	Standby rating		Prime rating		Continuous rating		Data sheets	
	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	

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 °C (-0.4 °F) 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 °C Standby, 105 °C 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
<ul style="list-style-type: none"> • 110/90 • 139/240 • 240/416 	<ul style="list-style-type: none"> • 120/208 • 120/240 • 254/440 	<ul style="list-style-type: none"> • 277/480 • 347/600 	

Note: Consult factory for other voltages.

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 °C rise
- 125 °C 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.

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 °C to +70 °C 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 °C to +70 °C

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.

PowerCommand 3.3 Control System



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

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

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

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

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

Regulation compliant – Prototype tested: UL, CSA and CE compliant.

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

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

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

Multi-language support

Operator panel features

Operator/display functions

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

Paralleling control functions

- First Start Sensor System selects first generator set to close to bus
- Phase Lock Loop Synchronizer with voltage matching
- Sync check relay
- Isochronous kW and kVar load sharing
- Load govern control for utility paralleling
- Extended Paralleling (Base Load/Peak Shave) Mode
- Digital power transfer control, for use with a breaker pair to provide open transition, closed transition, ramping closed transition, peaking and base load functions,
- Alternator data
- Line-to-Neutral and Line-to-Line AC volts
- 3-phase AC current
- Frequency
kW, kVar, power factor kVA (three phase and total)

- Engine data
- DC voltage
- Engine speed
- Lube oil pressure and temperature
- Coolant temperature
- Comprehensive FAE data (where applicable)
- Other data
- Genset model data
- Start attempts, starts, running hours, kW hours
- Load profile (operating hours at % load in 5% increments)
- Fault history
- Data logging and fault simulation (requires InPower)

Standard control functions

Digital governing

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

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

AmpSentry AC protection

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

Engine protection

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

Control functions

- Time delay start and cool down
- Real time clock for fault and event time stamping
- Exerciser clock and time of day start/stop
- Data logging
- Cycle cranking
- Load shed
- Configurable inputs and outputs (4)
- Remote emergency stop

Options

- Auxiliary output relays (2)

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):

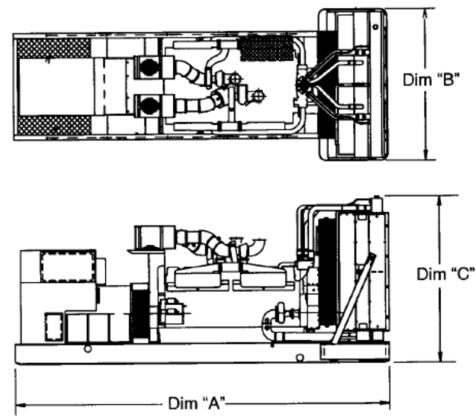
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

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

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)	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

Codes and Standards

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

	<p>This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.</p>		<p>The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage.</p>
	<p>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.</p>	<p>U.S. EPA</p>	<p>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.</p>
	<p>All low voltage models are CSA certified to product class 4215-01.</p>	<p>International Building Code</p>	<p>The generator set package is available certified for seismic application in accordance with the following International Building Code: IBC2000, IBC2003, IBC2006, IBC2009 and IBC2012.</p>

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

Our energy working for you.™



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 (OSHDP):	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)

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 ₂ O)	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 ₂ O)	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 ₂ O)	0.12 (0.5)		

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

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 ₂ O)	0.12 (0.5)		

Optional heat exchanger cooling	Standby rating	Prime rating	Continuous rating
Set coolant capacity, L (US gal)			
Heat rejected, jacket water circuit, MJ/min (Btu/min)			
Heat rejected, aftercooler circuit, MJ/min (Btu/min)			
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)			
Maximum raw water pressure, jacket water circuit, kPa (psi)			
Maximum raw water pressure, aftercooler circuit, kPa (psi)			
Maximum raw water pressure, fuel circuit, kPa (psi)			
Maximum raw water flow, jacket water circuit, L/min (US gal/min)			
Maximum raw water flow, aftercooler circuit, L/min (US gal/min)			
Maximum raw water flow, fuel circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US gal/min)			
Raw water delta P at min flow, jacket water circuit, kPa (psi)			
Raw water delta P at min flow, aftercooler circuit, kPa (psi)			
Raw water delta P at min flow, fuel circuit, kPa (psi)			
Maximum jacket water outlet temp, °C (°F)			
Maximum aftercooler inlet temp, °C (°F)			
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)			

Optional remote radiator cooling¹

Set coolant capacity, L (US gal)			
Max flow rate at max friction head, jacket water circuit, L/min (US gal/min)			
Max flow rate at max friction head, aftercooler circuit, L/min (US gal/min)			
Heat rejected, jacket water circuit, MJ/min (Btu/min)			
Heat rejected, aftercooler circuit, MJ/min (Btu/min)			
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)			
Maximum friction head, jacket water circuit, kPa (psi)			
Maximum friction head, aftercooler circuit, kPa (psi)			
Maximum static head, jacket water circuit, m (ft)			
Maximum static head, aftercooler circuit, m (ft)			
Maximum jacket water outlet temp, °C (°F)			
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)			
Maximum aftercooler inlet temp, °C (°F)			
Maximum fuel flow, L/hr (US gph)			
Maximum fuel return line restriction, kPa (in Hg)			

Weights²

Unit dry weight kgs (lbs)
Unit wet weight kgs (lbs)

Refer to drawings for specific weights and dimensions

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	120/208		110/190	120/208			277/480	347/600	
Surge kW	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	<u>120/208</u> 1042	<u>127/220</u> 985	<u>139/240</u> 903	<u>220/380</u> 570	<u>240/416</u> 521	<u>254/440</u> 483	<u>277/480</u> 452	<u>347/600</u> 361				

Refer to alternator datasheet for project specific temperature ratings

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.

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.

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or visit power.cummins.com**

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PowerCommand® 2.3 Control System



Control System Description

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

Features

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

PowerCommand Digital Genset Control PCC 2300



Description

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

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

Features

- 12 and 24 VDC battery operation.
- Digital voltage regulation - Three phase full wave FET type regulator compatible with either shunt or PMG systems. Sensing is three phase.
- Full authority engine communications (where applicable) - Provides communication and control with the Engine
- due to thermal Control Module (ECM).
- AmpSentry™ protection provides industry-leading alternator overcurrent protection:
 - Time-based generator protection applicable to both line-to-line and line-to-neutral, that can detect an unbalanced fault condition and swiftly react appropriately. Balanced faults can also be detected by AmpSentry and appropriate acted upon.
- Reduces the risk of Arc Flash overload or electrical faults by inverse time protection
- Common harnessing - with higher feature Cummins controls. Allows for easy field upgrades.
- Generator set monitoring - Monitors status of all critical engine and alternator functions.
- Digital genset metering (AC and DC).
- Genset battery monitoring system to sense and warn against a weak battery condition.
- Configurable for single or three phase AC metering.
- Engine starting - Includes relay drivers for starter, Fuel Shut Off (FSO), glow plug/spark ignition power and switch B+ applications.
- Generator set protection – Protects engine and alternator.
- Real time clock for fault and event time stamping.
- Exerciser clock and time of day start/stop.
- Advanced serviceability - using InPower™, a PC-based software service tool.

- Environmental protection - The control system is designed for reliable operation in harsh environments. The main control board is a fully encapsulated module that is protected from the elements.
- Modbus interface for interconnecting to customer equipment.
- Configurable inputs and outputs - Four discrete inputs and four dry contact relay outputs.
- Warranty and service - Backed by a comprehensive warranty and worldwide distributor service network.
- Certifications - Suitable for use on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., CE and CSA standards.

Base Control Functions

HMI Capability

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

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

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

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

Alternator data

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

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

Engine data

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

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

Service adjustments (continued)

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

Engine Control

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

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

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

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

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

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

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

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

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

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

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

Alternator Control

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

Major system features include:

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

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

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

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

Protective Functions

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

Protective functions include:

Battle Short Mode

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

Derate

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

Configurable Alarm and Status Inputs

The control accepts up to four alarm or status inputs (configurable contact closed to ground or open) to indicate a configurable (customer-specified) condition. The control is programmable for warning, shutdown or status indication and for labeling the input.

Emergency Stop

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

Full Authority Electronic Engine Protection

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

General Engine Protection

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

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

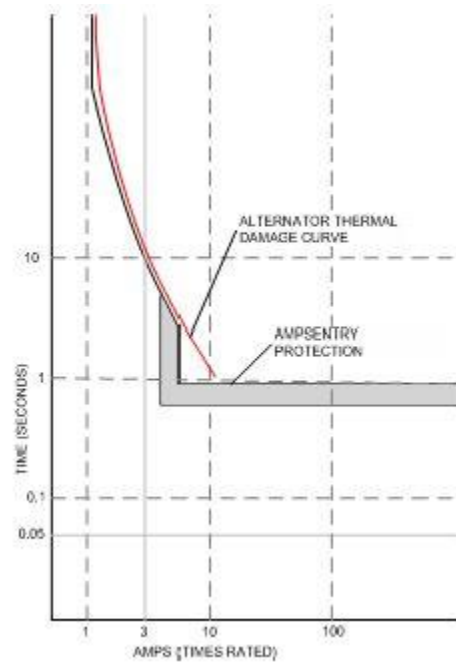
Fail to start (overcrank) shutdown - The control system will indicate a fault if the generator set fails to start by the completion of the engine crank sequence.

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

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

Alternator Protection

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

Field Control Interface

Input signals to the PowerCommand control include:

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

Output signals from the PowerCommand control include:

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

- Configurable relay outputs: Control includes (4) relay output contacts (3 A, 30 VDC). These outputs can be configured to activate on any control warning or shutdown fault as well as ready to load, not in auto, common alarm, common warning and common shutdown.

- Ready to load (generator set running) signal: Operates when the generator set has reached 90% of rated speed and voltage and latches until generator set is switched to off or idle mode.

Communications Connections Include:

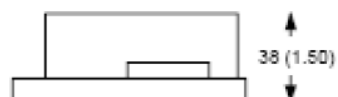
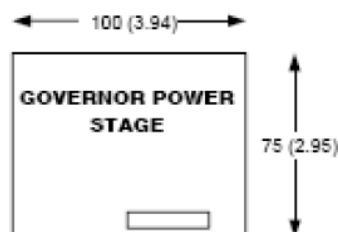
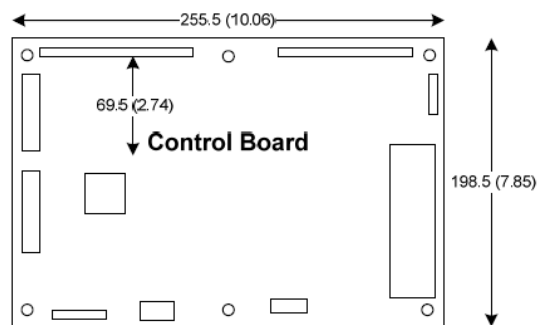
- PC tool interface: This RS-485 communication port allows the control to communicate with a personal computer running InPower software.

- Modbus RS-485 port: Allows the control to communicate with external devices such as PLCs using Modbus protocol.

Note - An RS-232 or USB to RS-485 converter is required for communication between PC and control.

- Networking: This RS-485 communication port allows connection from the control to the other Cummins products.

Mechanical Drawings



PowerCommand Human Machine Interface HMI320



Description

This control system includes an intuitive operator interface panel that allows for complete genset control as well as system metering, fault annunciation, configuration and diagnostics. The interface includes five genset status LED lamps with both internationally accepted symbols and English text to comply with customer's needs. The interface also includes an LED backlit LCD display with tactile feel soft-switches for easy operation and screen navigation. It is configurable for units of measurement and has adjustable screen contrast and brightness.

The *run/off/auto* switch function is integrated into the interface panel.

All data on the control can be viewed by scrolling through screens with the navigation keys. The control displays the current active fault and a time-ordered history of the five previous faults.

Features

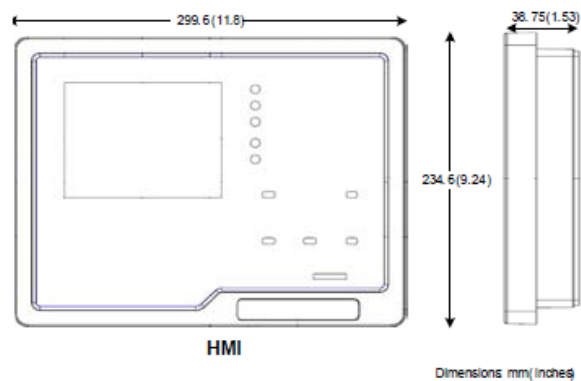
- LED indicating lamps:
 - Genset running
 - Remote start
 - Not in auto
 - Shutdown
 - Warning
 - Auto
 - Manual and stop
- 320 x 240 pixels graphic LED backlight LCD.
- Four tactile feel membrane switches for LCD defined operation. The functions of these switches are defined dynamically on the LCD.
- Seven tactile feel membrane switches dedicated screen navigation buttons for up, down, left, right, ok, home and cancel.
- Six tactile feel membrane switches dedicated to control for auto, stop, manual, manual start, fault reset and lamp test/panel lamps.

- Two tactile feel membrane switches dedicated to control of circuit breaker (where applicable).
- Allows for complete genset control setup.
- Certifications: Suitable for use on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., CE and CSA standards.
- LCD languages supported: English, Spanish, French, German, Italian, Greek, Dutch, Portuguese, Finnish, Norwegian, Danish, Russian and Chinese Characters.

Communications connections include:

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

Mechanical Drawing



Software

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

Environment

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

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

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

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

Certifications

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

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

Warranty

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



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2024 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:	RCEXL0540AAB-009
Effective Date:	05/01/2023
Date Issued:	05/01/2023
EPA Engine Family (Cummins Emissions Family):	RCEXL0540AAB

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		
	<u>NO_x + NMHC</u>	<u>CO</u>	<u>PM</u>	<u>NO_x + NMHC</u>	<u>CO</u>	<u>PM</u>
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 NO_x 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.



Cooling System Data

DQDAC

QSL9-G7

EPA NSPS Stationary Emergency

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, unhooded (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, unhooded (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.



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

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 (10⁻¹²W).
11. Exhaust sound power levels are per ISO 6798, as applicable.



