ADDENDUM TO THE CONTRACT

for the

GLACIER FIRE STATION M/E UPGRADES &
JUNEAU FIRE STATION GENERATOR REPLACEMENT

Contract No. BE22-108

ADDENDUM NO.: **ONE**

CURRENT DEADLINE FOR BIDS:
September 1, 2022

PREVIOUS ADDENDA: **NONE**

ISSUED BY:
City and Borough of Juneau
ENGINEERING DEPARTMENT
155 South Seward Street
Juneau, Alaska 99801

DATE ADDENDUM ISSUED: **August 25, 2022**

The following items of the contract are modified as herein indicated. All other items remain the same. This addendum has been issued and is posted online. Please refer to the CBJ Engineering Public Purchase webpage at: https://www.publicpurchase.com/gems/juneau,ak/buyer/public/home

INFORMATION TO BIDDERS:

- Prospective Bidders are invited to attend a site visit at 1:00pm on Tuesday, August 30.

  The site visit will begin at the Glacier Fire Station at 1700 Crest Avenue, before moving to the Downtown Fire Station at 820 Glacier Avenue.

CLARIFICATIONS:

Question: "*Can you confirm if fire sprinkler shop drawings are required for this project?*"

Response: Fire Sprinkler Shop Drawings are not required. See Specification section 211300 for fire suppression sprinkler requirements.

Question: *"Can we use the generator to provide temporary power while the new utility feed is being installed?"*

Response: The stand-by generator is not available for temporary power.

Question: *"Will the owner be responsible for all O&M information for their provided equipment?"*

Response: Yes.

Question: *"Who will be responsible for fueling and ensuring the owner supplied generator is ready for startup? E.G. check all fluids, belts, hoses, etc. prior to operating the equipment."*

Response: The Contractor shall ensure the generator is ready for startup and commissioning, including providing fuel, per Specification Section 263213.

Question: *"Will testing/startup/programming/adjustment be covered by the owner for OFCI equipment such as the generators and ATSs?"*

Response: No. The Contractor is responsible for these items, per Specification Sections 263213 and 263600.

Question: *"Specification 260000 1.15(E), (F), & (G) call for temporary power connections to the Apparatus Bay Doors, Station Alerting System, & Radio Communication System. Can the power requirements for these systems be further clarified? Also, can it be confirmed that only these systems will require temporary power connections when the main switchboard is being replaced?"*

Response: This question will be addressed in Addendum #2.

Question: *"Can product information be provided for the Stand-by generator panel?"*

Response: See approved Shop Drawing Submittal, attached.

Question: "*Can product data be provided for the (OFCI) ATS?"*

Response: See approved Shop Drawing Submittal, attached, pages 129-146

Question: "*Can the number of raceways and conductors going to each panel to be replaced be clarified?"*

Response: No. The Contractor is responsible for surveying the existing conditions per Specification Section 260000, 1.6.

Question: *"Can it be confirmed that the owner is coordinating & paying AEL&P for transformer and raceway/conductor replacement up to the new MSB's?"*

Response: Yes. AEL&P costs will be paid directly by the Owner. The Contractor is responsible for coordination of the work. We recommend bidders contact AEL&P to confirm the scope of work.

Question: *"It was mentioned in the contract documents that the site conditions should be thoroughly examined prior to bid submissions for both the Juneau and Glacier fire stations. Will the sites be readily available prior to bid submissions for items needing to be examined? Will contractors be free to come and go as needed to clarify site conditions?"*

Response: Submit a written request to the CBJ Project Manager and CCFR Chief Quinto. To minimize disruption to CCFR's operations, reasonable notice is required. No site visits after the deadline for questions – which is Friday, August 26, 2022, 4:30pm.

Question: *"Who currently inspects and upkeeps the fire alarm system for the Juneau and Glacier fire stations?"*

Response: Johnson Controls handles all of CBJ's fire panels currently.

Question: *"What is the make and model of the FACP located at the Glacier fire station?"*

Response: Silent Knight Model SK-5208.

Question: *"Will fire alarm specifications be provided?"*

Response: Fire alarm specifications are not required.

Question: *"On previous projects, the external mounted SPDs were more readily available than the integral SPDs. It caused extensive lead times for the panel replacement materials. Will it be acceptable to have external SPDs in lieu of the integral SPDs?"*

Response: External SPDs are not acceptable.

Question: *"Can it be clarified what assemblies are fire rated and may need fire stopping where penetrations have been made?"*

Response: See original 1980 Sheets A3 and A4 for Fire Rated walls on Glacier Fire Station floors 1 and 2, attached.

Question: *"There are several feeders shown as existing on detail 2 of sheet E301. With the relocation of the MSB are the feeders shown as (E) to be spliced and extended to the new location or pulled new from the MSB to panel served? The work is not detailed on the floor plans or one-line diagram. This work cannot be reasonably inferred from the contract documents, please provide direction."*

Response: Splice and extend feeders.

Question: *"There are loads shown as (F), future, on the one-line diagram, equipment schedule and panel schedules. The size of the raceway along with the number of conductors is detailed in the equipment schedule. Is the extent of this future work limited to supplying the OCPD?"*

Response: Yes.

Question: *"Can the location of the incoming water service, building steel and available Ufer ground be provided for the Glacier fire station so that the length of the grounding conductors can be measured?"*

Response: No. The Contractor is responsible for surveying the existing conditions per Specification Section 260000, 1.6.

Question: "*Can J-hooks be installed above the drop ceilings for installation of communication cabling between the generator and remote annunciator?"*

Response: J-hooks are allowable above accessible ceilings only.

Question: *"It looks like the fence gate operator for access to the airfield is fed from panel "E". Will there need to be any special requirements through the airport for shutting this down or will there need to be any added airport security during this outage?"*

Response: Due to FAA and Airport regulations, the perimeter security gate must remain in operation 24/7.

Question: *"Will SIDA clearance be required if work in the ARFF apparatus bay comes up, work associated with the gate operator or will an escort be provided?"*

Response: The Contractor and Subcontractor's personnel will need to apply for a General Aviation badge. They will need to fill out the form, and have a background check done. This process takes three weeks.

Question: "*After reviewing the equipment schedule, it is not clear if the disconnects and motor starters are new or existing? Also, who should supply these?"*

Response: Disconnects and motor starters are new, and provided by the Electrical Contractor, unless otherwise noted.

Question: "*For existing to remain mechanical loads, is the intent of the project to simply disconnect and reconnect these loads? I am not sure why they are shown as bold, this would be for loads similar to:*
CUH-1
UH-2
UH-3
RF-1
SF-1"

Response: The equipment listed above are either being replaced, or are new, except for SF-1, which is being re-wired. Review the mechanical and electrical plan drawings for coordination.

Question: *"These devices are shown in bold with disconnects but the raceway is existing. Can it be clarified if the extent of the work is disconnecting and reconnecting the equipment or are we to provide new disconnects at these locations?"*

Response: Provide disconnects as scheduled on Drawing E403.

Question: "*On sheet E203 it shows 4 data drops. 2 in each mechanical control panel. Can it be clarified where these cables are to originate from and what equipment the cables are to terminate on? Has it been confirmed if there is available patch panel and switch space?*"

Response: See Sheet Note 1, Drawing E203. Bidders shall assume termination on an existing patch panel.

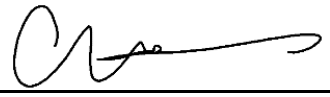
DRAWINGS:

Item No. 1: Drawing E301, GLACIER STATION – SINGLE LINE DIAGRAMS, Detail 1

Revise PAD MOUNTED UTILITY TRANSFORMER ***to*** (P) PAD MOUNTED UTILITY TRANSFORMER.

Item No. 2: Drawing E301, GLACIER STATION – SINGLE LINE DIAGRAMS, Detail 2

Revise (E) PAD MOUNTED UTILITY TRANSFORMER ***to*** REPLACED PAD MOUNTED UTILITY TRANSFORMER.

By: 

Caleb Comas,
Contract Administrator

Total number of pages contained within this Addendum: 153

FIRST FLOOR PLAN

1/8" = 1'-0"

NORTH

LEGEND

ONE HOUR FIRE-RESISTIVE WALL CONSTRUCTION ACOUSTICALLY INSULATING WALL (3" BLANKETS) - CAULK ALL WALL EDGES.

ADDITIVE ALTERNATE TRAINING TOWER SEE SHEET A-1.0

ADDITIVE ALTERNATE BAY SEE SHEET A-1.5

ACKLEY & ASSOCIATES INC. ARCHITECTS

STATE OF ALASKA 49TH DOUGLAS ACKLEY 534-A REGISTERED PROFESSIONAL ARCHITECT

GLACIER VOLUNTEER FIRE DEPARTMENT & AIRPORT CRASH-FIRE-RESCUE STATION

CITY & BOROUGH OF JUNEAU, ALASKA

FEDERAL AVIATION ADMINISTRATION ADAP 6-02-0133-06

E-78-28

AS BUILT OCT. '80 KA

DRAWN F. BROWN

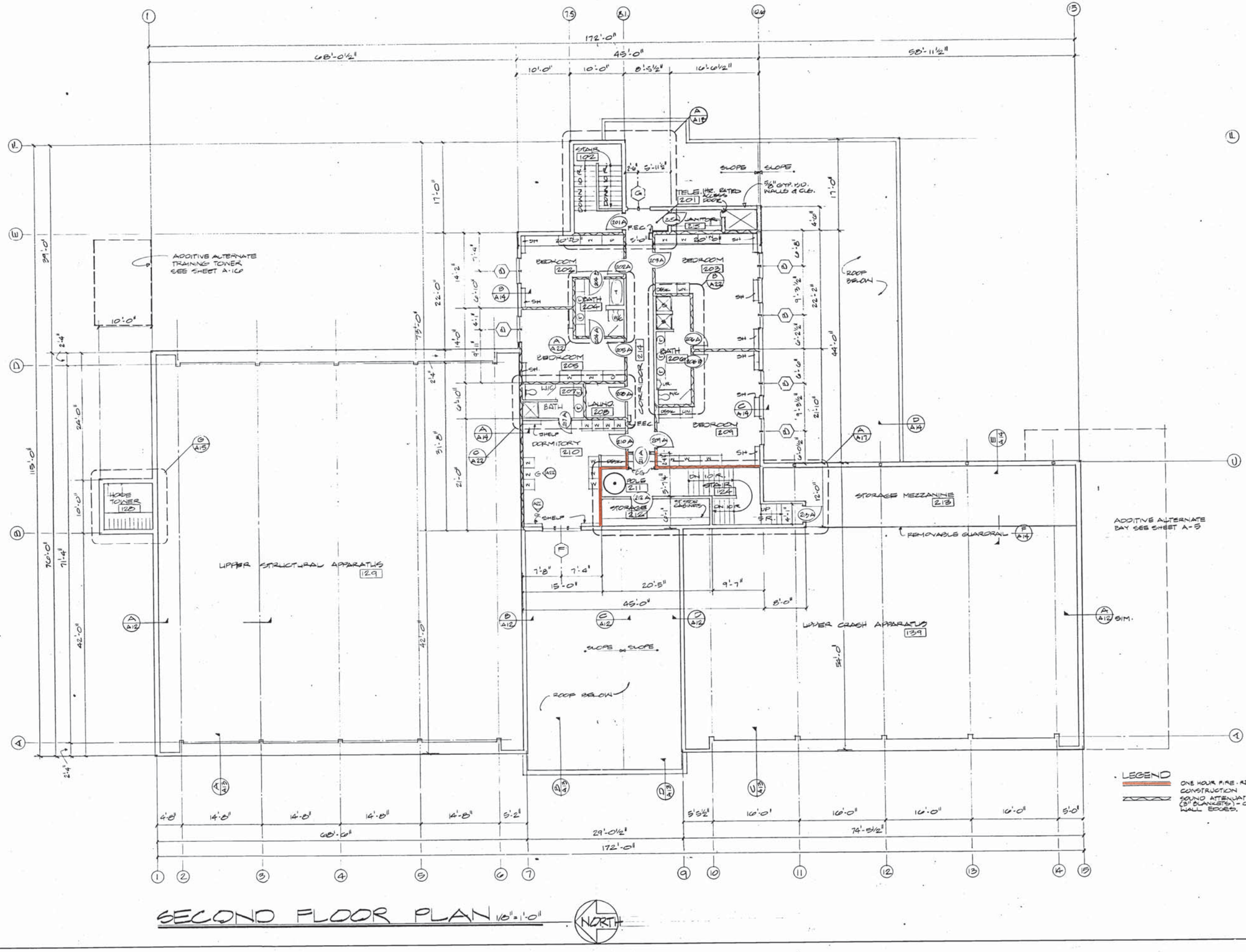
DATE NOV. 1978

ARCHITECTURAL

FIRST FLOOR PLAN

SHEET a-3 OF 27

1557



SECOND FLOOR PLAN 1/8"=1'-0"

NORTH

ACKLEY & ASSOCIATES INC. ARCHITECTS

STATE OF ALASKA 49TH DOUGLAS ACKLEY 534 A REGISTERED PROFESSIONAL ARCHITECT

GLACIER VOLUNTEER FIRE DEPARTMENT & AIRPORT CRASH-FIRE-RESCUE STATION

CITY & BOROUGH OF JUNEAU, ALASKA
FEDERAL AVIATION ADMINISTRATION ADAP 6-02-0133-06

E-78-28

AS BUILT
OCT. '80 K.O.

