DATE: March 8, 2022

ADDENDUM NO: ONE

TO ALL BIDDERS:

REFERENCE: IFB No: 2022-IFB-3031533
Commodity: Greer Elementary School Backup Generator Installation Manual Project
IFB Closing On: March 15, 2022

Please note the following clarifications and/or changes made to this solicitation:

1. Please see attached Architect Addendum #ONE, dated, MARCH 8, 2022, which includes the Pre-bid meeting summary, questions and answers, and sign-in sheet.

2. All other terms and conditions of the solicitation remain unchanged. Sealed bids must be received in accordance with the solicitation requirements by **3:00 PM** EDT on **MARCH 15, 2022**. Late bids will not be considered.

3. A signed acknowledgement of this addendum must be received by this office attached to your bid. Signature on this addendum does not constitute your signature on the original bid document. The original bid document must be signed also.

Sincerely,

Debra Shifflett

Debra Shifflett, VCO, VCA
Buyer II
Phone: (434) 296-5854

Name of Firm _____ Signature/Title _____

Date _____ Printed Name _____

COUNTY OF ALBEMARLE
FACILITIES & ENVIRONMENTAL SERVICES – FACILITIES PLANNING & CONSTRUCTION DIVISION
PRE-BID CONFERENCE ATTENDEES

Project: **Greer Elementary School Generator:**

Location: **190 Lambs Lane, Charlottesville, VA 22901**

Date: **February 28, 2022**

Name:	WAYNE PROFFITT
Organization:	A&L ELECTRICAL
Phone No.:	434-907-4335
Fax No.:	—
E-Mail:	w.proffitt@alelectricalinc.com

Name:	NEAL CRAMER
Organization:	ZRW CONSULTANTS
Phone No.:	
Fax No.:	
E-Mail:	

Name:	NEALE CRAFT
Organization:	ALBEMARLE COUNTY
Phone No.:	
Fax No.:	
E-Mail:	

Name:	DAVID VIA
Organization:	ALBEMARLE CO. PUBLIC SCHOOLS
Phone No.:	
Fax No.:	
E-Mail:	

Name:	
Organization:	
Phone No.:	
Fax No.:	

ADDENDUM 1

Project:	**20158.01 – Greer Elementary School Generator**		Pages:	1
IFB#	2022-IFB-3031533			
To:	Neale Craft	Albemarle County		
	Debra Shifflett	Albemarle County		
CC:	David Via	Albemarle County Public Schools		
From:	Neal Cramer, PE		Date:	March 8, 2022
Subject:	Addendum 1			

The following are revisions to the Construction Documents. Coordinate any additional work among trades and update all record documents accordingly.
NOTE: If you have questions about this project, please contact, Neal Cramer, nealc@2RW.com, Project Manager.

CLARIFICATIONS:

1. Fire watch during unoccupied times is NOT required.

2. Bidders are reminded to review Insurance requirements in Supplemental General Conditions in Project Manual.

3. Startup and load bank testing are included in Owner's procurement of generator. Coordinate with Owner's Project Manager to schedule startup and testing.

4. Owner will provide fuel for generator. Contractors shall coordinate with Owner's Project Manager to schedule fuel delivery for startup and testing.

5. Refer to attached submittal for generator and associated equipment provided by Owner. Generator remote annunciator is not indicated in submittal but will be provided by Owner. Contractor shall install annunciator per contract documents.

END OF DOCUMENT

2RW.com

100 10th St. NE
Suite 202
Charlottesville, VA 22902
T: 434.296.2116

2750 Prosperity Ave.
Suite 200
Fairfax, VA 22031
T: 703.718.4355

SUBMITTAL REVIEW COMMENTS

Project:	20158.1 – Greer ES Generator
Rev by:	Neal Cramer
Submittal pkg:	**Genset & ATS**
Submittal no.:	2601
Date:	**January 7, 2022**
Department:	**Electrical**

Status	
1	NO EXCEPTIONS TAKEN
2	APPROVED AS NOTED (UPDATE SUBMITTAL AS NOTED FOR INCLUSION IN CLOSEOUT DOCUMENTATION ONLY, RE-SUBMISSION NOT REQUIRED)
3	REVISE & RESUBMIT (MAKE CORRECTIONS NOTED)
4	REJECTED AS NOTED
NA	REVIEW NOT REQUIRED
NS	NOT SUBMITTED

This review is only for general conformance with the design concept of the project, and general compliance with the information given in the construction documents. Partial submissions or those for which submittals of correlated items have not been provided will be returned to the Contractor without review by the Engineer. The Engineer shall not be responsible for any deviations from the construction documents not brought to the attention of the Engineer in writing by the Contractor.

The action indicated is subject to the requirements of the construction documents. The contractor is responsible for dimensions which shall be confirmed and coordinated at the project site. The contractor is responsible for fabrication processes, techniques of construction, weights / gauges of materials, quantities, the coordination of his work with all other trades and subcontractors, and the satisfactory performance of the work.

Item	Status	Comments
Engine Generator		
Lug sizing	**1**	•
EPA Certification	**1**	•
Generator Set	**1**	•
Permanent Magnet Generator	**1**	•
Anti-condensation heater	**1**	•
Control Panel	**1**	•
Voltage Regulator	**1**	•
Engine Controller	**1**	•
Enclosure	**1**	•
Fuel Tank	**1**	•
GFCI Receptacles	**1**	•
Coolant Heater	**1**	•
Battery	**1**	•
Battery Charger	**1**	•

2RW.com

100 10th St. NE
Suite 202
Charlottesville, VA 22902
T: 434.296.2116

2750 Prosperity Ave.
Suite 200
Fairfax, VA 22031
T: 703.718.4355

Drawings and Schematics	**1**	•
Transfer Switches	**1**	•

Carter CAT LET'S GET TO WORK.
8362 Richfood Rd, Mechanicsville, Virginia 23116 Phone: 804-730-1810 Fax:

Letter of Transmittal

Date: December 29, 2021
To: Albemarle County Schools
Project #: 21-497SD
Attention: Neale Craft
Re: Greer Elementary School Genset and ATS

INCLUDED:

- ☐ Shop Drawings
- ☐ Reports
- ☐ Spec Sheet
- ☐ Manual
- ☐ Prints
- ☐ Specifications
- ☉ Submittal
- ☐ Other
- ☐ Plans
- ☐ Copy of Letter

SUBMITTAL STATUS:

- ☑ Submitted
- ☐ Approved
- ☐ Rejected

OTHER:

Copies	Date	No.	Description
1	12/29/21	001	Genset and ATS Submittal

THESE ARE TRANSMITTED as checked below:

- ☑ For approval
- ☐ Approved as submitted
- ☐ Resubmit
- ☑ For your use
- ☐ Approved as noted
- ☐ Submit
- ☑ As requested
- ☐ Returned for corrections
- ☐ Return
- ☑ For review & comment
- ☐ Other
- ☑ Remarks:

Neale,

See attached "For Approval" Submittal for the genset and two ATS.

PROJECT SUBMITTAL

For Approval:

EQUIPMENT:	**Generator Set Model D80GC, 80kW**
PROJECT LOCATION:	**Greer Elementary School**
CUSTOMER:	**Albemarle County**
PURCHASE ORDER:	**TBD**
CMCo PROJECT ID#:	**21-497SD**
Date:	**December 29, 2021**

Carter Machinery Company primary point of contact for any questions moving forward:

Steve Dunn | Project Manager

Office: **757-995-7557**
Fax: **757-485-7662**
Email: **steve_dunn@cartermachinery.com**

Power Systems Sales Representative: Gary Ouellette
Power Systems Sales Engineer: Craig Brander

Carter CAT

LET'S GET TO WORK.®

Table of Contents

\

SECTION A

GENERATOR BILL OF MATERIALS

One (1) Caterpillar Diesel Fueled Packaged Generator Set Model D80GC with Brushless Generator, 80 kW Standby at 0.8 P.F., 277/480 Volt, 3-Phase, 60 Hertz at 1800 RPM.

BASE MODEL

- **EPA STATIONARY EMERGENCY CERTIFIED- EPA TIER 3 & CARB EMISSIONS LEVELS (PER EPA NSPS RULE)**
  - **NAC306P [D80GC, 80kW, 277/480V, 60Hz ENGINE-GENERATOR SET – 3-PHASE]**

ATTACHMENTS

- **EMISSION CERTIFICATION**
  - CERTESE [STATIONARY EMERGENCY]

- **UL LISTING**
  - ULLIST – [UL2200 LISTED PACKAGE]

- **VOLTAGE INDICATOR**
  - 60H0480 [277/480V]

- **APPLICATION INDICATOR**
  - STANDBY [STANDBY RATING]

- **CONTROL PANEL**
  - GCCP1.2 [CAT GCCP1.2 AUTOSTART CONTROL PANEL]
  - FSS [FUEL LEVEL ALARMS]
  - PSV1 [VOLTAGE ADJUST POTENTIOMETER]
  - VFRCON [VOLT FREE ALARM CONTACTS and GEN RUN RELAY]
  - PAA [LOCAL ALARM HORN WITH MUTE]

- **GENERATOR and GENERATOR ATTACHMENTS**
  - OGNSEJM [CAT 60HZ GENERATOR- M2236L4]
  - PMEXCI3 [PERMANENT MAGNET EXCITATION]
  - AH1H – [GENERATOR ANTI-CONDENSATION HEATER]

- **CIRCUIT BREAKERS**
  - CB0150A [150A/3P/100% RATED, ADJUSTABLE TRIP]
  - CB0100A [100A/3P/100% RATED, ADJUSTABLE TRIP]
  - SHTAUX – [Shunt Trip and Aux Contacts]
  - NOSUSE – [NUETRAL BAR INSTALLED]

- **COOLING SYSTEM**
  - WSS1 [LOW COOLANT LEVEL SHUTDOWN CIRCUIT]
  - WCA1 [LOW COOLANT LEVEL ALARM 69/80 degree F]
  - WHH [COOLANT WATER HEATER, 90/130 degree F]

- **ENCLOSURE**
  - ENCSAB2 [Level 2 STEEL SOUND ATTENUATED WEATHERPROOF ENCLOSURE WITH INTERNAL CRITICAL SILENCER – 75 dBA @ 23' UNDER FULL LOAD]
    - [CATERPILLAR WHITE in COLOR]

- **FUEL STORAGE SYSTEM**
  - FTDW043 - [200-Gallon Integral UL-142 Double-Wall, 29-HR Runtime @ 100% Load, 36-HR at 75% and 49-HR at 50% Loads FUEL TANK]
  - FFLCK – [LOCKING FUEL CAP]
  - FLEKP – [LEAK PROBE]
  - FAHL90 – [AUDIBLE and VISUAL 90% HIGH FUEL ALARM]

- **STARTING/CHARGING SYSTEM**
  - BTC1028 [BATTERY CHARGER 10A, NFPA 110 Compliant]
  - BAT2465[12v LEAD ACID BATTERY SYSTEM with RACK]

- **TESTS/REPORTS**
  - STDTEST [Factory 0.8 POWER FACTOR TEST]

INCLUDED:

- ALL INCOMING/OUTGOING FREIGHT AND JOBSITE DELIVERY
- STANDARD STARTUP SERVICE DURING OUR NORMAL WORKING HOURS
  - INCLUDES ANY MILEAGE AND TRAVEL CHARGES
- TWO (2) HOUR RESISTIVE LOADBANK TESTING at Time of Startup during our Normal Working Hours
  - No Fuel Included.
- ONSITE OWNER PERSONNEL TRAINING SESSION DURING STARTUP
- Five (5) Year / 2500hr Platinum Level Genset Warranty. No Deductibles.
- YARDWORK/RESTRAP/BREAKER MODIFICATIONS.
- ONE (1) EACH 60amp and 100amp CAT CG SERIES AUTOMATIC TRANSFER SWITCHES, NEMA-1 INDOOR ENCLOSURES, OPEN TRANSITION, NON-SERVICE RATED, 3-POLE SOLID NEUTRAL, 480v, ENGINE EXERCISERS.

NOT INCLUDED:

- Off-Loading, Setting, Installation, Any Fuel.
- Engineered Drawings/Engineering fees.
- Coordination/Arch Flash Studies, Sound Level Testing.
- Anything not listed in this Bill of Materials.

NOTES:

- Dimensions of Genset: 128”L x 44”W x 66”H and weighs 3,000lbs without fuel.
- This package is based on the information provided by the end user; no formal project plans or specifications have been referenced. This Bill of Materials contains our complete offering. Any and all other materials and or requirements will be provided by others.
- All work M-F during our normal working hours.

EXEMPTION STATEMENT

Carter Machinery Co., Inc. is quoting this project as a material supplier only and therefore is exempt from provisions in the contract document, if any, pertaining to sub – contractor performance bonds and retainages .The equipment and services listed in this quotation are being offered as our interpretation of the customer requirements. Contract drawings or specification requirements were not provided. We have included herein a complete listing of the equipment and services we propose to supply.

Only equipment, testing, reports etc. shown or listed in our Bill of Materials and or this submittal will be provided.

If it is not shown or listed it will not be provided by Carter Machinery.

Failure to return this Exemption Statement signed with transmittal review and submittal approval with notification of any required changes, constitutes understanding and acceptance.

ELECTRICAL CONTRACTOR: _____

BY: _____ DATE: _____

AND

ENGINEERING FIRM / OWNER:_____

BY: _____ DATE: _____

IMPORTANT – Lug Sizing

To be executed by the Electrical Contractor and or the Engineer prior to release for production. Cable Connection Lugs are provided as Follows for:

Albemarle County - Greer Elementary School

Circuit Breaker, 150 Ampere, 3 Pole: ***Square - D H Frame***

Line: Qty/Phase: (1) Wire Range: #14 – 2/0 AWG

Circuit Breaker, 100 Ampere, 3 Pole: ***Square – D H Frame***

Line: Qty/Phase: (1) Wire Range: #14 – 2/0 AWG

(2) Automatic Transfer Switches, 60 amp & 100 amp, 3 Pole: ***CAT***

Line: Qty/Phase: (1) Wire Range: #6 – 300 MCM
Emergency: Qty/Phase: (1) Wire Range: #6 – 300 MCM
Load: Qty/Phase: (1) Wire Range: #6 – 300 MCM

No lug sizing information was available or provided. The lugs listed above are standard for the equipment to be supplied.

Failure to return this lug sizing sheet signed with transmittal review and notification of required changes, constitutes acceptance of the submitted lugs above.

THE ABOVE LUGS ARE CORRECT FOR THIS PROJECT.

ELECTRICAL CONTRACTOR: _____

BY: _____ DATE: _____

AND / OR

ENGINEERING FIRM / OWNER:_____

BY: _____ DATE: _____

IMPORTANT – Generator Control Wiring

To be executed by Contractor and/or end user prior to on-site generator commissioning.
Control Wiring Recommendations are provided as follows for:

Albemarle County – Greer Elementary School

Generator Model:	D80GC, 80kW
Generator Control Panel:	GCCP 1.2
ATS Models:	(2) CAT CG Series, 60a & 100a
Control panel to each ATS:	(2) #14 stranded wire

Power Requirements: (1) 30 AMP, 120V circuit pulled to junction block in genset control panel.

THE ABOVE WIRING REQUIREMENTS HAVE BEEN MET FOR THIS PROJECT.

CONTRACTOR: _____

BY: _____ DATE: _____

ATTACHMENTS

ULCERT
UL 2200 LISTING

INCLUDES THE FOLLOWING:

ALTERNATOR
Alternator insulation system is UL Recognized (UL 1446). PMG and AREP alternators are available. Automatic voltage regulators are UL Recognized.

WIRE HARNESS
AC, DC, and power harnesses are made with UL Listed wire and UL Listed terminals.

CONTROL PANEL
Control panels are comprised of UL Listed and UL Recognized components. EMCP is UL Recognized.

CIRCUIT BREAKER
Output circuit breaker is 100% rated and UL Listed.

TESTING
All UL Listed sets are designed and rigorously tested in accordance with UL Standard for Safety, UL 2200.

LABELING
Labeling meets UL requirements.

MECHANICAL OPTIONS
Mechanical options do not require UL Listing and, therefore, are not affected. The exceptions to this are:

FUEL TANKS
If a fuel tank is ordered with the unit, it must be UL Listed. Two versions are available: 24 hour integral (FCUL2) and 24/48 hour sub-base (FSBT)

ENCLOSURES
Factory installed enclosures meet UL requirements. Weatherproof and sound attenuated versions are available.

ELECTRICAL OPTIONS
The table below shows electrical options that meet UL requirements:

EOS	Lube Oil Sump Heater
WCA1	Low Coolant Level Shutdown
WSS1	Low Coolant Temperature Alarm
AH1H	Anti-Condensation Heater
WHH	Coolant Heater
GOVES	Electronic Governor (Fully Adjustable)
FSS1	Critical Low Fuel Level Shutdown
FSS2	Low Fuel Level Alarm
FSSS	Critical High Fuel Alarm
PBCSUL	UL Listed Battery Charger
PBC10NU	NFPA Battery Charger, UL Listed

LEHE0410-01 (11-

BUILT FOR IT.

Effective with sales to the first user on or after August 1, 2018

CATERPILLAR LIMITED WARRANTY

Industrial, Petroleum, Locomotive, and Agriculture Engine Products and Electric Power Generation Products

Worldwide

Caterpillar Inc. or any of its subsidiaries ("Caterpillar") warrants new and remanufactured engines and new and rebuild electric power generation products sold by it (including any products of other manufacturers packaged and sold by Caterpillar), to be free from defects in material and workmanship.

This warranty does not apply to engines sold for use in on-highway vehicle or marine applications; engines in machines manufactured by or for Caterpillar; C175, 3500 and 3600 series engines used in locomotive applications; 3000 Family engines, C0.5 through C4.4 and ACERT™ (C6.6, C7, C7.1, C9, C9.3, C11, C13, C15, C18, C27, and C32) engines used in industrial, mobile agriculture and locomotive applications; or Cat® batteries; or Electric Power Generation Products manufactured or assembled in India. These products are covered by other Caterpillar warranties.

This warranty is subject to the following:

Warranty Period

- For industrial engines, engines in a petroleum applications or Petroleum Power Systems (excluding petroleum fire pump application), or engines in a Locomotive application, or Uninterruptible Power Supply (UPS) systems, the warranty period is 12 months after date of delivery to the first user.
- For engines used in petroleum fire pump and mobile agriculture applications the warranty period is 24 months after date of delivery to the first user.
- For controls only (EPIC), configurable and custom switchgear products, and automatic transfer switch products, the warranty period is 24 months after date of delivery to the first user.
- For new CG132, CG170 and CG260 series power generation products the warranty period is 24 months after date of delivery to first user, but not to exceed 36 months from shipment from the Caterpillar place of manufacture.
- For electric power generation products other than CG132, CG170 and CG260 series in prime or continuous applications the warranty period is 12 months. For standby applications the warranty period is 24 months/1000 hours. For emergency standby applications the warranty period is 24 months/400 hours. All terms begin after date of delivery to the first user.
- For Caterpillar rebuild electric power generation products the warranty period is 12 months, but not to exceed 24 months from shipment of rebuilt electric power generation product from Caterpillar.
- For all other applications the warranty period is 12 months after date of delivery to the first user.

Caterpillar Responsibilities

If a defect in material or workmanship is found during the warranty period, Caterpillar will, during normal working hours and at a place of business of a Cat dealer or other source approved by Caterpillar:

- Provide (at Caterpillar's choice) new, Remanufactured, or Caterpillar approved repaired parts or assembled components needed to correct the defect.

Note: New, remanufactured, or Caterpillar approved repaired parts or assembled components provided under the terms of this warranty are warranted for the remainder of the warranty period applicable to the product in which installed as if such parts were original components of that product. Items replaced under this warranty become the property of Caterpillar.

- Replace lubricating oil, filters, coolant, and other service items made unusable by the defect.
- Provide reasonable and customary labor needed to correct the defect, including labor to disconnect the product from and reconnect the product to its attached equipment, mounting, and support systems, if required.

For new 3114, 3116, and 3126 engines and, new and Caterpillar rebuild electric power generation products (which includes the following: any new products of other manufacturers packaged and sold by Caterpillar)

- Provide travel labor, up to four hours round trip, if in the opinion of Caterpillar, the product cannot reasonably be transported to a place of business of a Cat dealer or other source approved by Caterpillar (travel labor in excess of four hours round trip, and any meals, mileage, lodging, etc. is the user's responsibility).

For all other products:

- Provide reasonable travel expenses for authorized mechanics, including meals, mileage, and lodging, when Caterpillar chooses to make the repair on-site.

User Responsibilities

The user is responsible for:

- Providing proof of the delivery date to the first user.
- Labor costs, except as stated under "Caterpillar Responsibilities," including costs beyond those required to disconnect the product from and reconnect the product to its attached equipment, mounting, and support systems.
- Travel or transporting costs, except as stated under "Caterpillar Responsibilities."
- Premium or overtime labor costs.
- Parts shipping charges in excess of those that are usual and customary.
- Local taxes, if applicable.
- Costs to investigate complaints, unless the problem is caused by a defect in Caterpillar material or workmanship.
- Giving timely notice of a warrantable failure and promptly making the product available for repair.
- Performance of the required maintenance (including use of proper fuel, oil, lubricants, and coolant) and items replaced due to normal wear and tear.
- Allowing Caterpillar access to all electronically stored data.

Limitations

Caterpillar is not responsible for:

- Failures resulting from any use or installation that Caterpillar judges improper.
- Failures resulting from attachments, accessory items, and parts not sold or approved by Caterpillar.
- Failures resulting from abuse, neglect, and/or improper repair.
- Failures resulting from user's delay in making the product available after being notified of a potential product problem.
- Failures resulting from unauthorized repairs or adjustments, and unauthorized fuel setting changes.
- Damage to parts, fixtures, housings, attachments, and accessory items that are not part of the engine, Cat Selective Catalytic Reduction System or electric power generation product (including any products of other manufacturers packaged and sold by Caterpillar).
- Repair of components sold by Caterpillar that is warranted directly to the user by their respective manufacturer. Depending on type of application, certain exclusions may apply. Consult your Cat dealer for more information.

(Continued on reverse side…)

This warranty covers every major component of the products. Claims under this warranty should be submitted to a place of business of a Cat dealer or other source approved by Caterpillar. For further information concerning either the location to submit claims or Caterpillar as the issuer of this warranty, write Caterpillar Inc., 100 N. E. Adams St., Peoria, IL USA 61629.

Caterpillar's obligations under this Limited Warranty are subject to, and shall not apply in contravention of, the laws, rules, regulations, directives, ordinances, orders, or statutes of the United States, or of any other applicable jurisdiction, without recourse or liability with respect to Caterpillar.

A) For products operating outside of Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:

NEITHER THE FOREGOING EXPRESS WARRANTY NOR ANY OTHER WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED, IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS THAT IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EXCEPT CATERPILLAR EMISSION-RELATED COMPONENTS WARRANTIES FOR NEW ENGINES, WHERE APPLICABLE. REMEDIES UNDER THIS WARRANTY ARE LIMITED TO THE PROVISION OF MATERIAL AND SERVICES, AS SPECIFIED HEREIN.

CATERPILLAR IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.

IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS IS EXCLUDED IN ITS ENTIRETY.

For personal or family use engines or electric power generation products, operating in the USA, its territories and possessions, some states do not allow limitations on how long an implied warranty may last nor allow the exclusion or limitation of incidental or consequential damages. Therefore, the previously expressed exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary by jurisdiction. To find the location of the nearest Cat dealer or other authorized repair facility, call (309) 675-1000. If you have questions concerning this warranty or its applications, call or write:

In USA and Canada: Caterpillar Inc, 100 N.E. Adams St., Peoria, IL USA 61629, Attention: Customer Service Manager, Telephone 1 (309) 675-1000, outside the USA and Canada: Contact your Cat dealer.

B) For products operating in Australia, Fiji, Nauru, New Caledonia, New Zealand, Papua New Guinea, the Solomon Islands and Tahiti, the following is applicable:

THIS WARRANTY IS IN ADDITION TO WARRANTIES AND CONDITIONS IMPLIED BY STATUTE AND OTHER STATUTORY RIGHTS AND OBLIGATIONS THAT BY ANY APPLICABLE LAW CANNOT BE EXCLUDED, RESTRICTED OR MODIFIED ("MANDATORY RIGHTS"). ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED (BY STATUTE OR OTHERWISE), ARE EXCLUDED. WITHOUT LIMITING THE FOREGOING PROVISIONS OF THIS PARAGRAPH, WHERE A PRODUCT IS SUPPLIED FOR BUSINESS PURPOSES, THE CONSUMER GUARANTEES UNDER THE CONSUMER GUARANTEES ACT 1993 (NZ) WILL NOT APPLY.

NEITHER THIS WARRANTY NOR ANY OTHER CONDITION OR WARRANTY BY CATERPILLAR, EXPRESS OR IMPLIED (SUBJECT ONLY TO THE MANDATORY RIGHTS), IS APPLICABLE TO ANY ITEM CATERPILLAR SELLS THAT IS WARRANTED DIRECTLY TO THE USER BY ITS MANUFACTURER.

IF THE MANDATORY RIGHTS MAKE CATERPILLAR LIABLE IN CONNECTION WITH SERVICES OR GOODS, THEN TO THE EXTENT PERMITTED UNDER THE MANDATORY RIGHTS, THAT LIABILITY SHALL BE LIMITED AT CATERPILLAR'S OPTION TO (a) IN THE CASE OF SERVICES, THE SUPPLY OF THE SERVICES AGAIN OR THE PAYMENT OF THE COST OF HAVING THE SERVICES SUPPLIED AGAIN AND (b) IN THE CASE OF GOODS, THE REPAIR OR REPLACEMENT OF THE GOODS, THE SUPPLY OF EQUIVALENT GOODS, THE PAYMENT OF THE COST OF SUCH REPAIR OR REPLACEMENT OR THE ACQUISITION OF EQUIVALENT GOODS.

CATERPILLAR EXCLUDES ALL LIABILITY FOR OR ARISING FROM ANY NEGLIGENCE ON ITS PART OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN RESPECT OF THE MANUFACTURE OR SUPPLY OF GOODS OR THE PROVISION OF SERVICES RELATING TO THE GOODS.

CATERPILLAR IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES UNLESS IMPOSED UNDER MANDATORY RIGHTS.

IF OTHERWISE APPLICABLE, THE VIENNA CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS IS EXCLUDED IN ITS ENTIRETY.

C) For products supplied in Australia:

IF THE PRODUCTS TO WHICH THIS WARRANTY APPLIES ARE:

- **I. PRODUCTS OF A KIND ORDINARILY ACQUIRED FOR PERSONAL, DOMESTIC OR HOUSEHOLD USE OR CONSUMPTION; OR**
- **II. PRODUCTS THAT COST AUD 40,000 OR LESS,**

WHERE THOSE PRODUCTS WERE NOT ACQUIRED FOR THE PURPOSE OF RE-SUPPLY OR FOR THE PURPOSE OF USING THEM UP OR TRANSFORMING THEM IN THE COURSE OF PRODUCTION OR MANUFACTURE OR IN THE COURSE OF REPAIRING OTHER GOODS OR FIXTURES, THEN THIS SECTION C APPLIES.

