Pump Station & Force Main Improvements Project
Gleneden Beach, Oregon

Submittal Transmittal No. *012*

Contractor: R&G Excavating, Inc.	Engineer: Harper Hour Peterson Righellis Inc	Date Received:	
Address: 39300 Montgomery Dr. Scio, OR 97374 (503) 394-2190 (503) 394-2169	Address: Ken Condit 205 SE Spokane Street, Suite 200 Portland, OR 97202	Checked By: Date Checked: Date Returned: Spec Section: 1st Submittal?	 *26 32 13* *X*
Date Transmitted: 5/17/2021	Previous Transmittal Date:	ReSubmittal?	

No. Copies	Description	Manufacturer	Dwg or Data No.	Action Taken
electronic	Generator- 15 kw - Coronado Street PS	Cummins		

NO EXCEPTION TAKEN

CHECKING IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. ANY ACTION SHOWN IS SUBJECT TO THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR: DIMENSIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE; FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION; COORDINATION OF THEIR WORK WITH THAT OF ALL OTHER TRADES AND THE SATISFACTORY PERFORMANCE OF HIS WORK.

MFIA, INC.
CONSULTING ENGINEERS
2007 S.E. ASH STREET
PORTLAND, OR 97214

DATE: 6.8.21 **BY:** R Connell

MFIA Electrical

Remarks:

NET-- No Exceptions Taken
MCN -- Make Corrections Noted
A&R -- Amend and Resubmit
R-- Rejected
NR -- Engineer's review not required

CONTRACTOR: Must certify one of the following statements pertaining to the transmittal or submittal sent for review:

__ The undersigned, acting on behalf of the Contractor, certifies that this submittal has been reviewed and is approved; products have been verified as being as specified, field measurements and field construction criteria have been or will be coordinated, and the submittal is in compliance with Contract Documents.

___ As the general contractor for this project we certify that the material or equipment contained in this submittal meets all the requirements specified except for the attached deviations.

Glinda Ireland, Operations Manager

Engineer Comments:

DIVISION 26 - ELECTRICAL

SECTION 26 32 13 - DIESEL-ENGINE-DRIVEN GENERATOR SETS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide complete factory assembled diesel engine driven electric generator set and related equipment as specified herein and as shown on the drawings.

B. Provide factory test, startup by a supplier authorized by the equipment manufacturer(s), and on-site testing of the system.

C. The generator set manufacturer shall warrant all equipment provided under this section, whether or not it is manufactured by the generator set manufacturer, so that there is one source for warranty and product service. Technicians specifically trained and certified by the manufacturer to support the product and employed by the generator set supplier shall service the generator sets.

1.2 QUALITY ASSURANCE

A. The generator set installation and on-site testing shall conform to the requirements of the following codes and standards, as applicable. The generator set shall include necessary features to meet the requirements of these standards.

1. CSA 282 – Emergency Electrical Power Supply for Buildings
2. IEEE446 – Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
3. NFPA37
4. NFPA70 – National Electrical Code with any State modifications. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
5. NFPA99 – Essential Electrical Systems for Health Care Facilities
6. NFPA110 – Emergency and Standby Power Systems. The generator shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit. Component level type tests will not substitute for this requirement.

B. The generator set and supplied accessories shall meet the requirements of the following standards:

1. NEMA MG1. Alternator shall comply with the requirements of the current version of this standard as they apply to AC alternators.
2. UL142 – Sub-base Tanks
3. UL1236 – Battery Chargers
4. UL2200. The generator set shall be listed to UL2200 or submit to an independent third party certification process to verify compliance as installed.

C. The control system for the generator set shall comply with the following requirements:

1. CSA C22.2, No. 14 – M91 Industrial Control Equipment.
2. EN50082-2, Electromagnetic Compatibility – Generic Immunity Requirements, Part 2: Industrial.

3. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
4. FCC Part 15, Subpart B.
5. IEC8528 part 4. Control Systems for Generator Sets
6. IEC Std 801.2, 801.3, and 801.5 for susceptibility, conducted, and radiated electromagnetic emissions.
7. UL508. The entire control system of the generator set shall be UL508 listed and labeled.
8. UL1236 – Battery Chargers.

D. The generator set manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

1.2 SUBMITTALS

A. Shop Drawings: Detail fabrication, piping, wiring, and installation of the field-installed portions of the system. Include general arrangement drawings showing locations of auxiliary components in relation to the engine generator set and duct, piping, and wiring connections between the generator set and the auxiliary equipment. Show connections, mounting, and support provisions and access and working space requirements. Single-line diagrams of transfer switch units showing connections between automatic transfer switch, power source and load, wiring diagrams, elementary or schematic, differentiating between manufacturer-installed and field-installed wiring, including required interconnection between the generator set, the transfer switch, and the remote annunciator panel.

B. Product Data: Include data on features, components, ratings, and performance. Include dimensioned outline plan and elevation drawings of engine generator set and other system components. Include product data for each transfer switch, including dimensioned plans, sections, and elevations showing minimum clearances; conductor entry provisions; gutter space; installed features and devices; and materials lists. Provide motor-starting KVA performance data (graphical) along with calculations indicating worst-case motor starting scenario. See drawings for loads on the generator, and confirm load sizes with actual equipment to be furnished.

C. Operating and Maintenance Data.

Submit at later date

D. Factory Start-Up Test Report.

E. Site Test Report.

F. Submit stamped drawings and calculations prepared by a structural engineer licensed in the State of Oregon for the design of the generator-set seismic restraint and bracing.

PART 2 - PRODUCTS

2.1 MATERIALS

Cummins

A. Acceptable Manufacturers: Caterpillar, Kohler, Onan, Olympian, Generac, and MTU Onsite Power.

B. Other Manufacturers: Submit Substitution Request prior to bid date.

2.2 GENERATOR SET:

A. Generator set shall be the product of a manufacturer regularly engaged in the production of this type of equipment and one that has a local distributor and service organization. The generator shall have a continuous standby rating as indicated on the drawings.

B. Factory Assembly:

1. The entire generating system shall be built, tested and shipped so as to assure the unit is factory engineered and assembled so there is only one source of supply, service, and warranty responsibility.
2. The manufacturer shall have local parts and service facilities within a 100 mile radius of site to assure prompt emergency service within 24 hours.
3. The manufacturer shall have a flat-rate maintenance agreement program available to the customer.

C. Performance Requirements:

1. Frequency regulation shall by isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.5 percent.
2. Voltage manually adjustable from + 5% of nominal voltage.
3. Ambient conditions.
   a. Altitude of site at Hood River, Oregon.
   b. 100 degrees F air temperature at engine intake.
4. Voltage regulation shall be plus or minus 0.5 percent for any constant load between no load and rated load. Random voltage variation with any steady load from no load to full load shall not exceed plus or minus 0.5 percent.
5. Voltage transient performance +/- 20% line to line with step removal/application 30% of rated load up to 90% of rated load, including motor loads. Recovery time shall not exceed 1.5 seconds.
6. Motor starting performance: 20% maximum line-to-line voltage dip with step removal/application of any motor load while balance of loads are running.
7. On cold start-up voltage and frequency shall stabilize within specified bandwidths at the same time (not to exceed 2 seconds).
8. The alternator shall produce a clean AC voltage waveform, with not more than 5% total harmonic distortion at full linear load, when measured from line to neutral, and with not more than 3% in any single harmonic, and no 3rd order harmonics or their multiples. Telephone influence factor shall be less than 40.
9. The generator set shall be certified by the engine manufacturer to be suitable for use at the installed location and rating, and shall meet all applicable exhaust emission requirements at the time of commissioning.

D. Construction

1. The generator set shall consist of one diesel engine directly coupled to one AC alternator, mounted on a heavy-duty steel base to maintain alignment between components. The base shall incorporate a battery tray with hold-down clamps within the rails.
2. All switches, lamps, and meters in the control system shall be oil-tight and dust-tight. All active control components shall be installed within a UL/NEMA 3R enclosure. There shall be no exposed points in the control (with the door open) that operate in excess of 50 volts.

E. Connections

1. The generator set load connections shall be composed of silver or tin plated copper bus bars, drilled to accept mechanical or compression terminations of the number and type as shown on the drawings. Sufficient lug space shall be provided for use with cables of the number and size as shown on the drawings.
2. Power connections to auxiliary devices shall be made at the devices, with required protection located at a wall-mounted common distribution panel.
3. Generator set control interfaces to other system components shall be made on a permanently labeled terminal block assembly. Labels describing connection point functions shall be provided.

F. Engine and Engine Equipment: The engine shall be diesel, 4 cycle, radiator and fan cooled. The horsepower rating of the engine at its minimum tolerance level shall be sufficient to drive the alternator and all connected accessories. Two cycle engines are not acceptable. Engine accessories and features shall include:

1. An electronic governor system shall provide automatic isochronous frequency regulation. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate and excitation as appropriate to the state of the generator set. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed. The governing system shall include a programmable warm up at idle and cooldown at idle function. While operating in idle state, the control system shall disable the alternator excitation system.
2. Skid-mounted radiator and cooling system rated for full load operation in 122 degrees F (50 degrees C) ambient as measured at the alternator air inlet. Radiator fan shall be suitable for use in a system with 0.5 in H2O restriction. Radiator shall be sized based on a core temperature that is 20F higher than the rated operation temperature, or prototype tested to verify cooling performance of the engine/radiator/fan operation in a controlled environment. Radiator shall be provided with a duct adapter flange. The equipment manufacturer shall fill the cooling system with a 50/50-ethylene glycol/water mixture prior to shipping. Rotating parts shall be guarded against accidental contact.
3. Electric starter(s) capable of three complete cranking cycles without overheating.
4. Positive displacement, mechanical, full pressure, lubrication oil pump.
5. Full flow lubrication oil filters with replaceable spin-on canister elements and dipstick oil level indicator.
6. An engine driven, mechanical, positive displacement fuel pump. Fuel filter with replaceable spin-on canister element. Fuel cooler, suitable for operation of the generator set at full rated load in the ambient temperature specified shall be provided if required for operation due to the design of the engine and the installation.
7. Replaceable dry element air cleaner with restriction indicator.
8. Flexible supply and return fuel lines.
9. Engine mounted battery charging alternator, 40-ampere minimum, and solid-state voltage regulator.
10. Coolant Heater:
    a. Engine mounted, thermostatically controlled, coolant heater(s) for each engine. Heater voltage shall be as shown on the project drawings. The coolant heater shall be UL499 listed and labeled.

b. The coolant heater shall be installed on the engine with silicone hose connections. Steel tubing shall be used for connections into the engine coolant system wherever the length of pipe run exceeds 12 inches. The coolant heater installation shall be specifically designed to provide proper venting of the system. The coolant heaters shall have provisions to isolate the heater for replacement of the heater element without draining the coolant from the generator set. The quick disconnect/automatic sealing couplers shall allow the heater element to be replaced without draining the engine cooling system or significant coolant loss.

c. The coolant heater shall be provided with a DC thermostat, installed at the engine thermostat housing. An AC power connection box shall be provided for a single AC power connection to the coolant heater system.

d. The coolant heater(s) shall be sized as recommended by the engine manufacturer to warm the engine to a minimum of 104F (40C) in a 40F (4C) ambient, in compliance with NFPA110 requirements, or the temperature required for starting and load pickup requirements of this specification.

11. Provide vibration isolators, spring/pad type, quantity as recommended by the generator set manufacturer. Isolators shall include seismic restraints if required by site location.
12. Starting and Control Batteries shall be calcium/lead antimony type, 24 volt DC, sized as recommended by the engine manufacturer, complete with battery cables and connectors. The batteries shall be capable of a minimum of three complete 15-second cranking cycles at 40F ambient temperature when fully charged.
13. Provide exhaust silencer(s) for each engine of size and type as recommended by the generator set manufacturer and approved by the engine manufacturer. The muffler(s) shall be critical grade. Exhaust system shall be installed according to the engine manufacturer's recommendations and applicable codes and standards.
14. Provide a minimum 12 amp battery charger for each
15. All fuel and lube oil filters shall be "spin-on" type.
16. Provide a packaged fuel tank system including double-wall sub-base fuel tank, integral float switch, low fuel level warning alarm contacts and a fuel level gauge. Size for 24-hr 75% full load run time. Tank and vents, fills, etc. shall comply with all State and Local codes.
17. An immersion-type oil heater operating on 120 VAC shall be installed in lube pan sump.
18. Engine starting shall be initiated via the generator control panel mode selector switch either manually or through remote 2-wire system. It shall include an electric 24V DC starting system.
19. Charging system shall include an engine-driven 35 amp 24V DC battery charging alternator, lead acid starting batteries rated at a minimum of 225 amp hours each, an automatic constant potential battery charger rated 10 amps, operating on 120V AC with voltmeter, ammeter, input and output fuse protection, float equalize switch, and low battery voltage contacts.
20. Cooling system shall be unit-mounted radiator with blower-type fan to cool engine at 100% rated load at 104 degrees F ambient. Provide an immersion-type block heater with adjustable thermostat and oil pressure disconnect switch for operation on 120 V AC. Supply in system a rust inhibitor in addition to the anti-freeze required. Anti-freeze protection shall equal 0 degrees F.
21. Safety alarms shall include an automatic shutdown system to protect from high water temperature, low oil pressure, overspeed, and overcrank

22. Instrumentation shall include control panel mounted gauges to monitor lube oil pressure, engine coolant temperature, battery charge rate, hours of operation, "Auto-Off/Reset-Test" engine mode selector switch, and push to test pilot lights indicating nature of shutdown conditions.

E. General Description - Alternator:

1. Alternator shall be a brushless, single bearing, and directly coupled to the engine flywheel via a flexible disk. It shall be engine driven, synchronous type, with amortisseur windings. Insulation shall be non-hygroscopic Class H, with a temperature rise not to exceed 105 degrees C above a 40 degrees C ambient. Alternator shall be a 10 or 12 lead machine with leads brought to a terminal box.
2. Voltage regulator shall be a solid-state type with no moving parts. It shall include overvoltage and underfrequency protection and be moisture proof.
3. Alternator and control panel strip heaters for use on 120V AC to raise the temperature 35 degrees C above ambient for moisture protection. Provide relay to disconnect heaters when generator is running.
4. Instrumentation includes control panel mounted gauges to monitor voltage, amps, frequency, four-position phase selector switch, voltage adjusting rheostats, and push to test pilot lights indicating breaker tripped. Engine and breaker must be manually reset after shutdown. Breaker shall not trip on overcrank. The control panel shall contain field adjustable solid-state circuitry for overcrank protection designed to open the cranking circuit after a minimum of three cranking cycles of 30 second crank/15 second pause if engine fails to start.

F. Vibration isolation shall be accomplished by mounting unit on a minimum of six spring-type vibration isolators with adjusting screws and earthquake restraints, unless manufacturer recommends no external vibration isolation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install the engine-generator set, battery charger, and batteries per the manufacturers recommendations and as shown on the Drawings.

B. Provide proper filters for fuel and lubricating oils and fill engine with proper type and amount of oil.

C. Fill the engine cooling system with ethylene-glycol antifreeze solution and water in a 50/50 mixture.

D. Provide all necessary connections for a complete and operating installation.

E. Provide seismic restraint and bracing for the generator set in accordance with the current Oregon Structural Specialty Code and as designed by a professional engineer licensed in the State of Oregon.

3.2 MAINTENANCE INSTRUCTIONS

A. All personnel directly concerned with the operation of the system shall be thoroughly instructed in the use of the systems by authorized distributor personnel. Such service shall be provided in conjunction with the system equipment. Allocate 4 hours of site training for Owner's personnel. Schedule training time with Owner.

3.3 WARRANTY

A. The complete diesel engine generator system shall be guaranteed for two years from date of acceptance.

B. In addition to the manufacturer's standard warranty, the warranty shall include 100% parts, labor, travel mileage, transportation costs, and freight associated with failure unless failure is caused by misuse, abuse, or accident (e.g. fires, floods, etc.). Manufacturer's factory service personnel, skilled in the repair of the unit, shall be dispatched to repair the equipment at the site within 24 hours after receiving the purchaser's call.

3.4 TESTING

A. Prior to installation of the engine generator set, a factory test shall be performed and a logged test report issued to the Owner. A resistive load bank shall be connected to the load side of the standby generator. The load bank shall be used to test the generator set for full load and half load. The log shall include the length of time for generator set start-up after the commercial source is interrupted, the length of time for the generator set to reach frequency stability after zero to half load and from half load to full load switching. The generator set shall be run for a minimum of four hours at full load. All the temperatures of the engine and the voltages, frequency and amperages shall be recorded on every 15 minute interval during the test.

B. A site test shall be performed, logged and witnessed by the Owner's representative. The total facility standby load shall be connected to the unit for one full hour. Each breaker shall be used to approximate half and full load. The log shall indicate the same information contained in the pre-installation test. Notify the Owner 72 hours in advance so that his representative can be present at the test.

3.5 ACCEPTANCE

A. Upon satisfactory completion of tests instruction and completion of the project, the system shall be deemed accepted.

END OF SECTION

Sales and Service

CUMMINS INC
4711 N Basin
Portland, OR 97217
971-280-0800

May 12th, 2021

Submittal for:
Gleneden Beach PS C150Kw D6D

Cummins Inc. Project No. 211478
PO No.: PO2103

Customer Requested Delivery Date:_____

Customer Requested Equipment Delivery Address:_____

_____

Contact Person & Phone # for Deliveries:_____

Prepared for:
Glinda Ireland
Gleneden Beach PS
Full Address undetermined

Phone No.: 503-394-2190

Fax No. :

Email

bids@rgexcavating.com

Prepared by: Robinson Cantero

Office Number: 971-280-0800

Mobile Number: -

Fax Number: -

Email address: Robinson.cantero@cummins.com

Customer Approval

□ Revise and Resubmit

□ Approved as Noted/Release for Production

□ Released for Production

By: _____ Dated:_____

Important:
1. By signing this submittal you're approving it as submitted unless noted.
2. Any change to the scope of supply may impact the current shipping schedule and the contract price, as such, Cummins Inc. can NOT accept any changes to the scope of supply within 60 Calendar days before shipment.
3. **Our Company policy states that "We can NOT order any materials or proceed with production without an approved and release submittal that includes a required ship date".**

May12h, 2021
Project Name:Gleneden Beach PS
Project Number: 211478

Dear: Glinda Ireland

Thank you for your order. The next step in the process is the submittals phase.
Attached please find the submittal, prepared by Robinson Cantero, the Project Manager assigned to your project. Please review the submittal and return it to him as soon as possible along with your approval and/or changes clearly indicated so we can continue to process your order.

Our company policy states we cannot order any materials or proceed with any production without an approved submittal returned from you along with requested delivery date.

Current lead time is approximately **16-18 Weeks** from submittal approval. Split shipments and drop shipments on equipment that do not need local upfit are possible, but requirements must be advised at the time of release.

Note: Requested delivery date is not a guarantee of delivery date. Leadtimes at time of release can vary due to market conditions and manufacturing production capacities. We will advise you of our closest delivery target to match your request within 1-2 weeks.

A Cummins Project Team has now been assigned to your project. Their names and contact info are listed below. For all issues your Project Manager, Robinson Cantero, will best be able to assist you.

Name	Title	Function	Phone	email
Chris Walhberg	Territory Manager	Sales	503-806-0322	christopher.c.Wahlberg@cummins.com
Robinson Cantero	Project Manager Portland	Prepares Submittals, handles all Project issues	971-280-0800	Robinson.cantero@cummins.com
Chris Walhberg	Territory Manager	Sales	503-307-7529	christopher.c.Wahlberg@cummins.com
Jenness Mann	PC	Project Coordinator	503-972-6646	jenness.mann@cummins.com
John McWilliams	Senior Application Engineer	Technical Resource for all projects	510-347-6673	john.l.mcwilliams@cummins.com
TBD	TBD	Schedules pre-inspect and S&T	TBD	TBD
Dan Lanske	Director of Sales Powergen	Director of Sales Power Gen	206-450-2383	dan lanske@cummins.com

Best regards,

Robinson Cantero
Cummins Inc.

Sales and Service

May 12th, 2021
Project Name: Gleneden Beach PS
Project Number: **211478**
PO Number: **2103**

Summary Sheet

(Not for Construction, please refer to specific materials within submittal or call Cummins Inc. to double check values.)

Project Manager Robinson Cantero 971-280-0800

Major Equipment Shipping Weights and Dimensions

Equipment	Length (in)	Width (in)	Height (in)	Weight (lbs)	Color	Sources Drawing Number
C150 D6d	180	40	77	4800	Green	
Diesel Fuel Gallonage						
				-		
Total Genset Package						

Generator Set - Lug Information

Max. Breaker Amps	Wire (Cooper)	
	Quantity	Size
250A	1	350MCM

Automatic Transfer Switch - Lug Information

Amperage	Cable/Phase	Cable Size
400A ATS	2	350MCM

AC Power Supplies needed for Genset Accessories

Accessories	No. phases	Voltage	Wattage
Engine Oil Heater	1	120Vac	432
Alternator Heater	1	120Vac	276
Coolant Heater	1	120Vac	1000

*For genset 250kW and below refer to drawing 0333-0588 for reconnectable heater.

General Wiring Guidelines

Interconnection Wiring To Be # 14 AWG Stranded Wire Minimum. Ac and Dc Control Wires to Be Run In Separate Conduits

Battery Charger to Battery to Be Sized For Charger Output And length of run.

For AC Connections Use # 14 AWG or larger for lengths up to 40 Feet.

Use # 12 AWG or larger for lengths up to 50 Feet.

Use # 10 AWG or larger for lengths up to 100 Feet.

For DC Connections Use # 14 AWG or larger for lengths up to 100 Feet.

Paralleling load share cable to be 18 AWG 4 - conductor twisted shielded cable.
Modbus and PCCnet cable to be Belden model 9729 twisted shielded pair.
Echelon Lontalk network cable to be stranded CAT5.
We recommend running additional 20% spare wires for each circuit.
****REFER TO WIRING DIAGRAMS SUPPLIED WITH SUBMITTAL FOR SPECIFIC INFORMATION****

Special Requirements / Submittal Review Notes

Warranty Statement

Global Power Electronics

Transfer Switch

English
Original Instructions

1-2015

A029Y876 Issue D

Limited Warranty

Transfer Switch

This limited warranty applies to all Cummins Power Generation® branded Transfer Switches 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 commissioning†, demonstration or 18 months after factory ship date, whichever is sooner.

† Date of commissioning not to exceed date of Generator Set initial start-up.

Transfer Switch Coverage Duration:

The warranty coverage duration for Transfer Switches is defined in the table below for the different product families:

Product Family	Duration
GTEC, LT, LC, RST, OTEC	▪ 1 Year: Parts, Labor & Travel
RSS, RA, and other Power Transfer Devices††	▪ 2 Years: Parts, Labor & Travel
OT, OTPC, BTPC, OHPC, CHPC, PLT	▪ Years 0-2: Parts, Labor &Travel ▪ Years 3-5: Parts Only ▪ Years 6-10: Main Contacts Only

†† Devices manufactured by Cummins Power Generation that allow power transfer between two power sources.

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:

- Parts and labor required to repair the Product as defined by coverage duration.
- Reasonable travel expenses to and from the Product site location as defined by coverage duration.

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.

In addition, the owner will be responsible for:

- Incremental costs and expenses associated with Product removal and reinstallation resulting from non-standard installations.
- Costs associated with rental of power generating equipment 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.
- Non-conformance to applicable industry standards for installation
- 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.
- 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®.
- Owner or operator abuse or neglect such as: late servicing and maintenance and improper storage.
- Damage to parts, fixtures, housings, attachments and accessory items that are not part of the transfer switch or paralleling system.

This limited warranty does not cover costs resulting from:

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

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:_____

Warranty Statement

Global Commercial Warranty Statement

Generator Set

English
Original Instructions

7-2017

A028U870 (Issue 5)

Our energy working for you.™

Power Generation

Limited Warranty

Commercial Generating Set

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

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

Warranty Period:

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

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

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

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

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

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

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

Base Warranty Coverage Duration (Whichever occurs first)

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

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

Cummins Power Generation® Responsibilities:

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

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

Owner Responsibilities:

The owner will be responsible for the following:

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

Limitations:

This limited warranty does not cover Product failures resulting from:

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

This limited warranty does not cover costs resulting from:

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

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

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

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

CUMMINS POWER GENERATION® RIGHT TO FAILED COMPONENTS:

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

Extended Warranty:

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

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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:_____

Specification sheet

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 ℃ (122 ℉) 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.