Alternator data sheet

Frame size: HCI434D

Characteristics		1-brg w/coupling adapter							
Weights:	Stator assembly:	926 lb	420 kg						
	Rotor assembly:	818 lb	371 kg						
	Complete assembly:	2097 lb	351 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)		<u>110/190</u> <u>220/380</u> (311)	<u>120/208</u> <u>240/416</u> (311)	<u>139/240</u> <u>277/480</u> (311)	<u>347/600</u> (17)	<u>110/190</u> <u>220/380</u> (311)	<u>115/200</u> <u>230/400</u> (311)	<u>120/208</u> <u>240/415</u> (311)	<u>127/220</u> <u>254/440</u> (311)
150° C rise ratings	kW	264	292	320	320	256	256	256	248
	kVA	330	365	400	400	320	320	320	310
125° C rise ratings	kW	248	275	300	300	240	240	240	232
	kVA	310	344	375	375	300	300	300	290
105° C rise ratings	kW	230	252	276	276	224	224	224	216
	kVA	288	315	345	345	280	280	280	270
80° C rise ratings	kW	200	218.4	240	240	192	192	192	182.4
	kVA	250	273	300	300	240	240	240	228
Reactances	(per unit ± 10%)	<u>110/190</u> <u>220/380</u> (311)	<u>120/208</u> <u>240/416</u> (311)	<u>139/240</u> <u>277/480</u> (311)	<u>347/600</u> (07)	<u>110/190</u> <u>220/380</u> (311)	<u>115/200</u> <u>230/400</u> (311)	<u>120/208</u> <u>240/415</u> (311)	<u>127/220</u> <u>254/440</u> (311)
(Based on full load at 125° C rise rating)									
Synchronous		3.89	3.60	2.95	2.97	3.16	2.85	2.65	2.28
Transient		0.24	0.22	0.18	0.18	0.20	0.18	0.17	0.15
Subtransient		0.16	0.15	0.12	0.13	0.14	0.13	0.12	0.10
Negative sequence		0.30	0.28	0.23	0.23	0.26	0.24	0.22	0.19
Zero sequence		0.11	0.10	0.08	0.08	0.10	0.09	0.08	0.07
Motor starting		<u>Broad Range</u>			<u>600</u>	<u>Broad Range</u>			
Maximum kVA (90% sustained voltage)		1028			1028	762			
Time constants	(sec)	<u>Broad Range</u>			<u>600</u>	<u>Broad Range</u>			
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			

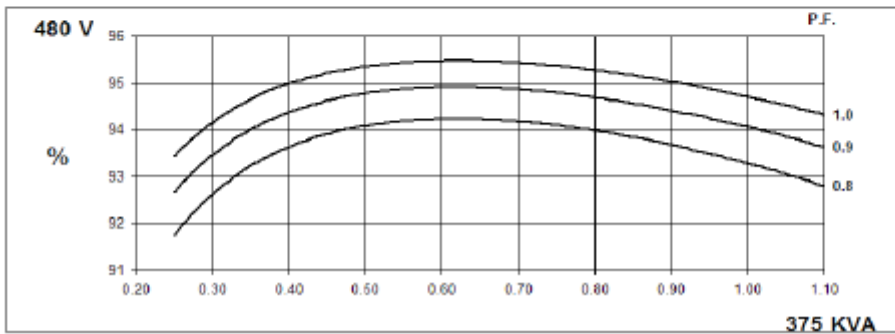
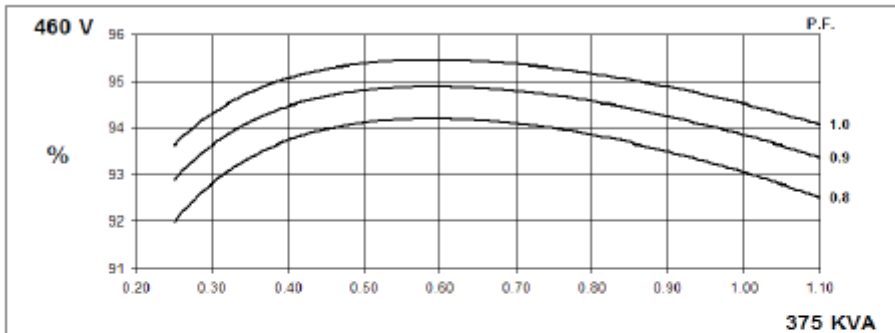
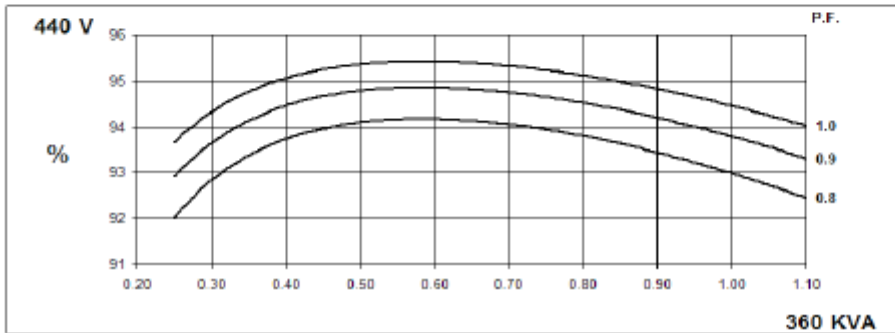
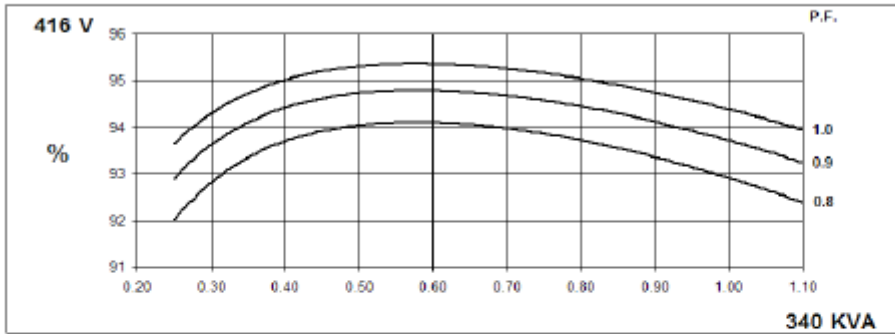


Alternator data sheet

Frame size: HCI434D

Winding 311 THREE PHASE EFFICIENCY CURVES

**60
Hz**





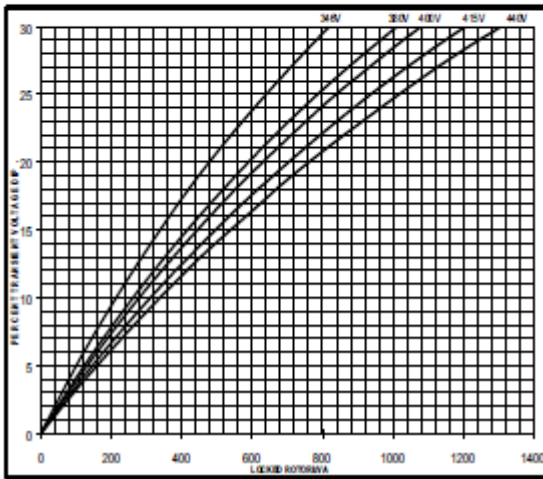
Alternator data sheet

Frame size: HCl434D

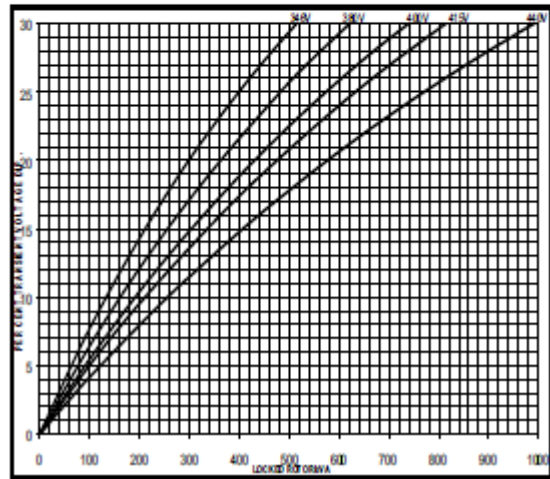
Winding 311 Locked Rotor Motor Starting Curve

**50
Hz**

MX

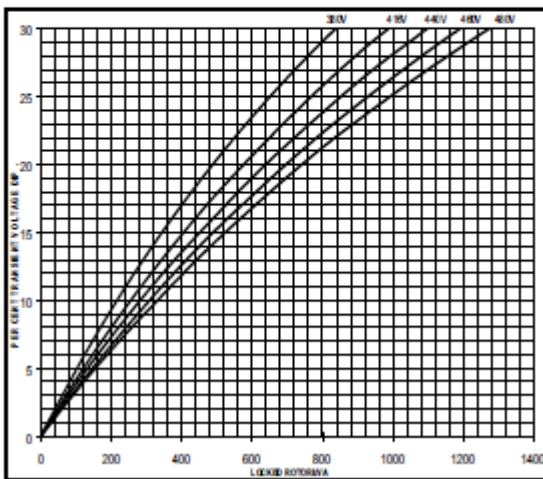


SX

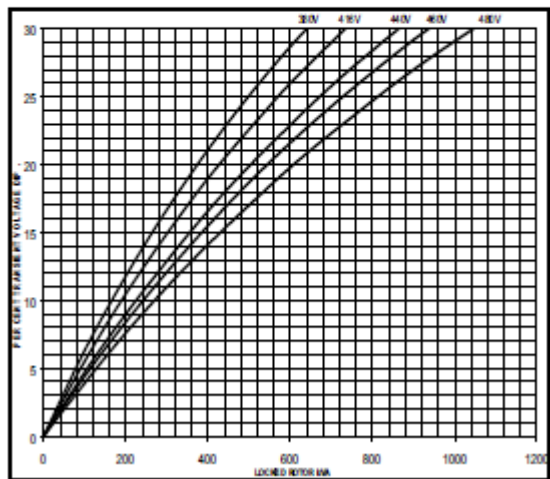


**60
Hz**

MX



SX



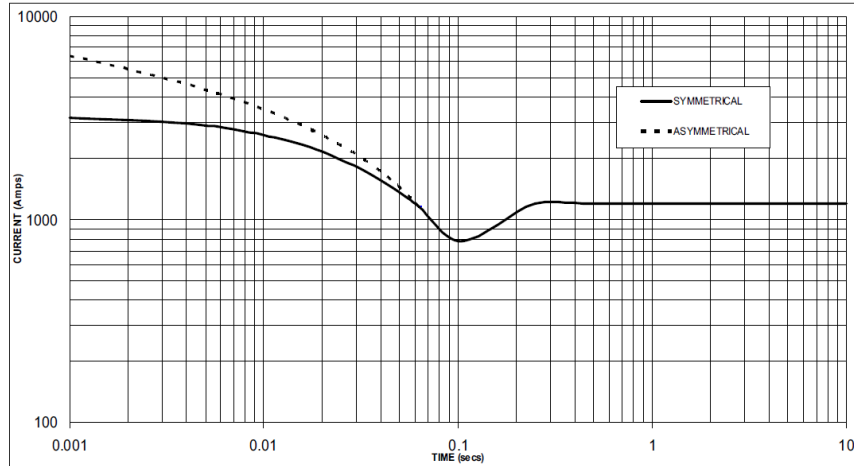


Alternator data sheet

Frame size: HCI434D

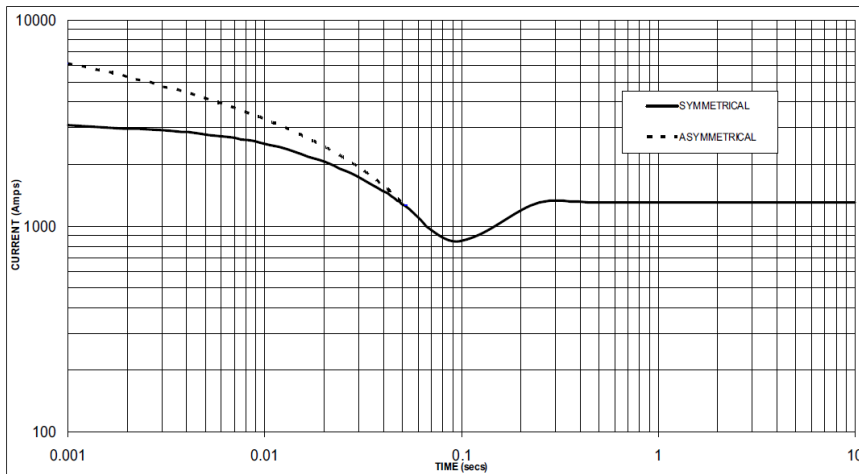
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.