DRAWN
F. BROWN

DATE
NOV. 1978

ARCHITECTURAL

SECOND FLOOR PLAN

SHEET
a-4 OF 27

1557

NC POWER SYSTEMS CAT

JUNEAU FIRE STAT
TECHNICAL SUBMITTA

CATERPILLAR C9 PGAM 30
PACKAGED STATIONARY DIESEL ENGINE
RATED 300KW STANDBY POWER, 208/120VA

NC PROJECT # 220316
NC QUOTE # 31017427-1A

PREPARED FOR:
CITY AND BOROUGH OF JUNEAU
PO. # 114783

PROJECT:
JUNEAU FIRE STATION
JUNEAU, AK

COMPILED BY:
N C POWER SYSTEMS CO.
6405 ARCTIC BLVD, ANCHORAGE, AK 99518
(907) 786-7500

ROB COLLINS – SALES REPRESENTATIVE
ANDY MILLER – PROJECT MANAGER

SUBMITTAL REVISION: PRELIMINARY
AUGUST 4, 2022

HR3

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JUNEAU FIRE STATION
C9 PGAM 300EKW DIESEL GENERATOR SET
300KW STANDBY, 208/120VAC, 3-Φ, 0.8PF, 60Hz

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NC POWER SYSTEMS

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PROJECT: JUNEAU FIRE STATION

DATE: 29-Jul-22
PROJECT No. 220316

C9 PGAM 300EKW DIESEL GENERATOR SET
300kW STANDBY, 208/120VOLT, 3-Φ, 0.8PF, 60Hz

ITEM	QTY	NUMBER	DESCIPTION
			C9 PGAM 300EKW DIESEL GENERATOR SET
1	2	C09DE48	300kW STANDBY, 208/120VOLT, 3-Φ, 0.8PF, 60Hz
			EXHAUST SYSTEM
			- Exhaust manifold; dry
			AIR INLET SYSTEM
			- Aftercooler core
			- Turbocharger
			FUEL SYSTEM
			- Primary fuel filter w/integral water separator & secondary filter
			- Fuel cooler
			- Fuel priming pump
			- Flexible fuel lines
			- Engine fuel transfer pump
			GENERATORS AND GENERATOR ATTACHMENTS
			- Brushless, self-excited 2/3 pitch, random wound
			- IP23 Protection
			- Insulation Class H and temperature rise
			- Power center, IP22 bottom cable entry
			- Segregated low voltage wiring panel
			GOVERNING SYSTEM
			- Cat Electronic Governor (ADEM A4)
			LUBE SYSTEM
			- Oil cooler
			- Lubricating Oil
			- Oil filter and dipstick
			- Oil drain lines with valve; piped to edge of base
			- Fumes disposal; piped to front of radiator
			PROTECTION SYSTEM
			Safety shutoffs for:
			- High water temperature
			- Overspeed
			- low Oil pressure
			COOLING SYSTEM
			- Coolant drain line with valve; terminated on edge of base
			- Fan and belt guards
			- Coolant Level Sensor
			- Thermostats and housing, full open temperature 92 deg C (198 deg F)
			- Coolant Level sight gauge
			- Jacket water pump, gear driven, centrifugal
			- Caterpillar Extended Life Coolant
			STARTING/CHARGING SYSTEM
			- 24-volt electric starting motor
			- 24V, 45 amp charging alternator
			GENERAL
			- Paint, Caterpillar Yellow
			- Vibration damper
			- Parts book
			- Operation & maintenance manual pack and Storage Compartment
			Wiring diagrams included

NC POWER SYSTEMS CAT

SCOPE OF SUPPLY

CUSTOMER: CITY AND BOROUGH OF JUNEAU
PROJECT: JUNEAU FIRE STATION

DATE: 29-Jul-22
PROJECT No. 220316

C9 PGAM 300EKW DIESEL GENERATOR SET
300kW STANDBY, 208/120VOLT, 3-Φ, 0.8PF, 60Hz

ITEM	QTY	NUMBER	DESCIPTION
			C9 PGAM 300EKW DIESEL GENERATOR SET
			CATERPILLAR COMPONENTS (FEATURES):
2	2	CERTESE	EPA STATIONARY EMERGENCY
3	2	60H0208	60HZ 208 VOLT (WYE)
4	2	STANDBY	STANDBY POWER
5	2	KW00300	300ekW, 60Hz, 1800rpm
6	2	ULLIST	UL 2200 LISTED PACKAGE GEN SET
7	2	IBCSCCB	IBC SEISMIC CERT OF COMPLIANCE
8	2	LANENGO	ENGLISH INSTRUCTION LANGUAGE
9	2	MSEPGGN	GENERAL EPG
10	2	MSCEC77	PUBLIC OR CIVIL SERVICES
11	2	MWCODEF	STANDBY POWER
12	2	WELL	AUTHORIZED APPROVAL NUMBER
13	2	SHK0012	SPACE HEATER 12
14	2	GENT105	105C TEMP RISE OVER 40C AMB
15	2	OGNSEU5	LC6114B SE CIP ALT U5
16	2	STDIVR	INTEGRATED VOLTAGE REGULATOR
17	2	EMCCAS3	GEN RUNNING & FAULT RELAY
18	2	PMEXCI3	PERMANENT MAGNET EXCITATION 03
19	2	CT1505A	1500:5 CT RATIO
20	2	GENMTG	GEN MOUNTING DUCT PLATE
21	2	NOCOLDB	NO COLD WEATHER BUNDLE
22	2	FAHL90	AUD&VIS FUEL ALARM (90% LEVEL)
23	2	MNTWB08	WIDE BASE
24	2	FTDW008	660 GALLONS SUB TANK BASE
25	2	FSCO5G	5 GALLON SPILL CONTAINMENT
26	2	ENCAL07	ALUMINUM SA L1 -WHITE COLD WEA
27	2	IBCWBC2	150 MPH IBC CERT WIND ENCLOSU
28	2	ELACDC1	ENCLOSURE LIGHTS
29	2	MOTDMP	MOT INLET & GRAVITY DISCG DAMP
30	2	EMCP42B	EMCP4.2B CONTROL PANEL
31	2	GFR001	GROUND FAULT RELAY INDICATION
32	2	BAT2454	STANDARD WET BATTERY
33	2	BTC1028	BATTERY CHARGER 10 AMP
34	2	WHHH03	JACKET WATER HTR PUMP STYLE 03
35	2	EMCCPLH	CONTROL PANEL MOUNTING LEFT
36	2	LDC125A	125A LOAD CENTER
37	2	GFCICS1	20A GFCI (CONTROLS SIDE)
38	2	HTRCG01	HEATER CONTROL GROUP
39	2	DUAL	DUAL CIRCUIT BREAKER
40	2	PWRCTRH	POWER CENTER - RH MOUNTED
41	2	CBK0708	1200A LSI MULT MANUAL 1ST CB
42	2	CBK0713	1200A LSI MULT MANUAL 2ND CB
43	2	NOSUSE	NO SUSE DECALS & FILMS
44	2	CBAUX1	1ST BREAKER AUXILIARY CONTACTS
45	2	NTS2	NEUTRAL BAR NTS2
46	2	CBLG001	CB CABLE GP ABB/T7-1200
47	2	CBLG201	2ND CB CABLE GP ABB/T7-1200
48	2	NCBG003	NEUTRAL CABLE GP 1200A
49	2	STDAIR	STD AIR CLEANER - LIGHT DUTY

NC POWER SYSTEMS CAT

SCOPE OF SUPPLY

CUSTOMER: CITY AND BOROUGH OF JUNEAU
PROJECT: JUNEAU FIRE STATION

DATE: 29-Jul-22
PROJECT No. 220316

C9 PGAM 300EKW DIESEL GENERATOR SET
300kW STANDBY, 208/120VOLT, 3-Φ, 0.8PF, 60Hz

ITEM	QTY	NUMBER	DESCIPTION
			C9 PGAM 300EKW DIESEL GENERATOR SET
50	2	STDRAD	STANDARD RADIATOR
51	2	MUFSA42	SA LEVEL 2 MUFFLER
52	2	EMCLAM1	LOCAL ANNUN NFPA99-110/CSA282
53	2	ANNR001	QTY REMOTE ANNUNC
54	2	ANNMB01	ANNUNCIATOR BOX
55	2	ANNR010	QTY REMOTE ANNUNC
56	2	EMGSTP1	REMOTE E-STOP BUTTON
57	2	PL444	PRODUCT LINK 4G LTE TELEMATICS
58	2	AM	AMERICAS BAND
59	2	TCVYES	ACCEPT - REVIEW LINK IN DESC
60	2	STDTEST	STD TEST - PKG GEN SET 0.8 PF
61	2	CATDEC	CAT DECALS
62	2	SWP0021	SHRINK WRAP PROTECTION 21
63	2	TRSGEN7	PGS TEST REPORT @ 0.8 PF
64	2	ESD	CAT 5 YR/2500 HRS PLATINUM LEVEL WARRANTY - ZERO DEDUCTIBLE
ITEM	Qty		**DEALER SITE SERVICES:**
65	2		NC COMMISSIONING / LOAD BANK / STAFF DEMONSTRATION
66	2		CUSTOMER VALUE AGREEMENT
ITEM	Qty		**DEALER SHIPPED LOOSE ITEMS:**
67	2	ATC3C5X31200BSU	AUTOMATIC TRANSFER SWITCH 1200A, 3P, OPEN TRANS, NEMA 1, ATC-300+ Product Family: Wall Mount Switch Type: Automatic Contactor 40A thru 1600A 208/120v, 60hz, 3 Phase, 4 Wire, 3 poles Transition Mode: Open Controller Type: ATC-300+ Continuous Current: 1200 Amps Withstand: 05 sec) Normal Source Terminals: (4) 1/0-750 CU/AL Emergency Source Terminals: (4) 1/0-750 CU/AL Load Side Terminals: (4) 1/0-750 CU/AL Neutral Terminals: (12) 1/0-750 CU/AL *INCLUDES FACTORY TECHNICIAN ONSITE SET UP/DEMONSTRATION
ITEM	Qty		**ADDITIONAL COMPONENTS:**
68	-	N/A	N/A

JUNEAU FIRE STATION
C9 PGAM 300EKW DIESEL GENERATOR SET
300KW STANDBY, 208/120VAC, 3-Φ, 0.8PF, 60Hz

CLARIFICATION OF SUPPLY

NC Power Systems Co. will not supply the following items unless they are specifically itemized in the quotation, purchase order, or subsequent change orders.

1. Off engine piping of any kind (vents, fuel etc.).
2. Pipe hangers, brackets, isolators, or in-line valves for item 1.
3. Off engine wiring, conduit, conduit fittings, or lugs.
4. Design of the systems described above.
5. Electrical components required by code but not detailed in the specification.
6. Concrete Slabs.
7. Anchors.
8. Unloading at the jobsite. Cranes, Rigging. Installation.
9. Filling of fuel for testing or training and upon completion of this period, the refill of full supply of fuel.
10. Prices do not include installation, fuel, any local taxes, second freight charges, off-engine pumps or piping for fuel or exhaust systems, ducting air intake/exhaust or flex adapters, unit off-loading or setting in place, fuel permits, licenses that may applicable.
11. NC Power Systems Co. is supplying equipment only. Installation of all shipped loose components is the responsibility of the installing contractor.
12. Caterpillar Application and Installation guides are available.
13. Installation, startup and commissioning to be quoted and provided by nearest local contractor.

The proposed equipment are in compliance with the project specifications, except as noted below:

1. Not applicable, no specification given to review

NC POWER SYSTEMS CAT

SECTION 1
CERTIFICATIONS

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ATTACHMENTS

CAT®

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

UL Listing is available on all diesel fuelled generator sets up to 17S kW at 60 Hz, 600 vac maximum.

LEHE0410-01 (11-18)

BUILT FOR IT.™

CERTIFICATE OF COMPLIANCE
SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certification No.

VMA-50365-01C (Revision 13)

Expiration Date: 9/30/2023

Certification Parameters:

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

IBC 2018, 2015, 2012, 2009, 2006

The following model designations, options, and accessories are included in this certification. Reference report number VMA-50365-01 as issued by The VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

Caterpillar; Diesel Gensets
Series C4.4LC, C4.4, C6.6, C7.1, C9, C13, C15, C18

The above referenced equipment is **APPROVED** for seismic application when properly installed[3], used as intended, and contains a Seismic Certification Label referencing this Certificate of Compliance[4]. As limited by the tabulated values, below grade, grade, and roof-level installations, installations in essential facilities, for life safety applications, and/or of equipment containing hazardous contents are permitted and included in this certification with an Equipment Importance Factor assigned as I_p=1.5. The equipment is qualified by comparative analysis and successful seismic shake table testing at the nationally recognized University of California Berkeley Pacific Earthquake Engineering Research Center and CERL (US Army Corp. of Engineers) Laboratory under the review of the ISO Accredited Product Certification Agency, the VMC Group.

Certified Seismic Design Levels			
Certified **IBC**	**Importance $I_p \leq 1.5$** Soil Classes A-E Risk Categories I-IV Design Categories A-F	z/h ≤ 1.0	z/h = 0.0
		$S_{DS} \leq 0.753$ g	$S_{DS} \leq 2.260$ g

Certified Seismic Installation Methods[8]	
Rigid Mounting From Unit Base To Rigid Structure	Rigid Mounting From Unit Base To Fuel Tank
External Isolation Mounting From Unit Base To Rigid Structure	

HEADQUARTERS
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TEXAS
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Houston, TX 77041
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Fax: 713.466.1355

thevmcgroup.com

VMC GROUP
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CATERPILLAR®

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certified Product Table:

Series	Max Rating [kW]	EPA Rating	Length [in]	Width [in]	Height [in]	Max. Off Tank Weight [lbs]	Max. On Tank Weight [lbs]	S_{DS} at z/h=0.0	S_{DS} at z/h=1.0	Certified Installation Methods
C4.4LC	60	Tier 3	98	43	78	2,293	4,979	2.49	0.83	Rigid
C4.4	100		136	44	92	3,961	8,516			
C6.6	175		198		96	5,080	12,752			
C7.1	200					5,338	13,010			
C9	300		219	81	114	8,364	19,850	2.26	0.75	Rigid and Externally Spring Isolated
C13	400		286		124	11,036	30,864			
C15	450		251		127	11,393	28,504			
	500	Tier 2				11,923	29,034			
C18	600		286		124	12,179	32,031			
	500	Tier 4F	247	90	111	13,720	21,687			
	750	Tier 2	275	91	106	15,585	N/A			Rigid
						N/A	28,209		1.29	

Group	Type	SDS (z/h=0)	SDS (z/h=1)	A_{Flex-H}	A_{Rig-H}	A_{Flex-V}	A_{Rig-V}	F_p/W_p
Seismic	AC156	2.26	0.75	2.26	0.9	1.51	0.6	0.54

Notes:
1. Weights include genset, enclosure (where applicable), tank and fuel (where applicable)
2. For a detailed list of weights, certified installation methods, and certified seismic design levels please refer to the certification report referenced on the first page of this certificate.