	Standby 60 Hz		Prime 60 Hz		
Model	**kW**	**kVA**	**kW**	**kVA**	**Data sheets**
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 ℃ (32 ℉)
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 ºC (248 ℉) 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 ℃ temperature rise alternator
- 105 ℃ temperature rise alternator
- PMG excitation
- Alternator heater, 120 V
- Reconnectable full 1 phase output alternator upto 175 kWe

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 ℃ (40 ℉) – cold weather
  - <-18 ℃ (0 ℉) – 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

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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 ℃ to +70 ℃ (-40 ℉ to +158 ℉) 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 ℃ to +70 ℃
- 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):

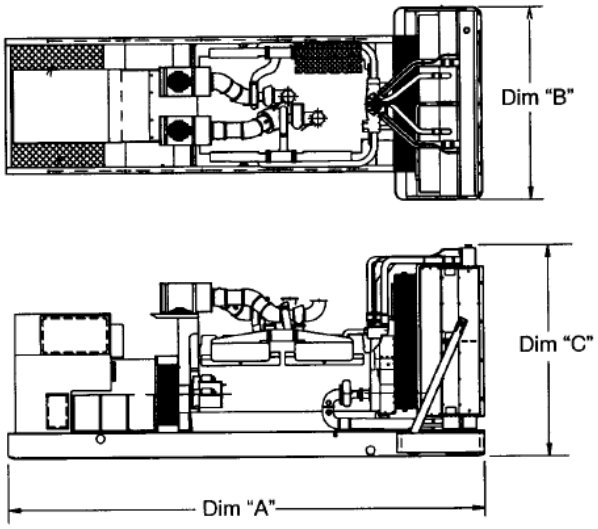
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

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*wet 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.

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

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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NAS-6370-EN.DOCX (04/19) A061F585

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, m3/min (scfm)	14.78 (522)	14.22 (502)
Maximum Air Cleaner Restriction with Clean Filter, kPa (in H2O)	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_2O)	10 (40.19)	10 (40.19)
Actual Exhaust Back Pressure with CPG Sound level 2 Enclosure Muffler, kPa (in H_2O)	9.5 (38.18)	8.6 (34.36)
Actual Exhaust Back Pressure with CPG Weather Enclosure Muffler, kPa (in H_2O)	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_2O)	0.12 (0.5)	

Weight[2]

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.

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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

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Formulas for Calculating Full Load Currents:

Three phase output	Single phase output
$\frac{kW \times 1000}{Voltage \times 1.73 \times 0.8}$	$\frac{kW \times SinglePhaseFactor \times 1000}{Voltage}$

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

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Specification Sheet

PowerCommand® 1.1 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

Easy to view: HMI 211RS for residential use. 128 x 64 pixel graphic LED backlight LCD.

Easy to use: Tactile buttons for generator set start/stop. Residential Standby display for convenient use.

Modbus® interface: Eliminates need for MODLON.

Progressive protective functions: Advanced Overcurrent Protection – Generator set monitoring & protection.

Digital voltage regulation: Single phase full wave SCR type regulator compatible with either shunt or PMSG systems.

Digital engine speed governing: Provides isochronous frequency regulation.

12 and 24 VDC battery operation.

Automatic mains failure: Smooth & automatic transfer and re-transfer of load from utility to generator set & vice-versa.

Exerciser clock: Runs generator set exerciser routines for dependability of operation.

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

Certification: Suitable for us on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC Mil Std., CE and CSA standards.

PowerCommand Digital Generator Set Control PCC 1302

Description

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

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

Features

- 12 and 24 VDC battery operation.
- Digital voltage regulation.
- Digital engine speed governing (where applicable) - Provides isochronous frequency regulation.
- Full authority engine communications (where applicable) - Provides communication and control with the Engine Control Module (ECM).
- 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.
- 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.
- 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.
- Exerciser function – Routine exercising of generator set.
- Supports dual fuel control.
- Automatic Mains Failure function built in generator set controller. Modbus interface - for interconnecting to customer equipment.
- Configurable inputs and outputs - Four discrete inputs and two 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.

Fault history - Provides a record of the most recent fault conditions with control hours time stamp. Up to 10 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)
- kVA (three phase and total)
- Frequency
- Engine data
- Starting battery voltage
- Engine speed
- Engine temperature
- Engine oil pressure
- Partial 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:
- Engine speed governor adjustments
- Voltage regulation adjustments
- Cycle cranking
- Configurable fault set up
- Configurable output set up
- Meter calibration
- 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.

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.

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.

Remote start mode - 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 three methods: magnetic pickup, battery charging alternator feedback or main alternator output frequency. The control also supports configurable glow plug control when applicable.

Cycle cranking - 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 line-to-line sensing voltage regulation system that is compatible with shunt or PMG excitation systems. The voltage regulation system is full wave rectified and has an SCR output for good motor starting capability. Major system features include:

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

The automatic voltage regulator feature can be disabled to allow the use of an external voltage regulator.

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.

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.

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 labelling the input.

Emergency stop

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

General engine protection

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

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

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

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

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

Hydro mechanical fuel system engine protection

Overspeed shutdown - Default setting is 115% of nominal.

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

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

High engine temperature warning/shutdown - Level is pre-set (configurable with InPower) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

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

Sensor failure indication - Logic is provided on the base control to detect analog sensor or interconnecting wiring failures.

Full authority electronic engine protection

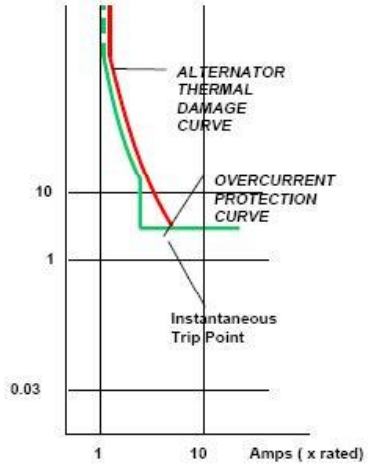
Engine fault detection is handled inside the engine ECM. Fault information is communicated via the SAE-J1939 data link for annunciation in the HMI

Alternator protection

High AC voltage shutdown (59) - Output voltage on any phase exceeds pre-set values. Time to trip is inversely proportional to amount above threshold. Values adjustable from 105-130% 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 pre-set value. Adjustable over a range of 50-95% of reference voltage, time delay 2-20 seconds. Default value is 85% for 10 seconds.

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



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

Over frequency shutdown/warning (81o) - 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, 10 seconds, enabled.

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

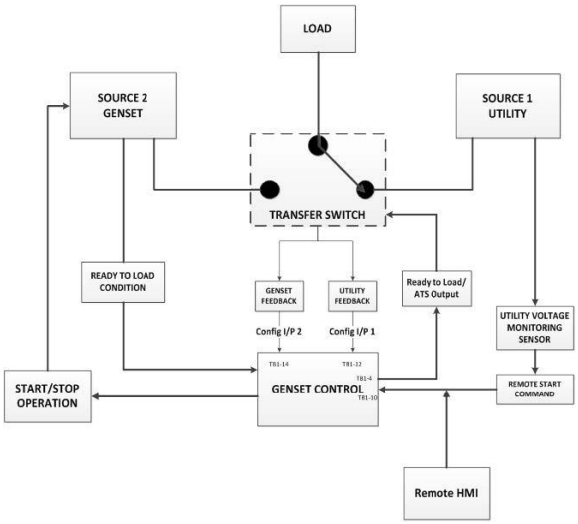
Field overload shutdown - Uses field voltage to shutdown generator set when a field overload condition occurs.

Advanced Functions

Automatic mains failure*

The built in AMF feature provides the automatic transfer and re-transfer of the load from utility to generator set and vice-versa.

- Automatically starts-stops the generator set in the event of utility failure.
- Annunciates faults.



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* A utility voltage monitoring sensor (as shown in the AMF diagram above) must be connected in order to use the AMF feature on the 1302 control. Use Schneider Electric Relay RSB1A120U7 and Socket RSZE1S35M.

Exerciser clock

The exerciser clock runs the generator set exerciser routines for dependability of operation.

Field Control Interface

Input signals to the base control include:

- Remote start
- Local and Emergency stop
- 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:

- Configurable relay outputs: Control includes (2) relay output contacts rated at 2 A. 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.

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 Ø Ratings (1.0 power factor)		**60 Hz**			**50 Hz**	
(Based on specific temperature rise at 40 ℃ ambient temperature)		Double delta	4 lead		Double delta	
		120/240	120/240		110-120 220-240	
125 ℃ rise ratings	kW/kVA	109/109	135/135		96/96	
105 ℃ rise ratings	kW/kVA	98/98	125/125		87/87	

3 Ø Ratings (0.8 power factor)		Upper broad range		LBR*	347/600	Broad range		
(Based on specified temperature rise at 40 ℃ ambient temperature)		120/208 240/416	139/240 277/480	190-208 380-416	347/600	110/190 220/380	120/208 240/415	127/220 254/440
150 ℃ Rise ratings	kW	150	170	148	170	136	136	128
	kVA	188	213	185	213	170	170	160
125 ℃ Rise ratings	kW	145	165	144	165	128	128	120
	kVA	181	206	180	206	160	160	150
105 ℃ Rise ratings	kW	130	150	128	150	116	116	108
	kVA	163	188	160	188	145	145	135
80 ℃ Rise ratings	kW	112	128	110	128	101	101	94
	kVA	140	160	138	160	126	126	118
3 Ø Reactances (per unit, ±10%)								
(Based on full load at 105 ℃ 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 Ø 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.

Data Sheet

Circuit Breakers

Description

This Data sheet provides circuit breaker manufacturer part numbers and specifications. The Circuit breaker box description is the rating of that breaker box installation on a Cummins Generator. Please refer to the website of the circuit breaker manufacturer for breaker specific ratings and technical information.

Applicable Models

Engine	Models					
Kubota	C10D6	C15D6	C20D6			
QSJ2.4	C20N6	C25N6	C30N6	C30N6H	C36N6	C36N6H
	C40N6	C40N6H	C50N6H	C60N6H		
B3.3	C25D6	C30D6	C35D6	C40D6	C50D6	C60D6
QSJ5.9G	C45N6	C50N6	C60N6	C70N6	C80N6	C100N6
QSJ8.9G	C125N6	C150N6				
QSB5	DSFAC	DSFAD	DSFAE	C50D6C	C60D6C	C80D6C
	C100D6C	C125D6C				
QSB7	DSGAA	DSGAB	DSGAC	DSGAD	DSGAE	
		C125D6D	C150D6D	C175D6D	C200D6D	
QSL9	DSHAD	DQDAA	DQDAB	DQDAC		
QSM11	DQHAB					
QSX15	DFEJ	DFEK				

Instructions

1. Locate the circuit breaker feature code or part number and use the charts below to find the corresponding manufacturer circuit breaker catalog number.

2. Use the first letter of the circuit breaker catalog number to determine the "frame" of the breaker. If the first letter is an “N”, use the second letter. Then follow the corresponding website link from the table below to find the breaker catalog number description.

Please refer to the catalog numbering systems page, which is given in the chart, to understand the nomenclature of the catalog number.

Frame	Catalog name*	Catalog number description page(s)
P	0612CT0101 http://www.schneider-electric.us/en/download/document/0612CT0101/	16-17
H, J, and L	0611CT1001 http://www.schneider-electric.us/en/download/document/0611CT1001/	8-9
Q	0734CT0201 http://www.schneider-electric.us/en/download/document/0734CT0201/	4

*The following link may also be used to search specifically by the breaker part number or for the catalog name listed above. http://products.schneider-electric.us/technical-library/

3. Search the catalog by using the first 3 letters of the breaker catalog number and the first 5 numbers to find information such as trip curves, accessories, and dimensional details regarding the circuit breaker.

*If the catalog number starts with “N”, skip the N and begin your search with the second letter.

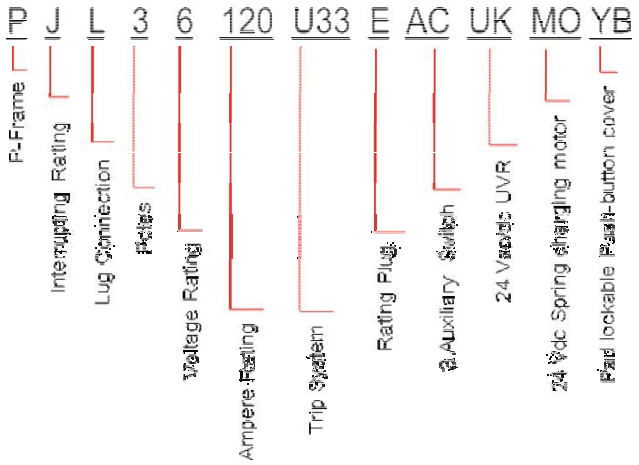
*If the first 3 letters are “PJP,” the search will not work. You will need to start with just “PJ” and use the description pages to obtain the information you are looking for on the “PJP.”

Example

After finding your circuit breaker catalog number to be "PJL36120U33EACUKMOYB," navigate to the P-frame catalog by using the link provided.

Look at pages 16-17 of the pdf catalog to find the nomenclature of the breaker.

Search the P-frame spec sheet using the search "PJL36120.”



Feature Code	Breaker Box Description	Cummins Part #	Manufacturer	Breaker Catalog Number	Trip Unit	Plug Type
KV35-2	CB,Loc A,50A,3P,600VAC,80%,UL	A043L461	Schneider Electric	HDL36050	Thermal Magnetic	N/A
KV36-2	CB,Loc A,60A,3P,600VAC,80%,UL	A043L459	Schneider Electric	HDL36060	Thermal Magnetic	N/A
KV37-2	CB,Loc A,70A,3P,600VAC,80%,UL	A043L451	Schneider Electric	HDL36070	Thermal Magnetic	N/A
KV38-2	CB,Loc A,80A,3P,600VAC,80%,UL	A043L012	Schneider Electric	HDL36080	Thermal Magnetic	N/A
KV39-2	CB,Loc A,90A,3P,600VAC,80%,UL	A043K997	Schneider Electric	HDL36090	Thermal Magnetic	N/A
KV40-2	CB,Loc A,100A,3P,600VAC,80%,UL	A043L024	Schneider Electric	HDL36100	Thermal Magnetic	N/A
KV41-2	CB,Loc A,125A,3P,600VAC,80%,UL	A043K994	Schneider Electric	HDL36125	Thermal Magnetic	N/A
KV42-2	CB,Loc A,150A,3P,600VAC,80%,UL	A043K991	Schneider Electric	HDL36150	Thermal Magnetic	N/A
KV43-2	CB,Loc A,175A,3P,600VAC,80%,UL	A043L619	Schneider Electric	JDL36175	Thermal Magnetic	N/A
KV44-2	CB,Loc A,200A,3P,600VAC,80%,UL	A043L520	Schneider Electric	JDL36200	Thermal Magnetic	N/A
KV45-2	CB,Loc A,225A,3P,600VAC,80%,UL	A043L517	Schneider Electric	JDL36225	Thermal Magnetic	N/A
KV46-2	CB,Loc A,250A,3P,600VAC,80%,UL	A043L510	Schneider Electric	JDL36250	Thermal Magnetic	N/A
KV47-2	CB,Loc A,250A,3P,600VAC,100%,UL	A044C640	Schneider Electric	JDL36250U31XLC	MicroLogic 3.2S	N/A
KV55-2	CB,Loc B,15A,2P,600VAC,80%,UL	A043E189	Schneider Electric	HDL26015	Thermal Magnetic	N/A
KV57-2	CB,Loc B,25A,2P,600VAC,80%,UL	A043E191	Schneider Electric	HDL26025	Thermal Magnetic	N/A
KV58-2	CB,Loc B,30A,2P,600VAC,80%,UL	A043E185	Schneider Electric	HDL26030	Thermal Magnetic	N/A
KV59-2	CB,Loc B,40A,2P,600VAC,80%,UL	A043E183	Schneider Electric	HDL26040	Thermal Magnetic	N/A

Prototype Test Support (PTS)
60 Hz test summary

Generator set models	Representative prototype	
C125D6D	Model:	C200D6D
C150D6D	Engine:	QSB7-G5 NR3
C175D6D	Alternator:	UCDI274K

The following summarizes prototype testing conducted on the designated representative prototype of the specified models. This testing is conducted to verify the complete generator set electrical and mechanical design integrity.

Prototype testing is conducted only on generator sets not sold as new equipment.

Maximum surge power: 211.5 kW

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

Alternator temperature rise:

The highest rated temperature rise (20 °C) test result are reported as follows to verify that worst case temperature rises do not exceed allowable NEMA MG1 limits for class H insulation. Tests were conducted per IEEE 115, rise by resistance and embedded detector, with rated voltages. Only the highest temperatures are reported.

Torsional analysis and testing:

The generator set with UCDI274K was tested to verify that the design is not subjected to harmful torsional stresses. A spectrum analysis of the transducer output was conducted over the speed range of 1710 to 1890 RPM.

Cooling system: 49 °C ambient
0.5 in H2O restriction

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

Durability:

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

Electrical and mechanical strength:

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

Steady state performance:

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

Voltage regulation:	± 0.5%
Random voltage variation:	± 0.5%
Frequency regulation:	Isochronous
Random frequency variation:	± 0.25%

Transient performance:

The generator set was tested with the listed alternator to verify single step loading capability as required by NFPA 110. Voltage and frequency response on load addition or rejection were evaluated. The following results were recorded at 0.8 power factor:

Full load acceptance:

Voltage dip:	29.4%
Recovery time:	3.3 seconds
Frequency dip:	20.3%
Recovery time:	4.4 seconds

Full load rejection:

Voltage rise:	32.7%
Recovery time:	1.4 seconds
Frequency rise:	11%
Recovery time:	2.1 seconds

All data based on 0.8 power factor:

Harmonic analysis:

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

	Line to Line		Line to Neutral	
Harmonic	No load	Full load	No load	Full load
3	0.0	0.1	0.2	1.1
5	0.9	0.9	0.9	0.9
7	0.7	2.2	0.7	2.2
9	0.0	0.0	0.7	1.2
11	0.0	0.2	0.1	0.2
13	0.1	0.1	0.0	0.1
15	0.0	0.0	0.2	0.4

2021 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:	MCEXL0409AAD-019
Effective Date:	06/8/2020
Date Issued:	06/8/2020
EPA Engine Family (Cummins Emissions Family):	MCEXL0409AAD

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		
	NO_X + NMHC	CO	PM	NO_X + NMHC	CO	PM
Test Results	3.0	0.7	0.08	4.0	1.0	0.11
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 NOx correction, Restrictions: Intake Restriction set to a maximum allowable limit for clean filter; Exhaust Back Pressure set to a maximum allowable limit..

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

Exhaust Emission Data Sheet
C150D6D
60 Hz Diesel Generator Set

Engine Information:

Model:	Cummins QSB7-G5 NR3	Bore:	4.21 in. (106.9 mm)
Type:	4 cycle, in-line, 6 cylinder diesel	Stroke:	4.88 in. (123.9 mm)
Aspiration:	Turbocharged and Charge Air Cooled	Displacement:	408 cu. in. (6.7 liters)
Compression Ratio:	17.2:1	Exhaust Stack Diameter:	4 in (101.6 mm)
Emission Control Device:	Turbocharged and Charge Air Cooled		

Performance Data	1/4 Standby	1/2 Standby	3/4 Standby	Full Standby	Full Prime
BHP @ 1800 RPM (60 Hz)	85.1	135.4	185.7	237.1	215.7
Fuel Consumption (gal/Hr)	4.7	6.9	9.2	11.7	10.7
Exhaust Gas Flow (CFM)	652.3	948.5	1143.2	1258.0	1189.2
Exhaust Gas Temperature (°F)	685.9	764.7	825.8	872.2	849.2
Exhaust Emission Data					
HC (Total Unburned Hydrocarbons)	0.29	0.18	0.09	0.04	0.05
NOx (Oxides of Nitrogen as NO_2)	1.85	1.91	2.23	2.89	2.61
CO (Carbon Monoxide)	1.82	1.17	0.68	0.35	0.48
PM (Particulate Matter)	0.17	0.12	0.08	0.05	0.07
Smoke (Bosch)	0.74	0.68	0.58	0.48	0.58
Sulfur Dioxide (SO_2)	0.17	0.17	0.16	0.15	0.15

All values (except smoke) are cited: g/BHP-hr

Test Conditions

Data is representative of steady-state engine speed (± 25 RPM) at designated genset loads. Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:	ASTM D975 No. 2-D diesel fuel with 0.03-0.05% sulfur content (by weight), and 40-48 cetane number.
Fuel Temperature:	99 ± 9 °F (at fuel pump inlet)
Intake Air Temperature:	77 ± 9 °F
Barometric Pressure:	29.6 ± 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H_2O/lb dry air
Reference Standard:	ISO 8178

The NOx, HC, CO and PM emission data tabulated here are representative of test data taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subjected to instrumentation and engine-to-engine variability. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may results in elevated emission levels.

Specification sheet

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	

Basic fuel tanks

Standard features:

UL 142 and ULC-S601 listed - Minimum 110% secondary containment capacity.

NFPA and IFC - Capable of meeting NFPA 30 and NFPA 110 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:

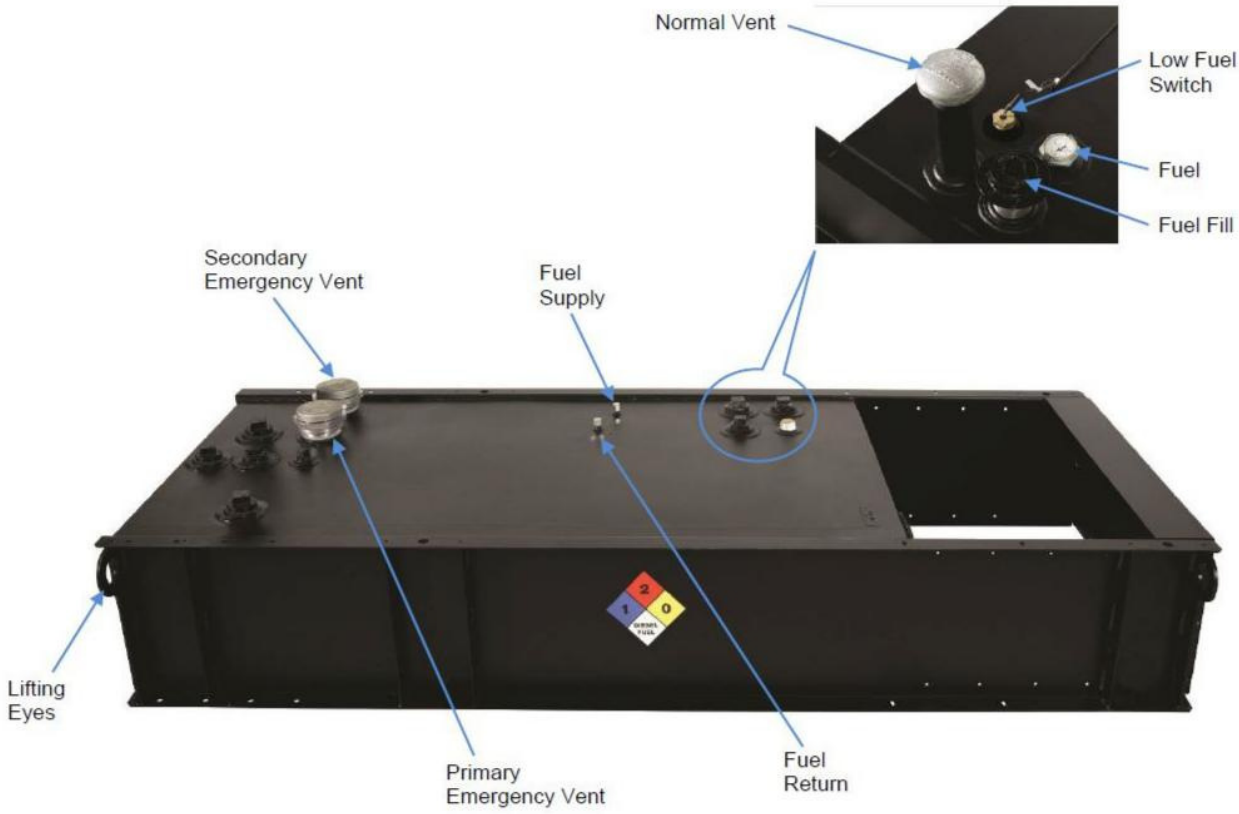
Secondary containment basin switch (rupture switch) - Activates a warning in the event of a primary tank leak. Side mounted.

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.



*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		11.7	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		13.3	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		14.9	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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NAAC-5868-EN (02/18)

VMC GROUP
THE POWER OF TOGETHER™

CERTIFICATE OF COMPLIANCE
SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certification No.

