



Section 1 - PROJECT INFORMATION

Project Bill of Material

Section 2 - GENERATOR SPEC SHEETS

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| | |
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Section 4 - GENERATOR ACCESSORIES

| | |
|--|--------------|
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Section 5 - STARTUP & WARRANTY

| | |
|------------------------------|----------|
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Section 1 – Project Information

March 6, 2023

Bill of Material

| Feature Code | Description | Qty |
|-----------------|---|-----|
| C150D6D | C150D6D, Diesel Genset, 60Hz, 150kW | 2 |
| Install-US-Stat | U.S. EPA, Stationary Emergency Application | |
| C150 D6D | C150D6D, Diesel Genset, 60Hz, 150kW | |
| A331-2 | Duty Rating - Standby Power (ESP) | |
| L169-2 | Emission Certification, EPA, Tier 3, NSPS CI Stationary Emergency | |
| L090-2 | Listing - UL 2200 | |
| L193-2 | NFPA 110 Type 10 Level 1 Capable | |
| L224-2 | IBC Seismic Certification | |
| B184-2 | Exciter/Regulator - Permanent Magnet Generator, 3 Phase Sensor | |
| R002-2 | Voltage - 277/480, 3 Phase, Wye, 4 Wire | |
| BB95-2 | Alternator - 60Hz, 12L, 480/277V, 105C, 40C Ambient, Increased Motor Starting (IMS) | |
| F217-2 | Aluminum Sound Attenuated Level 2 Enclosure, with Exhaust System | |
| P176-2 | Enclosure Color - Green, Aluminum | |
| F252-2 | Enclosure - Wind Load 180 MPH, ASCE7 - 10 | |
| F179-2 | Skidbase - Housing Ready | |
| C301-2 | Fuel Tank - Regional, Dual Wall, Sub Base, 24 Hour Minimum | |
| C127-2 | Fuel Water Separator | |
| C310-2 | Low Fuel Level Switch, 40% | |
| C312-2 | Mechanical Fuel Gauge | |
| C318-2 | Switch - Fuel Tank, Rupture Basin | |
| H609-2 | Control Mounting - Left Facing | |
| H703-2 | PowerCommand 2.3 Controller | |
| H012-2 | Gauge - Oil Pressure | |
| H728-2 | Meters - AC Output Analog (kVA) | |
| K796-2 | Stop Switch - Emergency | |
| KS52-2 | Relays - Auxiliary, Qty 2, 25A - 15V DC/10A - 30V DC | |
| H536-2 | Control Display Language - English | |
| KV03-2 | Load Connection - Single | |
| KX26-2 | Circuit Breaker, Location A, 70A - 250A, 3P, LSI, 600 Volts AC, 100%, UL | |
| KB72-2 | Bottom Entry, Right | |
| A366-2 | Engine Governor - Electronic, Isochronous | |
| A422-2 | Engine Starter - 12 Volt DC Motor | |
| D041-2 | Engine Air Cleaner - Normal Duty | |
| A333-2 | Battery Charging Alternator | |
| E125-2 | Engine Cooling - Radiator, High Ambient Air Temperature, Ship Fitted | |
| H389-2 | Shutdown - Low Coolant Level | |
| E089-2 | Extension - Coolant Drain | |
| H669-2 | Engine Coolant - 50% Antifreeze, 50% Water Mixture | |
| E153-2 | Coolant Heater | |
| H706-2 | Engine Oil | |
| L028-2 | Genset Warranty - 2 Years Base | |
| L050-2 | Literature - English | |
| A322-2 | Packing - Skid, Poly Bag | |
| F065-2 | Battery Rack | |
| H268-2 | Extension - Oil Drain | |
| L260-2 | Green Sound Level 2 Intake Baffle - Ship Loose | |
| L262-2 | Ship Loose - Vent Kit B | |
| A048G602 | 10A Battery Charger | 2 |
| A054X752 | Battery Heater Kit | 2 |
| ACC-BAT-34 | Batteries | 4 |

Section 2 – Generator Spec Sheets



Diesel generator set

QSB7 series engine
125-200 kW @ 60 Hz
EPA Tier 3 emissions



Description

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

Features

Heavy duty engine - Rugged 4-cycle industrial diesel delivers reliable power 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® 1.1 electronic control is standard equipment and provides total generator set system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, output metering, auto-shutdown at fault detection and NFPA 110 Level 1 compliance.

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

Enclosures - The aesthetically appealing enclosure incorporates special designs that deliver one of the quietest generators of its kind. Aluminium material plus durable powder coat paint provides the best anti-corrosion performance. The generator set enclosure has been evaluated to withstand 180 MPH wind loads in accordance with ASCE7 -10. The design has hinged doors to provide easy access for service and maintenance.

Fuel tanks - Dual wall sub-base fuel tanks are offered as optional features, providing economical and flexible solutions to meet extensive code requirements on diesel fuel tanks.

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

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

| Model | Standby 60 Hz | | Prime 60 Hz | | Data sheets |
|----------------|------------------|-----|----------------|-----|-------------|
| | kW | kVA | kW | kVA | |
| C125D6D | 125 | 156 | 113 | 141 | NAD-6371-EN |
| C150D6D | 150 | 188 | 135 | 169 | NAD-6372-EN |
| C175D6D | 175 | 219 | 158 | 197 | NAD-6373-EN |
| C200D6D | 200 | 250 | 180 | 225 | NAD-6374-EN |

Generator set specifications

| | |
|--|---|
| Governor regulation class | ISO8528 Part 1 Class G3 |
| Voltage regulation, no load to full load | ± 1.0% |
| Random voltage variation | ± 1.0% |
| Frequency regulation | Isochronous |
| Random frequency variation | ± 0.50% |
| Radio frequency emissions compliance | FCC code title 47 part 15 class A and B |

Engine specifications

| | |
|-----------------------------|---|
| Design | Turbocharged and charge air cooled |
| Bore | 107 mm (4.21 in.) |
| Stroke | 124 mm (4.88 in.) |
| Displacement | 6.7 L (408 in ³) |
| Cylinder block | Cast iron, in-line 6 cylinder |
| Battery capacity | 2 x 850 amps per battery at ambient temperature of 0 °C (32 °F) |
| Battery charging alternator | 100 amps |
| Starting voltage | 2 x 12 volt in parallel, negative ground |
| Lube oil filter type(s) | Spin-on with relief valve |
| Standard cooling system | High ambient radiator |
| Rated speed | 1800 rpm |

Alternator specifications

| | |
|--|--|
| Design | Brushless, 4 pole, drip proof, revolving field |
| Stator | 2/3 pitch |
| Rotor | Direct coupled, flexible disc |
| Insulation system | Class H per NEMA MG1-1.65 |
| Standard temperature rise | 120 °C (248 °F) Standby |
| Exciter type | Torque match (shunt) with PMG as option |
| 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

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

Generator set options

Fuel system

- Basic fuel tanks
- **Regional fuel tanks**

Engine

- Engine air cleaner – normal or heavy duty
- Shut down – low oil pressure
- Extension – oil drain
- Engine oil heater

Alternator

- 120 °C temperature rise alternator
- 105 °C temperature rise alternator
- PMG excitation
- Alternator heater, 120 V
- Reconnectable full 1 phase output alternator upto 175 kW

Control

- AC output analog meters
- Stop switch – emergency
- Auxiliary output relays (2)
- Auxiliary configurable signal inputs (8) and relay outputs (8)

Electrical

- One, two or three circuit breaker configurations
- 80% rated circuit breakers
- 80% or 100% rated LSI circuit breakers
- Battery charger

Enclosure

- Aluminium enclosure Sound Level 1 or Level 2, green color
- Aluminium weather protective enclosure with muffler installed, green color

Cooling system

- Shutdown – low coolant level
- Warning – low coolant level
- Extension – coolant drain
- Coolant heater options:
 - <4 °C (40 °F) – cold weather
 - <-18 °C (0 °F) – extreme cold

Exhaust system

- Exhaust connector NPT
- Exhaust muffler mounted

Generator set application

- Base barrier – elevated genset
- Radiator outlet duct adapter

Warranty

- Base warranty – 2 year/1000 hours, Standby
- Base warranty – 1 year/unlimited hours, Prime
- 3 & 5 year Standby warranty options

Generator set accessories

- Coolant heater
- Battery heater kit
- Engine oil heater
- Remote control displays
- Auxiliary output relays (2)
- Auxiliary configurable signal inputs (8) and relay outputs (8)
- Annunciator – RS485
- Audible alarm
- Remote monitoring device – PowerCommand 500/550
- Battery charger – stand-alone, 12 V
- Circuit breakers
- Enclosure Sound Level 1 to Sound Level 2 upgrade kit
- Base barrier – elevated generator set
- Mufflers – industrial, residential or critical
- Alternator PMG excitation
- Alternator heater
- Improved PC1.1 display readability
- Top conduit entry access

Control system PowerCommand 1.1



PowerCommand control is an integrated generator set control system providing voltage regulation, engine protection, operator interface and isochronous governing (optional). Major features include:

- Battery monitoring and testing features and smart starting control system.
- Standard PCCNet interface to devices such as remote annunciator for NFPA 110 applications.
- Control boards potted for environmental protection.
- Control suitable for operation in ambient temperatures from -40 °C to +70 °C (-40 °F to +158 °F) and altitudes to 5000 meters (13,000 feet).
- Prototype tested; UL, CSA, and CE compliant.
- InPower™ PC-based service tool available for detailed diagnostics.

Operator/display panel

- Manual off switch
- Alpha-numeric display with pushbutton access for viewing engine and alternator data and providing setup, controls and adjustments (English or international symbols)
- LED lamps indicating generator set running, not in auto, common warning, common shutdown, manual run mode and remote start
- Suitable for operation in ambient temperatures from -40 °C to +70 °C
- Bargraph display (optional)

AC protection

- Over current warning and shutdown
- Over and under voltage shutdown
- Over and under frequency shutdown
- Over excitation (loss of sensing) fault
- Field overload

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

Alternator data

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

Engine data

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

Other data

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

Digital governing (optional)

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

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

Control functions

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

Options

- Auxiliary output relays (2)
- Remote annunciator with (3) configurable inputs and (4) configurable outputs
- PMG alternator excitation
- PowerCommand 500/550 for remote monitoring and alarm notification (accessory)
- Auxiliary, configurable signal inputs (8) and configurable relay outputs (8)

- AC output analog meters (bargraph)
 - Color-coded graphical display of:
 - 3-phase AC voltage
 - 3-phase current
 - Frequency
 - kVa
- Remote operator panel
- PowerCommand 2.3 control with AmpSentry protection

Ratings definitions

Emergency Standby Power (ESP):

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

Limited-Time Running Power (LTP):

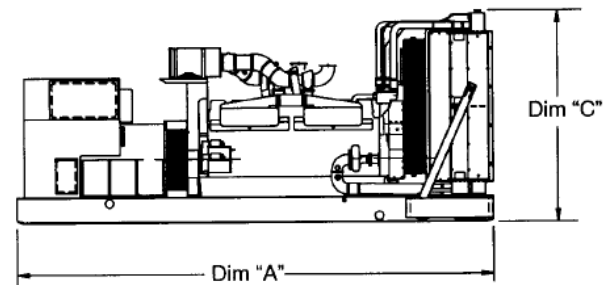
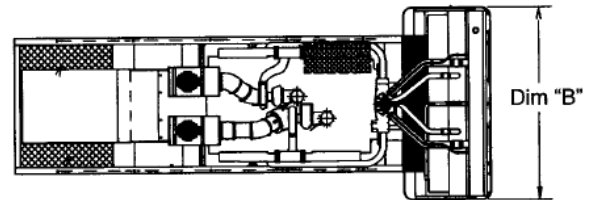
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime Power (PRP):

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

Base Load (Continuous) Power (COP):

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



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





Do not use for installation design

| Model | Dim "A" mm (in.) | Dim "B" mm (in.) | Dim "C" mm (in.) | Set weight* kg (lbs.) |
|---|---------------------|---------------------|---------------------|--------------------------|
| Open set | | | | |
| C125D6D | 2867 (113) | 1016 (40) | 1415 (56) | 1470 (3240) |
| C150D6D | 2867 (113) | 1016 (40) | 1415 (56) | 1470 (3240) |
| C175D6D | 2867 (113) | 1016 (40) | 1415 (56) | 1470 (3240) |
| C200D6D | 2867 (113) | 1016 (40) | 1415 (56) | 1470 (3240) |
| Weather protective enclosure | | | | |
| C125D6D | 2867 (113) | 1016 (40) | 1836 (72) | 1600 (3527) |
| C150D6D | 2867 (113) | 1016 (40) | 1836 (72) | 1600 (3527) |
| C175D6D | 2867 (113) | 1016 (40) | 1836 (72) | 1600 (3527) |
| C200D6D | 2867 (113) | 1016 (40) | 1836 (72) | 1600 (3527) |
| Sound attenuated enclosure Level 1 | | | | |
| C125D6D | 3621 (143) | 1016 (40) | 1836 (72) | 1649 (3635) |
| C150D6D | 3621 (143) | 1016 (40) | 1836 (72) | 1649 (3635) |
| C175D6D | 3621 (143) | 1016 (40) | 1836 (72) | 1649 (3635) |
| C200D6D | 3621 (143) | 1016 (40) | 1836 (72) | 1649 (3635) |
| Sound attenuated enclosure Level 2 | | | | |
| C125D6D | 4061 (160) | 1016 (40) | 1836 (72) | 1665 (3671) |
| C150D6D | 4061 (160) | 1016 (40) | 1836 (72) | 1665 (3671) |
| C175D6D | 4061 (160) | 1016 (40) | 1836 (72) | 1665 (3671) |
| C200D6D | 4061 (160) | 1016 (40) | 1836 (72) | 1665 (3671) |

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

Codes and standards

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

| | | | |
|---|---|--|--|
|  | <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 generator set is available Listed to UL 2200, Stationary Engine Generator Assemblies.</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 U.S. EPA SI Stationary Emission Regulation 40 CFR, Part 60.</p> |
|  | <p>All low voltage models are CSA certified to product class 4215-01.</p> | <p>International Building Code</p> | <p>The generator set is certified to International Building Code (IBC) 2012.</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

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Generator Set Data Sheet

Model: C150D6D
Frequency: 60 Hz
Fuel Type: Diesel
KW Rating: 150 Standby
 135 Prime
Emissions level: EPA Tier 3, Stationary Emergency

| | |
|------------------------------------|----------|
| Exhaust Emission Data Sheet: | EDS-3044 |
| Exhaust Emission Compliance Sheet: | EPA-2033 |
| Sound Performance Data Sheet: | MSP-4008 |
| Cooling Performance Data Sheet: | MCP-2048 |
| Prototype Test Summary Data Sheet: | PTS-636 |

| Fuel Consumption | Standby | | | | Prime | | | |
|------------------|-----------|-------|-------|-------|-----------|-------|-------|-------|
| | kW (kVA) | | | | kW (kVA) | | | |
| Ratings | 150 (188) | | | | 135 (169) | | | |
| Load | 1/4 | 1/2 | 3/4 | Full | 1/4 | 1/2 | 3/4 | Full |
| US gph | 4.7 | 6.9 | 9.2 | 11.7 | 4.4 | 6.4 | 8.4 | 10.7 |
| L/hr | 17.78 | 26.11 | 34.82 | 44.28 | 16.65 | 24.22 | 31.79 | 40.49 |

| Engine | Standby rating | Prime rating |
|--------------------------------------|------------------------------------|--------------|
| Engine Manufacturer | Cummins Inc. | |
| Engine Model | QSB7-G5 | |
| Configuration | Cast iron, in-line, 6 cylinders | |
| Aspiration | Turbocharged and charge air cooled | |
| Gross Engine Power Output, kWm (bhp) | 242 (324) | 208 (279) |
| BMEP at set rated load, kPa (psi) | 1763 (255.7) | 1601 (232) |
| Bore, mm (in) | 107 (4.21) | |
| Stroke, mm (in) | 124 (4.88) | |
| Rated Speed, rpm | 1800 | |
| Piston Speed, m/s (ft/min) | 7.44 (1464) | |
| Compression Ratio | 17.2:1 | |
| Lube Oil Capacity, L (qt) | 17.4 (18.38) | |
| Overspeed Limit, rpm | 2250 | |

Fuel Flow

| | |
|---|------------|
| Maximum Fuel Flow, L/hr (US gph) | 103 (27.0) |
| Maximum Fuel Inlet Restriction with Clean Filter, mm Hg (in Hg) | 127 (5.0) |

| Air | Standby rating | Prime rating |
|--|----------------|--------------|
| Combustion Air, m ³ /min (scfm) | 14.78 (522) | 14.22 (502) |
| Maximum Air Cleaner Restriction with Clean Filter, kPa (in H ₂ O) | 3.7 (15) | |

Exhaust

| | | |
|--|--------------|--------------|
| Exhaust Flow at set rated load, m ³ /min (cfm) | 35.62 (1258) | 33.66 (1189) |
| Exhaust Temperature, °C (°F) | 466.67 (872) | 453.89 (849) |
| Maximum Back Pressure, kPa (in H ₂ O) | 10 (40.19) | 10 (40.19) |
| Actual Exhaust Back Pressure with CPG Sound level 2 Enclosure Muffler, kPa (in H ₂ O) | 9.5 (38.18) | 8.6 (34.36) |
| Actual Exhaust Back Pressure with CPG Weather Enclosure Muffler, kPa (in H ₂ O) | 7.2 (28.93) | 6.5 (26) |

Standard Set-mounted Radiator Cooling

| | | |
|--|----------------|-------------|
| Ambient Design, °C (°F) | 50 (122) | |
| Fan Load, kW _m (HP) | 14.02 (18.8) | |
| Coolant Capacity (with radiator), L (US Gal) | 22 (5.9) | |
| Cooling System Air Flow, m ³ /min (scfm) | 305.82 (10800) | |
| Total Heat Rejection, MJ/min (Btu/min) | 7.91 (7499) | 7.25 (6871) |
| Maximum Cooling Air Flow Static Restriction, kPa (in H ₂ O) | 0.12 (0.5) | |

Weight²

| | |
|---------------------------|-------------|
| Unit Wet Weight kgs (lbs) | 1390 (3064) |
|---------------------------|-------------|

Notes:

¹ For non-standard remote installations contact your local Cummins Power Generation 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 3425 m (11237 ft.) at ambient temperatures up to 40° C (104° F) and 2298 m (7540 ft.) at 50° C (122° F). Consult your Cummins distributor for temperature and ambient requirements outside these parameters. |
| Prime | Engine power available up to 2743 m (9000 ft.) at ambient temperatures up to 40° C (104° F) and 2151 m (7057 ft.) at 50° C (122° F). Consult your Cummins distributor for temperature and ambient requirements outside these parameters. |

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. |

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

Phone 763 574 5000
 Fax 763 574 5298

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 NAD-6372-EN (08/20) A061F587



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Alternator Data

| Standard Alternators | Single phase ² | Three Phase ¹ | | | | | |
|---|---------------------------|--------------------------|---------|---------|---------|---------|---|
| Maximum Temperature Rise above 40 °C Ambient | 120 °C | 120 °C | | | | | |
| Feature Code | BB88-2 | B946-2 | B986-2 | B952-2 | B943-2 | BB86-2 | BB88-2 |
| Alternator Data Sheet Number | ADS212 | ADS-210 | ADS-210 | ADS-209 | ADS-209 | ADS-210 | ADS-212 |
| Voltage Ranges | 120/240 | 120/208 | 120/240 | 347/600 | 277/480 | 127/220 | 120/208, 127/220, 277/480 |
| Voltage Feature Code | R104 | R098-2 | R106-2 | R114-2 | R002-2 | R020-2 | R098-2, R020-2, R106-2, R002-2 |
| Surge kW | 205.9 | 210.2 | 211.4 | 211.1 | 211.4 | 210.7 | 211.6 |
| Motor Starting kVA (at 90% sustained voltage) Shunt | 770 | 563 | 563 | 516 | 516 | 563 | 770 |
| Motor Starting kVA (at 90% sustained voltage) PMG | 920 | 663 | 663 | 607 | 607 | 663 | 920 |
| Full Load Current Amps at Standby Rating | 625 | 520 | 451 | 180 | 226 | 492 | 226 to 520 |

Alternator Data

| Standard Alternators | Single phase ² | Three phase ¹ | | | | |
|---|---|--------------------------|---------|---------|---------|---------|
| Maximum Temperature Rise above 40 °C Ambient | 105 °C | 105 °C | 105 °C | 105 °C | 105 °C | 105 °C |
| Feature Code | BB87-2 | BB93-2 | BB94-2 | BB95-2 | BB92-2 | BB85-2 |
| Alternator Data Sheet Number | ADS-212 | ADS-210 | ADS-210 | ADS-209 | ADS-209 | ADS-210 |
| Voltage Ranges | 120/208, 120/240, 127/220, 277/480, 347/600 | 120/208 | 120/240 | 277/480 | 347/600 | 127/220 |
| Voltage Feature Code | R098-2, R020-2, R002-2, R104-2, R106-2, R114-2 | R098-2 | R106-2 | R002-2 | R114-2 | R020-2 |
| Surge kW | 205.9 | 210.2 | 211.4 | 211.4 | 210.7 | 211.6 |
| Motor Starting kVA (at 90% sustained voltage) Shunt | 770 | 563 | 563 | 516 | 516 | 563 |
| Motor Starting kVA (at 90% sustained voltage) PMG | 920 | 663 | 663 | 607 | 607 | 663 |
| Full Load Current Amps at Standby Rating | 625 | 520 | 451 | 226 | 180 | 492 |

Notes:

¹ Single phase power can be taken from a three phase generator set at up to 2/3 set rated 3-phase kW at 1.0 power factor

² Full single phase output up to full set rated 3-phase kW at 1.0 power factor

North America

1400 73rd Avenue N.E.

Minneapolis, MN 55432

USA

Phone 763 574 5000

Fax 763 574 5298

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NAD-6372-EN (08/20) A061F587



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Formulas for Calculating Full Load Currents:

Three phase output

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

Single phase output

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

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

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

Phone 763 574 5000
Fax 763 574 5298

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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.

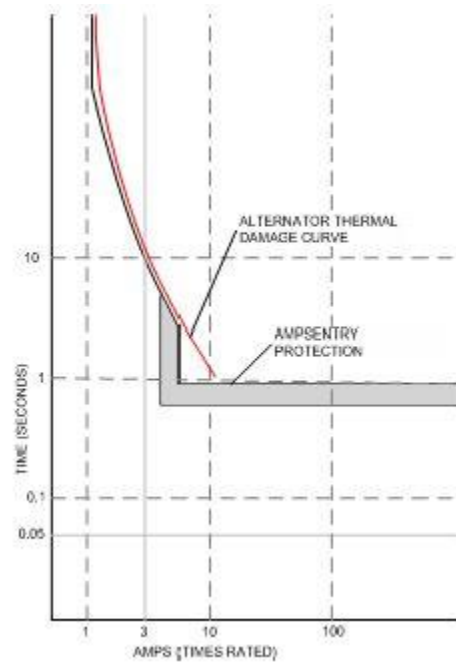
Fail to start (overcrank) shutdown - The control system will indicate a fault if the generator set fails to start by the completion of the engine crank sequence.

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:

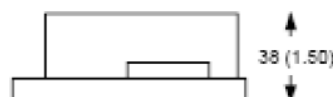
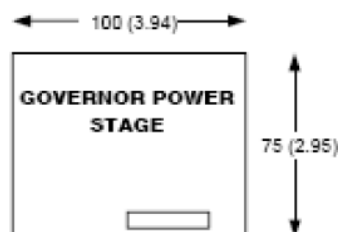
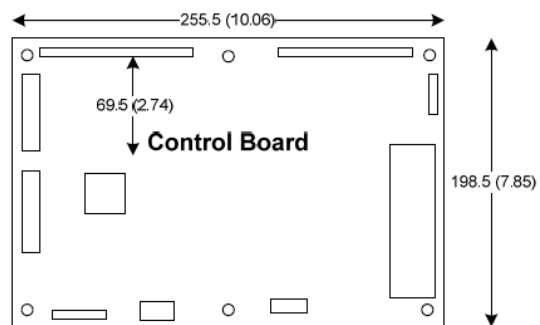
- PC tool interface: This RS-485 communication port allows the control to communicate with a personal computer running InPower software.

- 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

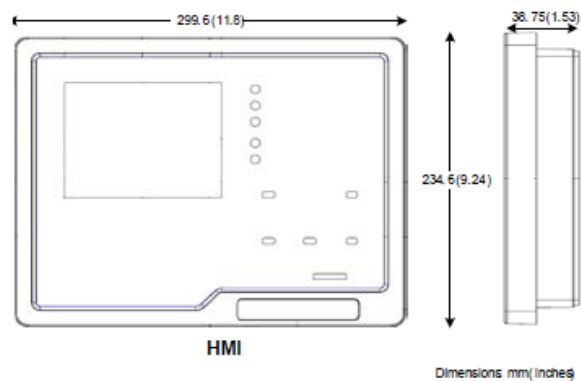
- LED indicating lamps:
 - Genset running
 - Remote start
 - Not in auto
 - Shutdown
 - Warning
 - Auto
 - Manual and stop
- 320 x 240 pixels graphic LED backlight LCD.
- Four tactile feel membrane switches for LCD defined operation. The functions of these switches are defined dynamically on the LCD.
- 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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2023 EPA Tier 3 Exhaust Emission Compliance Statement C150D6D 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: | PCEXL0409AAD-026 |
| Effective Date: | 05/24/2022 |
| Date Issued: | 05/24/2022 |
| EPA Engine Family (Cummins Emissions Family): | PCEXL0409AAD |

Engine Information:

| | | | |
|--------------------------|-------------------------------------|-------------------------|------------------------|
| Model: | QSB7-G5 NR3 | Bore: | 4.21 in. (106.9 mm) |
| Engine Nameplate HP: | 324 | Stroke: | 4.88 in. (124 mm) |
| Type: | 4 Cycle, In-line, 6 Cylinder Diesel | Displacement: | 408 cu. in. (7 liters) |
| Aspiration: | Turbocharged and Charge Air Cooled | Compression ratio: | 17.2:1 |
| Emission Control Device: | | Exhaust stack diameter: | 4 in. (101.6) |

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 Sulphur

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.