THE FOLLOWING MANDATORY TEXT IS INCLUDED PURSUANT TO THE AUSTRALIAN CONSUMER LAW AND INCLUDES REFERENCES TO RIGHTS THE USER MAY HAVE AGAINST THE DIRECT SUPPLIER OF THE PRODUCTS: OUR GOODS COME WITH GUARANTEES THAT CANNOT BE EXCLUDED UNDER THE AUSTRALIAN CONSUMER LAW. YOU ARE ENTITLED TO A REPLACEMENT OR REFUND FOR A MAJOR FAILURE AND COMPENSATION FOR ANY OTHER REASONABLY FORESEEABLE LOSS OR DAMAGE. YOU ARE ALSO ENTITLED TO HAVE THE GOODS REPAIRED OR REPLACED IF THE GOODS FAIL TO BE OF ACCEPTABLE QUALITY AND THE FAILURE DOES NOT AMOUNT TO A MAJOR FAILURE. THE INCLUSION OF THIS TEXT DOES NOT CONSTITUTE ANY REPRESENTATION OR ACCEPTANCE BY CATERPILLAR OF LIABILITY TO THE USER OR ANY OTHER PERSON IN ADDITION TO THAT WHICH CATERPILLAR MAY HAVE UNDER THE AUSTRALIAN CONSUMER LAW.

TO THE EXTENT THE PRODUCTS FALL WITHIN THIS SECTION C BUT ARE NOT OF A KIND ORDINARILY ACQUIRED FOR PERSONAL, DOMESTIC OR HOUSEHOLD USE OR CONSUMPTION, CATERPILLAR LIMITS ITS LIABILITY TO THE EXTENT IT IS PERMITTED TO DO SO UNDER THE AUSTRALIAN CONSUMER LAW TO, AT ITS OPTION, THE REPAIR OR REPLACEMENT OF THE PRODUCTS, THE SUPPLY OF EQUIVALENT PRODUCTS, OR THE PAYMENT OF THE COST OF SUCH REPAIR OR REPLACEMENT OR THE ACQUISITION OF EQUIVALENT PRODUCTS.

THE WARRANTY SET OUT IN THIS DOCUMENT IS GIVEN BY CATERPILLAR INC. OR ANY OF ITS SUBSIDIARIES, 100 N. E. ADAMS ST, PEORIA, IL USA 61629, TELEPHONE 1 309 675 1000, THE USER IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH MAKING A CLAIM UNDER THE WARRANTY SET OUT IN THIS DOCUMENT, EXCEPT AS EXPRESSLY STATED OTHERWISE IN THIS DOCUMENT, AND THE USER IS REFERRED TO THE BALANCE OF THE DOCUMENT TERMS CONCERNING CLAIM PROCEDURES, CATERPILLAR RESPONSIBILITIES AND USER RESPONSIBILITIES.

TO THE EXTENT PERMISSIBLE BY LAW, THE TERMS SET OUT IN THE REMAINDER OF THIS WARRANTY DOCUMENT (INCLUDING SECTION B) CONTINUE TO APPLY TO PRODUCTS TO WHICH THIS SECTION C APPLIES.

5 yr ESC

Cat® Extended Service Coverage (ESC)

4 EASY STEPS TO PROTECT YOUR STANDBY GENERATOR SET

Your operation depends on reliable power. That's why you trust Cat® generator sets. With Cat Financial Insurance Services, you get service coverage that's just as durable and long-lasting. ESC for **new, used and overhauled standby generator sets** protects your investment and your peace of mind. Choosing coverage is as easy as following these four steps.

1 CHOOSE FROM A VARIETY OF COVERAGE OPTIONS

First, extend your protection beyond the original factory warranty by choosing the coverage option that's right for your situation.

→ **NEW ESC**	Coverage for electric power standby generator sets is available in 36- to 120- month terms, in 12-month increments, if purchased before the end of your original factory warranty.
ADVANTAGE ESC	Coverage is available after the end of the original factory warranty in 12- to 60-month terms, in 12-month increments, and before the first overhaul. Your standby generator set is eligible if: > It's less than four years from delivery date and accumulated less than 3,000 hours total use since new, OR > It's less than 10 years from build date AND currently enrolled in New ESC or Advantage ESC, OR > It's less than 10 years from build date AND currently covered by an authroized Cat dealer Customer Support Agreement (CSA), OR > It passes a qualifying inspection performed by an authorized Cat dealer in accordance with the Advantage Certification Inspection Worksheet.
OVERHAUL PROTECTION FOR COMMERCIAL (OPC) ESC	Coverage is available in 12- to 60- month terms, in 12-month increments. Your standby generator set is eligible once a qualifying overhaul has been completed by an authorized Cat dealer in accordance with the OPC Certification Worksheet.

2 IDENTIFY YOUR COVERAGE NEEDS

Next, identify the age and current operating hours of your generator set since delivery or overhaul. Then calculate your annual hours of use to choose the best ESC coverage terms to fit your needs.

3 SELECT YOUR COVERAGE LEVEL

Then, choose from our Silver, Gold, Platinum or Platinum Plus coverage levels to get the exact amount of protection you need based on the Coverage Matrix[1] and Additional Allowances.

COVERAGE MATRIX[1]

Cooling System	Silver	Gold	Platinum[2]
Thermostat Housing	✓	✓	✓
Water Manifold Housing	✓	✓	✓
Jacket Water Precooler	✓	✓	✓
Jacket Water Pump		✓	✓
Thermostat			✓
Radiator & Fan			✓
Fuel System			
Steel Fuel Lines	✓	✓	✓
Fuel Shutoff Solenoid	✓	✓	✓
Fuel Injectors		✓	✓
Fuel Transfer Pump & Housing			✓
Fuel Priming Pump			✓
Fuel Transfer Pump			✓
Lubrication System			
Pan, Pump Cooler	✓	✓	✓
Crankcase Breather			✓
Engine Oil Pump Drive			✓
Prelubrication Pump			✓
Electric System			
Control Module (ECM)	✓	✓	✓
Sensors: All Engine Sensors	✓	✓	✓
Wiring Harness & Connectors			✓
Starter			✓
Engine Alternator			✓
Alternator End			
Alternator, including Rotor, Stator and Exciter	✓	✓	✓
Generator Controls		✓	✓
Power Center		✓	✓

Air Induction & Exhaust	Silver	Gold	Platinum[2]
Exhaust Manifolds, Studs & Gaskets	✓	✓	✓
Inlet Air Heater Relay	✓	✓	✓
Intake Manifold	✓	✓	✓
Turbocharger(s)		✓	✓
Air-to-Air Aftercooler Cores			✓
Muffler/Exhaust System			✓
Exhaust Guards			✓
Diesel Oxydation Catalyst			✓
Short Block			
Cylinder Block Casting	✓	✓	✓
Crankshaft	✓	✓	✓
Connecting Rod Assembly	✓	✓	✓
Piston, Wrist Pin, Retainer Clip & Piston Rings	✓	✓	✓
Idler and Timing Gears			✓
Accessory Drive			✓
Cylinder Head			
Cylinder Head	✓	✓	✓
Intake & Exhaust Valves	✓	✓	✓
Valve Mechanism	✓	✓	✓
Camshaft, Camshaft Bearings, Key, Gear	✓	✓	✓
Front & Rear Covers			
Front Cover/Plate/Housing/Gears & Gaskets	✓	✓	✓
Vibration Damper	✓	✓	✓
Flywheel Housing & Gasket	✓	✓	✓
Crankshaft Front & Rear Seal			✓
Optional Aftertreatment Coverage			
Diesel Particulate Filter	✓[3]	✓[3]	✓[3]
Selective Catalytic Reduction	✓[3]	✓[3]	✓[3]

1 This Coverage Matrix is for reference only and does not represent a complete list of covered components. For additional information, please reference the appropriate ESC contract.
2 Platinum level coverage covers all as-shipped consist from the factory with Cat part numbers. Some exclusions may apply.
3 Recent emissions-compliant engines or generator sets may be equipped with a Diesel Particulate Filter (DPF) and/or a Selective Catalytic Reduction (SCR). We offer coverage at an additional costs on these emissions components. Silver, Gold, Platinum or Platinum Plus base level coverage is required.

Platinum Plus coverage covers all components covered by Platinum coverage plus additional Cat components, having a Cat part number, installed by an authorized dealer and approved using the Platinum Plus Additional Coverage Component List and Approval Verification form.

ADDITIONAL ALLOWANCES

	Travel/Mileage Limitations		Emergency Freight	Rental[5]		Crane & Rigging[6]	Overtime
Engine Displacement[4]	Silver, Gold, Platinum	Platinum Plus Only	All Coverage Levels	Platinum Only	Platinum Plus Only	Platinum Plus Only	Platinum Plus Only
Up to 4 liters	2 hr/100 mi	10 hr/500 mi	$500	$2,500	$5,000	$1,000	$1,500
Over 4 liters up to 7.5 liters	4 hr/200 mi	10 hr/500 mi	$500	$5,000	$10,000	$1,000	$1,500
Over 7.5 liters up to 34 liters	8 hr/320 mi	10 hr/500 mi	$500	$10,000	$20,000	$5,000	$1,500
Over 34 liters	8 hr/320 mi	10 hr/500 mi	$500	$15,000	$40,000	$12,500	$1,500

4 Please refer to the generator set spec sheets for particular engine displacement.
5 Allowance is granted if covered failure repairs cannot be completed within 96 hours (for Platinum) or 48 hours (for Platinum Plus) of the authorized dealer technician's initial visit.
6 Allowance is granted if covered failure repairs cannot be completed within 48 hours of the authorized dealer technician's initial visit.

4 PURCHASE AND REGISTER YOUR ESC

Finally, work with your local Cat dealer to complete the process—and get the protection and peace of mind you deserve.

This is a brief description of ESC. It is subject to change without notice. In case of conflict, the ESC contract will govern.

CAT Financial

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2021 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Perkins Engines Co Ltd**
(U.S. Manufacturer or Importer)

Certificate Number: MPKXL04.4NP1-005

Effective Date: 08/26/2020

Expiration Date: 12/31/2021

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 08/26/2020

Revision Date: N/A

Model Year: 2021
Manufacturer Type: Original Engine Manufacturer
Engine Family: MPKXL04.4NP1

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 56<=kW<75
Fuel Type: Diesel, Non-Standard Fuel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

CARTER MACHINERY CO., INC.
PARTS AND SERVICE FACILITIES

Abingdon, VA	**(540) 669-7222**
Ashland, VA	**(804) 752-6070**
Bluefield, WV	**(304) 325-5411**
Chesapeake, VA	**(757) 485-4895**
Chesapeake, VA	**(757) 424-1444**
Fishersville, VA	**(540) 337-4220**
Fredericksburg, VA	**(540) 371-2844**
Lewisburg, VA	**(304) 645-6440**
Lynchburg, VA	**(540) 821-7701**
Newport News, VA	**(757) 874-2340**
Norton, VA	**(540) 679-1010**
Oakwood, VA	**(540) 498-4586**
Pineville, VA	**(304) 732-8646**
Richmond, VA	**(804) 730-1810**
Richmond, VA	**(804) 752-6070**
Salem, VA	**(540) 387-1111**
Roanoke, VA	**(540) 992-1722**
Warrenton, VA	**(540) 349-1100**

SECTION B

Cat® D80 GC
Diesel Generator Sets

Standby : 60 Hz

Image shown might not reflect actual configuration.

Engine Model	Cat® C4.4 In-line 4, 4-cycle diesel
Bore x Stroke	105 mm x 127 mm (4.1in x 5.0 in)
Displacement	4.4 L (269 in³)
Compression Ratio	16.7:1
Aspiration	Turbocharged
Fuel Injection System	Common Rail

Model	Standby	Emission Strategy
D80 GC	80 ekW	EPA TIER III

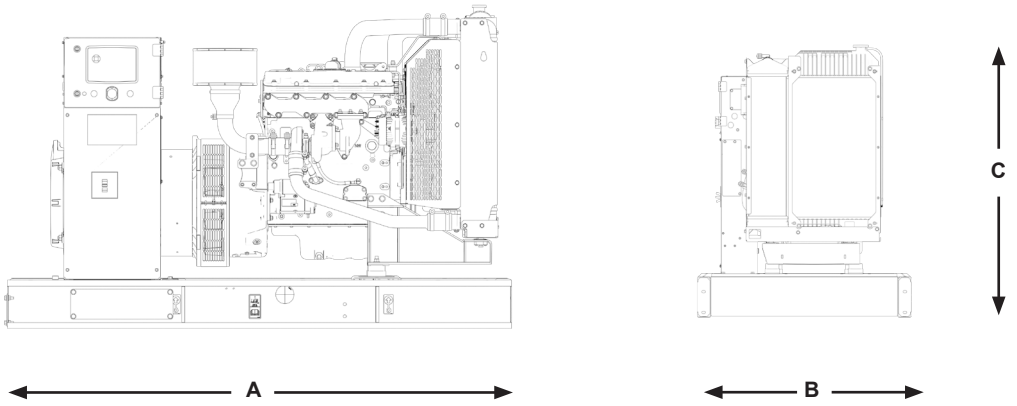
PACKAGE PERFORMANCE

Performance	Standby	
	3-Phase	1-Phase
Frequency	60 Hz	60 Hz
Genset Power Rating	100 kVA	80 kVA
Genset power rating with fan, 3p@ 0.8 & 1p@1.0 power factor	80 ekW	80 ekW
Performance Number	P4510A	P4510A
Fuel Consumption		
100% load with fan, L/hr (gal/hr)	22.9 (6.1)	23.3 (6.2)
75% load with fan, L/hr (gal/hr)	18.4 (4.9)	18.6 (4.9)
50% load with fan, L/hr (gal/hr)	13.5 (3.6)	13.6 (3.6)
Cooling System[1]		
Radiator air flow restriction (system), kPa (in. Water)	0.12 (0.48)	
Engine coolant capacity, L (gal)	7.0 (1.8)	
Radiator coolant capacity, L (gal)	10.0 (2.6)	
Total coolant capacity, L (gal)	17.0 (4.4)	
Inlet Air		
Combustion air inlet flow rate, m³/min (cfm)	7.8 (275)	7.8 (275)
Max. Allowable Combustion Air Inlet Temp, °C (°F)	45 (113)	
Exhaust System		
Exhaust stack gas temperature, °C (°F)	630 (1166)	630 (1166)
Exhaust gas flow rate, m³/min (cfm)	17.6 (620)	17.6 (621)
Exhaust system backpressure (maximum allowable) kPa (in. water)	15.0 (60.2)	15.0 (60.2)
Heat Rejection		
Heat rejection to exhaust (total) kW (Btu/min)	77.7 (4419)	77.7 (4419)
Heat rejection to atmosphere from engine, kW (Btu/min)	13.5 (768)	13.5 (768)

D80 GC Diesel Generator Sets
Electric Power

Emissions (Nominal)[2]	Standby			
	3-Phase			1-Phase
NOx + HC, g/kW-hr	3.6			3.6
CO, g/kW-hr	0.9			0.9
PM, g/kW-hr	0.12			0.12
Alternator[3]				
Voltages	480V	208V	600V	240V
Motor starting capability @ 30% Voltage Dip, skVA	143	128	328	182
Current Amps	120	278	96	333
Frame Size	M2233L4	M2236L4	M2236L4	M2235L4
Excitation	PMG	SE	AREP	SE
Temperature Rise, °C	130	105	105	130

WEIGHTS & DIMENSIONS



Note: General configuration not to be used for installation. See general dimension drawings for detail.

Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
2097 (82.6)	**1100 (43.3)**	**1343 (52.9)**	**950 (2095)**

APPLICABLE CODES AND STANDARDS:

AS1359, CSA C22.2 No100-04, UL142, UL489, UL869, UL2200, NFPA37, NFPA70, NFPA99, NFPA110, IBC, IEC60034-1, ISO3046, ISO8528, NEMA MG1-22, NEMA MG1-33, 2006/95/EC, 2006/42/EC, 2004/108/EC.
Note: Codes may not be available in all model configurations. Please consult your local Cat Dealer representative for availability.

STANDBY: Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

PRIME: Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated ekW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year

RATINGS: Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions.

DEFINITIONS AND CONDITIONS

[1] For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.

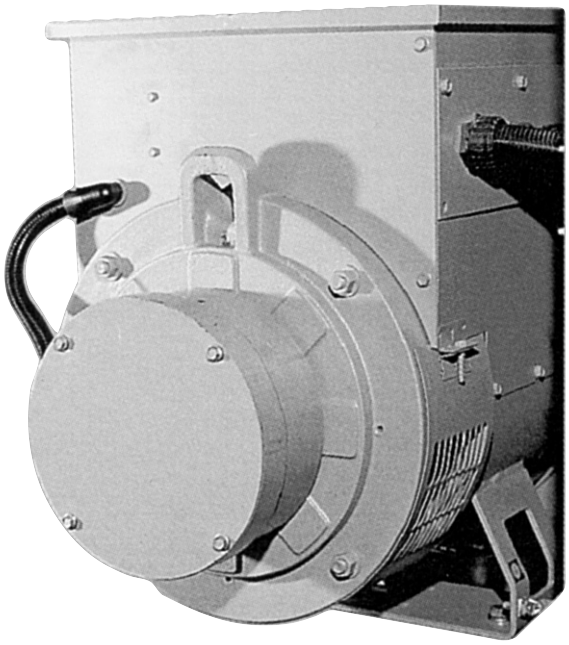
[2] Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77° F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 BTU/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

[3] UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics. Generator temperature rise is based on a 40° C ambient per NEMA MG1-32.

LET'S DO THE WORK.™

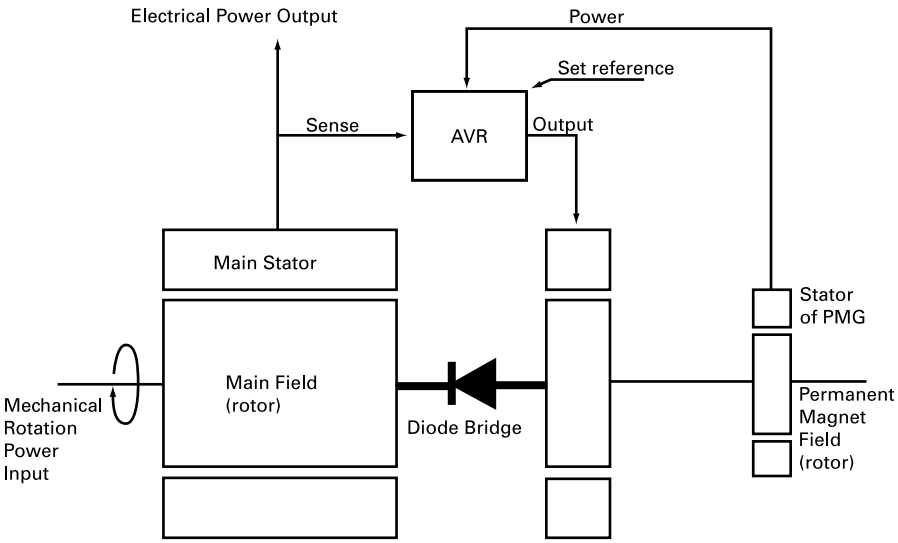
LEHE2662-02 (01/21)

CATERPILLAR®

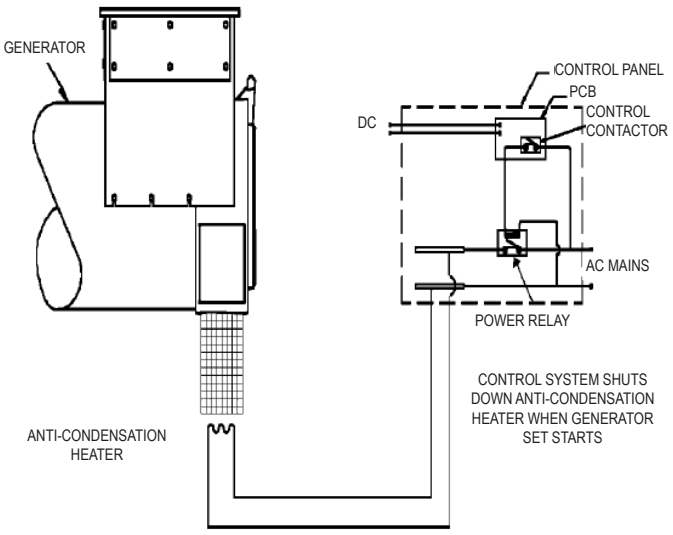


AVR12 – PERMANENT MAGNET GENERATOR

The permanent magnet generator (PMG) option upgrades the excitation system of the generator from the standard self-excited system to a separately-excited system. The PMG couples to the non-drive end of the generator and provides an independent source of excitation power that ensures initial voltage build-up. The PMG improves the voltage response of the generator during transient load application, such as motor starting, and provides a sustained short-circuit current for the operation of protective devices. Isolation of the excitation power ensures that regulation is not affected by non-linear distorting loads.



BLOCK DIAGRAM OF PMG



Generator Anti-condensation Heater AH1H

Appropriate when the generator set is to be sited in a low ambient and/or high humidity environment, the heater maintains the AC generator at a suitable temperature to prevent winding corrosion due to condensation.

The heater itself is powered by a 110/120 volt (VAC 120) or 208/240 volt (VAC 240) AC auxiliary supply protected by a fuse inside the main control panel. When the generator set is not running the heater is automatically connected to the AC supply through a power relay mounted in the control panel. Upon receiving a start signal the AC supply is automatically disconnected by the power relay and automatically reconnected when the start signal is removed and the engine has stopped.

Generator Frame	Nominal Heater Power Consumption (Watts)
LC15XX, M17XX	60
LC31XX, M22XX	100
LC50XX, M27XX	250

CATERPILLAR®

GEN SET PACKAGE PERFORMANCE DATA [NAC306P]

DECEMBER 28, 2021

For Help Desk Phone Numbers Click here

Performance Number: P4510A

Change Level: 00

Sales Model: C4.4 DITA
Combustion: DI
Aspr: TA
Engine Power:
80 W/F EKW
132 HP
Speed: 1,800 RPM
After Cooler: AA
Manifold Type:
Governor Type:
After Cooler Temp(F): 131
Turbo Quantity:
Engine App: GP
Turbo Arrangement:
Hertz: 60
Application Type: PACKAGE-DIE
Engine Rating: PGS
Strategy:
Rating Type: STANDBY
Certification:

General Performance Data 1

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
80	100	132	215.53	0.35	6.57	41.19	275.45	920.48	621.54
60	75	99	161.63	0.37	5.2	34.32	254.27	840.56	554.44
40	50	66	107.74	0.39	3.66	23.6	218.95	728.06	448.5
20	25	33	53.9	0.45	2.11	12.47	176.57	562.1	321.36
8	10	13	21.54	0.61	1.14	5.48	148.32	397.58	229.55

Engine Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	FROM AFT CLR BTU/MN
80	100	2,724.1	767.7	4,418.8	756.4
60	75	2,138.3	654.0	3,668.1	619.9
40	50	1,563.9	528.9	2,638.8	409.5
20	25	995.2	398.1	1,569.6	210.4
8	10	636.9	318.5	858.7	102.4

EMISSIONS DATA

- ********** J1

No notes were found for this certification...

REFERENCE EXHAUST STACK DIAMETER	0 IN
WET EXHAUST MASS	1,203.7 LB/HR
WET EXHAUST FLOW (-- STACK TEMP)	--
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	--
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	--
FUEL FLOW RATE	--

RATED SPEED "Potential site variation"

TOTAL CO LB/HR	PERCENT LOAD	TOTAL HC LB/HR	PART MATTER LB/HR
0	0	.0100	.0000

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:		**Lube Oil Press @ Rated Spd(PSI):**	52.8
Effective Serial No:		**Piston Speed @ Rated Eng SPD(FT/Min):**	--
Primary Engine Test Spec:		**Max Operating Altitude(FT):**	-3,277.6
Performance Parm Ref:		**PEEC Elect Control Module Ref**	
Performance Data Ref:	P4510A	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:		**Turbocharger Model**	
Certification Ref:	EPA TIER 3 EQUIV	**Fuel Injector**	
Certification Year:		**Timing-Static (DEG):**	--
Compression Ratio:	16.7	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	131	**Unit Injector Timing (MM):**	--
Crankcase Blowby Rate(CFH):	--	**Torque Rise (percent)**	0.0
Fuel Rate (Rated RPM) No Load(Gal/HR):	--	**Peak Torque Speed RPM**	1800
Lube Oil Press @ Low Idle Spd(PSI):	59.6	**Peak Torque (LB.FT):**	383.5

Reference Number: P4510A J1

Parameters Reference:

GENERATOR DATA

(AT400240)-ENGINE (BAA126422A)-CEM

DECEMBER 28, 2021

For Help Desk Phone Numbers Click here

Selected Model

Engine: C4.4	**Generator Frame:** M2236L4	**Genset Rating (kW):** 80.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 5969912	**Genset Rating (kVA):** 100.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 120.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 42423 /44117 /44146 /11719

Spec Information

Generator Specification

Frame: M2236L4 **Type:** LC	**No. of Bearings:** 1
Winding Type: RANDOM WOUND	**Flywheel:** 11.5
Connection: SERIES STAR	**Housing:** 3
Phases: 3	**No. of Leads:** 12
Poles: 4	**Wires per Lead:** 1
Sync Speed: 1800	**Generator Pitch:** 0.6667

Generator Efficiency

Per Unit Load	kW	Efficiency %
0.25	20.0	86.9
0.5	40.0	90.7
0.75	60.0	91.9
1.0	80.0	91.8

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.0740	0.1704
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.1580	0.3641
TRANSIENT - SATURATED X'_d	0.1233	0.2840
SYNCHRONOUS - DIRECT AXIS X_d	2.8458	6.5568
SYNCHRONOUS - QUADRATURE AXIS X_q	1.4514	3.3440
NEGATIVE SEQUENCE X_2	0.1160	0.2672
ZERO SEQUENCE X_0	0.0051	0.0117

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	2.3087
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.1000
OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_{d0}	0.0166
SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_d	0.0100
OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_{q0}	0.0918
SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_q	0.0100
EXCITER TIME CONSTANT T_e	0.0180
ARMATURE SHORT CIRCUIT T_a	0.0150

Short Circuit Ratio: 0.55	Stator Resistance = 0.1005 Ohms	Field Resistance = 2.3539 Ohms

Voltage Regulation	
Voltage level adjustment: +/-	5.0%
Voltage regulation, steady state: +/-	1.0%
Voltage regulation with 3% speed change: +/-	1.0%
Waveform deviation line - line, no load: less than	2.0%
Telephone influence factor: less than	50

Generator Excitation

	No Load	Full Load, (rated) pf	
		Series	Parallel
Excitation voltage:	9.2 Volts	36.31 Volts	Volts
Excitation current	0.79 Amps	2.56 Amps	Amps

Selected Model

Engine: C4.4	**Generator Frame:** M2236L4	**Genset Rating (kW):** 80.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 5969912	**Genset Rating (kVA):** 100.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 120.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 42423 /44117 /44146 /11719

Generator Mechanical Information

Center of Gravity

Dimension X	-313.0 mm	-12.3 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.