VMA-51071-01C (Revision 7)

Expiration Date: 6/30/2021

Certification Parameters:

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

IBC 2012, 2015, 2018

The following model designations, options, and accessories are included in this certification. Reference report number VMA-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
Commerical Series; 10kW-200kW

The above referenced equipment is **APPROVED** for seismic application when properly installed[3], used as intended, and contains a Seismic Certification Label referencing this Certificate of Compliance[4]. As limited by the tabulated values, below grade, grade, and roof-level installations, installations in essential facilities, for life safety applications, and/or of equipment containing hazardous contents are permitted and included in this certification with an Equipment Importance Factor assigned as I_p=1.5. The equipment is qualified by successful seismic shake table testing at the nationally recognized Dynamic Certification Laboratories under the 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 ≤ 1.0	z/h = 0.0
		$S_{DS} \leq 2.000$ g	$S_{DS} \leq 2.500$ g

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

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

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

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

thevmcgroup.com

VMC GROUP
THE POWER OF TOGETHER™

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certified Product Table:

Model	Power Rating	RPM	Max Length (in)	Max Width (in)	Max Height (in)	Max Weight with Enclosure (lbs.)	Certified Fuel Tank Capacities (gal.)	S_{DS} (g) @ z/h = 0.0	S_{DS} (g) @ z/h = 1.0
C10 D6	10 kW	1800	98	34	88	4300	46, 74, 91, 132, 195, 263	2.5	2
C15 D6	15 kW					4400			
C20 D6	20 kW					4470			
C25 D6	25 kW		131			5890	74, 132, 195, 263, 389		
C30 D6	30 kW					5930			
C35 D6	35 kW					5960			
C40 D6	40 kW					6140			
C50 D6	50 kW					6260			
C60 D6	60 kW								
C50 D6C	50 kW		170	40	104	8943	250, 425, 625		2.5
C60 D6C	60 kW					8990			
C80 D6C	80 kW					9040			
C100 D6C	100 kW					9216			
C125 D6C	125 kW					9300			
C125 D6D									
C150 D6D	150 kW		180	71	111	14300	351, 737, 1055		
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	2.5	2	3.2	2.4	1.667	0.675	2.4

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.

IBC CERTIFIED VMC GROUP

VMA-51071-01C (Revision 7)
Issue Date: Friday, July 3, 2015
Revision Date: Tuesday, June 23, 2020
Expiration Date: Wednesday, June 30, 2021

VMC GROUP
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CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Notes & Comments:

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

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

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

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

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

6. This certificate applies to units manufactured at:
   1400 73rd Ave NE, OF 143, Minneapolis, MN 55432

John P. Giuliano, PE
President, VMC Group

IBC® CERTIFIED VMC GROUP

VMA-51071-01C (Revision 7)
Issue Date: Friday, July 3, 2015
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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.

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

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
DIM: X ±1, .X ±0.8, .XX± 0.38
HOLE: 0.00- 4.99 +0.15/-0.08; 5.00- 9.99 +0.20/-0.10; 10.00-17.49 +0.25/-0.13; 17.50-24.99 +0.30/-0.13
ANG TOL: ± 1.0° SCALE: 1/1

SIM TO A051N157
DO NOT SCALE PRINT
- CONFIDENTIAL - PROPERTY OF CUMMINS POWER GENERATION GROUP

DWN D HOFMEISTER
CKD D HOFMEISTER
APVD G STAFFENHAGEN
DATE 05MAR18
FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994 | FIRST USED ON ARROW

SITE CODE PGF

CUMMINS POWER GENERATION
INSTALLATION, GENSET
SEISMIC REQUIREMENTS
DWG SIZE D | A058C559 | SHEET 1 OF 6 | DWG REV A

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

Drawing Name: A058C560 Revision: A
Part Name: A058C559 Revision: A
ECO-170731 Sheet 1 of 7

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	CONCRETE SLAB THICKNESS
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
DIM: X ±1 / .X ±0.8 / .XX± 0.38
HOLE: 0.00- 4.99 +0.15/-0.08; 5.00- 9.99 +0.20/-0.10; 10.00-17.49 +0.25/-0.13; 17.50-24.99 +0.30/-0.13
ANG TOL: ± 1.0° SCALE: 1/1

SIM TO A051N157
DO NOT SCALE PRINT
- CONFIDENTIAL -
PROPERTY OF CUMMINS POWER GENERATION GROUP

DWN D HOFMEISTER
CKD D HOFMEISTER
APVD G STAFFENHAGEN
DATE 05MAR18
FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5M-1994
FIRST USED ON ARROW

SITE CODE PGF

CUMMINS POWER GENERATION
INSTALLATION, GENSET
SEISMIC REQUIREMENTS
ENG SIZE D | A058C559 | SHEET 2 OF 6 | DRG REV A

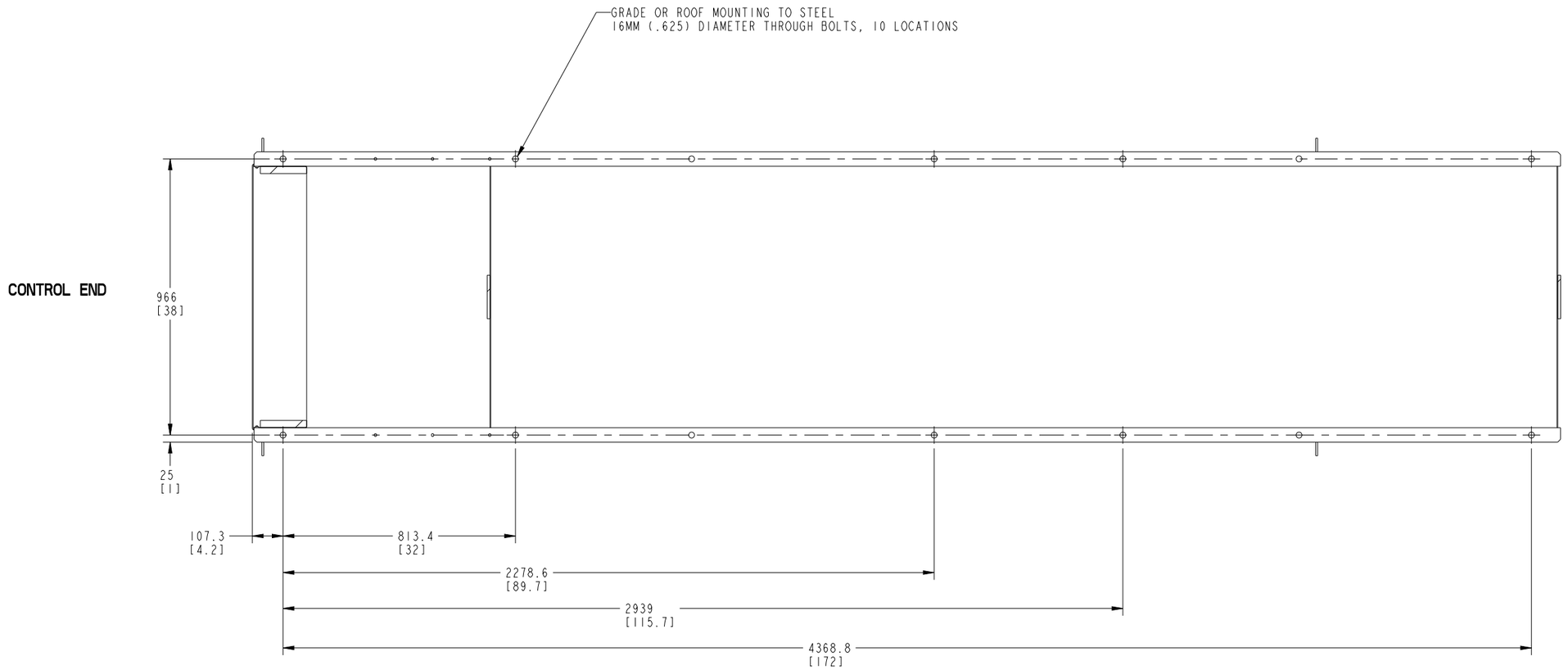
Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: IBC,OSHPD

Drawing Name: A058C560 Revision: A
Part Name: A058C559 Revision: A
ECO-170731 Sheet 2 of 7

PTC® Creo® Parametric

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



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

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS

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

ANG TOL: ± 1.0° SCALE: 1/1

SIM TO A05IN157

DO NOT SCALE PRINT

- CONFIDENTIAL -
PROPERTY OF CUMMINS POWER GENERATION GROUP

DWN	D HOFMEISTER
CKD	D HOFMEISTER
APVD	G STAFFENHAGEN
DATE	05MAR18

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

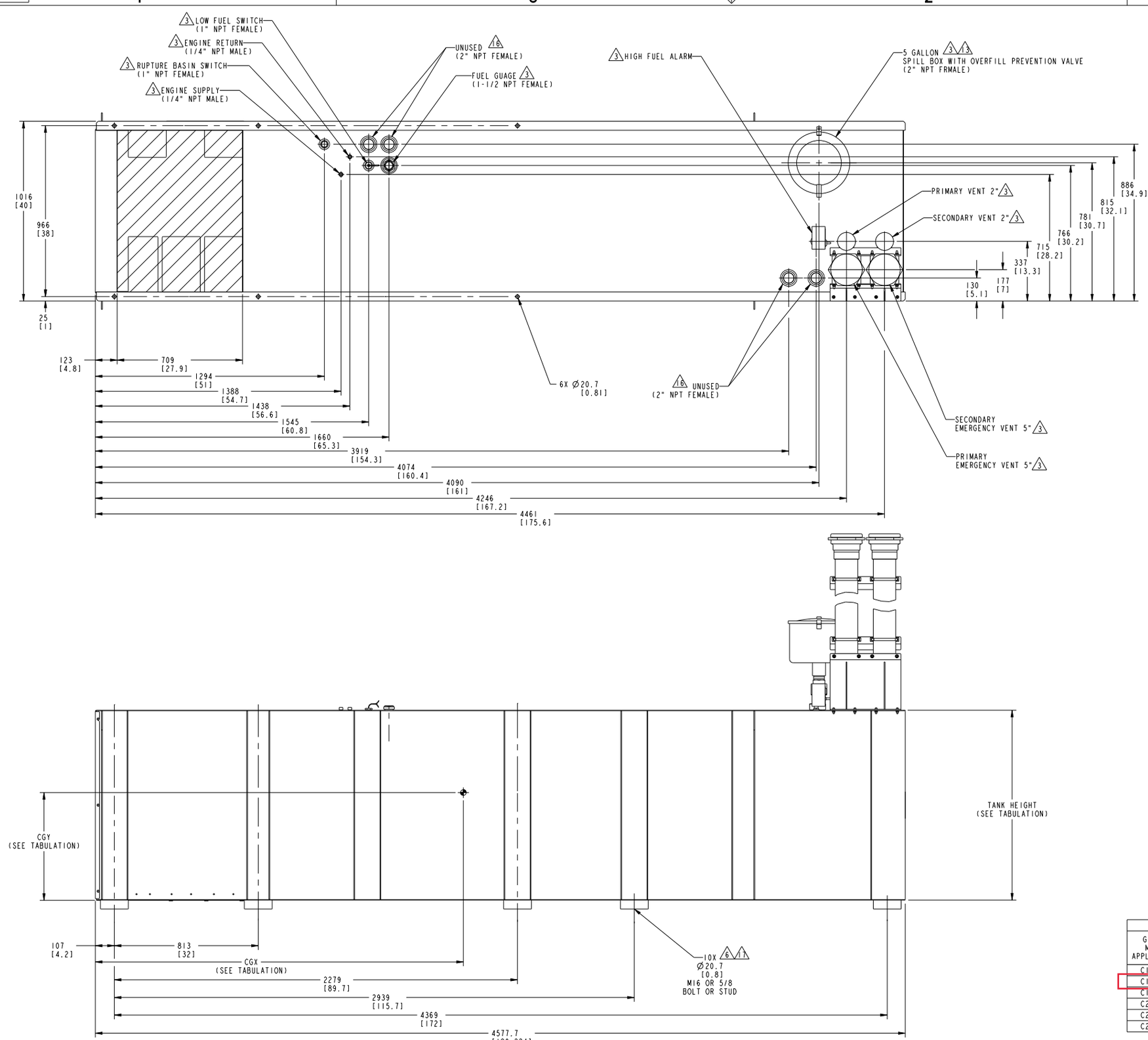
CUMMINS POWER GENERATION

INSTALLATION, GENSET
SEISMIC REQUIREMENTS

SITE CODE: PGF

DWG SIZE: D — A058C559 — SHEET 4 of 6 — DWG REV: A

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



REL NO	REV	NO	REVISION	DRN	CKD	APVD	DATE
ECO-170441	A	1	PRODUCTION RELEASE	DAH	DAH	STAFFENHAGEN	27FEB18

NOTES:

1. TANKS ARE UL142 LISTED. SECONDARY CONTAINMENT FUEL TANK. REFER TO TANK LABELS AND LOCAL CODE TO DETERMINE VENTING REQUIREMENTS FOR BOTH COMPARTMENTS.
2. 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:
   - 2.1 REFER TO APPLICATION MANUAL T030 FOR GENERAL SET MOUNTING GUIDELINES.
   - 2.2 AFTER PLACING SET ON FOUNDATION, VERIFY ALL MOUNTING PADS CONTACT FOUNDATION.
   - 2.3 THERE ARE SHIMS ATTACHED TO EACH FUEL TANK. THESE ARE INTENDED TO FILL ANY GAP BETWEEN THE MOUNTING PADS AND FOUNDATION.
   - 2.4 INSERT THE MAXIMUM HEIGHT STACK OF SHIMS THAT WILL SLIDE INTO THE GAP.
   - 2.5 TIGHTEN TANK HOLD DOWN MOUNTING FASTENERS.
3. INDICATES PIPE SIZE OF FEATURE OR OPTION INDICATED.
4. DIMENSIONS IN [ ] ARE IN INCHES.
5. FOR IBC SEISMIC CERTIFIED INSTALLATIONS, SEE GENSET IBC SEISMIC INSTALLATION REQUIREMENTS DRAWING.
6. FUEL TANK HAS A FLANGE THICKNESS OF UP TO 10 mm [0.394 in], ALLOW EXTRA LENGTH ON HARDWARE FOR UNEVENESS OF MOUNTING SURFACE. RISER FEATURE WILL ADD ADDITIONAL 51 mm [2 in].
7. FUEL TANK PERIMETER IS SHOWN. FOUNDATION SHOULD BE EXTENDED BEYOND THIS PERIMETER. SEE (T030) APPLICATION MANUAL.
8. INSTALLATION & REMOVAL LIFTING AND SERVICE ACCESS CLEARANCE (SUGGESTED MINIMUM).
9. REMOVABLE STUB-UP ACCESS PANEL.
10. ELECTRICAL STUB-UP AREA WITH FUEL TANK RISER FEATURE INSTALLED.
11. 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.
13. FILL CAP LOCATED HERE IF OVERFILL PREVENTION VALVE IS NOT INSTALLED.
14. TANK ONLY.
15. TANK WITH FUEL AND ACCESSORIES.
16. PORT SEALED WITH REMOVABLE STEEL PLUG.
17. SHOWN WITH RISERS.

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

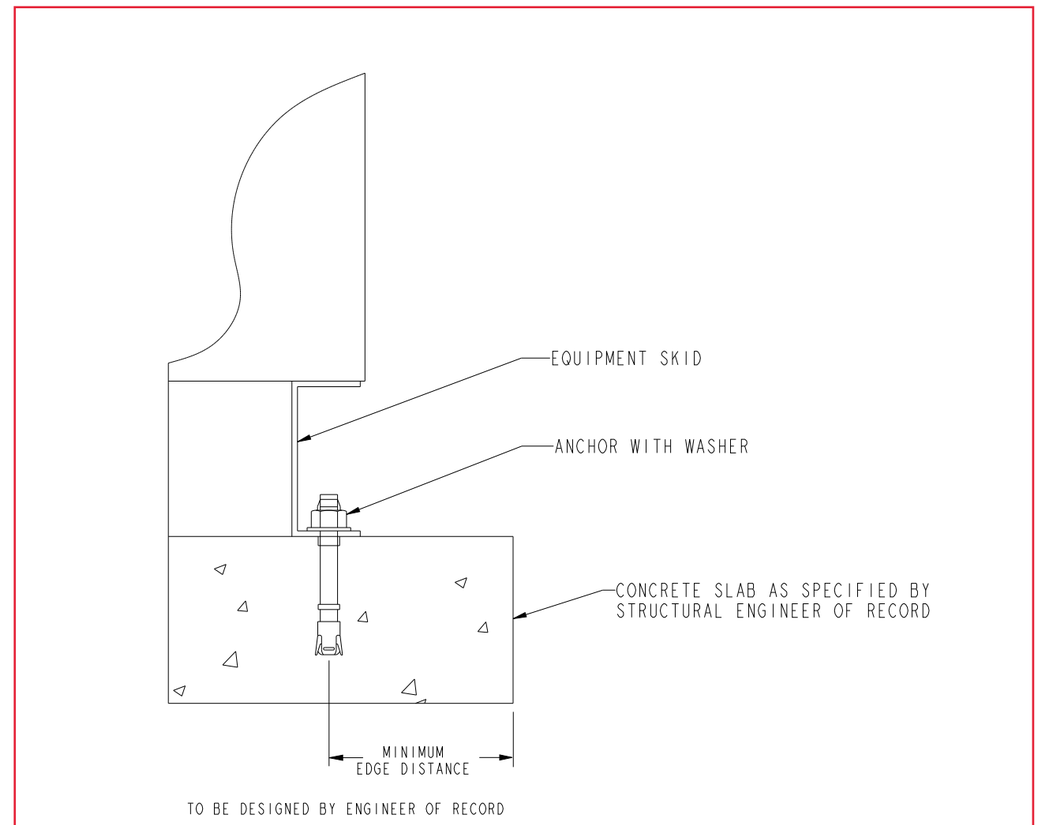
TABULATION

TANK NUMBER	TANK HEIGHT	VENT EXTENSIONS HEIGHT WITH 10' PIPES MM [INCH]	VENT EXTENSIONS HEIGHT WITH 4' PIPES MM [INCH]	VENT HEIGHT WITHH NO EXTENSIONS MM [INCH]	TANK VOLUME				WEIGHT				CG_X				CG_Y				TANK VOLUME BASED ON DISTANCE FROM BOTTOM OF TANK	
					TOTAL		USABLE		MINIMUM 14		MAXIMUM 15		MINIMUM 14		MAXIMUM 15		MINIMUM 14		MAXIMUM 15			
					LITER	GALLON	LITER	GALLON	KG	LB	KG	LB	MM	IN	MM	IN	MM	IN	MM	IN	LITER/MM	GALLON/INCH
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	7535	2440	96	2553	100	483	19.0	520	20.5	2.9	19.4

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS. DIM X ±1, .X ±0.8, .XX± 0.38. ROLL 0.00- 4.99 +0.15/-0.08, 5.00- 9.99 +0.20/-0.10, 10.00-17.49 +0.25/-0.13, 17.50-24.99 +0.30/-0.13. ANG TOL ± 1.0°. SCALE 1:8. Sym 15 DO NOT SCALE PRINT. THIS DOCUMENT AND THE INFORMATION SHOWN THEREON, IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN WHOLE OR IN ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC. DRN D HOFMEISTER. CKD D HOFMEISTER. APVD G STAFFENHAGEN. DATE 27FEB18. FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, USE ASME Y14.5-2009. THIRD ANGLE PROJECTION. ARROW. CUMMINS POWER GENERATION. OUTLINE, TANK. REGIONAL. SITE CODE PGF. SIZE E. A057P198. CAD SHEET 1 of 3.

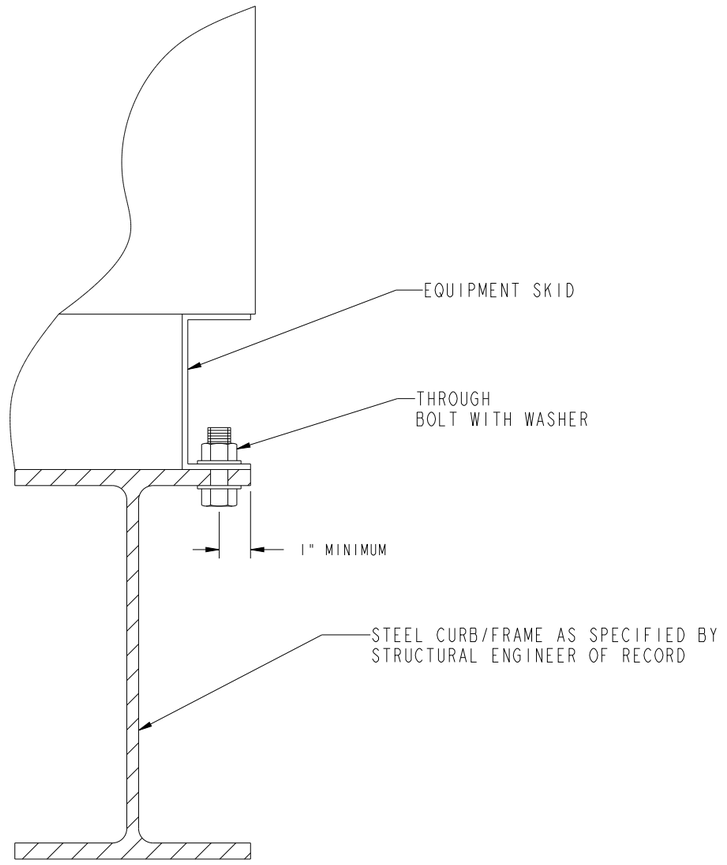
PTC® Creo® Parametric

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



TO BE DESIGNED BY ENGINEER OF RECORD

CONCRETE CONNECTION



STEEL CONNECTION

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS

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

ANG TOL: ± 1.0° SCALE: 1/1

SIM TO A051N157

DO NOT SCALE PRINT

- CONFIDENTIAL -
PROPERTY OF CUMMINS POWER GENERATION GROUP

DWN	D HOFMEISTER
CKD	D HOFMEISTER
APVD	G STAFFENHAGEN
DATE	05MAR18
FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING, REF ASME Y14.5M-1994	FIRST USED ON ARROW

Cummins

SITE CODE PGF

CUMMINS POWER GENERATION

INSTALLATION, GENSET
SEISMIC REQUIREMENTS

DWG SIZE D | A058C559 | SHEET 6 OF 6 | DWG REV A

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

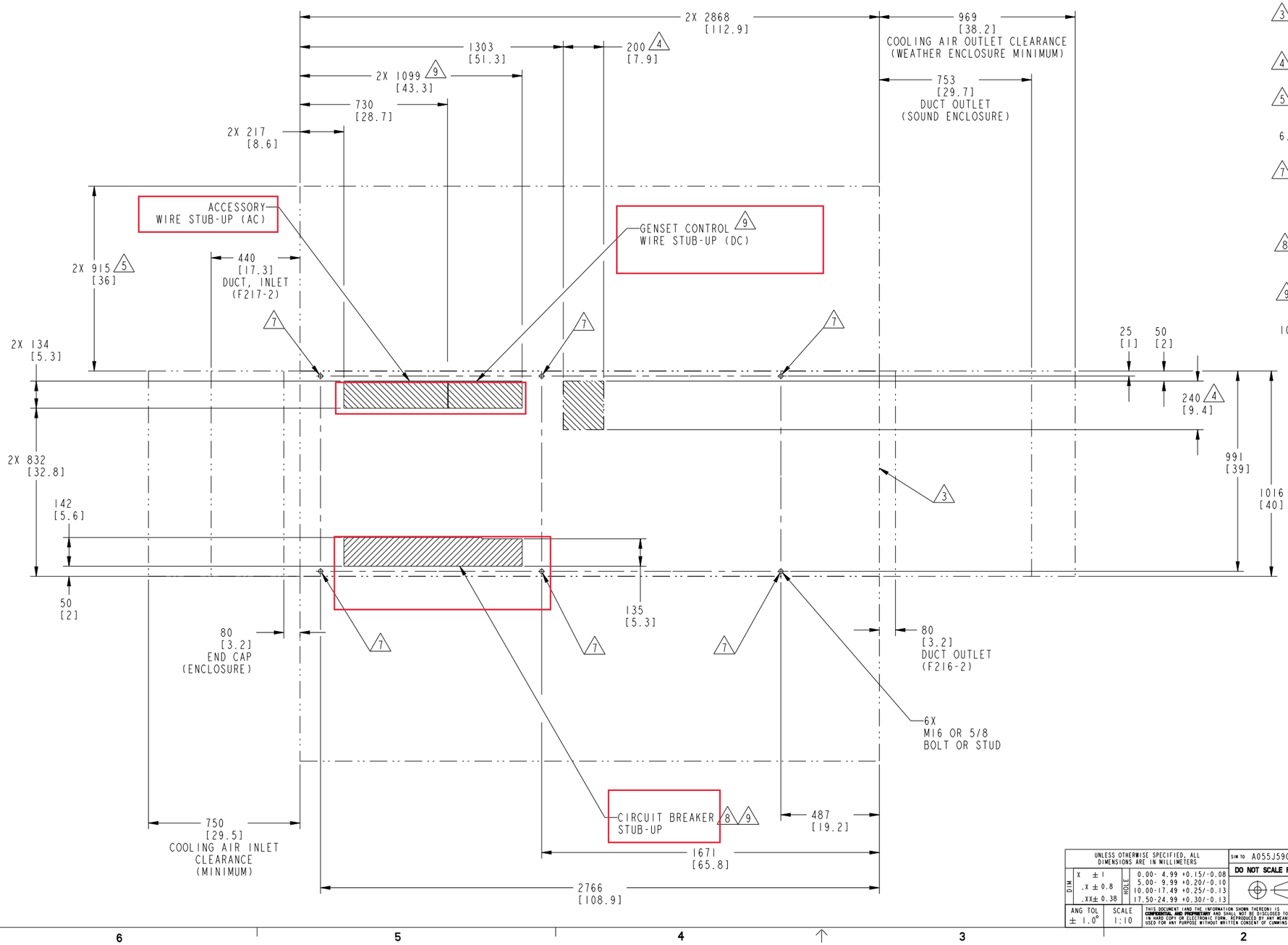
Drawing Name: A058C560 Revision: A
Part Name: A058C559 Revision: A
ECO-170731 Sheet 6 of 7

PTC® Creo® Parametric

REL NO	REV	NO	REVISION	DWN	CKD	APVD	DATE
ECO-176532	A	1	PRODUCTION RELEASE	DAH	DAH	GILLETT	09APR18

NOTES:

1. DIMENSIONS IN [ ] ARE IN INCHES.
2. GENERATOR SET BASE FLANGE THICKNESS 3.42 MM. MOUNTING HARDWARE MUST ACCOUNT FOR UNEVENESS OF MOUNTING SURFACE.
3. GENERATOR SET BASE PERIMETER IS SHOWN. FOUNDATION SHOULD BE EXTENDED BEYOND THIS PERIMETER. SEE (T030) APPLICATION MANUAL.
4. FUEL SUPPLY AND RETURN STUB-UP AREA. THIS STUB-UP AREA NOT AVAILABLE WITH UNDER SKID TANK.
5. INSTALLATION AND REMOVAL LIFTING AND SERVICE ACCESS CLEARANCE (SUGGESTED MINIMUM).
6. FOR IBC SEISMIC CERTIFIED INSTALLATION, SEE GENSET IBC SEISMIC INSTALLATION REQUIREMENTS DRAWING.
7. HOLES IN GENERATOR SET BASE AT THESE LOCATIONS ARE INTENDED FOR ATTACHMENT TO THE MOUNTING SURFACE. IF GENERATOR SET IS MOUNTED ON A FUEL TANK, REFER TO FUEL TANK OUTLINE DRAWING FOR LOCATION OF TANK ATTACHMENT POINTS.
8. REFER TO CIRCUIT BREAKER OUTLINE DRAWING FOR COMPLETE ELECTICAL STUB-UP INFORMATION FOR SPECIFIC BREAKERS AND BREAKER POSITIONS.
9. WHEN EQUIPPED WITH FUEL TANK REFER TO FUEL TANK OUTLINE FOR STUB-UP AREA LENGTH.
10. REFER TO FUEL TANK OUTLINE DRAWINGS FOR REQUIRED REVISIONS TO FOUNDATION DIMENSIONS.