Sound Data

C150D6D

QSB7-G5 NR3 60Hz Diesel

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

See notes 2, 5 and 7-11 listed below

| Configuration | Exhaust | Applied Load | Position (Note 2) | | | | | | | | 8 Position Average |
|---|------------------|--------------|-------------------|----|----|----|----|----|----|----|--------------------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Standard – Unhoused | Infinite Exhaust | 100% Standby | 84 | 86 | 88 | 88 | 83 | 90 | 88 | 88 | 87 |
| F216-2 Weather Aluminum | Mounted | 100% Standby | 86 | 85 | 83 | 87 | 84 | 89 | 83 | 86 | 86 |
| F231-2 Sound Attenuated Level 1, Aluminum | Mounted | 100% Standby | 83 | 79 | 74 | 74 | 74 | 75 | 75 | 80 | 78 |
| F217-2 Sound Attenuated Level 2, Aluminum | Mounted | 100% Standby | 72 | 72 | 71 | 72 | 73 | 72 | 71 | 73 | 72 |

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

See notes 1, 5 and 7-14 listed below

| Configuration | Exhaust | Applied Load | Octave Band Center Frequency (Hz) | | | | | | | | | | | Overall Sound Pressure Level |
|---|------------------|--------------|-----------------------------------|------|----|-----|-----|-----|------|------|------|------|-------|------------------------------|
| | | | 16 | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | 16000 | |
| Standard – Unhoused | Infinite Exhaust | 100% Standby | N/A | 46 | 68 | 81 | 89 | 91 | 91 | 90 | 88 | 86 | 90 | 98 |
| F216-2 Weather Aluminum | Mounted | 100% Standby | N/A | 42 | 67 | 83 | 90 | 89 | 90 | 87 | 84 | 80 | 81 | 96 |
| F231-2 Sound Attenuated Level 1, Aluminum | Mounted | 100% Standby | N/A | 45 | 62 | 74 | 80 | 80 | 81 | 79 | 76 | 77 | 73 | 88 |
| F217-2 Sound Attenuated Level 2, Aluminum | Mounted | 100% Standby | N/A | 45 | 63 | 72 | 77 | 76 | 77 | 76 | 73 | 71 | 65 | 84 |

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

See notes 1, 3, 5 and 7-14 listed below

| Configuration | Exhaust | Applied Load | Octave Band Center Frequency (Hz) | | | | | | | | | | | Overall Sound Pressure Level |
|---|------------------|--------------|-----------------------------------|------|----|-----|-----|-----|------|------|------|------|-------|------------------------------|
| | | | 16 | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | 16000 | |
| Standard – Unhoused | Infinite Exhaust | 100% Standby | N/A | 43 | 68 | 79 | 85 | 89 | 89 | 90 | 89 | 88 | 95 | 99 |
| F216-2 Weather Aluminum | Mounted | 100% Standby | N/A | 42 | 67 | 79 | 84 | 84 | 82 | 81 | 78 | 75 | 78 | 90 |
| F231-2 Sound Attenuated Level 1, Aluminum | Mounted | 100% Standby | N/A | 50 | 66 | 75 | 81 | 82 | 81 | 78 | 75 | 74 | 69 | 87 |
| F217-2 Sound Attenuated Level 2, Aluminum | Mounted | 100% Standby | N/A | 50 | 67 | 76 | 80 | 79 | 79 | 76 | 73 | 72 | 61 | 86 |



Sound Data

C150D6D

QSB7-G5 NR3 60Hz Diesel

A-weighted Sound Power Level, dB(A)

See notes 1, 3 and 6-14 listed below

| Configuration | Exhaust | Applied Load | Octave Band Center Frequency (Hz) | | | | | | | | | | | Overall Sound Power Level |
|---|------------------|--------------|-----------------------------------|------|----|-----|-----|-----|------|------|------|------|-------|---------------------------|
| | | | 16 | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | 16000 | |
| Standard – Unhoused | Infinite Exhaust | 100% Standby | N/A | 63 | 86 | 98 | 106 | 108 | 109 | 107 | 106 | 103 | 107 | 116 |
| F216-2 Weather Aluminum | Mounted | 100% Standby | N/A | 60 | 85 | 101 | 108 | 107 | 107 | 105 | 102 | 97 | 99 | 114 |
| F231-2 Sound Attenuated Level 1, Aluminum | Mounted | 100% Standby | N/A | 63 | 80 | 92 | 99 | 99 | 99 | 97 | 94 | 95 | 91 | 106 |
| F217-2 Sound Attenuated Level 2, Aluminum | Mounted | 100% Standby | N/A | 64 | 81 | 91 | 95 | 94 | 95 | 94 | 91 | 90 | 84 | 102 |

Exhaust Sound Power Level, dB(A)

See notes 4 and 6-14 listed below

| Configuration | Applied Load | Octave Band Center Frequency (Hz) | | | | | | | | | | | Overall Sound Power Level |
|---------------------------|--------------|-----------------------------------|------|----|-----|-----|-----|------|------|------|------|-------|---------------------------|
| | | 16 | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | 16000 | |
| Open Exhaust (No Muffler) | 100% Standby | N/A | 64 | 93 | 106 | 115 | 117 | 114 | 113 | 113 | 105 | 94 | 122 |

Global Notes:

1. Sound pressure levels at 1 meter are measured per the requirements of ISO 3744, ISO 8528-10, and European Communities Directive 2000/14/EC as applicable. The microphone measurement locations are 1 meter from a reference parallelepiped just enclosing the generator set (enclosed or unenclosed).
2. Seven-meter measurement location 1 is 7 meters (23 feet) from the generator (alternator) end of the generator set, and the locations proceed counterclockwise around the generator set at 45° angles at a height of 1.2 meters (48 inches) above the ground surface.
3. Sound Power Levels are calculated according to ISO 3744, ISO 8528-10, and/or CE (European Union) requirements.
4. Exhaust Sound Levels are measured and calculated per ISO 6798, Annex A.
5. Reference Sound Pressure Level is 20 µPa
6. Reference Sound Power Level is 1 pW (10⁻¹² Watt)
7. Sound data for remote-cooled generator sets are based on rated load without cooling fan noise.
8. Sound data for the generator set with infinite exhaust do not include the exhaust noise contribution
9. Published sound levels are measured at CE certified test site and are subject to instrumentation measurement, installation, and manufacturing variability.
10. Unhoused/Open configuration generator sets refers to generator sets with no sound enclosures of any kind.
11. Housed/Enclosed/Closed/Canopy configuration generator sets refer to generator sets that have noise reduction sound enclosure installed over the generator set and usually integrally attached to the skid base/base frame/fuel container base of the generator set.
12. Published sound levels meet the requirements India's Central Pollution Control Board (Ministry of Environment & Forests), vide GSR 371 (E), which states the A-weighted sound level at 1 meter from any diesel generator set up to a power output rating of 1000kVA shall not exceed 75 dB(A).
13. For updated noise pollution information for India see website: <http://www.envfor.nic.in/legis/legis.html>
14. Sound levels must meet India's Ambient Air Noise Quality Standards detailed for Daytime/Nighttime operation in Noise Pollution (Regulation and Control) Rules, 2000



Cooling System Data

C150D6D

High Ambient Air Temperature Radiator Cooling System

| | Fuel Type | Duty | Rating (kW) | Max Cooling @ Air Flow Static Restriction, Unhoused (inches water/mm water) | | | | | Housed in Free Air, No Air Discharge Restriction | | |
|-------|-----------|---------|-------------|---|----------|----------|-----------|----------|--|---------------|---------------|
| | | | | 0.0/0.0 | 0.25/6.4 | 0.5/12.7 | 0.75/19.1 | 1.0/25.4 | Weather | Sound Level 1 | Sound Level 2 |
| | | | | Maximum allowable ambient temperature, degree C | | | | | | | |
| 60 Hz | Diesel | Standby | 150 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| | | Prime | 135 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |

Notes:

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



Alternator data sheet

Frame size: **UC3F**

| Characteristics | | | | | | | | |
|--|--|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Weights: | | Wound stator assembly: | | 337 lb | | | 153 kg | |
| | | Rotor assembly: | | 419 lb | | | 190 kg | |
| | | Complete alternator: | | 1175 lb | | | 533 kg | |
| Maximum speed: | | | | 2250 rpm | | | | |
| Excitation current: | | Full load: | | 2 Amps | | | | |
| | | No load: | | 0.5 Amps | | | | |
| Insulation system: | | Class H throughout | | | | | | |
| 1 ∅ Ratings (1.0 power factor) | | 60 Hz | | | | 50 Hz | | |
| (Based on specific temperature rise at 40 °C ambient temperature) | | Double delta | | 4 lead | | Double delta | | |
| | | <u>120/240</u> | | <u>120/240</u> | | 110-120 | | |
| 125 °C rise ratings kW/kVA | | 109/109 | | 135/135 | | <u>220-240</u> | | |
| 105 °C rise ratings kW/kVA | | 98/98 | | 125/125 | | 96/96 | | |
| | | | | | | 87/87 | | |
| 3 ∅ Ratings (0.8 power factor) | | Upper broad range | | LBR* | 347/600 | | Broad range | |
| (Based on specified temperature rise at 40 °C ambient temperature) | | 120/208 | 139/240 | 190-208 | | 110/190 | 120/208 | 127/220 |
| | | <u>240/416</u> | <u>277/480</u> | <u>380-416</u> | <u>347/600</u> | <u>220/380</u> | <u>240/415</u> | <u>254/440</u> |
| 150 °C Rise ratings kW | | 150 | 170 | 148 | 170 | 136 | 136 | 128 |
| kVA | | 188 | 213 | 185 | 213 | 170 | 170 | 160 |
| 125 °C Rise ratings kW | | 145 | 165 | 144 | 165 | 128 | 128 | 120 |
| kVA | | 181 | 206 | 180 | 206 | 160 | 160 | 150 |
| 105 °C Rise ratings kW | | 130 | 150 | 128 | 150 | 116 | 116 | 108 |
| kVA | | 163 | 188 | 160 | 188 | 145 | 145 | 135 |
| 80 °C Rise ratings kW | | 112 | 128 | 110 | 128 | 101 | 101 | 94 |
| kVA | | 140 | 160 | 138 | 160 | 126 | 126 | 118 |
| 3 ∅ Reactances (per unit, ±10%) | | | | | | | | |
| (Based on full load at 105 °C rise rating) | | | | | | | | |
| Synchronous | | 2.21 | 1.92 | 1.68 | 1.97 | 2.04 | 1.71 | 1.42 |
| Transient | | 0.18 | 0.15 | 0.14 | 0.16 | 0.17 | 0.15 | 0.12 |
| Subtransient | | 0.13 | 0.11 | 0.09 | 0.10 | 0.12 | 0.10 | 0.09 |
| Negative sequence | | 0.14 | 0.12 | 0.10 | 0.11 | 0.13 | 0.11 | 0.09 |
| Zero sequence | | 0.08 | 0.07 | 0.07 | 0.07 | 0.08 | 0.07 | 0.06 |
| 3 ∅ Motor starting | | | | | | | | |
| Maximum kVA (Shunt) | | 516 | | 516 | 516 | | 367 | |
| (90% sustained voltage) (PMG) | | 607 | | 607 | 607 | | 458 | |
| Time constants (Sec) | | | | | | | | |
| Transient | | 0.035 | | 0.035 | 0.035 | | 0.035 | |
| Subtransient | | 0.011 | | 0.011 | 0.011 | | 0.011 | |
| Open circuit | | 0.900 | | 0.900 | 0.900 | | 0.900 | |
| DC | | 0.009 | | 0.009 | 0.009 | | 0.009 | |



Alternator data sheet

Frame size: **UC3F**

| Windings | (@ 20 °C) | | | | |
|-------------------|----------------------|--------|--------|--------|--------|
| Stator resistance | (Line to Line, Ohms) | 0.0480 | 0.0400 | 0.0700 | 0.0480 |
| Rotor resistance | (Ohms) | 0.0480 | 0.0400 | 0.0700 | 0.0480 |
| Number of leads | | 12 | 12 | 6 | 12 |

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



Dual wall sub-base diesel fuel tanks - 10-200 kW generator sets



Description

Cummins® offers two series of fuel tanks (basic series and regional series) for the 10~125 kW diesel generator sets. The “basic” series of fuel tanks provide economical solutions for areas with no or minimal local/regional code requirements on diesel fuel tanks. The footprint of “basic” tanks matches the generator set’s footprint. The “regional” series of fuel tanks provide flexible and upgradable solutions for areas with extensive local/regional code requirements on diesel fuel tanks. The footprint of the “regional” series of fuel tanks extends beyond the generator set to allow room for installation of optional features at factory or accessories in the field for meeting local/regional code requirements or customer specification on diesel fuel tanks. All fuel tanks and optional features are compatible with factory installed enclosures.

These tanks are constructed of heavy gauge steel and include an internally reinforced baffle structure for supporting the generator set. The fuel tank design features fewer seams and welds for better corrosion resistance performance.

These tanks are pre-treated with a conversion coating and then finished with a textured powder paint. The paint has superior UV and chemical resistance with best-in-class adhesion, flexibility, and durability to resist chipping and substrate corrosion. Both interior compartments are treated with a rust preventative for extended corrosion protection.

These tanks are UL and ULC Listed as secondary containment generator base tanks. Inner and outer containments are leak checked per UL and ULC testing procedures to ensure their integrity.

These fuel tanks are offered in various sizes to satisfy different fuel capacities requirements.

Compatible generator set model

| Engine | D1703M | V2203M | 4BT3.3-G5 | 4BTAA3.3-G7 | QSB5-G5 | QSB7-G5 |
|---------------------------|--------|--------|-----------|-------------|---------|---------|
| Generator set model names | C10D6 | C20D6 | C25D6 | C50D6 | C50D6C | C125D6D |
| | C15D6 | | C30D6 | C60D6 | C60D6C | C150D6D |
| | | | C35D6 | | C80D6C | C175D6D |
| | | | C40D6 | | C100D6C | C200D6D |
| | | | | | C125D6C | |

Regional fuel tanks

Standard features:

UL 142 and ULC-S601 listed - Minimum 110% secondary IBC 2012 and 2015 certified - All optional features are seismically certified with this range of tanks and generator sets. Requires factory-installed 2 ft vent extensions or higher.

UL 142 & ULC-S601 listed - Minimum 125% secondary containment capacity.

NFPA & IFC - Capable of meeting NFPA 30, NFPA 110, and IFC codes with available factory-installed optional features.

Emergency pressure relief vents - Ensure adequate ventilation of the primary and secondary tank compartments under extreme temperature and emergency conditions.

Normal atmospheric vent - "Mushroom" style vent ensures adequate venting of the primary tank during fill, generator set running, and temperature variations. Raised above fuel fill.

Raised fuel fill - Includes lockable sealed fuel cap.

Lifting eyes - Allow lifting of fuel tank with generator set installed.

Optional features:

Secondary containment basin switch (rupture switch) - Activates a warning in the event of a primary tank leak. Side Mounted.

Low fuel level switch - Activates a warning when 40% of the fuel is left in the tank.

Fuel level gauge - Provides direct reading of fuel level. Top mounted.

Electric fuel level sender with gauge - Allows remote electrical monitoring of fuel tank level. Flying leads for customer connection.

Tank to foundation clearance - 2-inch bolt-thru risers allow visual inspection under tank including rodent barrier.

Spill containment box for fuel fill - 5 gallon capacity with integral drain (to tank). Lockable lid.

Overfill prevention valve - Shuts off fuel flow during filling at approximately 95% full*. Includes fill down tube, as needed, to terminate within 6" of the bottom of the fuel tank. Uses a 2 inch type "F" cam lock adapter for filling.

High fuel switch - Activates at 90% of full fuel level. Flying leads for customer connection.

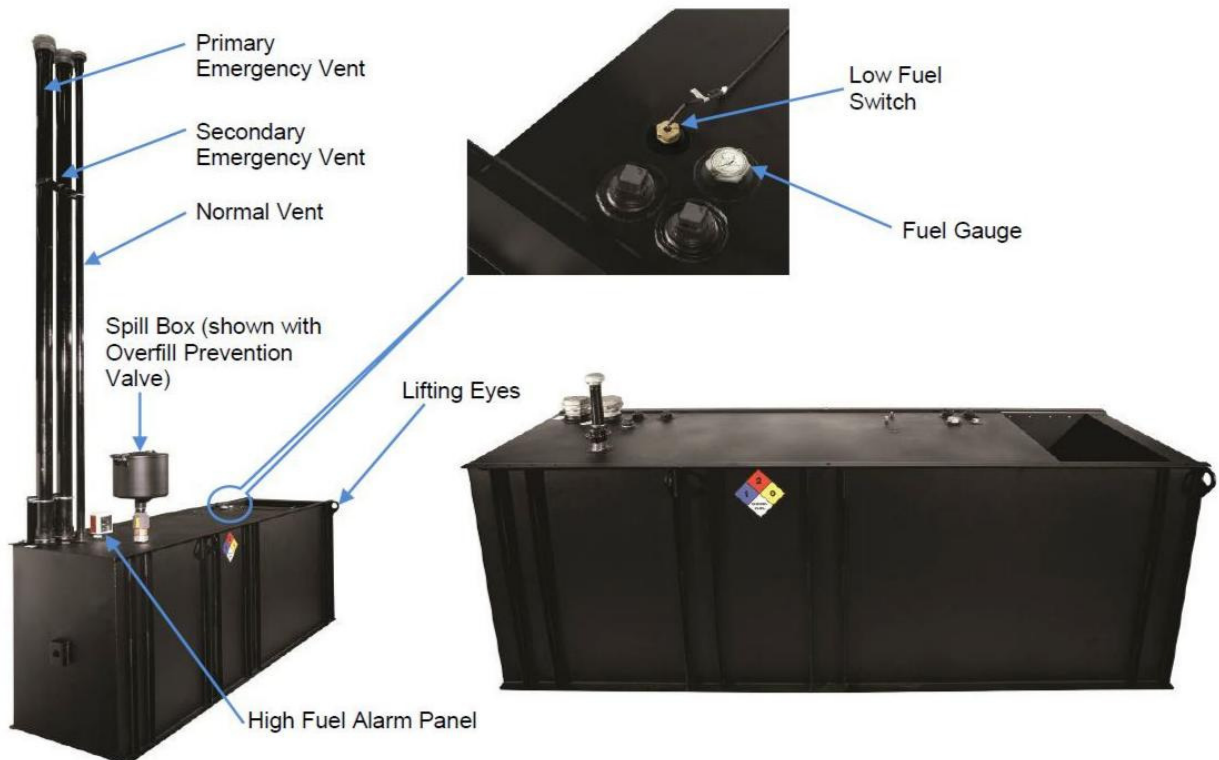
High fuel alarm panel - Provides audible & visual alarm when fuel level reaches 90% of full fuel level.

Fill drop tube - Terminates fuel fill location within 6" of the bottom of the fuel tank.

Vent extensions - Terminate normal and emergency vents (both primary and secondary) a minimum of 12 ft above the bottom of tank.

Seismic vent extensions - 2 ft normal and emergency (both primary & secondary) extensions to meet IBC/OSHPD seismic requirements.

* The OFPV inherently shuts off fuel at approximately 2" below the top of the fuel tank. Some tanks will shut off below this 95% fill level.



*Picture is for reference only. See outline drawing for tank specific information by model.

Regional tanks

| Generator set Standby power output | Generator set model | Engine model | Fuel consumption (100% load, Standby) | Tank feature code | Minimum run time feature | Tank dimensions (L x W x H) | Nominal dry weight* | Tank usable volume | Actual run time w/o OFPV | Actual run time w/OFPV |
|------------------------------------|---------------------|--------------|---------------------------------------|-------------------|--------------------------|-----------------------------|---------------------|--------------------|--------------------------|------------------------|
| kW | | | gal/hr | | hr | inch | lbs | gal | hr | hr |
| 10 | C10 D6 | D1703M | 1.12 | C301-2 | 24 | 87.6 x 34 x 15 | 510 | 74 | 66 | 56 |
| | | | | C303-2 | 48 | 87.6 x 34 x 15 | 510 | 74 | 66 | 56 |
| | | | | C305-2 | 72 | 87.6 x 34 x 23 | 723 | 132 | 118 | 107 |
| | | | | C307-2 | 96 | 87.6 x 34 x 23 | 723 | 132 | 118 | 107 |
| 15 | C15 D6 | D1703M | 1.38 | C301-2 | 24 | 87.6 x 34 x 15 | 510 | 74 | 53 | 45 |
| | | | | C303-2 | 48 | 87.6 x 34 x 15 | 510 | 74 | 53 | 45 |
| | | | | C305-2 | 72 | 87.6 x 34 x 23 | 723 | 132 | 95 | 86 |
| | | | | C307-2 | 96 | 87.6 x 34 x 32 | 962 | 195 | 141 | 132 |
| 20 | C20 D6 | V2203M | 1.81 | C301-2 | 24 | 87.6 x 34 x 15 | 510 | 74 | 41 | 35 |
| | | | | C303-2 | 48 | 87.6 x 34 x 23 | 723 | 132 | 73 | 66 |
| | | | | C305-2 | 72 | 87.6 x 34 x 32 | 962 | 195 | 108 | 101 |
| | | | | C307-2 | 96 | 87.6 x 34 x 32 | 962 | 195 | 108 | 101 |
| 25 | C25 D6 | 4BT3.3-G5 | 2.42 | C301-2 | 24 | 121 x 34 x 10.5 | 514 | 74 | 31 | 25 |
| | | | | C303-2 | 48 | 121 x 34 x 16.2 | 686 | 132 | 54 | 47 |
| | | | | C305-2 | 72 | 121 x 34 x 22.1 | 879 | 195 | 80 | 73 |
| | | | | C307-2 | 96 | 121 x 34 x 29.5 | 1120 | 263 | 109 | 101 |
| 30 | C30 D6 | 4BT3.3-G5 | 2.81 | C301-2 | 24 | 121 x 34 x 10.5 | 514 | 74 | 26 | 21 |
| | | | | C303-2 | 48 | 121 x 34 x 22.1 | 879 | 195 | 69 | 63 |
| | | | | C305-2 | 72 | 121 x 34 x 29.5 | 1120 | 263 | 94 | 87 |
| | | | | C307-2 | 96 | 121 x 34 x 42.0 | 1461 | 389 | 138 | 132 |
| 35 | C35 D6 | 4BT3.3-G5 | 3.16 | C301-2 | 24 | 121 x 34 x 16.2 | 686 | 132 | 42 | 36 |
| | | | | C303-2 | 48 | 121 x 34 x 22.1 | 879 | 195 | 62 | 56 |
| | | | | C305-2 | 72 | 121 x 34 x 29.5 | 1120 | 263 | 83 | 77 |
| | | | | C307-2 | 96 | 121 x 34 x 42.0 | 1461 | 389 | 123 | 117 |
| 40 | C40 D6 | 4BT3.3-G5 | 3.66 | C301-2 | 24 | 121 x 34 x 16.2 | 686 | 132 | 36 | 31 |
| | | | | C303-2 | 48 | 121 x 34 x 22.1 | 879 | 195 | 53 | 48 |
| | | | | C305-2 | 72 | 121 x 34 x 42.0 | 1461 | 389 | 106 | 101 |
| | | | | C307-2 | 96 | 121 x 34 x 42.0 | 1461 | 389 | 106 | 101 |
| 50 | C50 D6 | 4BTAA3.3-G7 | 4.25 | C301-2 | 24 | 121 x 34 x 16.2 | 686 | 132 | 31 | 27 |
| | | | | C303-2 | 48 | 121 x 34 x 29.5 | 1120 | 263 | 62 | 58 |
| | | | | C305-2 | 72 | 121 x 34 x 42.0 | 1461 | 389 | 92 | 87 |
| 60 | C60 D6 | 4BTAA3.3-G7 | 5.04 | C301-2 | 24 | 121 x 34 x 16.2 | 686 | 132 | 26 | 23 |
| | | | | C303-2 | 48 | 121 x 34 x 29.5 | 1120 | 263 | 52 | 49 |
| | | | | C305-2 | 72 | 121 x 34 x 42.0 | 1461 | 389 | 77 | 73 |
| 50 | C50D6C | QSB5-G5 | 5.30 | C301-2 | 24 | 154 x 40 x 22 | 1388 | 250 | 47 | 45 |
| | | | | C303-2 | 48 | 154 x 40 x 32 | 1657 | 425 | 80 | 76 |
| | | | | C305-2 | 72 | 154 x 40 x 32 | 1657 | 425 | 80 | 76 |
| | | | | C307-2 | 96 | 154 x 40 x 46 | 2096 | 625 | 118 | 112 |
| 60 | C60D6C | QSB5-G5 | 6.10 | C301-2 | 24 | 154 x 40 x 22 | 1388 | 250 | 41 | 39 |
| | | | | C303-2 | 48 | 154 x 40 x 32 | 1657 | 425 | 70 | 66 |
| | | | | C305-2 | 72 | 154 x 40 x 46 | 2096 | 625 | 102 | 97 |
| | | | | C307-2 | 96 | 154 x 40 x 46 | 2096 | 625 | 102 | 97 |
| 80 | C80D6C | QSB5-G5 | 7.30 | C301-2 | 24 | 154 x 40 x 22 | 1388 | 250 | 34 | 33 |
| | | | | C303-2 | 48 | 154 x 40 x 32 | 1657 | 425 | 58 | 55 |
| | | | | C305-2 | 72 | 154 x 40 x 46 | 2096 | 625 | 85 | 81 |
| 100 | C100D6C | QSB5-G5 | 8.90 | C301-2 | 24 | 154 x 40 x 22 | 1388 | 250 | 28 | 27 |
| | | | | C303-2 | 48 | 154 x 40 x 32 | 1657 | 425 | 48 | 45 |
| | | | | C305-2 | 72 | 154 x 40 x 46 | 2096 | 625 | 70 | 66 |
| 125 | C125D6C | QSB5-G6 | 10.30 | C301-2 | 24 | 154 x 40 x 22 | 1388 | 250 | 24 | 23 |
| | | | | C303-2 | 48 | 154 x 40 x 46 | 2096 | 625 | 60 | 58 |

* All weights are approximate.

Regional tanks

| Generator set Standby power output | Generator set model | Engine model | Fuel consumption (100% load, Standby) | Tank feature code | Minimum run time feature | Tank dimensions (L x W x H) | Nominal dry weight* | Tank usable volume | Actual run time w/o OFPV | Actual run time w/OFPV |
|------------------------------------|---------------------|--------------|---------------------------------------|-------------------|--------------------------|-----------------------------|---------------------|--------------------|--------------------------|------------------------|
| kW | | | gal/hr | | hr | inch | lbs | gal | hr | hr |
| 125 | C125D6D | QSB7-G5 | 10.1 | C301-2 | 24 | 180x40x21 | 1477 | 351 | 34 | 30 |
| | | | | C303-2 | 48 | 180x40x42 | 2302 | 737 | 72 | 69 |
| | | | | C305-2 | 72 | 180x40x42 | 2302 | 737 | 72 | 69 |
| | | | | C307-2 | 96 | 180x65.5x35.3 | 3552 | 1055 | 104 | 98 |
| 150 | C150D6D | | C301-2 | 24 | 180x40x21 | 1477 | 351 | 30 | 26 | |
| | | | C303-2 | 48 | 180x40x42 | 2302 | 737 | 63 | 59 | |
| | | | C305-2 | 72 | 180x65.5x35.3 | 3552 | 1055 | 90 | 84 | |
| 175 | C175D6D | | C301-2 | 24 | 180x40x21 | 1477 | 351 | 26 | 23 | |
| | | | C303-2 | 48 | 180x40x42 | 2302 | 737 | 55 | 52 | |
| | | | C305-2 | 72 | 180x65.5x35.3 | 3552 | 1055 | 79 | 74 | |
| 200 | C200D6D | | C301-2 | 24 | 180x40x21 | 1477 | 351 | 24 | 21 | |
| | | | C303-2 | 48 | 180x40x42 | 2302 | 737 | 49 | 47 | |
| | | C305-2 | 72 | 180x65.5x35.3 | 3552 | 1055 | 72 | 66 | | |

Certifications/standards/codes



UL 142 Listed - Cummins dual wall sub-base tanks are UL Listed and constructed in accordance with Underwriters Laboratories Standard UL 142 "steel aboveground tanks for flammable and combustible liquids," as a "secondary containment generator base tank"



NFPA - Cummins tanks are built in accordance with all applicable NFPA codes:

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



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



ULC - Cummins tanks are built in accordance with all applicable ULC codes

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

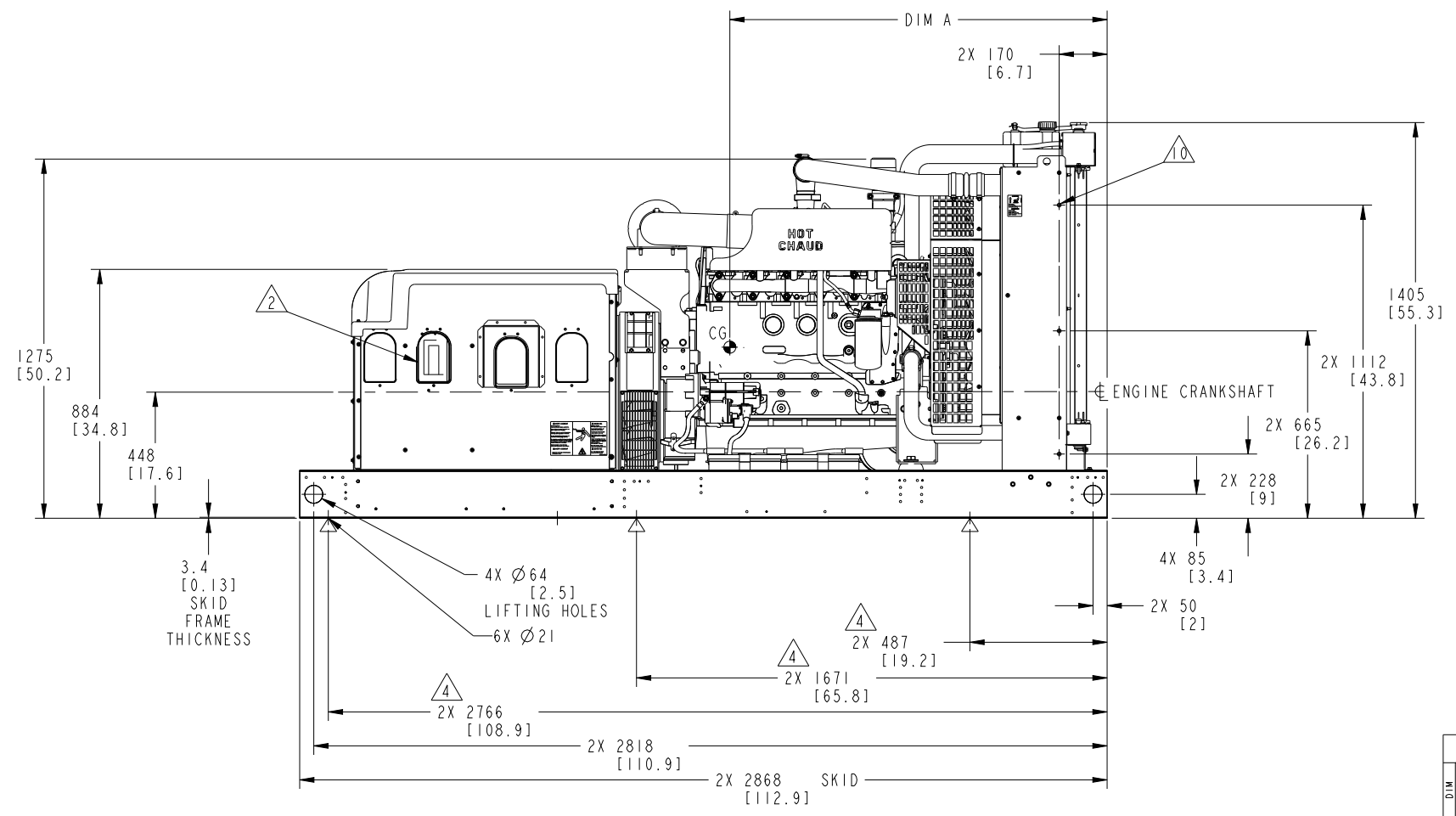
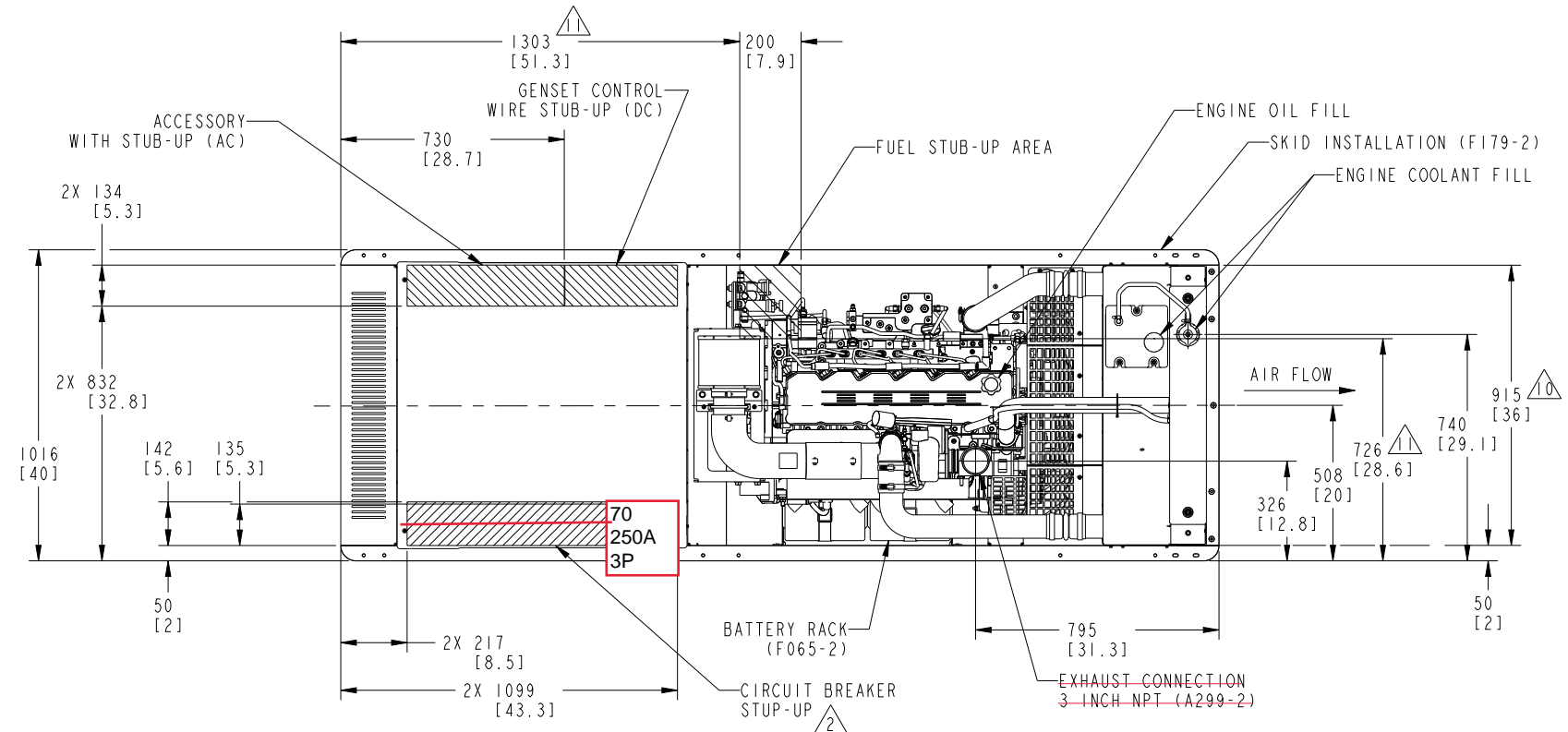
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Section 3 – Generator Drawings

| REL NO | REV | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|---------|---------|
| ECO-176532 | A | 1 | PRODUCTION RELEASE | DAH | DAH | GILLETT | 04APR18 |

NOTES:

- ALL DIMENSIONS ARE REFERENCE, UNLESS SPECIFICALLY TOLERANCED.
- REFER TO CIRCUIT BREAKER OUTLINE DRAWING FOR ELECTRICAL STUB-UP AREA FOR SPECIFIC BREAKERS.
- CONTROL INTERFACE CONNECTIONS SHOULD BE MADE WITH FLEXIBLE CONNECTIONS.
- Ø21 (0.81) HOLES MARKED BY FOR SECURING TO MOUNTING SURFACE. HOLES IN GENERATOR SET BASE AT THESE LOCATIONS ARE INTENDED FOR ATTACHMENT TO THE MOUNTING SURFACE. IF GENERATOR SET IS MOUNTED ON A FUEL TANK, REFER TO FUEL TANK OUTLINE DRAWING FOR LOCATION OF TANK ATTACHMENT POINTS.
- REFER TO GENSET OR FUEL TANK FOUNDATION OUTLINES FOR ELECTRICAL, FUEL AND OTHER FOUNDATION SPECIFICS.
- GENSET SUPPLIED WITH FLEXIBLE FUEL LINES THAT CAN BE CONNECTED TO ENGINE INTERFACE POINTS.
 - FUEL SUPPLY LINE: 670 [26] LONG WITH 1/4 INCH NPT MALE TERMINATION.
 - FUEL RETURN LINE: 930 [37] LONG WITH 1/4 INCH NPT MALE TERMINATION.
- OIL DRAIN EXTENSION: 5/8 INCH HOSE I.D.
- FOR IBC SEISMIC CERTIFIED INSTALLATIONS, SEE GENSET IBC SEISMIC INSTALLATION REQUIREMENTS DRAWING.
- DRY WEIGHT = WET WEIGHT - 38.5 KG (85 LB).
- 6X Ø7.3 HOLES FOR CUSTOMER-SUPPLIED COOLING EXHAUST AIR DUCT ADAPTER.
- FUEL SUPPLY AND RETURN STUB-UP AREA.