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

IBC CERTIFIED VMC GROUP

VMA-50365-01C (Revision 13)
Issue Date: Friday, May 6, 2016
Revision Date: Friday, November 20, 2020
Expiration Date: Saturday, September 30, 2023

CERTIFICATE OF COMPLIANCE

SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Notes & Comments:

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

2. The following building codes are addressed under this certification:
   IBC 2018 referencing ASCE7-16 and ICC-ES AC-156
   IBC 2015 referencing ASCE7-10 and ICC-ES AC-156
   IBC 2012 referencing ASCE7-10 and ICC-ES AC-156
   IBC 2009 referencing ASCE7-05 and ICC-ES AC-156
   IBC 2006 referencing ASCE7-05 and ICC-ES AC-156

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

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

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

6. This certificate applies to units manufactured at:
   1720 West Kingsbury Street, Seguin, TX 78155
   Rodovia Luiz de Queiorz-KM 157 CEP 13420-900, Piracicaba/SP-Brazil

7. This certification follows the VMC Group's ISO-17065 Scheme.

8. The certified seismic installation methods states are a summary for all series this certificate covers, for more detailed information on the certified seismic installation methods, see the certified product tables.

John P. Giuliano, PE
President, VMC Group

VMA-50365-01C (Revision 13)
Issue Date: Friday, May 6, 2016
Revision Date: Friday, November 20, 2020
Expiration Date: Saturday, September 30, 2023

CERTIFICATE OF COMPLIANCE

WIND RESISTANT DESIGN CERTIFICATION OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certification No.

VMA-50365-02C (Revision 6)

Expiration Date: 12/31/2024

Certification Parameters:

The nonstructural products listed on this certificate are CERTIFIED FOR WIND APPLICATIONS in accordance with the following building code[1] releases.

IBC 2009, 2012, 2015, 2018

The following model designations, options, and accessories are included in this certification. Reference report number **VMA-50365-02** as issued by VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

CAT C Series Diesel Fuel Generator Set Enclosures

The above referenced equipment is **APPROVED** for wind application when properly installed[2], used as intended, and contains a Wind Certification Label referencing this Certificate of Compliance[3]. As limited by the tabulated values, installations in essential facilities, for life safety applications, and/or of equipment containing hazardous contents are permitted and included in this certification.

Certified Wind Design Levels				
Certified **IBC 2018**	**Importance IP ≤ 1.15** Exposure Categories B-D Risk Categories I-IV	**V ≤ 112 mph** V ≤ 50 m/s		**V ≤ 82 mph** V ≤ 37 m/s
		z ≤ 15 ft z ≤ 5 m		**z ≤ 500 ft** z ≤ 152 m
		Pressure Basis[4]	$\frac{F_h}{A_f} = q_z G C_f =$	**53.03 lbs/ft²** 2.65 kPa

Certified Wind Installation Methods
Rigid mounting from unit base to rigid structure

VMC GROUP
THE POWER OF TOGETHER

CATERPILLAR®

CERTIFICATE OF COMPLIANCE

WIND RESISTANT DESIGN CERTIFICATION OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certified Product Table:

Model	Type	Material	Wind Velocity z ≤ 15 ft. Exposure B			Wind Velocity z ≤ 15 ft. Exposure C			$\frac{F_h}{A_f}$ [psf]
			ASCE 7-16	ASCE 7-10	ASCE 7-05	ASCE 7-16	ASCE 7-10	ASCE 7-05	
C2.2	Sound Attenuated Level 1	Steel	183 mph	183 mph	240 mph	150 mph	150 mph	197 mph	78.92
C4.4	Weather Protective	Steel							
	Sound Attenuated Level 1	Steel							
	Sound Attenuated Level 2	Steel							
	Sound Attenuated Level 2	Aluminum							
C6.6	Weather Protective	Steel							
	Sound Attenuated Level 1	Steel							
	Sound Attenuated Level 2	Steel							
	Sound Attenuated Level 2	Aluminum							
C7.1	Weather Protective	Steel							
	Sound Attenuated Level 1	Steel							
	Sound Attenuated Level 2	Steel							
	Sound Attenuated Level 2	Aluminum							
C9	Weather Protective	Steel	150 mph	150 mph	197 mph	123 mph	123 mph	161 mph	53.03
	Sound Attenuated Level 1	Steel							
	Sound Attenuated Level 2	Steel							
	Sound Attenuated Level 2	Aluminum							
C13	Weather Protective	Steel							
	Sound Attenuated Level 1	Steel							
	Sound Attenuated Level 1	Aluminum							
	Sound Attenuated Level 2	Steel							
C15	Weather Protective	Steel							
	Sound Attenuated Level 1	Steel							
	Sound Attenuated Level 1	Aluminum							
	Sound Attenuated Level 2	Steel							
C18	Weather Protective	Steel							
	Sound Attenuated Level 1	Steel							
	Sound Attenuated Level 1	Aluminum							
C18 Tier 4F	Sound Attenuated Level 1	Steel							
C18 (650-750kW)	Sound Attenuated Level 1	Steel							
	Sound Attenuated Level 1	Aluminum							
	Cold Weather	Steel							
	Cold Weather	Aluminum							

IBC CERTIFIED VMC GROUP

VMA-50365-02C (Revision 6)
Issue Date: December 02, 2016
Revision Date: December 27, 2021
Expiration Date: December 31, 2024

VMC GROUP
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CERTIFICATE OF COMPLIANCE

WIND RESISTANT DESIGN CERTIFICATION OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Level Comparison Table:

C2.2, C4.4, C6.6 & C7.1 Gensets

IBC		2018			2015, 2012			2009		
ASCE		7-16			7-10			7-05		
Exposure Catergory		B	C	D	B	C	D	B	C	D
Velocity[5] (mph)	z ≤ 15 ft	183	150	136	183	150	136	240	197	179
	z ≤ 500 ft	111	104	100	145	136	132	145	136	132

C9, C13, C15, C18, & C18PD Gensets

IBC		2018			2015, 2012			2009		
ASCE		7-16			7-10			7-05		
Exposure Catergory		B	C	D	B	C	D	B	C	D
Velocity[5] (mph)	z ≤ 15 ft	150	123	112	150	123	112	197	161	146
	z ≤ 500 ft	91	85	82	119	112	108	119	112	108

IBC CERTIFIED VMC GROUP

VMA-50365-02C (Revision 6)
Issue Date: December 02, 2016
Revision Date: December 27, 2021
Expiration Date: December 31, 2024

CERTIFICATE OF COMPLIANCE

WIND RESISTANT DESIGN CERTIFICATION OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Notes and Comments:

1. The following building codes are addressed under this certification:

   ASCE 7-05 - Minimum Design Loads for Buildings and Other Structures
   ASCE 7-10 - Minimum Design Loads for Buildings and Other Structures
   ASCE 7-16 - Minimum Design Loads for Buildings and Other Structures
   IBC 2009 – referencing ASCE 7-05
   IBC 2012 – referencing ASCE 7-10
   IBC 2015 – referencing ASCE 7-10
   IBC 2018 – referencing ASCE 7-16

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

3. For this certificate to remain valid, it must correspond to the “Wind Certification Label” found affixed to the unit by the factory. The label ensures the manufacturer built the unit in conformance to the IBC wind design criteria set forth by the Product Certification Agency, The VMC Group, and meets the wind design levels claimed by this certificate.

4. The qualified wind design pressure stated is for the horizontal wind pressure for applications utilizing ASCE 7-10, for more detailed ranges of qualified wind design levels, sees the report cited on Page 1. This wind design pressure utilizes LRFD load combinations.

5. Design velocity (highlighted in yellow) was chosen based on the corresponding ASCE 7 wind map. Other velocities were derived from the design pressure resulting from the design velocity.

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

7. This certificate applies to units manufactured at:
   1720 West Kingsbury Street, Seguin, TX 78155
   Rodovia Luiz de Queiorz-KM 157 CEP 13420-900, Piracicaba/SP-Brazil

John P. Giuliano, PE
President, The VMC Group

VMA-50365-02C (Revision 6)
Issue Date: December 02, 2016
Revision Date: December 27, 2021
Expiration Date: December 31, 2024

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2022 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: **NPKXL07.0PW1-002**

Effective Date: 09/23/2021

Expiration Date: 12/31/2022

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 09/23/2021

Revision Date: N/A

Model Year: 2022
Manufacturer Type: Original Engine Manufacturer
Engine Family: NPKXL07.0PW1

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 225<=kW<450
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.

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Effective with sales to the first user on or after July 1, 2021

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:

T**HIS 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 100,000 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.

ELECTRIC POWER EXTENDED SERVICE COVERAGE

Backed by the Power of Cat

Whether you need Prime Power or Standby, you can protect your Electric Power solution with Extended Service Coverage (ESC) from the Caterpillar® dealer network.

Your ESC provides 100 percent of usual and customary parts and labor costs for engine failures due to defect in materials and workmanship on covered components.

COVERAGE THAT IS RIGHT FOR YOU

Prime Power Coverage

Platinum coverage - this includes all original factory equipment with Cat part numbers, excluding consumables such as filters, hoses and belts.

Standby Power Coverage

Select the level of coverage that meets your need.
Silver coverage includes a wide range of covered components and you have confidence that ESC repairs will be done by trained professionals who use genuine Cat® parts.
Gold coverage includes all the same items as silver, as well as turbochargers, injectors and water pumps.
Platinum coverage for Standby units (over three liters) also covers generator rental expenses up to $20,000 per occurrence, if the unit is down for more than 48 hours for a covered repair.

Extended Service Coverage for Electric Power is available everywhere in the world. So whether your unit remains in one location or is mobile around the globe, the Cat dealer network is available to serve you.

COVERAGE AVAILABLE FOR THE LONG TERM

An ESC from the Caterpillar dealer network can protect your Electric Power unit for up to 5 years. You can choose from a variety of coverage terms.

COVERAGE FOR YOUR FULLY INTEGRATED CAT POWER SOLUTION

You turn to Cat for a total Electric Power solution, and you can select an ESC to cover it. See your Cat dealer today.

CATERPILLAR®

Electric Power Coverage Matrix

Platinum Level Coverage Components: All as shipped consist from the factory with Caterpillar part numbers excluding filters, fluids, vee belts, hoses, power take-offs, paint, batteries and clutches. Also for power modules, coverage excludes containers, undercarriage, ladders, lights, wheels, axles, brakes, tires, stabilizing jacks and fire extinguishers.

Item	Silver	Gold
COOLING SYSTEM		
Thermostat Housing	Yes	Yes
Water Manifold Housing	Yes	Yes
Jacket Water Precooler	Yes	Yes
Jacket Water Pump	No	Yes
FUEL SYSTEM		
Steel Fuel Lines	Yes	Yes
Fuel Shutoff Solenoid	Yes	Yes
Fuel Injectors	No	Yes
LUBRICATION SYSTEM		
Oil Pan	Yes	Yes
Engine Oil Pump	Yes	Yes
Oil Cooler Housing & Core / Bonnet	Yes	Yes
Oil Filter Base	Yes	Yes
ELECTRONIC SYSTEM		
Electronic Control Module (ECM)	Yes	Yes
Sensors: all engine sensors	Yes	Yes
FRONT AND REAR COVERS		
Front Covers / Plate / Housing / Gears & Gaskets	Yes	Yes
Vibration Damper	Yes	Yes
Flywheel Housing & Gasket	Yes	Yes
MISCELLANEOUS		
Cat Bolts, Attaching Covered Components	Yes	Yes
GENERATOR END		
Entire Generator End	Yes	Yes
Generator Controls (EMCP, Wiring)	Yes	Yes
AIR INDUCTION & EXHAUST		
Exhaust Manifolds, Studs & Gaskets	Yes	Yes
Inlet Air Heater Relay	Yes	Yes
Intake Manifold	Yes	Yes
Turbocharger (mounting hardware, lines, wastegate)	No	Yes
SHORT BLOCK		
Cylinder Block Casting	Yes	Yes
Freeze Plugs	Yes	Yes
Crankshaft	Yes	Yes
Crankshaft Rod, Main & Thrust Bearings	Yes	Yes
Connecting Rod Assembly	Yes	Yes
Piston, Wrist Pin, Retainer Clip & Piston Rings	Yes	Yes
Piston Cooling Jet Tubes	Yes	Yes
Cylinder Liner, Seals & Filler Band	Yes	Yes
Main Bearing Cap Bolts	Yes	Yes
CYLINDER HEAD		
Cylinder Head Casting, Sleeves, Bolts & Gaskets	Yes	Yes
Freeze Plug	Yes	Yes
Spacer Plate & Spacer Plate Gasket	Yes	Yes
Intake & Exhaust Valve (all related components)	Yes	Yes
Roller Follower	Yes	Yes
Valve Mechanism, Rocker Arm, Brackets, Push, Tube, Bridge Dowels, Adjusting Screws, Nuts & Shaft	Yes	Yes
Valve Cover & Base	Yes	Yes
Camshaft, Camshaft Bearings, Key, Gear	Yes	Yes
Camshaft Rear Cover / Seal	Yes	Yes

SILVER and GOLD Level Coverage Components

All engine covered components listed plus base radiator, fuel tank, generator-mounted control panel, generator rotor & stator, bearings, exciter, EMCP Module, voltage regulator, and start/stop module. EPG Power Module - All Generator Set covered components listed above plus transfer switch and/or switchgear as shipped from the factory.

Travel & Mileage Limitations:

For Caterpillar generator sets up to and including 7 liter displacement, for ATS models up to and including 1,200 amperes and for all Olympian products

- Up to 4 hours and 0 miles / 0 kilometers travel allowance

For all other models

- Up to 8 hours and 320 miles / 515 kilometers travel allowance

Important Notice:

All Covered Components must pass inspection or be replaced at the proper intervals by an authorized dealer as prescribed in the Manufacturer's Operation and Maintenance Manual to qualify for continued coverage under this contract. **Failure to follow the Manufacturer's Operation and Maintenance Manual will result in denial of claims.**

Additional coverage for Cat Standby Generator Sets over 3 liter displacement with Platinum Level Extended Coverage: Additional coverage is allowed if repairs can not be completed within 48 hours of the authorized dealer technician's initial visit for a covered mechanical breakdown due solely to the nature of the mechanical breakdown or Cat's inability to supply the required repair components. Up to $20,000 (US$) is allowed for rental genset expenses that are hereby defined as the reasonable and customary rental charge, mileage per guidelines given in the repairer travel & mileage limitations section of this contract and the necessary labor for connection & disconnection to your facility of the Rental GenSet from an authorized dealer.