GENSET MODEL APPLICATION
C125D6D
C150D6D
C175D6D
C200D6D

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS

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

ANG TOL ± 1.0° | SCALE 1:10

SIM TO A055J590 | DO NOT SCALE PRINT

DWN D HOFMEISTER | CKD D HOFMEISTER | APVD D GILLETT | DATE 09APR18

FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009 | FIRST USED ON ARROW

CUMMINS POWER GENERATION

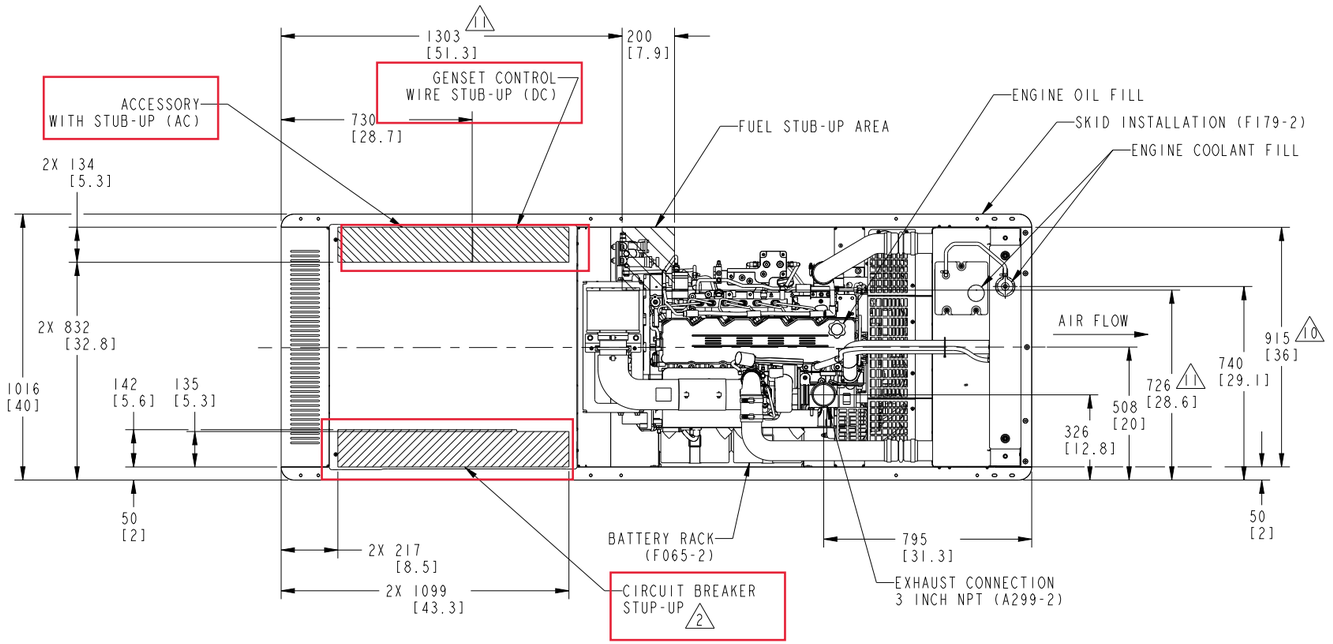
OUTLINE, GENSET FOUNDATION

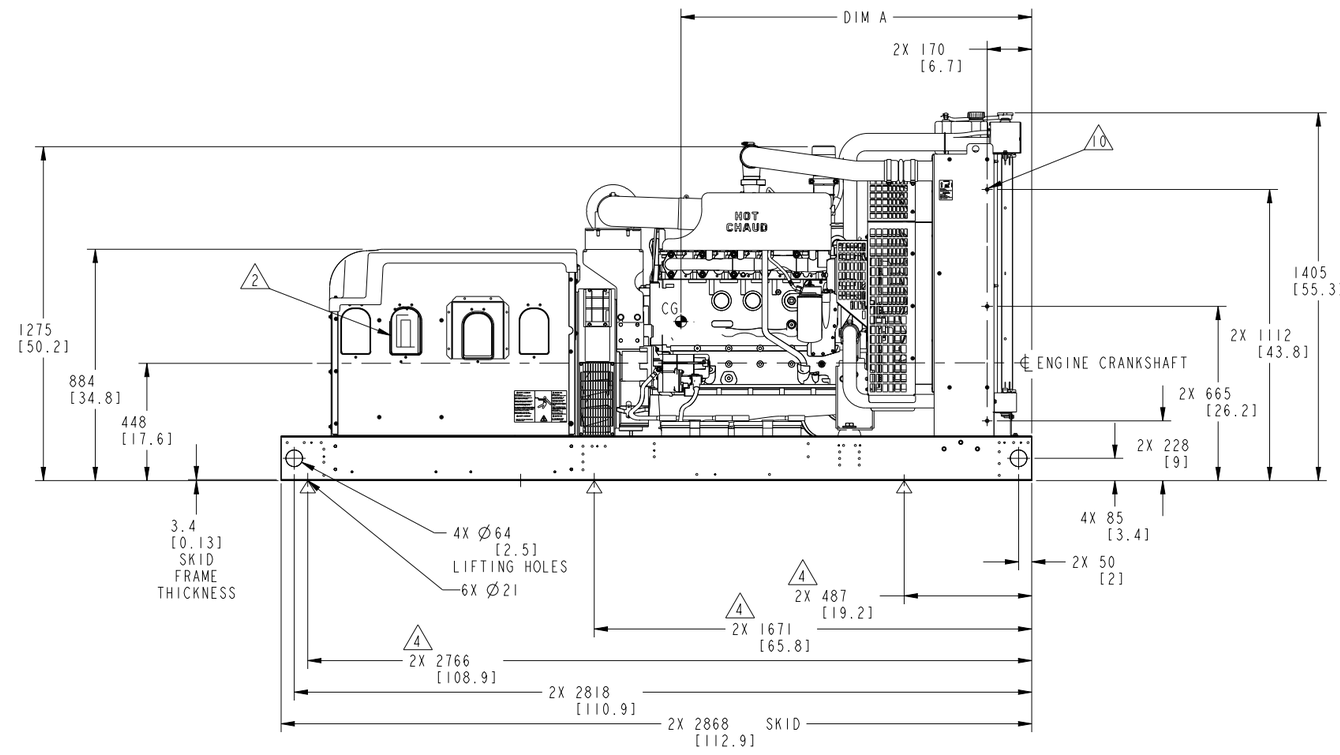
SITE CODE PGF | DWG SIZE D | A060C864 | CAD SHEET 1 OF 1

Drawing Name: A060C865 Revision: A
Part Name: A060C864 Revision: A
ECO-176532 Sheet 1 of 2

PTC® Creo® Parametric

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





NOTES:

1. ALL DIMENSIONS ARE REFERENCE, UNLESS SPECIFICALLY TOLERANCED.
2. REFER TO CIRCUIT BREAKER OUTLINE DRAWING FOR ELECTRICAL STUB-UP AREA FOR SPECIFIC BREAKERS.
3. CONTROL INTERFACE CONNECTIONS SHOULD BE MADE WITH FLEXIBLE CONNECTIONS.
4. Ø21 [0.8] 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.
5. REFER TO GENSET OR FUEL TANK FOUNDATION OUTLINES FOR ELECTRICAL, FUEL AND OTHER FOUNDATION SPECIFICS.
6. GENSET SUPPLIED WITH FLEXIBLE FUEL LINES THAT CAN BE CONNECTED TO ENGINE INTERFACE POINTS.
   - 6.1 FUEL SUPPLY LINE: 670 [26] LONG WITH 1/4 INCH NPT MALE TERMINATION.
   - 6.2 FUEL RETURN LINE: 930 [37] LONG WITH 1/4 INCH NPT MALE TERMINATION.
7. OIL DRAIN EXTENSION: 5/8 INCH HOSE I.D.
8. FOR IBC SEISMIC CERTIFIED INSTALLATIONS, SEE GENSET IBC SEISMIC INSTALLATION REQUIREMENTS DRAWING.
9. DRY WEIGHT = WET WEIGHT - 38.5 KG (85 LB).
10. 6X Ø7.3 HOLES FOR CUSTOMER-SUPPLIED COOLING EXHAUST AIR DUCT ADAPTER.
11. FUEL SUPPLY AND RETURN STUB-UP AREA.

TABULATION

ALT DATA SHEET #	DIM A	DIM B	GENSET WET WEIGHT KG	GENSET WET WEIGHT 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
DIM: X ±1, .X ±0.8, .XX± 0.38
HOLE: 0.00- 4.99 +0.15/-0.08; 5.00- 9.99 +0.20/-0.10; 10.00-17.49 +0.25/-0.13; 17.50-24.99 +0.30/-0.13
ANG TOL ± 1.0°
SCALE 3:32
SIM TO .
DO NOT SCALE PRINT

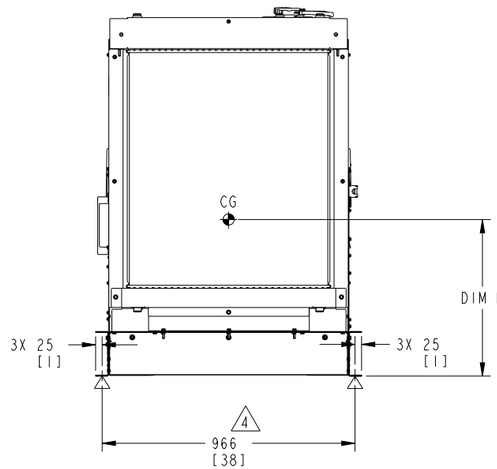
FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009
FIRST USED ON ARROW

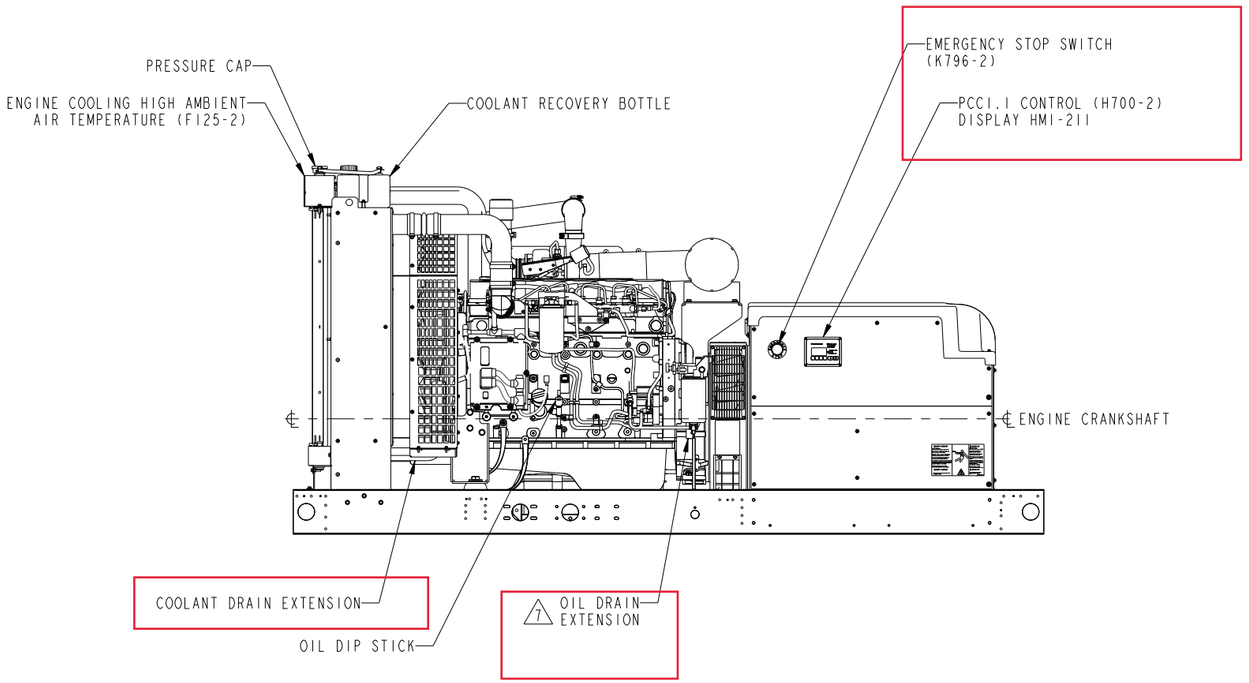
DWN D HOFMEISTER
CKD D HOFMEISTER
APVD D GILLETT
DATE 04APR18

CUMMINS POWER GENERATION
OUTLINE,GENSET
SITE CODE PGF
DWG SIZE D
A060C858
CAD SHEET 1 OF 2

PTC® Creo® Parametric

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





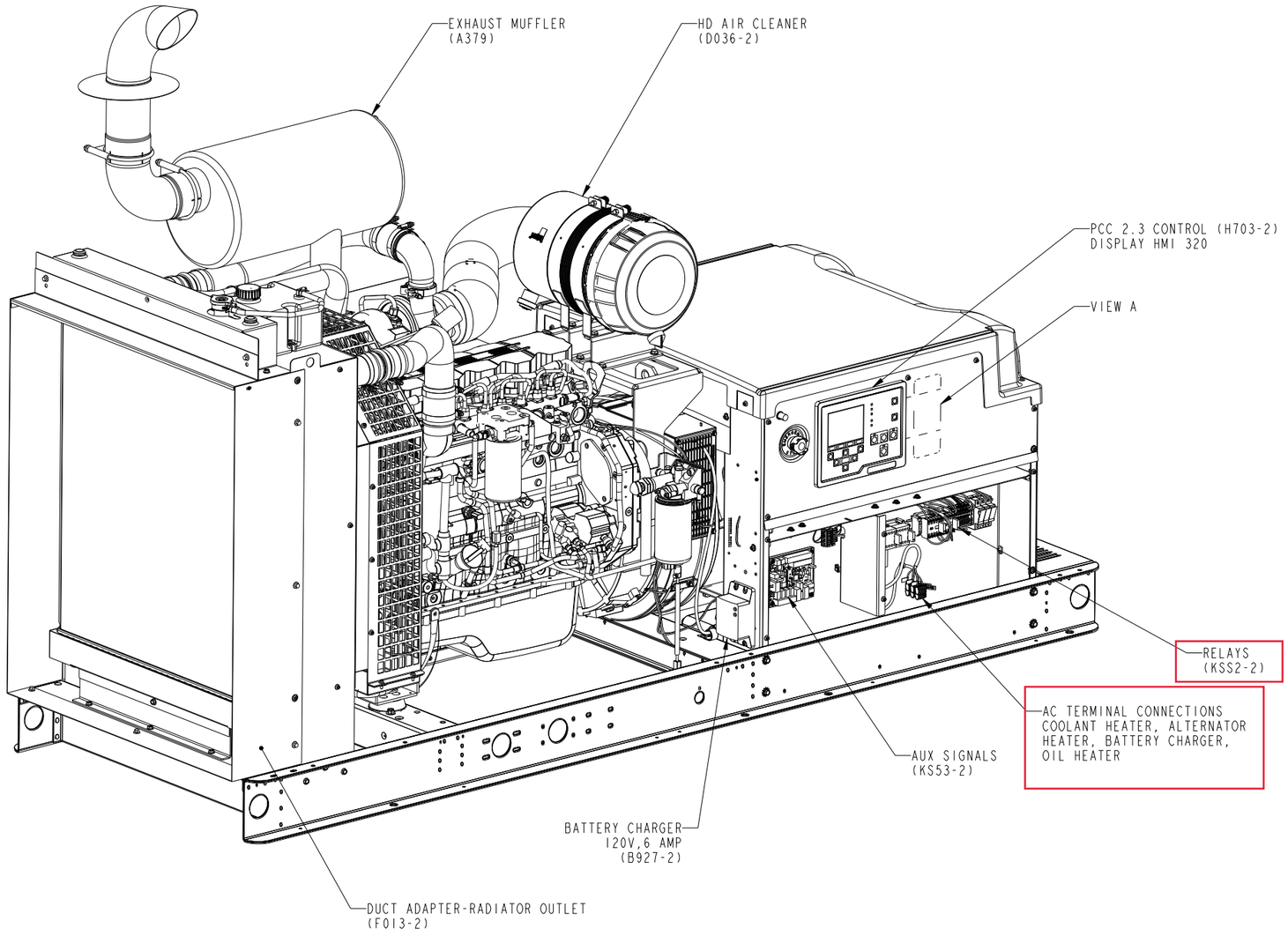
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS	SIM TO .	DWN D HOFMEISTER	Cummins®	CUMMINS POWER GENERATION	
DIM: X ±1, .X ±0.8, .XX± 0.38 — HOLE: 0.00- 4.99 +0.15/-0.08, 5.00- 9.99 +0.20/-0.10, 10.00-17.49 +0.25/-0.13, 17.50-24.99 +0.30/-0.13	DO NOT SCALE PRINT	CKD D HOFMEISTER		OUTLINE, GENSET	
		APVD D GILLETT	SITE CODE		
		DATE 04APR18			
ANG TOL ± 1.0°	SCALE 3:32	FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009	FIRST USED ON ARROW	PGF	DWG SIZE D — A060C858 — CAD SHEET 2 of 2

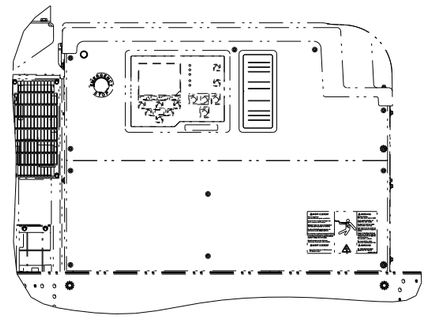
PTC® Creo® Parametric

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

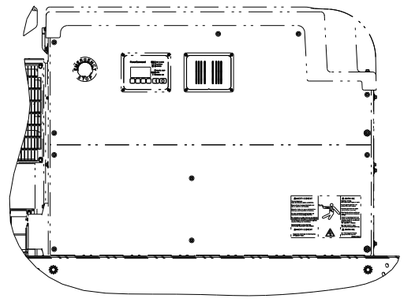
NOTE:

1. DIMENSIONS SHOWN IN [ ] ARE IN INCHES.





BARGRAPH OPTION
(H606-2) FOR H703-2 CONTROL



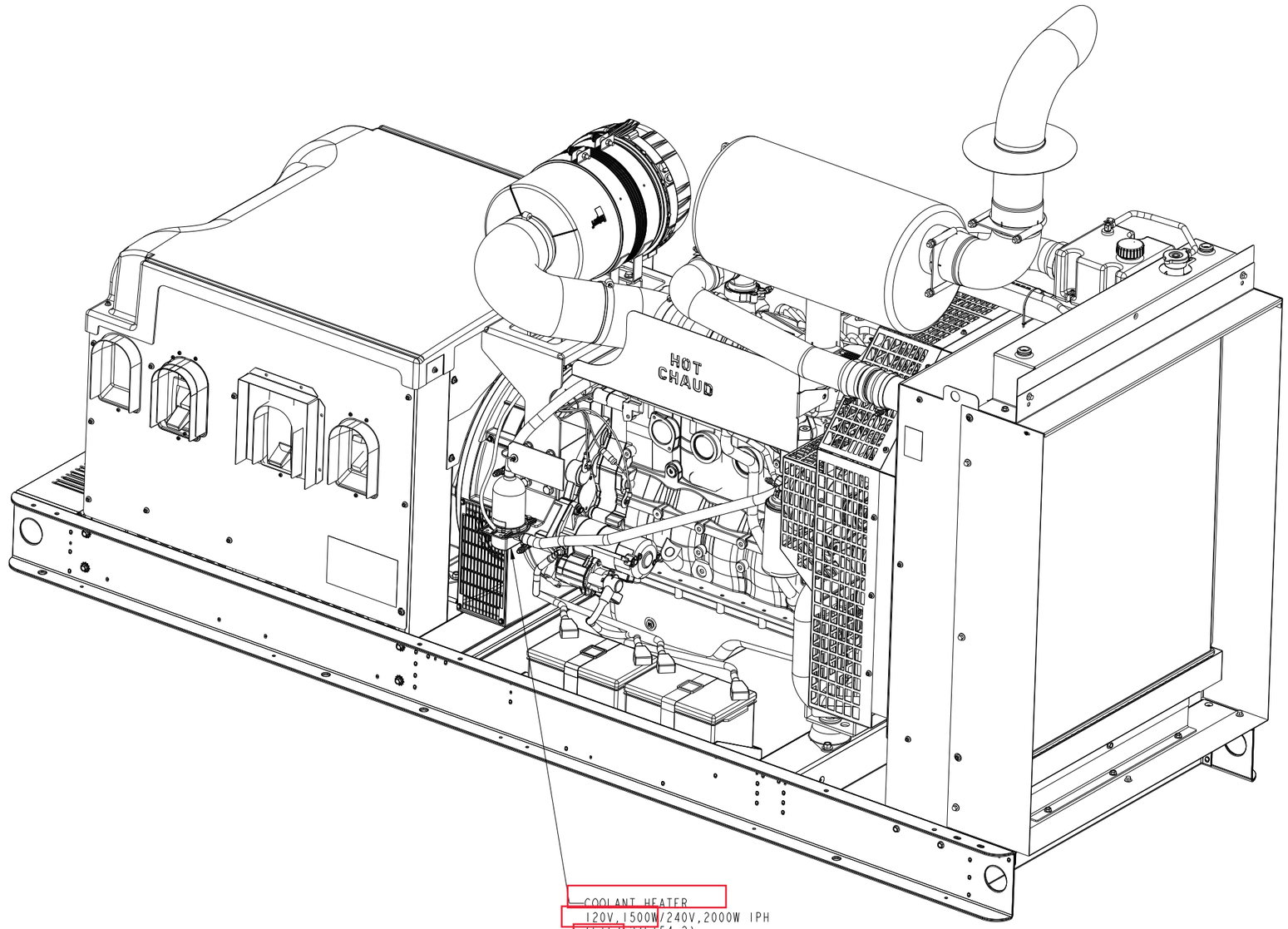
BARGRAPH OPTION
(H606-2) FOR H700-2 CONTROL