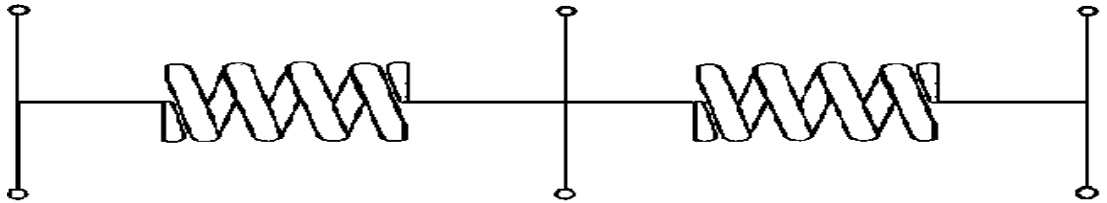
- "X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details
- "Y" is measured vertically from rotor center line. Up is positive.
- "Z" is measured to left and right of rotor center line. To the right is positive.

Generator WT =	* Rotor WT =	* Stator WT =
295 kg	118 kg	177 kg
650 LB	260 LB	390 LB

Rotor Balance = 0.0 mm deflection PTP

Overspeed Capacity = 125% of synchronous speed

Generator Torsional Data



J1 = Coupling and Fan | **J2 = Rotor** | **J3 = Exciter End**

TOTAL J = J1 + J2 + J3

K1 = Shaft Stiffness between J1 + J2 (Diameter 1)

K2 = Shaft Stiffness between J2 + J3 (Diameter 2)

J1	K1	Min Shaft Dia 1	J2	K2	Min Shaft Dia 2	J3
0.9 LB IN. s^2	11.3 MLB IN./rad	2.8 IN.	6.3 LB IN. s^2	11.4 MLB IN./rad	3.0 IN.	0.8 LB IN. s^2
0.105 N m s^2	1.27351 MN m/rad	72.0 mm	0.715 N m s^2	1.29 MN m/rad	75.0 mm	0.09 N m s^2
			Total J			
			8.1 LB IN. s^2			
			0.91 N m s^2			

Selected Model

Engine: C4.4	**Generator Frame:** M2236L4	**Genset Rating (kW):** 80.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 5969912	**Genset Rating (kVA):** 100.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 120.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 42423 /44117 /44146 /11719

Generator Cooling Requirements - Temperature - Insulation Data

Cooling Requirements:		Temperature Data: (Ambient 40 ^{0}C)	
Heat Dissipated:	7.1 kW	**Stator Rise:**	105.0 ^{0}C
Air Flow:	18.0 m^3/min	**Rotor Rise:**	105.0 ^{0}C

Insulation Class: H

Insulation Reg. as shipped: 100.0 MΩ minimum at 40 ^{0}C

Thermal Limits of Generator

Frequency:	60 Hz
Line to Line Voltage:	480 Volts
B BR 80/40	104.6 kVA
F BR -105/40	119.0 kVA
H BR - 125/40	130.8 kVA
F PR - 130/40	130.8 kVA
H PR - 150/40	138.6 kVA
H PR27 - 163/27	143.9 kVA

Selected Model

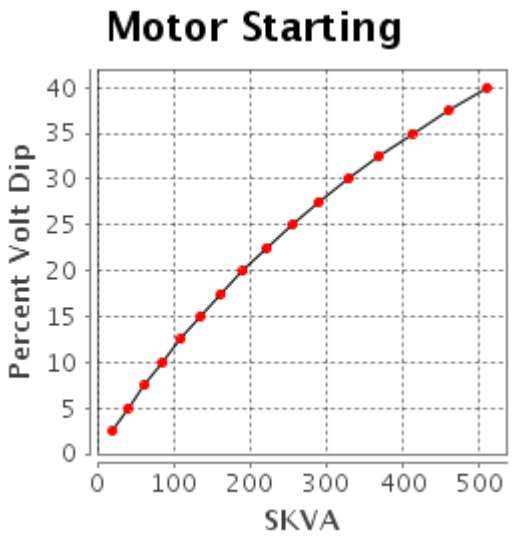
Engine: C4.4	**Generator Frame:** M2236L4	**Genset Rating (kW):** 80.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 5969912	**Genset Rating (kVA):** 100.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 120.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 42423 /44117 /44146 /11719

Starting Capability & Current Decrement

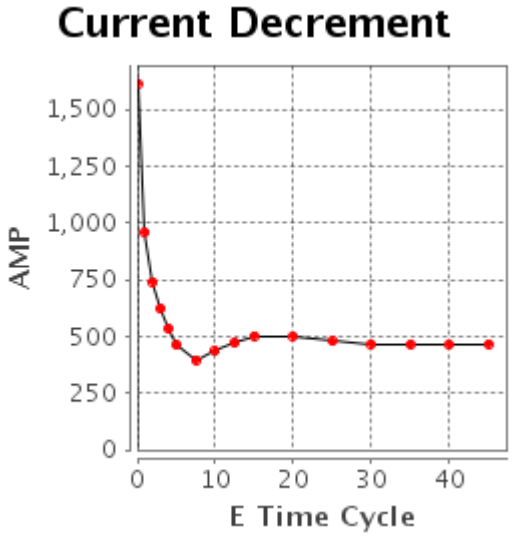
Motor Starting Capability (0.6 pf)

SKVA	Percent Volt Dip
20	2.5
40	5.0
62	7.5
85	10.0
109	12.5
135	15.0
162	17.5
191	20.0
222	22.5
255	25.0
290	27.5
328	30.0
368	32.5
412	35.0
459	37.5
510	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	1,614
1.0	959
2.0	741
3.0	622
4.0	534
5.0	462
7.5	396
10.0	436
12.5	473
15.0	503
20.0	502
25.0	478
30.0	467
35.0	464
40.0	465
45.0	467



Instantaneous 3 Phase Fault Current: 1614 Amps

Instantaneous Line - Line Fault Current: 1088 Amps

Instantaneous Line - Neutral Fault Current: 1836 Amps

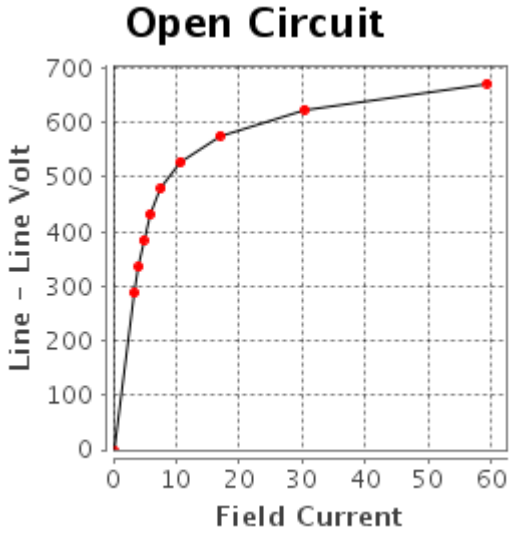
Selected Model

Engine: C4.4	**Generator Frame:** M2236L4	**Genset Rating (kW):** 80.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 5969912	**Genset Rating (kVA):** 100.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 120.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 42423 /44117 /44146 /11719

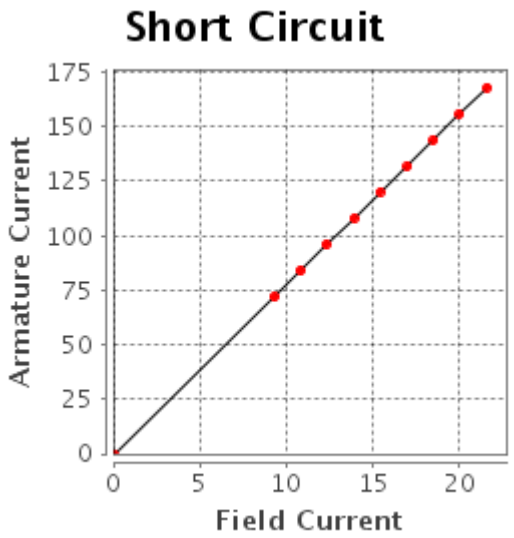
Generator Output Characteristic Curves
Open Circuit Curve

Field Current	Line - Line Volt
0.0	0
3.3	288
4.0	336
4.8	384
5.8	432
7.6	480
10.7	528
17.0	576
30.4	624
59.4	672



Short Circuit Curve

Field Current	Armature Current
0.0	0
9.3	72
10.8	84
12.3	96
13.9	108
15.4	120
17.0	132
18.5	144
20.0	156
21.6	168



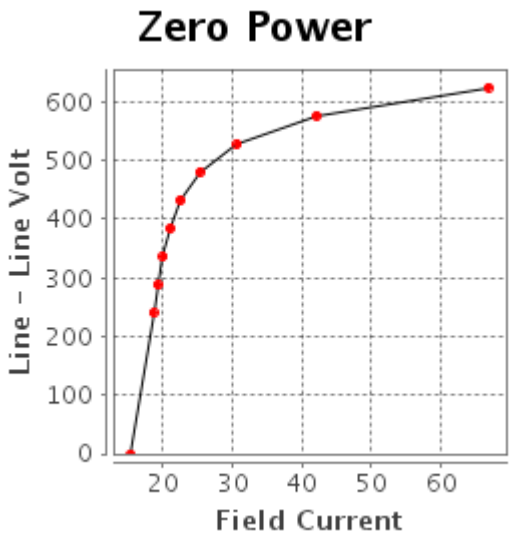
Selected Model

Engine: C4.4
Fuel: Diesel
Frequency: 60
Duty: STANDBY
Generator Frame: M2236L4
Generator Arrangement: 5969912
Excitation Type: Permanent Magnet
Connection: SERIES STAR
Genset Rating (kW): 80.0
Genset Rating (kVA): 100.0
Pwr. Factor: 0.8
Application: EPG
Line Voltage: 480
Phase Voltage: 277
Rated Current: 120.3
Status: Current
Version: 42423 /44117 /44146 /11719

Generator Output Characteristic Curves

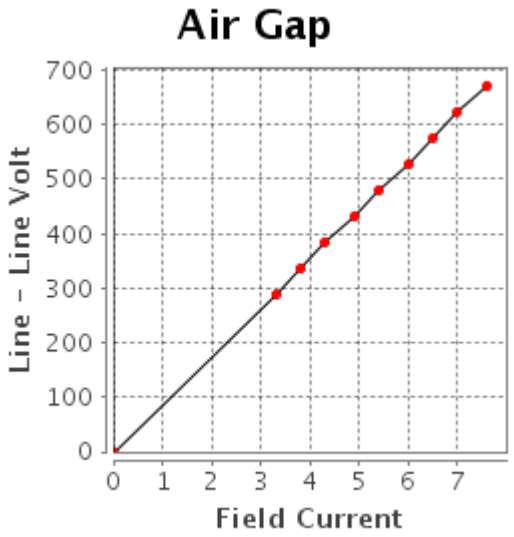
Zero Power Factor Curve

Field Current	Line - Line Volt
15.4	0
18.6	240
19.2	288
20.0	336
21.0	384
22.5	432
25.3	480
30.7	528
42.1	576
66.8	624



Air Gap Curve

Field Current	Line - Line Volt
0.0	0
3.3	288
3.8	336
4.3	384
4.9	432
5.4	480
6.0	528
6.5	576
7.0	624
7.6	672

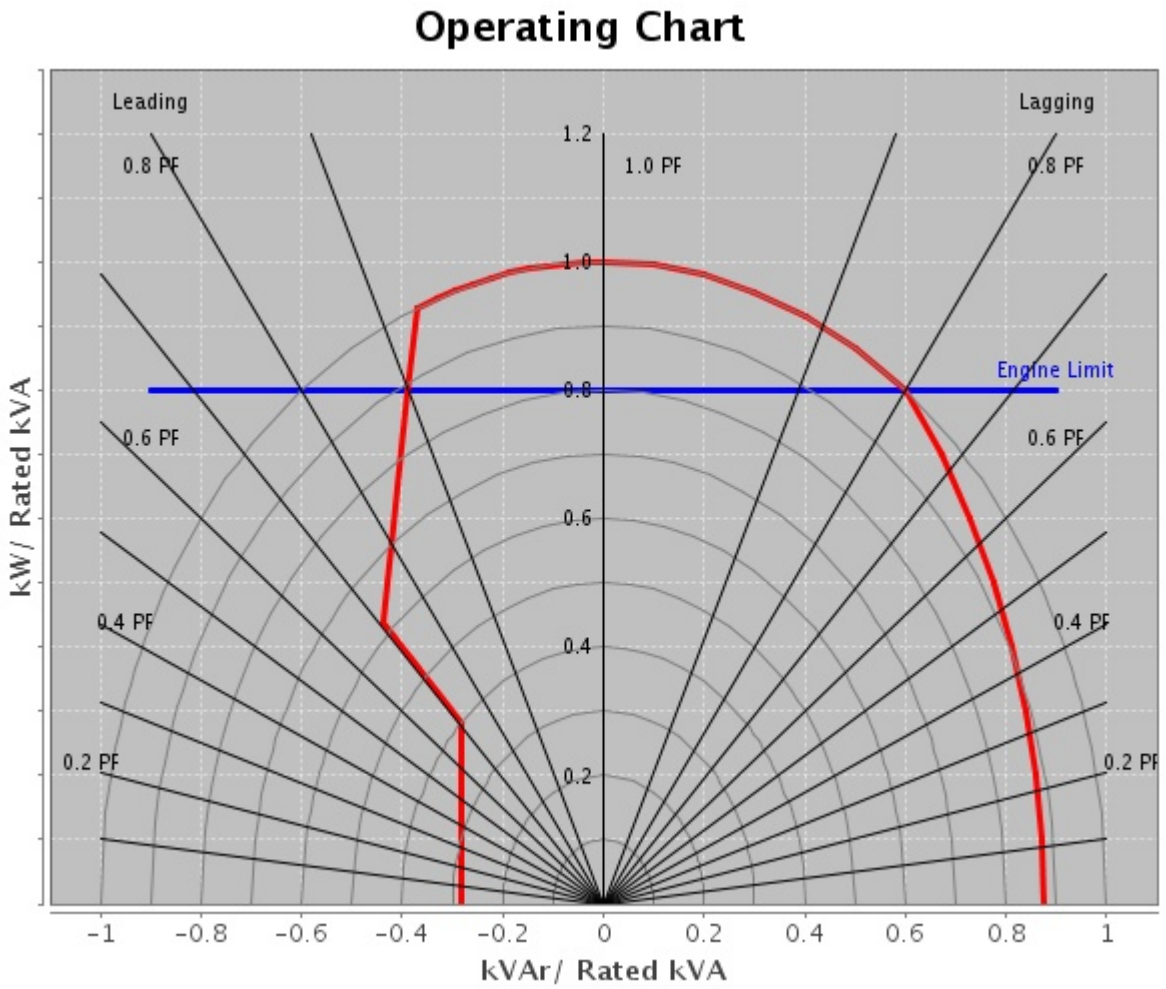


Selected Model

Engine: C4.4	**Generator Frame:** M2236L4	**Genset Rating (kW):** 80.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 5969912	**Genset Rating (kVA):** 100.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 120.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 42423 /44117 /44146 /11719

Reactive Capability Curve



Selected Model

Engine: C4.4	**Generator Frame:** M2236L4	**Genset Rating (kW):** 80.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 5969912	**Genset Rating (kVA):** 100.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 120.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 42423 /44117 /44146 /11719

General Information

GENERATOR INFORMATION (DM7900)

---

1. Motor Starting
Motor starting curves are obtained in accordance with IEC60034, and are displayed at 0.6 power factor.

2. Voltage Dip
Prediction of the generator synchronous voltage dip can be made by consulting the plot for the voltage dip value that corresponds to the desired motor starting kVA value.

3. Definitions
A) Generator Keys
Frame: abbreviation of generator frame size
Freq: frequency in hertz.
PP/SB: prime/standby duty respectively
Volts: line - line terminal voltage
kW: rating in electrical kilo watts
Model: engine sales model

B) Generator Temperature Rise
The indicated temperature rises are the IEC/NEMA limits for standby or prime power applications. The quoted rise figures are maximum limits only and are not necessarily indicative of the actual temperature rise of a given machine winding.

C) Centre of Gravity
The specified centre of gravity is for the generator only. For single bearing, and two bearing close coupled generators, the center of gravity is measured from the generator/engine flywheel-housing interface and from the centreline of the rotor Shaft.

For two bearing, standalone generators, the center of gravity is measured from the end of the rotor shaft and from the centerline of the rotor shaft.

D) Generator Current Decrement Curves
The generator current decrement curve indicates the generator armature current arising from a symmetrical three-phase fault at the generator terminals. Generators equipped with AREP or PMG excitation systems will sustain 300% of rated armature current for 10 seconds.

E) Generator Efficiency Curves
The efficiency curve is displayed for the generator only under the given conditions of rating, voltage, frequency and power factor. This is not the overall generating set efficiency curve.

SECTION C

Cat® GC Control Panel

Image shown might not reflect actual configuration

GCCP 1.2 - Control Panel

GCCP 1.2 is an auto Start Control Module suitable for a wide variety of diesel gen-set applications. Monitoring an extensive number of engine parameters, the modules will display warnings, shutdown and engine status information on the back-lit LCD screen, illuminated LEDs and remote PC.

FEATURES

- 4-line back-lit LCD text display
- Multiple display languages
- Five-key menu navigation
- LCD alarm indication
- Customisable power-up text and images
- Data logging facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB & RS485 communication
- Front panel configuration with PIN protection
- Power save mode
- 3-phase generator sensing and protection
- Generator current and power monitoring (kW, kvar, kVA, pf)
  kW and kvar overload and reverse power alarms
- Over current protection
- Unbalanced load protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using
  CAN Support for 0 V to 10 V & 4 mA to 20 mA sensors
- 8 configurable digital inputs (3 available for Customer use)
- 8 configurable digital outputs (5 available for Customer use)
- 4 configurable analogue inputs (3 available for Customer Use)
- CAN, MPU and alternator frequency speed sensing in one variant
- Real time clock
- Engine pre-heat and post-heat functions
- Engine run-time scheduler
- Engine idle control for starting &stopping
- Fuel usage monitor and low fuel level alarms
- 3 configurable maintenance alarms

BENEFITS

- Hours counter provides accurate information for monitoring and maintenance periods
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored & displayed simultaneously for full visibility
- The module can be configured to suit a wide range of applications for user flexibility
- PLC editor allows user configurable functions to meet user specific application requirements.
- RS485 Communication port can be used for the Remote Monitoring Communication (Compatible with Cat PLG)

SPECIFICATION

DC SUPPLY
CONTINUOUS VOLTAGE RATING
8 V to 35 V Continuous
5 V for upto 1 minute

CRANKING DROPOUTS
Able to survive 0 V for 100 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries.
LEDs and backlight will not be maintained during cranking.

MAXIMUM OPERATING CURRENT
260 mA at 12 V, 150 mA at 24 V

MAXIMUM STANDBY CURRENT
145 mA at 12 V, 85 mA at 24 V

CHARGE FAIL/EXCITATION RANGE
0 V to 35 V

GENERATOR & MAINS (UTILITY) VOLTAGE RANGE
15 V to 415 V AC (Ph to N)
26 V to 719 V AC (Ph to Ph)

FREQUENCY RANGE
3.5 Hz to 75 Hz

MAGNETIC PICKUP VOLTAGE RANGE
+/- 0.5 V to 70 V

FREQUENCY RANGE
10,000 Hz (max)

INPUTS
DIGITAL INPUTS A TO H
Negative switching

ANALOGUE INPUTS A & D
Configurable as:
Negative switching digital input 0 V to 10 V sensor
4 mA to 20 mA sensor Resistive sensor

ANALOGUE INPUTS B & C
Configurable as:
Negative switching digital input Resistive sensor

OUTPUTS
OUTPUT A & B (FUEL & START)
15 A DC at supply voltage

AUXILIARY OUTPUTS C, D, E, F, G & H
2 A DC at supply voltage

DIMENSIONS OVERALL
216 mm x 158 mm x 43 mm
8.5" x 6.2" x 1.5"

PANEL CUT-OUT
184 mm x 137 mm
7.2" x 5.3"

MAXIMUM PANEL THICKNESS
8 mm
0.3"

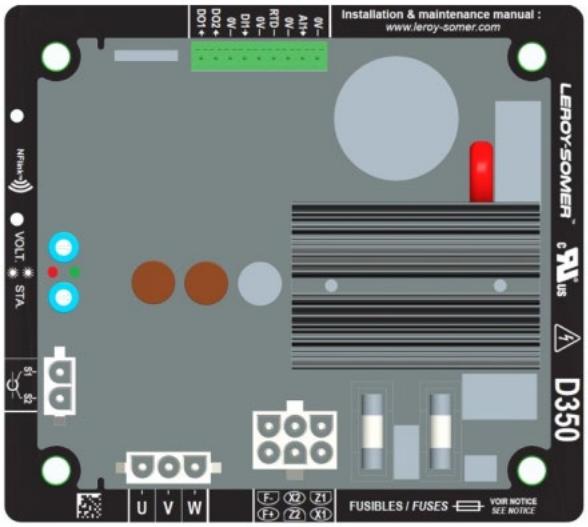
STORAGE TEMPERATURE RANGE
-40°C to +85°C
-40 °F to +185 °F

OPERATING TEMPERATURE RANGE
-30°C to +70°C
-22 °F to +158 °F

LEHE2017-02 (09-20)

www.Cat.com/electricpower

AUTOMATIC VOLTAGE REGULATOR



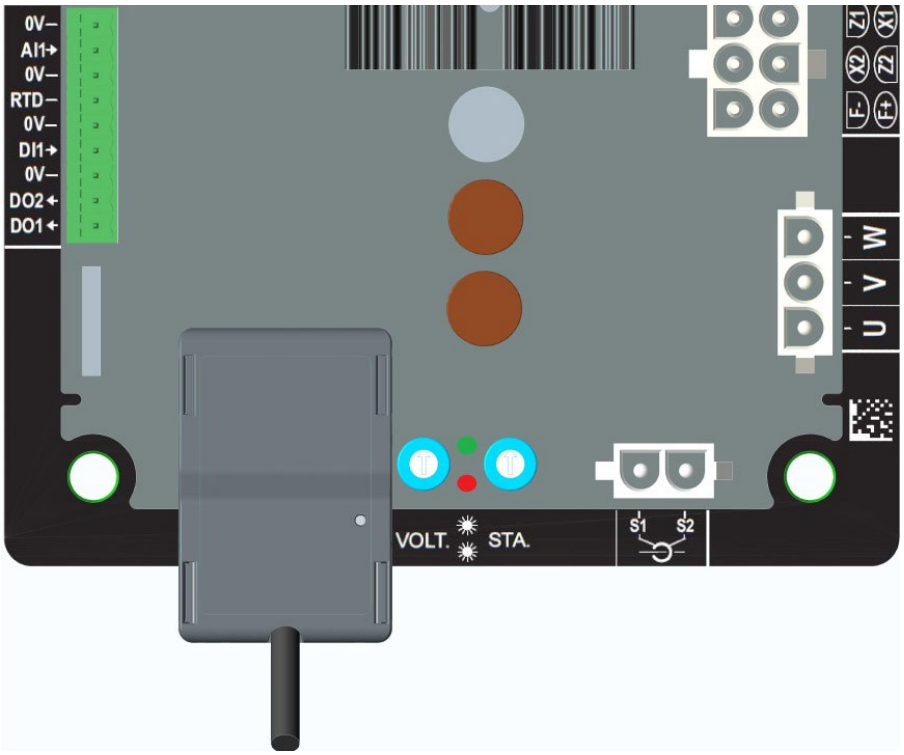
D350 AVR

The D350, Digital Voltage Regulator is used to regulate alternators with a field current of less than 5 A in continuous operations, and 10 A maximum in the event of short-circuit for 10 seconds maximum.

Its design is in accordance with mounting in a generator terminal box or a control cabinet. It is required, at a minimum, to follow the local protection and safety standards, especially those specific to electrical installations for voltages of 300 VAC phase-to-neutral maximum.

NFLink™ configuration module

The D350 is equipped with NFC technology for communication and configuration purposes. The configuration module is placed over the two dedicated positioning holes on the plastic enclosure as shown below. Once the configuration is done, the NF Link must be removed as it is not supposed to be left on the



AUTOMATIC VOLTAGE REGULATOR

Technical characteristics

D350 regulator can be used to perform the following functions:

Voltage regulation

- With or without reactive droop compensation (Reactive droop to allow parallel operation)
- With or without line droop compensation.

Regulation of the field current, or manual mode, which allows direct control of the field current.

The D350 can also be used to:

- Adjust the reference for the regulation mode in progress, using an analogue input (0-10V
- and potentiometer)
- Monitoring of temperature sensor (Pt100 or CTP)
- Limit the minimum field current delivered to the exciter field
- Monitoring of the maximum stator current limit
- Loss of voltage sensing
- Withstand a sudden short-circuit for 10 seconds maximum in AREP, PMG
- Signals monitoring (events logger).
- 2 digital outputs for various trip, regulation mode and measurement data

Alternator voltage sensing:

- 3 phases without neutral, 2 phases or 1 phase with neutral
- Three-phase range 0-530VAC
- Consumption < 2VA

Stator current measurement with CT:

- Range 0-1A or 0-5A
- Consumption < 2VA

Power supply:

- 4 terminals for PMG, AREP, SHUNT
- Range 50-277 VAC
- Consumption max < 3000VA

Field excitation:

- Rated 0-5 A
- Short-circuit 10A max.
- Field winding resistance > 4 ohms

Frequency:

- Range 10-100Hz

AUTOMATIC VOLTAGE REGULATOR

- Regulation accuracy: +/-0.25% of the average of the three phases on a linear load, with harmonic distortion less than 5%
- Voltage adjustment range: 0 to 150% of the rated voltage
- Quadrature droop adjustment range: -20% to 20%
- Under frequency protection: integrated, adjustable threshold, slope adjustable from 0.5 to 3V/Hz in steps of 0.1 V/Hz
- Excitation ceiling: adjustable by configuration at 3 points
- Environment: ambient temperature from -40°C to +65°C, relative humidity of less than 95% non-condensing, mounted in a cabinet or in a terminal box

Easy Reg Advanced:

- All the D350 settings are entered / configured using the "EasyReg Advanced" software.
- This program is only compatible with computers running WINDOWS® versions Windows 7 and Windows 10 operating systems.