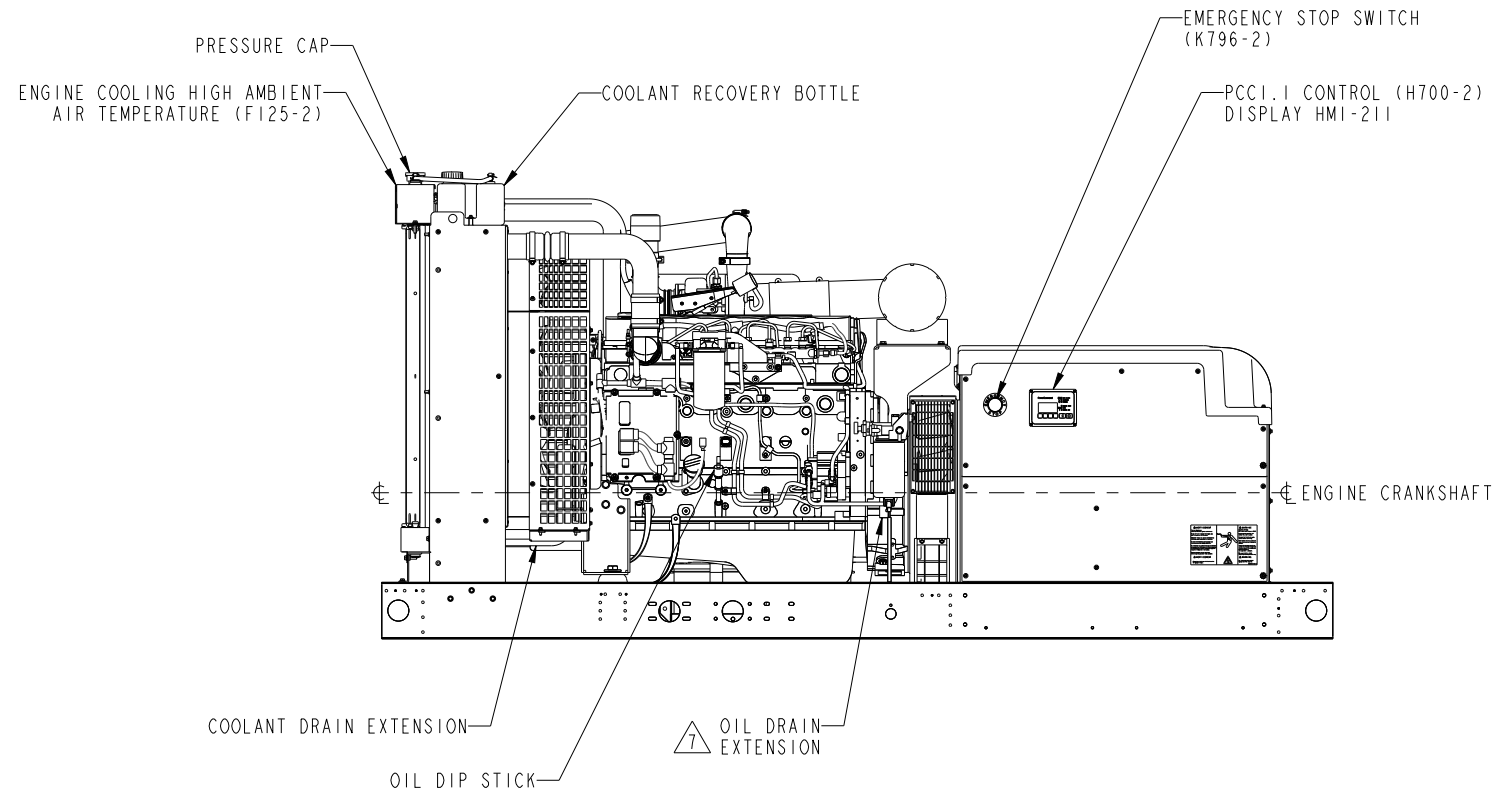
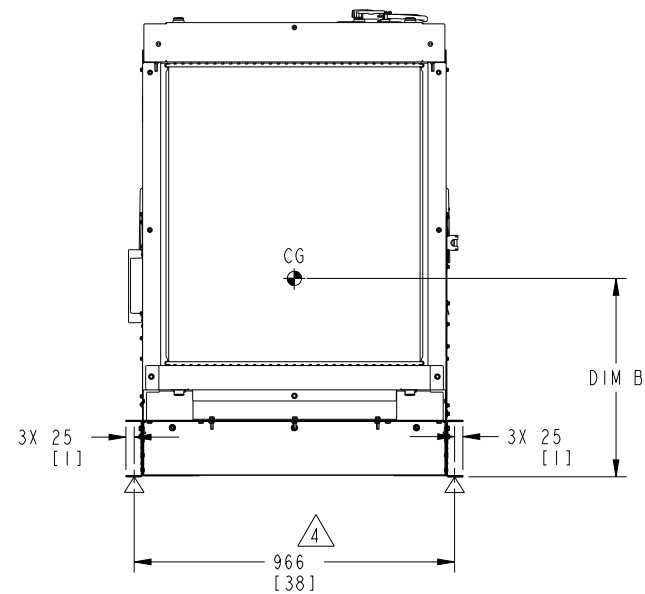


| ALT DATA SHEET # | DIM A | DIM B | GENSET WET WEIGHT | |
|------------------|-------|-------|-------------------|------|
| | | | KG | LB |
| ADS-208 | 1414 | 504 | 1340 | 2955 |
| ADS-209 | 1443 | 502 | 1390 | 3064 |
| ADS-210 | 1470 | 500 | 1442 | 3179 |
| ADS-211 | 1493 | 499 | 1480 | 3262 |
| ADS-212 | 1526 | 495 | 1583 | 3491 |
| ADS-213 | 1526 | 495 | 1583 | 3491 |

C125D6D, C150D6D, C175D6D, C200D6D

| | | | | | | |
|---|--|------------------|--|---|--------------------------|------------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SW TO | DWN D HOFMEISTER | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | CKD D HOFMEISTER | APVD D GILLETT | | OUTLINE, GENSET | |
| DATE 04APR18 | | FIRST USED ON | | SITE CODE | PGF | |
| ANG TOL ± 1.0° | | SCALE 3:32 | THIS DOCUMENT (AND THE INFORMATION SHOWN THEREON) IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN HARD COPY OR ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC. | FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009 | FILE D | A060C858 |
| | | | ARROW | | | CAD SHEET 1 of 2 |

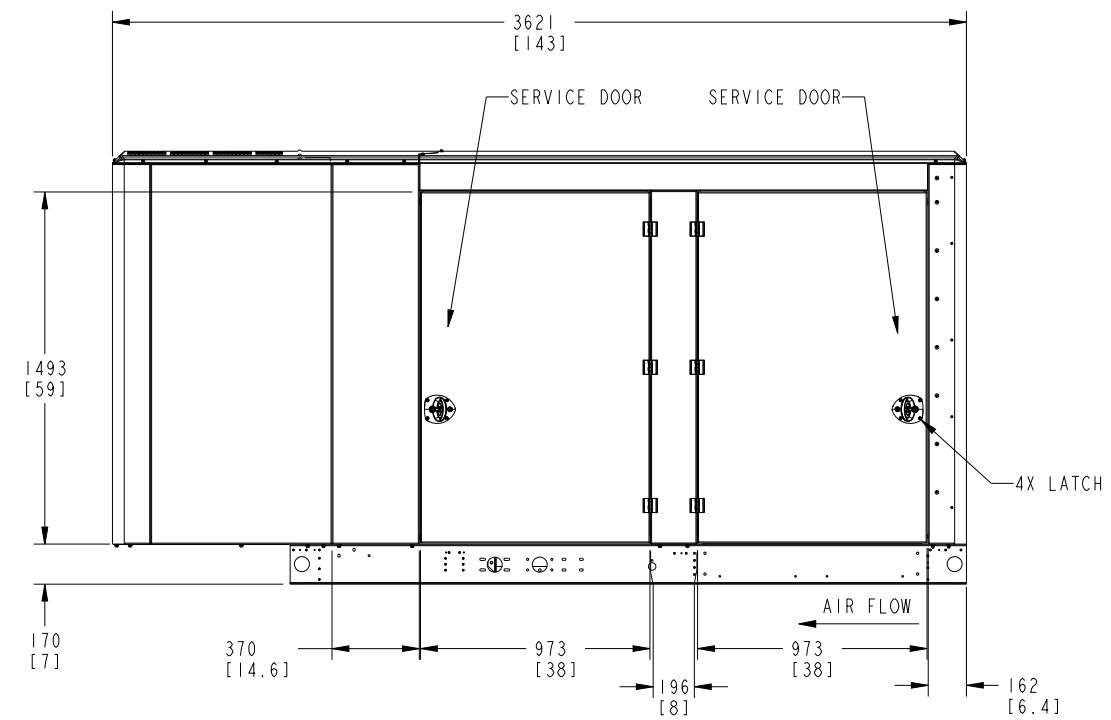
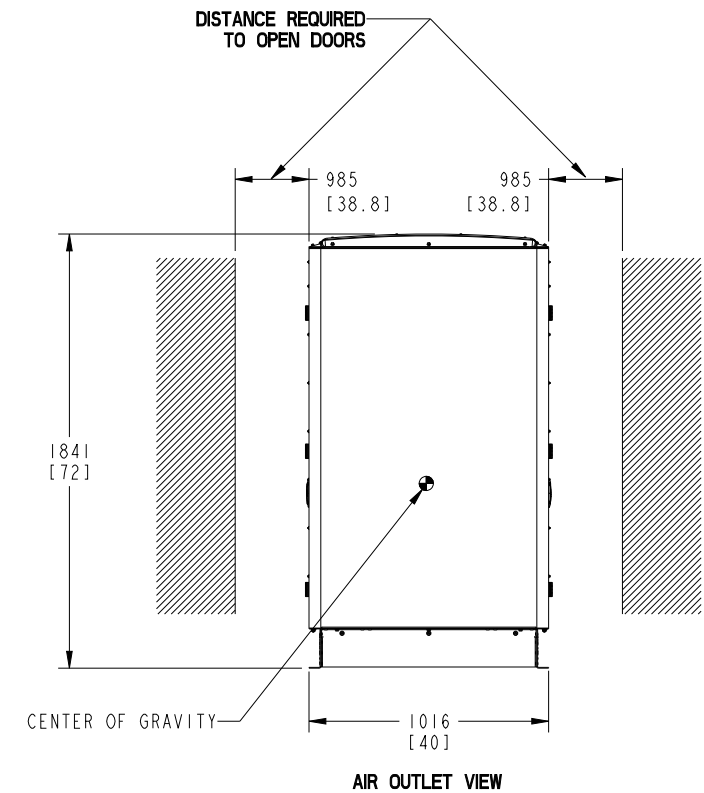
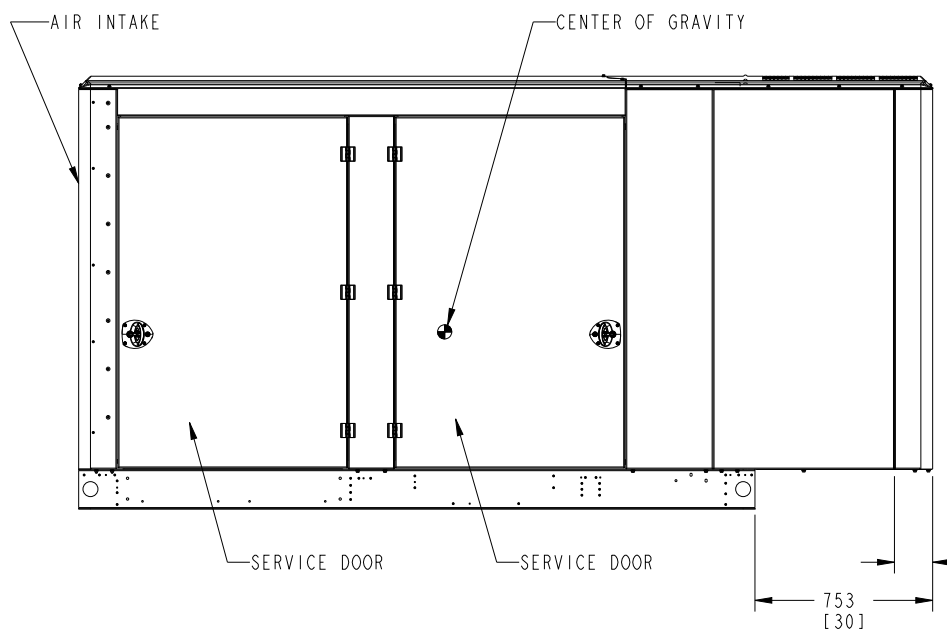
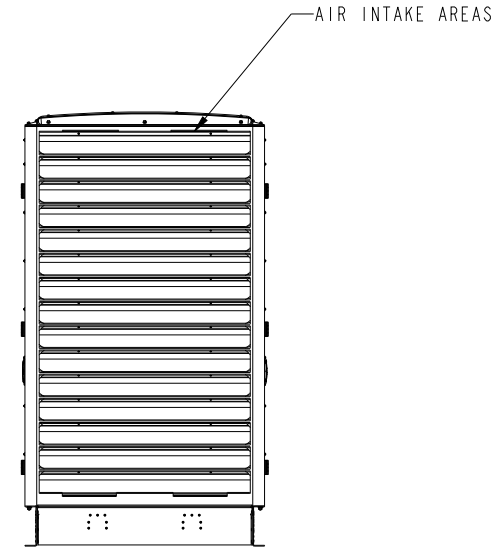
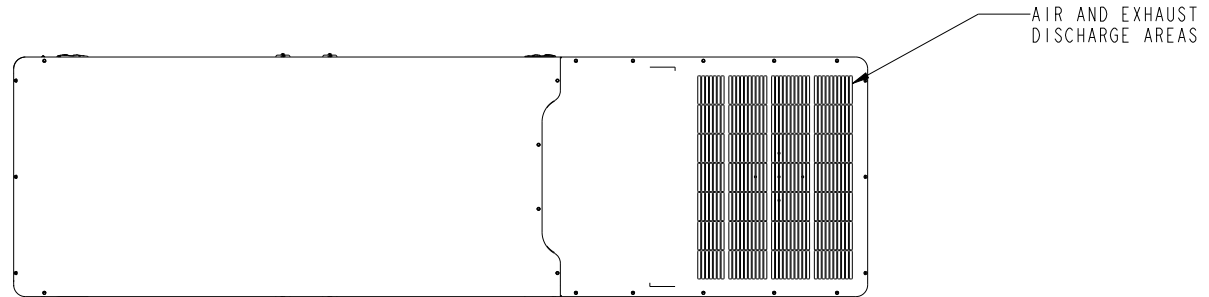
| REL NO | REV | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|---------|---------|
| ECO-176532 | A | 1 | PRODUCTION RELEASE | DAH | DAH | GILLETT | 04APR18 |
| | | | | | | | |



| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SHW TO | DWN D HOFMEISTER | | CUMMINS POWER GENERATION | | | | | | | | | | | | | | | | | |
|---|-------------|-------------|------------------|-------|--------------------------|-------------|----------|-----------|-------------|------------|-------------|-------------|--|-------------|-------------|------------|---|--|--|---------------------------------------|-----------------|---------------------|
| DO NOT SCALE PRINT | | | CKD D HOFMEISTER | | OUTLINE, GENSET | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <th>DIM</th> <th>TOL</th> <th>NOTE</th> </tr> <tr> <td>X ± 1</td> <td>0.00-4.99</td> <td>+0.15/-0.08</td> </tr> <tr> <td>.X ± 0.8</td> <td>5.00-9.99</td> <td>+0.20/-0.10</td> </tr> <tr> <td>.XX ± 0.38</td> <td>10.00-17.49</td> <td>+0.25/-0.13</td> </tr> <tr> <td></td> <td>17.50-24.99</td> <td>+0.30/-0.13</td> </tr> </table> | DIM | TOL | NOTE | 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 | SCALE 3:32 | <small>THIS DOCUMENT (AND THE INFORMATION SHOWN THEREON) IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN HARD COPY OR ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.</small> | | <small>FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009</small> | <small>FIRST USED ON</small> ARROW | PGF A060C858 | CAD SHEET 2 of 2 |
| DIM | TOL | NOTE | | | | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | |

| REL NO | REV | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|---------|---------|
| ECO-176502 | A | 1 | PRODUCTION RELEASE | DAH | DAH | GILLETT | 29MAR18 |
| | | | | | | | |

- NOTES:
- DIM [] IN INCHES
 - WITH F231-2 ENCLOSURE INSTALLED THE GENERATOR SET WEIGHT INCREASES BY 179 KG (395 LBS).
WITH F217-2 ENCLOSURE INSTALLED THE GENERATOR SET WEIGHT INCREASES BY 195 KG (429 LBS).
 - WITH F231-2 INSTALLED THE CENTER OF GRAVITY OF THE GENERATOR SET SHIFTS APPROXIMATELY 42 MM (1.7 INCH) TOWARDS THE AIR DISCHARGE END AND 61MM (2.4 INCH) HIGHER.
WITH F217-2 INSTALLED THE CENTER OF GRAVITY OF THE GENERATOR SET SHIFTS APPROXIMATELY 57 MM (2.2 INCH) HIGHER.
CHANGES IN CENTER OF GRAVITY LISTED ARE FOR GENERATOR SETS WITHOUT SUBBASE FUEL TANKS.
REFER TO OPEN GENERATOR SET OUTLINE DRAWING FOR CG LOCATIONS PRIOR TO ENCLOSURE INSTALLATION.

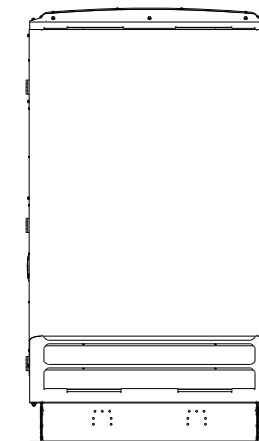
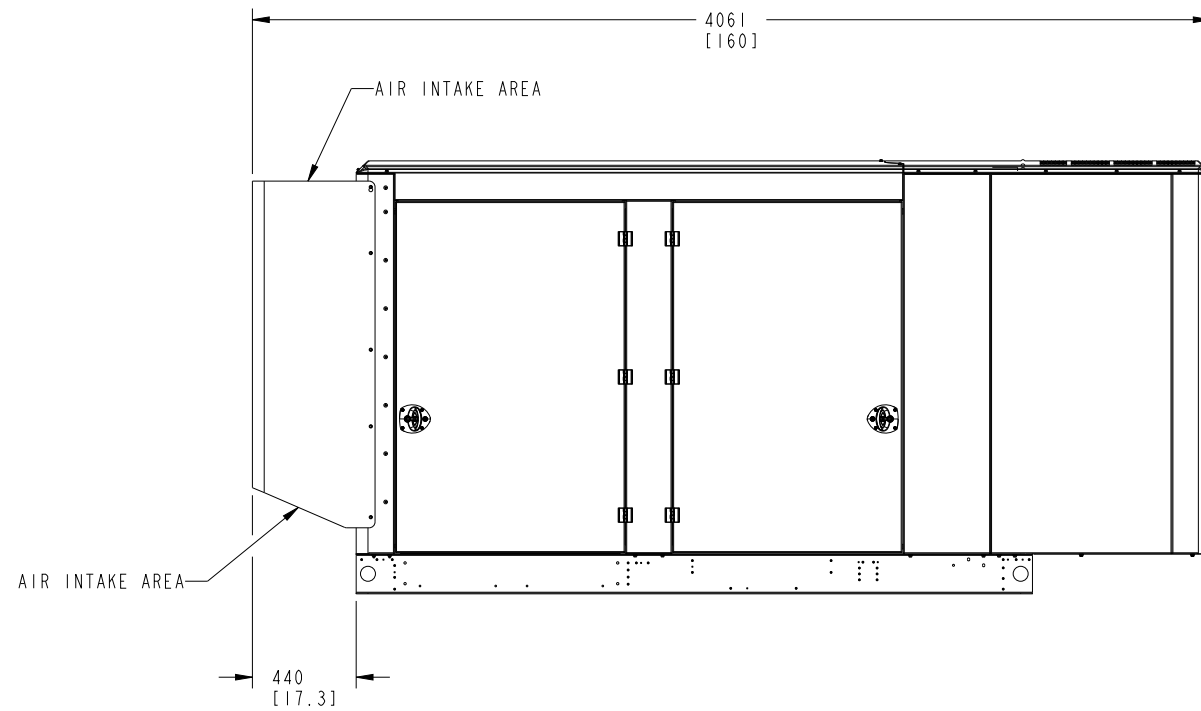
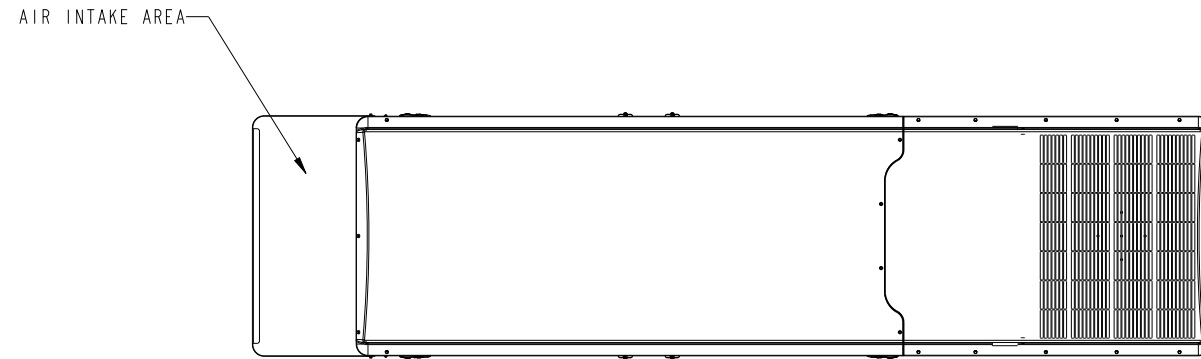


C125D6D, C150D6D, C175D6D, C200D6D

F231-2 ENCLOSURE CONFIGURATION

| | | | | |
|---|--|--|-------------------|-------------------------------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SHW TO: A055V240 | DWN: D HOFMEISTER | CUMMINS POWER GENERATION |
| DO NOT SCALE PRINT | | CKD: D HOFMEISTER | APVD: D GILLETT | |
| DATE: 29MAR18 | | FIRST USED ON: ARROW | | SITE CODE: PGF |
| ANG TOL: ± 1.0° | | SCALE: 1/15 | | A060C609 |
| <small>THIS DOCUMENT (AND THE INFORMATION SHOWN THEREON) IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN HARD COPY OR ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.</small> | | <small>FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009</small> | | CAD SHEET: 1 of 2 |

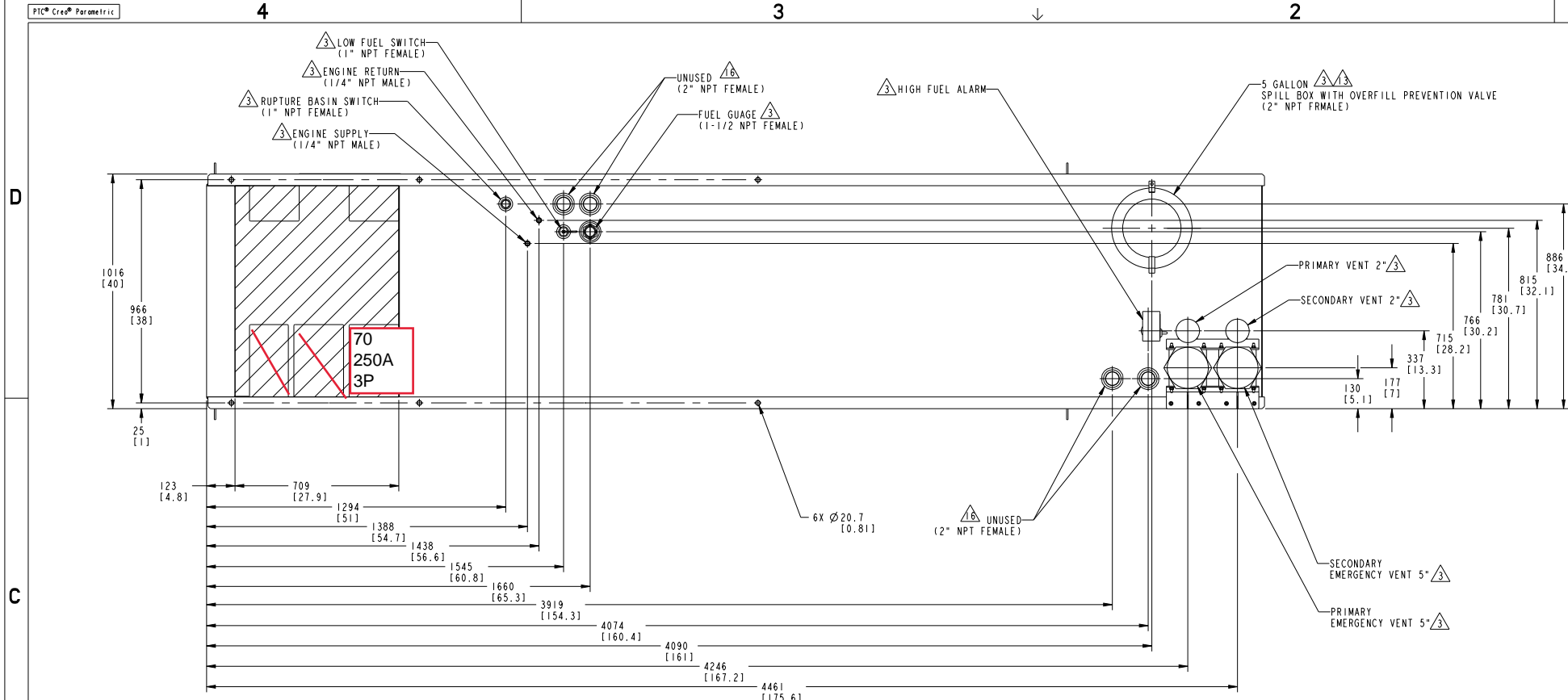
| REL NO | REV | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|---------|---------|
| ECO-176502 | A | 1 | PRODUCTION RELEASE | DAH | DAH | GILLETT | 29MAR18 |
| | | | | | | | |
| | | | | | | | |