VIEW A

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS	SIM TO A055J592	DWN D HOFMEISTER		CUMMINS POWER GENERATION	
DIM: X ±1, .X ±0.8, .XX± 0.38 — HOLE: 0.00- 4.99 +0.15/-0.08, 5.00- 9.99 +0.20/-0.10, 10.00-17.49 +0.25/-0.13, 17.50-24.99 +0.30/-0.13	DO NOT SCALE PRINT	CKD D HOFMEISTER		OUTLINE, GENSET OPTIONS	
		APVD D GILLETT			
		DATE 10APR18			
ANG TOL ± 1.0°	SCALE 3:16	FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009	FIRST USED ON ARROW	SITE CODE PGF	DWG SIZE D A060G756 CAD SHEET 1 OF 3

PTC® Creo® Parametric

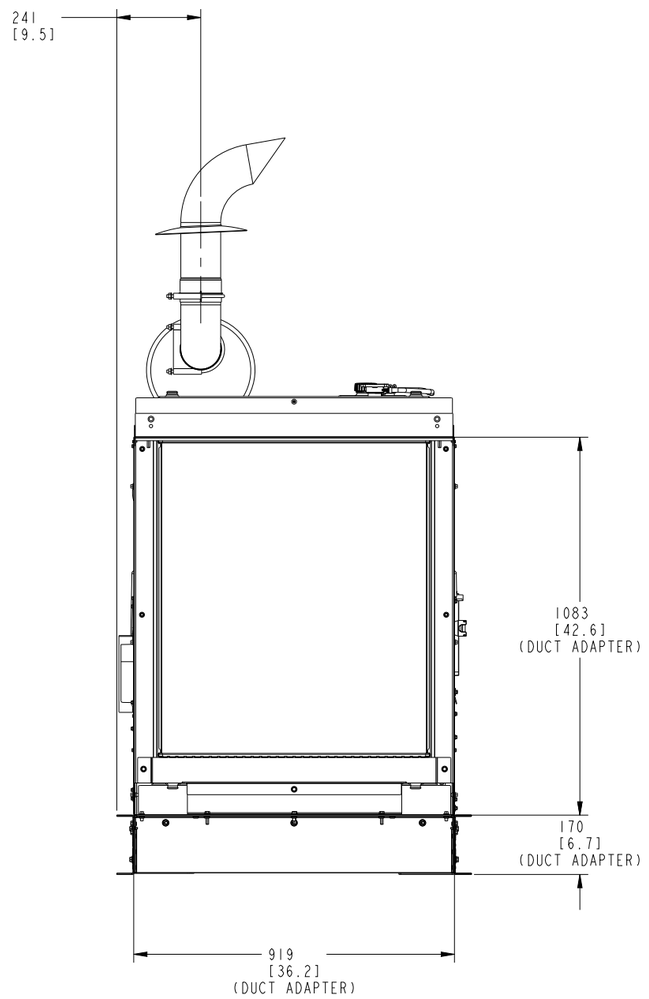
REL NO	REV	NO	REVISION	DWN	CKD	APVD	DATE
ECO-176532	A	1	PRODUCTION RELEASE	DAH	DAH	GILLETT	10APR18

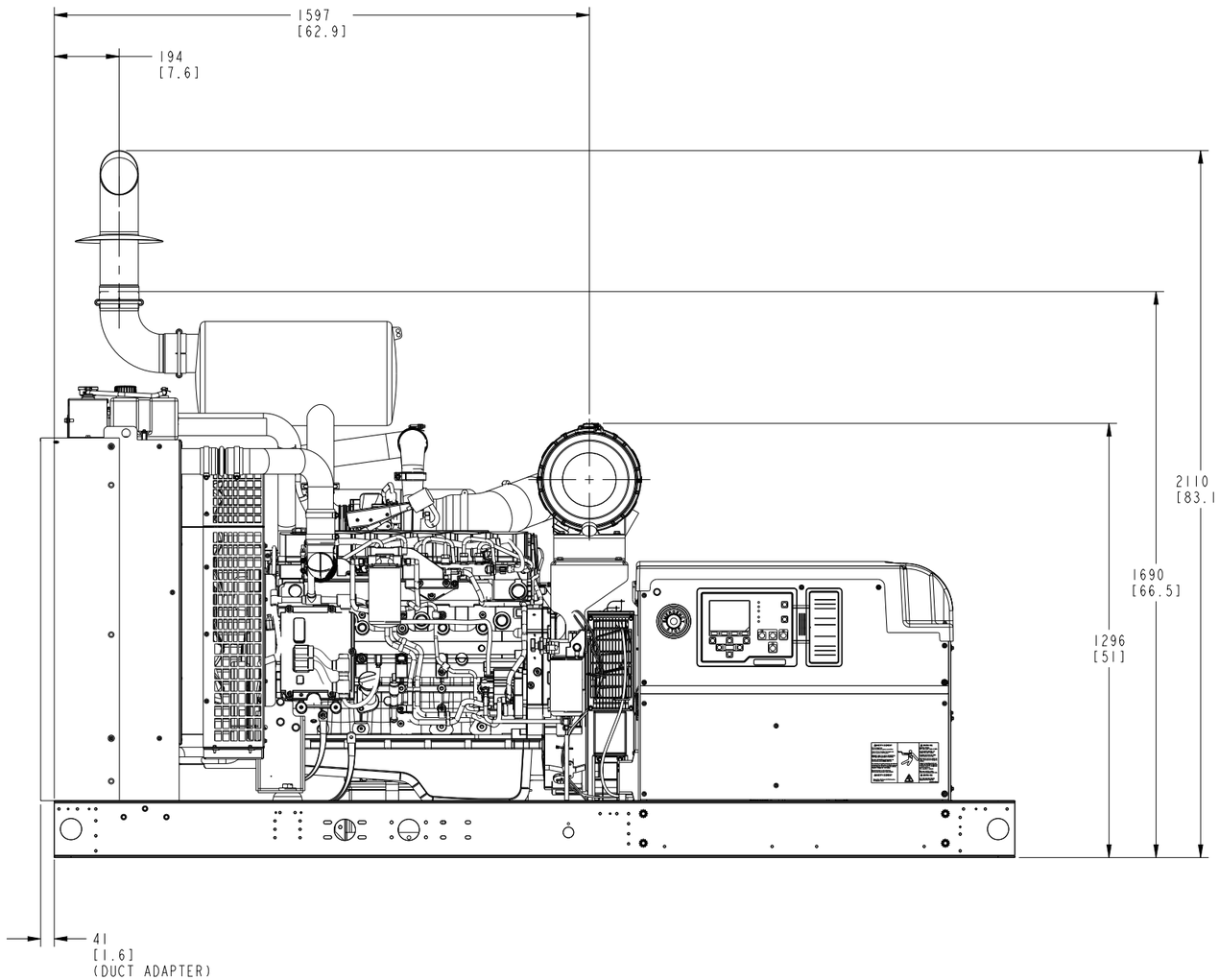


UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS			SIM TO A055J592	DWN D HOFMEISTER	CUMMINS POWER GENERATION
DIM: X ±1, .X ±0.8, .XX± 0.38	HOLE: 0.00- 4.99 +0.15/-0.08; 5.00- 9.99 +0.20/-0.10; 10.00-17.49 +0.25/-0.13; 17.50-24.99 +0.30/-0.13		DO NOT SCALE PRINT	CKD D HOFMEISTER	OUTLINE, GENSET OPTIONS
				APVD D GILLETT	
				DATE 10APR18	SITE CODE: PGF
ANG TOL ± 1.0°	SCALE 3:16	THIS DOCUMENT (AND THE INFORMATION SHOWN THEREON) IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS OR IN HARD COPY OR ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.	FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009	FIRST USED ON ARROW	DWG SIZE D: A060G756 — CAD SHEET 2 OF 3

PTC® Creo® Parametric

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

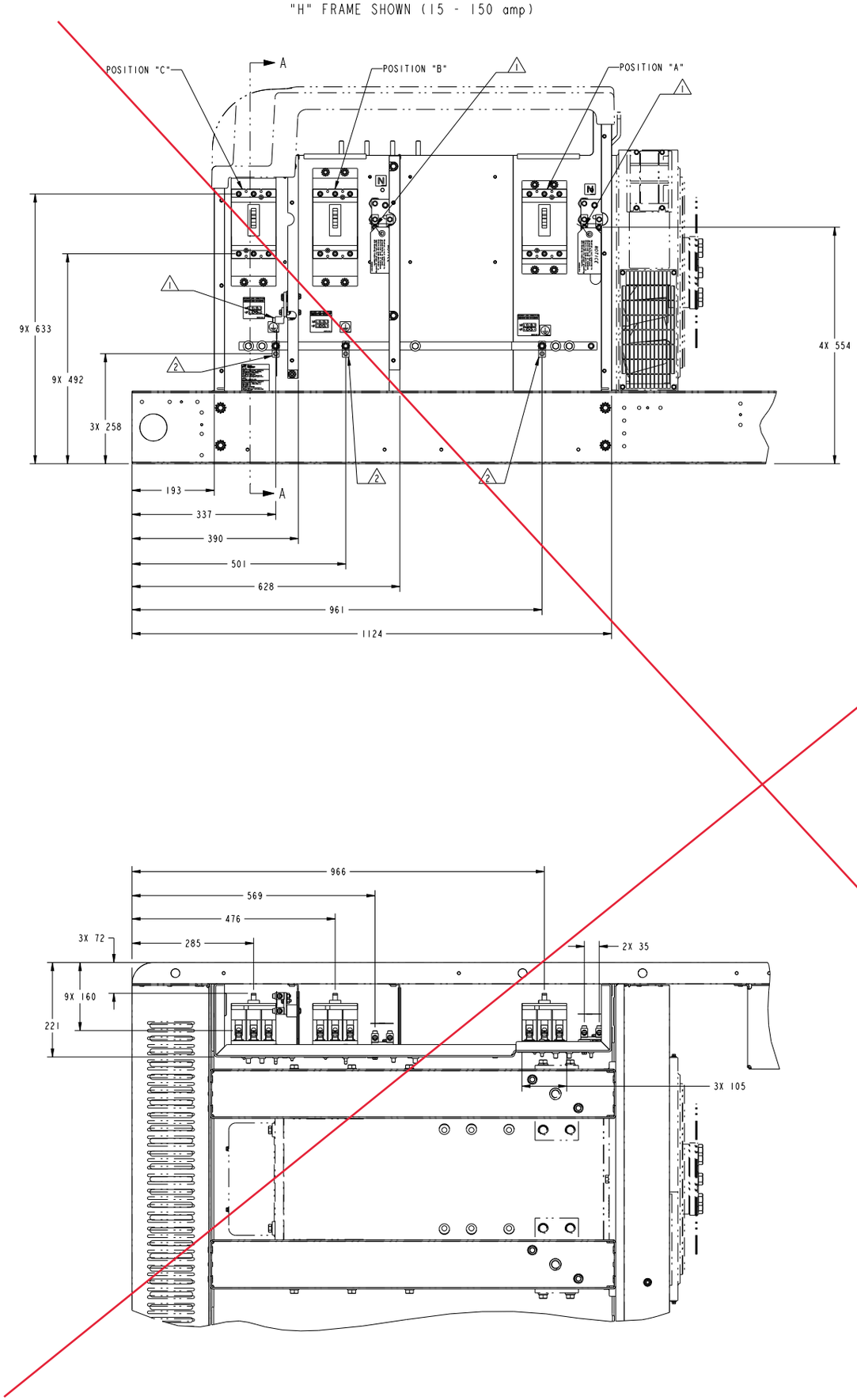


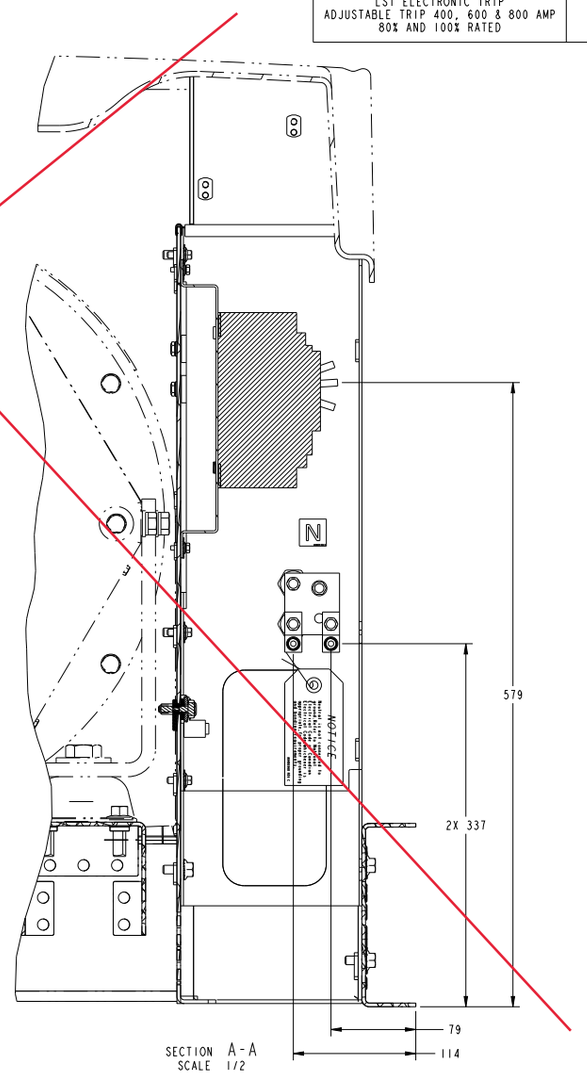


UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS			SIM TO A055J592	DWN D HOFMEISTER	CUMMINS POWER GENERATION
DIM: X ±1, .X ±0.8, .XX± 0.38	HOLE: 0.00- 4.99 +0.15/-0.08, 5.00- 9.99 +0.20/-0.10, 10.00-17.49 +0.25/-0.13, 17.50-24.99 +0.30/-0.13		DO NOT SCALE PRINT	CKD D HOFMEISTER	
				APVD D GILLETT	OUTLINE, GENSET OPTIONS
				DATE 10APR18	SITE CODE
ANG TOL ± 1.0°	SCALE 3:16	THIS DOCUMENT (AND THE INFORMATION SHOWN THEREON) IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN HARD COPY OR ELECTRONIC FORM, REPRODUCED BY ANY MEANS, OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.	FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ASME Y14.5-2009	FIRST USED ON ARROW	PGF
					DWG SIZE D A060G756 CAD SHEET 3 of 3

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

"H" FRAME SHOWN (15 - 150 amp)





SECTION A-A
SCALE 1/2

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

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS
DIM: X ±1, .X ±0.8, .XX± 0.38
DECIMAL: 0.00- 4.99 ±0.15/-0.08; 5.00- 9.99 ±0.20/-0.10; 10.00-17.49 ±0.25/-0.13; 17.50-24.99 ±0.30/-0.13
ANG TOL ± 1.0°
SCALE 1/4
THIS DOCUMENT AND THE INFORMATION SHOWN THEREON IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION OR BE USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.
SIM TO .
DO NOT SCALE PRINT
DRN A.JOHNSON
CKD A.JOHNSON
APVD P.LARSON
DATE 02MAY16
FOR INTERPRETATION OF DIMENSIONS, TOLERANCES AND SYMBOLS REFER TO ASME Y14.5-2009
FIRST USED ON ARROW
SITE CODE PGF
CUMMINS POWER GENERATION
OUTLINE,CIRCUIT BREAKER
ENG REV E
A055B603
CAD SHEET 1 of 6

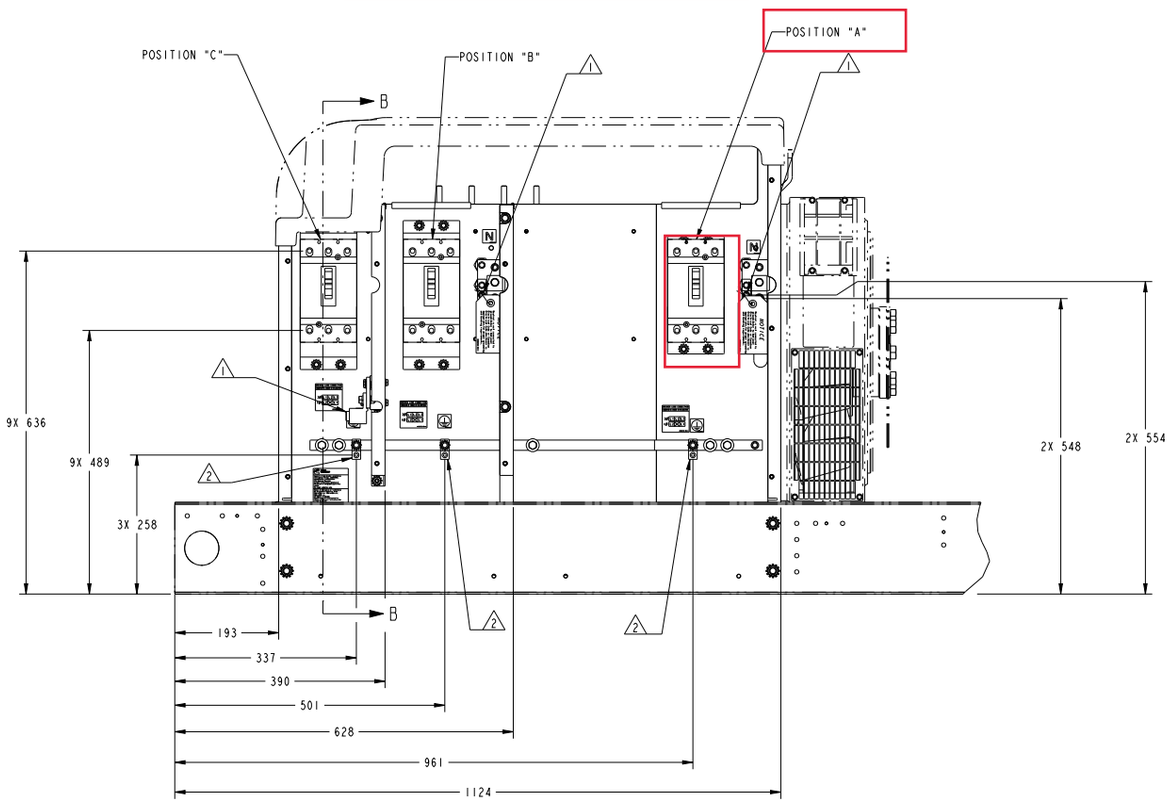
Regulatory Review and Approval is required prior to changing this item per PGG 1-01-01-116. This item impacts compliance with these External Regulations: UL,CSA

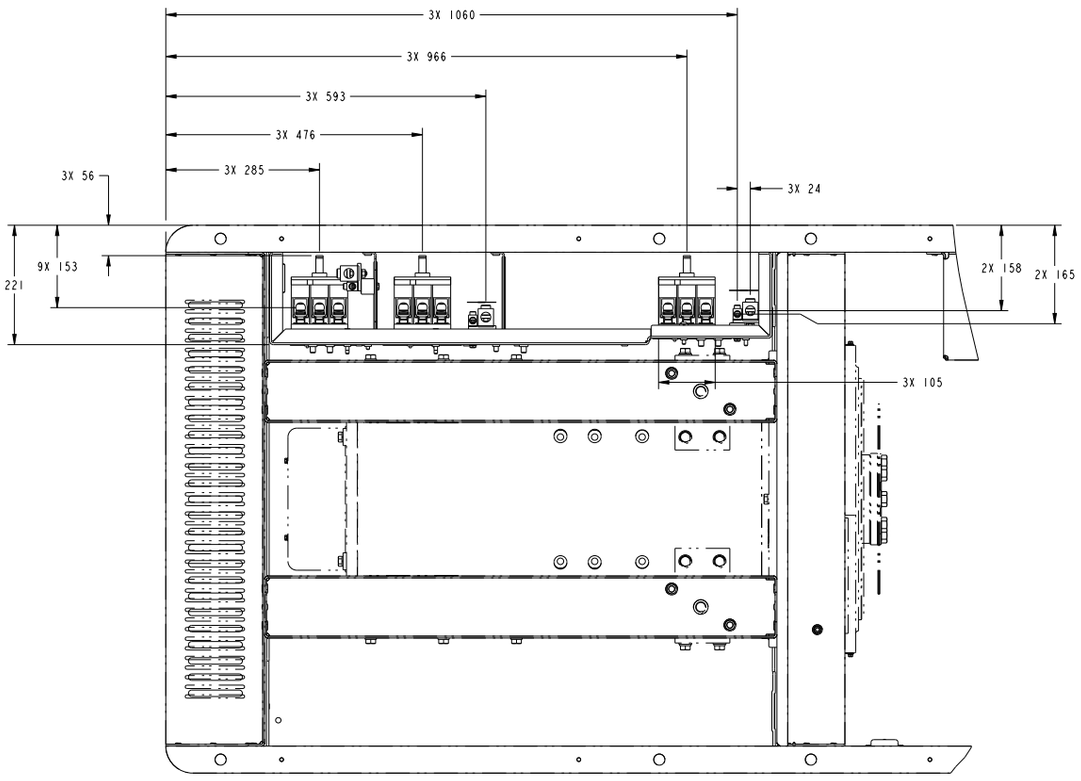
Drawing Name: A055B604 Revision: E
Part Name: A055B603 Revision: E
ECO-181477 Sheet 1 of 7

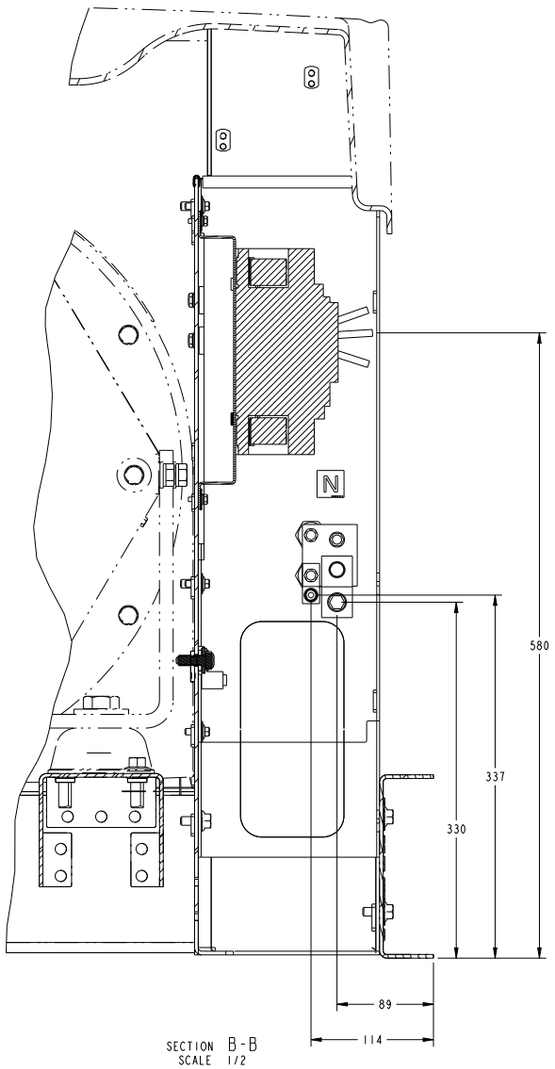
PTC® Creo® Parametric

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

"J" FRAME SHOWN (175 - 250 amp)