Dimensions:

- Height : 52.9mm
- width : 125mm
- Length : 140mm

Mounting:

- Holes spacing on the Length : 115mm
- Holes spacing on the width: 100mm

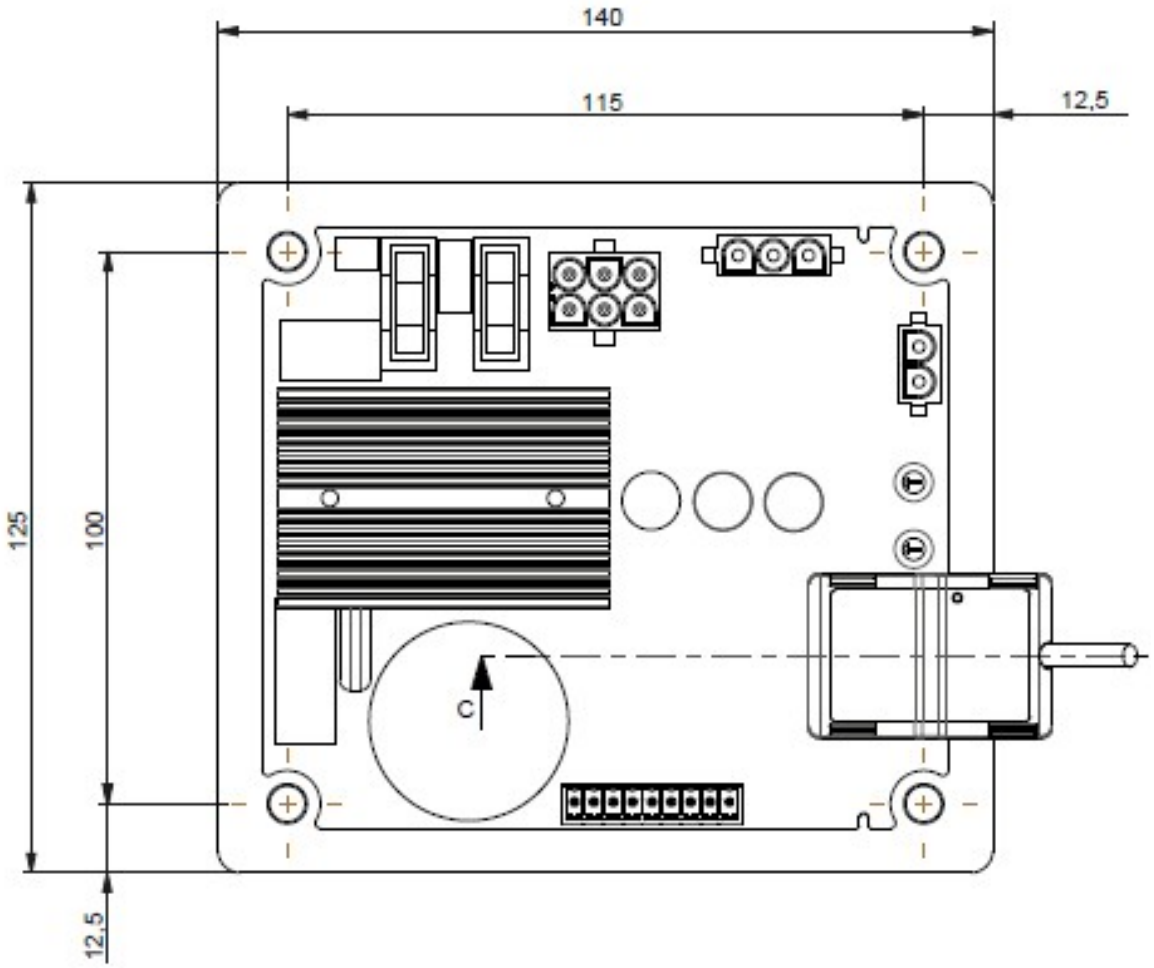
Weight: 0.45kg

Conformity to standards

- EMC: IEC 61000-6-2, IEC 61000-6-4
- Humidity: IEC 60068-1 and test in accordance with IEC 60068-2-14
- Dry heat: IEC 60068-2-2
- Damp heat: IEC 60028-2-30
- Cold: IEC 600068-2-1

AUTOMATIC VOLTAGE REGULATOR

D350 AVR and NFLink™ Dimensions



LEHE1923-00 (05-19)

www.Cat.com/electricpower

ENGINE CONTROLLER

ADEM™ A4 Engine Controller

The ADEM™ A4 is the main Electronic Control Module (ECM) used on select diesel engines. The ADEM A4 provides a higher degree of control over a large number of combustion variables. The ADEM A4 is designed to control/interface Electronic Unit Injector (EUI) equipped engines. The ADEM A4 engine system is composed of the ADEM A4 ECM, control software, sensors, actuators, fuel injectors, and interface to the generator system. The prime benefit of an ADEM A4 engine system is to better control and maintain the particulate emissions, both steady state and transient, while improving engine performance

FEATURES

RELIABLE, DURABLE

All ADEM A4 controllers are designed to survive the harshest environments.

- Environmentally sealed, die-cast aluminum housing isolates and protects electronic components from moisture and dirt contamination.
- Rigorous vibration testing ensures product reliability and durability.
- Accuracy maintained from –40° C to 85° C
- Electrical noise immunity to 100 volts/meter
- Internal circuits are designed to withstand shorts to +battery and –battery.

SIMPLE SERVICING

Each ADEM A4 system works in combination with the Cat® ET service tool software to keep the engine operating at peak performance.

- Displays measured parameters
- Retrieves active and logged event code documenting abnormal system operation
- Performs calibrations and diagnostic tests
- Supports flash programming of new software into the ADEM A4 ECM

SELF DIAGNOSTICS

Each ADEM A4 ECM has a full compliment of diagnostics. The ECM can detect faults in the electrical system and report those faults to the service technician for quick repair.

- Self-diagnostic capability pinpoints operational problems in need of attention.

ADVANCED FEATURES

- Enhanced performance from fuel injection timing and limiting
- Adjustable monitoring of vital engine parameters
- Programmable speed acceleration ramp rate
- Data link interfaces

ENGINE CONTROLLER

DESCRIPTION

The ECM is housed in an environmentally sealed casting. All wiring connections to the ECM are made using two sealed connectors: a single seventy-pin connector and a single one hundred twenty-pin connector.

ENGINE SPEED GOVERNING

Desired engine speed is calculated by the ECM and held within ±0.2 Hz for isochronous and droop mode. The ECM accounts for droop that is requested. The proper amount of fuel is sent to the injectors due to these calculations. The ECM also employs cooldown/shutdown strategies, acceleration delays on startup, acceleration ramp times and speed reference.

FUEL LIMITING

Warm and cold fuel-air ratio control limits are controlled by the ECM. Electronic monitoring system derates, torque limit, and cranking limit, programmable torque scaling, and cold cylinder cutout mode are standard features.

FUEL INJECTION TIMING

Master timing for injection is controlled by the ECM control. Temperature dependencies are accounted for in the fuel injection calculations.

ELECTRONIC MONITORING

Electronic monitoring of vital engine parameters can be programmed. Warning, derate, and shutdown event conditions may be customized by the user.

INFORMATION MANAGEMENT

The ECM stores information to assist with electronic troubleshooting. Active and logged diagnostic codes, active events, logged events, fuel consumption, engine hours, and instantaneous totals aid service technicians when diagnosing electronic faults and scheduling preventive maintenance.

CALIBRATIONS

Engine performance is optimized through injection timing. Auto/manual sensor calibrations are standard features.

ON-BOARD SYSTEM TESTS

System tests are available to assist in electronic troubleshooting. These tests include: injector activation, injector cutout, and override of control outputs.

DATA LINK INTERFACES

The ADEM A4 communicates with the EMCP via a dedicated communication network.

ELECTRONIC SENSING

The following sensing is available on the ADEM A4: oil pressure, fuel pressure, fuel temperature, atmospheric pressure, air inlet temperature, turbo outlet pressure, engine coolant temperature, engine speed, throttle, position, exhaust temperature, oil filter pressure differential, fuel filter pressure differential, air filter pressure differential and crankcase pressure.

ENGINE CONTROLLER

SPECIFICATIONS

Impervious to:
salt spray, fuel, oil and oil additives, coolant, spray cleaners, chlorinated solvents, hydrogen sulfide and methane gas, and dust

Input and output protection
all inputs and outputs are protected against short circuits to +battery and –battery

Input voltage range (24 VDC nominal)
18 to 32 VDC

Mounting
engine mounted

Reverse polarity protected

Shock, withstands 20 g

Temperature range
Operating: –40° C to 85° C (–40° F to 185° F)
Storage: –50° C to 120° C (–58° F to 248° F)

Vibration
withstands 8.0 g @ 24 to 2 kHz

This page is intentionally left blank

LEHE5347-01 (08/13)

Cat GC Circuit Breakers

Manually Operated Circuit Breakers for D40 GC – D200 GC Diesel Generator Sets

Current (A)	Frame	Number of poles	Interupting Ratings (kA ms)			Trip Unit	(#)Lugs Size	Aux options
			240V	480V	600V			
60	H	3	65	35	18	LSI	(1) 14-2/0 AWG	Form C (1NC & 1NO) Shunt Trip (12V)
100	H	3	65	35	18			
150	H	3	65	35	18			
250	J	3	65	35	18		(1) 1/0-300 kcmil	
400	T5N	3	65	35	18		Bus Bar	1 Form C + 1 Bell Alarm Shunt Trip (12V)
600	T6N	3	65	35	20			
800	T6N	3	65	35	20			

(#) No of Cables per Lug

Diesel D40 GC - D60 GC

First Breaker	Second Breaker
Circuit Breaker (A)	Circuit Breaker (A)
60	60
100	100
150	150
250	

Diesel D80 GC - D200 GC

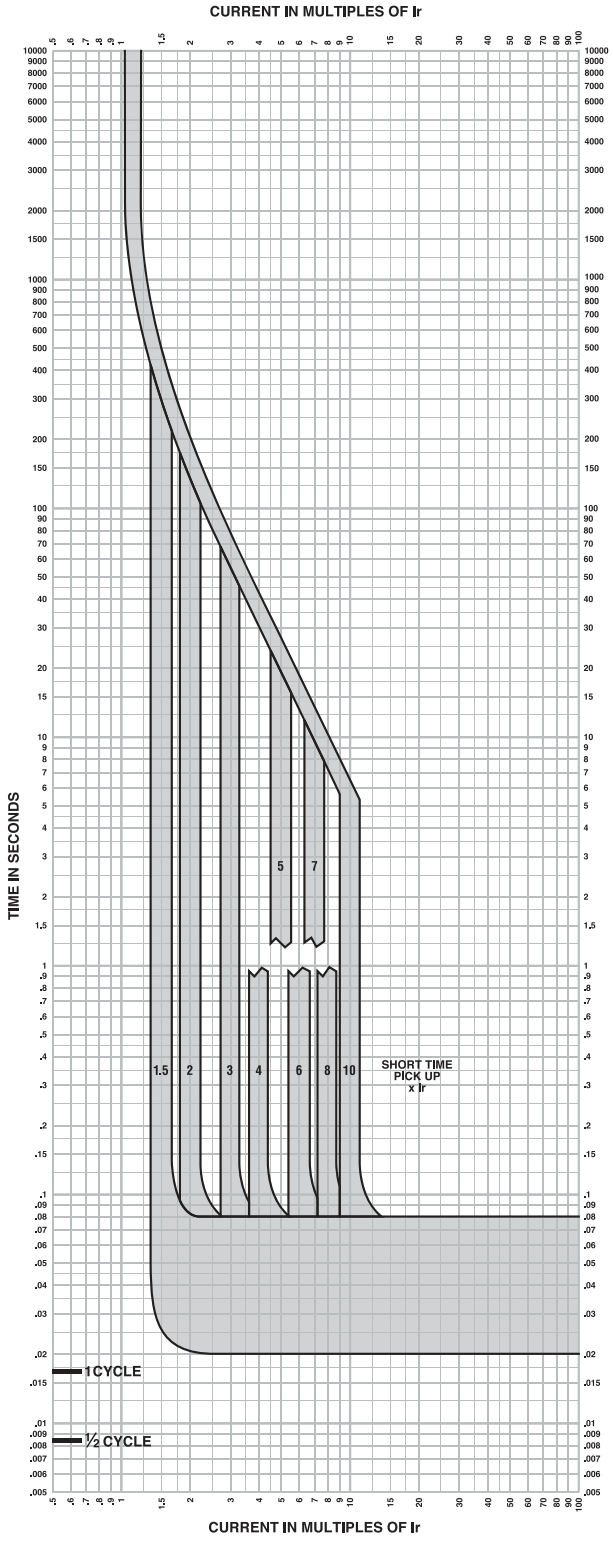
First Breaker	Second Breaker
Circuit Breaker (A)	Circuit Breaker (A)
100	60
150	100
250	150
400	250
600	
800	

Available Breaker Configurations	
First Breaker	Second Breaker
H	–
H	H
H	J
J	–
J	J
J	H

Available Breaker Configurations		
First Breaker	Second Breaker	
H	H	J
J	H	J
T5	H	J
T6	H	J

H-Frame Circuit Breakers

Electronic Trip Unit Long Time / Short Time Trip Curve



Long Time/Short Time Trip Curve
60A, 100A, 150A H-Frame

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

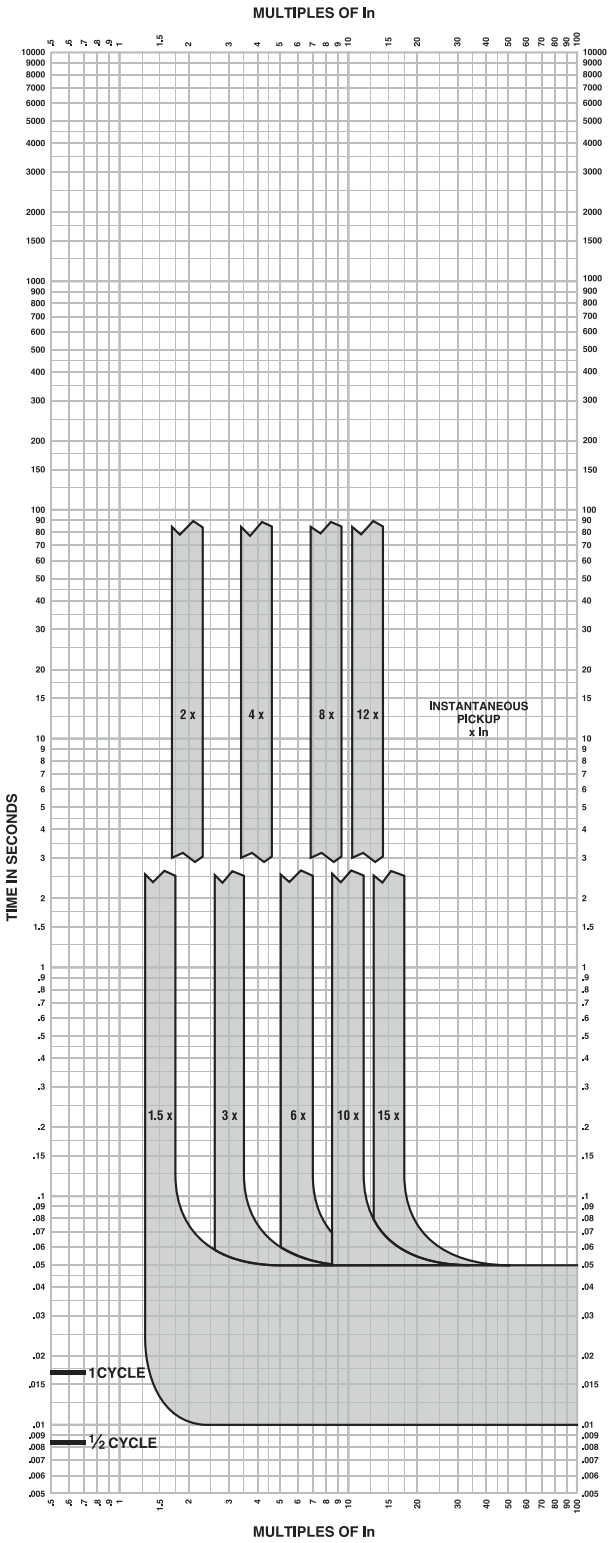
Notes:

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

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

H-Frame Circuit Breakers

Electronic Trip Unit Instantaneous Trip Curve



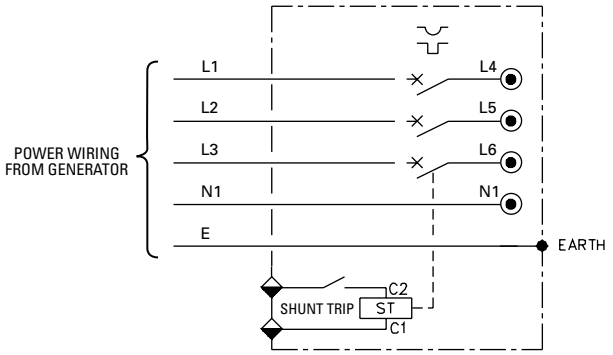
Instantaneous Trip Curve
60A, 100A, 150A H-Frame

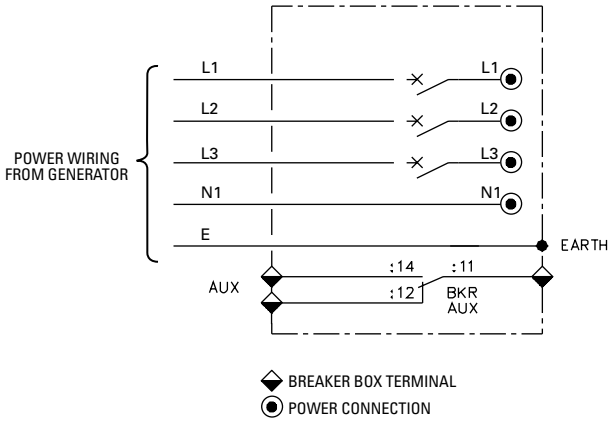
The time-current curve information is to be used for application and coordination purposes only.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. In = Maximum dial setting of Ir.
   60A H-Frame: In = 60A = Max Ir setting
   100A H-Frame: In = 100A = Max Ir setting
   150A H-Frame: In = 150A = Max Ir setting

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





AUX – AUXILIARY CONTACTS SHT2 – 12/24 V SHUNT TRIP

Option SHT2 adds a DC operated shunt trip which can be used to automatically open the circuit breaker upon activation of a generator set shut down signal from the generator set control panel, or from a remote signal (supplied by others).

Option AUX adds an auxiliary changeover switch which can be used for remote indication of the circuit breaker status.

Market: N. America

LEHE4009 (01-05)

www.cat-ElectricPower.com

SECTION D

Cat® GC Enclosures

Image shown might not reflect actual configuration

D40 GC - D200 GC Sound Attenuated Level 2 Enclosures

60 Hz:40 ekW - 200 ekW

Features

Robust/Highly Corrosion Resistant Construction

- Factory installed on skid base or 24hr Integral fuel tank
- Caterpillar white paint
- Environmentally friendly, polyester powder baked paint
- 18 gauge steel minimum.
- Zinc plated fasteners
- Stainless steel hinges
- Internally mounted exhaust silencing system
- Designed and tested to comply with UL 2200 Listed generator set package
- Comply with ASCE /SEI 7 for Wind Loads up to 100mph
- Optional seismic certification offered
- Compression door latches providing solid door seal

Excellent Access

- Large cable entry area for installation ease
- Accommodates side mounted single or multiple breakers
- Single door on left hand side
- Dual doors on right hand side
- Doors vertically hinged allow 180° opening rotation
- Doors capable of lift off at 90° opening rotation
- For non-routine service access are removeable panels
- Lube oil drain valve standard with coolant drain and valve piped to the exterior of the enclosure base
- Radiator fill cover

Security and Safety

- Lockable (keyed or padlock) doors which give full access to control panel and breaker
- Cooling fan and battery charging alternator fully guarded
- Fuel fill, oil fill and battery can only be reached via lockable access
- Optional externally mounted emergency stop button
- Designed for spreader bar lifting to ensure safety
- Stub-up area is rodent proof

Options

- Skid base compatible
- UL Listed integral fuel tank with 24 hour running time capacity
- DC lighting package

Cat® GC Enclosures

Enclosure Package Operating Characteristics

A. Sound Attenuated- Level 2

Model	Hz	ekW	SB	Sound Pressure Levels dBA 7m (23ft) 100% Load	Air Flow Rate		Ambient Capability* @100% Load	
					m^3/s	cfm	°C	°F
D40 GC	60	40	SB	67.7	1.5	3178.3	60	140
D50 GC	60	50	SB	68.6	1.5	3178.3	54	129
D60 GC	60	60	SB	69.6	1.5	3178.3	48	118
D80 GC	60	80	SB	74.9	3.5	7416.1	60	140
D100 GC	60	100	SB	76.4	3.5	7416.1	52	126
D125 GC	60	125	SB	74.8	3.4	7204.2	61	142
D150 GC	60	150	SB	75.4	3.4	7204.2	54	129
D175 GC	60	175	SB	79.3	4.1	8687.4	49	120
D200 GC	60	200	SB	79.5	4.1	8687.4	44	111

*TBD - To be determined - Data will be released soon

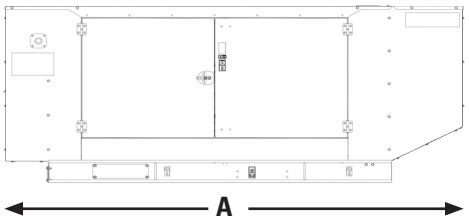
*Cooling system performance at sea level. Consult your Cat® dealer for site specific ambient and altitude capabilities.

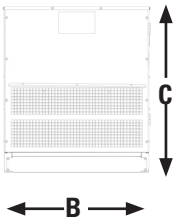
Note: Sound level measurements are subject to instrumentation, installation and manufacturing variability, as well as ambient site conditions.

B. Component Weights to Calculate Package Weight

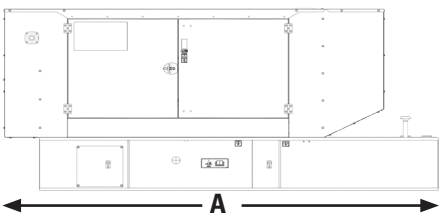
Standby ekW	Wide Skid Base		Sound Attentuted Enclosure (Steel)	
	kg	lb	kg	lb
40-60	92.6	204.1	178.8	394.2
80-100	96.2	212.1	189.1	416.9
125-200	115.9	255.5	274.4	604.9

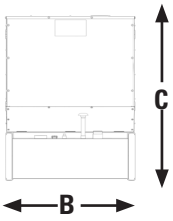
C. Weights & Dimensions





Sound Attenuated Enclosure on Skid Base





Sound Attenuated Enclosure on a UL Listed Integral Fuel Tank Base

*Note: For reference only – do not use for installation design. Please contact your local dealer for exact weights and dimensions

Cat® GC Enclosures

Enclosure Type	Standby ratings	Length, L		Width, W		Height, H		Package Weights	
	ekW	mm	in	mm	in	mm	in	kg	lb
Open Set on Skid (wide Base)	40	1976	77.2	1099.8	43.3	1219.2	48.0	837.7	1847
	50	1976	77.2	1099.8	43.3	1219.2	48.0	931.6	2054
	60	1976	77.2	1099.8	43.3	1219.2	48.0	905.8	1997
	80	2098	82.6	1099.8	43.3	1343.6	52.9	950.2	2095
	100	2098	82.6	1099.8	43.3	1343.6	52.9	1007.8	2222
	125	2634	103.7	1300.4	51.2	1402	55.2	1405.6	3099
	150	2634	103.7	1300.4	51.2	1402	55.2	1561.7	3443
	175	2634	103.7	1300.4	51.2	1490.9	58.7	1696.8	3741
	200	2634	103.7	1300.4	51.2	1490.9	58.7	1776.7	3917
Open Set on a UL Listed Integral Fuel Tank Base	40	2707.6	106.6	1099.8	43.3	1384.3	54.5	1536.3	3387
	50	2707.6	106.6	1099.8	43.3	1384.3	54.5	1630.2	3594
	60	2707.6	106.6	1099.8	43.3	1384.3	54.5	1604.3	3537
	80	3035.3	119.5	1099.8	43.3	1582.4	62.3	1914.1	4220
	100	3035.3	119.5	1099.8	43.3	1582.4	62.3	1972.2	4348
	125	3670.3	144.5	1300.4	51.2	1757.6	69.2	3207.8	7072
	150	3670.3	144.5	1300.4	51.2	1757.6	69.2	3363.3	7415
	175	3670.3	144.5	1300.4	51.2	1846.6	72.7	3498.5	7713
	200	3670.3	144.5	1300.4	51.2	1846.6	72.7	3578.4	7889
Sound Attenuated Enclosure on Skid Base	40	2456.1	96.1	1120.1	44.1	1330.9	52.4	1016.5	2241
	50	2456.1	96.1	1120.1	44.1	1330.9	52.4	1110.4	2448
	60	2456.1	96.1	1120.1	44.1	1330.9	52.4	1084.5	2391
	80	2768.6	109.0	1120.1	44.1	1432.5	56.4	1139.4	2512
	100	2768.6	109.0	1120.1	44.1	1432.5	56.4	1197.0	2639
	125	2633.9	103.7	1318.2	51.9	1569.7	61.8	1680.1	3704
	150	2633.9	103.7	1318.2	51.9	1569.7	61.8	1836.1	4048
	175	2633.9	103.7	1318.2	51.9	1569.7	61.8	1971.3	4346
	200	2633.9	103.7	1318.2	51.9	1569.7	61.8	2051.1	4522
Sound Attenuated Enclosure on a UL Listed Integral Fuel Tank Base	40	2931.1	115.4	1120.1	44.1	1496	58.9	1715.0	3781
	50	2931.1	115.4	1120.1	44.1	1496	58.9	1808.9	3988
	60	2931.1	115.4	1120.1	44.1	1496	58.9	1783.1	3931
	80	3256.2	128.2	1120.1	44.1	1673.8	65.9	2103.3	4637
	100	3256.2	128.2	1120.1	44.1	1673.8	65.9	2161.4	4765
	125	4008.1	157.8	1318.2	51.9	1925.3	75.8	3481.8	7676
	150	4008.1	157.8	1318.2	51.9	1925.3	75.8	3637.8	8020
	175	4008.1	157.8	1318.2	51.9	1925.3	75.8	3773.0	8318
	200	4008.1	157.8	1318.2	51.9	1925.3	75.8	3852.8	8494

*Note: Weights include genset, enclosure (where applicable), tank and fuel (where applicable)

LET'S DO THE WORK.™

LEHE20120-02 (03/21)

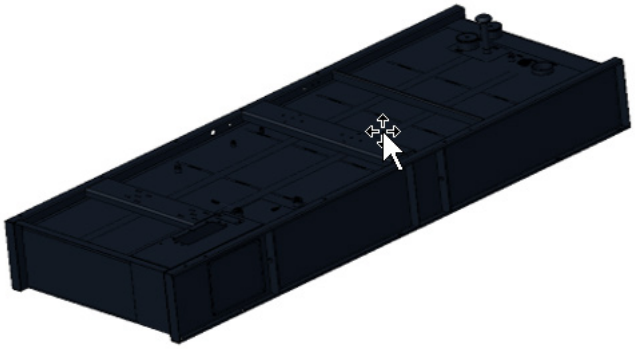


Image show might not reflect actual product

Integral Fuel Tanks

D40 GC – D200 GC

Features

- UL Listed for United States (UL 142) and Canada (CAN/ULC S601)
- Facilitates compliance with NFPA 30 code, NFPA 37 and 110 standards and CSA C282 code
- Dual wall
- Low fuel level warning standard, customer configurable warning or shutdown
- Primary tank leak detection switch in containment basin
- Tank design provides capacity for thermal expansion of fuel
- Fuel supply dip tube is positioned so as not to pick up fuel sediment
- Fuel return and supply dip tube is separated by an internal baffle to prevent immediate re-supply of heated return fuel
- Pressure washed with an iron phosphate solution
- Interior tank surfaces coated with a solvent-based thin-film rust preventative
- Heavy gauge steel gussets with internal lifting rings
- Primary and secondary tanks are leak tested at 20.7 kPa (3 psi) minimum
- Compatible with open packages and enclosures
- Gloss black polyester alkyd enamel exterior paint
- Welded steel containment basin (minimum of 110% of primary tank capacity)
- Direct reading fuel gauge with variable electrical

Integral

- Integral diesel fuel tank is incorporated into the generator set base frame
- Robust base design includes linear vibration isolators between tank base and engine generator.