F217-2 ENCLOSURE CONFIGURATION

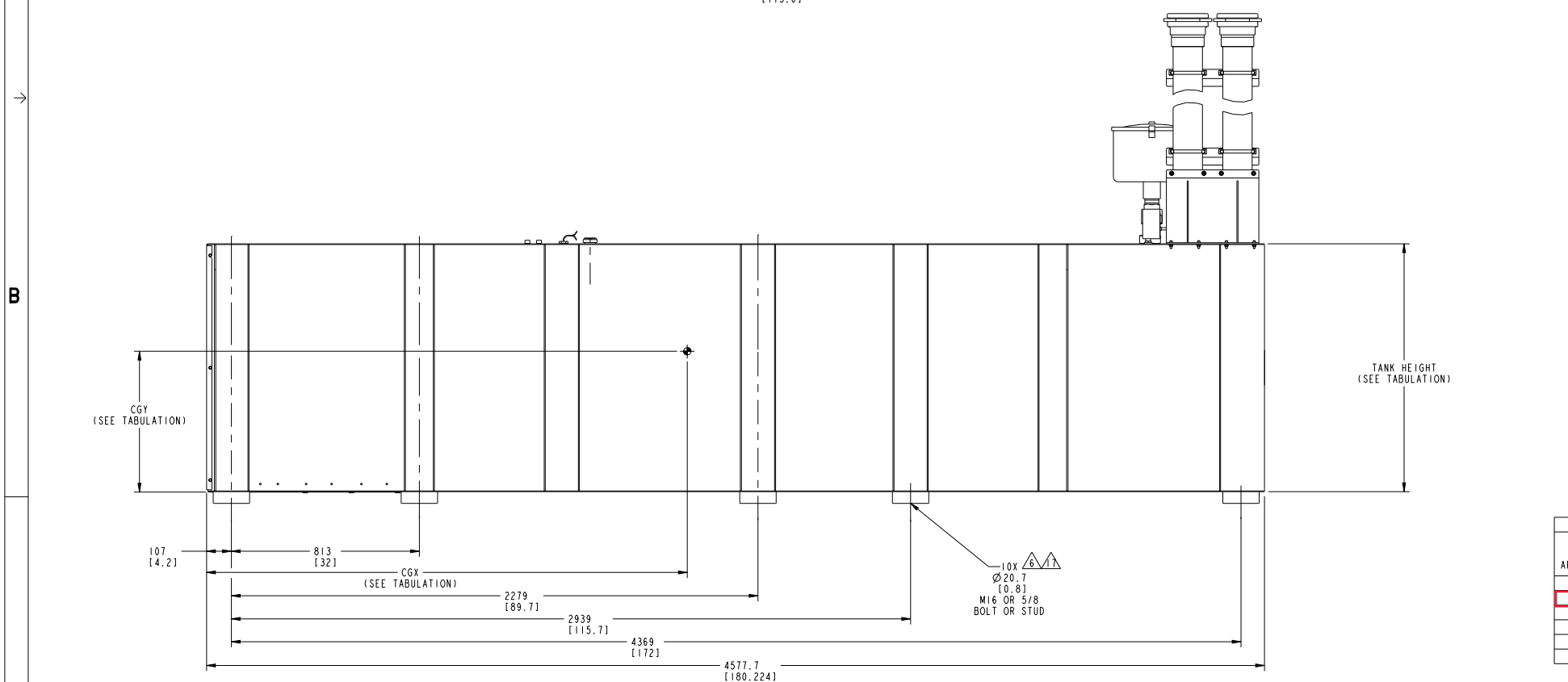
**REFER TO PAGE 1 (F231-2 ENCLOSURE) FOR
OTHER F217-2 ENCLOSURE DIMENSIONS**

| | | | | | | |
|---|-------------------------|--|------------------|---|--------------------------|------------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SHW TO A055V240 | DWN D HOFMEISTER | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | CKD D HOFMEISTER | APVD D GILLETT | | OUTLINE, ENCLOSURE | |
| DIM | TOL | DATE 29MAR18 | SITE CODE | | | |
| X ± 1 | 0.00- 4.99 +0.15/-0.08 | FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009 | PGF | D | A060C609 | CAD SHEET 2 of 2 |
| .X ± 0.8 | 5.00- 9.99 +0.20/-0.10 | | ARROW | | | |
| .XX ± 0.38 | 10.00-17.49 +0.25/-0.13 | | | | | |
| | 17.50-24.99 +0.30/-0.13 | | | | | |
| ANG TOL ± 1.0° | SCALE 1/15 | THIS DOCUMENT (AND THE INFORMATION SHOWN THEREON) IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN HARD COPY OR ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC. | | | | |



| REV NO | REV | NO | REVISION | NO | CD | APPD | DATE |
|------------|-----|----|--------------------|---------|--------------|---------|------|
| ECO-170441 | A | 1 | PRODUCTION RELEASE | DAH/DAH | STAFFENHAGEN | 27FEB18 | |

- NOTES:
- TANKS ARE UL142 LISTED. SECONDARY CONTAINMENT FUEL TANK. REFER TO TANK LABELS AND LOCAL CODE TO DETERMINE VENTING REQUIREMENTS FOR BOTH COMPARTMENTS.
 - SUBBASE FUEL TANK MOUNTING. EXCESSIVE TWISTING OF THE FUEL TANK, 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 APPLICATION MANUAL T030 FOR GENERAL SET MOUNTING GUIDELINES.
 - AFTER PLACING SET ON FOUNDATION, VERIFY ALL MOUNTING PADS CONTACT FOUNDATION.
 - THERE ARE SHIMS ATTACHED TO EACH FUEL TANK. THESE ARE INTENDED TO FILL ANY GAP BETWEEN THE MOUNTING PADS AND FOUNDATION.
 - INSERT THE MAXIMUM HEIGHT STACK OF SHIMS THAT WILL SLIDE INTO THE GAP.
 - TIGHTEN TANK HOLD DOWN MOUNTING FASTENERS.
- △ INDICATES PIPE SIZE OF FEATURE OR OPTION INDICATED.
 4. DIMENSIONS IN [] ARE IN INCHES.
 △ FOR IBC SEISMIC CERTIFIED INSTALLATIONS, SEE GENSET IBC SEISMIC INSTALLATION REQUIREMENTS DRAWING.
 △ FUEL TANK HAS A FLANGE THICKNESS OF UP TO 10 mm [0.394 in]. ALLOW EXTRA LENGTH ON HARDWARE FOR UNEVENNESS OF MOUNTING SURFACE. RISER FEATURE WILL ADD ADDITIONAL 51 mm [2 in].
 △ FUEL TANK PERIMETER IS SHOWN. FOUNDATION SHOULD BE EXTENDED BEYOND THIS PERIMETER. SEE (T030) APPLICATION MANUAL.
 △ INSTALLATION & REMOVAL LIFTING AND SERVICE ACCESS CLEARANCE (SUGGESTED MINIMUM).
 △ REMOVABLE STUB-UP ACCESS PANEL.
 △ ELECTRICAL STUB-UP AREA WITH FUEL TANK RISER FEATURE INSTALLED.
 △ MAINTAIN MIN 51 mm [2 in] CLEARANCE ABOVE E-VENT - (SEE SHEET 2).
 12. WEIGHT AND CENTER OF GRAVITY INFORMATION IS ESTIMATED AND CHANGES WITH TANK FEATURE INSTALLATION.
 △ FILL CAP LOCATED HERE IF OVERFILL PREVENTION VALVE IS NOT INSTALLED.
 △ TANK ONLY.
 △ TANK WITH FUEL AND ACCESSORIES.
 △ PORT SEALED WITH REMOVABLE STEEL PLUG.
 △ SHOWN WITH RISERS.



| GENSET MODEL APPLICATION | TANK FEATURE CODE/RUN TIME | | | | |
|--------------------------|----------------------------|-------------|-------------|--------------|--------------|
| | C301-2 24HR | C303-2 48HR | C305-2 72HR | C319-2 24 HR | C320-2 48 HR |
| C125D6D | A056Y392 | A056Y394 | A056Y394 | ----- | ----- |
| C150D6D | A056Y392 | A056Y394 | ----- | ----- | A056Y394 |
| C175D6D | A056Y392 | A056Y394 | ----- | ----- | A056Y394 |
| C200D6D | A056Y392 | A056Y394 | ----- | ----- | A056Y394 |
| C230D6D | A056Y394 | ----- | ----- | A056Y394 | ----- |
| C250D6D | A056Y394 | ----- | ----- | A056Y394 | ----- |

| TANK NUMBER | TANK HEIGHT | VENT EXTENSIONS HEIGHT WITH 10" PIPES MM [INCH] | VENT EXTENSIONS HEIGHT WITH 4" PIPES MM [INCH] | VENT HEIGHT WITH NO EXTENSIONS MM [INCH] | TANK VOLUME | | | | WEIGHT | | | | CG_X | | | | CG_Y | | | | TANK VOLUME BASED ON DISTANCE FROM BOTTOM OF TANK | |
|-------------|-------------|---|--|--|-------------|--------|--------|--------|---------|------|---------|------|---------|-----|---------|-----|---------|------|---------|------|---|-------------|
| | | | | | TOTAL | | USABLE | | MINIMUM | | MAXIMUM | | MINIMUM | | MAXIMUM | | MINIMUM | | MAXIMUM | | LITER/MM | GALLON/INCH |
| | | | | | LITER | GALLON | LITER | GALLON | KG | LB | KG | LB | MM | IN | MM | IN | MM | IN | MM | IN | | |
| A056Y392 | 533 [21] | 2556 [101] | 737 [29] | 65 [2.6] | 1417 | 374 | 1330 | 351 | 671 | 1477 | 1802 | 3969 | 2633 | 104 | 2613 | 103 | 260 | 10.2 | 264 | 10.4 | 2.9 | 19.4 |
| A056Y394 | 1073 [42] | 3106 [122] | 1277 [50] | 65 [2.6] | 2975 | 785 | 2793 | 737 | 1045 | 2302 | 3421 | 7555 | 2440 | 96 | 2553 | 100 | 483 | 19.0 | 520 | 20.5 | 2.9 | 19.4 |

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS

DO NOT SCALE PRINT

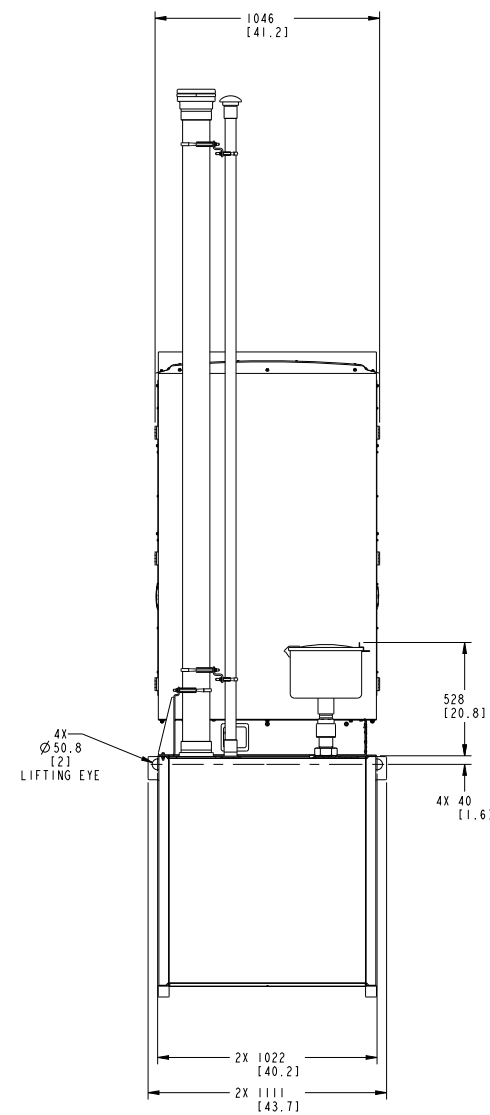
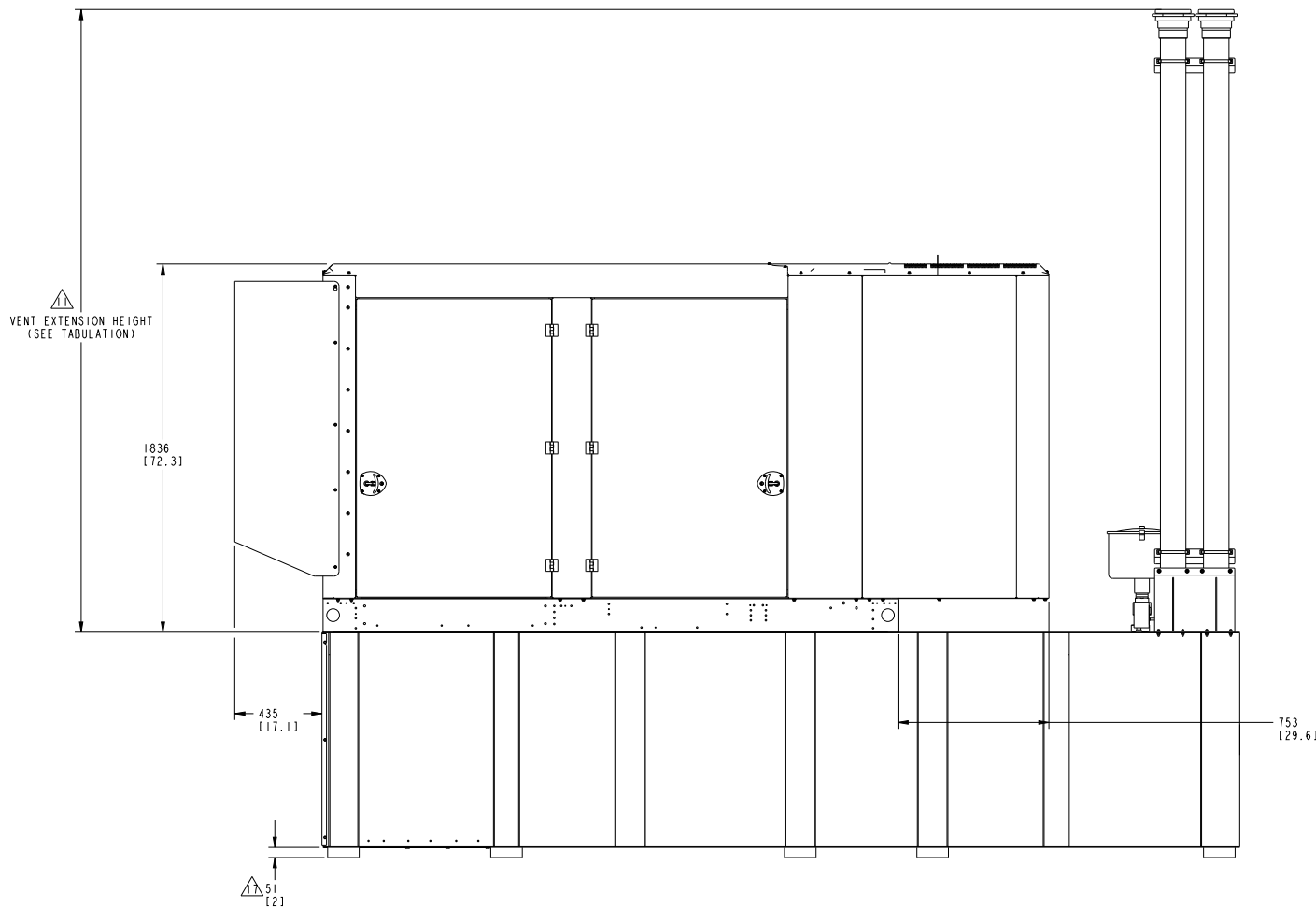
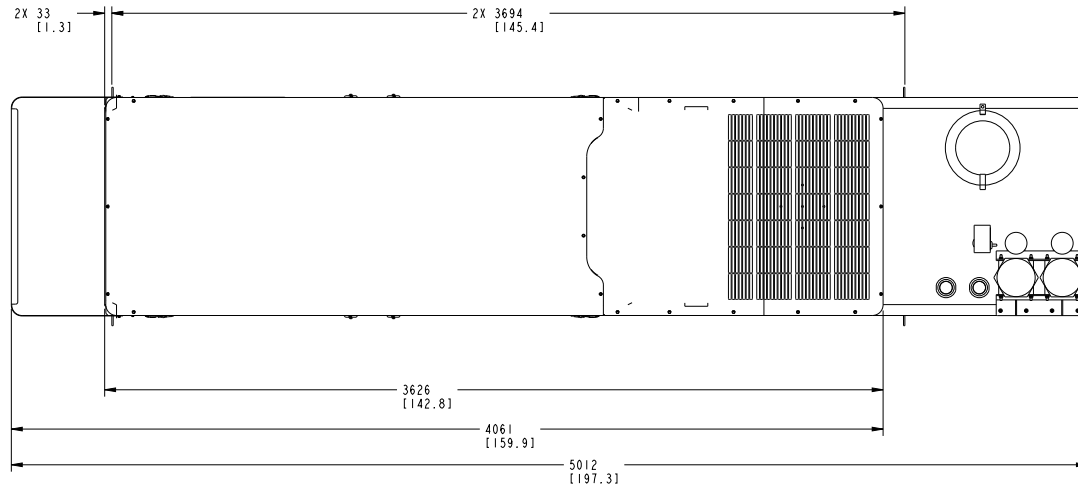
DIM: X ± 1 0.00 - 4.99 +0.15/-0.00
 Y ± 0.8 5.00 - 9.99 +0.20/-0.10
 Z ± 0.8 10.00 - 17.49 +0.25/-0.13
 R ± 0.38 17.50 - 24.99 +0.30/-0.13

APPR D HOFMEISTER
 APPR G STAFFENHAGEN
 DATE 27FEB18

CUMMINS POWER GENERATION
 OUTLINE, TANK REGIONAL
 SITE CODE
 PGF E A057P198

ANG TOL SCALE 1:8
 DATE 27FEB18
 SHEET 1 OF 3

| REV NO | REV | REVISION | NO | CHK | APPD | DATE |
|------------|-----|--------------------|-----|-----|--------------|---------|
| ECO-170441 | A | PRODUCTION RELEASE | DAH | DAH | STAFFENHAGEN | 27FEB18 |
| | | | | | | |
| | | | | | | |



| | | | |
|---|-------|---------------------|--------------------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | APP D HOFMEISTER | CUMMINS POWER GENERATION |
| DO NOT SCALE PRINT | | CHK D HOFMEISTER | |
| ANG TOL | SCALE | APPD G STAFFENHAGEN | OUTLINE, TANK |
| ± 1.0° | 1:8 | DATE 27FEB18 | REGIONAL |
| DATE 27FEB18 | | PGF | APPD E A057P198 |
| CUMMINS POWER GENERATION | | CAD SHEET 2 of 3 | |

| REV NO | REV | NO | REVISION | NO | CHK | APPD | DATE |
|------------|-----|----|--------------------|-----|-----|--------------|---------|
| ECO-170441 | A | 1 | PRODUCTION RELEASE | DAH | DAH | STAFFENHAGEN | 27FEB18 |

D

D

C

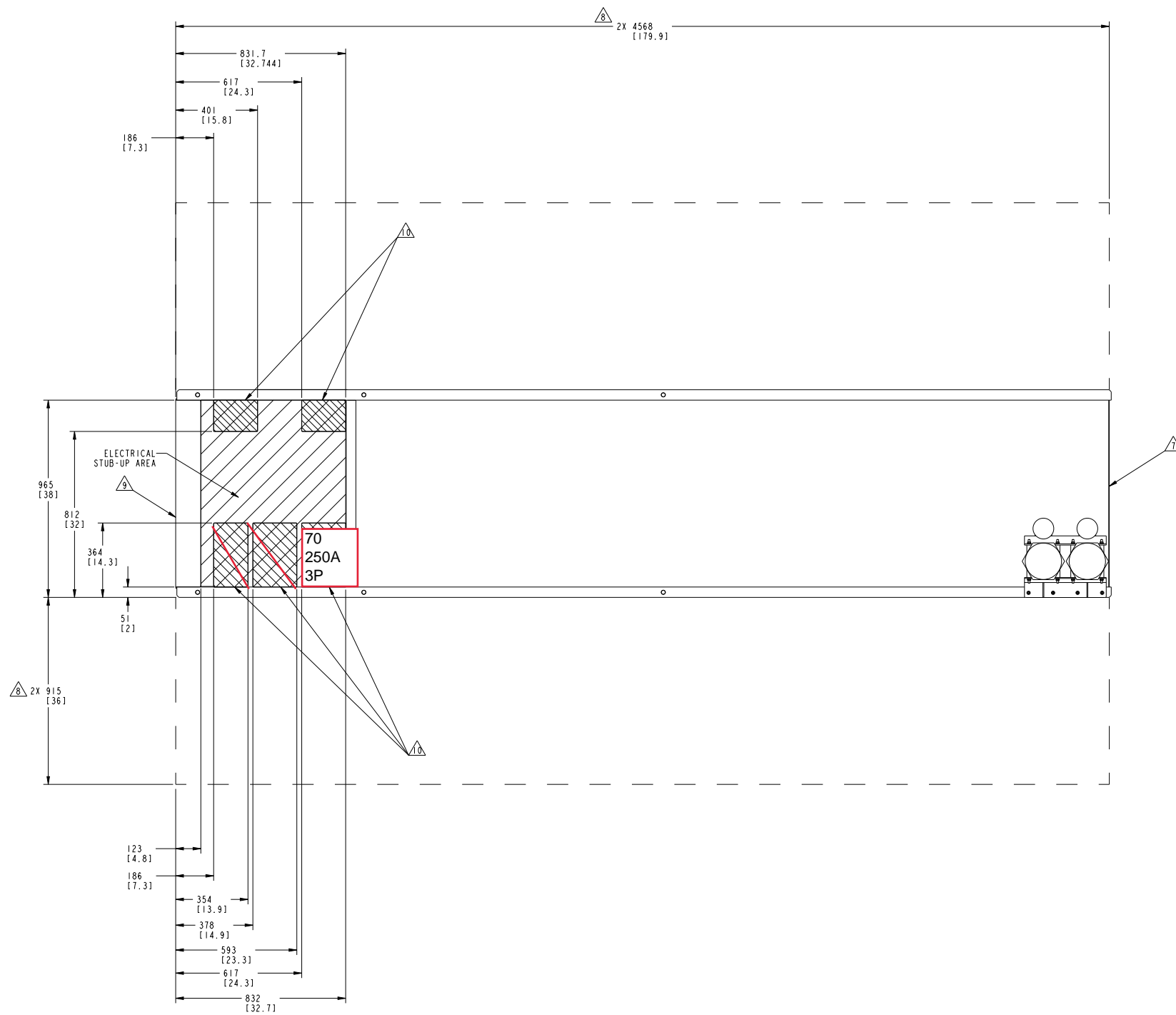
C

B

B

A

A



| | | | |
|---|-------|----------------------|--------------------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | APPD: D HOFMEISTER | CUMMINS POWER GENERATION |
| DO NOT SCALE PRINT | | CHK: D HOFMEISTER | |
| ANG TOL | SCALE | APPD: G STAFFENHAGEN | OUTLINE, TANK REGIONAL |
| ± 1.0° | 1:8 | DATE: 27FEB18 | |
| DATE: 27FEB18 | | SITE CODE: REGIONAL | PGF: E |
| PART NUMBER: A057P198 | | DATE: 27FEB18 | CAD SHEET: 3 of 3 |

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.™





VMC GROUP
THE POWER OF TOGETHER™



CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS



Certification No.

VMA-51071-01C (Revision 10)

Expiration Date: 6/30/2024

Certification Parameters:

The nonstructural products (mechanical and/or electrical components) listed on this certificate are CERTIFIED¹ FOR SEISMIC APPLICATIONS in accordance with the following building code² releases.

IBC 2018, 2015, 2012

The following model designations, options, and accessories are included in this certification. Reference report number VMA-51071-01 as issued by The VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

**Cummins Power Generation, Inc.; Diesel Gensets
Commercial Series; 10kW-200kW**

The above referenced equipment is APPROVED for seismic application when properly installed³, used as intended, and contains a Seismic Certification Label referencing this Certificate of Compliance⁴. As limited by the tabulated values, below grade, grade, and roof-level installations, installations in essential facilities, for life safety applications, and/or of equipment containing hazardous contents are permitted and included in this certification with an Equipment Importance Factor assigned as $I_p=1.5$. The equipment is qualified by successful seismic shake table testing at the nationally recognized Dynamic Certification Laboratories under the witness of the ISO Accredited Product Certification Agency, the VMC Group.

| Certified Seismic Design Levels | | | |
|---------------------------------|---|-------------------------------|-------------------------------|
| Certified IBC | Importance $I_p \leq 1.5$ Soil Classes A-E Risk Categories I-IV Design Categories A-F | $z/h \leq 1.0$ | $z/h = 0.0$ |
| | | $S_{DS} \leq 2.000 \text{ g}$ | $S_{DS} \leq 2.500 \text{ g}$ |

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

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

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

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

thevmcgroup.com





CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certified Product Table:

| Model | Power Rating | RPM | Max Length (in) | Max Width (in) | Max Height (in) | Max Weight with Enclosure (lbs.) | S _{DS} (g) @ z/h = 0.0 | S _{DS} (g) @ z/h = 1.0 |
|-----------------|--------------|------|-----------------|----------------|-----------------|----------------------------------|---------------------------------|---------------------------------|
| C10 D6 | 10 kW | 1800 | 98 | 34 | 88 | 4300 | 2 | 2 |
| C15 D6 | 15 kW | | | | | 4400 | | |
| C20 D6 | 20 kW | | 4470 | | | | | |
| C25 D6 | 25 kW | | 5890 | | | | | |
| C30 D6 | 30 kW | | 5930 | | | | | |
| C35 D6 | 35 kW | | 5960 | | | | | |
| C40 D6 | 40 kW | | 6140 | | | | | |
| C50 D6 | 50 kW | | 6260 | | | | | |
| C60 D6 | 60 kW | | 6260 | | | | | |
| C50 D6C | 50 kW | | 170 | | | 40 | | |
| C60 D6C | 60 kW | 8990 | | | | | | |
| C80 D6C | 80 kW | 9040 | | | | | | |
| C100 D6C | 100 kW | 9216 | | | | | | |
| C125 D6C | 125 kW | 9300 | | | | | | |
| C125 D6D | 125 kW | 9300 | | | | | | |
| C150 D6D | 150 kW | 180 | 71 | 111 | 14300 | | | |
| C175 D6D | 175 kW | | | | | | | |
| C200 D6D | 200 kW | | | | | | | |

| Group | Type | S _{DS} (z/h=0) | S _{DS} (z/h=1) | A _{Flex-H} | A _{Rig-H} | A _{Flex-V} | A _{Rig-V} | F _p /W _p |
|---------|-------|-------------------------|-------------------------|---------------------|--------------------|---------------------|--------------------|--------------------------------|
| Seismic | AC156 | 2.00 | 2.00 | 3.20 | 2.40 | 1.33 | 0.53 | 1.44 |
| | | 2.50 | | | | 1.67 | 0.67 | |

This certification includes the open generator set and the enclosed generator set when installed with or without the sub-base tank. This certification also includes the sub-base tank as a stand-alone accessory. The generator set and included options shall be a catalogue design and factory supplied. The generator set and applicable options shall be installed and attached to the building structure per the manufacturer supplied seismic installation instructions. This certification excludes all non-factory supplied accessories, including but not limited to mufflers, isolation/restraint devices, remote control panels, remote radiators, pumps and other electrical/mechanical components.



VMA-51071-01C (Revision 10)
Issue Date: Friday, July 3, 2015
Revision Date: Friday, December 3, 2021
Expiration Date: Sunday, June 30, 2024



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THE POWER OF TOGETHER™



CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Notes & Comments:

1. All equipment listed herein successfully passed the seismic acceptance criteria for shake testing non-structural components and systems as set forth in the ICC AC-156. The Test Response Spectrum (TRS) enveloped the Required Response Spectrum (RRS) for all units tested. The tested units were representative sample(s) of a contingent of models and all remained captive and structurally sound after the seismic shake simulation. The units also remained functionally operational after the simulation testing as functional testing was completed by the equipment manufacturer before and after the seismic simulations. Although a seismic qualified unit inherently contains some wind resisting capacity, that capacity is undetermined and is excluded from this certification. Snow/Ice loads have been neglected and thus limit the unit to be installed both indoors (covered by an independent protective structure) and out of doors (exposed to accumulating snow/ice) for ground snow loads no greater than 30 psf for all applications.
2. The following building codes are addressed under this certification:
IBC 2018 referencing ASCE7-16 and ICC-ES AC-156
IBC 2015 referencing ASCE7-10 and ICC-ES AC-156
IBC 2012 referencing ASCE7-10 and ICC-ES AC-156
3. Refer to the manufacturer supplied installation drawings for anchor requirements and mounting considerations for seismic applications. Required anchor locations, size, style, and load capacities (tension and shear) may be specified on the installation drawings or specified by a 3rd party. Mounting requirement details such as anchor brand, type, embedment depth, edge spacing, anchor-to-anchor spacing, concrete strength, special inspection, wall design, and attachment to non-building structures must be outlined and approved by the Engineer of Record for the project or building. Structural walls, structural floors, and housekeeping pads must also be seismically designed and approved by the project or building Structural Engineer of Record to withstand the seismic anchor loads as defined on the installation drawings. The installing contractor is responsible for ensuring the proper installation of all anchors and mounting hardware.
4. For this certificate and certification to remain valid, this certificate must correspond to the "Seismic Certification Label" found affixed to the unit by the factory. The label ensures the manufacturer built the unit in conformance to the IBC seismic design criteria set forth by the Certified Seismic Qualification Agency, the VMC Group, and meets the seismic design levels claimed by this certificate.
5. Mechanical, Electrical, and Plumbing connections to the equipment must be flexibly attached as to not transfer load through the connection. The structural integrity of any conduit, cable trays, piping, ductwork and/or flexible connections is the responsibility of others. This certification does not guarantee the equipment will remain compliant to NEMA, IP, UL, or CSA standards after a seismic event.
6. This certificate applies to units manufactured at:
1400 73rd Ave NE, OF 143, Minneapolis, MN 55432
7. This certification follows the VMC Group's ISO-17065 Scheme.