SECTION B-B
SCALE 1/2

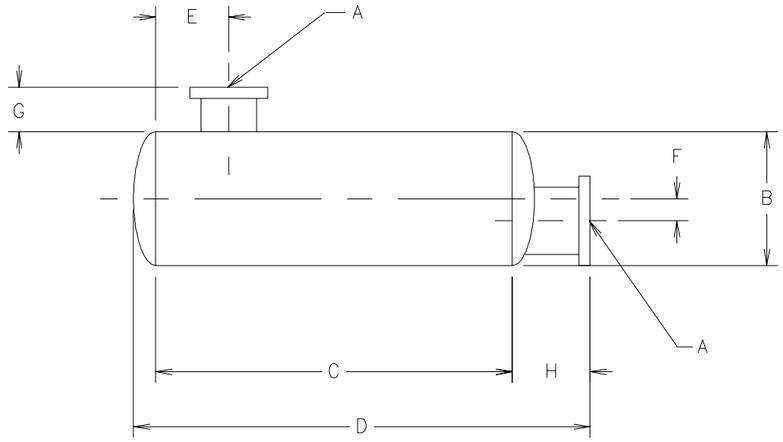
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS				DRN A_JOHNSON	CUMMINS POWER GENERATION
DIM X ±1 .X ±0.8 .XX± 0.38	ROUT	0.00- 4.99 +0.15/-0.08 5.00- 9.99 +0.20/-0.10 10.00-17.49 +0.25/-0.13 17.50-24.99 +0.30/-0.13	DO NOT SCALE PRINT	CKD A_JOHNSON APVD P_LARSON DATE 02MAY16	OUTLINE,CIRCUIT BREAKER
ANG TOL ± 1.0°	SCALE 1/4	THIS DOCUMENT AND THE INFORMATION SHOWN THEREON IS CONFIDENTIAL AND PROPRIETARY AND SHALL NOT BE DISCLOSED TO OTHERS IN WHOLE, COPY OR ELECTRONIC FORM, REPRODUCED OR USED FOR ANY PURPOSE WITHOUT WRITTEN CONSENT OF CUMMINS INC.	FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, USE ASME Y14.5-2009	FIRST USED ON ARROW	SITE CODE PGF SIZE E A055B603 CAD SHEET 2 of 6

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

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

155-2342 C

ER NO.	LTR	NO.	REVISION	ZONE	DR	CHKR	APPROVED	DATE
63391	E	1	REDRAWN TO CAD W/CHANGES PER ER	-	CC	BG	GLT	07-27-92
63284	G	1	ADD NOTE 4	2-C	DR	DY	RJG	01-25-93
		2	ADD -09 TAB	4-A	DR	DY	RJG	01-25-93
65236	H	1	-11 THRU -19 PRODUCTION RELEASE	-	JFK	GS	BGC	06-05-93
		2	ADDED MATERIAL TO TAB	-	JFK	GS	BGC	06-05-93
72644	**J**	**1**	**OSBOLETE -11 THRU -19 (SEE ER)**	**-**	**CC**	**BG**	**RJG**	**04-18-96**
72644	J	1	OSBOLETE -11 THRU -19 (SEE ER)	-	CC	BG	RJG	04-18-96
FRD691	K	1	ADD -10 TAB	4-A	SZR	BVM	BVM	02-11-99
FRD1300	L	1	-10 TAB: ADD DIMENSINS C, E, H, & WEIGHT	4-A	GWH	BVM	BVM	04-13-99
FRD1754	M	1	-10, DIM "H" 9.5 WAS 3.4	4-A	CB	BG	BVM	05-26-99
FRD3714	N	1	NOTE 1 WAS "PART NAME: NELSON..."	2C	CB	BG	DCK	12-22-99
		2	RMV NOTE 2 "VENDOR..."	2C	CB	BG	DCK	12-22-99
		3	ADD CODES & STANDARDS LABEL	4A	CB	BG	DCK	12-22-99
		4	RMV NELSON PART NUMBER COLUMN FROM TAB	4B	CB	BG	DCK	12-22-99
FRD4796	P	1	-01 DIM D WAS 76.4, -02 DIM D WAS 82.3	4B	RMM	BG	GILLETT	06-14-00
		2	-03 DIM D WAS 79.5, -04 DIM D WAS 108.4	4B	RMM	BG	GILLETT	06-14-00
		3	-05 DIM D WAS 66.5, -06 DIM D WAS 61.2	4B	RMM	BG	GILLETT	06-14-00
		4	-07 DIM D WAS 52.8, -08 DIM D WAS 49.6	4B	RMM	BG	GILLETT	06-14-00
		5	-09 DIM D WAS 42.4, -10 DIM D WAS 111.6	4A	RMM	BG	GILLETT	06-14-00
FRD6540	R	1	REVISED PER ECOR	-	RMM	BG	GILLETT	09-19-00



N4

NOTES:

N1 1. THIS PART IS VENDOR SOURCE CONTROLLED (SEE APVL).

N2 2.

3. FLANGES DRILLED TO 125#ASA STANDARD.

G1 4. SILENCER COATED WITH BAKED ON HIGH HEAT RESISTING SILICONE BLACK PAINT.

TABULATION

ITEM DASH NO.	CURRENT ER NUMBER	FLANGE "A"	DIM. B	DIM. C	DIM. D	DIM. E	DIM. F	DIM. G	DIM. H	WEIGHT (LBS)
-01	FRD6540	6" ASA FLANGE	16.12	69.0	76.4	5.0	3.06	4.0	5.9	180
-02	FRD6540	8" ASA FLANGE	22.12	72.1	82.3	8.0	0.0	4.0	6.9	255
-03	FRD6540	10" ASA FLANGE	26.12	72.1	83.4	9.0	0.0	4.0	7.4	387
-04	FRD6540	12" ASA FLANGE	30.12	96.0	108.4	10.0	0.0	4.0	8.0	610
-05	FRD6540	5" ASA FLANGE	14.12	60.0	67.5	4.0	2.56	4.0	5.7	112
-06	FRD6540	4" NPT	12.12	55.0	61.2	4.0	1.82	3.0	4.5	82
-07	FRD6540	3" NPT	11.12	47.0	52.8	3.0	0.0	3.0	4.3	58
-08	FRD6540	2.5" NPT	10.12	45.0	49.3	3.0	0.0	2.5	3.5	50
-09	FRD6540	2" NPT	9.00	38.0	42.4	2.5	0.0	2.0	3.0	34
-10	FRD6540	14" ASA FLANGE	42.25	96.0	111.6	10.0	0.0	4.0	9.5	1290

P1 P2 P3 P4 P5 G2 M1 K1 L1

N3

-THIS IS A CONTROLLED PRODUCT-
PER ONAN PROCEDURE FRE-1002

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

☐ CSA ☒ UL ☐ EC ☐ RVIA ☐ ABYC
☐ OTHER _____ ☐ OTHER _____
AND/OR ASSIGN INTERNAL ONAN DESIGN CONTROL FACILITIES ☐

CHANGES, DEVIATIONS, OR SUBSTITUTIONS OF MATERIAL, PROCESS, OR PERFORMANCE FOR THIS PRODUCT MUST BE APPROVED BY THE FOLLOWING DESIGN CONTROL FACILITIES

DESIGN CONTROL FACILITY FRIDLEY
DESIGN CONTROL FACILITY _____

REVISIO DWG

DO NOT SCALE PRINT

TOLERANCE UNLESS OTHERWISE SPECIFIED

DIM	mm	Inch
	X ±	.X ± ---
	.X ±	.XX ± ---
	.XX ±	.XXX ± ---

HOLE		
	0.09- 4.99 +0.15/-0.08	.004-.388 +.006/-.003
	5.00- 9.99 +0.20/-0.10	.201-.421 +.008/-.004
	10.00-17.49 +0.25/-0.13	.422-.703 +.010/-.005
	17.50-24.99 +0.38/-0.13	.704-.999 +.012/-.005

ANG TOL ± ---

DRAWN TO SCALE OF NONE

QTY

SIM TO 155-2340 C
COPIED FROM
THIRD ANGLE PROJECTION

ITEM	PART NO.	DWG SIZE	DESCRIPTION OR MATERIAL	REF DES

	NAME	DATE
DR	CYNTHIA CLARK	07-27-92
CHKR ☐ MFG ☐	BRUCE GROSS	07-27-92
APPROVED	G THOMPSON	07-29-92

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

MODEL FIRST USED ON DM SERIES

Cummins Onan

MINNEAPOLIS, MINNESOTA 55432

TITLE MUFFLER (CRITICAL)

DWG NO. 155-2342 SHEET 1 OF 1 DWG SIZE C

Battery charger-10 amp
A026H213

> Specification sheet

Our energy working for you.™

Power Generation

Description

Cummins Power Generation 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 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 is recommended in all applications, but is particularly valuable for generator sets in outdoor applications.

Battery chargers are field-configurable for charging either 12 or 24 VDC battery systems at 60 Hz operation. Simple jumper selectors enable selection of output voltage and battery type. (If 50/60 Hz operation is required use model NRG22-10-HC, consult the factory for details.)

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 aluminum enclosure designed for wall mounting.

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

Vibration resistant design - complies with UL 991 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.

Specifications

Performance and physical characteristics

Output:	Nominal voltage	12 or 24 VDC
	Float voltage – 12 V batteries	12.87, 13.08, 13.31, 13.50, 13.62, 14.30
	Float voltage – 24 V 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 A @ 12 VDC nom or 10 A @ 24 VDC
	Equalize charging	Battery interactive autoboost
Input:	Voltage AC	120, 208, 240 ±10%
	Frequency	60 Hz ±5%
Approximate net weight:		25 lbs (11.36 Kg)
Approximate dimensions: height x width x depth-in(mm)		12.5 x 7.7 x 6.5 (318 x 195 x 165)
Ambient temperature operation: At full rated output		- 4°F to 104 °F (-20 °C to 45 °C)

Americas
1400 73rd Avenue N.E.
Minneapolis, MN 55432 USA
Phone: 763 574 5000
Fax: 763 574 5298

Europe, CIS, Middle East and Africa
Manston Park Columbus Ave.
Manston Ramsgate
Kent CT 12 5BF United Kingdom
Phone 44 1843 255000
Fax 44 1843 255902

Asia Pacific
10 Toh Guan Road #07-01
TT International Tradepark
Singapore 608838
Phone 65 6417 2388
Fax 65 6417 2399

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

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

Our energy working for you.™

www.cumminspower.com

Cummins Power Generation

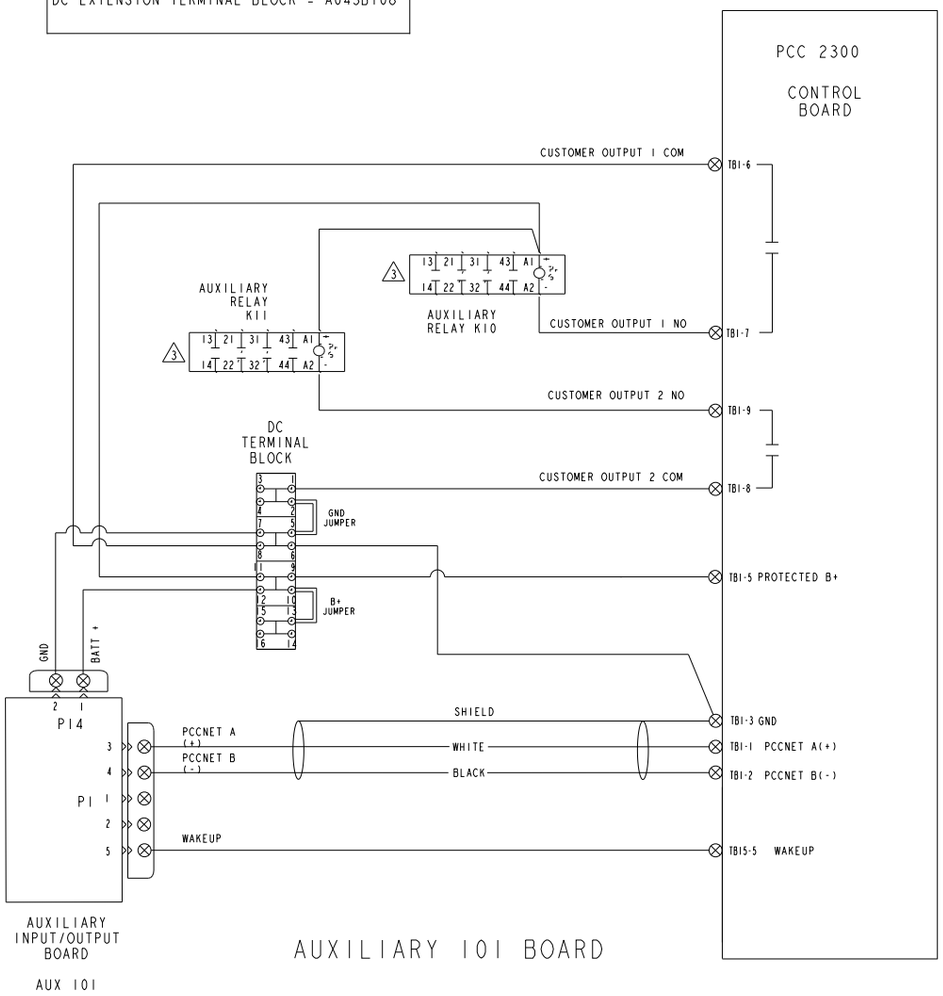
REL NO	REV	NO	REVISION	DRN	CKD	APVD	DATE
ECO-181411	E	1	ZONE D2, ADD PHRASE "208---AMBIENT"	PT	MT	M.TULADHAR	01NOV18
		2	ZONE C2, ADD PHRASE "USED---AMBIENT"	PT	MT	M.TULADHAR	01NOV18
		3	ADD PHRASE "120 Vac" TO COOLANT	--	--	--	--
			HEATER, ALTERNATOR HEATER, OIL PAN	--	--	--	--
			HEATER, BATTERY HEATER AND BATTERY	--	--	--	--
			CHARGER DIAGRAM	PT	MT	M.TULADHAR	01NOV18
		4	ZONE B2, RMV PHRASE "SOME CANADIAN---				
			RECEPTACLE"	PT	MT	M.TULADHAR	01NOV18

HARNESSES FOR OPTIONS

AUX 101 = A043A230

AUXILIARY RELAYS = A042Z041

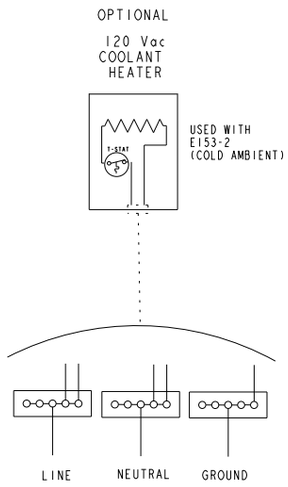
DC EXTENSION TERMINAL BLOCK = A043B108

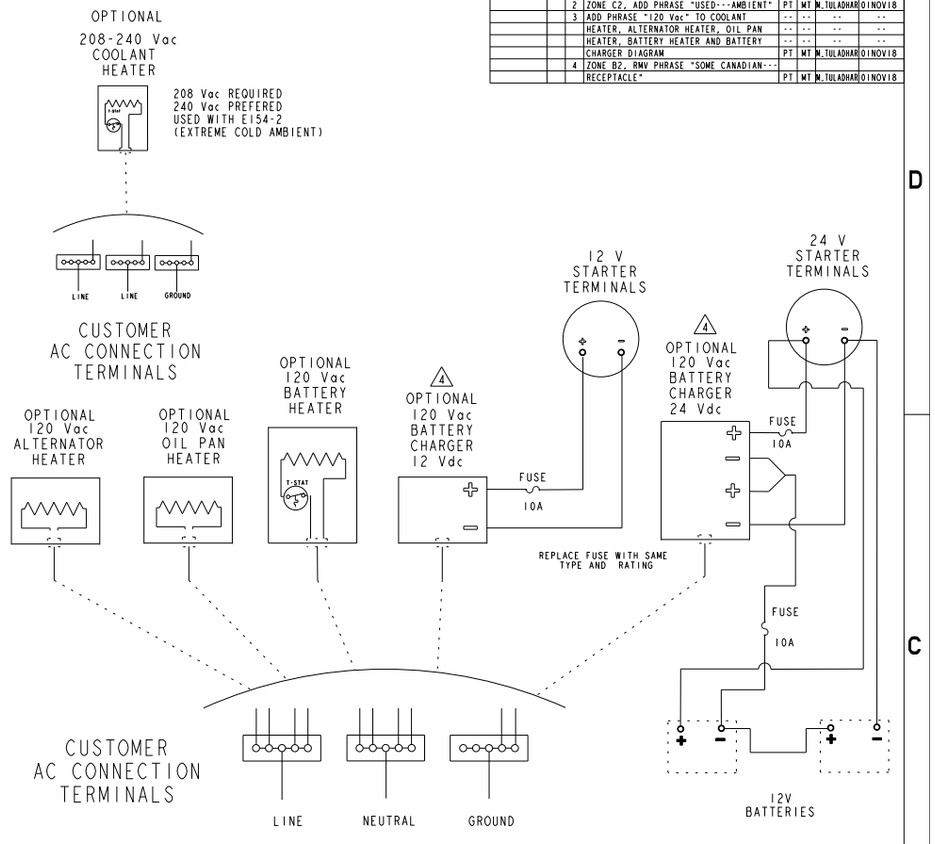


AUXILIARY 101 BOARD

AUXILIARY RELAYS

DC EXTENSION TERMINAL BLOCKS





INSTALLER TO PROVIDE BRANCH CIRCUITS TO POWER ALL ACCESSORIES

ALL ACCESSORIES ARE SINGLE PHASE 120/240 Vac 60 Hz

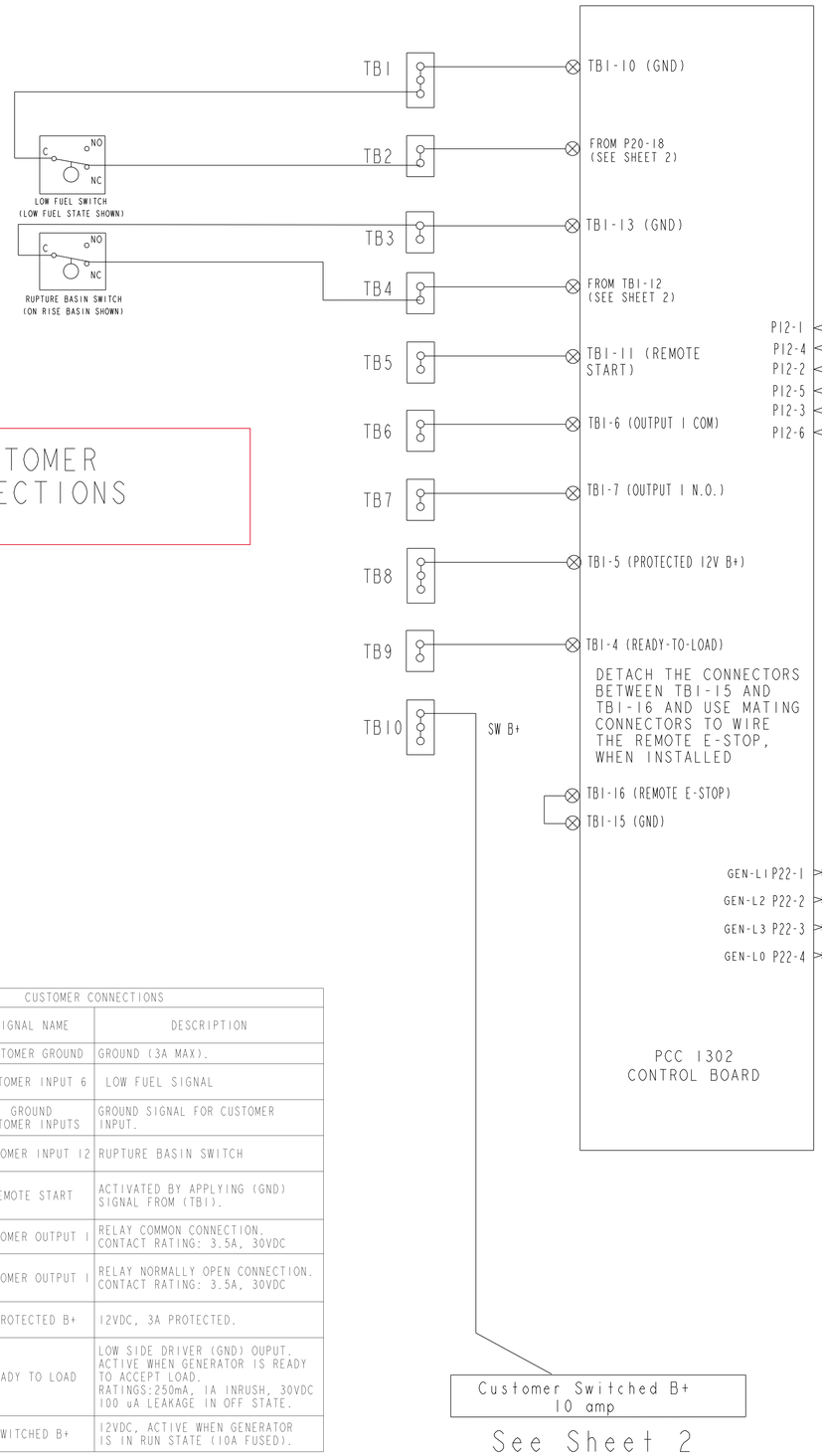
FOLLOW REGIONAL REGULATIONS AND APPLICABLE ELECTRIC CODES FOR INSTALLATION

Coolant heater (1) 1000 Watts, 120Vac, 8.33 amps
Coolant heater (2) 1500 Watts, 120Vac, 12.50 amps
Coolant heater (3) 2000 Watts, 240Vac, 8.4 amps / 1500 Watts, 208Vac, 7.2 amps
Battery heater 125 Watts, 120Vac, 1.04 amps
Oil pan heater 150 Watts, 120Vac, 1.25 amps
Alternator heater 100 Watts, 120Vac, 0.83 amps
Battery charger (12V), 192 Watts, 120Vac, 1.67 amps (max)
Battery charger (24V), 300 Watts, 120Vac, 2.5 amps (max)

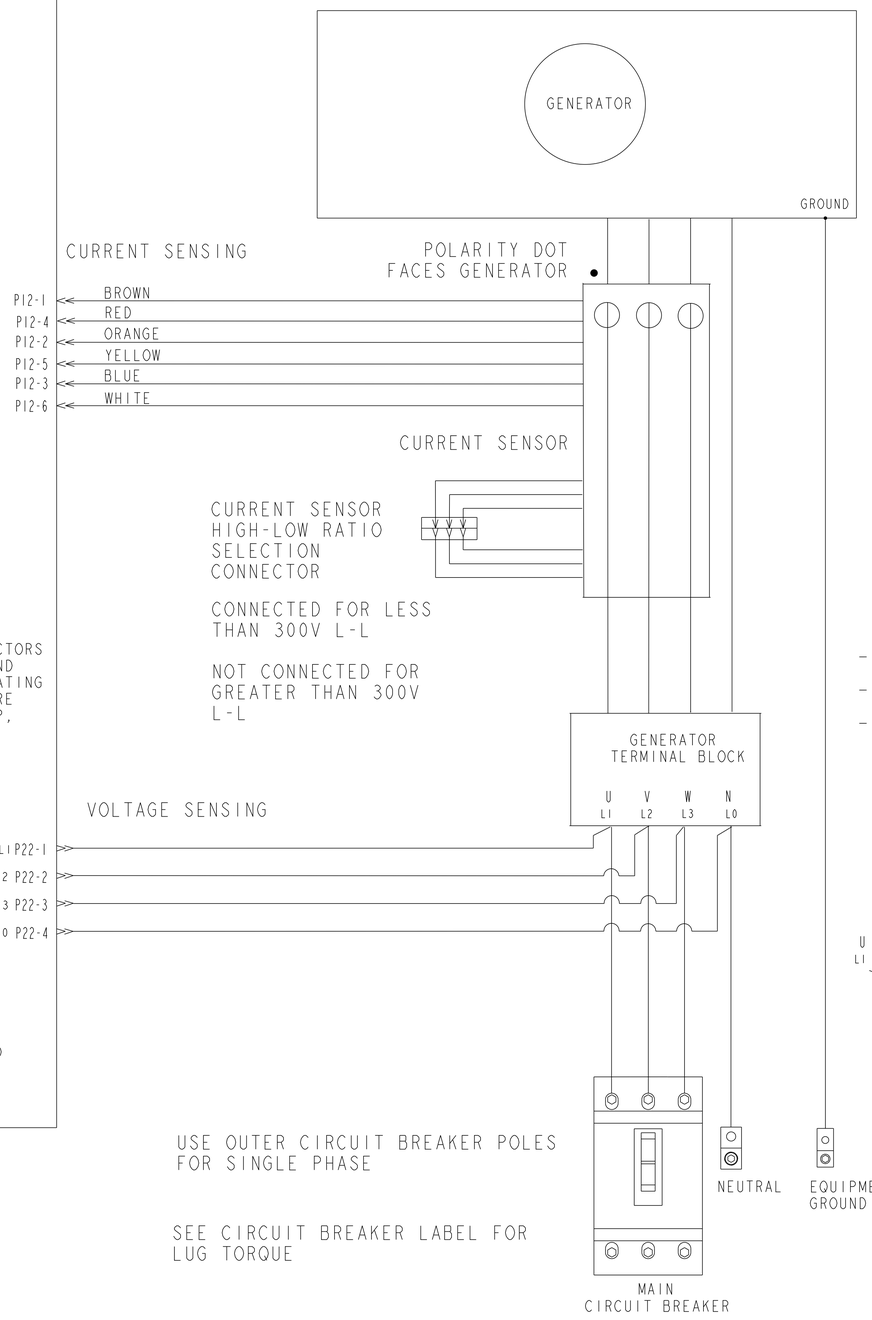
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS
DIM: X ±1, .X ±0.8, .XX± 0.38
ANG TOL ± 1.0°
SCALE 1/1
DO NOT SCALE PRINT
DRN C.BADGUJAR
CKD M.TULADHAR
APVD M.TULADHAR
DATE 20NOV15
SITE CODE PGF
CUMMINS POWER GENERATION
DIAGRAM,GENSET SCHEMATIC
DWG SIZE E
A054B421
CAD SHEET 5 of 5