Options

- Audio/visual fuel level alarm panel
- 5 gal (18.9L) spill containment
- Fuel tank fill pipe and lockable cap
- Overfill prevention Valve

Integral Fuel Tank Base Useable Capacities with Fuel Tank Dimensions & Weights

The heights listed above do not include lumber used during manufacturing and shipping

A. Open Set & Sound Attenuated Enclosure

Standby	Feature Code	Total Capacity		Useable Capacity	
eKW		Litre	Gallon	Litre	Gallon
40-60	FTDW044	523	138.2	466	123.1
80-100	FTDW043	769	203.1	690	182.3
125-200	FTDW045	1511	399.2	1355	357.9

Standby	Feature Code	Tank Only								Overall Package Height with Tank			
		Dry Weight		Height 'H'		Length 'L'		Width		Open		Enclosure	
eKW		kg	lb	mm	in	mm	in	mm	in	mm	in	mm	in
40-60	FTDW044	387.5	853.2	365	14.4	2708	106.6	1100	43.3	1384	54.5	1496	58.9
80-100	FTDW043	462.5	1019.6	440	17.3	3035	119.5	1100	43.3	1583	62.3	1673	65.9
125-200	FTDW045	736.1	1622.8	555	21.9	3670	144.5	1300	51.2	1847	72.7	1925	75.8

Time (Hours)

Tank Design	Feature Code	Standby Ratings (kVA)						
		ekW	100%		75%		50%	
			Hrs	L/hr	Hrs	L/hr	Hrs	L/hr
Integral Tank	FTDW044	40	33.5	13.9	43.1	10.8	57.5	8.1
		50	27.7	16.8	36.4	12.8	50.1	9.3
		60	24.0	19.4	27.7	16.8	35.6	13.1
	FTDW043	80	29.1	23.7	36.3	19.0	49.6	13.9
		100	24.0	28.8	29.7	23.2	40.1	17.2
	FTDW045	125	35.8	37.8	44.7	30.3	61.9	21.9
		150	31.5	43.0	38.8	34.9	54.2	25.0
		175	26.5	51.2	32.3	41.9	47.4	28.6
		200	24.0	56.4	29.6	45.8	41.6	32.6

Tanks include RH stub-up area directly below the circuit breaker or power terminal strips.

Fuel tanks and applicable options facilitate compliance with the following United States NFPA Code and Standards:

NFPA 30: Flammable and Combustible Liquids Code

NFPA 37: Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines

NFPA 110: Standard for Emergency and Standby Power Systems

Fuel tanks and applicable options facilitate compliance with the following Canadian Standard and Code:

CSA C282 – Emergency Electrical Power Supply for Buildings

CSA B139-09 – Installation Code for Oil-Burning Equipment

LET'S DO THE WORK.™

LEHE2681-00 (09/20)

Dip Charts

D40 GC - D200 GC

Dip Charts for Fuel Tanks

U.S. Sourced

Diesel Generator Set

40-200kW 60 Hz

Integral Tanks

D80 GC - D100 GC FTDW043		D40 GC - D60 GC FTDW044		D125 GC - D200 GC FTDW045			
Inches of Fuel on Dipstick	Measured Gallons	Inches of Fuel on Dipstick	Measured Gallons	Inches of Fuel on Dipstick	Measured Gallons	Inches of Fuel on Dipstick	Measured Gallons
0.5	7.8	0.5	6.8	0.5	11.5	14	322.4
1	15.5	1	13.7	1	23.0	14.5	333.9
1.5	23.3	1.5	20.5	1.5	34.5	15	345.4
2	31.1	2	27.3	2	46.1	15.5	356.9
2.5	38.8	2.5	34.2	2.5	57.6	16	368.4
3	46.6	3	41.0	3	69.1	16.5	379.9
3.5	54.4	3.5	47.9	3.5	80.6	17	391.4
4	62.1	4	54.7	4	92.1	17.17	395.3
4.5	69.9	4.5	61.5	4.5	103.6		
5	77.7	5	68.4	5	115.1		
5.5	85.4	5.5	75.2	5.5	126.6		
6	93.2	6	82.0	6	138.2		
6.5	101.0	6.5	88.9	6.5	149.7		
7	108.7	7	95.7	7	161.2		
7.5	116.5	7.5	102.5	7.5	172.7		
8	124.3	8	109.4	8	184.2		
8.5	132.0	8.5	116.2	8.5	195.7		
9	139.8	9	123.1	9	207.2		
9.5	147.6	9.5	129.9	9.5	218.7		
10	155.3	10	136.7	10	230.3		
10.5	163.1	10.8	137.8	10.5	241.8		
11	170.9			11	253.3		
11.5	178.6			11.5	264.8		
12	186.4			12	276.3		
12.5	194.2			12.5	287.8		
13	201.9			13	299.3		
13.03	202.4			13.5	310.8		

Image shown may not reflect actual configuration.

20A Tamper-Resistant, Weather-Resistant GFCI Receptacles

Features and Benefits

- Automatically tests the GFCI every time the reset button is pushed in. The GFCI will not reset if the GFCI circuit is not functioning properly.
- By blocking reset of the GFCI if protection has been compromised, SmartLockPRO reduces the possibility of end-users incorrectly assuming that a reset GFCI outlet is providing ground fault protection when it actually is not.
- A line-load reversal diagnostic feature is provided which prevents the GFCI from being reset and stops power from being fed to the GFCI receptacle face or through to downstream devices. A green LED indicator on the GFCI's face also illuminates to alert the installer to the line-load wiring reversal.

Weather-Resistant GFCIs

- Meet UL 498 requirements for weather-resistant receptacles.

Tamper-Resistant GFCIs

- Shutter mechanism inside the receptacle blocks access to the contacts unless a two-prong plug is inserted, helping ensure foreign objects will be locked out.

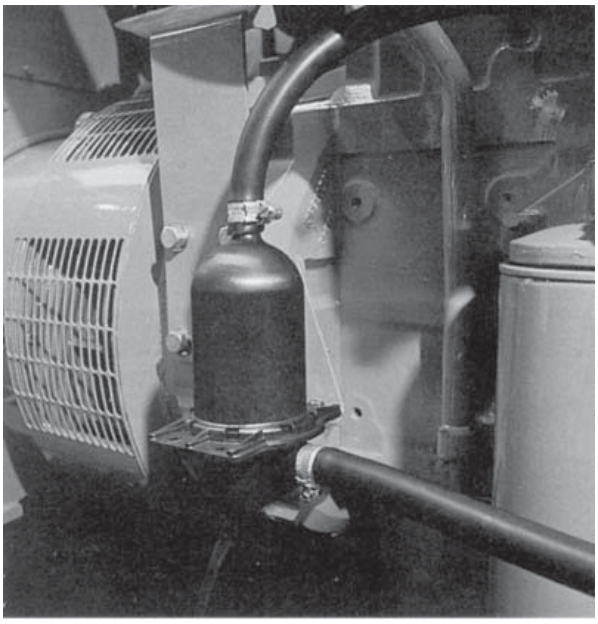
Product Features

- Grounding: GFCI ground fault
- Feature: Weather and tamper-resistant
- Amperage: 20 Amp
- Voltage: 125 Volt
- NEMA: 5-20R
- Trip Level: Class A, 5mA plus or minus 1mA
- Pole: 2
- Wire: 3
- Color: White

Standards and Certifications

- NEMA: WD-6
- ANSI: C-73
- UL498: File E13399
- CSA C22.2 No. 42: File LR-57811
- NOM: 057
- UL 943: File E48380

Receptacles contained in a weather resistant box and in-use cover.



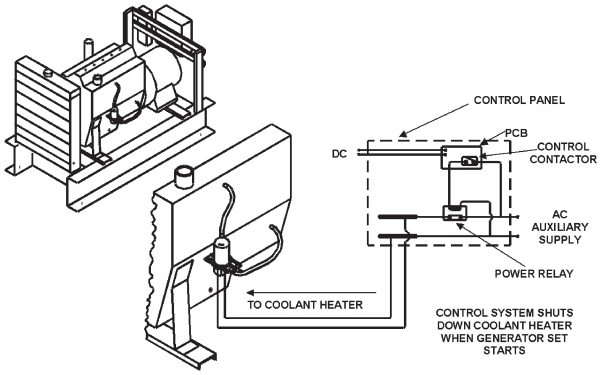
Coolant Heater (WHH)

Appropriate when the generator set is to be sited in a low ambient environment, the heater maintains the engine coolant at a temperature [typically 38°C (100°F)] which facilitates rapid starting and load acceptance. The heater assembly uses UL compliant components (to UL1030) and has CSA certification which is to both CSA and UL Standards.

The heater itself is powered by a 110/120 volt (VAC 120) AC auxiliary supply protected by a safeguard breaker inside the main control panel. A thermostatic controller is included to regulate the output temperature to within safe limits. When the generator set is not running the heater is automatically connected to the AC supply through a power relay mounted in the control panel. Upon receiving a start signal the AC supply is automatically disconnected by the power relay and automatically reconnected when the start signal is removed and the engine has stopped.

Features

- Molded from Polyphenylene Sulphide
- Rust free, corrosion resistant with exceptional tensile strength
- Vibration and shock tested to extreme limits to ensure durability
- Compatible with all coolant additives
- Incoloy element for longer service life



VAC 120

Diesel Generator Set Engine Models	Nominal Coolant Heater Power Consumption (Watts)
C2.2, C4.4, C4.4 ACERT™	1000
C7.1 ACERT	1800
Gas Generator Set Models	**Nominal Coolant Heater Power Consumption (Watts)**
DG30-2, DG50-2, DG60-2, DG80-2	1000
DG100-2, DG125-2, DG150-2	1800

www.Cat-ElectricPower.com

Cat® Batteries

Cat Batteries – Greater Starting Power – Lower Maintenance – Longer Life

Cat Premium High Output (PHO) batteries are used in all Caterpillar Machines and Engine Gen-Sets. They are designed to meet stringent Caterpillar design specifications, which provide industry leading cold cranking amp (CCA) capability and maximum vibration resistance.

Maintenance Free or low maintenance designs are available in wet and dry configurations.

General Service Line batteries are available in Maintenance Free or low maintenance designs and in wet or dry configurations. Wide selections of BCI group sizes are available for automotive, light truck, bus, industrial, agricultural, marine, recreational and valve regulated (VRLA-AGM & Gel) applications.

Caterpillar. The difference counts.™

Cat Dealers define world – class product support. We offer you the right parts and service solutions, when and where you need them.

The Cat Dealer network of highly trained experts keeps your entire fleet up and running to maximize your equipment investments.

CATERPILLAR®

World's Toughest Batteries

Premium High Output – Maximum Vibration Resistance

- Vibration Resistance...five times the Industry Standard
- Exclusive "flat top" BCI group 4D & 8D batteries are Maintenance Free and have the industries highest cold cranking amps (CCA)
- Popular BCI group 31 Maintenance Free batteries with industry leading cold cranking amps...up to 1000 (CCA), for electric power, machine or on-highway truck and bus applications. Deep cycle models available for truck, marine or recreational usage

Specifications for Cat Premium High Output Batteries – Available Worldwide

								BCI Overall Dimensions				Nominal Weight	
BCI Group Size	Part No.	Cold Cranking Amps"	Reserve Capacity Minutes'	Volts	Amp Hr. Capacity @ 20 Hrs.	Construction	Add Water Maintenance Check Hours	Length In (mm)	Width In (mm)	Height In (mm)	Wet Lb (kg)	Dry Lb (kg)	Nominal Acid to Fill Qt (liter)
8D	153-5720	1500	465	12	210	C	MF	20.47 (520)	10.8 (275)	9.76 (248)	132 (60)	–	–
8D	101-4000	1400	400	12	190	LAC+	1000	20.7 (526.5)	10.96 (278)	9.76 (248)	132 (60)	86 (39)	18.0 (17.0)
4D	153-5710	1400	425	12	200	C	MF	20.47 (520)	8.58 (218)	9.76 (248)	119 (54)	–	–
4D	153-5700	1125	305	12	145	C	MF	20.47 (520)	8.58 (218)	9.76 (248)	101 (46)	–	–
4D	9X-9730	1300	400	12	190	LAC+	1000	20.75 (527)	8.58 (218)	9.76 (248)	119 (54)	81 (37)	14.8 (14.0)
4D	9X-9720	1000	275	12	140	LAC+	1000	20.75 (527)	8.58 (218)	9.76 (248)	101 (46)	59 (27)	15.9 (15.0)
31	175-4390	1000	180	12	90	C/S	MFA	12.9 (328.4)	6.74 (171.2)	9.29 (236)	60 (27)	–	–
31	175-4370	825	190	12	100	C/S**	MFA	12.9 (328.4)	6.74 (171.2)	9.29 (236)	60 (27)	–	–
31	175-4360	710	185	12	100	C/S***	MFA	12.9 (328.4)	6.74 (171.2)	9.29 (236)	60 (27)	–	–
31	**250-0480**	710	185	12	100	C/SDT***	MF	12.9 (328.4)	6.74 (171.2)	9.29 (236)	60 (27)	–	–
31	115-2422	1000	170	12	90	C SAE	MFA	12.9 (328.4)	6.74 (171.2)	9.46 (240.3)	60 (27)	–	–
31	115-2421	950	170	12	90	C SAE +	MFA	12.9 (328.4)	6.74 (171.2)	9.46 (240.3)	60 (27)	44 (20)	6.6 (6.2)
31	9X-3404	950	165	12	100	C SAE	MF	13 (330.2)	6.77 (172)	9.46 (240.3)	58 (26)	–	–
31	3T-5760	750	165	12	100	C SAE	MF	13 (330.2)	6.77 (172)	9.46 (240.3)	55 (25)	–	–
24	153-5656	650	110	12	52	SC	MF	10.98 (278.9)	6.85 (174)	9.0 (229.1)	39 (18)	–	–
65	230-6368	880	140	12	80	SC	MF	11.9 (303.4)	7.5 (190.8)	7.5 (191.4)	45.5 (21)	–	–
74	153-5660	650	110	12	52	SC*	MF	10.98 (278.9)	7.0 (178.2)	8.15 (206.9)	39 (18)	–	–
58	175-4280	500	70	12	35	SC	MF	9.96 (253.1)	7.2 (182.5)	6.9 (176)	31 (14)	–	–
2	153-5690	765	210	6	90	LAC+	1000	10.24 (260)	6.8 (173)	8.72 (221.6)	37 (17)	22 (10)	4.8 (4.5)

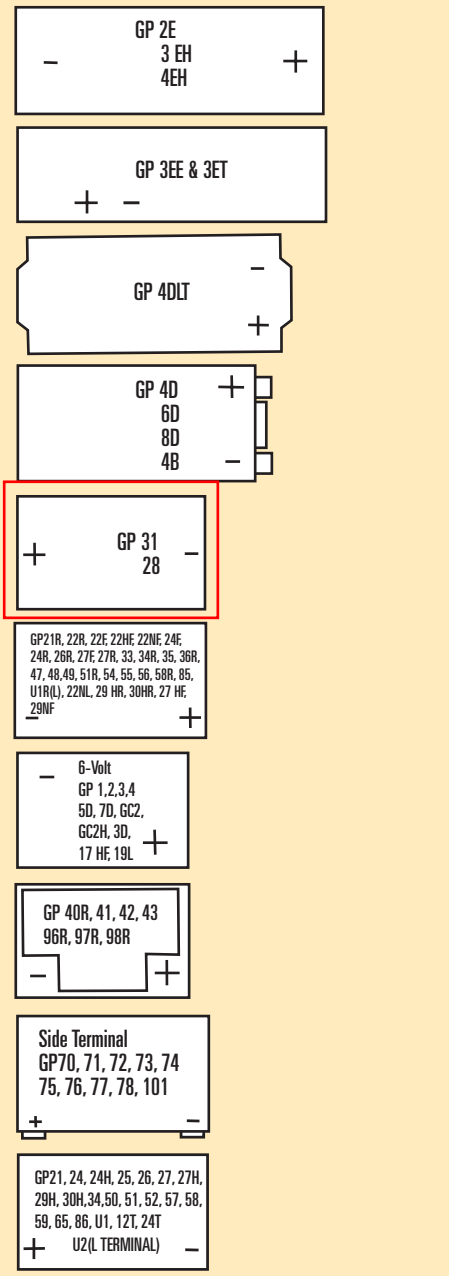
Construction Notes:
LAC = Low Maintenance, Hybrid Construction
C = Calcium Lead Alloy Grid Design
MF = Maintenance Free
MFA = Maintenance Free with Accessible Vent Caps
S = Stud Terminals
+ = Shipped Dry Only
* = Side Terminals
** = Starting and Deep Cycle Battery
*** = Deep Cycle and Starting Battery
" = For 30 seconds at 0° F (-18° C)
' = Minimum of 25 amp output at 80° F (27° C)
SAE = Uses SAE Posts
SDT = Dual, Top mounted Terminals, Stud and SAE Post, Marine Deep Cycle/Starting Battery
SC = Silver (Ag) Calcium Alloy Grids for resistance to high underhood temperatures

Rugged Design – Built Tough – Reliable Starting

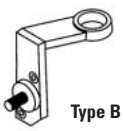
- Positive and Negative plates are anchored to container bottom and locked at the top of cell element for maximum vibration resistance.
- Heavy-duty forged terminal post bushings provide maximum strength and resistance to acid seepage.
- Hefty full-frame grids, no sharp edges, optimum acid/paste combination provides better charge acceptance after deep discharge.
- Manifold vented cover with built-in Flame Arrestor…a safety feature that directs corrosive gases away from the battery and hold-downs.
- Thick, robust container resists rugged treatment typical of heavy-duty commercial use. Embossed part number & descriptors for easy serviceability.

Battery Information

BCI Terminal Locations



Transit Bus Terminal for 8D Part # 250-0473
One piece end terminal.
Right end of Battery.
1/2" - 13 Steel Positive Stud
3/8" - 16 Steel Negative Stud



Type B

Cat Premium High Output Batteries – Built Tough to Exceed Demanding Performance Test Requirements:

100 hour Vibration Testing – Five Times the Industry Standard

- Battery must be able to withstand vibration forces without suffering mechanical damage, loss of capacity, loss of electrolyte or without developing internal/external leaks
- Battery must pass a high rate discharge test after the vibration testing

Five 72-hour Deep Discharge/Recharge Test Cycles

- Battery must recover to 25 charging amps within 20 minutes and meet Industry Electrical Performance Standards

30 Day Complete Discharge Test

- Battery must recover to 25 charging amps within 60 minutes and meet Industry Electrical Performance Standards after recharging

SAE J2185 Life Cycle Test

- Battery subject to deeper discharge and charge cycles at extreme temperatures not normally encountered in starting a machine or vehicle

Cold Soak Test

- Battery cold soaked at sub-freezing temperatures and then tested by starting an equally cold engine

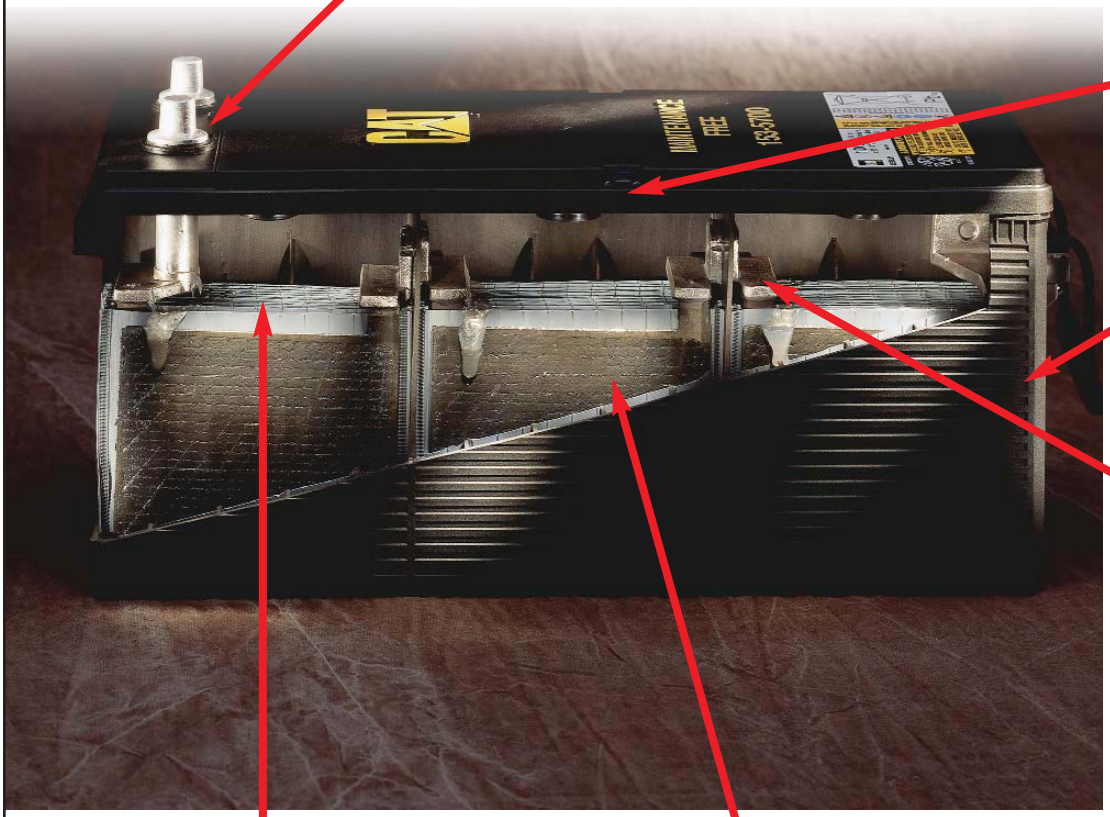
Battery Accessories

Group 31 – Charging Posts for Stud Terminals – Part # 4C-5637
Screw-in Charging Posts for Side Terminals – Part # 4C-5638
Wing Nut – Part # 2B-9498 for Part #'s 175-4390/175-4370/175-4360/8C-3628
Wing Nut – Part # 3B-0723 for Part #'s 8C-3638 and 8C-3639
Digital Battery Analyzer – Part # 177-2330
Battery Voltmeter – Part # 4C-6600
Battery Load Tester – Part # 4C-4911
Booster Cable 12' (3.66 m) – Part # 4C-4933
Booster Cable 20' (6.00 m) – Part # 4C-4937
Heavy Duty Commercial Fast Charger (110V) – Part # 4C-4921
Heavy Duty Commercial Fast Charger (220V) – Part # 4C-4910
Extra Vent Caps (6) for Dry Batteries – Part # 7N-0060

Note: Ratings and Part Numbers are subject to change without notice.

Recycle all scrap batteries.
We accept lead-acid batteries for recycling.

Cat Batteries



Robust Components = Long Life + Reliable Starts

- Heavy-duty forged terminal post bushings provide maximum strength and resistance to acid seepage that causes corrosion and black posts. Thicker internal terminal posts provide lower electrical resistance and higher cold cranking amp output.
- Rugged microporous polyethylene envelope separators protect against “shorts” and vibration damage. Deep Cycle batteries utilize double insulated Glass mat separators for longer cycling life.
- Maintenance Free batteries utilize calcium lead alloy on both positive and negative plates that reduces gassing and water consumption. Automotive batteries have Silver (Ag) Calcium Alloy Grids for resistance to high underhood temperatures.
- Heavy-duty, full frame battery grids with no sharp edges. An optimum acid/paste combination provides better charge acceptance after a deep discharge.
- Positive and Negative plates are anchored to the container bottom and the cell element is locked at the top for maximum vibration resistance. Straps are thicker, heavier and cast (not welded) into the plates.
- Manifold vented cover with built-in Flame Arrestor…a safety feature that directs corrosive gases away from the battery and hold-downs.
- Robust reinforced case provides extra strength in all temperature extremes. Brickwork design on sides reduces chance of punctures and case flexing. Embossed part number and descriptors for easy serviceability.

For more information, see us today or visit our web site at www.cat.com

Caterpillar. The difference counts.™

CATERPILLAR®

PEHJ0073-01 Printed in the U.S.A.

Image shown may not reflect actual package

9461 – Battery Charger

The 9461 series of metal enclosed intelligent battery chargers have been developed with safety, usability, optimised battery performance and maximum battery lifetimes in mind.

A comprehensive range of input and output protections ensures a continued safe charging environment also enabling the use of the charger as a power supply.

Features

- Intelligent two, three and four stage charging profiles
- Configurable to suit most battery types (12V/24V)
- Adjustable current limit
- Can be used as a battery charger, power supply or both at the same time
- Automatic or Manual boost and storage charge functions to help maintain battery condition
- Digital Microprocessor Technology
- Temperature compensation for battery charging
- Low Output Ripple and superb line regulation
- Available in two variants (LCD display or LCD display & analogue meters) Full Protection
- AC input Under voltage
- AC input Over voltage
- Battery charger output Over voltage
- Battery charger output Over current
- Battery temperature compensation with over temperature protection
- Output short circuit and Inversion polarity with auto recovery
- Automatic power de-rating at high ambient temperatures
- Battery charger failure indication

Automatic Boost Mode

- Boosts and equalises cell charge improving battery performance and life

Power Save Mode

- Once the battery is fully charged the chargers switch to Eco-Power to save energy

Communication

- Can be integrated into external systems through:
  - Fully configurable via PC Software
  - External remote LCD option

Attachments

Benefits

- Fully flexible to maximise the life of the battery
- Suitable for a wide range of battery types
- Switched mode design
- Fault output
- Minimum 86% efficiency throughout full operating range
- No external intervention for boost mode
- Multiple chargers can be linked together to provide larger current output
- Can be permanently connected to battery and mains (utility) supply. No need to disconnect through high load conditions.