This is a brief description of Extended Coverage. See your Cat dealer for more information. The Extended Coverage contract will govern.

Note: components not listed in the coverage matrix are not covered under Silver or Gold level coverage options.

CATERPILLAR®

LEYE5135-03

CAT® PROTECTS YOUR INVESTMENT AT NO ADDITIONAL COST

5 YEAR PLATINUM EXTENDED SERVICE COVERAGE (ESC) **NOW INCLUDED** WITH YOUR CAT STANDBY GENERATOR SET PURCHASE*

*Applicable to diesel C4.4 - C32 gensets only

Your operation depends on reliable power. That's why you trust Cat® generator sets. With the most robust ESC in the industry, you receive coverage that's just as durable and long lasting. ESC protects your investment and your peace of mind.

Platinum level ESC is a reliable top choice coverage from Caterpillar. It covers the as-shipped consist of the generator set from the factory and offers Additional Allowances. Some exclusions apply.

COOLING SYSTEM	PLATINUM
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 AND EXHAUST	PLATINUM
Exhaust Manifolds, Studs & Gaskets	✓
Inlet Air Heater Relay	✓
Intake Manifold	✓
Turbocharger(s)	✓
Air-to-Air Cores	✓
Muffler / Exhaust System	✓
Exhaust Guards	✓
Diesel Oxidation 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	✓
AFTERTREATMENT (FACTORY INSTALLED)	
Diesel Particulate Filter	✓
Selective Catalytic Reduction	✓

For visual purposes only. Not all covered components listed.

PLATINUM ESC ADDITIONAL ALLOWANCES

TRAVEL / MILEAGE LIMITATIONS	
Up to 7.5 liters	4 hr / 200 mi
Over 7.5 liters up to 32 liters	8 hr / 320 mi
EMERGENCY FREIGHT	
$500 USD	✓
RENTAL	
Up to 7.5 liters	$5,000 USD
Over 7.5 liters up to 32 liters	$10,000 USD

PLATINUM PLUS ESC ADDITIONAL ALLOWANCES

TRAVEL / MILEAGE LIMITATIONS	
10 hr / 500 mi	✓
RENTAL	
Up to 7.5 liters	$10,000 USD
Over 7.5 liters up to 32 liters	$20,000 USD
CRANE & RIGGING	
Up to 7.5 liters	$1,000 USD
Over 7.5 liters up to 32 liters	$5,000 USD
OVERTIME	
Up to 32 liters	$3,000 USD

Based on Engine Displacement in Liters.

UPGRADING YOUR ESC

You may choose to upgrade to Platinum Plus coverage level or extend to a maximum 120 month term. Work with your local Cat dealer to price and register the ESC extension and get the protection and peace of mind you deserve.

CATERPILLAR®

CAT® PROTECTS YOUR INVESTMENT AT NO ADDITIONAL COST

5 YEAR PLATINUM EXTENDED SERVICE COVERAGE (ESC) **NOW INCLUDED** WITH YOUR CAT STANDBY GENERATOR SET PURCHASE

Dates & Program Eligibility

What are the effective dates of the program?
The program is effective for new generator sets ordered in USA or Canada on or after April 5th, 2021 and will continue until further notice, subject to regular review.

What models are eligible for the program?
The following generator set models ordered with a Standby rating are eligible.

Cat Models: C4.4, C7.1, C9, C13, C15, C18, C18 Tier 4 Final, C27, C32 and Gas C18.
Cat GC Models: D40 GC, D50 GC, D60 GC, D80 GC, D100 GC, D125 GC, D150 GC, D175 GC, D200 GC, D250 GC, D300 GC, D350 GC, D400 GC, D450 GC, D500 GC, D550 GC, D600 GC, D800 GC, D1000 GC, D1250 GC.

Does the program include the C18 Tier 4F model?
Yes. In addition to Platinum ESC coverage, the program also covers after-treatment components (DPF-Diesel Particulate Filter & SCR-Selective Catalytic Reduction) for the C18 Tier 4 model with a Standby rating.

What models are NOT included in the program?
Gas generator sets (with exception of Gas C18), generator sets larger than C32, generator sets ordered with a Prime rating and XQ (rental) generator sets are all excluded from the program.

What level of ESC coverage will be applied?
Cat models receive 60 months/2,500 hours Platinum level ESC. Cat GC models receive 60 months/2,500 hours Gold level ESC.

How do I ensure I receive this coverage?
Coverage must be registered appropriately to the generator set End-User / Owner to enable timely and accurate processing in the event of a claim. If you would like to submit or update your information, please email us at CatESC@cat.com with the following: [Generator set Serial Number, Company Name, Contact Name, Address, Email, Phone].

Where can I learn more about ESC?
Please visit our website cat.com/EP-ESC-NA to learn more.

CATERPILLAR®

NC POWER SYSTEMS CAT

SECTION 2

CATERPILLAR SPECIFICATION SHEETS

Cat® C9 DIESEL GENERATOR SETS

Standby & Prime: 60Hz

Image shown might not reflect actual configuration

Engine Model	Cat® C9 ACERT™ In-line 6, 4-cycle diesel
Bore x Stroke	112mm x 149mm (4.4in x 5.9in)
Displacement	8.8 L (538 in^3)
Compression Ratio	16.1:1
Aspiration	Turbocharged Air-to-Air Aftercooled
Fuel Injection System	HEUI
Governor	Electronic ADEM™ A4

Model	Standby	Prime	Emission Strategy
C9	**300 ekW, 375 kVA**	**275 ekW, 344 kVA**	**TIER III Non-Road**

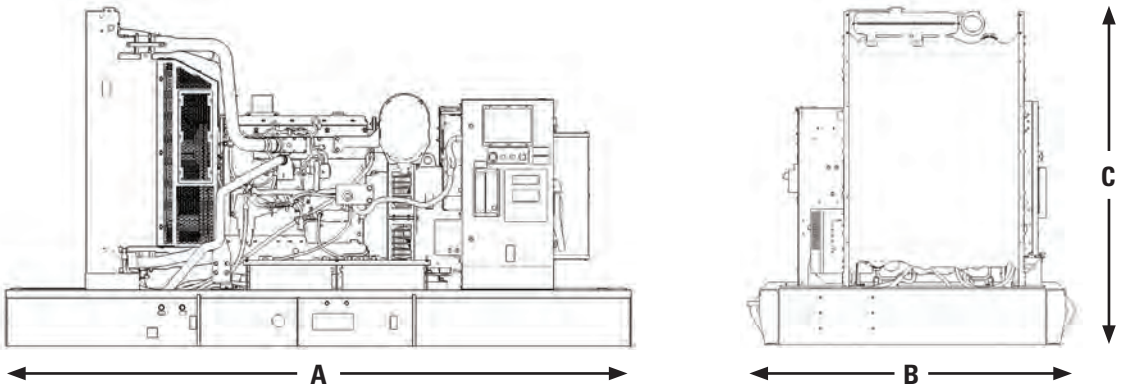
PACKAGE PERFORMANCE

Performance	Standby	Prime
Frequency	60 Hz	
Genset Power Rating	375 kVA	344 kVA
Genset power rating with fan @ 0.8 power factor	300 ekW	275 ekW
Emissions	TIER III Non-Road	
Performance Number	DM8168-04	DM8500-05
Fuel Consumption		
100% load with fan, L/hr (gal/hr)	86.0 (22.7)	80.5 (21.3)
75% load with fan, L/hr (gal/hr)	66.8 (17.6)	64.0 (16.9)
50% load with fan, L/hr (gal/hr)	51.5 (13.6)	50.5 (13.3)
25% load with fan, L/hr (gal/hr)	33.1 (8.7)	32.8 (8.7)
Cooling System[1]		
Radiator air flow restriction (system), kPa (in. Water)	0.12 (0.48)	0.12 (0.48)
Radiator air flow, m3/min (cfm)	497 (17551)	497 (17551)
Engine coolant capacity, L (gal)	13.9 (3.7)	13.9 (3.7)
Radiator coolant capacity, L (gal)	43 (11.5)	43 (11.5)
Total coolant capacity, L (gal)	57 (15)	57 (15)
Inlet Air		
Combustion air inlet flow rate, m^3/min (cfm)	26.0 (916.6)	25.3 (891.8)
Max. Allowable Combustion Air Inlet Temp, °C (°F)	50 (123)	51 (124)
Exhaust System		
Exhaust stack gas temperature, °C (°F)	497.3 (927.2)	495.7 (924.2)
Exhaust gas flow rate, m^3/min (cfm)	69.7 (2460.9)	67.4 (2379.6)
Exhaust system backpressure (maximum allowable) kPa (in. water)	10.0 (40.0)	10.0 (40.0)
Heat Rejection		
Heat rejection to jacket water, kW (Btu/min)	120 (6838)	113 (6431)
Heat rejection to exhaust (total) kW (Btu/min)	320 (18223)	307 (17454)
Heat rejection to aftercooler, kW (Btu/min)	92 (5239)	83 (4726)
Heat rejection to atmosphere from engine, kW (Btu/min)	23 (1312)	18 (1009)

Emissions (Nominal)[2]	Standby	Prime
NOx, mg/Nm³ (g/hp-hr)	2196.0 (4.0)	1975.0 (3.6)
CO, mg/Nm³ (g/hp-hr)	115.5 (0.2)	103.9 (0.2)
HC, mg/Nm³ (g/hp-hr)	23.1 (0.06)	23.2 (0.06)
PM, mg/Nm³ (g/hp-hr)	12.7 (0.03)	10.5 (0.03)

Alternator[3]				
Voltages	480V	600V	480V	600V
Motor starting capability @ 30% Voltage Dip	683 skVA	754 skVA	683 skVA	754 skVA
Current	451 amps	361 amps	414 amps	331 amps
Frame Size	LC5014J	LC5024J	LC5014J	LC5024J
Excitation	SE	AR	SE	AR
Temperature Rise	150 ° C	150 ° C	125 ° C	125 ° C

WEIGHTS & DIMENSIONS



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
3091 (122)	**1622 (64)**	**2066 (82)**	**2313 (5100)**

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.

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www.Cat.com/electricpower

LEHE1568-02 (05/20)

Picture shown may not reflect actual configuration

C9 ACERT™ Sound Attenuated and Weather Protective Enclosures

U.S. Sourced
180 – 300 kW 60 Hz

Features

Robust/Highly Corrosion Resistant Construction

- Factory-installed on skid base
- Environmentally friendly, polyester powder baked paint
- Zinc plated or stainless steel fasteners
- Internally mounted-critical exhaust silencing system (sound attenuated only)
- Externally front-mounted enclosed exhaust silencing system (weather protective only)
- Designed and tested to comply with UL 2200 listed generator set package
- Compression door latches providing solid door seal

Excellent Access

- Large cable entry area for installation ease
- Accommodates side-mounted single or multiple breakers
- Two doors on both sides
- Vertically hinged allow 180° opening rotation and retention with door stays
- Lube oil and coolant drains routed to the exterior of the enclosure base

Transportability

- These enclosures are of extremely rugged construction to withstand outdoor exposure and rough handling common on many construction sites

Security and Safety

- Lockable access 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
- Externally mounted emergency stop button
- Designed for spreader bar lifting to ensure safety
- Stub-up area is rodent proof

Options

- Caterpillar yellow* or white paint
- Weather protective enclosure constructed with 14-gauge steel
- Sound attenuated Level 1 constructed with 14-gauge steel
- Sound attenuated Level 2 constructed with 14-gauge steel
- Sound attenuated enclosure constructed with 12-gauge aluminum (5052 grade)
- UL Listed 203 gallon integral fuel tank
- UL Listed 660 or 1002 gallon sub base fuel tanks
- Seismic certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, IBC 2012, CBC 2007, CBC 2010
- IBC certification for 150 mph wind loading
- Anchoring details are site specific and are dependent on many factors such as generator set size, weight and concrete strength. IBC certification requires that the anchoring system used is reviewed and approved by a professional engineer.
- Control panel viewing window**
- Cold weather bundle. Available with SA Level 2 and Aluminum SA enclosures only

**Not available with aluminum enclosures
**Steel sound attenuated only

Enclosure Sound Pressure Levels at Standby Ratings

Enclosure Type	Standby eKW	Cooling Air Flow Rate		Ambient Capability*		(dBA) @ 7m (23 ft) at 100% Load
		m^3/s	cfm	°C	°F	
Sound Attenuated Level 2	300	351	12395	46	115	71
	250	351	12395	53	127	71
	200	351	12395	59	138	71
Sound Attenuated Level 1	300	351	12395	46	115	75
	250	351	12395	53	127	74
	200	351	12395	59	138	74
Weather Protective	300	516	18222	49	120	82
	250	516	18222	55	131	82
	200	516	18222	60	140	82
Aluminum Sound Attenuated	300	351	12395	46	115	73
	250	351	12395	53	127	72
	200	351	12395	59	138	72

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

Enclosure Sound Pressure Levels at Prime Ratings

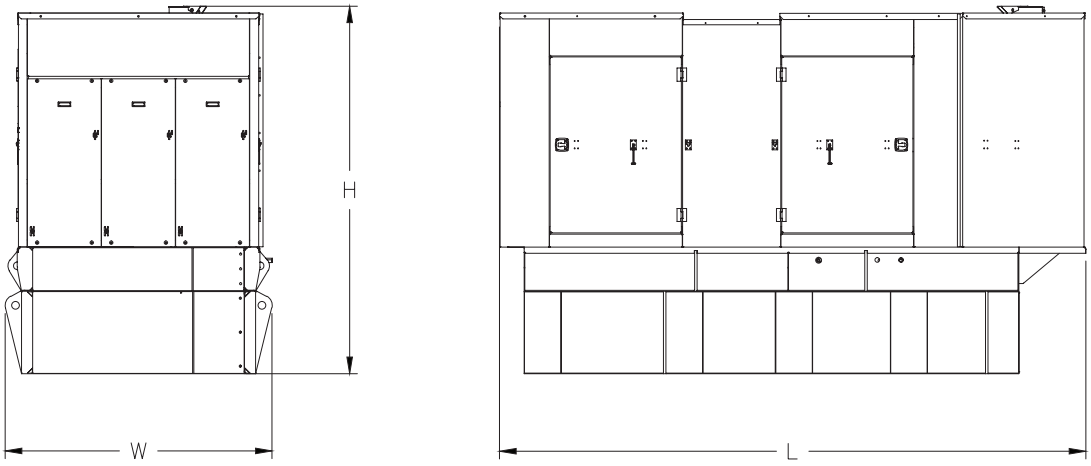
Enclosure Type	Prime eKW	Cooling Air Flow Rate		Ambient Capability*		(dBA) @ 7m (23 ft) at 100% Load
		m^3/s	cfm	°C	°F	
Sound Attenuated Level 2	275	351	12395	50	122	71
	225	351	12395	56	133	71
	180	351	12395	60	140	71
Sound Attenuated Level 1	275	351	12395	50	122	75
	225	351	12395	56	133	74
	180	351	12395	60	140	73
Weather Protective	275	516	18222	52	126	82
	225	516	18222	59	138	82
	180	516	18222	60	140	82
Aluminum Sound Attenuated	275	351	12395	46	115	72
	225	351	12395	56	133	72
	180	351	12395	60	140	72

*Cooling system performance at sea level. Consult your Cat dealer for site specific ambient and altitude capabilities. The sound pressure level data shown in the tables above is quoted as free field and is for guidance only. Actual levels produced may vary according to site conditions.