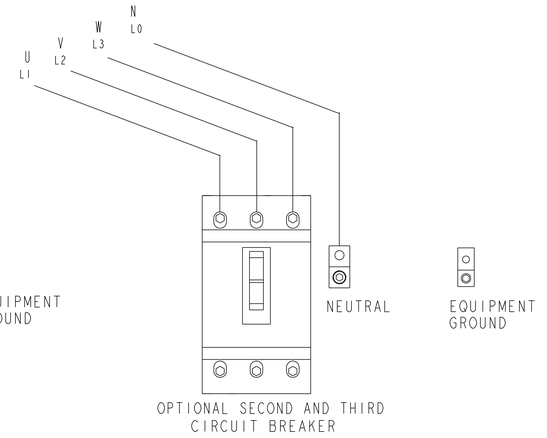
Drawing Name: A054B422 Revision: E
Part Name: A054B421 Revision: E
ECO-181411 Sheet 5 of 6

CUSTOMER CONNECTIONS



CUSTOMER CONNECTIONS		
TERMINAL NAME	SIGNAL NAME	DESCRIPTION
TB1	CUSTOMER GROUND	GROUND (3A MAX).
TB2	CUSTOMER INPUT 6	LOW FUEL SIGNAL
TB3	GROUND CUSTOMER INPUTS	GROUND SIGNAL FOR CUSTOMER INPUT.
TB4	CUSTOMER INPUT 12	RUPTURE BASIN SWITCH
TB5	REMOTE START	ACTIVATED BY APPLYING (GND) SIGNAL FROM (TB1).
TB6	CUSTOMER OUTPUT 1	RELAY COMMON CONNECTION. CONTACT RATING: 3.5A, 30VDC
TB7	CUSTOMER OUTPUT 1	RELAY NORMALLY OPEN CONNECTION. CONTACT RATING: 3.5A, 30VDC
TB8	PROTECTED B+	12VDC, 3A PROTECTED.
TB9	READY TO LOAD	LOW SIDE DRIVER (GND) OUPUT. ACTIVE WHEN GENERATOR IS READY TO ACCEPT LOAD. RATINGS:250mA, 1A INRUSH, 30VDC 100 uA LEAKAGE IN OFF STATE.
TB10	SWITCHED B+	12VDC, ACTIVE WHEN GENERATOR IS IN RUN STATE (10A FUSED).





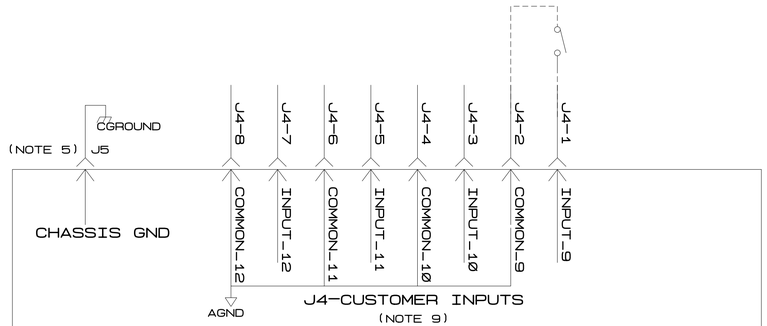
SEE DRAWING A048V210 FOR:

- VOLTAGE SENSING CONNECTION
- GENERATOR CONNECTION
- CURRENT SENSOR INSTALLATION

Cummins Inc.		
DIMENSIONS ARE IN: MILLIMETRES [ ] ARE IN: -	SIZE: E	SCALE: 1/1
DIMENSIONING AND TOLERANCING PER: ASME Y14.5-2009	THIRD ANGLE PROJECTION	CAD SYSTEM PTC® Creo® Parametric

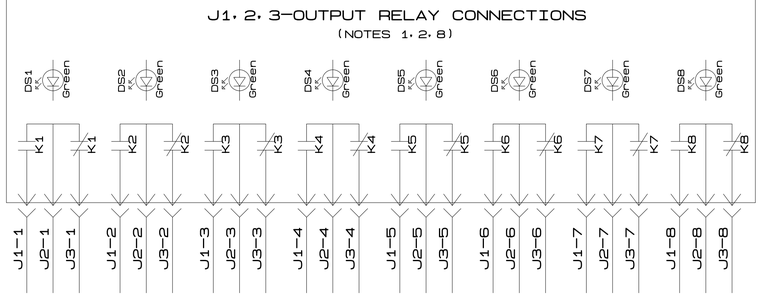
REL NO	LTR	NO.	REVISION	ZONE	DR	CHKR	APPROVED	DATE
FRD25376	A	1	PRODUCTION RELEASE	–	TAW	JfM	TAW	07-25-05
ECO-187041	B	–	----------	–	MRD	MS	SCHEVERELL	Ø5OCT05

EXAMPLE CONNECTION (DIGITAL, ACTIVE LOW)



J1

AUX102 DIGITAL I/O EXPANSION MODULE (327-1265)



ITEM	PART NO.	DWG SIZE	DESCRIPTION OR MATERIAL	REF DES	QTY

TOLERANCES UNLESS OTHERWISE SPECIFIED

	mm	Inch
DIM	X. ± .X ± .XX ±	.X ± .XX ± .XXX ±
HOLE	0.89~4.98 +0.15/-0.00 5.00~9.99 +0.20/-0.10 10.00~17.49 +0.25/-0.13 17.50~24.99 +0.30/-0.13	.004~.202 +.006/-.003 .201~.421 +.008/-.004 .422~.703 +.010/-.005 .704~.999 +.012/-.005

SIM TO
COPIED FROM
THIRD ANGLE PROJECTION

	NAME	DATE
DR	TROY WINSAND	7-20-05
CHKR ☒ MFG ☐	JOHN MCCARTHY	10-4-05
APPROVED	TROY WINSAND	7-20-05

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

MODEL FIRST USED ON SID

SITE CODE PGA

CUMMINS POWER GENERATION
1400 73rd AVE NE
MINNEAPOLIS, MN 55432

TITLE WD-CONTROL (SYSTEM I/O DEVICE)

DWG NO. Ø630-3142 SHEET 2 OF 2 DWG SIZE D

ZUKEN

DO NOT SCALE PRINT

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DRAWN TO SCALE OF

Specification sheet

OTPC Transfer switch open and closed transition

40 - 4000 Amp

Description

OTPC transfer switches are designed for operation and switching of electrical loads between primary power and Standby generator sets. They are suitable for use in emergency, legally required and optional Standby applications. The switch monitors both power sources, signals generator set startup, automatically transfers power, and returns the load to the primary power source when the utility returns and stabilizes.

OTPC transfer switches are available with closed transition transfer. By briefly connecting the two sources (for 100 msec or less), the transfer from the alternate source back to the normal source occurs without interruption in the power supply to loads.

Features

PowerCommand® control – A fully featured microprocessor-based control with digital display. Controls allow operator to enter settings and make adjustments to software-enabled features easily and accurately. Accommodates up to eight event schedules.

Programmed transition – Open transition timing can be adjusted to completely disconnect the load from both sources for a programmed time period, as recommended by NEMA MG-1 for transfer of inductive loads.

Advanced transfer switch mechanism – Unique bi-directional linear actuator provides smooth, Continuous transfer switch action during automatic operation.

Robust control system design – Optically isolated logic inputs and isolation transformers for AC power inputs provide high-voltage surge protection.

Main contacts – Heavy-duty silver alloy contacts with multi-leaf arc chutes are rated for motor loads or total system load transfer. They require no routine contact maintenance.

Continuous load current not to exceed 100% of switch rating and Tungsten loads not to exceed 30% of switch rating.

Communications capability – The transfer switch is capable of communicating with other transfer switches, SCADA and remote monitoring systems, or Cummins generators utilizing LonWorks® protocol.

Easy service/access – Single-plug harness connection and compatible terminal markings simplify servicing. Access space is ample. Door-mounted controls are field-programmable; not tool is required.

Complete product line – Cummins offers a wide range of equipment, accessories and services to suit virtually any backup power application.

Warranty and service - Products are backed by a comprehensive warranty and a worldwide network of distributors with factory-trained service technicians.

Transfer switch mechanism

- Transfer switch mechanism is electrically operated and mechanically held in the source 1 and source 2 positions. The transfer switch incorporates electrical and mechanical interlocks to prevent inadvertent interconnection of the sources.
- Independent break-before-make action is used for both 3-pole and 4-pole/ switched neutral switches. This design allows use of sync check operation when required, or control of the operating speed of the transfer switch for proper transfer of motor and rectifier-based loads (programmed transition feature).
- True 4-pole switching allows for proper ground (earth) fault sensing and consistent, reliable operation for the life of the transfer switch. The neutral poles of the transfer switch have the same ratings as the phase poles and are operated by a common crossbar mechanism, eliminating the possibility of incorrect neutral operation at any point in the operating cycle, or due to failure of a neutral operator.
- High pressure silver alloy contacts resist burning and pitting. Separate arcing surfaces further protect the main contacts. Contact wear is reduced by multiple leaf arc chutes that cool and quench the arcs. Barriers separate the phases to prevent interphase flashover. A transparent protective cover allows visual inspection while inhibiting inadvertent contact with energized components
- Switch mechanism, including contact assemblies, is third party certified to verify suitability for applications requiring high endurance switching capability for the life of the transfer switch. Withstand and closing ratings are validated using the same set of contacts, further demonstrating the robust nature of the design

Specifications

Voltage rating	600 VAC, 50 or 60 Hz.
Arc interruption	Multiple leaf arc chutes provide dependable arc interruption.
Neutral bar	A full current-rated neutral bar with lugs is standard on enclosed 3-pole transfer switches.
Auxiliary contacts	Two isolated contacts (one for each source) indicating switch position are provided for customer use. Contacts are normally open, and close to indicate connection to the source. Wired to terminal block for easy access. Rated at 10 amps Continuous and 250 VAC maximum. UL recognized, and CSA-certified.
Operating temperature	-40 ˚F (-40 ˚C) to 140 ˚F (60 ˚C)
Storage temperature	-40 ˚F (-40 ˚C) to 140 ˚F (60 ˚C)
Humidity	Up to 95% relative, non-condensing
Altitude	Up to 10,000 ft (3,000 m) without derating
Surge withstand ratings	Voltage surge performance and testing in compliance with the requirements of IEEE C62.41 (Category B3) and IEEE C62.45.
Total transfer time (source-to-source)	Will not exceed 6 cycles at 60 Hz with normal voltage applied to the actuator and without programmed transition enabled.
Manual operation handles	Transfer switches rated through 1000 amps are equipped with permanently attached operating handles and quick-break, quick-make contact mechanisms suitable for manual operation. Transfer switches over 1000 amps are equipped with manual operators. All switches must be de-energized before manual operation is attempted.

Transition modes

Open transition/programmed: Controls the time required for the device to switch from source to source, so that the load generated voltages decay to a safe level before connecting to an energized source. Recommended by NEMA MG-1 to prevent nuisance-tripping breakers and load damage. Adjustable 0-60 seconds, default 0 seconds. Programmed transition is standard on 150-1200 amp switches, and optional on 1600-4000 amps.

Open transition/in-phase: Initiates open transition transfer when in-phase monitor senses both sources are in phase. Operates in a break-before-make sequence. Includes ability to enable programmed transition as a back-up. If sources are not in phase within 120 seconds, switches from 40-1200 amps will transfer using programmed transition (not available on open transition switches over 1200 amps).

Closed transition: Used in applications where loads are sensitive to the momentary power interruption that occurs when performing open transition between sources. Closed transition is accomplished by briefly (<100 msec) paralleling two good sources to eliminate the momentary break in the power supply. Closed transition is only available as an option on OTPC models from 1000-4000 amps.

Genset-to-genset: Either genset can be designated as the lead genset. If the lead genset goes down or is taken offline, the transfer switch starts the second genset and transfer the load. The control can be programmed to alternate between the two gensets at a set interval up to 336 hours (2 weeks).

PowerCommand control

PowerCommand controls are microprocessor based and developed specifically for automatic transfer switch operation. The control includes all of the features and options required for most applications.

- LED lamps indicate source availability, source connected, exercise mode and test mode.
- Flash memory stores the control settings.
- Contents of the memory are not lost even if power to the controller is lost.
- On-board battery maintains the real-time clock setting and the engine start time delay.
- Choice of two control packages allows selection of the most suitable control for the application.

Control functions

Level 1 control (C023)

Open transition (in-phase)

Open transition (programmed)

Utility-to-genset applications

Software adjustable time delays:

- Engine start: 0 to 120 sec
- Transfer normal to emergency: 0 to 120 sec Re-transfer emergency to normal: 0 to 30 min
- Engine stop: 0 to 30 min
- Programmed transition: 0 to 60 sec

Undervoltage sensing: 3-phase normal, 1-phase emergency

- Accuracy: =/- 2%
- Pickup: 85% to 100% of nominal voltage
- Dropout: 75% to 98% of pickup setting
- Dropout time delay: 0-4 sec

Overvoltage sensing: 3-phase normal, 1-phase emergency

- Accuracy: =/- 2%
- Pickup: 95% to 99% of dropout setting
- Dropout: 105% to 135% of nominal voltage
- Dropout time delay: 0 to 120 sec

Over/under frequency sensing:

- Accuracy: ±0.05 Hz
- Pickup: ±5% to ±20% of nominal frequency
- Dropout: 1-5% beyond pickup
- Dropout time delay: 0.1 to 15.0 sec

Programmable genset exerciser: One event/schedule with or w/o load

Basic indicator panel:

- Source available/connected LED indicators
- Test/exercise/override buttons
- Digital display – optional (M018)
- Analog bar graph meter display – optional (D009)

Date/time-stamped event recording: 50 events

Load sequencing: Optional with network communications module M031. Provides control for eight steps of load with an adjustable time delay for each step on transfer, re-transfer or both.

Level 2 control (C024)

Open transition (in-phase)

Open transition (programed)

Closed transition: Includes fail-to-disconnect timer to prevent extended paralleling with the utility

Utility-to-genset applications

Utility-to-utility applications

Genset-to-genset applications

Software adjustable time delays:

- Engine start: 0 to 120 sec
- Transfer normal to emergency: 0 to 120 sec
- Re-transfer emergency to normal: 0 to 30
- min Engine stop: 0 to 30 min
- Programmed transition: 0 to 60 sec

Undervoltage sensing: 3-phase normal, 3-phase emergency

- Accuracy: +/- 2%
- Pickup: 85% to 100% of nominal voltage
- Dropout: 75% to 98% of pickup setting
- Dropout time delay: 0-4 sec

Overvoltage sensing: 3-phase normal, 3-phase emergency

- Accuracy: ± 2%
- Pickup: 95% to 99% of dropout setting
- Dropout: 105% to 135% of nominal voltage
- Dropout time delay: 0 to 120 sec

Over/under frequency sensing:

- Accuracy: =/- 0.05 Hz
- Pickup: ±5% to ±20% of nominal frequency
- Dropout: 1-5% beyond pickup
- Dropout time delay: 0.1 to 15.0 sec

Voltage imbalance sensing:

- Dropout: 2% to 10%
- Pickup: 90% of dropout
- Time delay: 2.0 to 20.0 sec

Phase rotation sensing:

- Time delay: 100 msec

Loss of single phase detection:

- Time delay: 100 msec

Programmable genset exerciser: Eight events/schedules with or w/o load

Basic indicator panel:

- Source available/connected LED indicators
- Test/exercise/override buttons
- Digital display – standard
- Analog bar graph meter display – optional (D009)

Date/time-stamped event recording: 50 events

Load sequencing: Optional with network communications module M031. Provides control for eight steps of load with an adjustable time delay for each step on transfer, re-transfer, or both.

Genset-to-genset: Same functions as above for lead and secondary generators.

Utility-to-utility: Same functions as above, for preferred and alternate source

Time-delay functions

Engine start: Prevents nuisance genset starts due to momentary power system variation or loss. Not included in utility-to-utility systems.

Transfer normal to emergency: Allows genset to stabilize before application of load. Prevents power interruption if normal source variation or loss is momentary. Allows staggered transfer of loads in multiple transfer switch systems. For genset-to-genset applications, delays transfer of load from lead to secondary generator.

Re-transfer emergency to normal: Allows the utility to stabilize before re-transfer of load. Prevents needless power interruption if return of normal source is momentary. Allows staggered transfer of loads in multiple transfer switch systems. For genset-to-genset applications, delays re-transfer of load from secondary back to lead generator.

Engine stop: Maintains availability of the genset for immediate reconnection if the normal source fails shortly after retransfer. Allows gradual genset cool down by running unloaded. Not included in utility-to-utility systems.

Elevator pre-transfer signal: Requires optional relay signal module (M023). Signals elevator system that transfer is pending and delays transfer for pre-set interval of 0-60 seconds to prevent a power interruption during elevator operation

User interfaces

Basic interface panel

LED indicators provide at-a-glance source and transfer switch status for quick summary of system conditions. Test and override buttons allow delays to be bypassed for rapid system checkout.

Digital display (M018)

The digital display provides a convenient method for monitoring load power conditions, adjusting transfer switch parameters, monitoring PowerCommand network status or reviewing transfer switch events. Password protection limits access to adjustments to authorized personnel. The digital display is optional with the PowerCommand Level 1 control and comes standard with the Level 2 control.

User interface options

Front panel security key (M017)

Locks front panel to prohibit access to digital control settings. Prevents unauthorized activation of transfer or test functions.

Bar graph meter display (D009)

An LED bar graph display provides an easy-to-read indicator of the level of power being supplied to the load. Information displayed includes: 3-phase voltage and current, frequency, power factor, and kilowatts. Green, amber, and red LEDs provide at-a-glance indication of system acceptability. Available as an option with the Level 2 PowerCommand microprocessor control.

Control options

Relay signal module (M023)

Provides relay output contacts for sending information to the building monitoring and control system. Relay outputs include: source 1 connected/available, source 2 connected/available, not in auto, test/exercise active, failed to disconnect, failed to synchronize, failed to transfer/re-transfer, and elevator control pre-transfer signal.

Loadshed (M007)

Removes the load from the emergency power source by driving the transfer switch to the neutral position when signalled remotely. Transfers load back to the emergency source when the signal contacts open. Immediately re-transfers back to the primary source when available. Available for utility-to-genset applications only.

PowerCommand network interface (M031)

Provides connection to the PowerCommand network. LonWorks compatible for integration with building monitoring and control system.

Load power and load current monitoring (M022)

Measures load phase and neutral current, power factor, real power (kW) and apparent power (kVA). Warns of excessive neutral current resulting from unbalanced or nonlinear loads. Minimum current level detection is 3%.

UL withstand and closing ratings

OTPC transfer switches must be protected by circuit breakers or fuses. Referenced drawings include detailed listings of specific breakers or fuse types that must be used with the respective transfer switches. Consult with your distributor/dealer to obtain the necessary drawings. Withstand and closing ratings (WCR) are stated in symmetrical RMS amperes.

Transfer switch ampere	MCCB protection			Special circuit breaker protection		
	WCR @ volts max with specific manufacturers MCCBs	Max MCCB ratings	Drawing reference	With specific current limiting breakers (CLB)	Max CLB rating	Drawing reference
40, 70, 125 3-pole	14,000 at 480	225 A	A050J441	200,000 at 480	225 A	A048J566
	14,000 at 600			100,000 at 600		
40, 70, 125 4-pole	30,000 at 480	400 A	A048E949	200,000 at 480	400 A	A051D533
	30,000 at 600			100,000 at 600		
150, 225, 260	30,000 at 480	400 A	A048E949	200,000 at 480	400 A	A051D533
	30,000 at 600			100,000 at 600		
300, 400, 600	65,000 at 480	1200 A	A056M829	200,000 at 480	1200 A	A048J564
	65,000 at 600			100,000 at 600		
800, 1000 open	65,000 at 480	1400 A	A056M821	150,000 at 480	1400 A	A048J562
	50,000 at 600			100,000 at 600		
1000, 1200 closed	85,000 at 480	1600 A	A052L319	200,000 at 480	1600 A	A048P186
	65,000 at 600*			200,000 at 600		
1200 open, delayed	85,000 at 480	1600 A	A056M825			
	65,000 at 600*					
1600, 2000, 3000, 4000	These amperages don't have specific circuit breaker ratings. See 3 cycle ratings table.					

*CSA only

Fuse protection

Transfer switch ampere	WCR @ volts max. with current limiting fuses	Max fuse, size and type	Drawing reference
40, 70, 125 3- and 4-pole	200,000 at 480 200,000 at 600	200 A Class, J, RK1, RK5, T	A050J441
150, 225, 260	200,000 at 480 200,000 at 600	600 A Class, J, RK1, RK5 1200 A Class L or T	A048E949
300, 400, 600	200,000 at 480 200,000 at 600	600 A Class, RK1 or RK5 1200 A Class L or T	A056M829
800, 1000 open	200,000 at 480 200,000 at 600	600 A Class, J, RK1 or RK5 1200 A Class T 2000 A Class L	A056M821
1000, 1200 closed	200,000 at 480**	3000 A Class L	A052L319
1200 open	200,000 at 480 200,000 at 600	600 A Class, J, RK1 or RK5 1200 A Class T 2000 A Class L	A056M825
1600, 2000	200,000 at 480**	2500 A Class L	A052L322
3000	200,000 at 480**	4000 A Class L	A052L322
4000	200,000 at 480** 200,000 at 600*	6000 A Class L	A052L324

*CSA only
**UL only

3-cycle ratings

Transfer switch ampere	WCR @ volts max 3 cycle rating	Max MCCB rating	Drawing reference
300, 400, 600	25,000 at 600	1200 A	A056M829
800, 1000	35,000 at 600	1400 A	A056M821
1000, 1200 closed	50,000 at 480 42,000 at 600*	1600 A	A052L319
1200 open	50,000 at 480 42,000 at 600	1600 A	A056M825
1600, 2000	100,000 at 480 65,000 at 600*	4000 A	A052L322
3000	100,000 at 480 65,000 at 600*	4000 A	A052L322
4000	100,000 at 480 85,000 at 600*	5000 A	A052L324

*CSA only

Transfer switch lug capacities

All lugs are 90°C rated and accept copper or aluminium wire unless indicated otherwise.