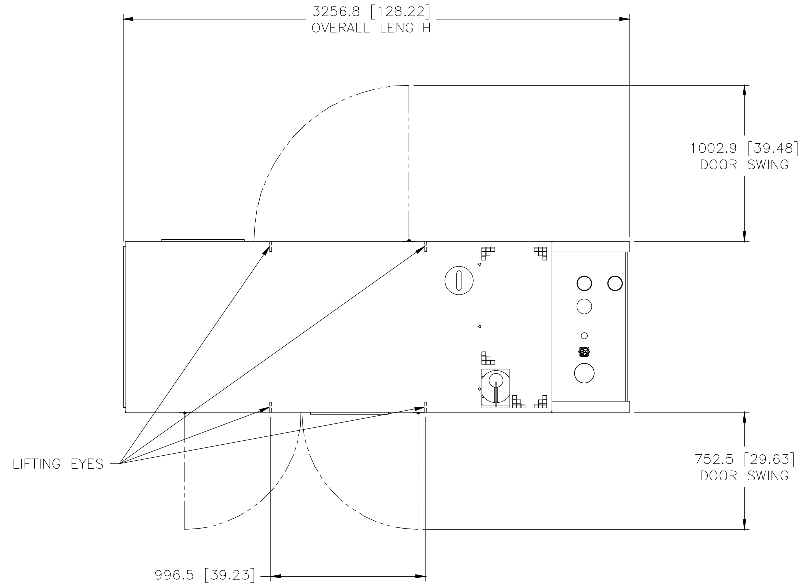
Specification

AC Supply Voltage Range 90V to 305V (L-N)	Frequency Range 48 Hz to 64 Hz (L-N)
DC Output Rating	10 A DC at 12 V & 24 V DC
Ripple and Noise	<1%
Efficiency	>86%
Auxiliary Output	100 mA DC at 12V
Regulation Line	<0.5%
Load	2%
Temperature Sensor Input	PT1000
Protections	Short Circuit DC Over Voltage DC Over Current Reverse Polarity Over Temperature AC Under & Over Voltage Battery Charger Failure
Charge Failure Relay	3 A at 30 V DC Volt Free Relay
Dimensions Overall	165 mm x 305 mm x 110 mm (6.5 in x 12 in x 4.3 in)
Weight	2.3 kg
Operating Temperature Range	-30 °C to +55 °C
Storage Temperature Range	-40 °C to +85 °C

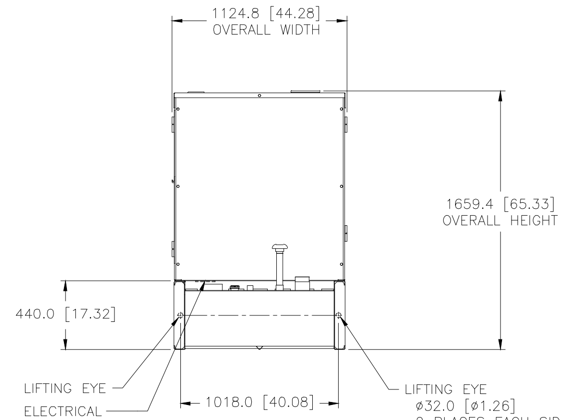
SECTION E

METRIC 610–1621

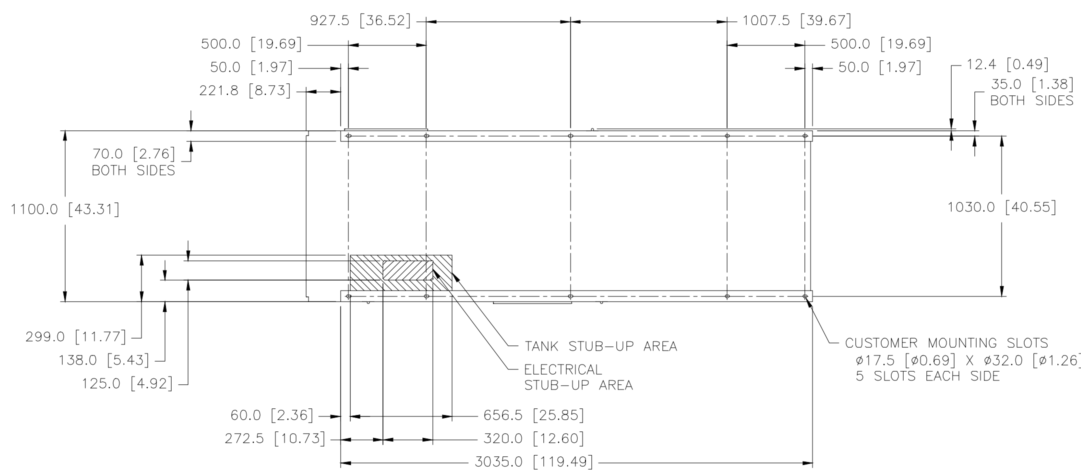
QTY	POSSIBLE TANK CONNECTIONS	SIZE	SHEET
1	EXHAUST	ø63.5 [ø2.50] OD	2
1	FUMES DISPOSAL HOSE	ø19.05 [ø0.75] ID	2
1	COOLANT DRAIN	13/16–16 THD	2
1	FUEL LEVEL SWITCH	1–1/2" NPTF	3
1	SENDER AS	1–1/2" NPTF	3
1	VENT	1–1/4" NPT	3
1	VENT AS – EMERGENCY	3" NPT	3
1	FUEL RETURN	3/4–16 THD	3
1	FUEL SUPPLY	3/4–16 THD	3



TOP VIEW



FRONT VIEW



FOOTPRINT
(DIMENSIONED OUTLINE VIEW FROM ABOVE)
(RIGHT SIDE ORIENTATION)

PACKAGE LIFTED IN 4 PLACES ON TANK

PACKAGE SHOWN WITH MORE DETAIL ON FOLLOWING SHEETS

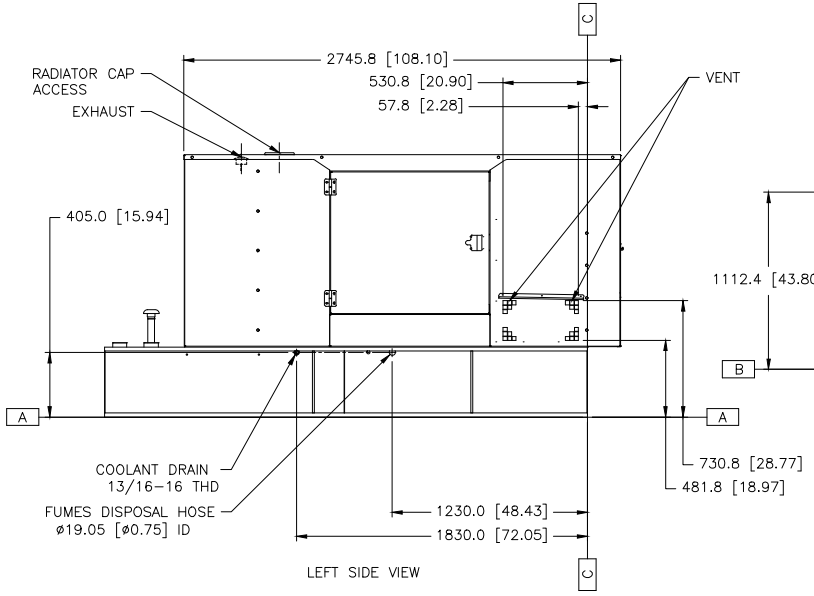
MODEL	TYPE	PRICING AR	ENCLOSURE	TANK BASE
C4.4	–	LS–4236 CHG 00 LS–4237 CHG 00	LS–4329 CHG 00	LS–4264 CHG 00

1E2966B IDENT
1E2733 DRAWING–AUTOCAD
1E0198W BRAND MARKINGS
1E0013G CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL
DRN J.E. NELSON
CHK M.J. SWIFT
APPD N.P. MOUNTJOY
RECORDS X
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM [INCH]
SCALE 1 = 10
SHEET 1 OF 3
THIRD ANGLE PROJECTION
01 06APR21

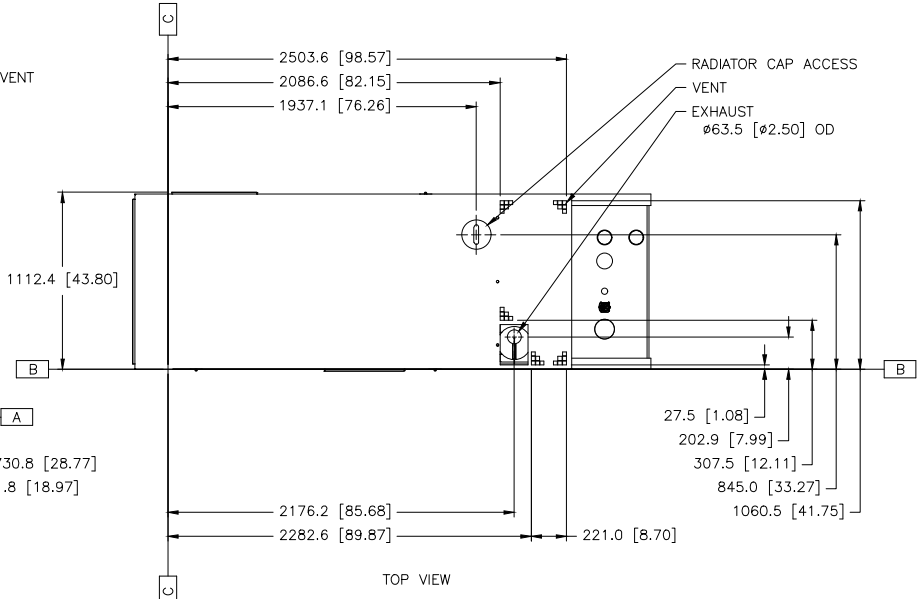
CATERPILLAR INC.

INSTALLATION–COMPOSITE
C4.4 ENCL W/TANK(D80/D100)
610–1621 W971 E

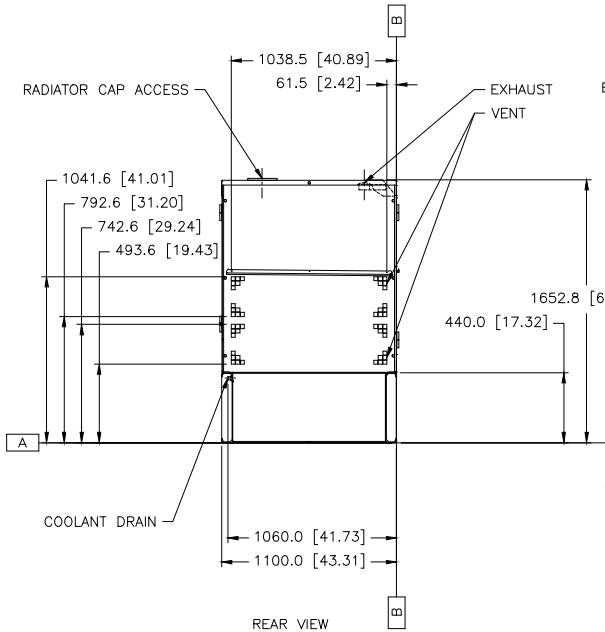
METRIC 610–1621



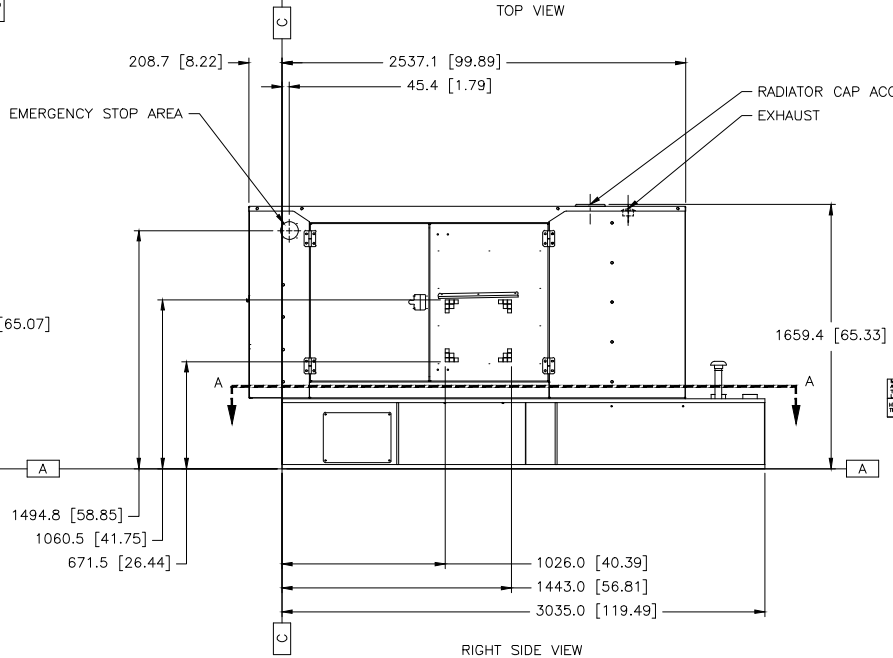
LEFT SIDE VIEW



TOP VIEW



REAR VIEW



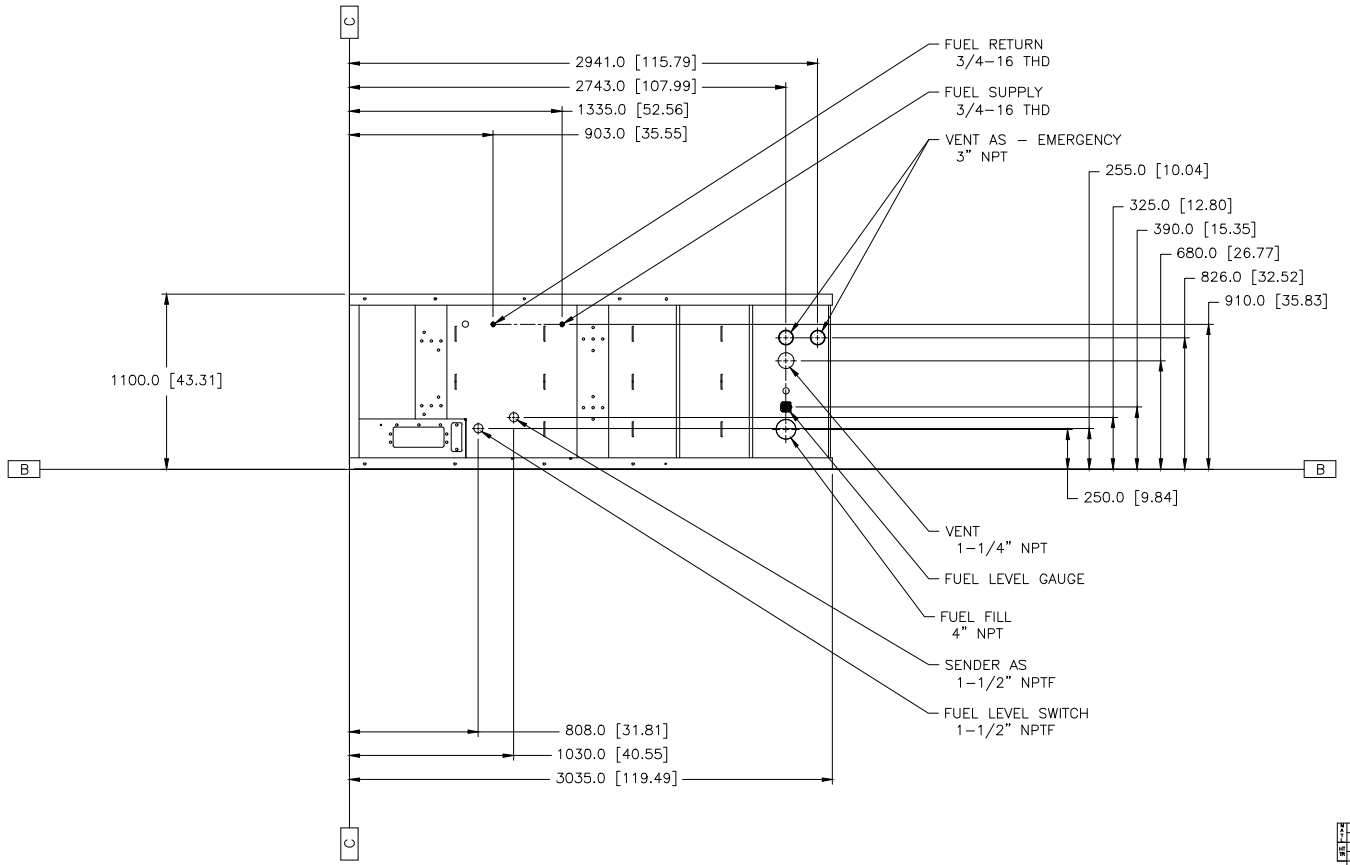
RIGHT SIDE VIEW

	1E2966B IDENT
	1E2733 DRAWING–AUTOCAD
	1E0198W BRAND MARKINGS
	1E0013G CONFIDENTIALITY
	1E0012A INTERPRETATION
	1E0011 INTER & TOL
DRN	J.E. NELSON
CHK	M. J. SWIFT
APP	N.P. MOUNTJOY
OTHER	RECORDS X
	SCALE 1 = 10
	SHEET 2 OF 3
	01 06APR21

CATERPILLAR INC.

INSTALLATION–COMPOSITE
C4.4 ENCL W/TANK(D80/DT00)
610–1621 - W971 E

METRIC 610–1621



VIEW A–A (TANK TOP)
LS4264 CHG 00
(RIGHT SIDE ORIENTATION)

1E2966B IDENT
1E2733 DRAWING–AUTOCAD
1E0198W BRAND MARKINGS
1E0013G CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL

DRN	J.E. NELSON	
CHK	M. J. SWIFT	
APVD	N.P. MOUNTJOY	
OTHER	RECORDS	X

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM [INCH] DIMENSIONS W/O TOL ARE BASIC
SCALE 1 = 10
SHEET 3 OF 3
THIRD ANGLE PROJECTION
01 06APR21

CATERPILLAR INC.

INSTALLATION–COMPOSITE
C4.4 ENCL W/TANK(280/DT00)
610–1621 - W971 E

THIS DIAGRAM IS FOR GC GENSET MODELS (60kW to 200kW)

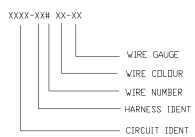
FOR USE WITH : C4.4 & C7.1 ENGINES

GCCP 1.2 CONTROLLER

SIGNAL NAMES

CIRCUIT_ID	COLOR	DESCRIPTION
10	WH	NEGATIVE_RUN/STOP
101	RD	UNSWITCHED_BTRY_(+)
105	WH	ECM_KEY_SW_(FUSED_25A)
108	WH	BTRY_(+)_(FUSED_10A)
10	RD	AVR_X2_TO_GENERATOR_T12
10A	WH	POSITIVE_RUN_STOP
11	WH	AUX_CONTACT_COMMON
12	WH	AUX_CONTACT_NC
123	WH	PLG_BTRY_(+)_(FUSED_5A)
14	WH	AUX_CONTACT_NO
14	WH	PMG_A_PHASE_TO_AVR_X2
148	WH	ELR_BTRY_(+)_(FUSED_2A)
15	WH	PMG_B_PHASE_TO_AVR_X1
16	WH	PMG_C_PHASE_TO_AVR_Z2
17A	WH	ENCLOSURE_ESTOP_#11_TO_E-C1_#1
17C	WH	ESTOP_LINK
200	GN-YL	MAIN_CHASSIS_GROUND
208	WH	BTRY_(-)
21	WH	AUX_CONTACT_COMMON
22	WH	AUX_CONTACT_NC
229	WH	GND_FOR_ANALOG_INPUTS
24	WH	AUX_CONTACT_NO
344	WH	EMER_STOP_SW_#22_TO_A-C10_#2
345	WH	A-C10_#1_TO_EMER_STOP_A_TERMINAL
346	WH	EMER_STOP_SW_#12_TO_#21
347	WH	EMER_STOP_SW_#11_TO_CONTROLLER_#3
4	WH	ECM_#18_BTRY_(-)_TO_ECR_#86
5	WH	ENCLOSURE_ESTOP_#22_TO_E-C1_#2
5+	RD	GENERATOR_EXCITER_(+)
6-	BK	GENERATOR_EXCITER_(-)
879	WH	REMOTE_START_CONTROLLER_#42
9	RD	AVR_X1_TO_GENERATOR_T7
95	BK	AUX_CONTACT_COMMON
951	WH	PLG_MODBUS_A_TO_CONTROLLER_#52
951	CU	BATT_CHRG_DSENET_SCR_TO_CONTROLLER_#28
952	BK	PLG_MODBUS_B_TO_CONTROLLER_#51
952	GN	BATT_CHRG_DSENET_B_TO_CONTROLLER_#26
953	CU	PLG_MODBUS_SCR_TO_CONTROLLER_#50
953	YL	BATT_CHRG_DSENET_A_TO_CONTROLLER_#27
954	WH	ANNUNCIATOR_MODBUS_A
955	BK	ANNUNCIATOR_MODBUS_B
956	CU	ANNUNCIATOR_MODBUS_SCR
96	BK	AUX_CONTACT_NC
98	BK	AUX_CONTACT_NO
A309	WH	AHR_#A1_TO_CONTROLLER_#8
A666	WH	ELR_#14_TO_ENC_LIGHT_EL-C1_#1
AC101	WH	120VAC_(FUSED_20A)_TO_GFCI_#LINE
AC102	WH	120VAC_(FUSED_10A)_TO_BATT_CHRG_#L
AC199	WH	SHORE_POWER_NEUTRAL
AC719	WH	120VAC_(FUSED_6A)_TO_AHR_#12
C1	WH	SHUNT_TRIP
C2	WH	SHUNT_TRIP
D_POS	WH	CHARGER_ALTERNATOR_EXCITATION
E486	WH	SENSING_V_-_PHASE_A
E487	WH	SENSING_V_-_PHASE_B
E488	WH	SENSING_V_-_PHASE_C
E494	WH	CT_V_-_PHASE_A
E495	WH	CT_V_-_PHASE_B
E496	WH	CT_V_-_PHASE_C
E498	WH	CT_RTN_COMMON
F409	WH	SENSING_V_NEUTRAL
F434	WH	GEN_PHASE_A
F435	WH	GEN_PHASE_B
F436	WH	GEN_PHASE_C
F5	WH	AVR_#F-
F6	WH	AVR+#F+
L1	BK	GENERATOR_L1_PHASE
L2	BK	GENERATOR_L2_PHASE
L3	BK	GENERATOR_L3_PHASE
LINK	WH	ENCLOSURE_ESTOP_LINK
N	BK	GENERATOR_NEUTRAL
N756	WH	ALM_HORN_(+)
P733	WH	ANLG_INP_1_(+)
R958	WH	DISCRETE_OUT._9
R959	WH	DISCRETE_OUT._10
U	RD	AVR_SENSING
V	RD	AVR_SENSING
W	RD	AVR_SENSING
WIFR	WH	WATER_IN_FUEL_RETURN
WIFS	WH	WATER_IN_FUEL_SWITCH
X861	WH	ECR_#87_STARTER_MAG_SW
Y797	WH	ENG_J1939_DATALINK_+
Y798	BK	ENG_J1939_DATALINK_-
Y799	CU	ENG_J1939_DATALINK_SHLD
Y983	WH	LOW_COOLANT_LEVEL_TO_CNTRL_#43
Y984	WH	FUEL_LEVEL_TO_CNTRL_#44
Y985	WH	ENCLOSURE_LIGHT_SW_TO_CNTRL_#46
YGN	GN/YL	GENERATOR_GND

WIRE NAME DEFINITION



COLOUR ABBREVIATIONS

ABBREVIATION	DESCRIPTION
RD	RED
WH	WHITE
OR	ORANGE
YL	YELLOW
PK	PINK
BK	BLACK
GY	GREY
PU	PURPLE
BR	BROWN
GN	GREEN
BU	BLUE
CU	COPPER
GN-YL	GREEN-YELLOW

ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
AC	ALTERNATING CURRENT
AHR	ALTERNATOR HEATER RELAY
AVR	AUTOMATIC VOLTAGE REGULATOR
BATT	BATTERY
CR	CONTROL RELAY
DC	DIRECT CURRENT
ECM	ENGINE CONTROL MODULE
ECR	ENGINE CRANK RELAY
ELR	ENCLOSURE LIGHTS RELAY
E-STOP	EMERGENCY STOP
FCR	FUEL CONTROL RELAY
FLS	FUEL LEVEL SENDER
GFR	GERNERAL FAULT RELAY
GND	GROUND
GRR	GENERATOR RUNNING RELAY
LCL	LOW COOLANT LEVEL
MCB	MINIATURE CIRCUIT BREAKER
OF	AUXILIAR SWITCH
PMG	PERMANENT MAGNET GENERATOR
Q/1	AUXILIAR SWITCH
SD	ALARM SWITCH
STR	SHUNT TRIP RELAY
SY	ALARM SWITCH
TERM	PANEL TERMINAL
VFC	VOLT FREE CONTACT

SYMBOL LEGEND TABLE

Symbol	Description
	MINIATURE CIRCUIT BREAKER
	EMERGENCY STOP PUSHBUTTON
	FUSED AUTOMOTIVE RELAY
	RESISTOR
	EARTH/GROUND
	CURRENT TRANSFORMER
X	PANEL TERMINAL
	TERMINAL
	CONNECTOR
	BATTERY
	SPLICE
	WIRE
	SCREEN CABLE
A	FUSE

INDEX TABLE

SHEET INDEX	DESCRIPTION
1	CROSS REFERENCE SHEET INDEX, NOTES
2	CONTROL SCHEMATIC
3	POWER SCHEMATIC
4	POWER SCHEMATIC (SINGLE PHASE)
5	ADDITIONAL OPTIONS
6	AC OPTIONS
7	ADDITIONAL INFORMATION

HARNESS LAYER TABLE

IDENT	PART NO	CHG	LOC	DESCRIPTION	NOTE
HARNESS AS.	-	-	-	-	-
A	596-2201	01	SH2	D125-D200 MAIN HARNESS	-
A	598-3162	01	SH2	D60-D100 MAIN HARNESS	-
AN	578-6063	01	SH5	ANNUNCIATOR HARNESS	-
AX	565-9586	00	SH5	AUX CONTACTS AND SHUNT TRIP	-
B	577-8429	01	SH5	PLG 641&601 MODBUS HARNESS	-
C	396-1978	00	SH2	E-STOP LINK (OPEN SET)	-
CD	605-2916	00	SH6	GFCI HARNESS	-
E	396-1928	03	SH2	E-STOP HARNESS (ENCLOSED SET)	-
EL	605-8468	00	SH5	ENCLOSURE LIGHTS HARNESS	-
ER	604-4015	00	SH6	BATTERY-CHARGER HARNESS	-
FR	605-8326	00	SH6	SHORE POWER L1 LINK	-
GR	605-3114	00	SH5	GENSET RUNNING & COMMON ALARM	-
PG	443-0637	01	SH3	PMG ADAPTOR HARNESS	
PM	604-4018	00	SH3	PMG ADAPTOR HARNESS	
RC	604-4020	00	SH6	ALTERNATOR SPACE HEATER HARNESS	-
T	577-3930	01	SH5	PLG 641&601 POWER SUPPLY	-
Y	586-4861	00	SH5	PLG 641&601 CAN HARNESS	-
WIRE AS./CABLE AS.	-	-	-	-	-
N	-	-	SH2	BATTERY NEGATIVE	-
P	-	-	SH2	BATTERY POSITIVE	-

NOTE A: FACTORY WIRING NOT PROVIDED AS STANDARD. REFER TO MANUFACTURER INSTALLATION INSTRUCTIONS.