John P. Giuliano, PE
President, VMC Group



VMA-51071-01C (Revision 10)
Issue Date: Friday, July 3, 2015
Revision Date: Friday, December 3, 2021
Expiration Date: Sunday, June 30, 2024



| REL NO | LTR | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|--------------|---------|
| ECO-170731 | A | 1 | PRODUCTION RELEASE | DAH | DAH | STAFFENHAGEN | 05MAR18 |
| | | | | | | | |
| | | | | | | | |

SEISMIC INSTALLATIONS NOTES:

1. THE DESIGN OF POST-INSTALLED ANCHORS IN CONCRETE USED FOR THE COMPONENT ANCHORAGE IS PRE-QUALIFIED FOR SEISMIC APPLICATIONS IN ACCORDANCE WITH "ACI 355.2-07" AND DOCUMENTED IN A REPORT BY A REPUTABLE TESTING AGENCY. (EX. THE EVALUATION SERVICE REPORT ISSUED BY THE INTERNATIONAL CODE COUNCIL)
2. ANCHORS MUST BE INSTALLED TO AN EMBEDMENT DEPTH AS RECOMMENDED IN THE PRE-QUALIFICATION TEST REPORT AS DEFINED IN NOTE 1. FOR "CBC 2013" APPLICATIONS.
3. ANCHORS MUST BE INSTALLED IN MINIMUM 3000 PSI COMPRESSIVE STRENGTH NORMAL WEIGHT STRUCTURAL CONCRETE. CONCRETE AGGREGATE MUST COMPLY WITH "ASTM C33".
4. ANCHORS MUST BE INSTALLED TO THE TORQUE SPECIFICATION AS RECOMMENDED BY THE ANCHOR MANUFACTURER.
5. ANCHORS MUST BE INSTALLED IN LOCATIONS SPECIFIED ON THIS INSTALLATION DRAWING.
6. WASHERS MUST BE INSTALLED AT EACH ANCHOR LOCATION BETWEEN THE ANCHOR HEAD AND EQUIPMENT FOR TENSION LOAD DISTRIBUTION. WASHERS MUST BE TYPE A OR B PLAIN WASHERS MEETING ASME B18.21.1-2009. WASHER SIZE TO MATCH ANCHOR DIAMETER.
7. CONCRETE FLOOR SLAB AND CONCRETE HOUSEKEEPING PADS MUST BE DESIGNED FOR SEISMIC APPLICATIONS IN ACCORDANCE WITH "ACI 318-11".
8. ALL HOUSEKEEPING PAD THICKNESSES MUST BE DESIGNED IN ACCORDANCE WITH THE PRE-QUALIFICATION TEST REPORT AS DEFINED IN NOTE 1 OR A MINIMUM OF 1.5X THE ANCHOR EMBEDMENT DEPTH, WHICHEVER IS LARGEST (UNLESS NOTED OTHERWISE).
9. ALL HOUSEKEEPING PADS MUST BE DOWELLED OR CAST INTO THE BUILDING STRUCTURAL FLOOR SLAB AND DESIGNED FOR SEISMIC APPLICATION PER "ACI 318-11" AND AS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD.
10. FLOOR MOUNTED EQUIPMENT (WITH OR WITHOUT A HOUSEKEEPING PAD) MUST BE INSTALLED TO A STEEL REINFORCED STRUCTURAL CONCRETE FLOOR THAT IS SEISMICALLY DESIGNED AND APPROVED BY THE ENGINEER OF RECORD TO RESIST ALL LOADS FROM EQUIPMENT BEING ANCHORED TO THE FLOOR.
11. COORDINATE REINFORCEMENT OF SUPPORT STRUCTURE WITH EQUIPMENT ANCHOR LOCATIONS.
12. ATTACHING SEISMIC CERTIFIED EQUIPMENT TO FLOOR OTHER THAN THOSE DESIGNED TO ACCEPT THE SEISMIC LOADS FROM CERTIFIED EQUIPMENT BY THE STRUCTURAL ENGINEER OF RECORD IS PROHIBITED.
13. INSTALLATION ONTO A STEEL ROOF STRUCTURE OR MANUFACTURED STEEL CURB SHALL BE COORDINATED WITH THE STRUCTURAL ENGINEER OF RECORD.
14. CONNECTIONS TO THE EQUIPMENT, INCLUDING BUT NOT LIMITED TO CONDUIT, WIRING FROM CABLE TRAYS, OTHER ELECTRICAL SERVICES OR OTHER CONNECTIONS, ARE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR AND BEYOND THE SCOPE OF THIS DOCUMENT. FLEXIBLE ATTACHMENTS MUST BE USED FOR SEISMIC CONNECTIONS TO ISOLATED COMPONENTS OR ISOLATED EQUIPMENT. THE FLEXIBLE ATTACHMENT MUST PROVIDE FOR ENOUGH RELATIVE DISPLACEMENT TO REMAIN CONNECTED TO THE EQUIPMENT AND FUNCTIONAL DURING AND AFTER A SEISMIC EVENT.
15. REFER TO GENSET OUTLINE DRAWINGS FOR WEIGHT, CG AND CONFIGURATION SPECIFICS.

| | | | | | | |
|---|------------|-------------------------|--|----------------------|--------------------------|--|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SM TO: A051N157 | DWN: D HOFMEISTER | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | | CKD: D HOFMEISTER | | INSTALLATION, GENSET | |
| DIM | X ± 1 | 0.00- 4.99 +0.15/-0.08 | APVD: G STAFFENHAGEN | SEISMIC REQUIREMENTS | | |
| | .X ± 0.8 | 5.00- 9.99 +0.20/-0.10 | DATE: 05MAR18 | SITE CODE | | |
| | .XX ± 0.38 | 10.00-17.49 +0.25/-0.13 | | | | |
| | | 17.50-24.99 +0.30/-0.13 | | | | |
| ANG TOL: | ± 1.0° | SCALE: 1/1 | FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, SEE ASME Y14.5M-1994 | PGF | DWG FILE: A058C559 | |
| | | | FIRST USED ON: ARROW | | SHEET 1 OF 6 | |
| | | | | | DWG REV: A | |

| REL NO | LTR | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|--------------|---------|
| ECO-170731 | A | 1 | PRODUCTION RELEASE | DAH | DAH | STAFFENHAGEN | 05MAR18 |
| | | | | | | | |

GRADE MOUNTED GENERATOR SETS

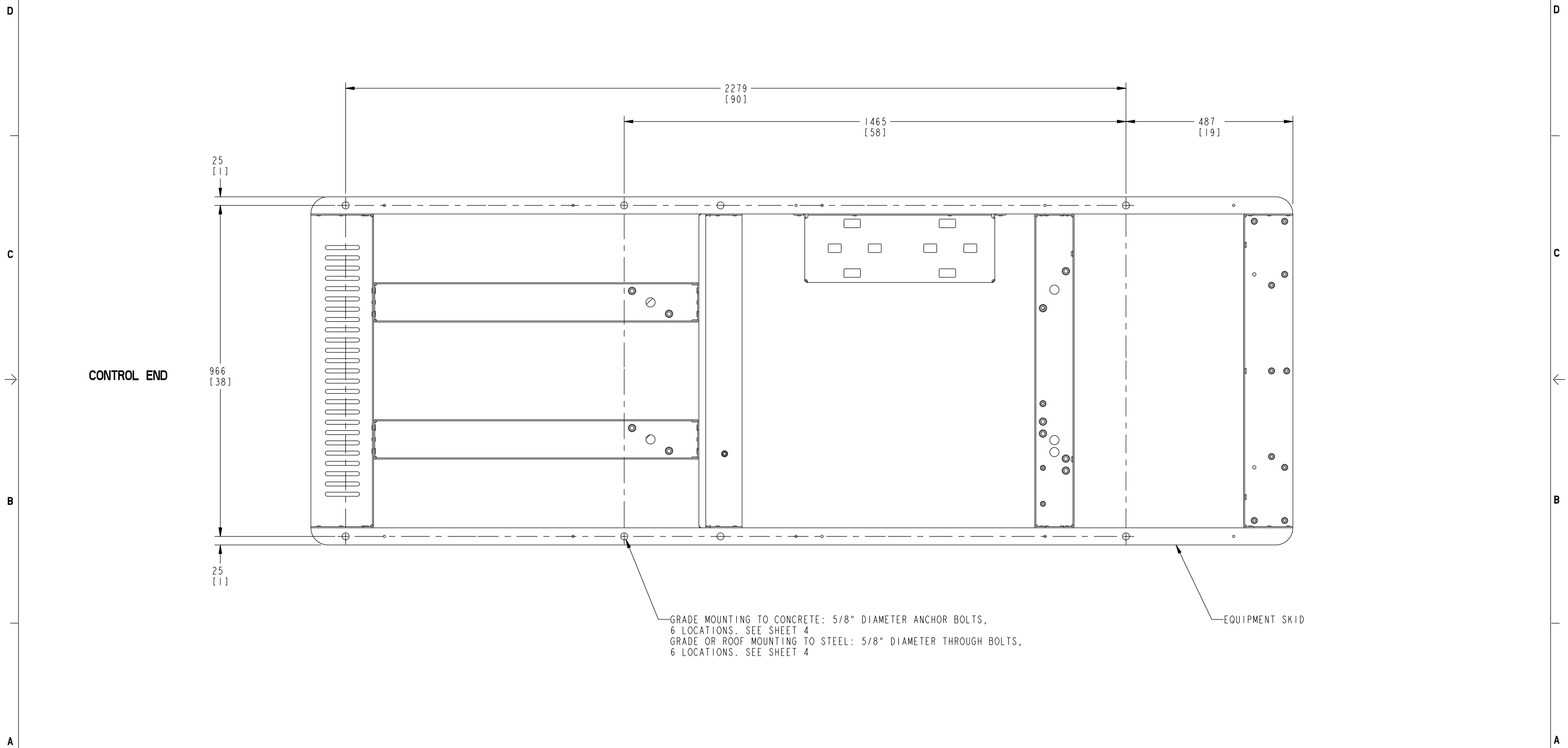
| CUMMINS GENSET MODEL | CONFIGURATION | ATTACHMENT TO CONCRETE | | | | | |
|--|---|---|---|---|------------------|----------------|-----------------------------|
| | | CBC 2018 EVALUATION PARAMETERS | IBC 2018 EVALUATION PARAMETERS | CONCRETE ANCHORS | ANCHOR EMBEDMENT | ANCHOR SPACING | DISTANCE TO NEAREST EDGE |
| C125D6D C150D6D C175D6D C200D6D | GENERATOR SET WITH OR WITHOUT ENCLOSURE NO FUEL TANK | Sds <= 2.5 Ip <= 1.5 ap/Rp <= 1.0/1.5 z/h = 0 Ω = 2.5 | Sds <= 2.5 Ip <= 1.5 ap/Rp <= 1.0/1.5 z/h = 0 Ω = 2.5 | NOTE: TYPE OF ANCHOR, ANCHOR ATTACHMENT SPECIFICS AND MINIMUM SLAB THICKNESS TO BE DESIGNED BY ENGINEER OF RECORD. | | | |

GRADE/ROOF MOUNTED GENERATOR SETS WITH FUEL TANKS

| CUMMINS GENSET MODEL | CONFIGURATION | ATTACHMENT TO STEEL | | |
|--|---|---|---|---|
| | | CBC 2018 EVALUATION PARAMETERS | IBC 2018 EVALUATION PARAMETERS | STEEL BOLTS |
| C125D6D C150D6D C175D6D C200D6D | GENERATOR SET WITH OR WITHOUT ENCLOSURE, WITH FUEL TANKS. FUEL TANKS: A056Y392, A056Y394, A055S002 | Sds <= 2.0 Ip <= 1.5 ap/Rp <= 1.0/1.5 z/h <= 1.0 | Sds <= 2.5 Ip <= 1.5 ap/Rp <= 1.0/1.5 z/h <= 1.0 | (QTY 6) 5/8" DIAMETER ASTM A325N OR A490 BOLTS WITH WASHERS THROUGH THE BASE RAIL MOUNTING HOLES OR FUEL TANK MOUNTING HOLES. |

| | | | | | | |
|---|--|-------------------|----------------------|----------------------|--------------------------|------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SIN TO: A05IN157 | DWN: D HOFMEISTER | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | CKD: D HOFMEISTER | APVD: G STAFFENHAGEN | | INSTALLATION, GENSET | |
| DATE: 05MAR18 | | SITE CODE: PGF | | SEISMIC REQUIREMENTS | | |
| ANG TOL: ± 1.0° | | SCALE: 1/1 | FIRST USED ON: ARROW | DWG FILE: A058C559 | SHEET: 2 of 6 | DWG REV: A |

| REL NO | LTR | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|--------------|---------|
| ECO-170731 | A | 1 | PRODUCTION RELEASE | DAH | DAH | STAFFENHAGEN | 05MAR18 |
| | | | | | | | |
| | | | | | | | |



GRADE MOUNTING TO CONCRETE: 5/8" DIAMETER ANCHOR BOLTS, 6 LOCATIONS. SEE SHEET 4
 GRADE OR ROOF MOUNTING TO STEEL: 5/8" DIAMETER THROUGH BOLTS, 6 LOCATIONS. SEE SHEET 4
 EQUIPMENT SKID

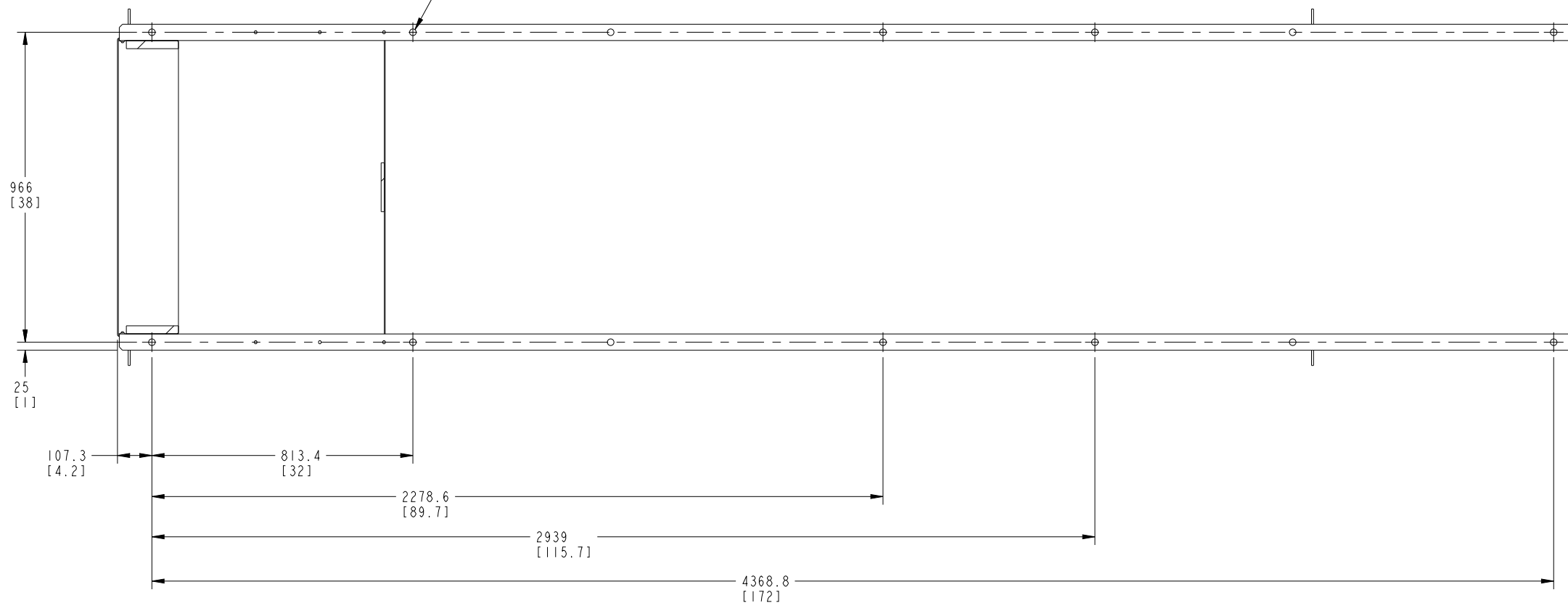
| | | | | | | |
|---|------------|---------------------------|--|-----------|--------------------------|--|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SIM TO: A05IN157 | DWN: D HOFMEISTER | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | CKD: D HOFMEISTER | APVD: G STAFFENHAGEN | | INSTALLATION, GENSET | |
| DIM | X ± 1 | 0.00 - 4.99 +0.15/-0.08 | DATE: 05MAR18 | SITE CODE | SEISMIC REQUIREMENTS | |
| | .X ± 0.8 | 5.00 - 9.99 +0.20/-0.10 | | PGF | A058C559 | |
| | .XX ± 0.38 | 10.00 - 17.49 +0.25/-0.13 | | | 3 of 6 | |
| | | 17.50 - 24.99 +0.30/-0.13 | | | A | |
| ANG TOL: | ± 1.0° | SCALE: 1/1 | FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, SEE ASME Y14.5M-1994 | ARROW | | |
| - CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP | | | FIRST USED ON | | | |

| REL NO | LTR | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|--------------|---------|
| ECO-170731 | A | 1 | PRODUCTION RELEASE | DAH | DAH | STAFFENHAGEN | 05MAR18 |
| | | | | | | | |
| | | | | | | | |

MOUNTING HOLE LOCATIONS FOR FUEL TANK WITH 10 BOLTS TO MOUNTING STRUCTURE

GRADE OR ROOF MOUNTING TO STEEL
16MM (.625) DIAMETER THROUGH BOLTS, 10 LOCATIONS

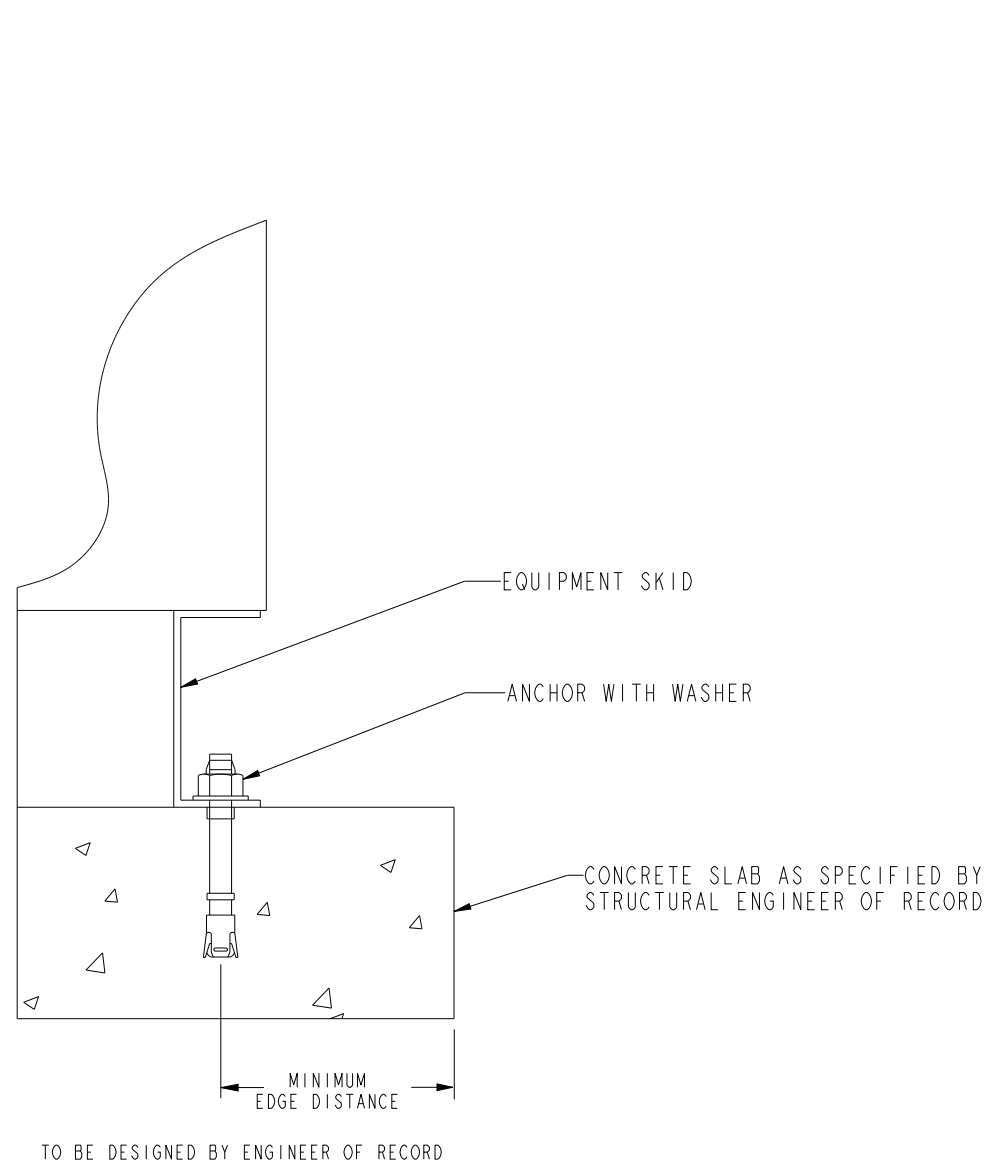
CONTROL END



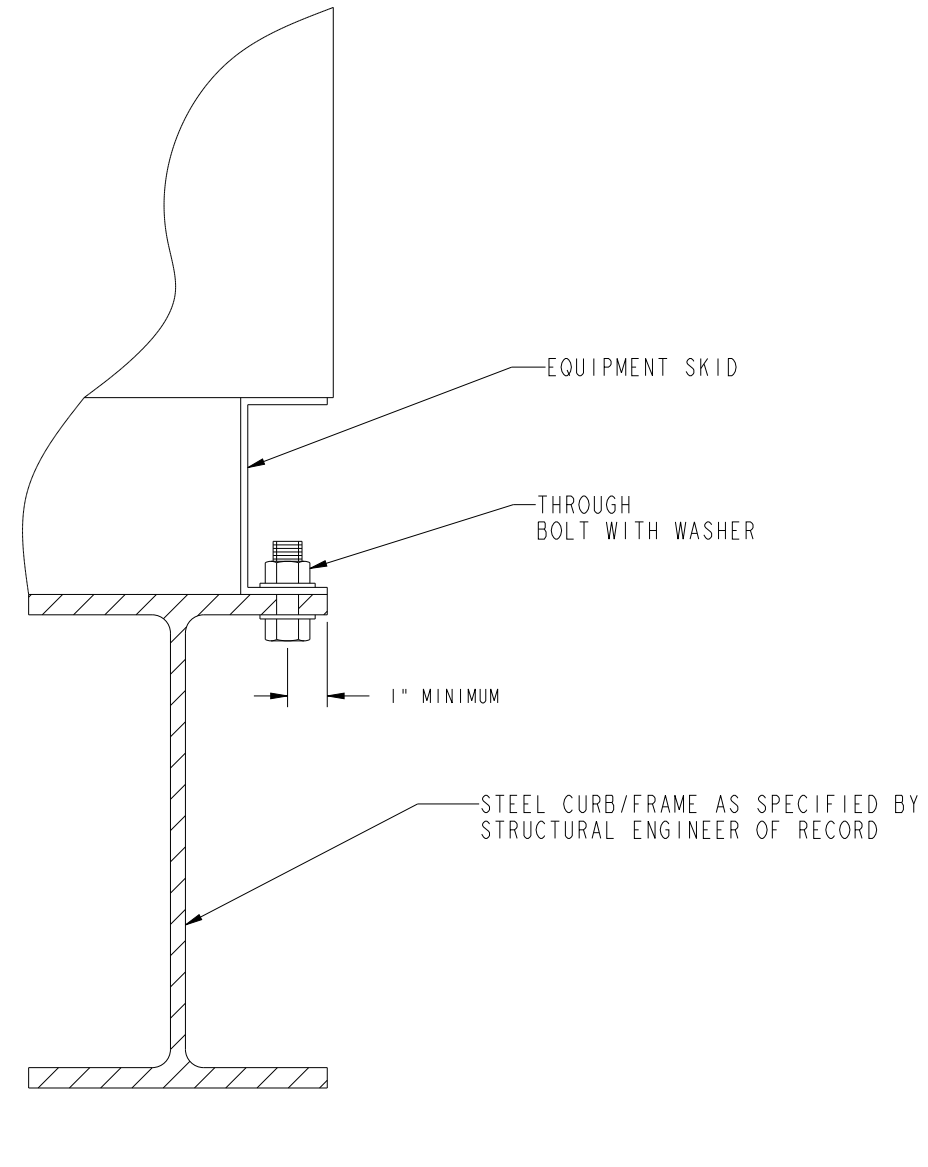
C125D6D, C150D6D, C175D6D, C200D6D: FUEL TANKS WITH 10 HOLE ATTACHMENTS
FUEL TANK: A056Y392, A056Y394

| | | | | | | |
|---|--|---|---|--|--------------------------|--------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SIN TO: A05IN157 | DWN: D HOFMEISTER | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | CKD: D HOFMEISTER | APVD: G STAFFENHAGEN | | INSTALLATION, GENSET | |
| DATE: 05MAR18 | | DATE: 05MAR18 | DATE: 05MAR18 | SITE CODE: | SEISMIC REQUIREMENTS | |
| ANG TOL: ± 1.0° | | SCALE: 1/1 | PGF | DWG FILE: D | A058C559 | SHEET 4 OF 6 |
| DIM X ± 1 .X ± 0.8 .XX ± 0.38 | | HOLE 0.00-4.99 +0.15/-0.08 5.00-9.99 +0.20/-0.10 10.00-17.49 +0.25/-0.13 17.50-24.99 +0.30/-0.13 | FIRST USED ON ARROW FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, SEE ASME Y14.5M-1994 | - CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP | 4 of 6 A | |

| REL NO | LTR | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|--------------|---------|
| ECO-170731 | A | 1 | PRODUCTION RELEASE | DAH | DAH | STAFFENHAGEN | 05MAR18 |
| | | | | | | | |



CONCRETE CONNECTION











STEEL CONNECTION

| | | | | | | |
|---|------------|---------------------------|--|----------------------|--------------------------|--|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SIM TO: A05IN157 | DWN: D HOFMEISTER | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | | CKD: D HOFMEISTER | | INSTALLATION, GENSET | |
| DIM | X ± 1 | 0.00 - 4.99 +0.15/-0.08 | APVD: G STAFFENHAGEN | SEISMIC REQUIREMENTS | | |
| | .X ± 0.8 | 5.00 - 9.99 +0.20/-0.10 | DATE: 05MAR18 | SITE CODE | | |
| | .XX ± 0.38 | 10.00 - 17.49 +0.25/-0.13 | | | | |
| | | 17.50 - 24.99 +0.30/-0.13 | | | | |
| ANG TOL: | ± 1.0° | SCALE: 1/1 | - CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, SEE ASME Y14.5M-1994 | | PGF D A058C559 | |
| | | | FIRST USED ON | | SHEET 6 OF 6 | |

| REV NO | REV | NO | REVISION | REV | CHK | APPD | DATE |
|------------|-----|----|--|-----|-----|-------------|---------|
| ECO-181477 | E | 1 | ADD SHEET 6 | RT | MT | M. TULADHAN | 05NOV18 |
| | | 2 | ZONE (A1) ADD TABLE | RT | MT | M. TULADHAN | 05NOV18 |
| | | 3 | ZONE (B1) UPDATE 'CIRCUIT BREAKER ACCESSORIES' TABLE | RT | MT | M. TULADHAN | 05NOV18 |

NOTES:

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

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

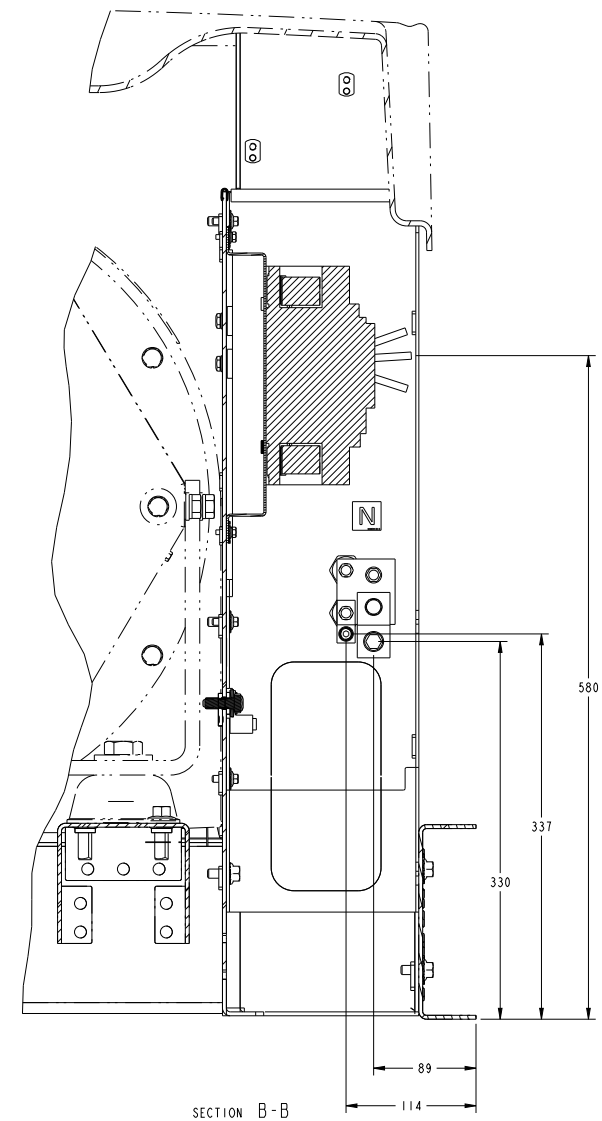
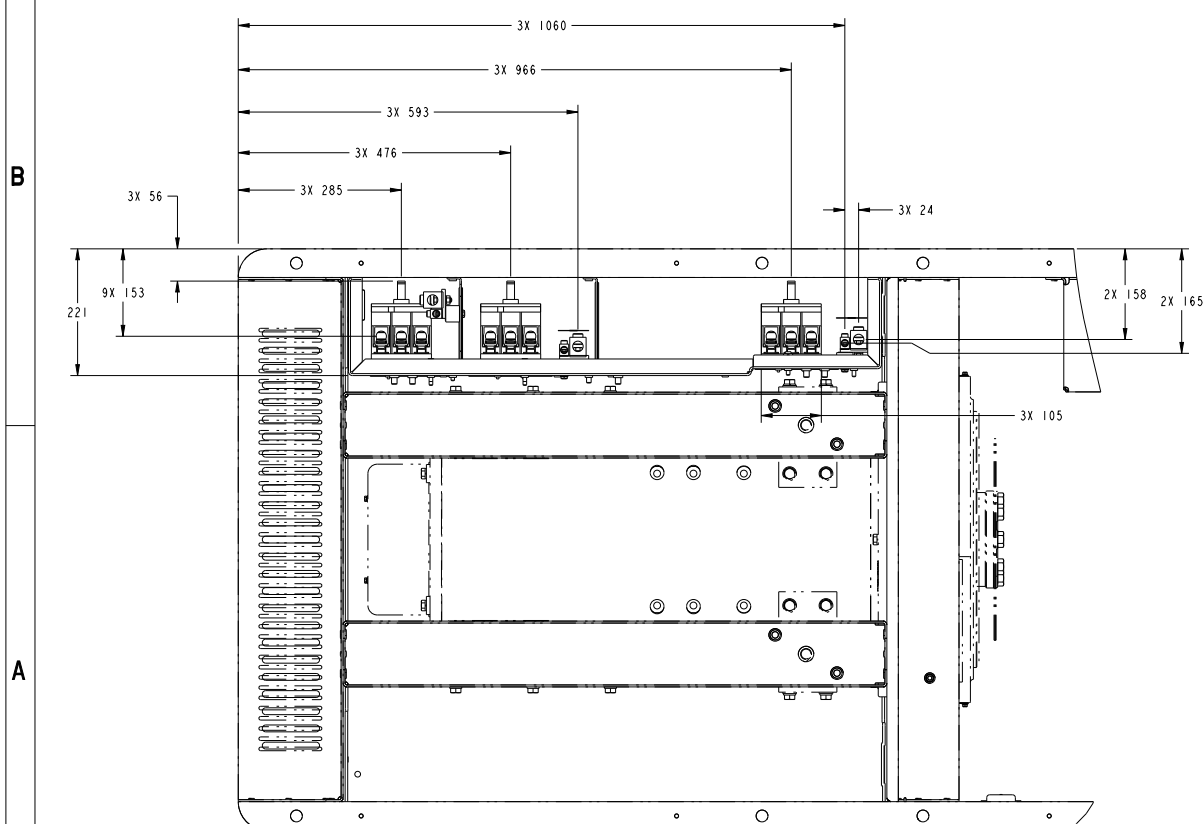
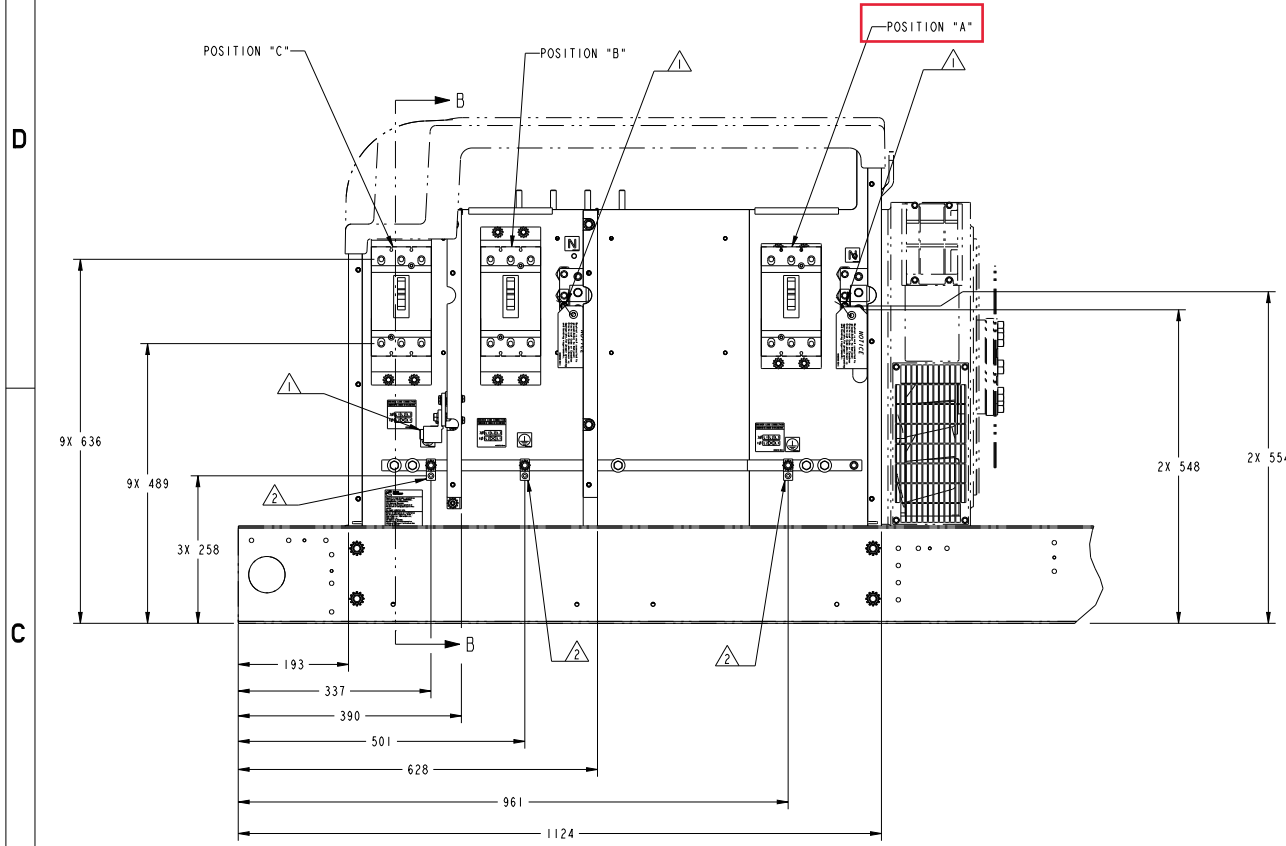
| CIRCUIT BREAKER ACCESSORIES | |
|-----------------------------|---|
| 1 | SHUNT TRIP (MX) P/N A043X760 12 VDC COIL BURDEN < 5 WATTS 10 AMP IN-RUSH |
| 2 | AUXILIARY CONTACTS P/N A043X785 OPEN/CLOSED (OF) TRIP INDICATION (SD) FORM C CONTACTS RATING: 6 AMPS AT 24 VAC, 48 VAC, 110 VAC 6 AMPS AT 24 VDC,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

| TABLE 1 | | | | |
|-----------------|---------------------------------------|---------------------|---------------|---------------|
| KIT PART NUMBER | MODELS AFFECTED | ENCLOSURES AFFECTED | | |
| A060M822 | C125 N6-C150 N6 C125 D6D- C200 D6D | OPEN ONLY | | |
| KIT PART NUMBER | NUMBER OF CB'S | LIMITATION | | |
| | | POS A | POS B | POS C |
| A060M822 | 1 | ANY RATING | - | - |
| | 2 | ANY RATING | 600A OR BELOW | - |
| | 3 | ANY RATING | 400A OR BELOW | 250A OR BELOW |

| | | | | | |
|---|-------|--------------------|----------------|--------------------------|--|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | DO NOT SCALE PRINT | APPD P. LARSON | CUMMINS POWER GENERATION | |
| DATE | SCALE | DATE | DATE | OUTLINE, CIRCUIT BREAKER | |
| ANG TOL | SCALE | DATE | DATE | A055B603 | |
| ± 1.0° | 1/4 | 1/4 | 1/4 | 1 OF 6 | |

"J" FRAME SHOWN (175 - 250 amp)

| REV NO | REV | NO | REVISION | REV | NO | APPRO | DATE |
|------------|-----|----|----------|-----|----|-------------|---------|
| ECO-181477 | E | - | - | RT | WT | N. TULADHAN | 05NOV18 |



| | | | | |
|---|---------------------------|--------------------|------------------|--------------------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | DO NOT SCALE PRINT | APP'D A. JOHNSON | CUMMINS POWER GENERATION |
| SIZE | TOLERANCE | DATE | DATE | |
| X ± 1 | 0.00 - 4.99 +0.15/-0.00 | 02MAY16 | 02MAY16 | OUTLINE, CIRCUIT BREAKER |
| -P ± 0.8 | 5.00 - 9.99 +0.25/-0.13 | | | |
| 3X ± 0.38 | 10.00 - 17.49 +0.25/-0.13 | | | SITE CODE |
| | 17.50 - 24.99 +0.20/-0.13 | | | |
| ANG TOL | SCALE | DATE | DATE | PGF |
| ± 1.0° | 1/4 | 02MAY16 | 02MAY16 | |

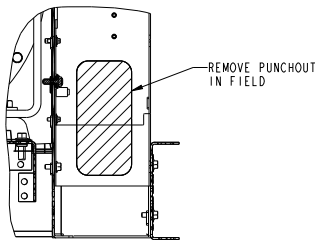
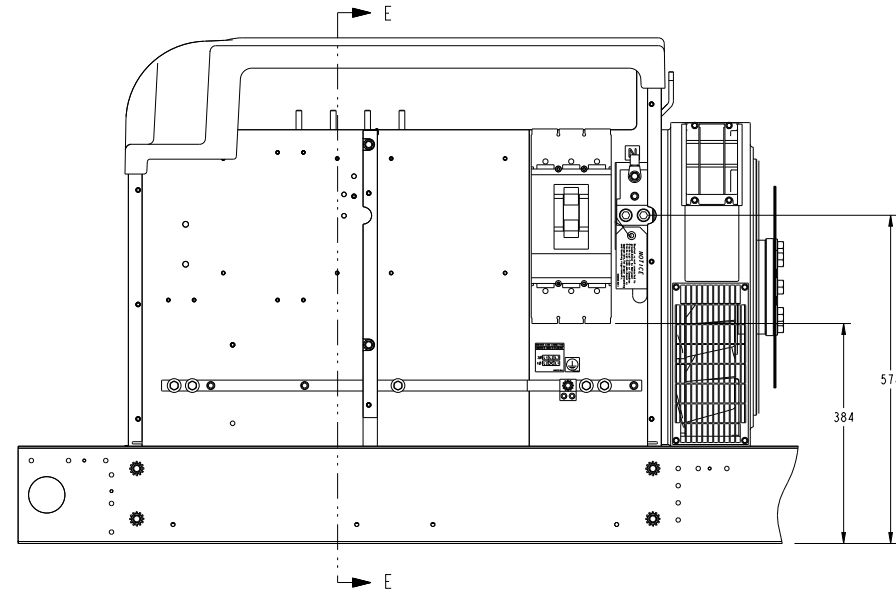
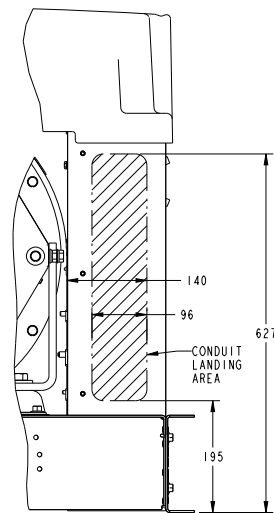
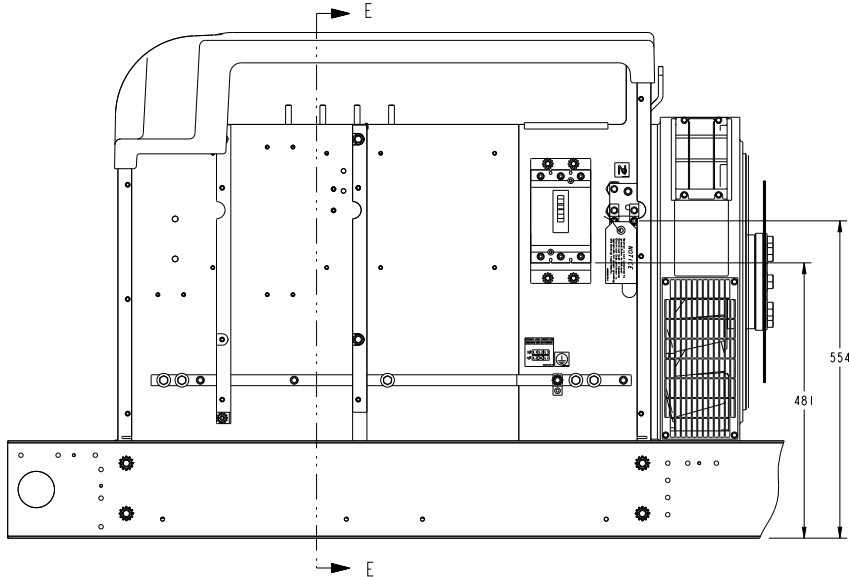
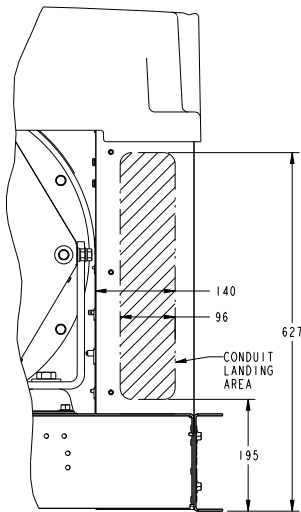
Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: UL,CSA

Drawing Name: A055B604 Revision: E Part Name: A055B603 Revision: E ECO-181477 Sheet 2 of 7

| REV NO | REV | NO | REVISION | REV | NO | DATE |
|------------|-----|----|----------|-----|----|---------|
| ECO-181477 | E | - | - | RT | MT | 05NOV18 |

"H" FRAME SHOWN (15 - 150 amp)

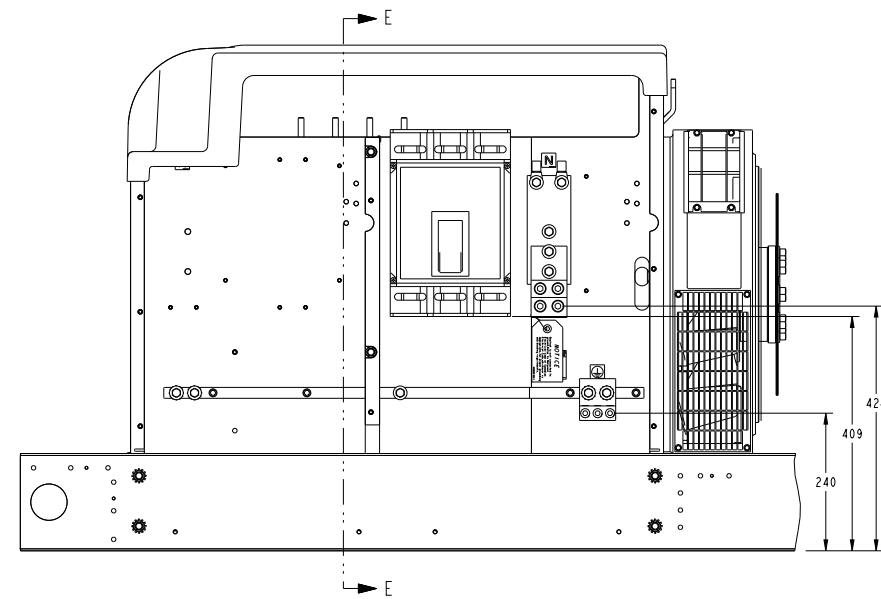
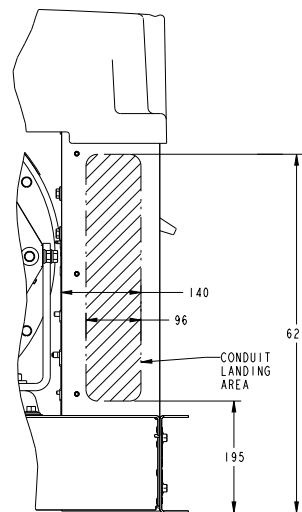
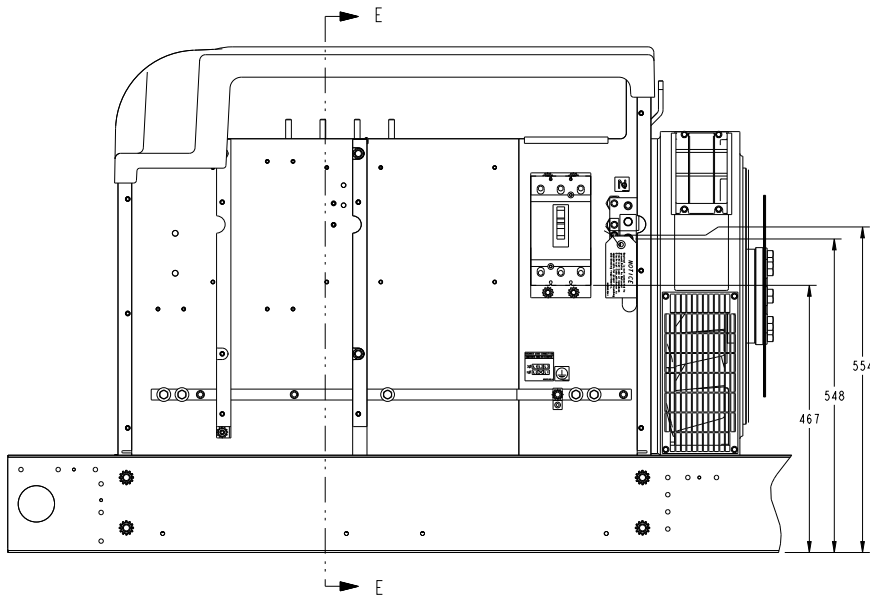
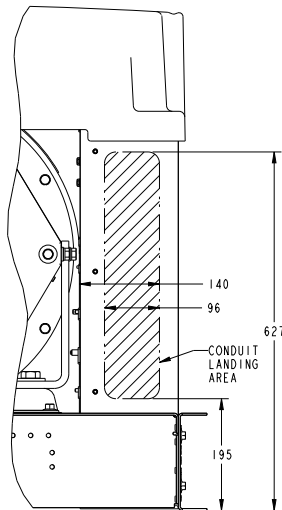
"L" FRAME SHOWN (400 - 600 amp)



SECTION E-E

"J" FRAME SHOWN (175 - 250 amp)

"P" FRAME SHOWN (400-800 amp)



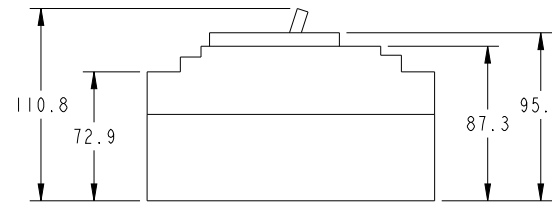
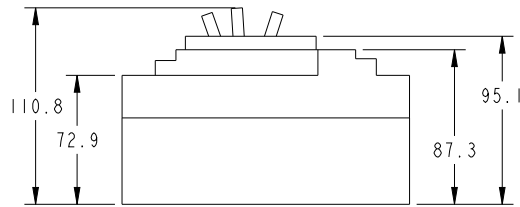
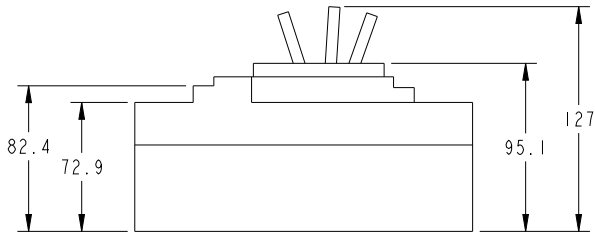
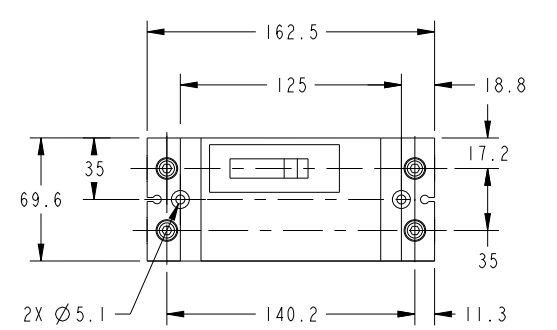
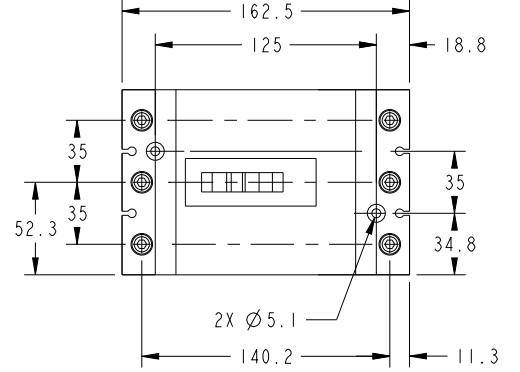
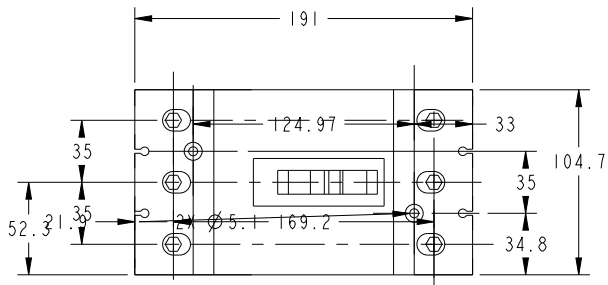
| | | | | |
|---|--|--|--------------------------------|---|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | DO NOT SCALE PRINT | APPD A. JOHNSON | CUMMINS POWER GENERATION OUTLINE, CIRCUIT BREAKER |
| DIM TOL X ± 1 -X ± 0.8 X ± 0.38 | 0.00 - 4.99 +0.15/-0.00 5.00 - 9.99 +0.20/-0.13 10.00 - 17.49 +0.25/-0.13 17.50 - 24.99 +0.30/-0.13 | DATE 02MAY16 | APPD P. LARSON DATE 02MAY16 | |
| ANG TOL ± 1.0° | SCALE 1/4 | DATE 02MAY16 INTERPRETER: FIRST USE ON THIS DRAWING DATE 02MAY16 | SITE CODE PGF E | PART NO A055B603 |

2 POLE & 3 POLE
J-FRAME

3 POLE
H-FRAME

2 POLE
H-FRAME

| REL NO | LTR | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|-----------------------------|-----|-----|-------------|---------|
| ECO-176287 | D | 1 | PART A050J727: "UPDATE MEP" | KSP | KAM | M.WINGFIELD | 03APR18 |
| | | 2 | ZONE A3; RMV C11 LABEL | KSP | KAM | M.WINGFIELD | 03APR18 |



NOTES:

- THIS PART IS MANUFACTURER SOURCE CONTROLLED.
 - SUPPLIED WITH LINE & LOAD MECHANICAL LUGS :
2.1 FOR THERMAL-MAGNETIC TRIP : AL/CU.
2.2 FOR ELECTRONIC TRIP: CU FOR 90°C.
- | INTERRUPTING RATINGS | | KA |
|----------------------|-----------------|-------|
| UL / CSA / NOM | 240 Vac | 25 |
| | 480 Vac | 18 |
| | 600 Vac | 14 |
| IEC 947-2 Icu/Ics | 220/240 Vac | 25/25 |
| | 380/440/415 Vac | 18/18 |
| | 500/525 Vac | 14/14 |
- H-FRAME: .65" WIRE STRIP LENGTH,
LUG TORQUE= A : #14-#10 AWG 50 LB-IN,75°C.
B : #8-3/0 AWG 120 LB-IN,75°C.
 - J-FRAME: 1" WIRE STRIP LENGTH,
LUG TORQUE= 1/0 AWG- 300 kcmil 250 LB-IN,75°C.

TABULATION

| PART NUMBER | CURRENT ER | AMP_RATING | VOLTS (UL/IEC) | FRAME_TYPE | POLES | BREAKER_TYPE | TRIP |
|-------------|------------|--------------------------|----------------|------------|-------|--------------|------------------------------|
| A043E193 | ECO-126169 | 250A | 600 | J-FRAME | 2 | JD | THERMAL-MAGNETIC 50-60 Hz |
| A043E195 | ECO-126169 | 225A | 600 | J-FRAME | 2 | JD | |
| A043E199 | ECO-126169 | 200A | 600 | J-FRAME | 2 | JD | |
| A043E202 | ECO-126169 | 175A | 600 | J-FRAME | 2 | JD | |
| A043L510 | ECO-126169 | 250A | 600 | J-FRAME | 3 | JD | |
| A043L517 | ECO-126169 | 225A | 600 | J-FRAME | 3 | JD | |
| A043L520 | ECO-126169 | 200A | 600 | J-FRAME | 3 | JD | |
| A043L619 | ECO-126169 | 175A | 600 | J-FRAME | 3 | JD | |
| A043C676 | ECO-126169 | 150A | 600 | H-FRAME | 2 | HD | |
| A043D274 | ECO-126169 | 125A | 600 | H-FRAME | 2 | HD | |
| A043D324 | ECO-126169 | 100A | 600 | H-FRAME | 2 | HD | |
| A043D326 | ECO-126169 | 90A | 600 | H-FRAME | 2 | HD | |
| A043D328 | ECO-126169 | 80A | 600 | H-FRAME | 2 | HD | |
| A043E169 | ECO-126169 | 70A | 600 | H-FRAME | 2 | HD | |
| A043E179 | ECO-126169 | 60A | 600 | H-FRAME | 2 | HD | |
| A043E181 | ECO-126169 | 50A | 600 | H-FRAME | 2 | HD | |
| A043E183 | ECO-126169 | 40A | 600 | H-FRAME | 2 | HD | |
| A043E185 | ECO-126169 | 30A | 600 | H-FRAME | 2 | HD | |
| A043E187 | ECO-126169 | 20A | 600 | H-FRAME | 2 | HD | |
| A043E189 | ECO-126169 | 15A | 600 | H-FRAME | 2 | HD | |
| A043E191 | ECO-126169 | 25A | 600 | H-FRAME | 2 | HD | |
| A043K991 | ECO-126169 | 150A | 600 | H-FRAME | 3 | HD | |
| A043K994 | ECO-126169 | 125A | 600 | H-FRAME | 3 | HD | |
| A043K997 | ECO-126169 | 90A | 600 | H-FRAME | 3 | HD | |
| A043L012 | ECO-126169 | 80A | 600 | H-FRAME | 3 | HD | |
| A043L024 | ECO-126169 | 100A | 600 | H-FRAME | 3 | HD | |
| A043L451 | ECO-126169 | 70A | 600 | H-FRAME | 3 | HD | |
| A043L459 | ECO-126169 | 60A | 600 | H-FRAME | 3 | HD | |
| A043L461 | ECO-126169 | 50A | 600 | H-FRAME | 3 | HD | |
| A043L464 | ECO-126169 | 40A | 600 | H-FRAME | 3 | HD | |
| A043L475 | ECO-126169 | 30A | 600 | H-FRAME | 3 | HD | |
| A043L480 | ECO-126169 | 20A | 600 | H-FRAME | 3 | HD | |
| A043L506 | ECO-126169 | 15A | 600 | H-FRAME | 3 | HD | |
| A043L508 | ECO-126169 | 25A | 600 | H-FRAME | 3 | HD | |
| A044C640 | ECO-126169 | SET TRIP: 70 TO 250 A | 600 | J-FRAME | 3 | JD | ELECTRONIC 50-60 Hz |
| A047W923 | ECO-137891 | 225A Cu LUG | 600 | J-FRAME | 3 | JD | THERMAL-MAGNETIC 50-60 Hz |
| A050J725 | ECO-145094 | 250A | 600 | J-FRAME | 3 | JD | LSI ELECTRONIC TRIP 80% |
| A050J727 | ECO-145094 | 250A | 600 | J-FRAME | 3 | JD | LSI ELECTRONIC TRIP 100% |

| | | | | | | |
|---|---------------------------------|-----------------|-----------------|-----------|--------------------------|---------------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SH TO: NONE | DWN: S_GAMBHIRE | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | CKD: M_TULADHAR | APVD: M_POZO | | BREAKER, CIRCUIT | |
| DIM | X ± 1 .X ± 0.8 .XX ± 0.38 | SCALE: 1/2 | DATE: 24SEP12 | SITE CODE | PGF | SHEET 1 OF 1 |
| ANG TOL: ± 1.0° | | SCALE: 1/2 | ARROW | PGF | D | Part Name: A043W056 |