Component Weights to Calculate Package Weight

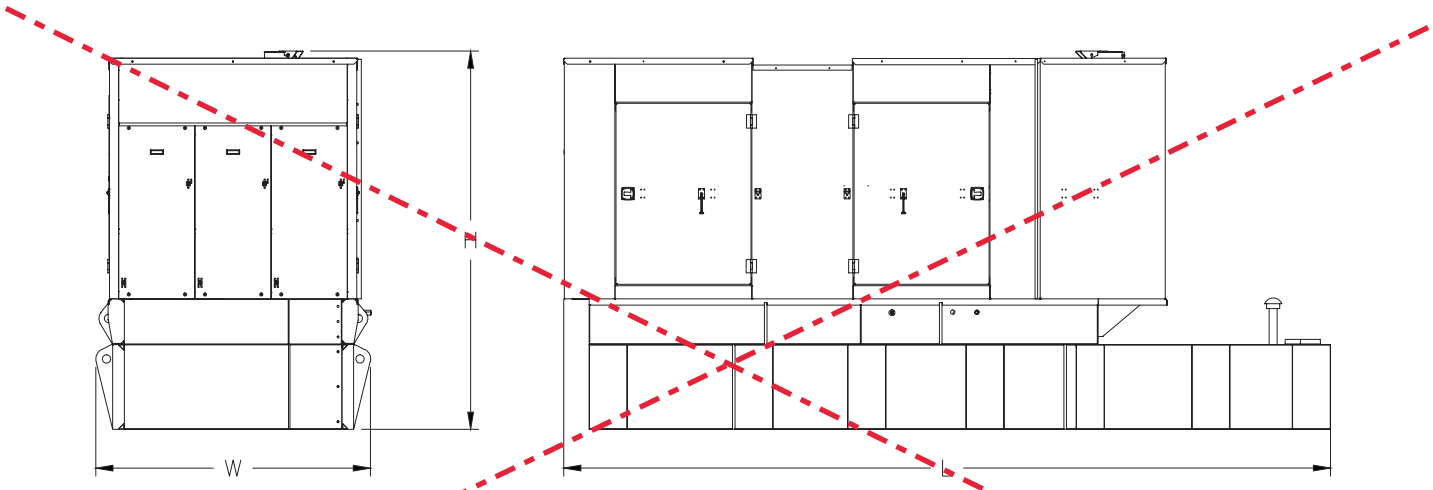
Narrow Skid		Wide Skid		Steel Enclosures						Aluminum Enclosure	
				Weather Protective		Sound Attenuated Level 1		Sound Attenuated Level 2		Sound Attenuated	
kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
219	483	468	1032	660	1455	1062	2341	1062	2341	629	1387

Enclosure on a UL Listed 660 Gallon Sub-base Fuel Tank Base



Enclosure Type	Length "L"		Width "W"		Height "H"	
	mm	in	mm	in	mm	in
Sound Attenuated	4515	177.8	2056	80.9	2831	111.5
Weather Protective	4035	158.9	2056	80.9	2777	109.3

Enclosure on a UL Listed 1002 Gallon Sub-base Fuel Tank Base



Enclosure Type	Length "L"		Width "W"		Height "H"	
	mm	in	mm	in	mm	in
Sound Attenuated	5739	225.9	2056	80.9	2831	111.5
Weather Protective	5739	225.9	2056	80.9	2777	109.3

LET'S DO THE WORK.™

Image shown may not reflect actual package.

LED Lights

Features

AC/DC Lighting Kit

- Capable of AC and DC operation with provided selector switch
- DC operation has a 60-minute timer switch to limit battery drain
- AC operation is enabled by transformer
- Low voltage, low energy circuit and operation
- Installation includes one single LED light.

Technical Data	
Theoretical Lumens Output	1600 lm
Operational Lumens Output	1000 lm
Color Temperature	5700 K
Lens	PC
Body	Aluminum
Weight	0.6 kg
IP Rating	IP68, IP6K9K
EMC	CISPR 25 Class 3, EN 12895, ISO 13766, ISO 14982, ISO 7637-2
Operating Temperatures	-40°C to +85°C (Overheat protected)

C9
Integral and Sub-Base Fuel Tanks

US Sourced
Diesel Generator Set
180 – 300 kW 60 Hz

Picture shown may not represent actual package

Features

- UL Listed for United States (UL 142) and Canada (CAN/ULC S601)
- Facilitate compliance with NFPA 30 code, NFPA 37 and 110 standards and CSA C282 code.
- Dual wall
- Lockable fuel fill cap, 4” (101.6mm) NPT
- 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 guage 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 output
- Emergency vents on primary and secondary tanks are sized in accordance with NFPA 30

Sub Base

- The sub-base fuel tank mounts below the generator set wide base

Integral Base

- 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 (18.9 L) spill containment
- 5 gal (18.9 L) spill containment with fuel fill drop tube with in 6” (152mm) from bottom of tank
- 5 gal (18.9 L) spill containment with overfill prevention valve and fuel fill drop tube with in 6” (152mm) from bottom of tank
- ULC Listed 7.5 gal (28.4 L) spill containment with vent extensions, vent whistle, and drop tube facilitating compliance with CSA B139-09
- ULC Listed 7.5 gal (28.4 L) spill containment with overfill prevention valve, vent extensions, vent whistle and drop tube facilitating compliance with CSA B139-09

Integral & Sub-Base Fuel Tank Base Capacities with Fuel Tank Dimensions & Weights

Integral – Width (W) 2014 mm (79.3 in)

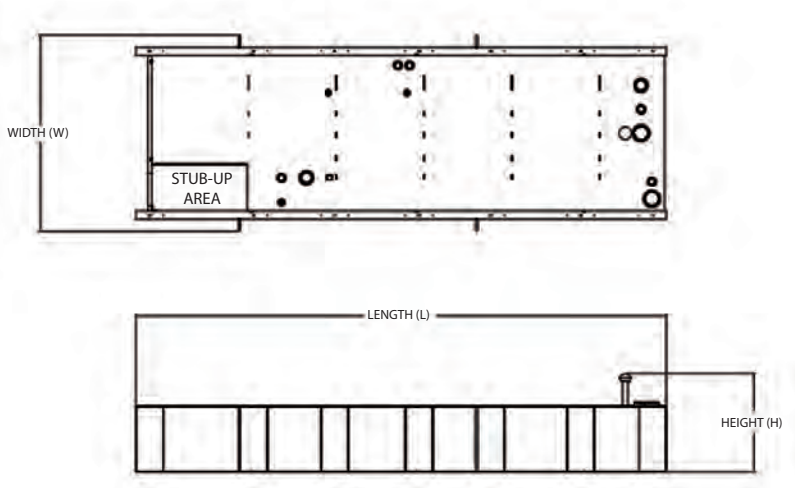
Sub-base – Width (W) 2056 mm (81.0 in)

Open Set, Weather Protective Enclosure & Sound Attenuated

C9 Tank Design	Feature Code	Total Capacity		Useable Capacity		Tank Only						Overall Package Height with Tank					
						Dry Weight		Height 'H'		Length 'L'		Open		Weather Protective		Sound Attenuated	
		Liter	Gallon	Liter	Gallon	kg	lb	mm	in	mm	in	mm	in	mm	in	mm	in
Integral	FTDW010	784	207	770	203	891	1964	635	25.0	3810	150.0	2360	90.0	2438	96.0	2492	98.1
Sub-Base	FTDW008	2476	654	2435	643	1468	3236	635	25.0	3810	150.0	2699	106.3	2777	109.4	2831	111.5
Sub-Base	FTDW009	3941	1041	3876	1024	1832	4039	635	25.0	5550	219.0	2699	106.3	2777	109.4	2831	111.5
Sub-Base	FTDW012	4285	1132	4221	1115	1542	3399	686	27.0	5550	219.0	5550	219.0	2750	108.3	2828	111.4

Estimated Run Times (Hours) at 100% Load

C9 Tank Design	Feature Code	Standby Ratings (ekW)			Prime Ratings (ekW)		
		300	250	200	275	225	180
Integral	FTDW010	9	11	13	10	11	14
Sub-Base	FTDW008	28	33	42	30	35	46
Sub-Base	FTDW009	45	53	67	48	56	73
Sub-Base	FTDW012	48	57	72	52	60	79



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

Tanks with full electrical stub-up area include removable end channel. Tanks with RH/LH stub-up include stub-up area directly below the circuit breaker or power terminal strips. Dimensions include weather-protective enclosure exhaust system.

Dual wall sub-base tanks are UL Listed and constructed in accordance with UL Standard for Safety UL 142, Steel Aboveground Tanks for Flammable and Combustible Liquids and Canada CAN/ULC S601, Standard for Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids.

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

The following sub-base fuel tanks meet Chicago code for containment and labelling:
FTDW008
FTDW009
FTDW012

C9
Dip Charts for Fuel Tanks

U.S. Sourced
Diesel Generator Set
180-300 kW 60 Hz

Integral Tank FTDW010				Sub-Base Tank FTDW008			
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	4.7	13.0	122.5	0.5	14.2	13.0	369.8
1.0	9.4	13.5	127.2	1.0	28.4	13.5	384.1
1.5	14.1	14.0	131.9	1.5	42.7	14.0	398.3
2.0	18.8	14.5	136.7	2.0	56.9	14.5	412.5
2.5	23.6	15.0	141.4	2.5	71.1	15.0	426.7
3.0	28.3	15.5	146.1	3.0	85.3	15.5	441.0
3.5	33.0	16.0	150.8	3.5	99.6	16.0	455.2
4.0	37.7	16.5	155.5	4.0	113.8	16.5	469.4
4.5	42.4	17.0	160.2	4.5	128.0	17.0	483.6
5.0	47.1	17.5	164.9	5.0	142.2	17.5	497.9
5.5	51.8	18.0	169.6	5.5	156.5	18.0	512.1
6.0	56.5	18.5	174.4	6.0	170.7	18.5	526.3
6.5	61.3	19.0	179.1	6.5	184.9	19.0	540.5
7.0	66.0	19.5	183.8	7.0	199.1	19.5	554.8
7.5	70.7	20.0	188.5	7.5	213.4	20.0	569.0
8.0	75.4	20.5	193.2	8.0	227.6	20.5	583.2
8.5	80.1	21.0	197.9	8.5	241.8	21.0	597.4
9.0	84.8	21.5	202.6	9.0	256.0	21.5	611.7
9.5	89.5	22.0	207.3	9.5	270.3	22.0	625.9
10.0	94.2			10.0	284.5	22.5	640.1
10.5	99.0			10.5	298.7	23.0	654.3
11.0	103.7			11.0	312.9		
11.5	108.4			11.5	327.2		
12.0	113.1			12.0	341.4		
12.5	117.8			12.5	355.6		

FUEL ALARMS

Image shown might not reflect actual configuration

FUEL LEVEL ALARMS – (FL1/EMCLFS3), (FL2 /EMCLFA2) and (FL3/EMCHFA2)

LOW FUEL LEVEL SHUTDOWN (FL1 / EMCLFS3) AND LOW FUEL LEVEL ALARM (FL2 / EMCLFA2)

These options provide an alarm on low fuel level and a shutdown on low fuel level. When fuel level reaches to a preset value, the fuel level sender senses the Low Fuel condition and activates a relay which in turn activates the alarm and Shut down. This warning is reported by an indicator light on the control panel with an audible alarm also available as an option. This warning can additionally be relayed to a remote annunciator.

HIGH FUEL LEVEL ALARM (FL3/ EMCHFA2)

This option provides an alarm on high fuel level. This warning is reported by an indicator light on the control panel with an audible alarm also available as an option. When Fuel level reaches to 90% the fuel level sender senses the condition and activates a relay which in turn activates.