NOTE B: RESISTOR TO BE REMOVED IF ADDITIONAL EXPANSION MODULES ARE CONNECTED.

E5167A	INT-PROP
E0198W	BRAND MARKINGS
E0013Y	CONFIDENTIALITY
E0012A	INTERPRETATION
E0011	INTPR & TOL

Caterpillar: Confidential Yellow

PROD X OTHER

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS W/O TOL ARE BASIC

VERSION TYPE: PRIMARY X / SECONDARY

THIRD ANGLE PROJECTION

SHEET 1 OF 7

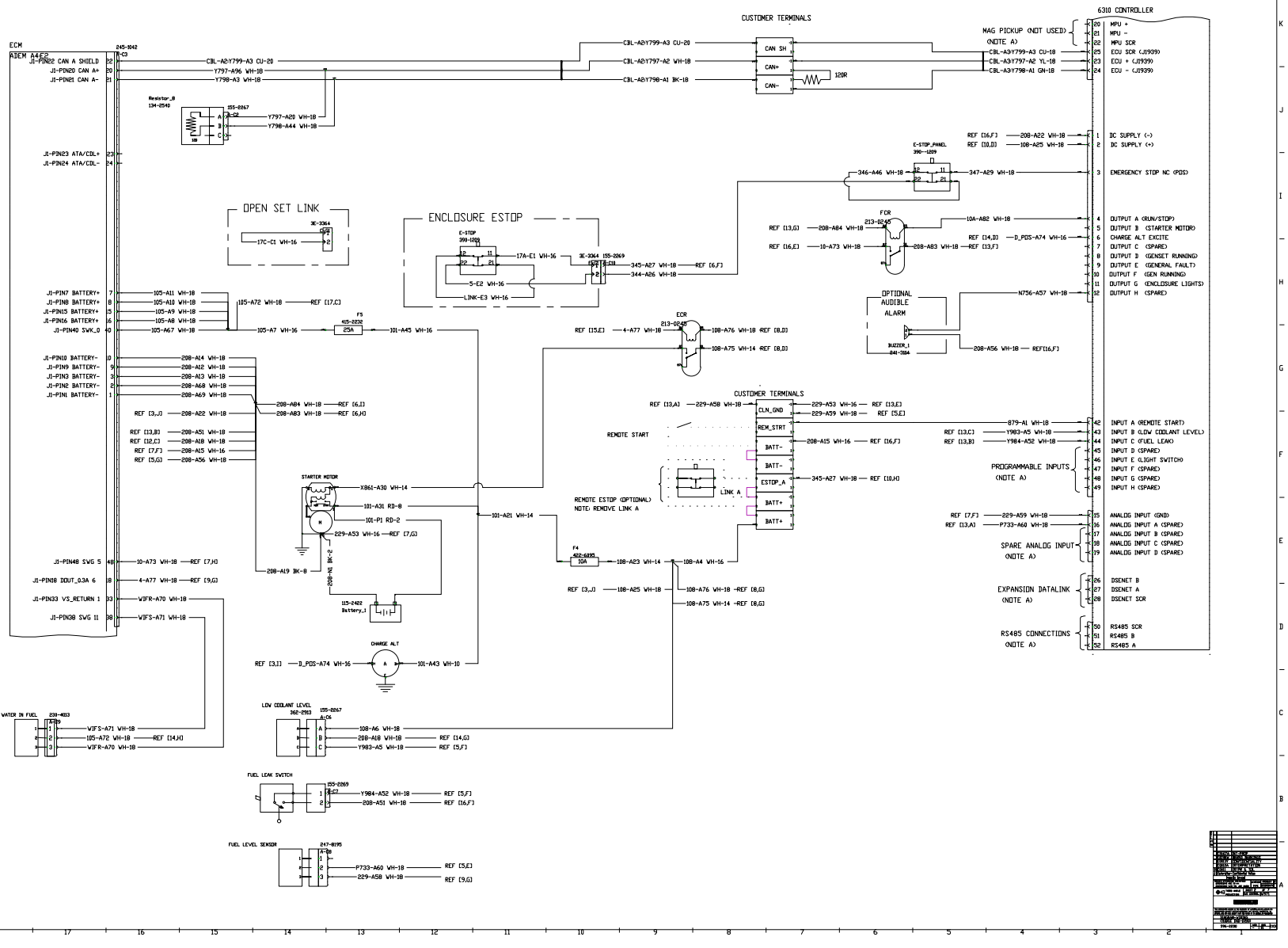
DWG CONTROL W971

CATERPILLAR

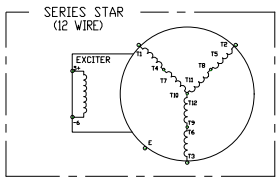
DIAGRAM-WIRING
(1100GC D60-D200)

596-2230 VER - CHG 01 2X3

CONTROL SCHEMATIC



POWER SCHEMATIC



150A HARNESS

CONNECT TO ALTERNATOR

- L1-UG1 BK-000
- L2-VG1 BK-000
- L3-WG1 BK-000
- N-NG1 BK-000

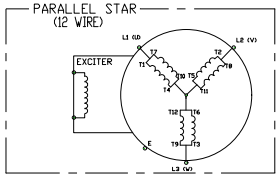
CONNECT TO BREAKER

100A/60A HARNESS

CONNECT TO ALTERNATOR

- L1-UH1 BK-1
- L2-VH1 BK-1
- L3-WH1 BK-1
- N-NH1 BK-1

CONNECT TO BREAKER



600A/800A HARNESS

CONNECT TO ALTERNATOR

- L1-UC1 BK-0000
- L1-UE1 BK-0000
- L2-VC1 BK-0000
- L2-VE1 BK-0000
- L3-WC1 BK-0000
- L3-WE1 BK-0000
- N-NC1 BK-0000
- N-NE1 BK-0000

CONNECT TO BREAKER

250A HARNESS

CONNECT TO ALTERNATOR

- L1-UF1 BK-0000
- L2-VF1 BK-0000
- L3-WF1 BK-0000
- N-NF1 BK-0000

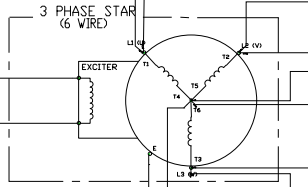
CONNECT TO BREAKER

400A HARNESS

- L1-UA1 BK-0000
- L2-VA1 BK-0000
- L3-WA1 BK-0000
- N-NA1 BK-0000

L1
L2
L3
N

CUSTOMER LOAD



NE LINK CABLE

GN/YL
GN/YL

MAIN CUSTOMER GROUND

BASEFRAME GROUND

E494-A36 WH-18
E495-A35 WH-18
E496-A34 WH-18
E497-A37 WH-18
E498-A33 WH-18
E498-A33 WH-18

280-A63 GN-YL-16
GENERATOR GROUND

280-A61 GN-YL-16
CONTROL PANEL DOOR GROUND

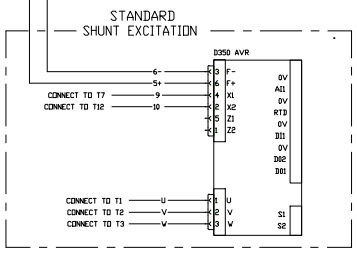
F434-A17 WH-18
F435-A42 WH-18
F436-A40 WH-18
F409-A41 WH-18

F1 7W-0482 2A
F2 7W-0482 2A
F3 7W-0482 2A

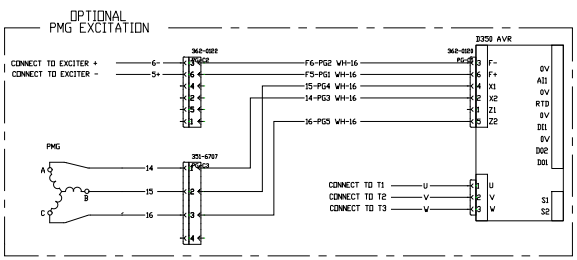
6310 CONTROLLER

E498-A33 WH-16	41	N/C
E496-A34 WH-18	40	CURRENT SENSING COMMON
E495-A35 WH-18	39	CURRENT SENSING L3
E494-A36 WH-18	38	CURRENT SENSING L2
E486-A66 WH-18	37	CURRENT SENSING L1
E487-A65 WH-18	29	VOLTAGE SENSING L1
E488-A64 WH-18	30	VOLTAGE SENSING L2
	31	VOLTAGE SENSING L3
	32	VOLTAGE SENSING N

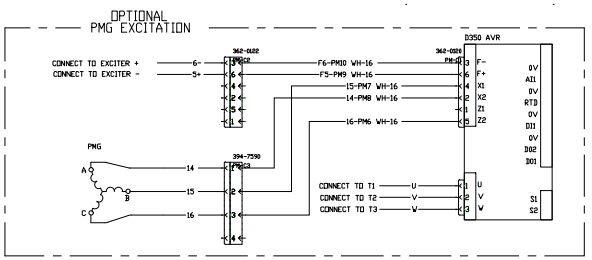
STANDARD
SHUNT EXCITATION



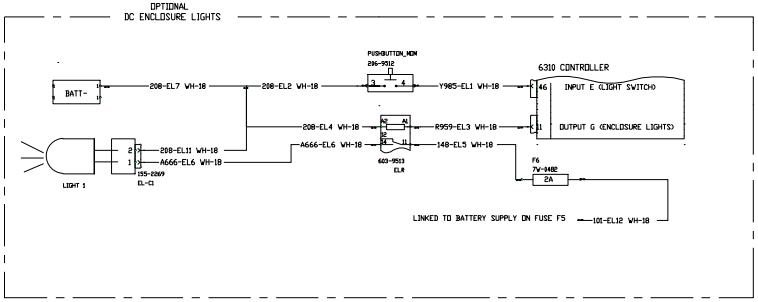
OPTIONAL
PMG EXCITATION

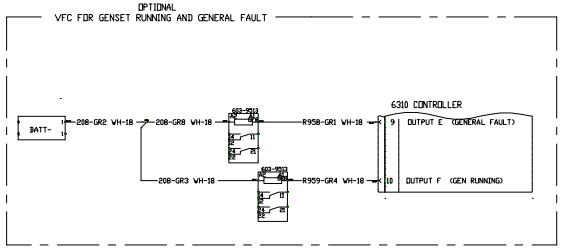


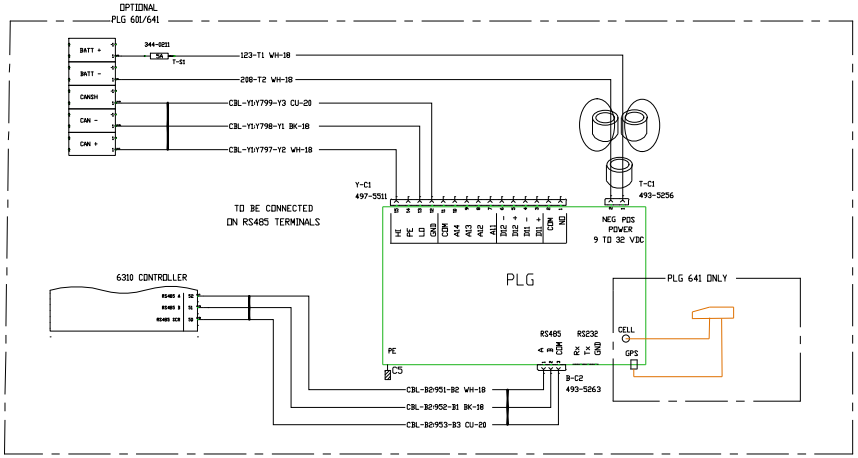
OPTIONAL
PMG EXCITATION

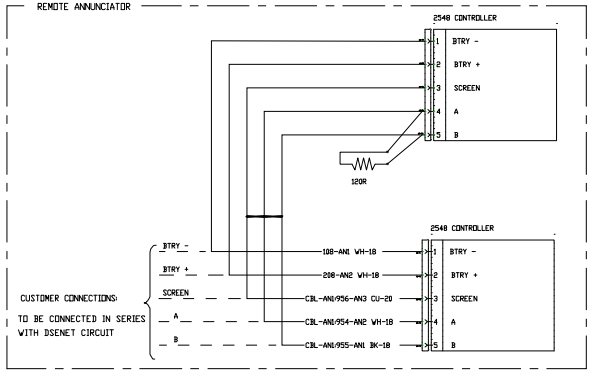


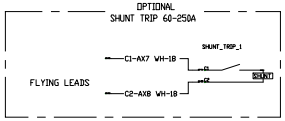
ADDITIONAL OPTIONS

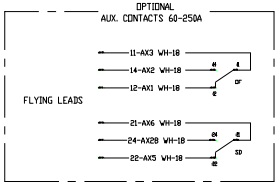


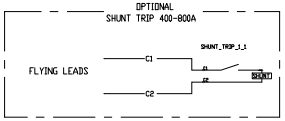


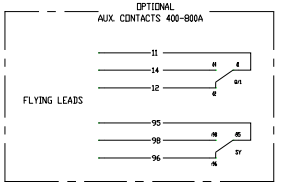




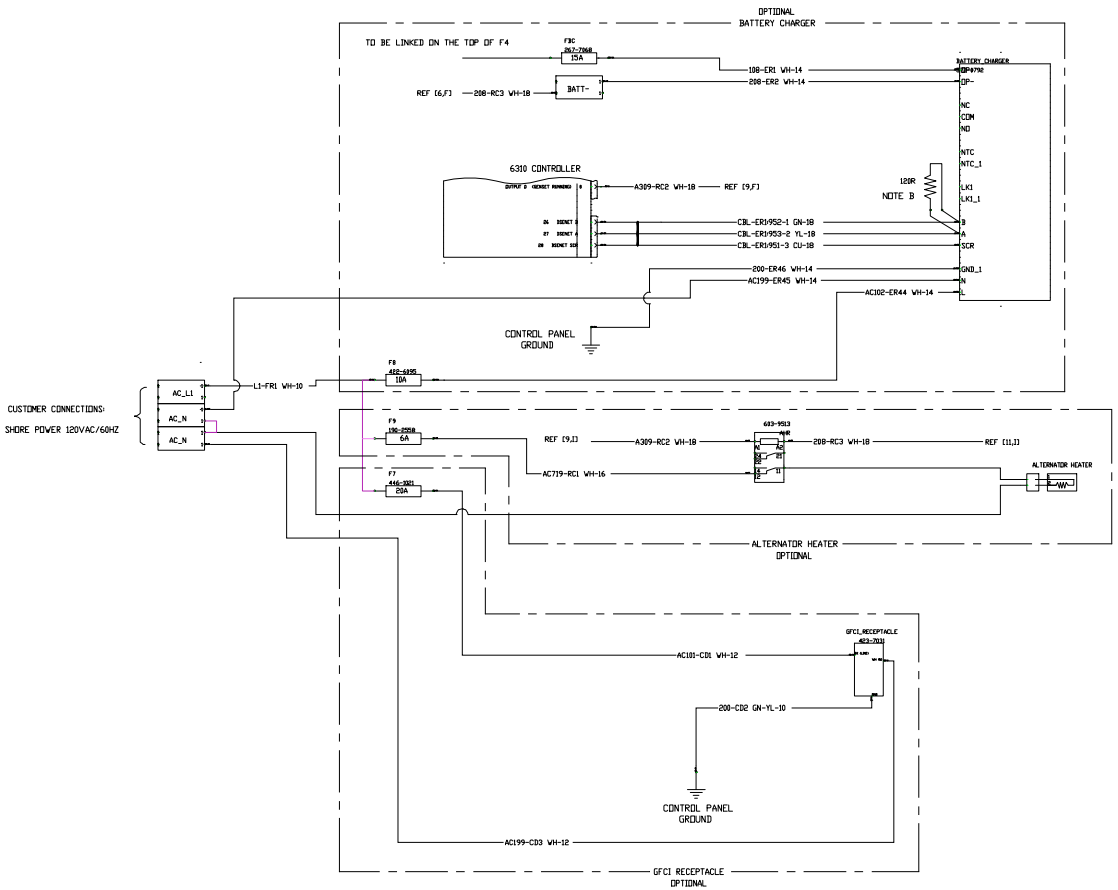








AC OPTIONS


OPTIONAL
BATTERY CHARGER
TO BE LINKED ON THE TOP OF F4
F3C
15A
BATT-
REF [6,F]
208-RC3 WH-18
108-ER1 WH-14
208-ER2 WH-14
BATTERY_CHARGER
DP-
NC
COM
NO
NTC
NTC_1
LK1
LK1_1
B
A
SCR
GND_1
N
L
6310 CONTROLLER
A309-RC2 WH-18
REF [9,F]
120R
NOTE B
CBL-ER1/952-1 GN-18
CBL-ER1/953-2 YL-18
CBL-ER1/951-3 CU-18
200-ER46 WH-14
AC199-ER45 WH-14
AC102-ER44 WH-14
CONTROL PANEL
GROUND
F8
10A
L1-FR1 WH-10
CUSTOMER CONNECTIONS:
SHORE POWER 120VAC/60HZ
AC_L1
AC_N
AC_N
F9
6A
REF [9,I]
A309-RC2 WH-18
208-RC3 WH-18
REF [11,I]
AC719-RC1 WH-16
ALTERNATOR HEATER
F7
20A
ALTERNATOR HEATER
OPTIONAL
GFCI_RECEPTACLE
AC101-CD1 WH-12
200-CD2 GN-YL-10
CONTROL PANEL
GROUND
AC199-CD3 WH-12
GFCI RECEPTACLE
OPTIONAL

ADDITIONAL INFORMATION - COMPONENT DETAILS & CUSTOMER CONNECTIONS

MAIN CUSTOMER RAIL
(OPTIONS INCLUDED)

COMPONENT	DESCRIPTION
AHR	ALTERNATOR SPACE HEATER RELAY
F7	GFCI FUSE (20A)
F8	BATTERY CHARGER FUSE (10A)
F9	ALTERNATOR HEATER FUSE (6A)

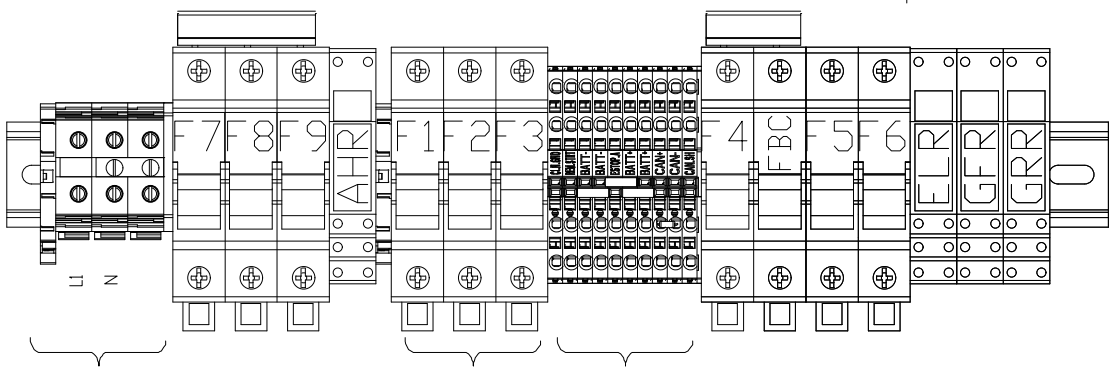
FUSE ID	CURRENT RATING	WIRE ID	DESCRIPTION
F4	10A	101; 108	PANEL SUPPLY
FBC	15A	101; 108	BATTERY CHARGER
F5	25A	101; 105	ECM POWER
F6	2A	148; 101	ENCLOSURE LIGHTS

RAIL	CURRENT RATING	DESCRIPTION
GFR	8A	GENERAL FAULT RELAY
GRR	8A	GENSET RUNNING RELAY
ELR	8A	ENCLOSURE LIGHTS RELAY

DC FUSES

DC FUSES

RELAY VFC CONNECTIONS



SHORE POWER 120VAC/60HZ CONNECTION

AC FUSES

CUSTOMER TERMINALS

COMPONENT	DESCRIPTION
L1	SHORE POWER AC SUPPLY LINE
N	SHORE POWER AC SUPPLY NEUTRAL

FUSE ID	CURRENT RATING	WIRE ID	DESCRIPTION
F1	2A	F434; E486	L1 SENSING AC
F2	2A	F435; E487	L2 SENSING AC
F3	2A	F436; E488	L3 SENSING AC

TERMINAL ID	WIRE ID	DESCRIPTION
CLN_GND	229	CLEAN GROUND FOR ANALOG INPUTS
REM_STRT	879	REMOTE START INPUT
BATT-	208	BATTERY NEGATIVE
BATT-	208	BATTERY NEGATIVE
ESTOP_A	545	GENSET CONTROLLER ESTOP INPUT
BATT+	108	BATTERY POSITIVE (10A FUSED)
BATT+	108	BATTERY POSITIVE (10A FUSED)
CAN+	Y797	CAN + COMMS
CAN-	Y798	CAN - COMMS
CAN_SH	Y799	CAN SH COMMS

SECTION F

Automatic Transfer Switch

60 and 100 AMP

Picture shown may not reflect actual configuration

Cat® CG Series

The Cat® CG Automatic Transfer Switch offers open- and delayed-transfer functionality for critical emergency power applications in commercial and light industrial applications, with an enhances feature set and LCD HMI interface.

The innovative design of the CG provides a durable mechanism that is tested up to 6,000 cycles in an assembly that weighs up to 30% less than comparable models yet offers up to 25% more wire bending space.

An innovative auto-configuration via the HMI sets electrical system parameters in seconds, minimizing on-site setup time. Premade configuration file upload is also available via USB or Bluetooth connection. Any programming changes can be done from the HMI with a few keystrokes, making commissioning quick and painless.