PowerPact H-, J-, and L-Frame Circuit Breakers General Information

Table 11: Circuit Breakers

| Circuit Breaker | 150 A H-Frame | | | | | 250 A J-Frame | | | | | 400 A L-Frame | | | | | 600 A L-Frame | | | | | 1200 A L-Frame | | |
|---|--|-----------|----|-----|-----|---------------|-----------|----|-----|-----|---------------|-------------|----|------|-----|---------------|-------------|----|-----|-----|-----------------|----------------|----|
| Circuit Breaker Type | HD | HG | HJ | HL | HR | JD | JG | JJ | JL | JR | LD | LG | LJ | LL | LR | LD | LG | LJ | LL | LR | LG | LL | |
| Number of poles ¹ | 2, 3 | | | 3 | | 2, 3 | | | 3 | | 3, 4 | | | 3, 4 | | | 4 | | | | | | |
| Amperage Range (A) | 15-150 | | | | | 70-250 | | | | | 70-400 | | | | | 200-600 | | | | | 700-1200 | | |
| UL 489 Circuit Breaker Ratings | | | | | | | | | | | | | | | | | | | | | | | |
| Breaking Capacity (AIR) | 240 Vac | 25 | 65 | 100 | 125 | 200 | 25 | 65 | 100 | 125 | 200 | 25 | 65 | 100 | 125 | 200 | 25 | 65 | 100 | 125 | 200 | — | — |
| | 480 Vac | 18 | 35 | 65 | 100 | 200 | 18 | 35 | 65 | 100 | 200 | 18 | 35 | 65 | 100 | 200 | 18 | 35 | 65 | 100 | 200 | — | — |
| | 600 Vac | 14 | 18 | 25 | 50 | 100 | 14 | 18 | 25 | 50 | 100 | 14 | 18 | 25 | 50 | 100 | 14 | 18 | 25 | 50 | 100 | — | — |
| | 250 Vdc ² | 20 | 20 | 20 | 20 | — | 20 | 20 | 20 | 20 | 20 | — | — | — | — | — | — | — | — | — | — | — | — |
| UL/CSA/NOM (kA rms) | 500 Vdc ^{2, 3} | — | 20 | — | 50 | — | — | 20 | — | — | 50 | — | — | — | 50 | — | — | 20 | — | 20 | — | 20 | 50 |
| IEC 947-2 Circuit Breaker Ratings | | | | | | | | | | | | | | | | | | | | | | | |
| Ultimate breaking capacity (Icu) (kA rms) | 220/240 Vac | 25 | 65 | 100 | 125 | 150 | 25 | 65 | 100 | 125 | 150 | 25 | 65 | 100 | 125 | 150 | 25 | 65 | 100 | 125 | 150 | — | — |
| | 380/415 Vac | 18 | 35 | 65 | 100 | 125 | 18 | 35 | 65 | 100 | 125 | 18 | 35 | 65 | 100 | 125 | 18 | 35 | 65 | 100 | 125 | — | — |
| | 440/480 Vac | 18 | 35 | 65 | 100 | 125 | 18 | 35 | 65 | 100 | 125 | 18 | 35 | 65 | 100 | 125 | 18 | 35 | 65 | 100 | 125 | — | — |
| | 500/525 Vac | 14 | 18 | 25 | 50 | 75 | 14 | 18 | 25 | 50 | 75 | 14 | 18 | 25 | 50 | 75 | 14 | 18 | 25 | 50 | 75 ⁴ | — | — |
| | 690 Vac | — | — | — | — | 20 | — | — | — | — | — | 20 | — | — | — | 20 | — | — | — | — | — | 20 | — |
| | 250 Vdc ² | — | — | — | — | — | 20 | 20 | 20 | 20 | 20 | — | — | — | — | — | — | — | — | — | — | — | — |
| 500 Vdc ^{2, 3} | — | — | — | — | — | 20 | 20 | 20 | 20 | 20 | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Service breaking capacity (Ics) | % Icu | 100% | | | | | 100% | | | | | 100% | | | | | 100% | | — | — | | | |
| Insulation Voltage | V _i | 750 Vac | | | | | 750 Vac | | | | | 750 Vac | | | | | 750 Vac | | — | — | | | |
| Impulse Withstand Voltage | V _{imp} | 8 kVac | | | | | 8 kVac | | | | | 8 kVac | | | | | 8 kVac | | — | — | | | |
| Operational Voltage | V _e | 690 Vac | | | | | 690 Vac | | | | | 690 Vac | | | | | 690 Vac | | — | — | | | |
| Sensor Rating | I _n | 150 A | | | | | 250 A | | | | | 400 A | | | | | 600 A | | — | — | | | |
| Utilization Category | — | A | | | | | A | | | | | A | | | | | A | | — | — | | | |
| Operations (Open-Close Cycles) | | | | | | | | | | | | | | | | | | | | | | | |
| Without Current | — | 4000 | | | | | 5000 | | | | | 5000 | | | | | 5000 | | — | — | | | |
| With Current | — | 4000 | | | | | 1000 | | | | | 1000 | | | | | 1000 | | — | — | | | |
| Protection and Measurements | | | | | | | | | | | | | | | | | | | | | | | |
| Short-circuit protection | Magnetic only | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — |
| | Thermal-magnetic | X | X | X | X | X | X | X | X | X | X | — | — | — | — | — | — | — | — | — | — | X | X |
| | Electronic | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — |
| | with neutral protection (Off-0.5-1-OSN) ⁵ | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — |
| | with ground fault protection | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — |
| with zone selective interlocking (ZSI) ⁶ | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — | |
| Display / I, V, f, P, E, THD measurements / interrupted-current measurement | | | | | | | | | | | | | | | | | | | | | | | |
| Options | Front display module (FDM121) | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — |
| | Operating assistance | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — |
| | Counters | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — |
| | Histories and alarms | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — |
| | Metering Com | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — |
| Device status/control com | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | — | — | |
| Dimensions / Weight / Connections | | | | | | | | | | | | | | | | | | | | | | | |
| Dimensions (Three-Pole Unit Mount) in. (mm) | Height | 6.4 (163) | | | | | 7.5 (191) | | | | | 13.38 (340) | | | | | 13.38 (340) | | | | | 13.38 (340) | |
| | Width | 4.1 (104) | | | | | 4.1 (104) | | | | | 5.51 (140) | | | | | 5.51 (140) | | | | | 5.51 (140) | |
| | Depth | 3.4 (86) | | | | | 3.4 (86) | | | | | 4.33 (110) | | | | | 4.33 (110) | | | | | 4.33 (110) | |
| Weight - lb. (Kg) | 4.8 (2.2) | | | | | 5.3 (2.4) | | | | | 13.2 (6.0) | | | | | 13.7 (6.2) | | | | | 13.7 (6.2) | | |
| Connections / Terminations | Unit Mount | X | | | | | X | | | | | X | | | | | X | | | | | X | |
| | I-Line | X | | | | | X | | | | | X | | | | | X | | | | | — | |
| | Rear Connection | X | | | | | X | | | | | X | | | | | X | | | | | X ⁷ | |
| | Plug-In | X | | | | | X | | | | | X | | | | | X | | | | | — | |
| | Drawout | X | | | | | X | | | | | X | | | | | X | | | | | — | |
| Optional Lugs | X | | | | | X | | | | | X | | | | | X | | | | | — | | |

1 H and J-frame breakers with Micrologic trip units available only with three poles. The HJ, HL and the J-Frame two pole circuit breakers are three pole modules.
 2 DC not available with PowerPact H, J or L-frame circuit breakers with Micrologic trip units.
 3 500 Vdc specific catalog numbers, ungrounded UPS systems only.
 4 I_{CS} for 600 A L-frame circuit breaker at 525 V is 19 kA.
 5 OSN: Over Sized Neutral protection for neutrals carrying high currents (e.g. 3rd harmonics).
 6 ZSI using restraint wires.
 7 Rear connection is not available for 700–1200 A four pole L-frame circuit breakers.

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

Circuit Breakers

Table 16: H-Frame 150 A and J-Frame 250 A Electronic Trip UL Rated Circuit Breakers (600 Vac, 50/60 Hz) With Factory Sealed Trip Unit Suitable for Reverse Connection

| Electronic Trip Unit | | | Sensor Rating | Interrupting Rating | | | | |
|--|----------|-------------------|--------------------|---------------------|---------------|----------------|----------------|----------------|
| Type | Function | Trip Unit | | D | G | J ¹ | L ² | R ² |
| Standard (80%) Rated Circuit Breakers, 3P | | | | | | | | |
| Standard | LI | 3.2 ² | 60 A ³ | HDL36060U31X | HGL36060U31X | HJL36060U31X | HLL36060U31X | HRL36060U31X |
| | | | 100 A ³ | HDL36100U31X | HGL36100U31X | HJL36100U31X | HLL36100U31X | HRL36100U31X |
| | | | 150 A ³ | HDL36150U31X | HGL36150U31X | HJL36150U31X | HLL36150U31X | HRL36150U31X |
| | | | 250 A ⁴ | JDL36250U31X | JGL36250U31X | JJL36250U31X | JLL36250U31X | JRL36250U31X |
| Standard | LSI | 3.2S ² | 60 A ³ | HDL36060U33X | HGL36060U33X | HJL36060U33X | HLL36060U33X | HRL36060U33X |
| | | | 100 A ³ | HDL36100U33X | HGL36100U33X | HJL36100U33X | HLL36100U33X | HRL36100U33X |
| | | | 150 A ³ | HDL36150U33X | HGL36150U33X | HJL36150U33X | HLL36150U33X | HRL36150U33X |
| | | | 250 A ⁴ | JDL36250U33X | JGL36250U33X | JJL36250U33X | JLL36250U33X | JRL36250U33X |
| Ammeter | LSI | 5.2A | 60 A ³ | HDL36060U43X | HGL36060U43X | HJL36060U43X | HLL36060U43X | HRL36060U43X |
| | | | 100 A ³ | HDL36100U43X | HGL36100U43X | HJL36100U43X | HLL36100U43X | HRL36100U43X |
| | | | 150 A ³ | HDL36150U43X | HGL36150U43X | HJL36150U43X | HLL36150U43X | HRL36150U43X |
| | | | 250 A ⁴ | JDL36250U43X | JGL36250U43X | JJL36250U43X | JLL36250U43X | JRL36250U43X |
| Energy | LSI | 5.2E | 60 A ³ | HDL36060U53X | HGL36060U53X | HJL36060U53X | HLL36060U53X | HRL36060U53X |
| | | | 100 A ³ | HDL36100U53X | HGL36100U53X | HJL36100U53X | HLL36100U53X | HRL36100U53X |
| | | | 150 A ³ | HDL36150U53X | HGL36150U53X | HJL36150U53X | HLL36150U53X | HRL36150U53X |
| | | | 250 A ⁴ | JDL36250U53X | JGL36250U53X | JJL36250U53X | JLL36250U53X | JRL36250U53X |
| Ammeter | LSIG | 6.2A | 60 A ³ | HDL36060U44X | HGL36060U44X | HJL36060U44X | HLL36060U44X | HRL36060U44X |
| | | | 100 A ³ | HDL36100U44X | HGL36100U44X | HJL36100U44X | HLL36100U44X | HRL36100U44X |
| | | | 150 A ³ | HDL36150U44X | HGL36150U44X | HJL36150U44X | HLL36150U44X | HRL36150U44X |
| | | | 250 A ⁴ | JDL36250U44X | JGL36250U44X | JJL36250U44X | JLL36250U44X | JRL36250U44X |
| Energy | LSIG | 6.2E | 60 A ³ | HDL36060U54X | HGL36060U54X | HJL36060U54X | HLL36060U54X | HRL36060U54X |
| | | | 100 A ³ | HDL36100U54X | HGL36100U54X | HJL36100U54X | HLL36100U54X | HRL36100U54X |
| | | | 150 A ³ | HDL36150U54X | HGL36150U54X | HJL36150U54X | HLL36150U54X | HRL36150U54X |
| | | | 250 A ⁴ | JDL36250U54X | JGL36250U54X | JJL36250U54X | JLL36250U54X | JRL36250U54X |
| 100% Rated Circuit Breakers, 3P⁵ | | | | | | | | |
| Standard | LI | 3.2 ² | 60 A ³ | HDL36060CU31X | HGL36060CU31X | HJL36060CU31X | HLL36060CU31X | HRL36060CU31X |
| | | | 100 A ³ | HDL36100CU31X | HGL36100CU31X | HJL36100CU31X | HLL36100CU31X | HRL36100CU31X |
| | | | 150 A ³ | HDL36150CU31X | HGL36150CU31X | HJL36150CU31X | HLL36150CU31X | HRL36150CU31X |
| | | | 250 A ⁴ | JDL36250CU31X | JGL36250CU31X | JJL36250CU31X | JLL36250CU31X | JRL36250CU31X |
| Standard | LSI | 3.2S ² | 60 A ³ | HDL36060CU33X | HGL36060CU33X | HJL36060CU33X | HLL36060CU33X | HRL36060CU33X |
| | | | 100 A ³ | HDL36100CU33X | HGL36100CU33X | HJL36100CU33X | HLL36100CU33X | HRL36100CU33X |
| | | | 150 A ³ | HDL36150CU33X | HGL36150CU33X | HJL36150CU33X | HLL36150CU33X | HRL36150CU33X |
| | | | 250 A ⁴ | JDL36250CU33X | JGL36250CU33X | JJL36250CU33X | JLL36250CU33X | JRL36250CU33X |
| Ammeter | LSI | 5.2A | 60 A ³ | HDL36060CU43X | HGL36060CU43X | HJL36060CU43X | HLL36060CU43X | HRL36060CU43X |
| | | | 100 A ³ | HDL36100CU43X | HGL36100CU43X | HJL36100CU43X | HLL36100CU43X | HRL36100CU43X |
| | | | 150 A ³ | HDL36150CU43X | HGL36150CU43X | HJL36150CU43X | HLL36150CU43X | HRL36150CU43X |
| | | | 250 A ⁴ | JDL36250CU43X | JGL36250CU43X | JJL36250CU43X | JLL36250CU43X | JRL36250CU43X |
| Energy | LSI | 5.2E | 60 A ³ | HDL36060CU53X | HGL36060CU53X | HJL36060CU53X | HLL36060CU53X | HRL36060CU53X |
| | | | 100 A ³ | HDL36100CU53X | HGL36100CU53X | HJL36100CU53X | HLL36100CU53X | HRL36100CU53X |
| | | | 150 A ³ | HDL36150CU53X | HGL36150CU53X | HJL36150CU53X | HLL36150CU53X | HRL36150CU53X |
| | | | 250 A ⁴ | JDL36250CU53X | JGL36250CU53X | JJL36250CU53X | JLL36250CU53X | JRL36250CU53X |

¹ UL Listed/CSA Certified as current limiting circuit breakers.

² 3P circuit breakers with this trip unit can be used for 2P applications.

³ Standard Lug Kit: AL150HD Terminal Wire Range: 14–3/0 AWG Al or Cu

⁴ Standard Lug Kit: AL250JD Terminal Wire Range: 3/0 AWG–350 kcmil Al or Cu
For smaller wire range (4–4/0 AWG Al or Cu), replace the lug's wire binding screws with the larger binding screws provided.

⁵ 100% rated circuit breakers have copper lugs and can be used with copper wire only.

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

**Table 17: J-Frame 250 A Mission Critical Electronic Trip UL Rated Circuit Breakers
(3P, 480Y/277 Vac, 50/60 Hz) With Factory Sealed Trip Unit Suitable for Reverse Connection**

| Electronic Trip Unit | | | Sensor Rating | Interrupting Rating ¹ | | | |
|--|----------|-----------|---------------|----------------------------------|---------------|---------------|---------------|
| Type | Function | Trip Unit | | D | G | J | L |
| Standard (80%) Rated Circuit Breakers, 3P | | | | | | | |
| Standard | LI | 3.2-W | 250 A | JDL34250WU31X | JGL34250WU31X | JJL34250WU31X | JLL34250WU31X |
| Standard | LSI | 3.2S-W | 250 A | JDL34250WU33X | JGL34250WU33X | JJL34250WU33X | JLL34250WU33X |
| Ammeter | LSI | 5.2A-W | 250 A | JDL34250WU43X | JGL34250WU43X | JJL34250WU43X | JLL34250WU43X |
| Energy | LSI | 5.2E-W | 250 A | JDL34250WU53X | JGL34250WU53X | JJL34250WU53X | JLL34250WU53X |
| Ammeter | LSIG | 6.2A-W | 250 A | JDL34250WU44X | JGL34250WU44X | JJL34250WU44X | JLL34250WU44X |
| Energy | LSIG | 6.2E-W | 250 A | JDL34250WU54X | JGL34250WU54X | JJL34250WU54X | JLL34250WU54X |

¹ Standard Lug Kit: AL250JD Terminal Wire Range: 3/0 AWG–350 kcmil Al or Cu
For smaller wire range (4–4/0 AWG Al or Cu), replace the lug's wire binding screws with the larger binding screws provided.

PowerPact H-, J-, and L-frame Circuit Breaker Trip Units

Table 12: Micrologic Trip Unit Features

| Features | Micrologic Trip Unit (X = Standard Feature, O = Available Option) | | | | | |
|--|---|-----------|-----------|-----------|-----------|-----------|
| | Standard | | Ammeter | | Energy | |
| | 3.2/3.3 | 3.2S/3.3S | 5.2A/5.3A | 6.2A/6.3A | 5.2E/5.3E | 6.2E/6.3E |
| LI | X | | | | | |
| LSI ¹ | | X | X | | X | |
| LSIG/Ground Fault Trip ² | | | | X | | X |
| Ground-Fault Alarm Trip | | | | X | | X |
| Current Settings Directly in Amperes | X | X | X | X | X | X |
| True RMS Sensing | X | X | X | X | X | X |
| UL Listed | X | X | X | X | X | X |
| Thermal Imaging | X | X | X | X | X | X |
| LED for Long-Time Pickup | X | X | X | X | X | X |
| LED for Long-Time Alarm | X | X | X | X | X | X |
| LED Green "Ready" Indicator | X | X | X | X | X | X |
| Up to 12 Alarms Used Together | | | X | X | X | X |
| Digital Ammeter | | | X | X | X | X |
| Zone-Selective Interlocking ³ | | | X | X | X | X |
| Communications | O | O | O | O | O | O |
| LCD Display | | | X | X | X | X |
| Front Display Module FDM121 | | | O | O | O | O |
| Advanced User Interface | | | X | X | X | X |
| Neutral Protection | | | X | X | X | X |
| Contact Wear Indication ⁴ | | | X | X | X | X |
| Incremental Fine Tuning of Settings | | | X | X | X | X |
| Load Profile ^{4, 5} | | | X | X | X | X |
| Power Measurement | | | | | X | X |
| Power Quality Measurements | | | | | X | X |

¹ The LSI with 3.2S/3.3S trip units have fixed short time and long time delays.

² Requires neutral current transformer on three-phase four-wire loads.

³ ZSI for H/J-frame devices is only OUT. ZSI for L-frame devices is IN and OUT.

⁴ Indication available using the communication system only.

⁵ % of hours in 4 current ranges: 0–49%, 50–79%, 80–89%, and >90% I_n.

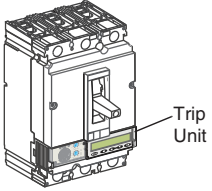
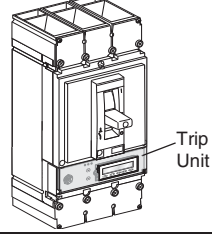
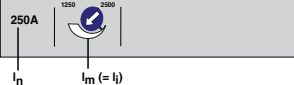

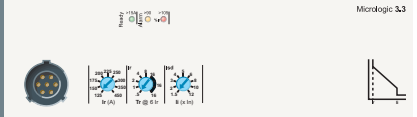

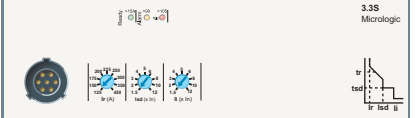






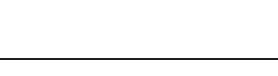

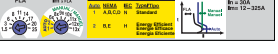


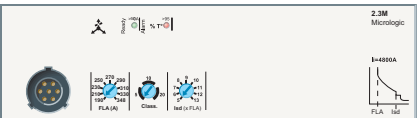
Thermal-Magnetic or Electronic Trip Unit?

Thermal-magnetic trip units (available on H- and J-frame circuit breakers only) protect against overcurrents and short-circuits using tried and true techniques. For applications requiring installation optimization and energy efficiency, electronic trip units offering more advanced protection functions combined with measurements.

Trip units using digital electronics are faster as well as more accurate. Wide setting ranges make installation upgrades easier. Designed with processing capabilities, Micrologic trip units can provide measurement information and device operating assistance. With this information, users can avoid or deal more effectively with disturbances and can play a more active role in system operation. They can manage the installation, anticipate events and plan any necessary servicing.

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

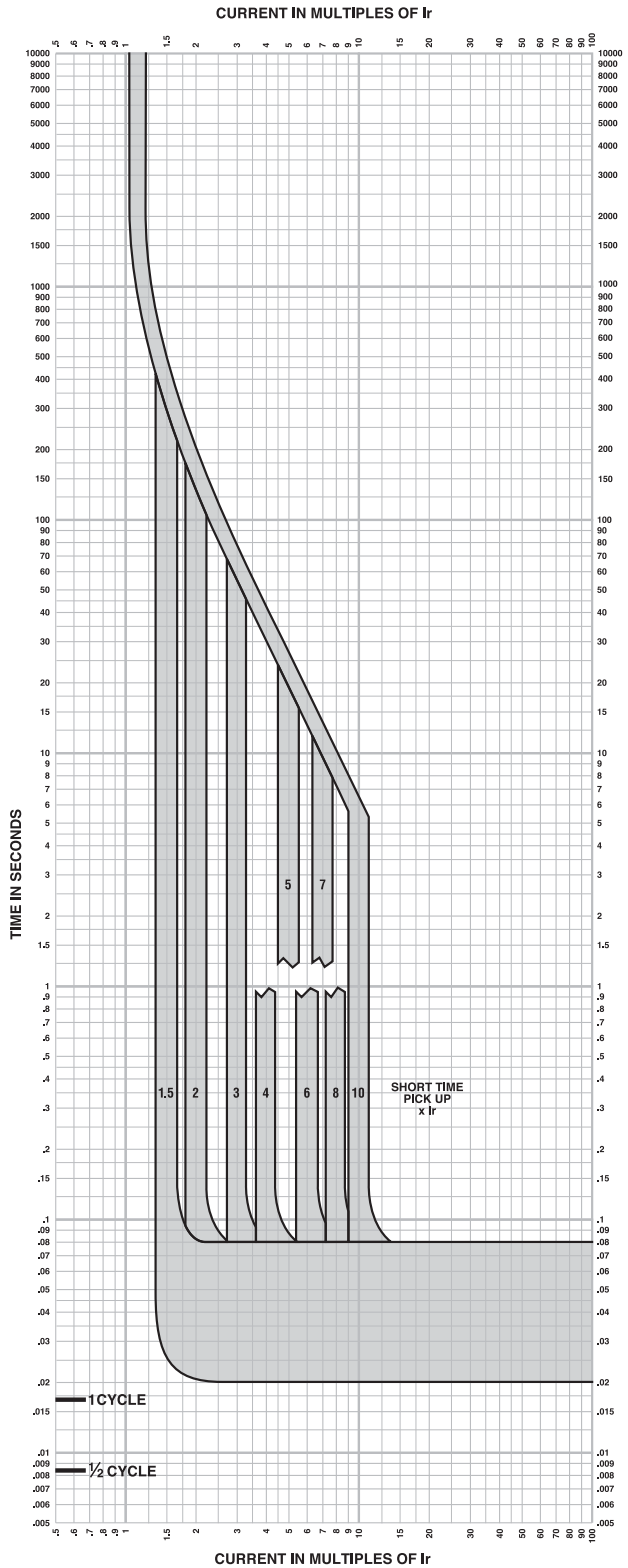
Table 62: Trip Unit Availability

| Trip Unit Type | Trip Unit | H-, J-Frame  | Trip Unit | L-Frame  |
|--|--------------------------------------|---|---------------------------------|---|
| Distribution Protection Thermal-Magnetic | T-M |  | N/A | |
| Distribution Protection LI | Micrologic 3.2 and 3.2-W |  | Micrologic 3.3 and 3.3-W |  |
| Distribution Protection LSI Fixed ST and LT delays | Micrologic 3.2S and 3.2S-W |  | Micrologic 3.3S and 3.3S-W |  |
| Distribution Protection LSI + Ammeter | Micrologic 5.2 A and 5.2 A-W |  | Micrologic 5.3 A and 5.3 A-W |  |
| Distribution Protection LSI + Energy Monitoring | Micrologic 5.2 E and 5.2 E-W |  | Micrologic 5.3 E and 5.3 E-W |  |
| Distribution Protection LSIG + Ammeter | Micrologic 6.2 A and 6.2 A-W |  | Micrologic 6.3 A and 6.3 A-W |  |
| Distribution Protection LSIG + Energy Monitoring | Micrologic 6.2 E and 6.2 E-W |  | Micrologic 6.3 E and 6.3 E-W |  |
| Motor Circuit Protection Magnetic Only | M |  | N/A | |
| Motor Protection Micrologic 1 M | N/A | | Micrologic 1.3M |  |
| Motor Protection Micrologic 2 M | Micrologic 2.2 M |  | Micrologic 2.3 M |  |

NOTE: W = mission critical trip unit.

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

Figure 110: Micrologic 3.2S and 3.2S-W Electronic Trip Unit Long Time / Short Time Trip Curve



MICROLOGIC™ ELECTRONIC TRIP UNITS Micrologic™ 3.2S and 3.2S-W Long Time/Short Time Trip Curve 250A J-Frame

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

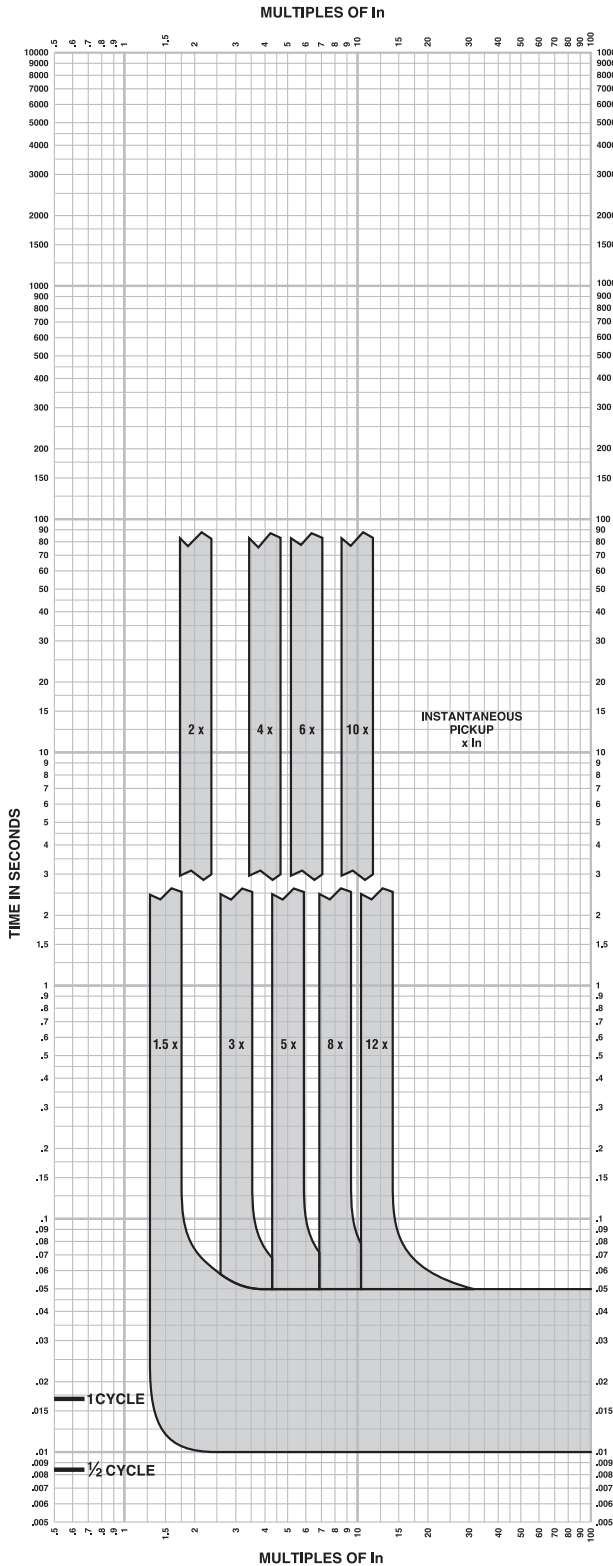
Notes:

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.