50 Hz



Sustained Short Circuit = 1,200 Amps

60 Hz



Sustained Short Circuit = 1,300 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 :

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 :

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

	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 Drawings

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
ECO-179982	D	1	ADD C322 INFO TO ALL TABULATIONS	CJF	MW	L CASSENS	29AUG18
		2	ZONE D-4: ADD COLUMN DIM_J	CJF	MW	L CASSENS	29AUG18
		3	SEE SHEET 2	CJF	MW	L CASSENS	29AUG18
		4	SEE SHEET 3	CJF	MW	L CASSENS	29AUG18
		5	SEE SHEET 4	CJF	MW	L CASSENS	29AUG18
		6	ADD FLAG NOTE 12	CJF	MW	L CASSENS	29AUG18

TABULATION									
FEATURE CODE	TANK CAPACITY	WEIGHTS KG [LBS]		DIM_D MM [IN]	DIM_E MM [IN]	DIM_F MM [IN]	DIM_H MM [IN]	DIM_J MM [IN]	
		LIFT BASE	FUEL TANK DRY						
LIFT BASE	F214	---	576 [1270]	---	2029.7 [79.9]	87 [3.4]	203.2 [8]	351 [13.8]	4318 [170]
FUEL TANK	C201	300	---	954 [2103]	2131.3 [83.9]	182 [7.2]	304.8 [12]	452 [17.8]	4549 [179]
	C202	400	---	1019 [2246]	2182.1 [85.9]	233.6 [9.2]	355.6 [14]	502 [19.8]	4549 [179]
	C203	500	---	1097 [2419]	2240 [88.2]	295 [11.6]	413 [16.3]	561 [22.1]	4549 [179]
	C204	600	---	1161 [2559]	2309.1 [90.9]	360.6 [14.2]	482.6 [19]	630 [24.8]	4549 [179]
	C205	660	---	1198 [2641]	2353 [92.6]	409 [16.1]	527 [20.7]	674 [26.5]	4549 [179]
	C206	720	---	1243 [2741]	2398 [94.4]	454 [17.9]	572 [22.5]	719 [28.3]	4549 [179]
	C321	1420	---	1788 [3943]	2740.9 [107.9]	771 [30.4]	914.4 [36]	1062 [41.8]	4976 [196]
	C322	2050	---	2478 [5463]	2740.9 [107.9]	771 [30.4]	914.4 [36]	1062 [41.8]	7290 [287]
	C242	270	---	939 [2071]	2131.3 [83.9]	182 [7.2]	304.8 [12]	452 [17.8]	4549 [179]

NOTES:


- DIMENSIONS SHOWN IN [] ARE INCHES.
- FOUNDATION REFERENCE POINT (—○—). SEE FOUNDATION DRAWING FOR DETAILS.
- FOR FEATURE CODE L116 AND L120 (FLORIDA AND MICHIGAN TANKS) ADD 162.05 [6.38] TO DIMS D, G, & H.
- SEE SHEET 2 AND 3 FOR TANK VENT LOCATIONS.
- SUBBASE FUEL TANK MOUNTING. EXCESSIVE TWISTING OF THE FUEL TANK, WHEN FASTENING IT TO A FOUNDATION, MAY RESULT IN STRUCTURAL FAILURE OF THE TANK. TO ENSURE THE INSTALLATION DOES NOT EXCESSIVELY TWIST THE FUEL TANK, THE FOLLOWING PROCEDURE MUST BE OBSERVED:
 - REFER TO CUMMINS APPLICATION MANUAL TO30 FOR GENERAL GENSET/TANK MOUNTING GUIDELINES.
 - TIGHTEN TANK HOLD DOWN MOUNTING FASTENERS.
- GENSET SUPPLIED WITH FLEXIBLE FUEL LINES THAT CAN BE CONNECTED TO GENERATOR SET INTERFACE POINTS.
 - FUEL SUPPLY LINE: 1525 [60] LONG WITH 1/2-14NPT (MALE) TERMINATION. FUEL RETURN LINE: 1780 [70] LONG WITH 1/2-14NPT (MALE) TERMINATION.
- TABULATED WEIGHT AND CG IS FOR GENERATOR SET WITH NO OPTIONS.
- STUB UP AREAS.
 - ELECTRICAL: REFER TO GENSET FOUNDATION OUTLINE DRAWINGS AND CIRCUIT BREAKER OUTLINE DRAWINGS (BREAKER SPECIFIC STUB UP) FOR ELECTRICAL STUB-UP AREAS.
 - FUEL: REFER TO GENSET OUTLINE DRAWINGS FOR FUEL STUB-UP AREAS.
- CONTROL INTERFACE CONNECTIONS SHOULD BE MADE WITH FLEXIBLE CONNECTIONS. NOT RIGID CONDUIT.
- ENTRANCE BOX (SHOWN) OR OPTIONAL BREAKER BOX (NOT SHOWN) WILL BE MOUNTED ON THE RIGHT SIDE AS VIEWED FROM THE CONTROL.
- EXHAUST CONNECTION LOCATING DIMENSIONS CAN BE FOUND ON A041F591.

△ DIM_A IS MEASURED TO FURTHEST LIFTING EYE BRACKET ON EACH RESPECTIVE TANK.

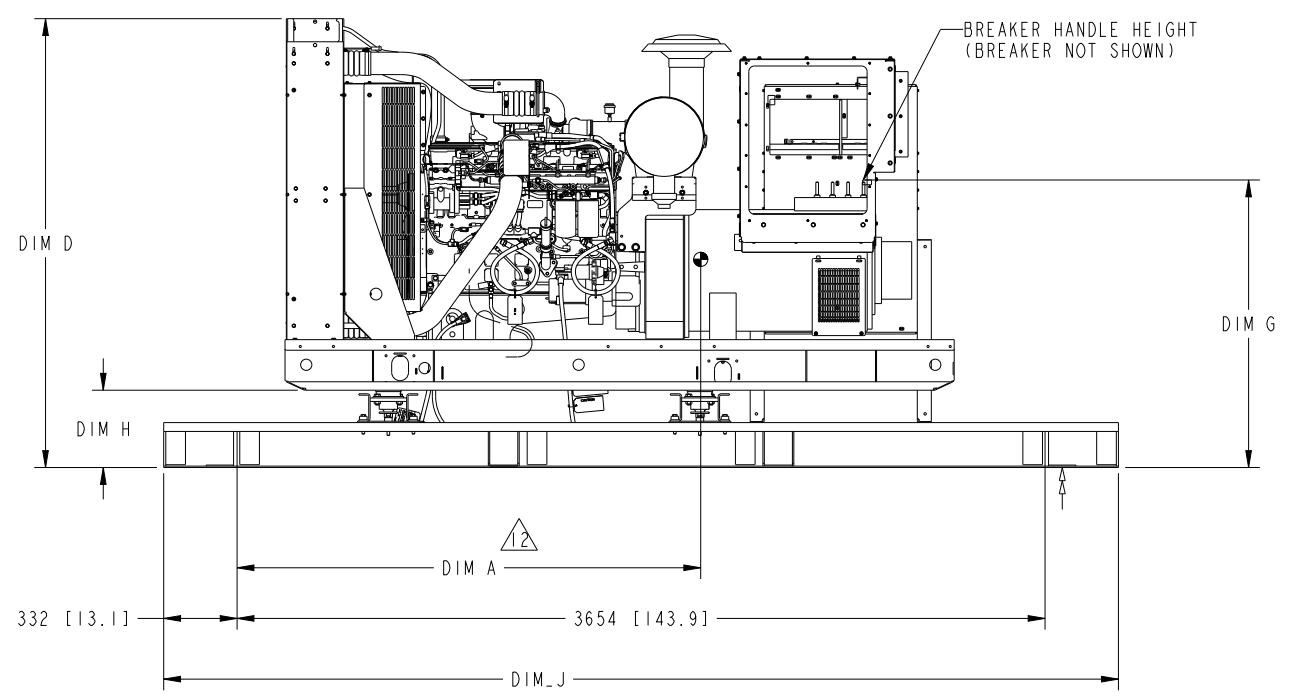
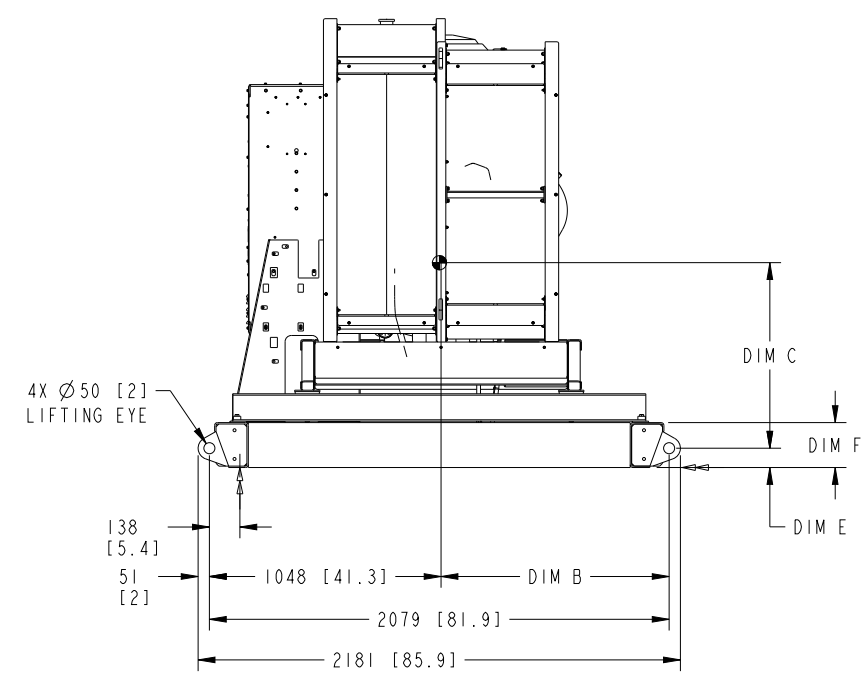
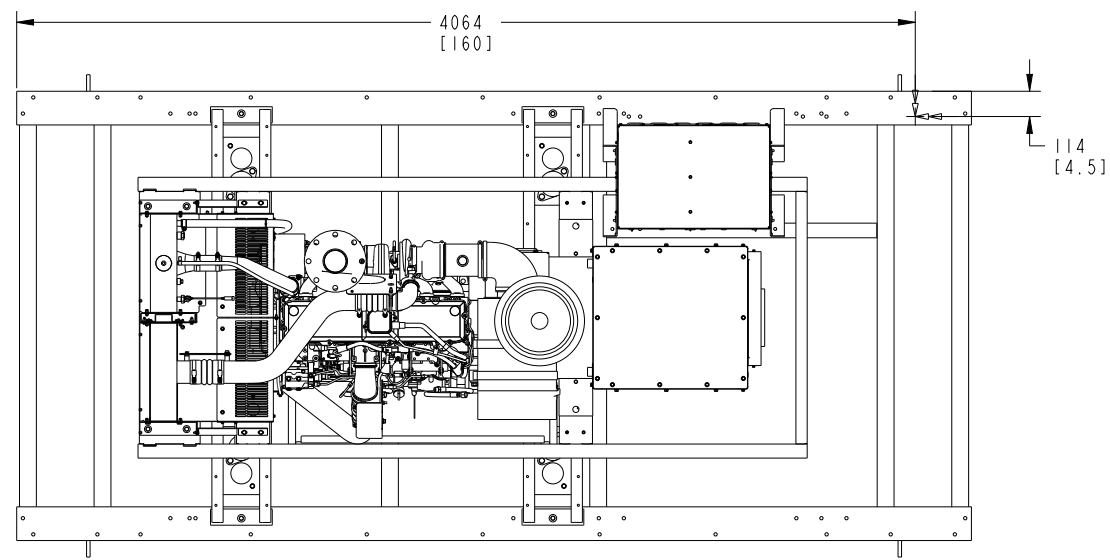
TABULATION FOR CIRCUIT BREAKER HANDLE HEIGHT			
TANK	DIM G		
FEATURE CODE	NSJ/NLG FRAME	3-P, 800A P FRAME	3-P, 1200A P FRAME
F214	1300 [51.2]	1182 [46.5]	1139 [44.8]
C201	1402 [55.2]	1284 [50.6]	1241 [48.9]
C202	1453 [57.2]	1335 [52.6]	1292 [50.9]
C203	1503 [59.2]	1385 [54.5]	1342 [52.8]
C204	1580 [62.2]	1462 [57.6]	1419 [55.9]
C205	1618 [63.7]	1500 [59.1]	1457 [57.4]
C206	1656 [65.2]	1538 [60.6]	1495 [58.9]
C321	2012 [79.2]	1894 [74.6]	1851 [72.9]
C322	2012 [79.2]	1894 [74.6]	1851 [72.9]
C242	1402 [55.2]	1284 [50.6]	1241 [48.9]

TABULATION						
WEIGHT, BASE AND GENSET						
FEATURE CODES	MODEL	ALT DATA SHEET	WEIGHT KG [LBS]	CG_DIM "A" MM [IN]	CG_DIM "B" MM [IN]	CG_DIM "C" MM [IN]
F214 W/F215	DODAA, AB, AC	340	2726 [6010]	1758.7 [69.3]	1036.1 [40.8]	666.9 [26.3]
		341	2810 [6196]	1782.3 [70.2]	1036.2 [40.8]	672.1 [26.5]
		342	2946 [6495]	1817.9 [71.6]	1036.4 [40.8]	679.8 [26.8]
WEIGHT, DRY TANK AND WET GENSET						
FEATURE CODES	MODEL	ALT DATA SHEET	WEIGHT KG [LBS]	CG_DIM "A" MM [IN]	CG_DIM "B" MM [IN]	CG_DIM "C" MM [IN]
C201 W/F215	DODAA, AB, AC	340	3104 [6843]	1731.3 [68.2]	1054.7 [41.5]	550.6 [21.7]
		341	3188 [7029]	1751.9 [69.0]	1054.4 [41.5]	558.2 [22.0]
		342	3324 [7329]	1783.5 [70.2]	1053.8 [41.5]	569.5 [22.4]
C202 W/F215	DODAA, AB, AC	340	3169 [6986]	1732.5 [68.2]	1054.1 [41.5]	530.6 [20.9]
		341	3253 [7172]	1752.7 [69.0]	1053.8 [41.5]	538.5 [21.2]
		342	3389 [7472]	1783.7 [70.2]	1053.3 [41.5]	550.4 [21.7]
C203 W/F215	DODAA, AB, AC	340	3247 [7159]	1733 [68.2]	1052.8 [41.4]	510.8 [20.1]
		341	3332 [7345]	1752.8 [69.0]	1052.5 [41.4]	519 [20.4]
		342	3468 [7645]	1783.3 [70.2]	1052.1 [41.4]	531.5 [20.9]
C204 W/F215	DODAA, AB, AC	340	3311 [7299]	1735.9 [68.3]	1052.2 [41.4]	479.9 [18.9]
		341	3395 [7485]	1755.2 [69.1]	1051.9 [41.4]	488.7 [19.2]
		342	3531 [7785]	1784.8 [70.3]	1051.5 [41.4]	502 [19.8]
C205 W/F215	DODAA, AB, AC	340	3348 [7381]	1737.1 [68.4]	1051.7 [41.4]	464.5 [18.3]
		341	3432 [7567]	1756.1 [69.1]	1051.4 [41.4]	473.5 [18.6]
		342	3568 [7867]	1785.3 [70.3]	1051 [41.4]	487.2 [19.2]
C206 W/F215	DODAA, AB, AC	340	3393 [7481]	1737.4 [68.4]	1051.9 [41.4]	449.9 [17.7]
		341	3478 [7667]	1756.2 [69.1]	1051.6 [41.4]	459.2 [18.1]
		342	3614 [7967]	1785.1 [70.3]	1051.2 [41.4]	473.2 [18.6]
C321 W/F215	DODAA, AB, AC	340	3939 [8683]	1897.2 [74.7]	1049.6 [41.3]	293.4 [11.6]
		341	4022 [8869]	1910.3 [75.2]	1049.4 [41.3]	304.9 [12.0]
		342	4159 [9169]	1930.8 [76.0]	1049.2 [41.3]	322.5 [12.7]
C322 W/F215	DODAA, AB, AC	340	4629 [10205]	3690.7 [145.3]	1048.5 [41.3]	198.2 [7.8]
		341	4712 [10388]	3711.4 [146.1]	1048.3 [41.3]	209.7 [8.3]
		342	4849 [10690]	3744.1 [147.4]	1048.2 [41.3]	227.5 [9.0]
C242 W/F215	DODAA, AB, AC	340	3089 [6811]	1731.3 [68.2]	1054.7 [41.5]	550.6 [21.7]
		341	3174 [6997]	1751.9 [69.0]	1054.4 [41.5]	558.2 [22.0]
		342	3310 [7297]	1783.5 [70.2]	1053.8 [41.5]	569.5 [22.4]

***WEIGHT & CG'S ARE SHOWN WITH STANDARD FUEL TANK AND STANDARD WET GENSET. ADDITION OF OTHER FEATURES MAY CHANGE THE WEIGHT AND CG'S.