PERFORMANCE

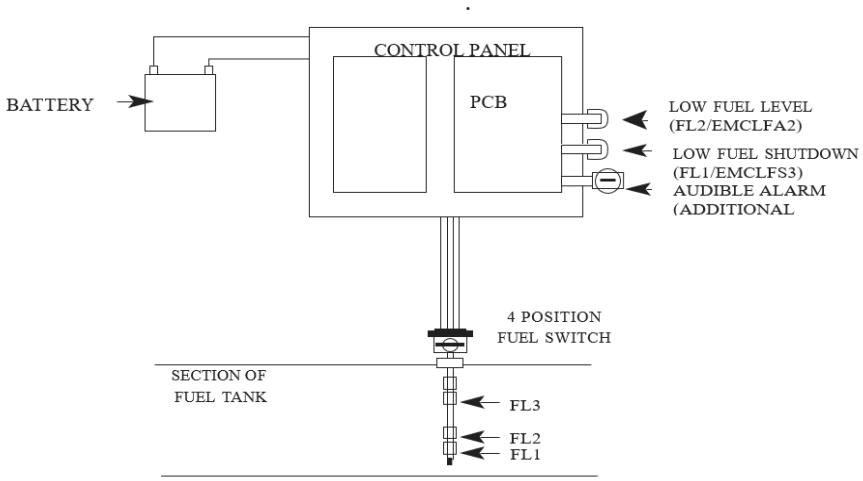
- Accuracy : +/- 2% of depth @ 20°C

MATERIALS

- Enclosure : 30% glass filled nylon
- Internal Electrode : PTFE
- Sensor Tube : 316 Stainless Steel
- Internal Spacers : polypropylene
- End Plug : PTFE
- Wetted Seals : Viton (FKM)

ENVIRONMENTAL RATINGS

- Sealing : IP67 with Mating Connector
- Max.Pressure : 1 bar
- Operating Temp : -20°C to +85°C
- Shock : 50g, 6.3 ms
- Vibration : 15.3 gms BS EN 60068-2-64:1993
- Weight : 300 g (1 m long sensor)



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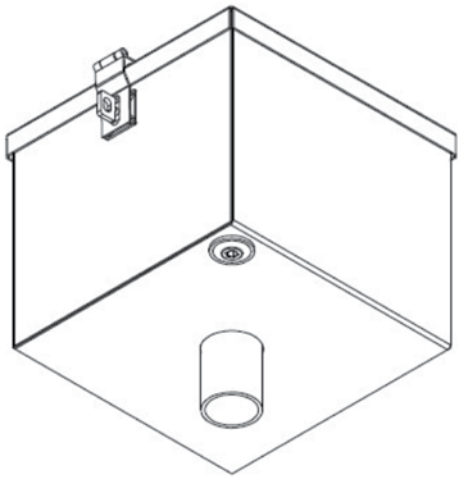

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5 Gallon Steel Spill Containment Box

Durable spill containment box designed for containment of small spills during filling of an above ground storage tank.

Features

- Optional overfill prevention valve
- Lockable hinged cover.

Dimensions

- Height: 13.08"
- Height with pipe: 13.40"
- Body Width: 12.38"
- Width: 13.68"
- Weight: 22 lbs.

AIR CLEANERS

Image shown might not reflect actual configuration

AIR CLEANERS FOR C9 ENGINES

GENERAL DESCRIPTION

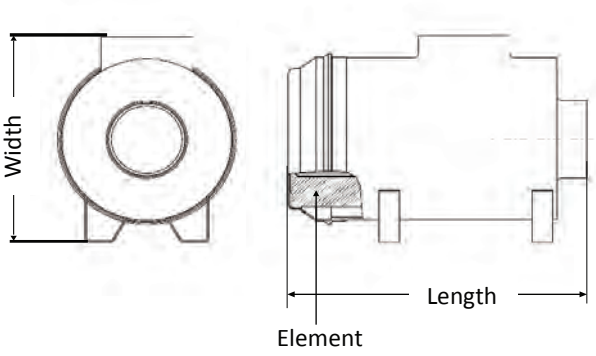
Air cleaners reduce contaminants flowing into the air intake system, provide a high level of engine protection from harmful contaminants and increase engine performance and fuel efficiency.

Dual element air cleaners provide additional protection for the engine.

FEATURES

Single element cleaner

- Element
  - Radial Seal & Pleatloc technology
  - No Safety Element
  - Standard Yellow Media
  - Unique fit filters with a proprietary design
  - More filter media in a smaller area
- Housing
  - Metal Body
- Service indicator
  - 1/8-27 NPT



SPECIFICATION

Single element cleaner

	Element
Flow rate (m^3/min)	14 - 19
Overall Efficiency	99.9 %
Effective filtering Area (m^2)	10.46
Number of convolutions	258
Depth of convolutions	50.8
Applicable Feature Codes	ACLSS04

CLEANER DIMENSIONS

- Length – 497 mm
- Width – 347 mm
- Height – 530 mm
- Weight – 8.6 Kg

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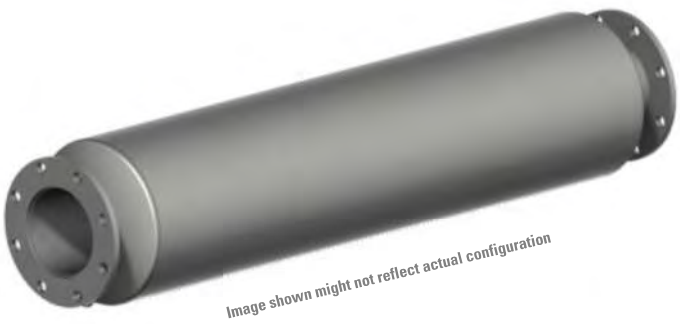
Silencers

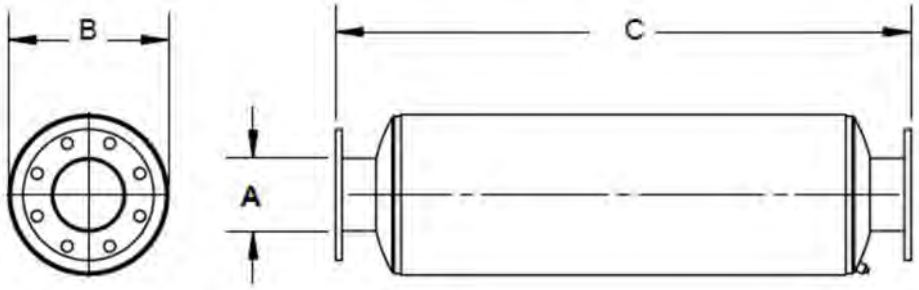


10dBA & 25 dBA,

Silencers for C9

STANDARD FEATURES

- End Inlet / End Outlet can be adapted to different exhaust configurations for ease of installation
- Coated with satin black paint rated to 650°C to retain appearance and corrosion resistance over time
- Connection ANSI flanges are readily adaptable to other hardware providing ease of installation
- Complete with condensate drain and plug
- Mild steel all welded construction for heavy duty application and corrosion resistance



Industrial Silencer – 10dBA

Generator Model	Frequency	Sound Attenuation @ 100% Load	Dimensions			Weight
	Hz	dBA	Length (C) mm	Width (B) mm	Inlet Diameter (A) mm	Kg
C9	50	10	1091	279	127	16
	60	10	292	279	127	12

Residential Silencer – 25dBA

Generator Model	Frequency	Sound Attenuation @ 100% Load	Dimensions			Weight
	Hz	dBA	Length (C) mm	Width (B) mm	Inlet Diameter (A) mm	Kg
C9	50	25	2052	483	159	124
	60	25	2052	483	159	124

LEHE1821-00

BUILT FOR IT.™

Dampers and Actuators

Gravity and Inlet Dampers

Image shown may not reflect actual package.

Gravity Damper

- Wide operating range – velocities up to 3000 fpm
- Corrosion resistant galvanized steel construction standard
- Mechanically locked blade seals

Air Inlet Dampers

- Blades constructed of AA5052 aluminum
- Shafts constructed of AA6061 aluminum.

Door Inlet Actuator

Image shown may not reflect actual package.

Operation

The actuators provide true spring return operation for reliable fail-safe application and positive close off on air tight dampers. The spring return system provides consistent torque to the damper with, and without, power applied to the actuator.

TECHNICAL DATA

Power supply		24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	**running**	5 W
	holding	2.5 W
Running time (nominal)	**motor**	< 40 to 75 sec
	spring	< 25 sec @-4°F to 122°F [-20°C to 50°C] < 60 sec @-22°F [-30°C]
Humidity		5 to 95% RH non-condensing
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Housing		NEMA type 2 / IP54
Housing material		zinc coated steel
Agency listings		cULus acc. to UL 873 and CAN/CSA C22.2 No. 24-93

Image shown may not reflect actual package.

Canopy Air Inlet Actuator

Operation

The actuators provide true spring return operation for reliable failsafe application and positive close off on air tight dampers. The spring return system provides constant torque to the damper with, and without, power applied to the actuator.

TECHNICAL DATA

Power supply		24 VAC ± 20% 50/60 Hz 24 VDC +20% / -10%
Power consumption	**running**	6 W
	holding	2.5 W
Running time (nominal)	**motor**	< 40 to 75 sec
	spring	< 25 sec @-4°F to 122°F [-20°C to 50°C] < 60 sec @-22°F [-30°C]
Humidity		max. 95% RH non-condensing
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Housing		Nema 2, IP54, Enclosure Type2
Housing material		zinc coated metal and plastic casing
Agency listings		cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC & 2006/95/EC

Pi cture shown may not reflect actual configuration

EMCP 4.2B GENERATOR SET CONTROLLER

The Cat® EMCP 4.2B offers fully featured power metering, protective relaying and engine and generator control and monitoring. Engine and generator controls, diagnostics, and operating information are accessible via the control panel keypads; diagnostics from the EMCP 4 optional modules can be viewed and reset through the EMCP 4.2B.

Full range of attachments

- Wide range of system expansion attachments, designed specifically to work with the EMCP 4
- Flexible packaging options for easy and cost effective installation

World wide product support

- Cat dealers provide extensive pre and post sale support
- Cat dealers have over 1,600 dealer branch stores operating in 200 countries

Features

- A 33 x 132 pixel, 3.8 inch, white backlit graphical display denotes text alarm/event descriptions, set points, engine and generator monitoring, and is visible in all lighting conditions.
- Textual display with support for 26 languages
- Advanced engine monitoring is available on systems with an ADEM™ controller.
- Integration with the CDVR and IVR provides enhanced system performance
- Fully featured power metering, protective relaying, engine and generator parameter viewing, and expanded AC metering are all integrated into this controller.
- Real-time clock allows for date and time stamping of diagnostics and events in the control's logs as well as service maintenance reminders based on engine operating hours or calendar days. Up to 40 diagnostic events are stored in the non-volatile memory

Features

- Ability to view and reset diagnostics on EMCP 4 optional modules via the control panel removes the need for a separate service tool for troubleshooting
- Set points and software stored in non-volatile memory, preventing loss during a power outage
- Five levels of security allow for configurable operator privileges
- Programmable security levels for groups of setpoints.
- Programmable kW Relays (3)
- Programmable weekly exerciser timer
- Dealer configurable resistive maps
- Default overview screen
- Real (kW) Load histogram
- Auto mains failure
- Programmable logic functionality
- Selectable units
    - Temperature: °C or °F
    - Pressure: psi, kPa, bar
    - Fuel Consumption: Liter/hr or Gal/hr (U.S. or U.K.)

Standard Features

- Voltage (L-L, L-N)
- Current (Phase)
- Average Volt, Amp, Frequency
- kW, kVAr, kVA (Average, Phase, %)
- Power Factor (Average, Phase)
- kW-hr, kVAr-hr (total)
- Excitation voltage and current (with CDVR)
- Desired Voltage, Excitation Command, Operating Mode (with IVR)
- Generator stator and bearing temp (with optional module)
- kW load histogram

Generator Protection

- Generator phase sequence
- Over/Under voltage (27/59)
- Over/Under frequency (81 O/U)
- Reverse Power (kW) (32)
- Reverse Reactive Power (kVAr) (32RV)
- Overcurrent (50/51)
- Thermal Damage Curve

Engine Monitoring

- Coolant temperature
- Oil pressure
- Engine speed (RPM)
- Battery voltage
- Run hours
- Crank attempt and successful start counter
- Enhanced engine monitoring (with electronic engines)

Engine Protection

- Control switch not in auto (alarm)
- High coolant temp (alarm and shutdown)
- Low coolant temp (alarm)
- Low coolant level (alarm)
- High engine oil temp (alarm and shutdown)
- Low, high, and weak battery voltage
- Overspeed
- Overcrank
- Low Oil Pressure

Control

- Run / Auto / Stop control
- Speed and voltage adjust
- Local and remote emergency stop
- Remote start/stop
- Cycle crank

Inputs & Outputs

- Two dedicated digital inputs
- Three analog inputs
- Six programmable digital inputs
- Eight relay out
- Two programmable digital outputs

Communications

- Primary and accessory CAN data links
- RS-485 annunciator data link
- Modbus RTU (RS-485 Half duplex)

Language Support

Arabic, Bulgarian, Czech, Chinese, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Italian, Icelandic, Japanese, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish, Turkish

Environmental

- Control module operating temperature: -40°C to 70°C
- Display operating temperature: -20°C to 70°C
- Humidity: 100% condensing 30°C to 60°C
- Storage temperature: -40°C to 85°C
- Vibration: Random profile, 24-1000 Hz, 4.3G rms

Standards

- UL Recognized
- CSA C22.2 No.100,14, 94
- Complies with all necessary standards for CE Certification
    - 98/37/EC Machinery Directive
    - BS EN 60204-1 Safety of Machinery 89/336/EEC EMC Directive
    - BS EN 50081-1 Emissions Standard
    - BS EN 50082-2 Immunity Standard 73/23/EEC Low Voltage Directive
    - EN 50178 LVD Standard
- IEC529, IEC60034-5, IEC61131-3
- MIL STND 461

Optional Modules

CAN annunciator

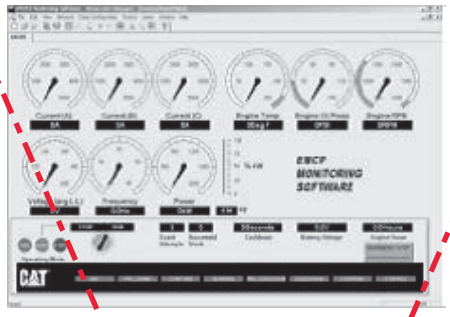
The EMCP 4 CAN Annunciator serves to display generator set system alarm conditions and status indications.
The annunciator has been designed for use on the accessory communication network and may be used in either local (package mounted) or remote (up to 800 feet) application. A maximum of four annunciators may be used with a single EMCP.

RS-485 annunciator

The EMCP 4 RS-485 Annunciator serves to display generator set system alarm conditions and status indications. The annunciator has been designed for use on the long distance annunciator datalink and is used for remote (up to 4000 feet) application.