Amp rating	Cables per phase	Size
40, 70, 125 3-pole	1	#12 AWG-2/0
40 4-pole	1	#14 AWG-2/0
70, 125 4-pole	1	#6 AWG - 300 MCM
150, 225	1	#6 AWG - 300 MCM
260	1	#6 AWG - 400 MCM
300, 400	2	Two hole lug, one accepts 3/0 AWG – 600 MCM and the other accepts #4 AWG – 250 MCM
600	2	250 - 500 MCM
800, 1000 open, delayed	4	250 - 500 MCM
1000, 1200 closed	4	#2 AWG to 600 MCM
1200 open, delayed	4	# 2 AWG to 600 MCM, standard (Feature N045) 1/0 AWG to 750 MCM, optional (Feature N066) Compression Lug Adapter, optional (feature N032)**
1600, 2000	8	#2 AWG to 600 MCM (lugs optional)
3000	8	#2 AWG to 600 MCM (lugs optional)
4000	12	1/0 AWG to 750 MCM (lugs optional)

**Recommended Compression lugs (½" stud , 1-3/4" centers) Lug mounting hardware included

750 MCM	600 MCM	500 MCM	Manufacturer
CRA- 750L2	CRA-600L2	CRA-500L2	ILSCO
2ACL-750	2ACL-600	2ACL-500	
2IACL-750	2IACL-600	2IACL-500	
54223	54289	54286	THOMAS & BETTS
60278	60275	60273	
60278N	60278N	60278N	
LCN75	LCN600	LCN500	
ATL502	ATL602	ATL5002	
YA39-2LN	YA36-2LN	YA34-2LN	BURNDY
YA39-2N	YA36-2N	YA34-2N	
YA44L-2NTC-LD	-	YA38L-2NTC-FX	
YAG44L-2NTC-LD	-	YAG38L-2NTC-LD	
YA44-2N-FXB	-	YA38-2N-FXB	
YA39A5 And YA39AM2	YA36A3	YA34A3	

Enclosures

Dimensions - transfer switch in UL type 1 enclosure

Amp rating	Height		Width		Depth				Weight 3-pole type		Outline drawing
					Door closed		Door open				
	in	mm	in	mm	in	mm	in	mm	lb	kg	
40, 70, 125 3-pole	27.0	686	20.5	521	12.0	305	31.5	800	82	37	0310-0544
40, 70, 125 4-pole	35.5	902	26.0	660	16.0	406	41.0	1042	165	75	0500-4896
150, 225	35.5	902	26.0	660	16.0	406	41.0	1042	165	75	0310-0414
260	43.5	1105	28.5	724	16.0	406	43.0	1093	170	77	0310-0540
300, 400, 600	54.0	1372	25.5	648	18.0	457	42.0	1067	225	102	0310-1307
800, 1000 open	68.0	1727	30.0	762	20.6	524	48.5	1232	360	163	0310-0417
1000, 1200 closed	76.3	1937	36.0	915	22.7	577	54.0	1372	450	204	0310-0482
1200 open, delayed	90.0	2290	39.0	991	27.5	699	64.7	1644	730	331	A030L605
1600, 2000*	90.0	2290	39.0	915	48.0	1219	84.0	2134	1100	499	0310-0483
3000*	90.0	2290	36.0	915	48.0	1219	84.0	2134	1250	567	0310-0484
4000*	90.0	2290	46.5	1180	60.0	1520	106	2700	1850	839	0500-4485

Dimensions - transfer switch in UL type 3R, 4, 4x, or 12 enclosure

Amp rating	Height		Width		Depth				Weight		Cabinet type	Outline drawing
					Door closed		Door open					
	in	mm	in	mm	in	mm	in	mm	lb	kg		
40, 70, 125 3-pole	34.0	864	26.5	673	12.5	318	36.5	927	125	57	3R, 12	0310-0453
											4	0310-0445
40, 70, 125 4-pole	42.5	1080	30.5	775	16.0	406	44.0	1118	190	86	3R, 12	0500-4896
											4	0500-4896
150, 225	42.5	1080	30.5	775	16.0	406	44.0	1118	215	97	3R, 12	0310-0454
											4	0310-0446
260	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	3R, 12	0310-0455
											4	0310-0447
300, 400, 600	59.0	1499	27.5	699	18.5	419	41.5	1054	290	132	3R, 12	0310-1315
											4	0310-1316
800, 1000 open	73.5	1867	32.5	826	20.8	529	49.5	1257	410	186	3R, 12	0310-0457
											4	0310-0449
1000, 1200 closed	76.3	1937	36.0	915	22.7	577	54.0	1372	450	204	3R, 12, 4	0310-0482
1200 open	90.0	2290	39.0	991	27.5	699	64.7	1644	730	331	3R, 12	A030L605
											4	A041N372
1600, 2000*	90.0	2290	38.0	826	50.9	1293	80.0	2032	1100	499	3R, 12, 4	0310-0744
3000*	90.0	2290	38.0	965	51.0	1295	84.5	2146	1250	567	3R	0310-0745
4000*	90.0	2290	49.0	1244	60.0	1524	105	2654	1850	839	3R	0500-4486

Dimensions - transfer switch in UL type 4X stainless steel enclosure

Amp rating	Height		Width		Depth				Weight		Cabinet type	Outline drawing
					Door closed		Door open					
	in	mm	in	mm	in	mm	in	mm	lb	kg		
40, 70, 125 3-pole	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	0500-4184
40, 70, 125 4-pole	46.0	1168	32.0	813	16.0	406	46.0	1168	1168	255	4X	0500-4896
150, 225	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	0500-4184
260	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	0500-4184
300, 400, 600	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186	4X	0500-4185
800, 1000 open	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186	4X	0500-4185
1000, 1200 closed	7.0	1778	40.0	1016	19.8	502	59.0	1499	450	204	4X	0310-0482
1200 open	90.0	2290	39.0	991	27.5	699	64.7	1644	730	331	4X	A041N372
1600, 2000*	90.0	2290	35.5	826	50.9	1293	80.0	2032	1100	499	4X	0310-0744

* Rear and side access is required for installation. Dimensions shown are for 4-pole. For information on 3-pole switches, call factory.

Submittal detail

Amperage ratings

- 40
- 70
- 125
- 150
- 225
- 260
- 300
- 400
- 600
- 800
- 1000
- 1200
- 1600
- 2000
- 3000
- 4000

Voltage ratings

- R020 120*
- R038 190
- R021 208
- R022 220
- R023 240
- R024 380
- R025 416
- R035 440
- R026 480
- R027 600

* Single phase connection (not available on 1200-4000 amps)

Pole configuration

- A028 Poles - 3 (solid neutral)
- A029 Poles - 4 (switched neutral)

Frequency

- A044 60 Hertz
- A045 50 Hertz

Transfer mode

- A077 Open transition/in-phase
- A078 Open transition/programmed
- A079 Closed transition (available 1000-4000 amps, for closed transition below 1000 amps, see CHPC spec sheet S-1437)

Application

- A035 Utility to genset
- A036 Utility to utility
- A037 Genset to genset

System options

- A041 Single Phase, 2-wire or 3-wire (not available 1200- 4000 amps)
- A042 Three Phase, 3-wire or 4-wire

Enclosure

- B001 Type 1: Indoor use, provides some protection against dirt (similar to IEC type IP30)
- B002 Type 3R:Intended for outdoor use, provides some protection from dirt, rain and snow (similar to IEC type IP34)
- B003 Type 4: Indoor or outdoor use, provides some protection from wind-blown dust and water spray (similar to IEC type IP65)
- B004 Open Construction: No enclosure – includes automatic transfer switch and controls (call factory for dimensions)
- B010 Type 12: Indoor use, some protection from dust (similar to IEC type IP61)
- B025 Type 4X: Stainless steel, indoor or outdoor use, provides some protection from corrosion (similar to IEC Type IP65)

Standards

- A046 UL 1008/CSA certification
- A064 NFPA 20 compliant (not available on 1200-4000 amp switches)
- A080 Seismic certification

Controls

- C023 PowerCommand control - Level 1
- C024 PowerCommand control - Level 2

Control options

- M017 Security key - front panel
- M018 Digital display
- M022 Load monitoring (min current level 3%)
- M023 Relay signal module. Includes pre-transfer module for elevator control
- M031 LonWorks network communications module (FTT-10)

Meter

- D009 Analog bar graph meter

Battery chargers

- K001 2 amps, 12/24 volts
- KB59 15 amps, 12 volts
- KB60 12 amps, 24 volts Protective relays (closed transition)
- M045 Paralleling timer and lock-out relays, ANSI/IEEE 62PL and 86
- M046 Paralleling timer, lock-out and reverse power relays, single phase, ANSI/IEEE 62PL, 86 and 32R
- M047 Paralleling timer, lock-out and reverse power relays, three phase, ANSI/IEEE 62PL, 86 and 32R
- Auxiliary relays - Relays are UL listed and factory installed. All relays provide two normally closed isolated and two normally open contacts rated 10 amps at 600 VAC. Relay terminals accept from one 18 gauge to two 12 gauge wires per terminal.
- L101 24 VDC coil - installed, not wired (for customer use).
- L102 24 VDC coil - emergency position - relay energized when switch is in Source 2 (emergency) position.
- L103 24 VDC coil - normal position - relay energized when switch is in Source 1 (normal) position
- L201 12 VDC coil - installed, not wired
- L202 12 VDC coil - emergency position - relay energized when switch is in Source 2 (emergency) position
- L203 12 VDC coil - normal position - relay energized when switch is in Source 1 (normal) position

Miscellaneous options

- M003 Terminal block - 30 points (not wired)
- N020 Terminal block – re-transfer inhibit
- M007 Load shed - from emergency - drives switch to neutral position when remote signal contact closes
- N009 Power connect - bus Stabs (1200 amp open construction only)
- N013 Extension harness (open construction only)

Lug Kits (select one)

- N008 Cable lugs, mechanical, 600 MCM, 8 per pole (1600A, 2000A, 3000A only)
- N032 Lug adapters, compression, ½ Stud (1200A only)
- N045 Cable lugs, mechanical, 600 MCM, 4 per pole (1200A only)
- N066 Cable lugs, mechanical, 750 MCM, 4 per pole (1200A only)
- N056 Cable Lugs, mechanical, 750 MCM, 12 per pole (4000A only)

Warranty

- G010 Years 0-2: Parts, labor and travel Years 3-5: Parts only Years 6-10: Main contacts only
- G013 Years 0-5: Comprehensive Years 6-10: Main contacts only

Shipping

- A051 Packing - export box

Accessories

- AC-167 Accessories specifications sheet

Certification

UL	All switches are UL 1008 Listed with UL Type Rated cabinets and UL Listed CU-AL terminals.	NEMA	All switches comply with NEMA ICS 10.
CSA	All switches are certified to CSA 282 Emergency Electrical Power Supply for Buildings, up to 600 VAC.	IEEE	All switches comply with IEEE 446 Recommended Practice for Emergency and Standby Power Systems.
NEC	Suitable for use in emergency, legally required and Standby applications per NEC 700, 701 and 702.	ISO 9001	This transfer switch is designed and manufactured in facilities certified to ISO9001.
NFPA	All switches comply with NFPA 70, 99 and 110 (Level 1).		

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

Our energy working for you.™

S-1270 (06/18)

0626_2311	D	Pro/ENGINEER	2D ONLY DWG

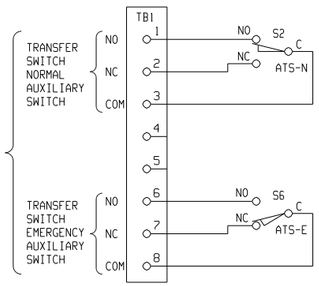
CUSTOMER CONNECTIONS

AUXILIARY CONTACTS

MOUNTED ON FRONT OF TRANSFER SWITCH. AVAILABLE ON ALL UNITS.

FOR CUSTOMER USE

TRANSFER SWITCH AUXILIARY CONTACTS RATED: 10 AMPS, 250 VAC



UTILITY TO GENERATOR

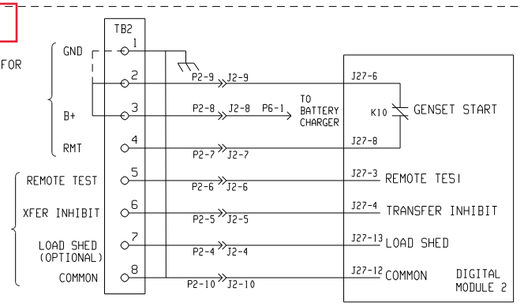
TO ENGINE GENERATOR CONTROL

REFER TO THE INTERCONNECTION DRAWING FOR PROPER INSTALLATION OF WIRING AND IF NEEDED, JUMPER LOCATION, BETWEEN THE GENSET CONTROL AND TRANSFER SWITCH.

ON PARALLELING SYSTEMS. REFER TO SYSTEM INTERCONNECTION DRAWING FOR CORRECT WIRING.

FOR CUSTOMER USE

TO USE REMOTE TEST, TRANSFER INHIBIT AND LOAD SHED CONNECT AN OPEN CONTACT BETWEEN THE APPLICABLE TERMINAL AND COMMON (TB2-8). CLOSE THE CONTACT TO ACTIVATE THE FUNCTION. NOTE THAT LOAD SHED IS OPTIONAL AND MUST BE INSTALLED IN ORDER TO USE.

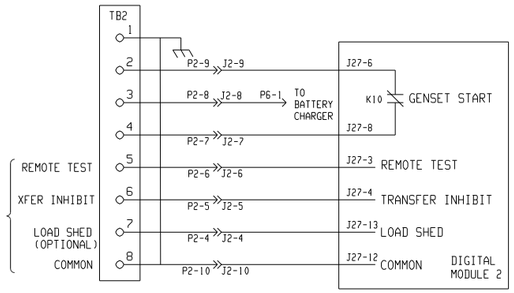


UTILITY TO UTILITY

FOR CUSTOMER USE

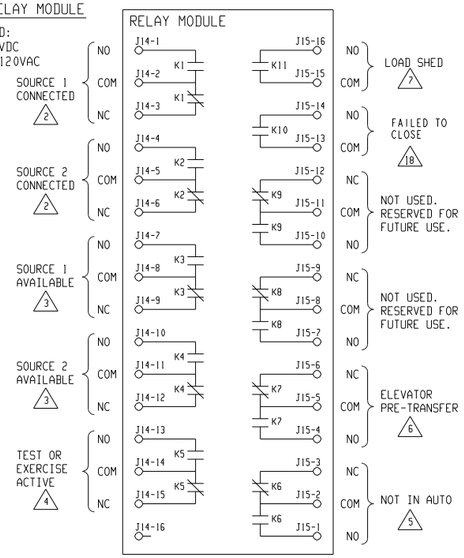
TO USE REMOTE TEST, TRANSFER INHIBIT AND LOAD SHED CONNECT AN OPEN CONTACT BETWEEN THE APPLICABLE TERMINAL AND COMMON (TB2-8). CLOSE THE CONTACT TO ACTIVATE THE FUNCTION. NOTE THAT LOAD SHED IS OPTIONAL AND MUST BE INSTALLED IN ORDER TO USE.

NOT AVAILABLE ON OTPCSE MODEL



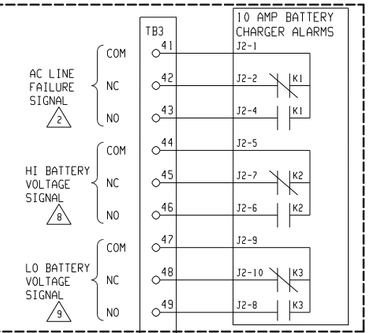
OPTIONAL: RELAY MODULE

CONTACTS RATED:
2 AMPS AT 30 VDC
0.60 AMPS AT 120VAC



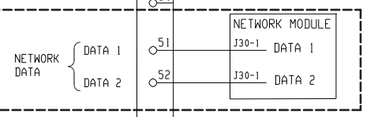
OPTIONAL: 10 AMP BATTERY CHARGER ALARMS

CONTACTS RATED:
4 AMPS AT 30 VDC OR 120VAC MAX



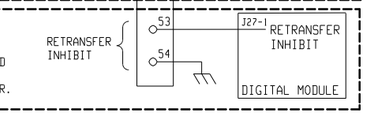
OPTIONAL: NETWORK MODULE

USE TWISTED PAIR



OPTIONAL: RETRANSFER INHIBIT

CONNECT A JUMPER OR A CLOSED CONTACT BETWEEN TB3-53 AND TB3-54 TO INHIBIT RETRANSFER.



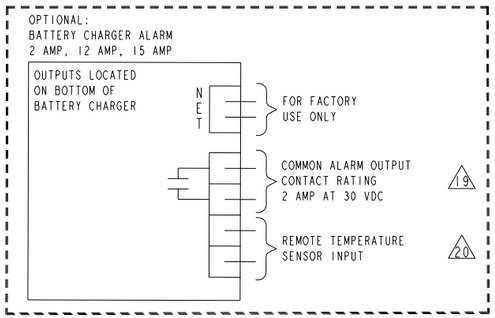
REL NO	LTR	NO	REVISION	ZONE	DR	CHKR	APPROVED	DATE
ECO-150717	G	1	ADDED CONNECTION TB2-1 TO TB2-8	5C	GAC	SAB	LHS	25MAR16
		2	ADDED CONNECTION TB2-1 TO TB2-8	5B	GAC	SAB	LHS	25MAR16
		3	SEE SHEET 4	-	GAC	SAB	LHS	25MAR16
		4	SEE SHEET 4	-	GAC	SAB	LHS	25MAR16
		5	SEE SHEET 5	-	GAC	SAB	LHS	25MAR16
		6	SEE SHEET 5	-	GAC	SAB	LHS	25MAR16
		7	SEE SHEET 5	-	GAC	SAB	LHS	25MAR16

NOTES:

1. TB1 AND TB2 ARE MOUNTED ON THE FRONT OF THE TRANSFER SWITCH. TB3 IS MOUNTED ON THE LEFT INSIDE PANEL OF THE ENCLOSURE.
2. SHOWN WITH SOURCE NOT CONNECTED.
3. SHOWN WITH SOURCE NOT AVAILABLE.
4. SHOWN NOT ACTIVE. CONTACTS CHANGE STATE DURING TEST OR EXERCISE PERIOD.
5. SHOWN WITH CONTROL IN AUTOMATIC MODE. CONTACTS CHANGE STATE WHEN CONTROL IS NOT IN AUTO.
6. SHOWN NOT ACTIVE. CONTACTS CHANGE STATE FOR AN ADJUSTABLE TIME BEFORE LOAD TRANSFER OCCURS.
7. SHOWN NOT ACTIVE. CONTACTS CHANGE STATE DURING LOAD SHED.
8. SHOWN UNDER NORMAL BATTERY VOLTAGE CONDITION. CONTACTS TRANSFER UNDER A HIGH BATTERY VOLTAGE CONDITION.
9. SHOWN UNDER A LOW BATTERY VOLTAGE CONDITION.
10. SEE SHEET 2.
11. SEE SHEET 2.
12. SEE SHEET 2.
13. SEE SHEET 4.
14. SEE SHEET 4.
15. SEE SHEET 5.
16. SEE SHEET 5.
17. SEE SHEET 5.
18. SHOWN NOT ACTIVE, CONTACT CHANGES STATE DURING A FAILED TO TRANSFER OR FAILED TO RETRANSFER EVENT.
19. THE FOLLOWING WILL CAUSE A BATTERY CHARGER ALARM OUTPUT:
    LOW BATTERY VOLTAGE
    HIGH BATTERY VOLTAGE
    LOW AC INPUT VOLTAGE
    HIGH AC INPUT VOLTAGE
    OVERCURRENT
    HIGH CHARGER TEMPERATURE
    BATTERY FAILURE
    HIGH BATTERY TEMPERATURE : NOT AVAILABLE ON 2 AMP CHARGER
20. USE THE INVENTER REMOTE TEMPERATURE PROBE. (PART NO. 0193-0530)
21. SEE SHEET 2.

LEVEL 2 CONTROL
DISPLAY MODULE
3 AND 4 POLE
OTPC 40-600 AMP, OTPCSE 40-125 AMP & OTPCSE 300-600 AMP
120 VOLT 1 PHASE L-N
240 VOLT 1 PHASE
190 VOLT 3 PHASE
208 VOLT 3 PHASE
220 VOLT 3 PHASE
240 VOLT 3 PHASE
380 VOLT 3 PHASE
415 VOLT 3 PHASE
440 VOLT 3 PHASE
480 VOLT 3 PHASE

OPTIONS:
NETWORK MODULE
LOAD SHED
RELAY MODULE
BAR GRAPH
LOAD CURRENT MODULE
BATTERY CHARGER
BATTERY CHARGER ALARMS
RETRANSFER INHIBIT



ITEM	PART NO	DWG SIZE	DESCRIPTION OR MATERIAL	REF DES

DO NOT SCALE PRINT

TOLERANCE UNLESS OTHERWISE SPECIFIED: mm: X ± 1, .X ± 1, .XX ± 1; inch: .X ± .XX ± .XXX ±

ANG TOL ± 1°

DRAWN TO SCALE OF 1/1

HOLE	mm	inch
A	0.89 - 4.99	+0.15/-0.08
B	5.00 - 9.99	+0.20/-0.10
C	10.00 - 17.49	+0.25/-0.13
D	17.50 - 24.99	+0.30/-0.13
	.035 - .200	+.006/-.003
	.201 - .421	+.008/-.004
	.422 - .703	+.010/-.005
	.704 - .999	+.012/-.005

SIM TO

COPIED FROM

THIRD ANGLE PROJECTION

	NAME	DATE
DR	S D MORE	11/26/04
CHKR ☒ MFG ☐	I A MAHADESHWAR	11/26/04
APPROVED	MILLER	11/26/04

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

MODEL FIRST USED ON: OTPC 40-600A SPEC A 120-480 VAC

SITE CODE: PGA

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

TITLE: WD-TRANSFER SWITCH

DWG NO: 0626_2311 | SHEET: 1 of 5 | DWG SIZE: D

Drawing Name: 0626-2311 Revision: G
Part Name: 0626-2311 Revision: G
ECO-150717 Sheet 1 of 6

Start and Test Checklist

Company Name: _____ Project Number: _____

Contact Name: _____ Project Name: _____

Phone Number: _____ Site Address: _____

Email: _____ City, State, Zip: _____

In order to ensure the site is ready for the Cummins technician to perform the Start and Test procedures, please complete and verify the following items by filling out the checklist. In order to schedule a Start and Test date, this checklist must be returned.

Site Info: Contact Name: _____ Phone: _____

Preferred Time on Site: _____ (AM/PM)

	Yes	No	Will be Completed by date	N/A
• Has all of the fuel plumbing to the tank been completed?	☐	☐	_____	☐
• Is there sufficient fuel* in the tank for start-up and testing?	☐	☐	_____	☐
• Are fuel tank vents* installed?	☐	☐	_____	☐
• Is the generator bolted to the concrete slab or spring mounts?	☐	☐	_____	☐
• Is shipping hardware removed?	☐	☐	_____	☐
• Are isolators adjusted?	☐	☐	_____	☐
• Is the automatic transfer switch installed?	☐	☐	_____	☐
• Is the exhaust system installed (silencer, flex, rain cap, etc.)?	☐	☐	_____	☐
• Are there any noise or exhaust emission restrictions that will prevent us from operating the generator during the scheduled start up? If yes, please briefly explain on the next page.	☐	☐	_____	☐
• Are electrical connections connected to:				
A. The generator?	☐	☐	_____	☐
B. The automatic transfer switch?	☐	☐	_____	☐
C. The battery charger?	☐	☐	_____	☐
D. The engine coolant heater?	☐	☐	_____	☐
E. The remote annunciator?	☐	☐	_____	☐
• Is utility power** available and connected to the transfer switch?	☐	☐	_____	☐
• Is utility power available for the battery charger & block heater?	☐	☐	_____	☐
• Is site load available and connected to the equipment?	☐	☐	_____	☐
• Can we transfer load to the emergency generator during start up?	☐	☐	_____	☐
• If training is required, are all trainees available on the scheduled date?	☐	☐	_____	☐

Gaseous Units Only: Fuel pressure after service regulator is:_____inches

- Site assessment:

A. Is parking available? Yes ☐ No ☐

B. A pickup-style service truck with trailer can park _____ feet from the unit.

C. Is a fee required to park? Yes ☐ No ☐ If yes, cost to park is $_____

D. Where is the unit located on the site?

☐ Roof (Floor # ___) ☐ Inside Building (Floor # ___)

☐ Basement (Floor # ___) ☐ Outside Building

☐ Other _____

E. What length of loadbank cable is required to reach between service truck (or well ventilated area to place load bank) and generator? _____feet

F. On what floor(s) is/are the transfer switch(es) located?

Switch #1 _____ Switch #2 _____ Switch #3_____ Switch #4 _____

G. What jurisdiction is the site in for purchasing an electrical permit?_____

Any other comments: _____

_____

_____

Please notify Cummins at least 48 hours prior to the schedule date of Start & Test if the above items have not, or cannot be completed. Cummins will not dispatch a technician to perform Start and Test if we have not received the completed checklist at least 48 hours prior to the scheduled service date.

Additional charges may apply as a result of delays and any work required or requested outside of the original scope of work where additional time or material are required from Cummins Sales and Service.

Please sign to acknowledge your understanding of the above requirements and expectations.

_____	_____
Print Name	Phone Number
_____	_____
Signature	Date

*If fuel tank pressure test is not required, contractor should install fuel tank vents prior to Cummins technician arrival. If test is required, DO NOT install vents and DO NOT fill with fuel until after pressure test is complete and you have obtained proper permits.

**Normal utility power should be connected and powered up through transfer switch.