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS		SH TO: A046S028	DWN: G. THOMAS	 CUMMINS POWER GENERATION OUTLINE, GENSET
DO NOT SCALE PRINT		CKD: D. RESCH	APVD: K. KISHORE	
DATE: 25 JUL 14		SITE CODE: .		SHEET: 1 of 5 Dwg No: A050L795
SCALE: 1/16		PGF		

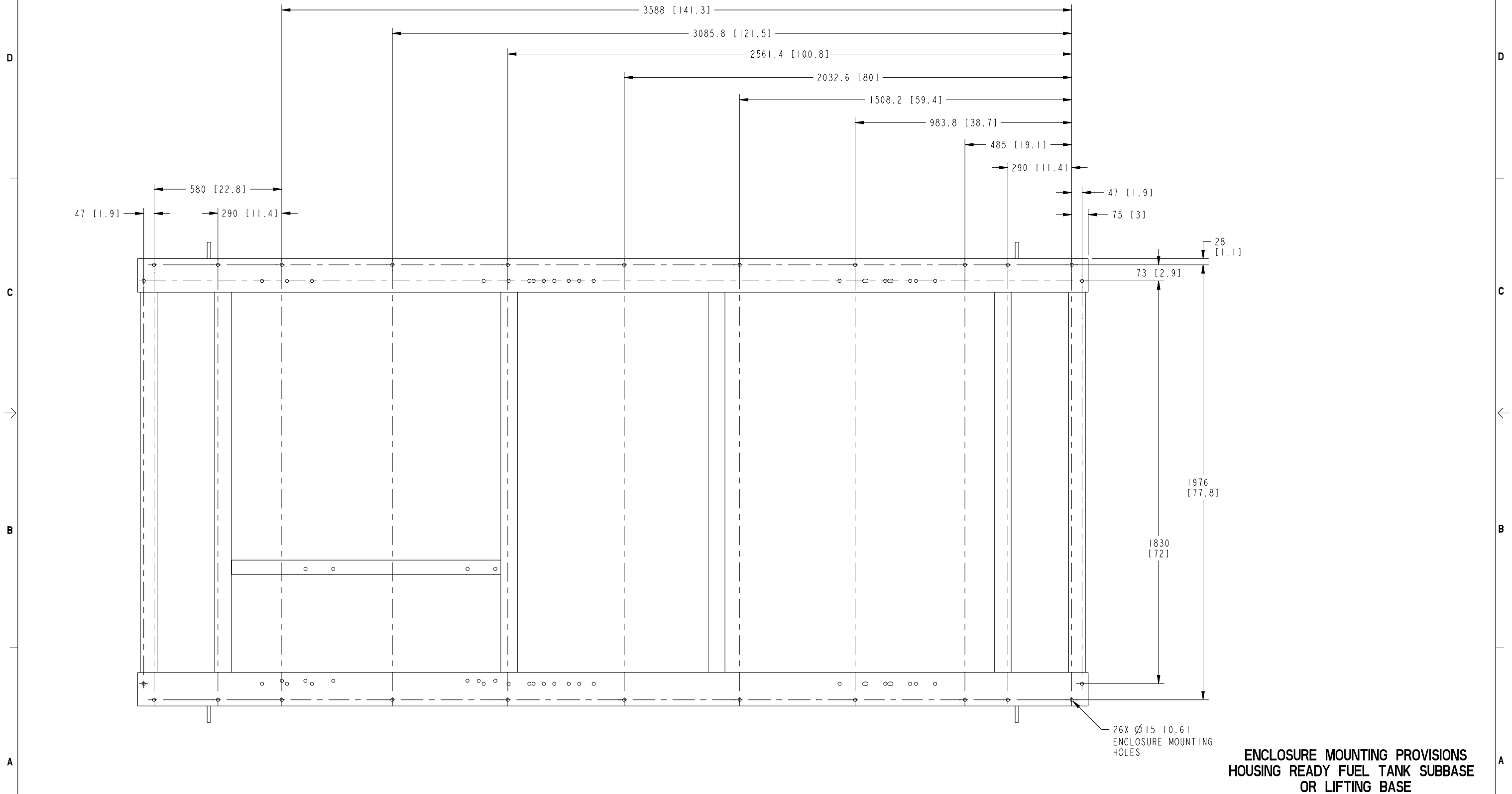
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ECO-179982	D	5	ZONE A-3: DIM_J WAS 4318 [170]	CJF	MW	L CASSENS	29AUG18



**HOUSING READY SUBBASE F215
WITH LIFTING BASE F214
(W/O FUEL TANK)**

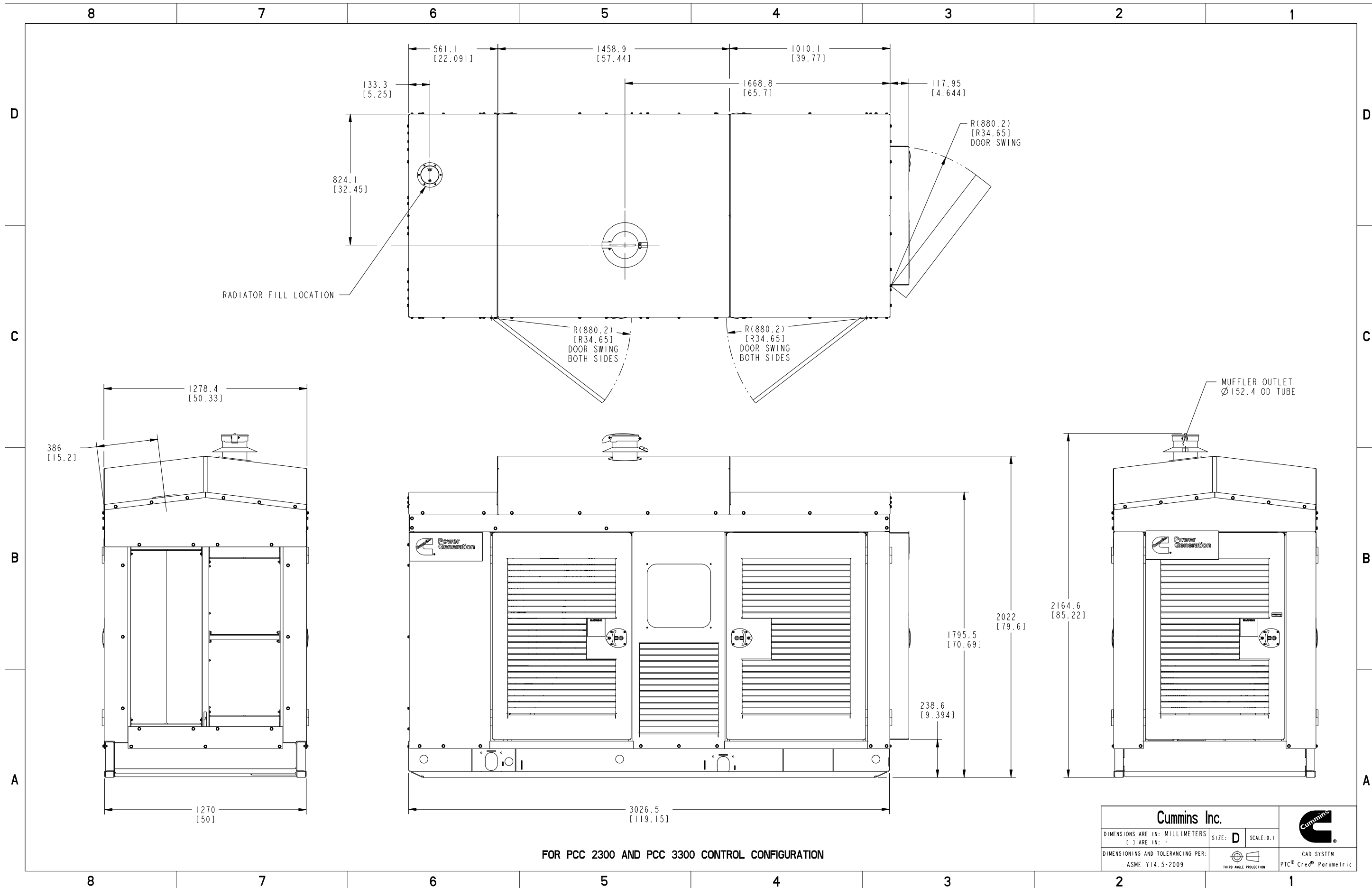
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS		SIN TO: A046S028	DWN: G. THOMAS		CUMMINS POWER GENERATION	
DO NOT SCALE PRINT			CKD: D. RESCH		OUTLINE, GENSET	
DIM X ± 3 .X ± 0.8 .XX ± 0.38		HOLE 0.00-4.99 +0.15/-0.08 5.00-9.99 +0.20/-0.10 10.00-17.49 +0.25/-0.13 17.50-24.99 +0.30/-0.13	APVD: K. KISHORE	SITE CODE: .	SHEET 4 OF 5	
ANG TOL: ± 1.0°		SCALE: 1/16	DATE: 25 JUL 14	PGF	DWG FILE: A050L795	DWG REV: D
- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP		FIRST USED ON: DODAA, AB, AC		FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, SEE ASME Y14.5M-1994		

REL NO	LTR	NO	REVISION	DWN	CKD	APVD	DATE
ECO-179982	D	--	----	CJF	MW	L CASSENS	29AUG18



**ENCLOSURE MOUNTING PROVISIONS
HOUSING READY FUEL TANK SUBBASE
OR LIFTING BASE**

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS		SIN TO: A046S028	DWN: G. THOMAS		CUMMINS POWER GENERATION	
DO NOT SCALE PRINT			CKD: D. RESCH		OUTLINE, GENSET	
DIM	TOLERANCE	X ± 3 .X ± 0.8 .XX ± 0.38	APVD: K. KISHORE	DATE: 25 JUL 14	SITE CODE:	
ANG TOL: ± 1.0°		SCALE: 13/160	- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP	FIRST USED ON: OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994	DODAA, AB, AC	PGF
			D	A050L795	5 of 5	D



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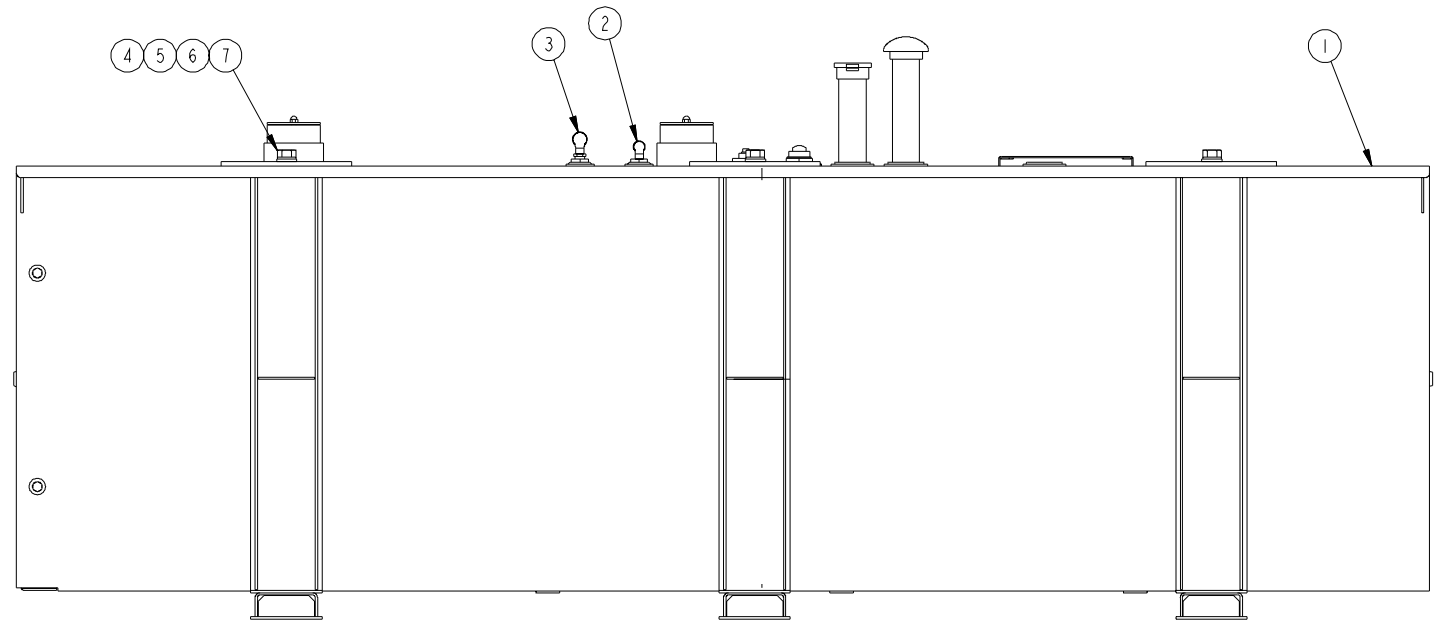
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Part Number: **A040E884** Part Revision: **C**
 Part Name: **OUTLINE,ENCLOSURE**
 Drawing Category: **Detail** State: **Released** Sheet 2 of 3

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

REL NO	LTR NO	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)
I	I	-	-	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)
I	I	I	I	3	0505_0050	-	ELBOW-BLACK STREET (1/2 X 90)
I	I	I	I	2	0505_0120	-	ELBOW-STREET (3/8 X 90)
I	-	I	-	1	0159_1694_02	D	TANK-FUEL
-	I	-	I	1	0159_1694_01	D	TANK-FUEL

DO NOT SCALE PRINT	TOLERANCE UNLESS OTHERWISE SPECIFIED		SHEET NO		ITEM		PART NO		DESCRIPTION OR MATERIAL		REF DIS
	mm	inch	QTY '04	QTY '05	QTY '06	QTY '07	QTY '08	QTY '09	QTY '10	QTY '11	QTY '12
ANG TOL ± 1.0°	0.00-4.99	+0.15/-0.00	.004-.200	+0.001/-0.003	SHEET NO		NAME		DATE		CUMMINS POWER GENERATION 4000 75th AVE NE MINNEAPOLIS, MINNESOTA 55432
SCALE OF 1/1	5.00-9.99	+0.20/-0.10	.201-.501	+0.001/-0.004	SHEET NO		DR		DATE		
	10.00-17.99	+0.25/-0.13	.502-.801	+0.001/-0.005	SHEET NO		CHR DR		DATE		TITLE TANK INSTL (FUEL) 0179_4621 1 of 1
	17.50-24.99	+0.30/-0.15	.802-.999	+0.001/-0.005	SHEET NO		MFG		DATE		
					SHEET NO		APPROVED		DATE		MODEL FIRST USED ON DQDAA, AB, AC 07-13-05

Section 4 – Generator Accessories



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.