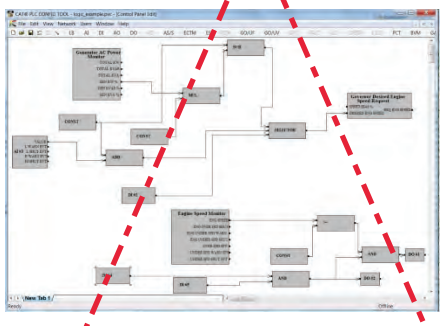
The remote monitoring software allows the user to configure data monitoring and data acquisition processes for monitoring, graphing, and logging of generator set data.

Remote monitoring software



The EMCP remote monitoring software package is a PC based program which allows the user to monitor and control a generator set, and is capable of running on a Windows based operating system. The remote monitoring software allows the user to configure data monitoring and data acquisition processes for monitoring, graphing, and logging of generator set data.

Programmable logic software



The EMCP programmable logic software package is a PC based program which allows the configuration of the programmable logic blocks, and is capable of running on a Windows based operating system. The programmable logic software allows the user to configure logic to change the operation of the EMCP control and interfaces within a limited scope.

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 solates 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 prob-lems 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

Description

The ECM is housed in an environmentally sealed cast-ing. 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 con-trolled 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 trou-bleshooting. 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 20g

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 8.0g @ 24 to 2 kHz

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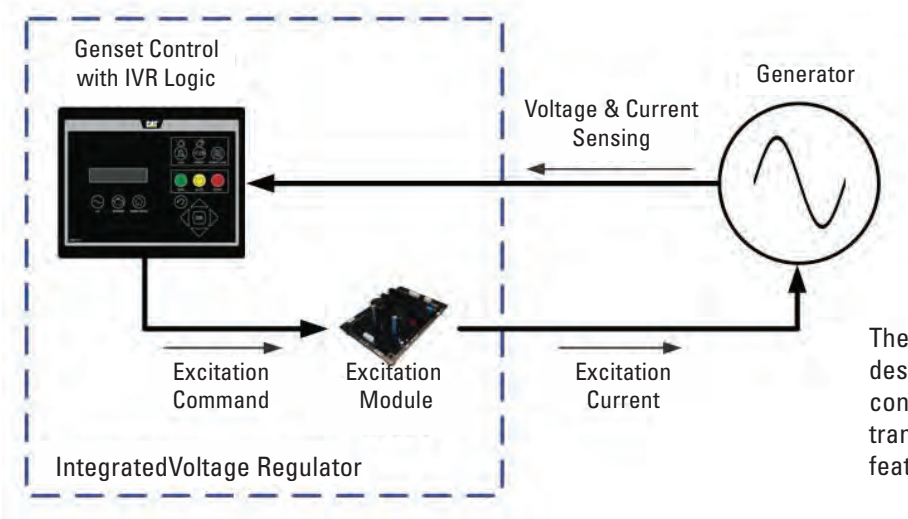
LEHE5347-03 (02/19)

INTEGRATED VOLTAGE REGULATOR



INTEGRATED VOLTAGE REGULATOR

The Integrated Voltage Regulator (IVR) is designed to provide robust, precise closed-loop control of the generator voltage, optimized transient performance and industry leading feature specification.

Caterpillar is leading the power generation marketplace with power solutions engineered to deliver unmatched flexibility, expandability, reliability and cost-effectiveness.

FEATURES

When used with an Excitation Module, EMCP 4.3/4.4 and IVR-compatible EMCP 4.1/4.2 (B) controllers offers:

- Automatic Voltage Regulation (AVR)
- Programmable stability settings
- Soft start control with an adjustable time setting in AVR control mode
- Dual Slope, Configurable Under Frequency (Volts/Hz) regulation
- Three-phase or single-phase generator voltage (RMS) sensing/regulation in AVR mode
- Setpoint adjustment from the EMCP display or Cat ET ServiceTool
- IVR Operating Status and Voltage Bias Overview screens to provide an enhanced level of user interface
- Integrated Voltage Regulator event monitoring

EMCP 4.3/4.4 and IVR-compatible EMCP 4.2 (B) controllers also offer:

- Power Factor Regulation (PF)
- Reactive Droop compensation
- Line drop compensation

WORLDWIDE PRODUCT SUPPORT

- Worldwide parts availability through the Cat dealer network
- Over 1,800 dealer branch stores operating in 200 countries
- The best product support record in the industry
- Cat dealers provide extensive post sale support including maintenance and repair agreements

COMPLETE SYSTEM INTEGRATION

Fully designed and factory tested to work seamlessly with Cat generators using Self Excitation (SE), Internal Excitation (IE) or Permanent Magnet (PMG) excitation systems and EMCP controls.

INTEGRATED VOLTAGE REGULATOR

INTEGRATED VOLTAGE REGULATOR FEATURE SPECIFICATION

	EMCP 4.1	EMCP 4.2(B)	EMCP 4.3	EMCP 4.4
				
SPECIFICATIONS				
No Load to Full Load Regulation	±0.5%	±0.25%	±0.25%	±0.25%
Configurable Volts / Hz Characteristic	•	•	•	•
Configurable Knee Frequency	•	•	•	•
Regulator ResponseTime	10 ms	10 ms	5 ms	5 ms
Single and Three Phase Sensing	•	•	•	•
Voltage Adjustment Range	± 30%	± 30%	± 30%	± 30%
CONTROL				
Characteristic	•	•	•	•
Excitation Enable I Disable Selection	•	•	•	•
Line Loss (I^2R) Compensation	–	•	•	•
Reactive Droop Compensation	–	•	•	•
Power Factor Control Mode	–	•	•	•
PROTECTION I ALARMS				
Generator Overvoltage	•	•	•	•
Generator Under voltage	•	•	•	•
Over Excitation	•	•	•	•
Loss of Sensing	•	•	•	•
Generator Reverse VARs	–	•	•	•
Event Log	•	•	•	•
METERING				
EMCP AC Metering	•	•	•	•
EMCP Power Metering	–	•	•	•
Excitation Command Percentage	•	•	•	•
Operating Mode Status 1ndication	•	•	•	•
VOLTAGE ADJUSTMENT				
EMCP 4 Display Voltage Bias	•	•	•	•
Digital Input (Raise I Lower) Voltage Bias[1]	•	•	•	•
Potentiometer Voltage Bias[1]	•	•	•	•
Analog Voltage Bias -Voltage Range[1]	0V to SV	0V to SV	-10V to +10V	-10V to +10V
Analog Voltage Bias - Current Range[1]	-	-	0mA to 20mA	0mA to 20mA
Analog Voltage Bias - PWM Range[1]	-	-	0% to 100%	0% to 100%
SCADA (Modbus) Voltage Bias	-	•	•	•

[1]Requires an available input on the EMCP 4.

EMCP 4 DISPLAY

EXAMPLE SCREENS - EMCP 4.1/4.2

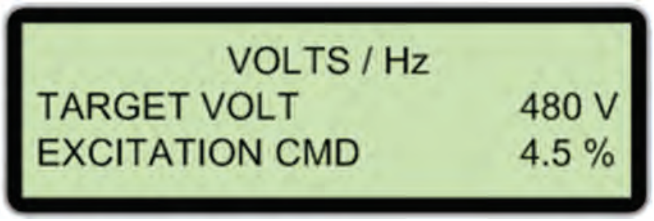


Figure 3: IVR Overview Screen

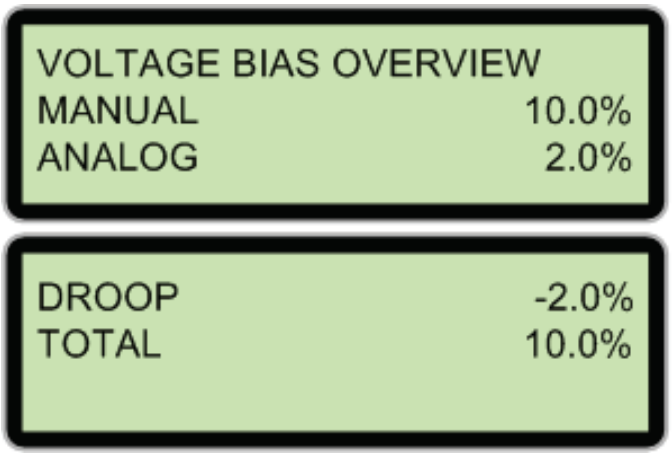


Figure 4: Voltage Bias Overview Screens

EXAMPLE SCREENS - EMCP 4.3/4.4

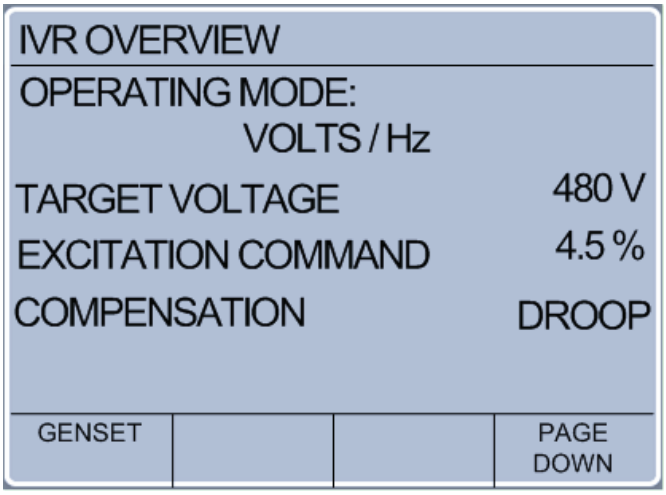


Figure 5: IVR Overview Screen

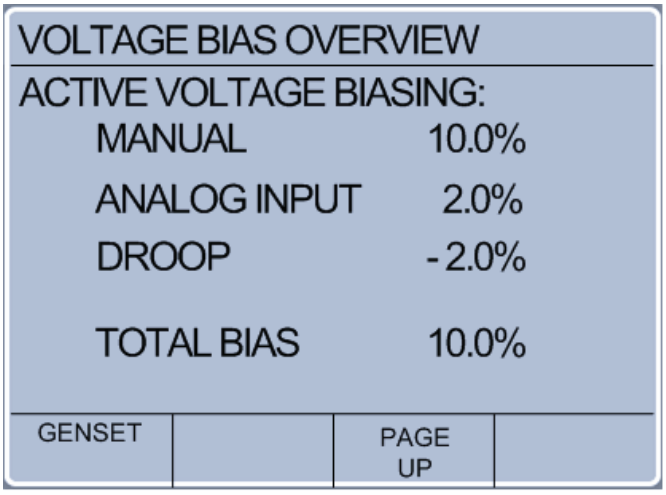


Figure 6: Voltage Bias Overview Screen

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Excitation Module

EM10

The EM10 Excitation Module is a power electronics component designed to provide excitation current to the generator that is controlled by the Integrated Voltage Regulator (IVR) feature in the EMCP 4 controls.

Caterpillar is leading the power generation marketplace with power solutions engineered to deliver unmatched flexibility, expandability, reliability and cost-effectiveness

Features

- Over-excitation protection – limit can be adjusted via a potentiometer (IEXC)
- Green status LED indicating unit is powered on
- Red status LED indicating excitation current limiting (flashing) or shutdown (solid)

When used with EMCP 4.3 / 4.4 and IVR-compatible EMCP 4.1 / 4.2 controllers, the Integrated Voltage Regulator system offers:

- Automatic Voltage Regulation (AVR)
- Programmable stability settings
- Soft start control with an adjustable time setting in AVR control mode
- Dual Slope Under Frequency (Volts / Hz) regulation
- 3 Phase or single-phase generator voltage (RMS) sensing / regulation in AVR mode

EMCP 4.3 / 4.4 and IVR-compatible EMCP 4.2 controllers also offer:

- Power Factor Regulation (PF)
- Generator paralleling with reactive droop compensation
- Line drop compensation

Worldwide Product Support

- Worldwide parts available through the Cat® dealer network
- Over 1,800 dealer branch stores operating in 200 countries
- The best product support record in the industry
- Cat dealers provide extensive post sale support including maintenance and repair agreements

Complete System Integration

Fully designed and factory tested to work seamlessly with Cat generators using Self Excitation (SE), Internal Excitation (IE) or Permanent Magnet (PMG) excitation systems and EMCP controls.

Excitation Module – EM10

Specifications	
Electrical	
Generator Excitation Types	Self Excitation / Internal Excitation / Permanent Magnet (PMG)
Max. Continuous Field Current Output	6 Amps
Max. Forcing Field Current Output	10 Amps
Max. AC Voltage Input (X1:X2, Z1:Z2)	180 Vrms

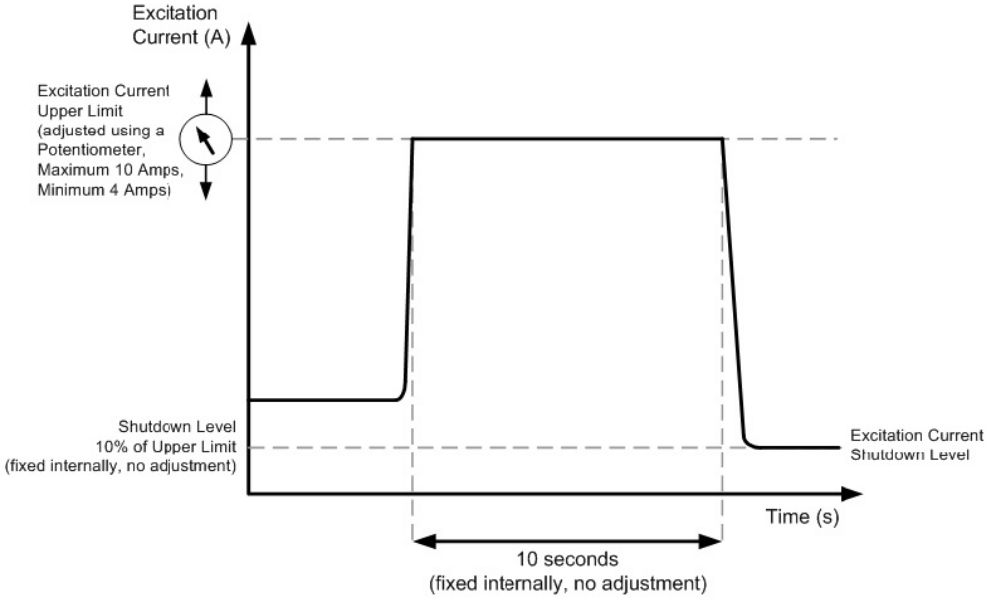
Environmental	
Operating Temperature Range	−40°C (−40°F) to +70°C (+158°F)
Storage Temperature Range	−40°C (−40°F) to +85°C (+185°F)
Relative Humidity Tolerance	95% non-condensing humidity
Salt Spray	5% salt (NaCl) solution for 120 hrs
Vibration	4.5 G-rms, 24-2000 Hz in 3 orthogonal planes
Electromagnetic Compatibility	RF Immunity (Radiated & Conducted) RF Emissions (Radiated & Conducted) Electrical Transients
Weight	770g ±30g
Power Consumption (at Max. Continuous Rating)	450 VA