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

Figure 111: Micrologic 3.2, 3.2-W, 3.2S, 3.2S-W, 5.2A, 5.2A-W, 5.2E, 5.2E-W, 6.2A, 6.2A-W, 6.2E, and 6.2E-W Electronic Trip Curve Instantaneous Trip Curve



MICROLOGIC™ ELECTRONIC TRIP UNITS Micrologic™ 3.2, 3.2-W, 3.2S, 3.2S-W, 5.2A, 5.2A-W, 5.2E, 5.2E-W, 6.2A, 6.2A-W, 6.2E, and 6.2E-W Instantaneous Trip Curve 250A J-Frame

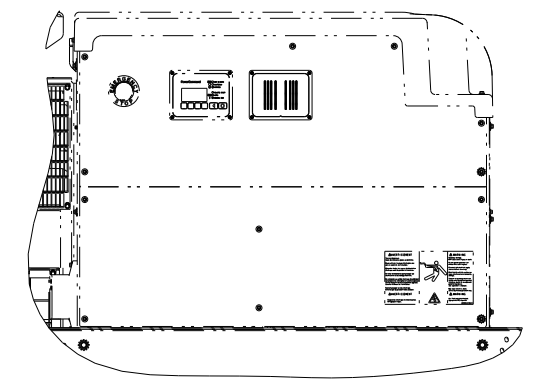
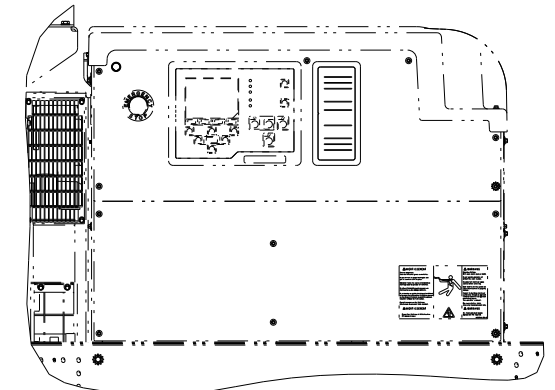
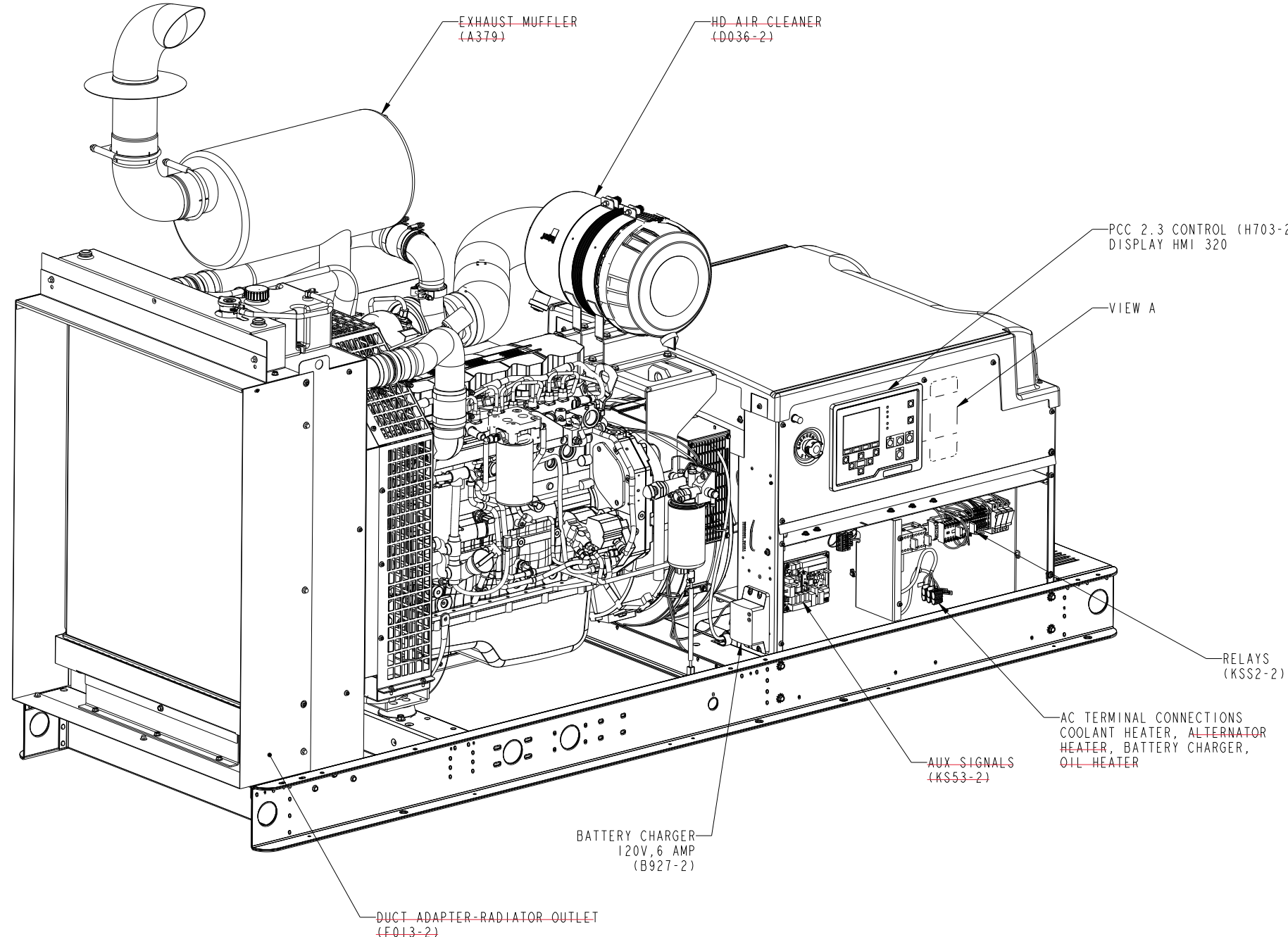
The time-current curve information is to be used for application and coordination purposes only.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
 2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
 3. In = Maximum dial setting of Ir.
250A J-Frame: In = 250A = Max Ir setting
- Curves apply from -35°C to +70°C (-31°F to +158°F) ambient temperature.

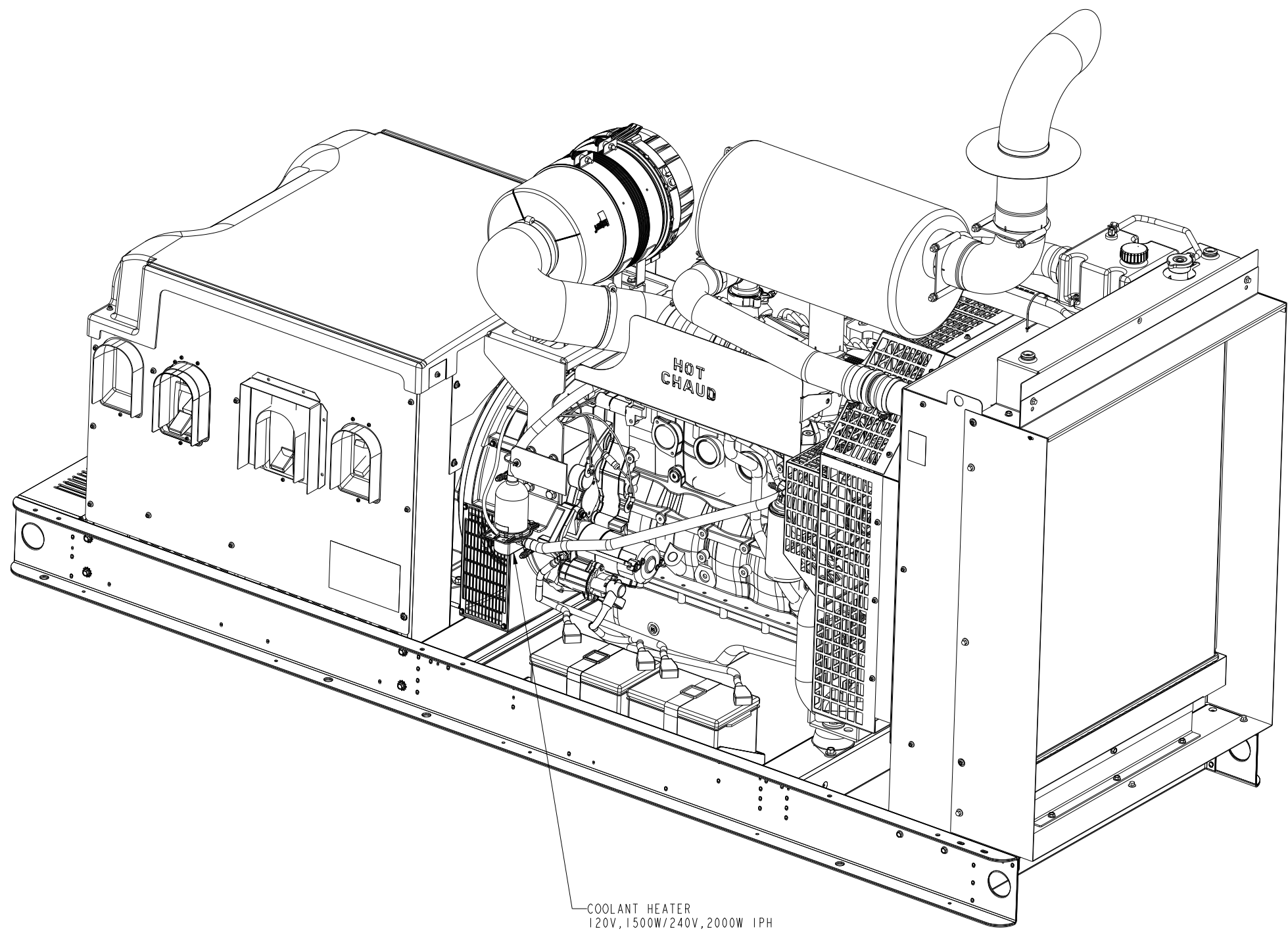
| REL NO | REV NO | REVISION | DRN | CKD | APVD | DATE | |
|------------|--------|----------|--------------------|-----|------|---------|---------|
| ECO-176532 | A | 1 | PRODUCTION RELEASE | DAH | DAH | GILLETT | 10APR18 |
| | | | | | | | |

NOTE:
1. DIMENSIONS SHOWN IN [] ARE IN INCHES.



| | | | | | | | | | | | | | | |
|---|---------------------------|--|------------------|---|--------------------------|-------------------------|------------|---------------------------|--|---------------------------|----------------|-----------|----------|--|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SHW TO A055J592 | DRW D HOFMEISTER | | CUMMINS POWER GENERATION | | | | | | | | | |
| DO NOT SCALE PRINT | | | CKD D HOFMEISTER | | OUTLINE, GENSET OPTIONS | | | | | | | | | |
| DIM | TOLERANCE | <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 | APVD D GILLETT | SITE CODE | A060G756 | |
| 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 | | | | | | | | | | | | | |
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| REL NO | REV NO | REVISION | DWN | CKD | APVD | DATE |
|------------|--------|----------|-----|-----|---------|---------|
| ECO-176532 | A | 1 | DAH | DAH | GILLETT | 10APR18 |
| | | | | | | |
| | | | | | | |

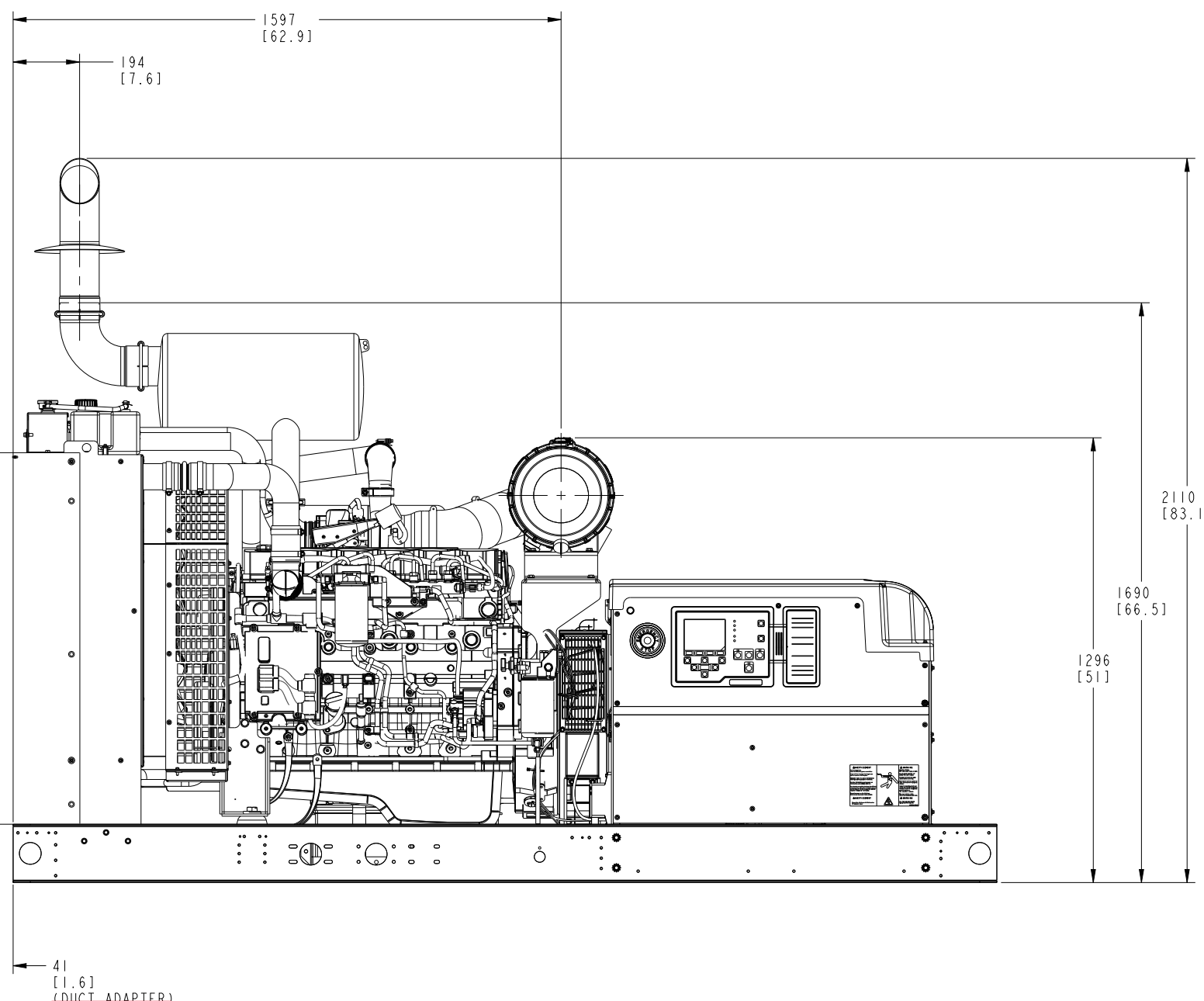
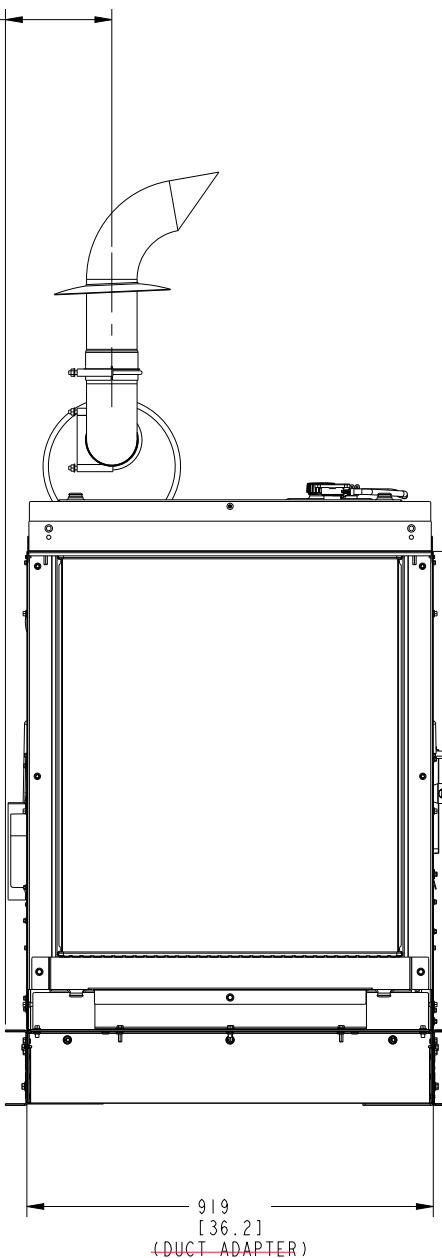


COOLANT HEATER
120V, 1500W/240V, 2000W IPH
(E153-2/E154-2)

| | | | | |
|---|-------|--|---------------------|---|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SHW TO A055J592 | DWN D HOFMEISTER | CUMMINS POWER GENERATION |
| DO NOT SCALE PRINT | | | CKD D HOFMEISTER | |
| DIM | TOL | 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 D GILLETT | OUTLINE, GENSET OPTIONS |
| ANG TOL | SCALE | ± 1.0° 3:16 | DATE 10APR18 | |
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| REL NO | REV NO | NO | REVISION | DRN | CKD | APVD | DATE |
|------------|--------|----|--------------------|-----|-----|---------|---------|
| ECO-176532 | A | 1 | PRODUCTION RELEASE | DAH | DAH | GILLETT | 10APR18 |
| | | | | | | | |

241
[9.5]



| | | | | | | |
|---|-------------------------|--|------------------|-----------|--------------------------|--------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SHW TO A055J592 | DWN D HOFMEISTER | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | | CKD D HOFMEISTER | | OUTLINE, GENSET | |
| DIM | TOLERANCE | | APVD D GILLETT | SITE CODE | OPTIONS | |
| X ± 1 | 0.00-4.99 +0.15/-0.08 | | DATE 10APR18 | | | |
| .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 | | | | | |
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| ± 1.0° | 3:16 | | ARROW | D | A060G756 | 3 of 3 |



Connect Series Accessories

Batteries

| Part Number | Standby/Cold | Group | Compatibility |
|-------------|-----------------|---------------|--|
| A052Y816 | Standby Battery | 51R – 450 CCA | RS13A, RS17A, RS20A |
| 0416-1051 | Standby Battery | 26 – 530 CCA | RS22, RS25, RS30, RS36, RS40, RX30, RX36, RX40, RX45, RX50, RX60 |
| A045P632 | Cold Starting | 34 – 850 CCA | RS22, RS25, RS30, RS36, RS40, RX30, RX36, RX40, RX45, RX50, RX60 |
| A045P632 | Standby Battery | 34 – 850 CCA | RS50, RS60, RS80, RS100 RS125 *, RS150 * |
| A030Y976 | Cold Starting | 4D – 1050 CCA | RS50, RS60, RS80, RS100 |

* - For Cold Starting, these generators take 2 of these batteries

Battery Accessories

Battery Heater Kits

Improves cold weather starting performance. Requires external power source connected to heater.

| Part Number | Compatibility | Kit Includes |
|-------------|--|--|
| A046G494 | RS22, RS25, RS30, RS36, RS40 RX30, RX36, RX40, RX45, RX50, RX60 | Heater pad with build-in thermostat, cable ties, instruction sheet |
| A052E356 | RS50, RS60, RS80, RS100 | Heater pad with build-in thermostat, cable ties, instruction sheet |
| A054X752 | RS125, RS150 | Heater pad with build-in thermostat, cable ties, instruction sheet |



A046G494

Battery Tray Kits

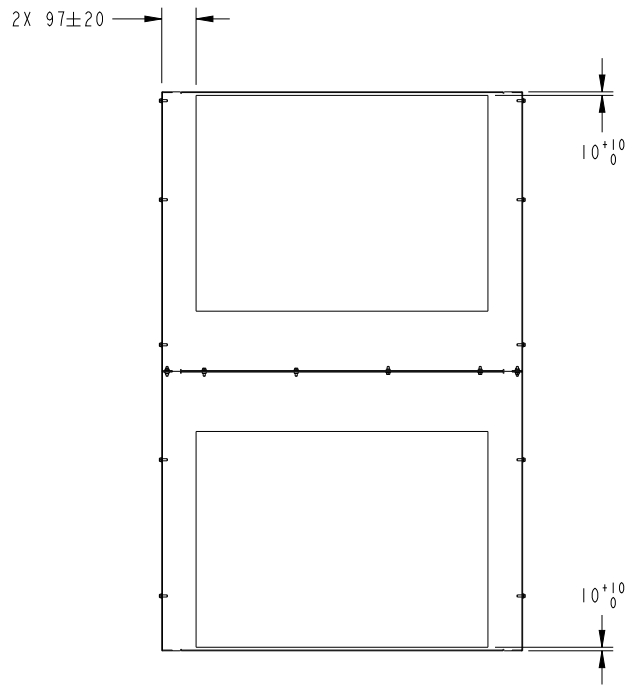
Larger tray which allows for installation of larger battery in place of the standard battery.

| Part Number | Compatibility | Kit Includes |
|-------------|-------------------------|---|
| A052A484 | RS50, RS60, RS80, RS100 | Battery tray, battery strap, screws, grommet, tie cable |

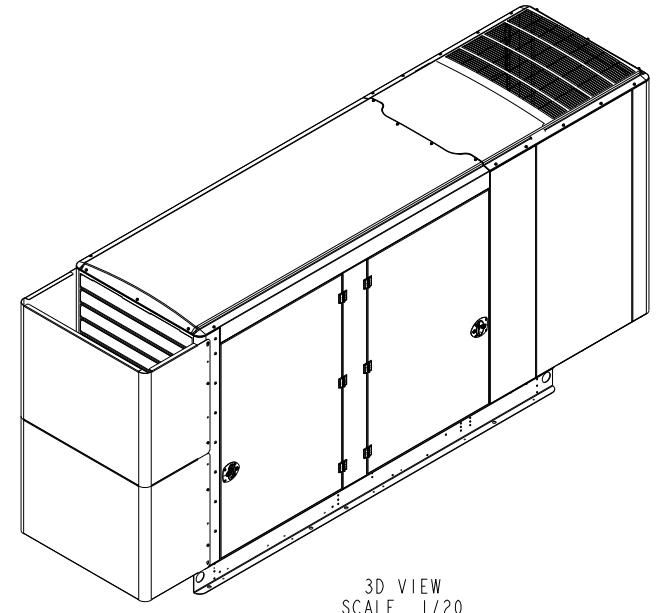
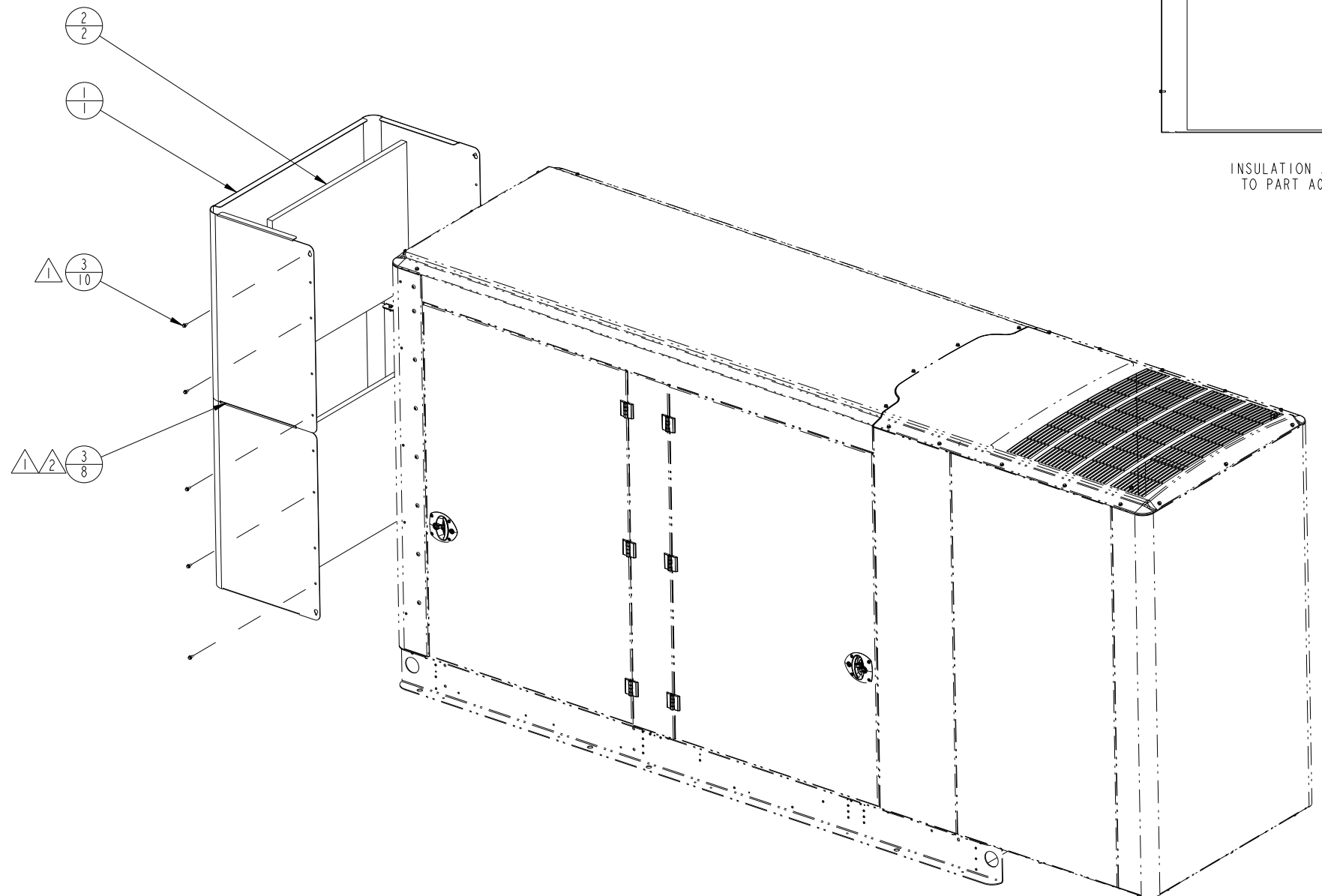
| REL NO | REV | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|---------|-----------|
| ECO-182895 | A | 1 | PRODUCTION RELEASE | DAH | DAH | GILLETT | 30 JAN 18 |
| | | | | | | | |

NOTE:

- 1. TORQUE TO 6 - 8 Nm.
- 2. HARDWARE IN THIS LOCATION FOR HOLDING DUCT PIECES TOGETHER.

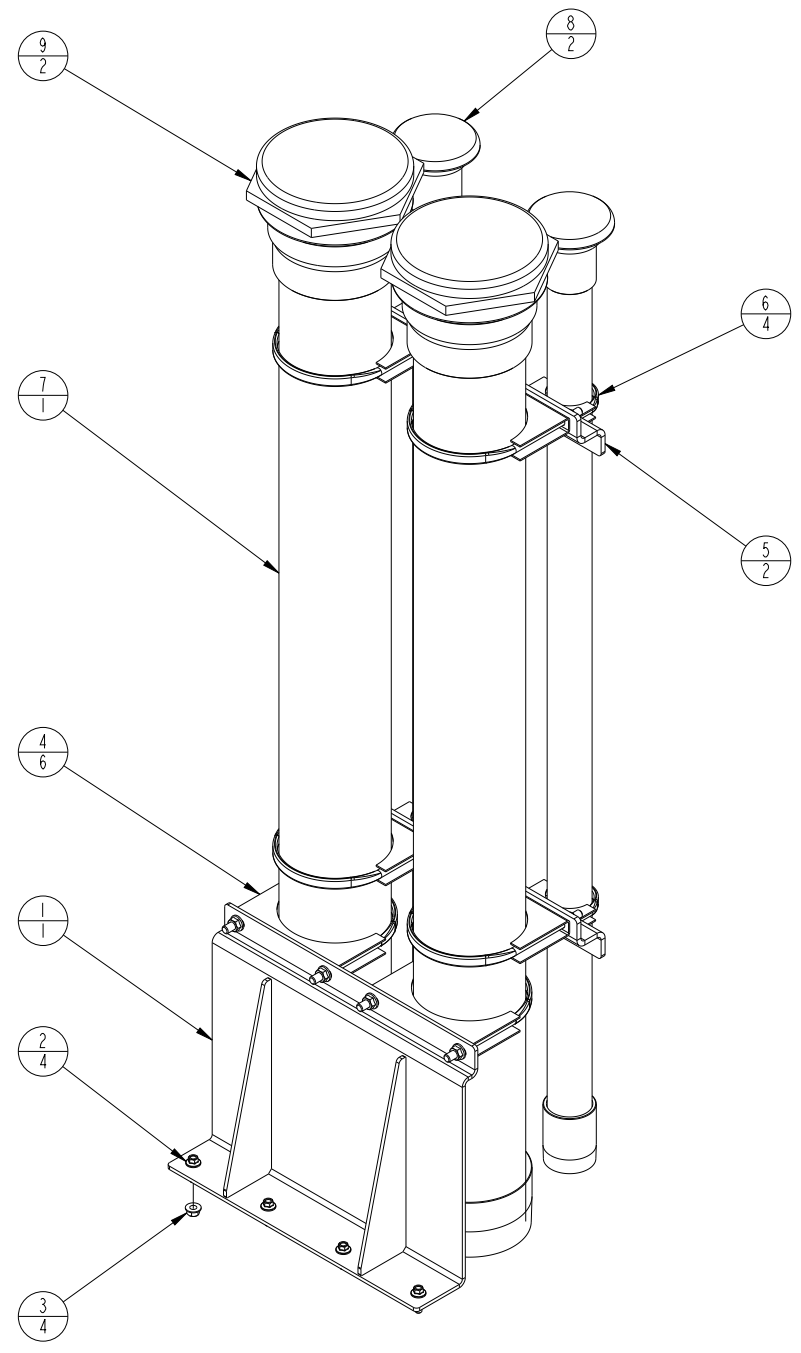


INSULATION ATTACHED TO PART A062J646



| | | | | | |
|---|---------------------------|--|------------------|---|--------------------------|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SHW TO A054F439 | DWN D HOFMEISTER | | CUMMINS POWER GENERATION |
| DO NOT SCALE PRINT | | | CKD D HOFMEISTER | | INSTALLATION, ENCLOSURE |
| DIM | TOL | | APVD D GILLETT | SITE CODE | |
| X ± 1 | 0.00 - 4.99 +0.15/-0.08 | | DATE 30 JAN 18 | | |
| .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 | | | | |
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| ± 1.0° | 1/10 | | ARROW | PGF | SCALE D |
| | | | | | A062H155 |
| | | | | | CAD SHEET 1 of 1 |

| REL NO | REV | NO | REVISION | DWN | CKD | APVD | DATE |
|------------|-----|----|--------------------|-----|-----|----------------|---------|
| ECO-177313 | A | 1 | PRODUCTION_RELEASE | RAH | GBS | G.STAFFENHAGEN | 03MAY18 |
| | | | | | | | |
| | | | | | | | |



| | | | | | | |
|---|------------|---------------------------|---|-----------|---------------------------------|--|
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS | | SHW TO A057C503 | DWN R_HALVERSON | | CUMMINS POWER GENERATION | |
| DO NOT SCALE PRINT | | | CKD G_STAFFENHAGEN | | KIT, FUEL SYSTEM | |
| DIM | X ± 1 | 0.00 - 4.99 +0.15/-0.08 | APVD G_STAFFENHAGEN | SITE CODE | VENT EXTENSION - 4FT-5 INCH DIA | |
| | .X ± 0.8 | 5.00 - 9.99 +0.20/-0.10 | DATE 03MAY18 | DWG | A060M240 | |
| | .XX ± 0.38 | 10.00 - 17.49 +0.25/-0.13 | | SCALE | 1 OF 1 | |
| ANG TOL | ± 1.0° | 17.50 - 24.99 +0.30/-0.13 | FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009 | ARROW | | |
| SCALE | 1/4 | | | PGF | | |

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

Drawing Name: A060M241 Revision: A
 Part Name: A060M240 Revision: A
 ECO-177313 Sheet 1 of 2

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 |
|-----|----|----|
| | | |
| | | |
| | | |

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 |
|-----|----|----|
| | | |
| | | |
| | | |
| | | |

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 |
|-----|----|----|
| | | |
| | | |
| | | |
| | | |

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

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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

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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

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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

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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

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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

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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

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

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

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

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