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 x 173 mm)
Ambient temperature operation: At full rated output -		- 4 °F to 104 °F (-20 °C to 40 °C)

Note:

- 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 fuses 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.
- 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:

- 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.
- 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.
- 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.
- 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.
- 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.
- Do not parallel these battery chargers with any other charging system.

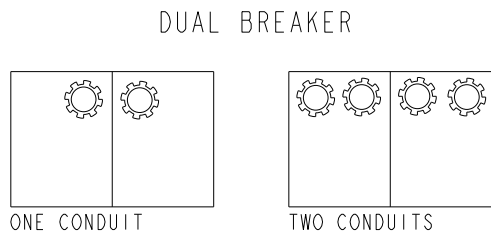
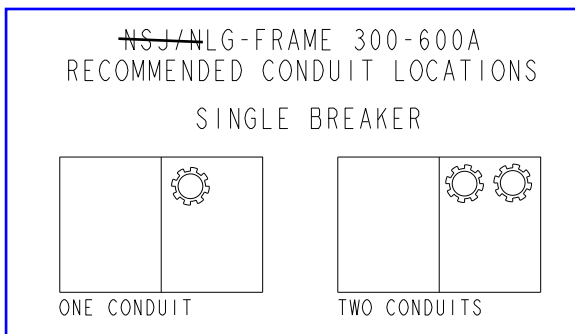
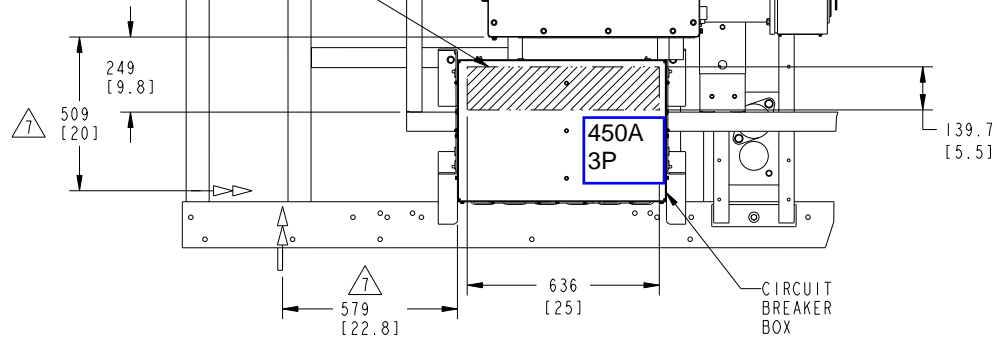
For more information contact your local Cummins distributor or visit power.cummins.com

Our energy working for you.™

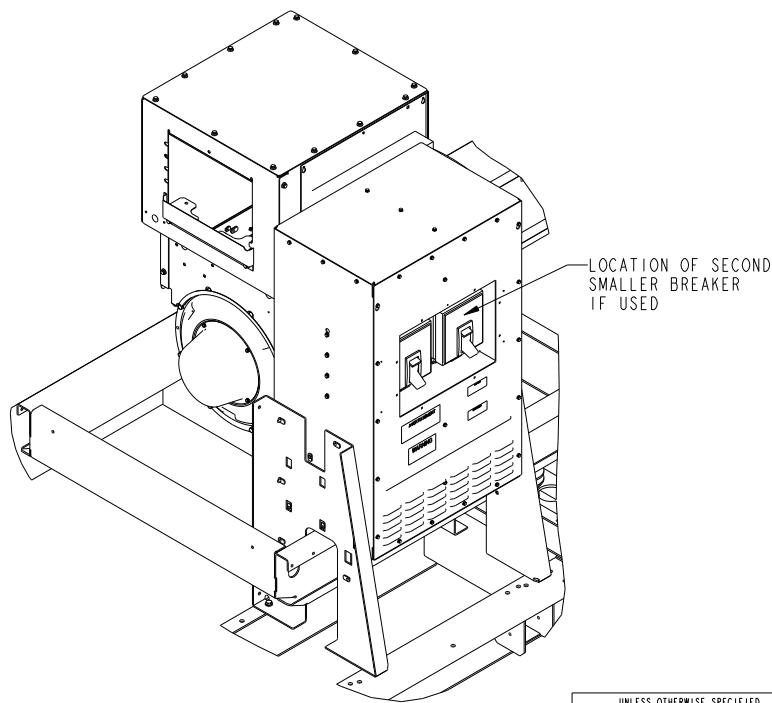
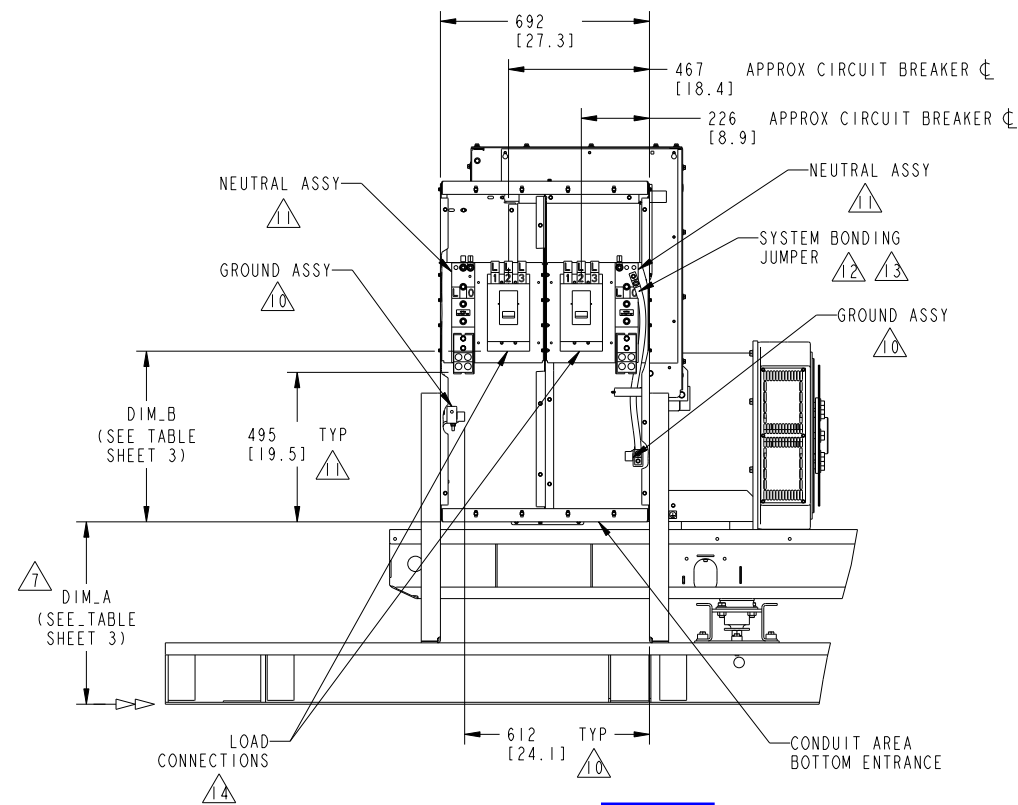


REL NO	LTR	NO	REVISION	DRN	CAD	APVD	DATE
ECO-138423	C	1	SEE SHEET 3	MAH	CBW	K. KISHORE	09OCT13

CONDUIT AREA
BOTTOM ENTRANCE



BOTTOM COVER
(LOOKING DOWN AT BOTTOM
OF BREAKER BOX)



NOTES:





- ALL DIMENSIONS ARE FOR REFERENCE ONLY
- DIMENSIONS SHOWN IN [] ARE IN INCHES
- BOTTOM COVER IS ADJUSTABLE VERTICALLY PLUS OR MINUS 6 [0.25] TO EASE CONDUIT ATTACHMENT
- 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
- "NS" 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
- CONDUITS AND WIRING SHOULD BE DESIGNED AND INSTALLED TO ALLOW FOR NORMAL GENERATOR SET MOVEMENT DURING CRANKING SHUT DOWN OR EXPECTED SEISMIC DISTURBANCES
- SEE FOUNDATION LAYOUT DRAWING (GENSET OUTLINE (FOUNDATION)) FOR THE LOCATION OF THE ELECTRICAL STUB UP AREAS AND FOUNDATION REFERENCE POINT ()
- ON FLORIDA UNITS WITH TANKS (FEATURE CODE LI16) ADD 106 [4.2] FOR RISER BEAMS THAT ARE REQUIRED ON THE UNDERSIDE OF THE TANK
- BOX DIMENSIONS AND CONDUIT LOCATIONS ARE THE SAME FOR ENTRANCE BOX WITHOUT CONDUITS
- EQUIPMENT GROUND AND 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
- 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
- TORQUE TO 9.8-11.9 Nm [7.2-8.8 FT-LBS] HARDWARE IS PROVIDED WITH BONDING JUMPER.
- 250 MCM SYSTEM BONDING JUMPER SIZED PER NEC TABLE 250.122 USING COPPER CABLE FOR A MAXIMUM AMPACITY RATING OF 2000 AMPS.
- CIRCUIT BREAKER LUGS - REFER TO RECOMMENDED TORQUE ON LABEL.
- 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.
- 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.

DQDAA/DQDAB/DQDAC
CIRCUIT BREAKER BOX
(RIGHT HAND BOTTOM ENTRY CONFIGURATION
NSJ/NLG-FRAME BREAKERS SHOWN)

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS		SIM NO 0500_3744	DRN D.CRANE		CUMMINS POWER GENERATION								
DO NOT SCALE PRINT		CAD H.TRUONG	APVD H.TRUONG		OUTLINE, CIRCUIT BREAKER								
<table border="1"> <tr> <td>X ± 1</td> <td>0.00- 4.99 +0.15/-0.08</td> </tr> <tr> <td>.X ± 0.8</td> <td>5.00- 9.99 +0.20/-0.10</td> </tr> <tr> <td>.XX ± 0.38</td> <td>10.00-17.49 +0.25/-0.13</td> </tr> <tr> <td></td> <td>17.50-24.99 +0.30/-0.13</td> </tr> </table>	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	DATE 27MAY11	SITE CODE	PGF	D	A040J894
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: 3/32	FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, SEE ASME Y14.5M-1994	FIRST USED ON DQDAA, AB, AC	SHEET 1 OF 3	REV C								


REL NO	LTR	NO	REVISION	DNW	CAD	APVD	DATE
ECO-138423	C	1	UPDATE DIM A TABULATION	MAH	CBW	K. KISHORE	09OCT13

UL/IEC LUGS					ACCESSORY SPECIFICATIONS			
LUG	FRAME	MAX AMPS	WIRE RANGE COPPER	DIM.B	ACCESSORY DESCRIPTION	CONTACT RATING	INRUSH CURRENT	CONNECTION TYPE
	NSJ/NLG	400A 3 POLE	#2-600 KCMIL	565 [22.2]	24 VDC SHUNT TRIP	-	10A Δ S	COMPRESSION TERMINALS #20-16 AWG OR SMALLER TORQUE: 1.13 Nm [10 LB-IN]
		600A 3-POLE	2/0-350 KCMIL		1 EA. FORM C 1 AUX CONTACT + 1 TRIP ALARM	6A AT 690 VAC 2.5A AT 48 VDC, 0.3A AT 250 VDC	-	
	P	800A 3-POLE	3/0-500 KCMIL	18.9 [480]	24 VDC SHUNT TRIP	-	200VA	COMPRESSION TERMINALS FOR 1 OR 2 #18-16 AWG. TORQUE: 1.13 Nm [10 LB-IN]
					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	-	
	P	1200A 3-POLE	3/0-500 KCMIL	17.2 [437]	24 VDC SHUNT TRIP	-	200VA	COMPRESSION TERMINALS FOR 1 OR 2 #18-16 AWG. TORQUE: 1.13 Nm [10 LB-IN]
					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	-	

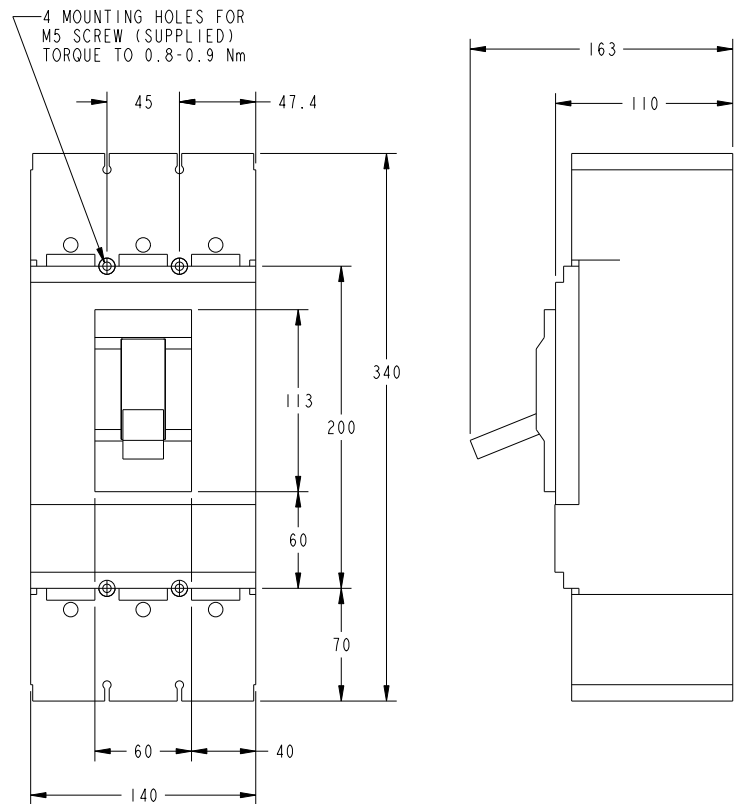
TYPICAL CONDUIT AND WIRE SIZE BASED ON NEC 2008, ARTICLE 310.15 AT 75C TEMPERATURE RATED CONDUCTOR AT 40C AMBIENT AND ANNEX C (LIQUID TIGHT FLEXIBLE METAL CONDUIT - LFCM)