Features

- Available 30 to 3000A
- Wide Control Voltage Range (200V-480V)
- USB port to upload/download settings
- Available Bluetooth connection and enhanced communication capabilities
- Password protection LCD HMI
- Integrated help button and menu
- Automatic Configuration Function
- UL1008, NFPA 70, 99, 101 and 110
- NEMA ICS 10
- cUL

Primary Functions

- Monitor normal and emergency source voltages and frequencies
- Provision of transfer & re-transfer control signals
- Provision of engine/generator start and shutdown signals
- Permit user programming of set points
- Display real time and historical information
- Permit system testing
- Store all parameters in nonvolatile memory
- Provide at-a-glance source status indication

Specifications

Cat CG Features

System Information	
Product nodes (amperes)	30, 60, 100, 125, 160, 200, 260, 400, 600, 800, 1000, 1200, 1600, 2000, 2600, 3000
Rated voltage & frequency	200-480Vac, 50/60 Hz
Phase system	Single and Three (three phase only >600A)
Number of poles	2, 3 and 4 (3 & 4 pole only >600A)
Neutral configuration	Optional Solid or Switched neutral
Product type	Open transition (I-II), Delayed Transition (I-O-II)
Voltage and frequency settings	
Pick up Voltage Source 1	71-99%,101-119%
Drop out Voltage Source 1 *	70-98%, 102-120%
Pick up Voltage Source 2	71-99%, 101-119%
Drop out Voltage Source 2 *	70-98%, 102-120%
Pick up Frequency Source 1	80.5-99.5%, 100.5-119.5%
Drop out Frequency Source 1	80-99%, 101-120%
Pick up Frequency Source 2	80.5-99.5%, 100.5-119.5%
Drop out Frequency Source 2	80-99%, 101-120%
Time delay settings	
Override momentary Source 1 Outage, sec	0-60
Transfer from Source 1 to Source 2, sec	0-3600
Override momentary Source 2 Outage, sec	0-60
Transfer from Source 2 to Source 1, min	0-120
Generator stop delay, min	0-60
Center-OFF delay, sec	0-300
Pre-transfer delay S1 to S2, sec	0-300
Post-transfer delay S1 to S2, sec	0-300
Pre-transfer delay S2 to S1, sec	0-300
Post-transfer delay S2 to S1, sec	0-300
Elevator Pre-signal delay S1 to S2, sec	0-60
Elevator Pre-signal delay S2 to S1, sec	0-60
Elevator Post-signal delay S1 to S2, sec	0-60
Elevator Post-signal delay S2 to S1, sec	0-60
Load shed delay, sec	0-300
Source failure detections	
No voltage	yes
Undervoltage	yes
Overvoltage	yes
Phase missing	yes
Voltage unbalance	yes
Invalid frequency	yes
Incorrect phase sequence	yes

Specifications

Additional Features	
Controls	LCD + keys
LED indications for ATS, S1 and S2 status	Yes
Open transition - Standard digital inputs/outputs	1/1
Delayed transition - Standard digital inputs/outputs	2/1
Programmable digital inputs/outputs	Yes
Auto config (voltage, frequency, phase system)	Yes
Source priority	Source 1/2, No priority
Manual re-transfer	Yes
In-phase monitor (synchro check)	Yes
Genset exercising: on-load, off-load	Yes
In-built power meter module	No
Load shedding	Yes
Real time clock	Yes
Event log	Yes
Predictive maintenance	No
Voltage and current harmonics measuring	No
Field-mount accessories	
Auxiliary contacts for position indication	Optional
Additional digital input/output contacts	Optional, adding up to 6 each
12-24 Vdc aux supply module for controller	Optional
Communication modules	Optional
Connectivity capability	
Modbus RTU (RS-485)	Optional
Modbus/TCP	Optional
Profibus DP	Optional
ProfiNet Yes	Optional
DeviceNet	Optional
Ethernet IP	Optional

Specifications

Cat CG series technical data

Criteria	Units	Switch Size			
		30-260A	400A	600-1200A	1600-3000A
Rated operational voltage	Vac	200-480			
Operating voltage range	Vac	160-576			
Rated frequency	Hz	50-60			
Rated for 'Total System Loads', or 'Motor Loads' at nameplate rating	A	Compliant			
Contact transfer time I-II, II-I (load interrupting time)	ms	<50			<100
Operating transfer time I-II, II-I	ms	<500			
Mechanical Endurance (includes cycles during OL testing)	No. of operating cycles	6050	4050	3050	2550
Suitable for applications		Utility-to Utility, or Utility-to-Generator			

Cat CG series Coordinated Breaker Withstand and Close-on Ratings (WCR)

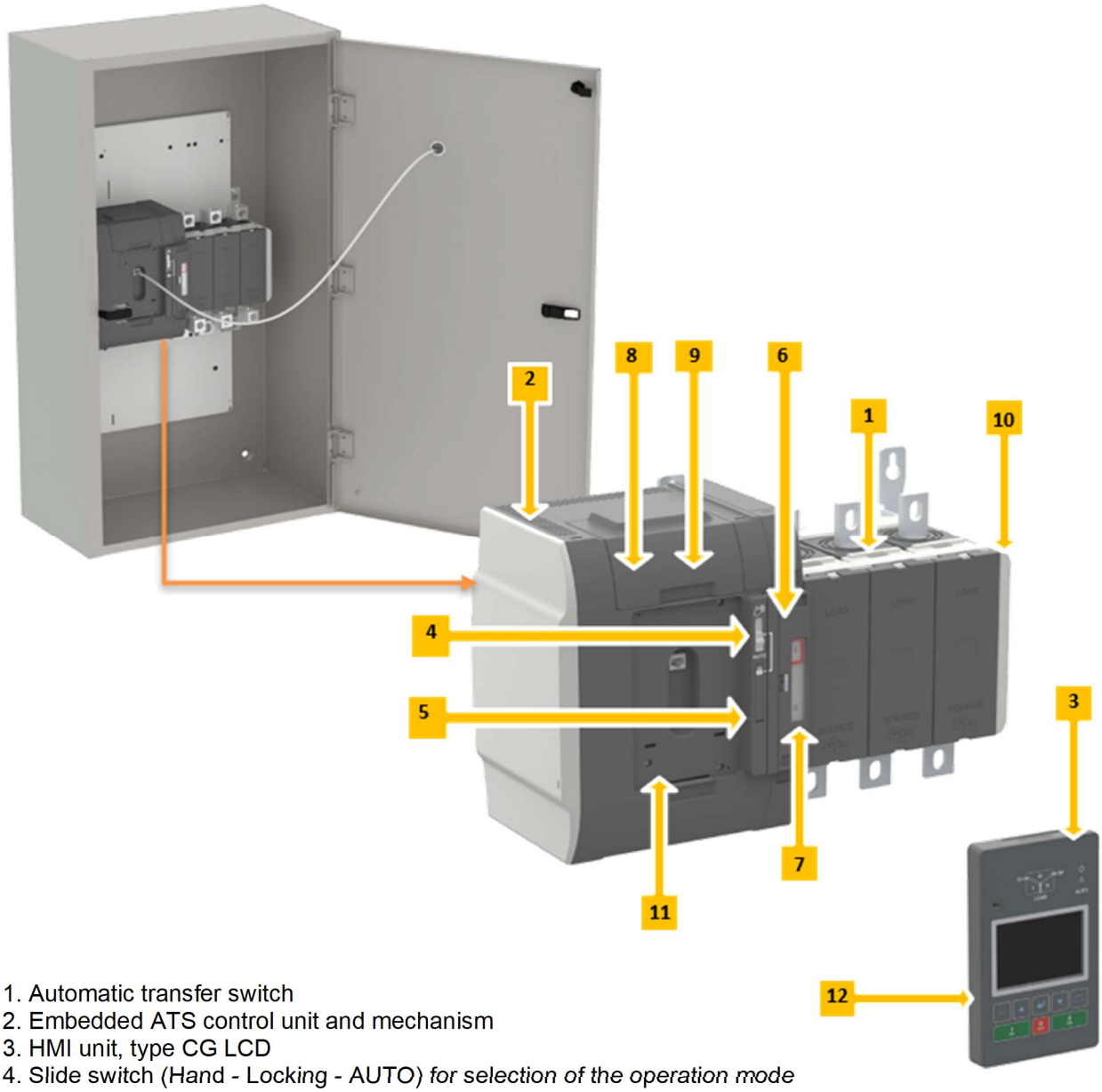
ATS Rating (A)	Max Voltage	Max Coordinated Breaker WCR (A)	Breaker Manufacturers[1]
30 - 200	480	30000	ABB, GE, Schneider, Eaton, Siemens
260	480	35000	ABB, GE, Schneider, Eaton, Siemens
400	480	50000	ABB, GE, Schneider, Eaton, Siemens
600	480	50000	ABB, GE, Schneider, Eaton, Siemens
800 - 1200	480	65000	ABB, GE, Schneider, Eaton, Siemens
1600 - 3000	480	100000	Any

1. For detailed WCR ratings by ATS and breaker type, please refer to Caterpillar supplemental ratings guide

Cat CG AL/CU UL Listed Solderless Screw-Type Terminals for External Power Connections

ATS Rating (A)	Cables per phase & neutral	Range of wire sizes
30 - 200	1	6 AWG - 300 kcmil (14 - 152 mm^2)
260	1	2 AWG - 600 kcmil (34 - 304 mm^2)
400	1	2 AWG - 600 kcmil (34 - 304 mm^2)
600	2	2 AWG - 600 kcmil (34 - 304 mm^2)
800 - 1200	4	2 AWG - 600 kcmil (34 - 304 mm^2)
1600 - 3000	8	2 AWG - 600 kcmil (34 - 304 mm^2)

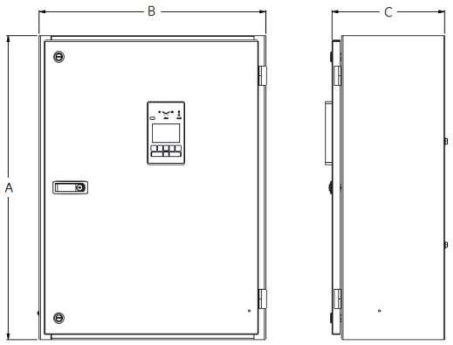
Units 30 to 1200A Leverage Unique Modular Construction...



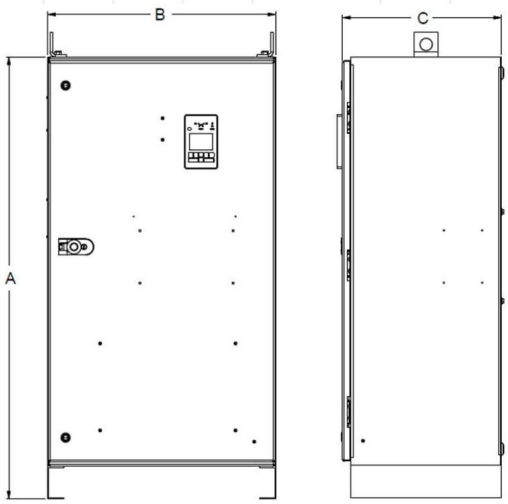
1. Automatic transfer switch
2. Embedded ATS control unit and mechanism
3. HMI unit, type CG LCD
4. Slide switch (Hand - Locking - AUTO) *for selection of the operation mode*
5. Padlocking the automatic transfer switch to prevent automatic and manual operation
6. Handle for manual operation
7. Position indication
8. Terminals for control circuit connections (behind the cover)
9. Place for connectivity modules (aux power supply, com and signaling)
10. Place for auxiliary contact block
11. Location of product identification label
12. Programming port, only for Ekip Programming module and Ekip Connect software

Weights and Dimensions

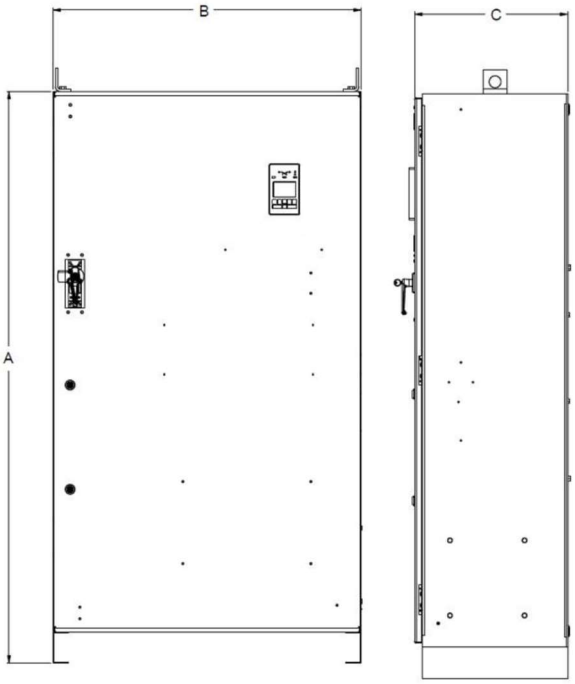
30-400 Amps



600 Amps



800-1200 Amps

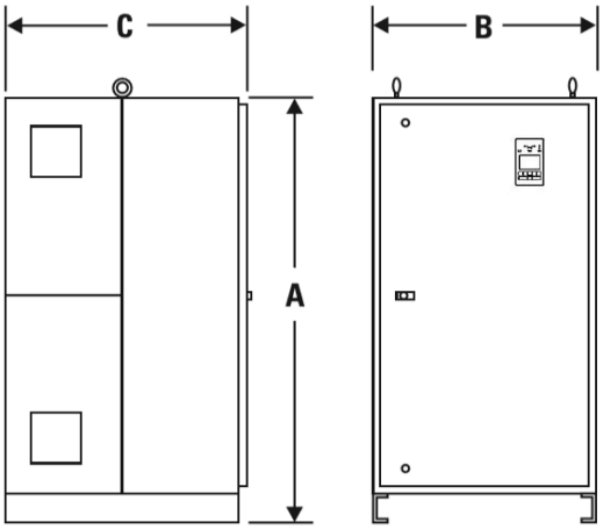


CG Series dimensions and weights, UL Type 1 Enclosure					
Ampere Rating	Poles	Weight[1] lb (kg)	Dimensions[2] in (mm)		
			Height (A)	Width (B)	Depth (C)
30-200	2	89 (40)	32 (813)	24 (610)	12 (305)
	3	93 (42)	32 (813)	24 (610)	12 (305)
	4	98 (44)	32 (813)	24 (610)	12 (305)
260	2	145 (66)	46 (1168)	24 (610)	14 (356)
	3	150 (68)	46 (1168)	24 (610)	14 (356)
	4	155 (70)	46 (1168)	24 (610)	14 (356)
400	2	153 (69)	46 (1168)	24 (610)	14 (356)
	3	159 (72)	46 (1168)	24 (610)	14 (356)
	4	290 (131)	54 (1372)	28 (711)	19.5 (495)
600	2	278 (126)	54 (1372)	28 (711)	19.5 (495)
	3	284 (129)	54 (1372)	28 (711)	19.5 (495)
	4	290 (131)	54 (1372)	28 (711)	19.5 (495)
800-1200	3	482 (219)	74 (1880)	40 (1016)	19.5 (495)
	4	515 (234)	74 (1880)	40 (1016)	19.5 (495)

1. Special Enclosures Type 3R, 12, 4, and 4X weights are up to 22% greater than Type 1 Enclosures
2. Special Enclosures Type 3R, 12, 4, and 4X dimensions may differ. Consult Caterpillar Switchgear Technical Support for details.
3. Packing materials must be added to weights shown. Allow 15% additional weight for cartons, skids, crates, etc.
4. All dimensions and weights are approximate and subject to change without notice.

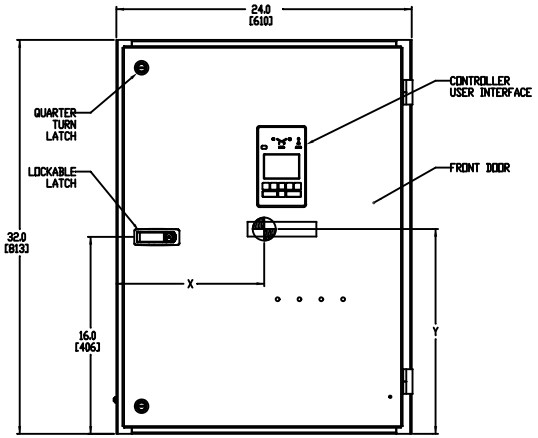
Weights and Dimensions

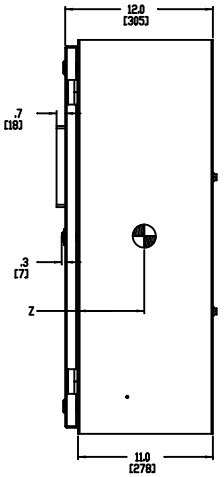
1600 - 3000 Amps

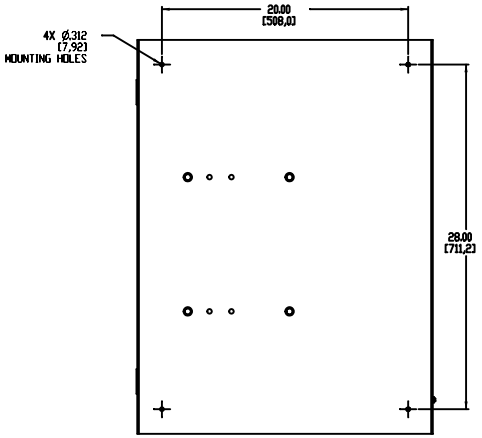


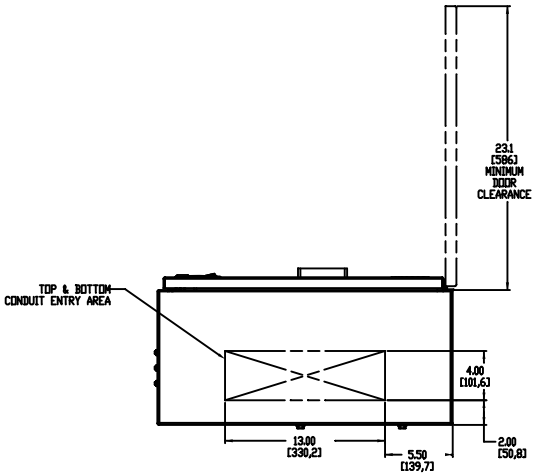
CG Series dimensions and weights, UL Type 1 Enclosure					
Ampere Rating	Poles	Weight[1] lb (kg)	Dimensions[2] in (mm)		
			Height (A)	Width (B)	Depth (C)
1600 - 3000	3	1150 (522)	90 (2286)	35.5 (902)	48 (1219)
	4	1400 (635)	90 (2286)	35.5 (902)	48 (1219)

1. Add 3" in height for lifting eyes.
2. Special Enclosure dimensions may differ (Type 3R, 12, 4, and 4X). Consult Caterpillar for details.
3. Packing materials must be added to weights shown. Allow 15% additional weight for cartons, skids, crates, etc.
4. All dimensions and weights are approximate and subject to change without notice.









AMP	POLE	CONTROLLER TYPE	CABINET #	LUG RANGE	WEIGHT LBS(KG)	CENTER OF GRAVITY INCHES (MILLIMETERS) X	Y	Z
30-200A	2	SEE TABLE A	F-2010MP	QTY 1 4 AWG-300 KCMIL	89(40)	11.3 (287)	15.9 (405)	5.4 (137)
	3				93(42)			
	4				98(44)			

TABLE A - HMI			
TYPE	TRANSITION	LEVEL	PART NO.
CTX	OPEN	2	DXAM11-L2
CTG	OPEN	3	DXAM11-L3
CTGD	DELAYED	3	DXBM11-L3

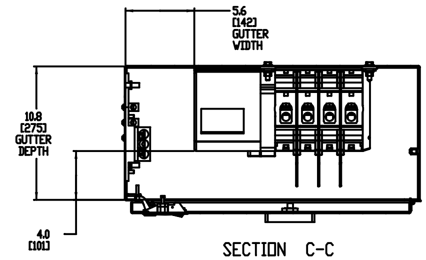
NOTES
1. ENCLOSURE : NEMA TYPE1, WALL MOUNT.
2. MATERIAL:14 GA (.0747) 1018 HRS REF.
3. FINISH : ANSI 61 GREY
4. CONSTRUCTION PER UL 1008 STANDARD.
5. FRONT ACCESSIBLE UNIT. NO SIDE OR REAR ACCESS REQUIRED.
6. SUITABLE WIRE BENDING SPACE PROVIDED PER THE SAFETY AGENCY STANDARDS.
7. UL AND CSA RECOGNIZED/CERTIFIED MECHANICAL LUGS ARE STANDARD.
8. EQUIPMENT GROUND LUG IS PROVIDED IN ALL UNITS. REFER TO SHEET 2 FOR DETAILS.
9. ALL DIMENSIONS ARE FOR REFERENCE ONLY AND SHOWN IN INCHES(MILLIMETERS).
10. 100% RATED SOLID/SWITCHED NEUTRAL PROVIDED PER THE SWITCH CONFIGURATION.
11. SUITABLE FOR TOP AND/OR BOTTOM CABLE ENTRY.

SEISMIC NOTES:

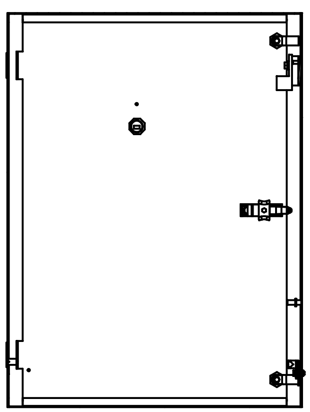
1. CENTER OF GRAVITY DIMENSIONS ARE FOR REFERENCE ONLY.
2. FOR WORKING CLEARANCE REFER TO NATIONAL AND LOCAL CODES AND STANDARDS.

DRAWING FILE: 50C1060	MODEL FILE: 50C1060	CATERPILLAR®	
DATE MODIFIED: 06-Jun-19 09:26:13 AM	DESIGNED BY: APP		
CAD: C067901	APPROVED BY: SR	TITLE: TruONE LAYOUT, 30A-200A NEMA 1	
VOLUME: 0.000 in^3	◇ Critical to Quality Characteristic		
MASS: 0.000 lbm	MATERIAL SPECIFICATION: —	FINISH SPECIFICATION: —	UNITS: In
UNLESS OTHERWISE SPECIFIED	MATERIAL DESCRIPTION: —		SIZE: D
TOLERANCES:	FINISH DESCRIPTION: —		SCALE: 9:100
	ROOT NUMBER: 50C1060	REV: 1	RELEASE STATE: Under Review
	PRODUCT LINE: CTX/CTG(D)		SHEET: 1 of 2

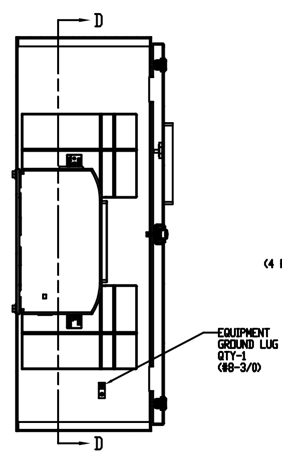
THIRD ANGLE PROJECTION



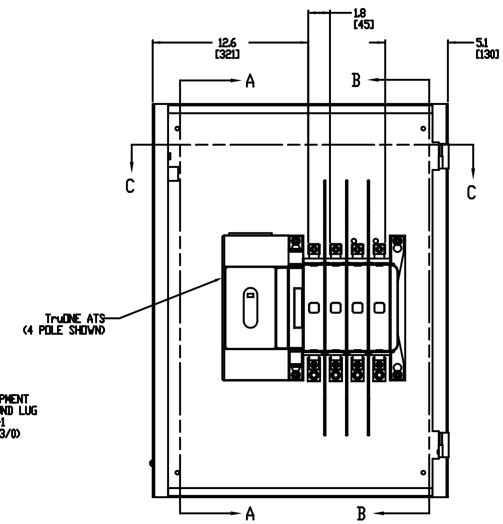
SECTION C-C
TOP VIEW
WITHOUT TOP PANEL



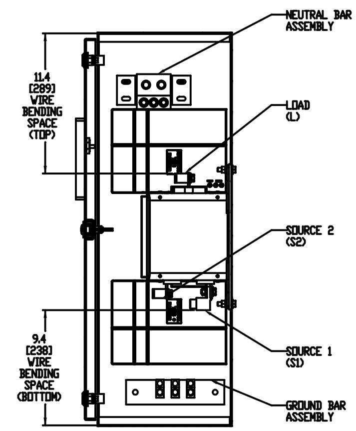
SECTION D-D
DOOR INSIDE VIEW



SECTION A-A
SCALE 15
LEFT SIDE
WITHOUT SIDE PANEL



FRONT VIEW
WITHOUT DOOR

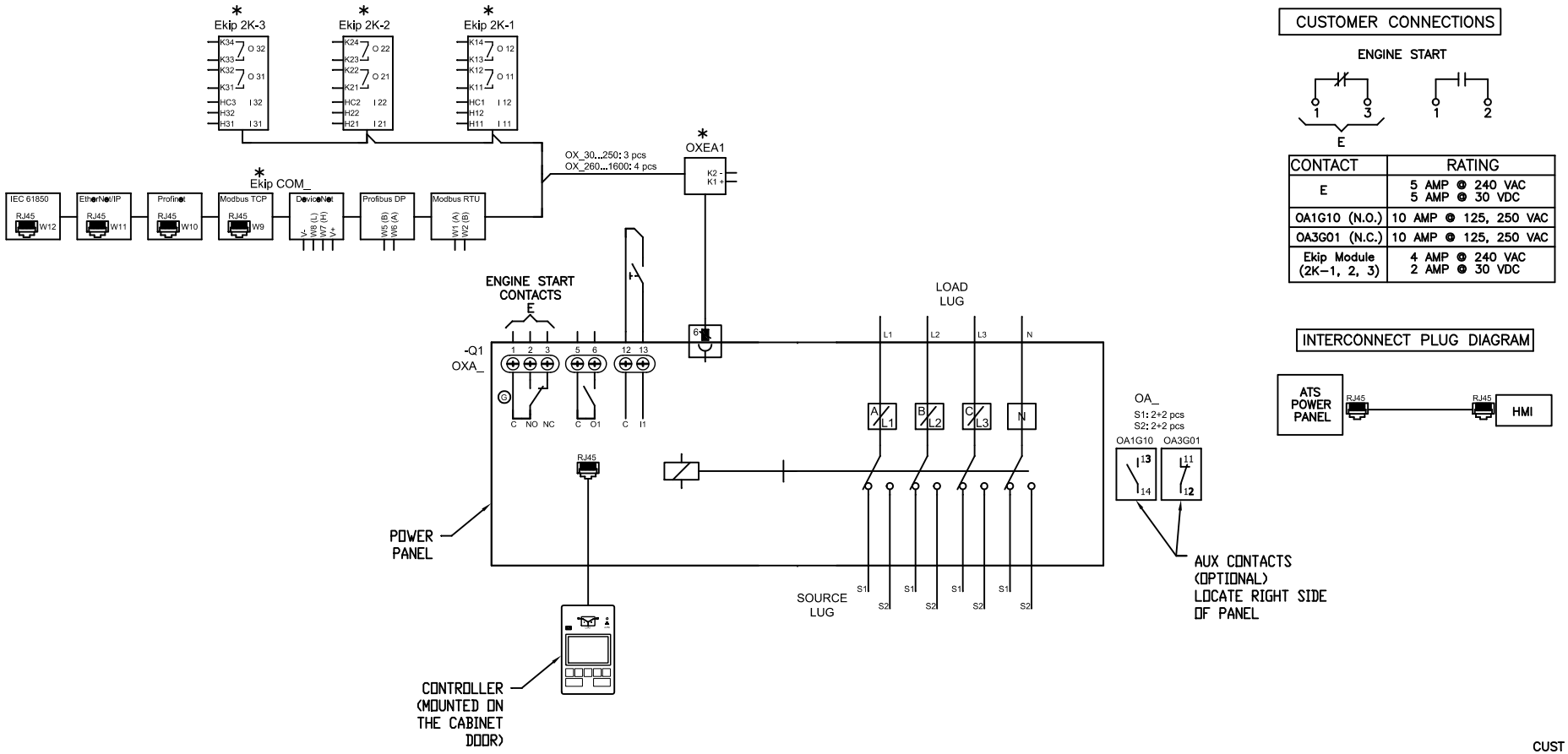


SECTION B-B
RIGHT SIDE
WITHOUT SIDE PANEL

Third Angle Projection

CATERPILLAR®

SIZE	NUMBER	REV
D	50C1060	1
SCALE	PRODUCT LINE	SHEET
9:100	CTX/CTG(D)	2 of 2



CUSTOMER CONNECTIONS

CONTACT	RATING
E	5 AMP @ 240 VAC 5 AMP @ 30 VDC
OA1G10 (N.O.)	10 AMP @ 125, 250 VAC
OA3G01 (N.C.)	10 AMP @ 125, 250 VAC
Ekip Module (2K-1, 2, 3)	4 AMP @ 240 VAC 2 AMP @ 30 VDC

INTERCONNECT PLUG DIAGRAM

CUST

LEGEND	NOTES
* OPTIONAL	

NOTES:

1. ATS SHOWN IN SOURCE 1 POSITION WITH NO POWER AVAILABLE.
2. REFER TO OPERATION AND MAINTENANCE MANUAL TO CONFIGURE THE OPTIONS.
3. # OF N.O. CONTACTS ON POWER PANEL WILL BE DIFFERENT BASED ON THE SWITCH AMPERAGE. REVIEW THE PRODUCT BROCHURE FOR THE DETAILS.

Third Angle Projection

DRAWING FILE 77A2000	MODEL FILE 77A2000	CATERPILLAR®	
DATE MODIFIED 27-Feb-19 07:54:08 AM	DESIGNED BY ---		
Calculated for: VOLUME 0.000 in^3	CN# CN-C067078	APPROVED BY ---	TITLE OPEN TRANSITION ATS SCHEMATIC FOR 30-1200A CTG PRODUCT
	◇ Critical to Quality Characteristic		
MASS 0.000 lbm	MATERIAL SPECIFICATION UNASSIGNED	FINISH SPECIFICATION ---	UNITS in / LOCAL TITLE ---
UNLESS OTHERWISE SPECIFIED TOLERANCE ON: 1 PL DECIMALS ± 0.1 2 PL DECIMALS ± 0.02 3 PL DECIMALS ± 0.005 ANGLES ± 1.0	MATERIAL DESCRIPTION ---		SIZE B / ROOT NUMBER 77A2000 / REV 1 / RELEASE STATE RELEASED
	FINISH DESCRIPTION ---		SCALE 1:1 / PRODUCT LINE CTG / SHEET 1 of 1

us_3rd_b.frm