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"

DIM_A TABULATION			
MODEL NAME	TANK/LIFT BASE FEATURE CODE	TANK CAPACITY (GAL)	HEIGHT DIM.A
DODAA, DODAB DODAC	C201	300	707[27.83]
	C202	400	758[29.83]
	C203	500	808[31.83]
	C204	600	885[34.83]
	C205	660	923[36.33]
	C206	720	961[37.83]
	C208	1470	1316[51.83]
	C242	270	758[29.83]
	F214	NA	605[23.83]

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS		SIM NO 0500_3744	DNW D.CRANE		CUMMINS POWER GENERATION	
DO NOT SCALE PRINT		CND H.TRUONG	APVD H.TRUONG		OUTLINE, CIRCUIT BREAKER	
X ± 1	0.00- 4.99 +0.15/-0.08	DATE 27MAY11		SITE CODE	FIRST USED ON	
.X ± 0.8	5.00- 9.99 +0.20/-0.10	DODAA, AB, AC		PGF	DODAA, AB, AC	
.XX ± 0.38	10.00-17.49 +0.25/-0.13	SCALE: 3/32		SIZE D	A040J894	
	17.50-24.99 +0.30/-0.13	ANG TOL: ± 1.0°		SHEET 3 OF 3		REV C
		- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP		FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, SEE ASME Y14.5M-1994		

3 POLE



- NOTES:
- THIS PART IS MANUFACTURER SOURCE CONTROLLED.
 - PART SPECIFICATIONS:
RMS ELECTRONIC TRIP
TRIP UNIT: MICROLOGIC 3.3S UNIT

LUGS INCLUDED ON ALL POLES
UP TO 400A: 1 CABLE 2 AWG-600 KCMIL CU
401-630A: 1 TO 2 CABLES 2/0 AWG TO 350 KCMIL CU

EACH CB INCLUDES MOUNTING HARDWARE:
M5 X 85 SCREWS, NUTS & LOCKWASHERS

AGENCIES: 3-POLE: UL LISTED
IEC
4-POLE: IEC ONLY

TABULATION						
PART NO.	CURRENT ECO	RATING (AMP)	POLE	VOLTS (UL/IEC)	DESCRIPTION	NOTES
A046P197	ECO-135274	600	3	600/690	LEFT HAND	
A046U528	ECO-135274	500	3	600/690	LEFT HAND	
A046U529	ECO-135274	450	3	600/690	LEFT HAND	
A046U530	ECO-135274	400	3	600/690	LEFT HAND	
A046U532	ECO-135274	350	3	600/690	LEFT HAND	
A046U534	ECO-135274	300	3	600/690	LEFT HAND	
A046U545	ECO-135274	630	4	690 (IEC ONLY)	LEFT HAND	
A046U546	ECO-135274	500	4	690 (IEC ONLY)	LEFT HAND	
A046U547	ECO-135274	400	4	690 (IEC ONLY)	LEFT HAND	
A046U552	ECO-135274	320	4	690 (IEC ONLY)	LEFT HAND	
A046U557	ECO-135274	250	3	600/690	LEFT HAND	
A046U558	ECO-135274	150	3	600/690	LEFT HAND	
A044T468	ECO-136325	600	3	600/690	RIGHT HAND	SEE NOTE 1
A045U081	ECO-136325	500	3	600/690	RIGHT HAND	SEE NOTE 1
A045U082	ECO-136325	450	3	600/690	RIGHT HAND	SEE NOTE 1
A045U083	ECO-136325	400	3	600/690	RIGHT HAND	SEE NOTE 1
A045U084	ECO-136325	350	3	600/690	RIGHT HAND	SEE NOTE 1
A045U085	ECO-136325	300	3	600/690	RIGHT HAND	SEE NOTE 1
A045U086	ECO-136325	630	4	690 (IEC ONLY)	RIGHT HAND	SEE NOTE 1
A045U087	ECO-136325	500	4	690 (IEC ONLY)	RIGHT HAND	SEE NOTE 1
A045U089	ECO-136325	400	4	690 (IEC ONLY)	RIGHT HAND	SEE NOTE 1
A045U090	ECO-136325	320	4	690 (IEC ONLY)	RIGHT HAND	SEE NOTE 1
A045U091	ECO-148659	250	3	600/690	RIGHT HAND	SEE NOTE 1
A045Z306	ECO-136325	150	3	600/690	RIGHT HAND	SEE NOTE 1
A045U164	ECO-130453	600	3	600/690	ACCESSORIES	
A045U165	ECO-130453	500	3	600/690	ACCESSORIES	
A045U168	ECO-130453	450	3	600/690	ACCESSORIES	
A045U169	ECO-130453	400	3	600/690	ACCESSORIES	
A045U170	ECO-130453	350	3	600/690	ACCESSORIES	
A045U171	ECO-130453	300	3	600/690	ACCESSORIES	
A045U172	ECO-130453	630	4	690 (IEC ONLY)	ACCESSORIES	
A045U173	ECO-130453	500	4	690 (IEC ONLY)	ACCESSORIES	
A045U175	ECO-130453	400	4	690 (IEC ONLY)	ACCESSORIES	
A045U176	ECO-130453	320	4	690 (IEC ONLY)	ACCESSORIES	
A045U177	ECO-130453	250	3	600/690	ACCESSORIES	
A045Z308	ECO-130453	150	3	600/690	ACCESSORIES	

-THIS IS A CONTROLLED ITEM-
PER CPG PROCEDURE FRC-1002
TO MAINTAIN COMPLIANCE WITH REQUIREMENTS OF THE CODES, STANDARDS, OR AGENCIES LISTED BELOW
 CSA UL CE RVIA AISC
 IBC OTHER OTHER
CHANGES, DEVIATIONS, OR SUBSTITUTIONS OF MATERIAL, PROCESS, OR PERFORMANCE FOR THIS ITEM MUST BE APPROVED BY THE FOLLOWING CONTROLLED ITEM APPROVER:
RESPONSIBLE CIA HOLE STATIONARY GENSET CIA
RESPONSIBLE CIA HOLE _____
RESPONSIBLE CIA HOLE _____

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS		SIM 10
X ± 1	0.00- 4.99 +0.15/-0.08	DO NOT SCALE PRINT
.X ± 0.8	5.00- 9.99 +0.20/-0.10	
	10.00-17.49 +0.25/-0.13	
.XX ± 0.38	17.50-24.99 +0.30/-0.13	
ANG TOL: ± 1.0°	SCALE: 1/2	

S. CANFIELD			CUMMINS POWER GENERATION	
M. SIMS			BREAKER, CIRCUIT	
V. GUPTA		DATE 29NOV12		SITE CODE
GENERAL		PGF	D	A044T469
SHEET 1 OF 1		REV D		

Product data sheet

Specifications

SQUARE D

Green Premium™



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

LGL36600U33X

Main

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

Complementary

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

Please see CB outline drawing for lug and termination details

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

Environment

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

Ordering and shipping details

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

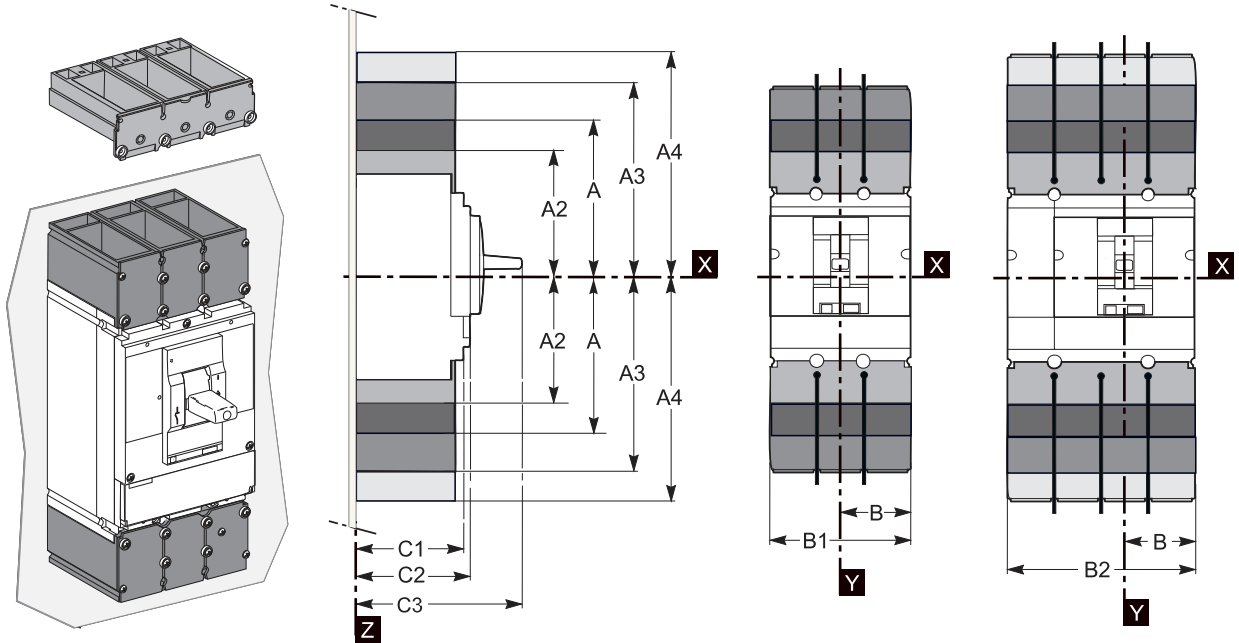
Packing Units

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

Offer Sustainability

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

Dimensions



A2 = Short Lug Pack
 AL400L61K3
 CU400L61K3
 AL600LF52K3
 CU600LF5283

A = Medium Lug Pack
 AL400L61K4
 CU400L61K4
 AL600LS52K3
 AL600LS52K4
 CU600LS52K3
 CU600LS52K4

A3 = Long Lug Pack
 Compression Lug Kits
 A4 = 500 Vdc Lug Pack

L-Frame

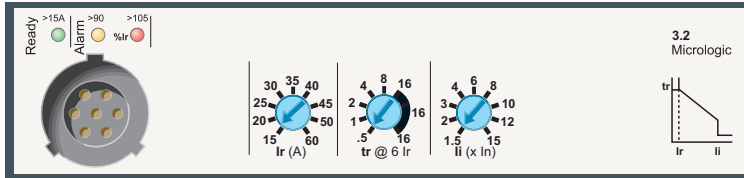
	A	A2	A3	A4	B	B1	B2	C1	C2	C3
inch	6.69	5.65	7.87	9.53	2.76	5.51	7.28	3.76	4.33	6.61
mm	170	143.5	200	242	70	140	185	105	110	168

Please see CB outline drawing for lug and termination details

PowerPact™ H-, J-, and L-Frame Circuit Breakers Trip Units

Micrologic™ 3 Trip Units

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



They provide:

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

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

Protection

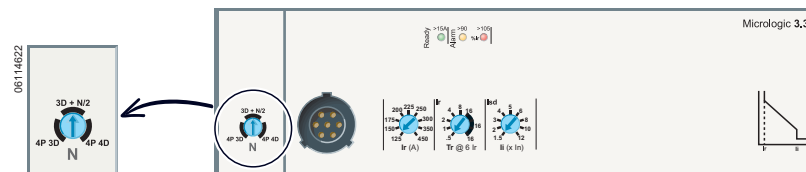
Settings are made using the adjustment rotary switches.

Overloads: Long time protection (I_r)

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

Neutral protection

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



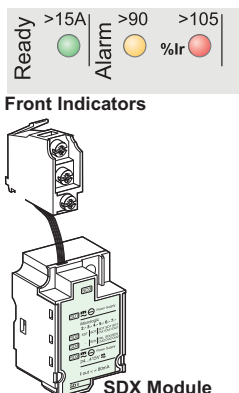
Indicators

Front indicators

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

Remote indicators

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



PowerPact™ H-, J-, and L-Frame Circuit Breakers Trip Units

Table 50: Micrologic™ 3 Trip Unit

Ratings	I_n at 104°F (40°C) ¹		60 A	100 A	150 A	250 A	400 A	600 A
Circuit Breaker	H-frame		X	X	X			
	J-frame					X		
	L-frame					X	X	X

Micrologic 3.2 / 3.3 trip units

L Long-time protection

Pick-Up (A) Tripping between 1.05 and 1.20 I_r	I_r	Value depending on sensor rating (I_n) and setting on rotary switch									
	$I_n = 60$ A	$I_r =$	15	20	25	30	35	40	45	50	60
	$I_n = 100$ A	$I_r =$	35	40	45	50	60	70	80	90	100
	$I_n = 150$ A	$I_r =$	50	60	70	80	90	100	110	125	150
	$I_n = 250$ A	$I_r =$	70	80	100	125	150	175	200	225	250
	$I_n = 400$ A	$I_r =$	125	150	175	200	225	250	300	350	400
	$I_n = 600$ A	$I_r =$	200	225	250	300	350	400	450	500	600

Time Delay (s) Accuracy 0 to -20%	t_r	0.5	1	2	4	8	16
	$1.5 \times I_r$	15	25	50	100	200	400
	$6 \times I_r$	0.5	1	2	4	8	16
	$7.2 \times I_r$	0.35	0.7	1.4	2.8	5.5	11

Thermal memory 20 minutes before and after tripping

I Instantaneous

Pick-up (A) accuracy ± 15%	$I_i \times$	60 A	1.5	2	3	4	6	8	10	12	15
		100 A	1.5	2	3	4	6	8	10	12	15
		150 A	1.5	2	3	4	6	8	10	12	15
		250 A	1.5	2	3	4	5	6	8	10	12
		400 A	1.5	2	3	4	5	6	8	10	12
		600 A	1.5	2	3	4	5	6	8	10	11
Non-tripping time Maximum break time		10 ms 50 ms for $I > 1.5 I_i$									

Micrologic 3.2S / 3.3S trip units

L Long-time protection

Pick-Up (A) Tripping between 1.05 and 1.20 I_r	I_r	Value depending on sensor rating (I_n) and setting on rotary switch									
	$I_n = 60$ A	$I_r =$	15	20	25	30	35	40	45	50	60
	$I_n = 100$ A	$I_r =$	35	40	45	50	60	70	80	90	100
	$I_n = 150$ A	$I_r =$	50	60	70	80	90	100	110	125	150
	$I_n = 250$ A	$I_r =$	70	80	100	125	150	175	200	225	250
	$I_n = 400$ A	$I_r =$	125	150	175	200	225	250	300	350	400
	$I_n = 600$ A	$I_r =$	200	225	250	300	350	400	450	500	600

Time Delay (s) Accuracy 0 to -20%	t_r	non-adjustable					
	$1.5 \times I_r$	400					
	$6 \times I_r$	16					
	$7.2 \times I_r$	11					

Thermal memory 20 minutes before and after tripping

S Short-time protection

Pick-up (A) accuracy ± 10%	$I_{sd} - I_r \times \dots$	1.5	2	3	4	5	6	7	8	10
Time delay (ms)	t_{sd}	non-adjustable								
	Non-tripping time Maximum break time	20 80								

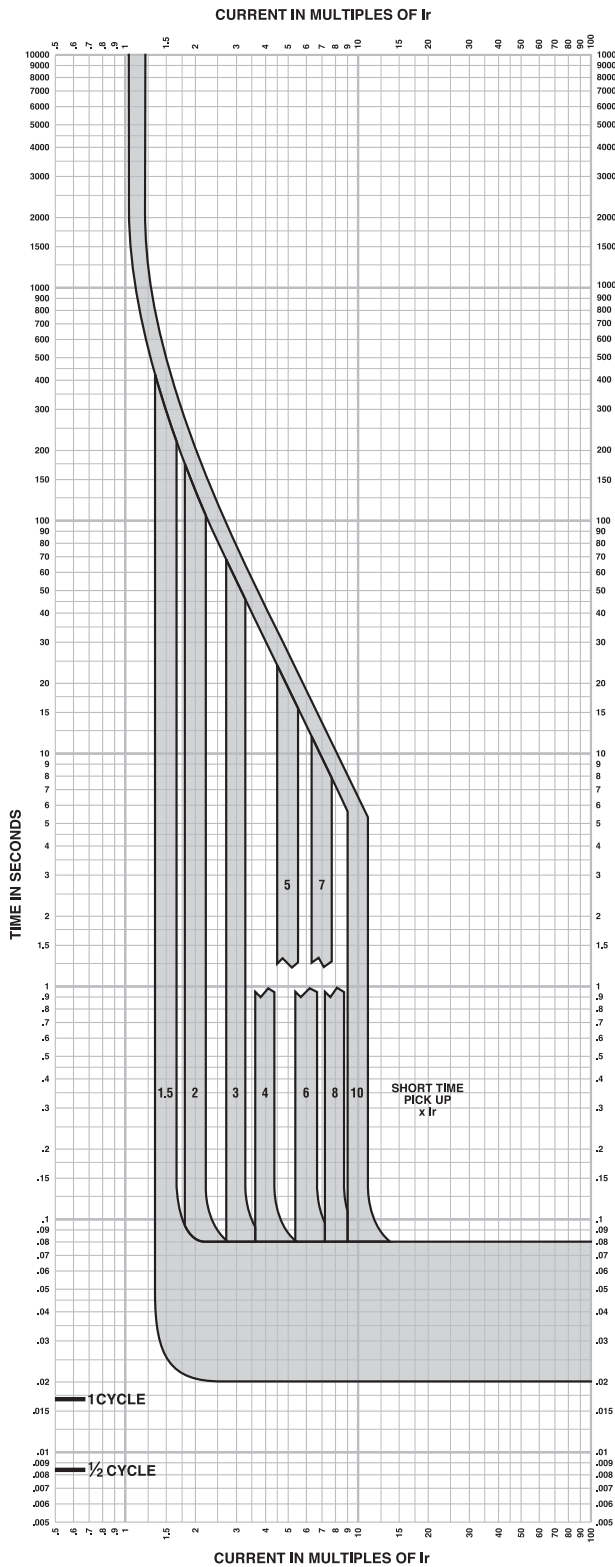
I Instantaneous

Pick-up (A) accuracy ± 15%	$I_i \times I_n$	1.5	2	3	4	6	8	10	12	15
	Non-tripping time Maximum break time		10 ms 50 ms for $I > 1.5 I_i$							

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

PowerPact H-, J-, and L-Frame Circuit Breakers Trip Curves

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



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

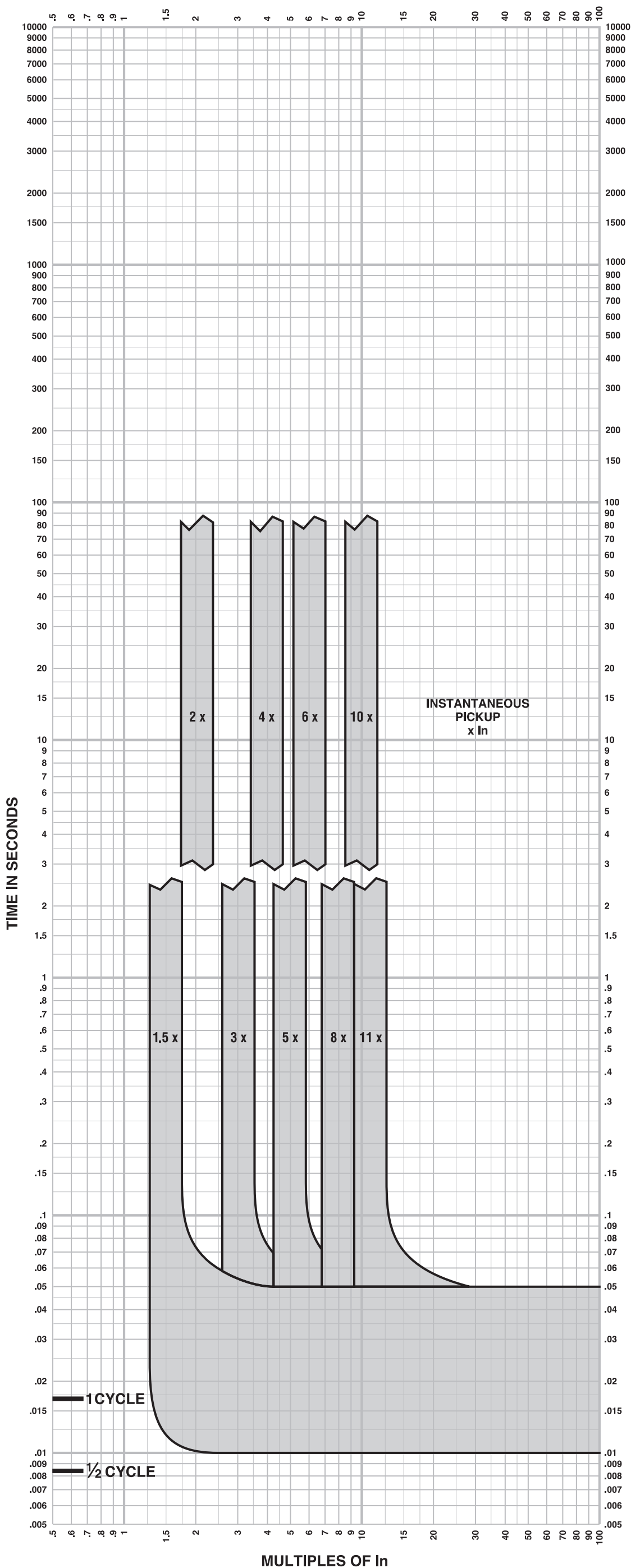
The time-current curve information is to be used for application and coordination purposes only.

Notes:

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

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

MULTIPLES OF I_n

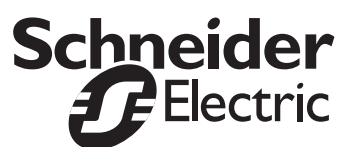


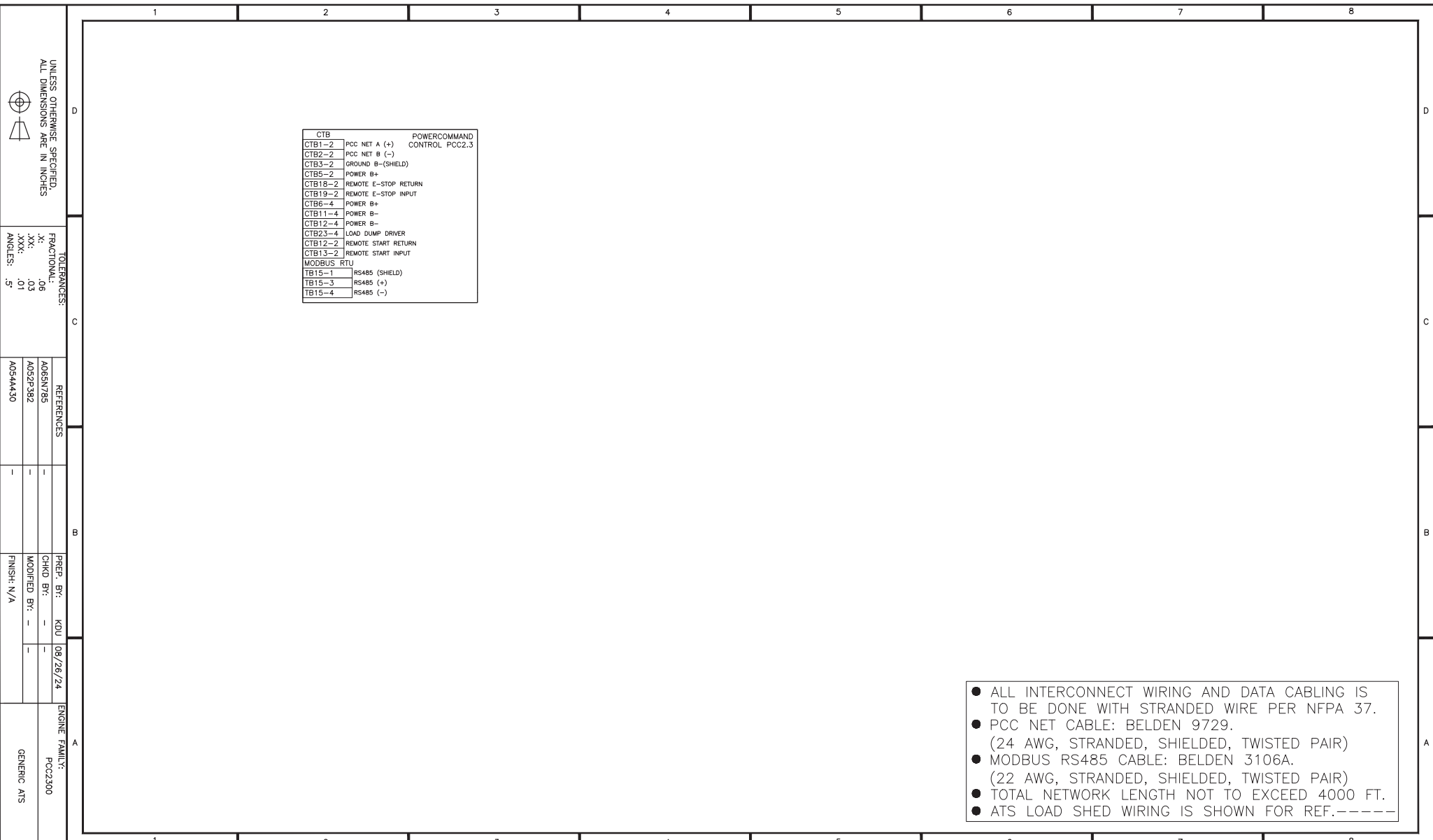
MICROLOGIC™ ELECTRONIC TRIP UNITS
Micrologic™ 3.3/3.3S/5.3A or E/6.3A or E
Instantaneous Trip Curve
600A L-Frame

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

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. I_n = Maximum dial setting of I_r .
 600A L-Frame: I_n = 600A = Max I_r setting
 Curves apply from -35°C to $+70^{\circ}\text{C}$ (-31°F to $+158^{\circ}\text{F}$) ambient temperature.





UNLESS OTHERWISE SPECIFIED,
ALL DIMENSIONS ARE IN INCHES



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

CTB	POWERCOMMAND
CTB1-2	PCC NET A (+) CONTROL PCC2.3
CTB2-2	PCC NET B (-)
CTB3-2	GROUND B-(SHIELD)
CTB5-2	POWER B+
CTB18-2	REMOTE E-STOP RETURN
CTB19-2	REMOTE E-STOP INPUT
CTB6-4	POWER B+
CTB11-4	POWER B-
CTB12-4	POWER B-
CTB23-4	LOAD DUMP DRIVER
CTB12-2	REMOTE START RETURN
CTB13-2	REMOTE START INPUT
MODBUS RTU	
TB15-1	RS485 (SHIELD)
TB15-3	RS485 (+)
TB15-4	RS485 (-)

REFERENCES

A06SNT785	
A052P382	
A054A430	

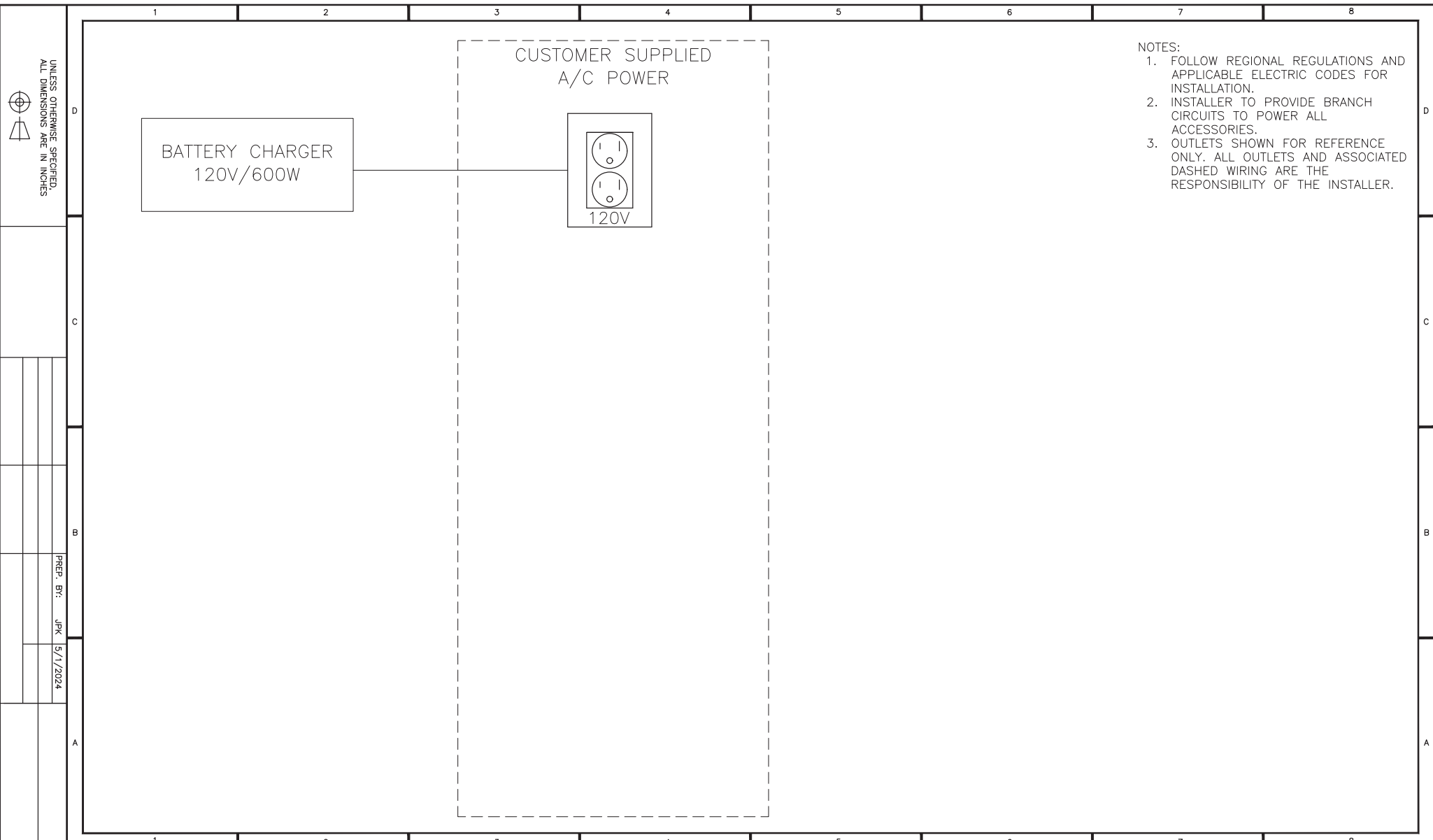
PREP. BY: KOU
CHKD BY: -
MODIFIED BY: -
FINISH: N/A

ENGINE FAMILY:
PCC2300
GENERIC AIS

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



SITE NAME:	-	CONTACT NAME:	-	CUSTOMER PROJECT NO:	-	TITLE:	PCC2.3 CONTROL / GENERIC ATS QSL9..QSK15..QSK23	
CONTRACTOR NAME:	-	CONTACT NO:	-	CSSNA PROJECT NO:	-	SCALE:	NONE	DO NOT SCALE PRINT
						SIZE:	DWG NO:	PCC2.3 INTERCONNECT
						SCALE:	NONE	DO NOT SCALE PRINT
						SHEET	1	OF 1



- 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.

UNLESS OTHERWISE SPECIFIED,
 ALL DIMENSIONS ARE IN INCHES
 PREP. BY: JPK
 5/1/2024

Section 5 – Startup & Warranty



Cummins Sales and Service

Customer / Contractor Pre Commissioning Inspection Form

The intent of this form is for the contractor to prepare for equipment to be commissioned by a certified Cummins Field Service Power Generation Technician. Filling out this form is required and will minimize delays due to equipment failing to meet requirements. Completing this checklist in its entirety should minimize the need for additional billing beyond the previously provided commissioning quote.

The items listed are the responsibility of the contractor and not Cummins Sales and Service.

Project Name/End User: _____

Contractor: _____

Address: _____ Contact: _____

Business Phone: _____ Cell Phone: _____

Email: _____

ON SITE INFORMATION

On-Site Contact Information: _____

Address: _____

Time Requested Onsite: _____

Sub location of Generator (ie. Roof, basement, floor): _____

Does the facility have the following: Loading Dock Elevator

Access (from truck and load bank parking to generator in feet): _____

Parking: Is parking available on-site for service truck: Yes No

Permits: Have all necessary air quality and local permits been secured: Yes No N/A

Fuel Tank Testing: Is fuel tank testing required: Yes No

If yes when is the inspector scheduled for: _____

ON SITE INFORMATION CONTINUED

YES	NA	NO
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Is the facility occupied and is customer aware there will be power outages after generator is started?

Will there be any site safety training needed for technician prior to beginning? On site contact for training: _____

Will customer representative be on site for operator training?
On site contact for operator training: _____

MECHANICAL LOCATION AND PLACEMENT OF THE GENERATOR SET

YES	NA	NO
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Generator is properly secured to pad or vibration isolators

Generator Enclosure and/or Room is free of all debris

No airflow obstructions to the engine or generator are present for cooling combustion
(See Cummins T-030 or Installation manual of generator set)

Room is designed for adequate inlet and outlet airflow

GASEOUS FUEL Natural Gas/LP Vapor/LP Liquid

YES	NA	NO
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Natural gas and/or LPG fuel supply is connected.

Fuel piping is the appropriate size based on full-load CFH/BTU requirement. Pipe size after service regulator: _____

Service regulator(s), (if supplied), fuel strainer(s), flexible fuel line(s) and manual shut off are installed

Fuel pressure after service regulator is: _____ inches of H2O

I have read and fully understand the fuel requirements for this equipment, I am verifying that the piping and fuel supply meets or exceeds those requirements. I also understand failure to meet the requirements will result in additional charges.

Contractor "requestor" Signature

Date

DIESEL FUELED GENERATORS

YES NA NO

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Flexible fuel connections, (supply and return) are connected to generator and piping.

Day tank installed, wired and plumbed (lines free of obstruction) to genset and main fuel tank if applicable. Only black iron pipe for fuel lines, never use copper or galvanized pipe.

All tanks filled with enough fuel to perform startup and testing.

A return line from engine to day tank and day tank to main tank should be in place

EXHAUST SYSTEM

YES NA NO

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Exhaust wrapped or isolated to prevent accidental activation of fire protection devices and sprinklers.

Exhaust flex-pipe is installed at engine exhaust outlet (The silencer and flex-pipe are supplied with the generator set).

Silencer is installed with appropriate supports (no weight should be placed on the exhaust outlet of the genset).

Exhaust system has proper expansion joints and wall thimbles (Thimbles are required for wall or roof penetration).

GENERATOR ELECTRICAL CONNECTIONS

YES NA NO

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Load conductors connected to breakers

Flexible connections used on all conduit connections to the generator set output box

Remote start interconnection **stranded** wiring is installed between the generator set and the automatic transfer switch(s) and annunciator.

AC Power conductors in dedicated conduit separate from any DC control or network wiring

Ground fault connected/functioning on generator, if supplied

AC power wired to the coolant heaters (Do NOT energize)

Check for AC oil pan heater, control heater or generator winding heater (Needing AC wiring)

Generator is grounded in compliance with local codes

If applicable, louver motors are operational and connected to generator controls

GENERATOR ELECTRICAL CONNECTIONS CONTINUED

YES NA NO

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Annunciator mounted in a location where someone can observe a fault of the remote generator system

Where is annunciator located? _____

Are there additional ancillary devices/equipment that need to be integrated into the system? If yes, please define _____

Battery charger mounted (free of vibration, weather, accessible for an operator to observe easily) and connected to the appropriate AC and DC wiring to operate the charger.

TRANSFER SWITCH ELECTRICAL CONNECTIONS

YES NA NO

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Conductors connected for Utility, Load and Emergency

Remote start interconnection **stranded** wiring is installed between the generator set and the automatic transfer switch(s).

Four Pole Transfer Switch: Is generator neutral grounded?

DAY OF STARTUP

YES NA NO

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Training of facility personnel will be done on the same day as start up. Additional trips for operational training will be an additional charge.

Can transfer switch be tested at time of generator startup? (There will be a power interruption) **Note: After hours testing could result in additional charges.**

If the associated switchgear and/or ATS(s) are not provided by Cummins, will the manufacturer's representative be on site?

Exercise with or without load?

If known, Transfer Time delay set recommendations Generator Set to exercise Day: _____ Time: _____

Contractor "requestor" Signature

Printed Name

Date: _____

Please complete this form and return to schedule start up, if not returned within 5 business days prior to scheduled startup it may be delayed. I understand that the start-up date may have to be rescheduled at my expense if the above items have not been completed properly.



Warranty Statement

Global Commercial Warranty Statement

Generator Set

Limited Warranty

Commercial Generating Set

This limited warranty applies to all Cummins Power Generation® branded commercial generating sets and associated accessories (hereinafter referred to as "Product").

This warranty covers any failures of the Product, under normal use and service, which result from a defect in material or factory workmanship.

Warranty Period:

The warranty start date[†] is the date of initial start up, first rental, demonstration or 18 months after factory ship date, whichever is sooner. See table for details.

Continuous Power (COP) is defined as being the maximum power which the generating set is capable of delivering continuously whilst supplying a constant electrical load when operated for an unlimited number of hours per year. No overload capability is available for this rating.

Prime Power (PRP) is defined as being the maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year. The permissible average power output over 24 hours of operation shall not exceed 70% of the PRP. For applications requiring permissible average output higher than stated, a COP rating should be used.

Limited-Time Running Power (LTP) is defined as the maximum power available, under the agreed operating conditions, for which the generating set is capable of delivering for up to 500 hours of operation per year.

Emergency Standby Power (ESP) is defined as the maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 500 hours of operation per year. The permissible average power output over 24 hours of operation shall not exceed 70% of the ESP.

Environmental Protection Agency – Stationary Emergency (EPA-SE) is defined as being the maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generator set is capable of delivering in the event of a utility power outage or under test conditions and used in strict accordance with the EPA NSPS for stationary engines, 40 CFR part 60, subparts IIII and JJJJ, where a reliable utility must be present. The permissible average power output over 24 hours of operation shall not exceed 70% of the EPA-SE.

Data Center Continuous (DCC) is defined as the maximum power which the generator is capable of delivering continuously to a constant or varying electrical load for unlimited hours in a data center application.

Base Warranty Coverage Duration (Whichever occurs first)

Rating	Months	Max. Hours
COP	12	Unlimited
PRP	12	Unlimited
LTP	12	500 hrs
ESP	24	1000 hrs
EPA-SE	24	Unlimited
DCC	24	Unlimited

[†] Warranty start date for designated rental and oil and gas model Products is determined to be date of receipt of Product by the end customer.

Cummins Power Generation® Responsibilities:

In the event of a failure of the Product during the warranty period due to defects in material or workmanship, Cummins Power Generation® will only be responsible for the following costs:

- All parts and labor required to repair the Product.
- Reasonable travel expenses to and from the Product site location.
- Maintenance items that are contaminated or damaged by a warrantable failure.

Owner Responsibilities:

The owner will be responsible for the following:

- Notifying Cummins Power Generation® distributor or dealer within 30 days of the discovery of failure.
- Installing, operating, commissioning and maintaining the Product in accordance with Cummins Power Generation®'s published policies and guidelines.
- Providing evidence for date of commissioning.
- Providing sufficient access to and reasonable ability to remove the Product from the installation in the event of a warrantable failure.
- Incremental costs and expenses associated with Product removal and reinstallation resulting from non-standard installations.
- Costs associated with rental of generating sets used to replace the Product being repaired.
- Costs associated with labor overtime and premium shipping requested by the owner.
- All downtime expenses, fines, all applicable taxes, and other losses resulting from a warrantable failure.

Limitations:

This limited warranty does not cover Product failures resulting from:

- Inappropriate use relative to designated power rating.
- Inappropriate use relative to application guidelines.
- Inappropriate use of an EPA-SE application generator set relative to EPA's standards.
- Normal wear and tear.
- Improper and/or unauthorized installation.
- Negligence, accidents or misuse.
- Lack of maintenance or unauthorized repair.
- Noncompliance with any Cummins Power Generation® published guideline or policy.
- Use of improper or contaminated fuels, coolants or lubricants.
- Improper storage before and after commissioning.
- Owner's delay in making Product available after notification of potential Product problem.
- Replacement parts and accessories not authorized by Cummins Power Generation®.
- Use of Battle Short Mode.
- Owner or operator abuse or neglect such as: operation without adequate coolant or lubricants; overfueling; overspeeding; lack of maintenance to lubricating, cooling or air intake systems; late servicing and maintenance; improper storage, starting, warm-up, run-in or shutdown practices, or for progressive damage resulting from a defective shutdown or warning device.

- Damage to parts, fixtures, housings, attachments and accessory items that are not part of the generating set.

This limited warranty does not cover costs resulting from:

- Difficulty in gaining access to the Product.
- Damage to customer property.

A "Data center" is defined as a dedicated facility that house computers and associated equipment for data storage and data handling.

Reliable utility is defined as utility power without routine or regularly scheduled black-outs.

Please contact your local Cummins Power Generation® Distributor for clarification concerning these limitations.

CUMMINS POWER GENERATION® RIGHT TO FAILED COMPONENTS:

Failed components claimed under warranty remain the property of Cummins Power Generation®. Cummins Power Generation® has the right to reclaim any failed component that has been replaced under warranty.

Extended Warranty:

Cummins Power Generation® offers several levels of Extended Warranty Coverage. Please contact your local Cummins Power Generation® Distributor for details.

www.power.cummins.com

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