Conformity	
UL	UL Recognized (U.S. and Canada) File No. E334232
CE Integrated Certificate	In conformity with the applicable requirements of the following Standards: EN 50178 EN 60204-1 EN 61000-6-2 EN 61000-6-4

Excitation Module – EM10

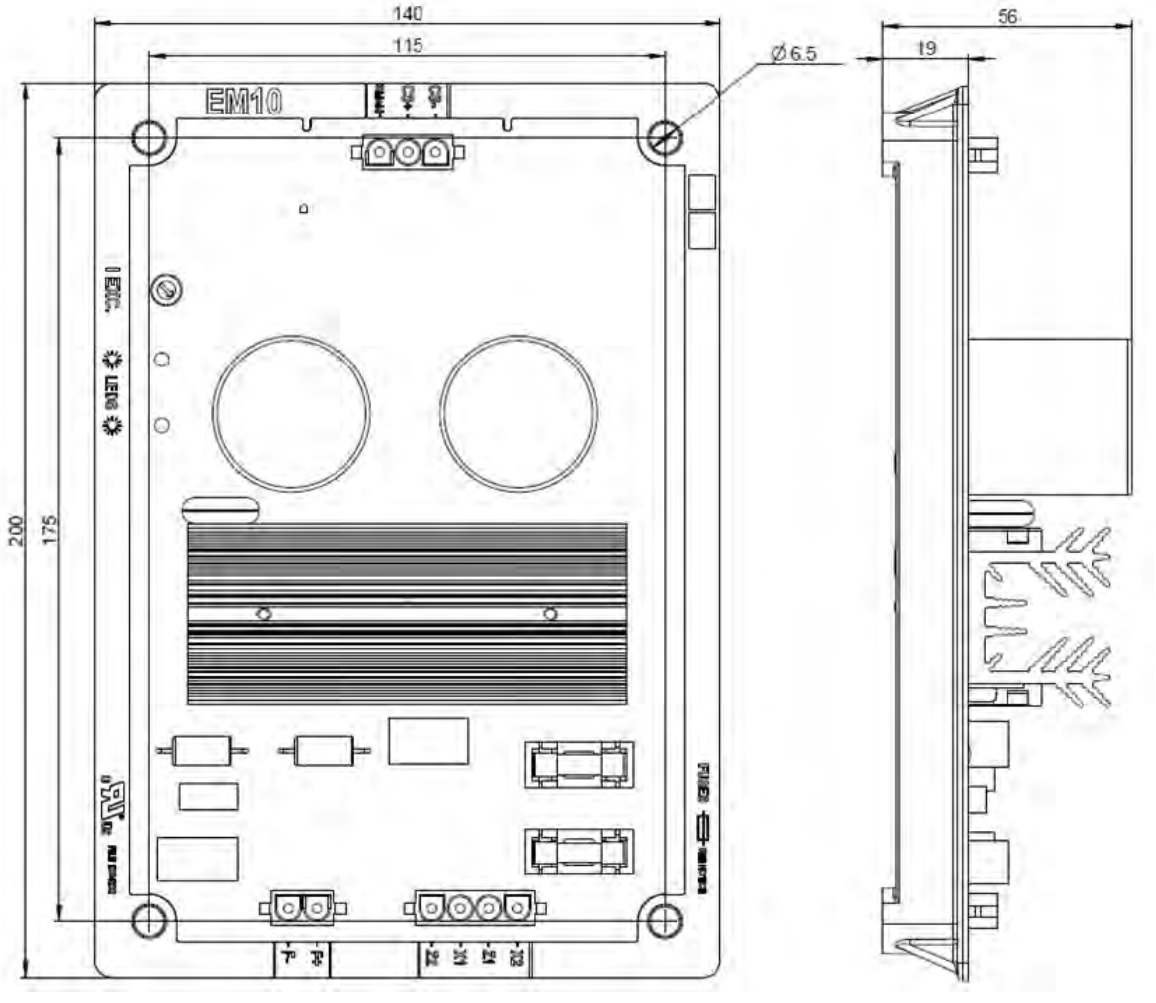
Over-Excitation Protection

- If a short-circuit fault occurs at the generator teminals, the EM10 will allow the excitation current to rise to the upper limit value set by the adjustment potentionmeter (max. 10 Amps).
- The excitation current will be clamped at the upper limit value for 10 seconds (fixed internally).
- After 10 seconds, the excitation current is reduced to a value of 10% of the potentiometer setting.



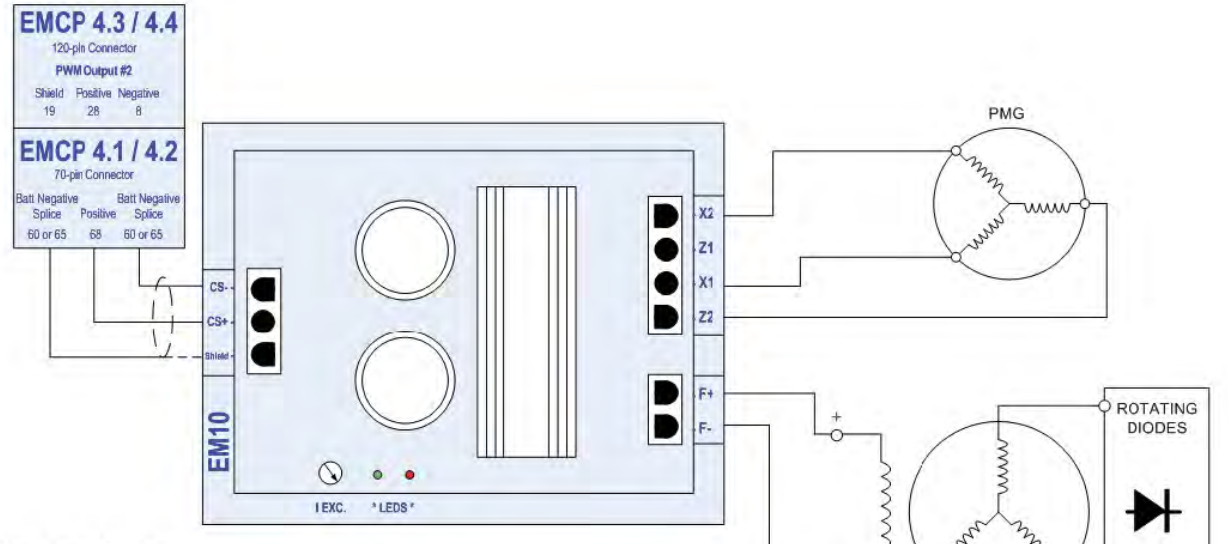
Excitation Module – EM10

Outline Drawing (Dimensions in mm)



Excitation Module – EM10

Example Connection Diagram (Permanent Magnet Excitation)



2-way Connector Functions:

Terminal	Label	Function
P2-1	F+	Exciter Field Positive Output
P2-2	F-	Exciter Field Negative Output

3-way Connector Functions:

Terminal	Label	Function
P3-1	Shield	Excitation Command Shield
P3-2	CS+	Excitation Command Positive Input
P3-3	CS-	Excitation Command Negative Input

4-way Connector Functions (PMG Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (PMG Phase B)
P4-2	Z1	Not Connected
P4-3	X1	Excitation Power Supply Input (PMG Phase A)
P4-4	Z2	Excitation Power Supply Input (PMG Phase C)

4-way Connector Functions (Self-Excitation):

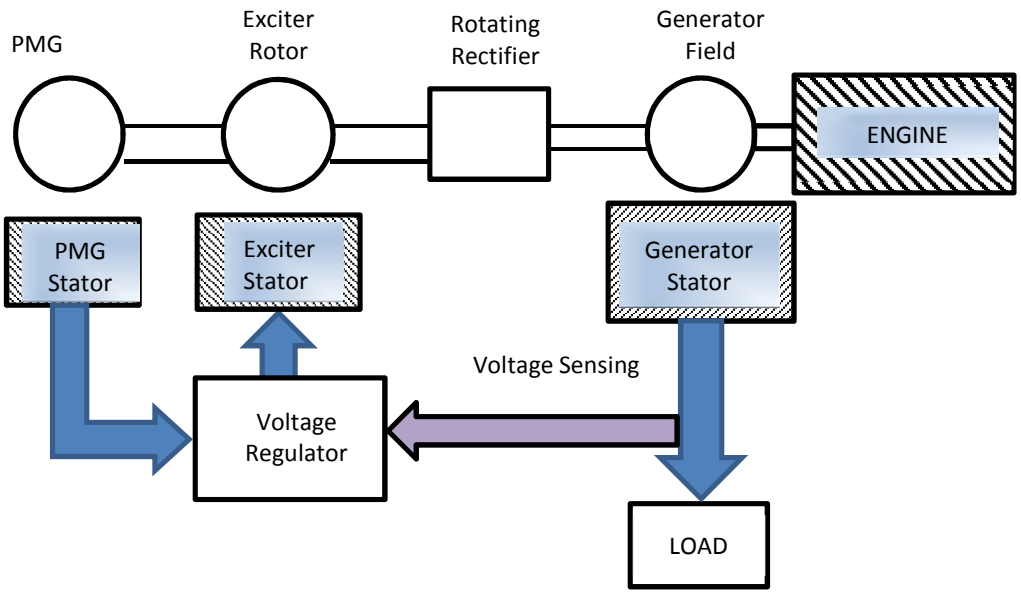
Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (single-phase)
P4-2	Z1	Not Connected
P4-3	X1	Excitation Power Supply Input (single-phase)
P4-4	Z2	Not Connected

4-way Connector Functions (Internal Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (Aux Winding 1 - Positive)
P4-2	Z1	Excitation Power Supply Input (Aux Winding 2 - Positive)
P4-3	X1	Excitation Power Supply Input (Aux Winding 1 - Negative)
P4-4	Z2	Excitation Power Supply Input (Aux Winding 2 - Negative)

Permanent Magnet Excitation

Block Diagram of Diesel Generator set using Permanent Magnet Generator (PMG) excitation system



In Diesel generator sets employing PMG excitation system a small permanent magnet generator (PMG) is attached to the same shaft as the main generator at the non-drive end. The PMG stator produces clean power source for the voltage regulator.

The PMG excitation system can be retrofittable on most alternators. It has the following benefits over a self-excitation system.

1. Provides reliable, isolated power which is independent of the generator output
2. Ability to provide sustained short circuit current (up to 3 times the rated current) during fault conditions and allows breaker discrimination.
3. Provides clean and uninterrupted power to the voltage regulator even when the diesel generator set is supplying non-linear or harmonic loads.
4. Can provide reduced transient voltage dip on motor starting compared to a self-excited diesel generator set.

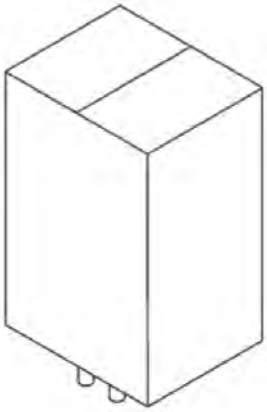
The PMG excitation system is offered as an option on Caterpillar C3.3 to C18 gensets as shown in the table below. The use of PMG excitation system may require an upgrade to the voltage regulator and alternator.

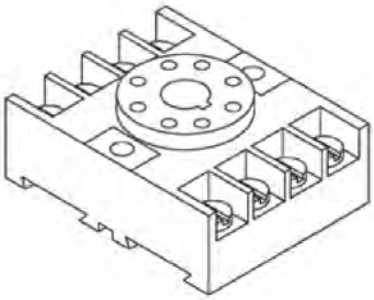
Alternator Frame	Engine Model
LC Frame	C3.3 – C18
A Frame	C9 – C18

CEPR0008-00

Genset Model	Alternator Model	PMG Kit Part Number
C3.3	LC1500 Frame Alternator	424-7522
C3.3, C4.4	LC3100 Frame Alternator	452-9220
C7.1, C9	LC 5100 Frame Alternator	478-8012
C9	A2600 Frame Alternator	547-6952
C13, C15	A2900 Frame Alternator	505-3287
C18	A3300 Frame Alternator	505-3286
C18	A3800 Frame Alternator	567-1847
C13, C15	LC 6100 Frame Alternator	505-3245
C18	LC 7000 Frame Alternator	505-3244
C18	LC 7200 Frame Alternator	505-3284

Engine-Run Relay





- 10 Amp contact rating
- 12 or 24 Volt DC input
- Contact open or closure on engine run

SPECIFICATIONS

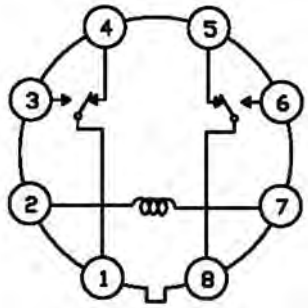
CONTACTS

- Type: DPDT
- Material: Silver
- Rating: UL
  10A @ 240VAC
  10A @ 30VDC

COILS

- Input Voltage: 24VDC
- Resistance: 400 Ohms
- Nominal Power: 1.5 W

PIN DETAIL



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LEHE1652-00 (2-18)

GROUND FAULT RELAY (GFR)

Picture shown may not reflect actual configuration

GENERAL DESCRIPTION

GFR is a microprocessor-based ground-fault relay for resistance- and solidly-grounded systems.
In addition to common systems, it is uniquely suited for use on systems with significant harmonic content.
GFR can provide main-plant protection, feeder-level protection, or individual-load protection.
Proper current transformer selection provides the desired pickup range. The output contacts can be connected for use in protective tripping circuits or in alarm indication circuits. The analog output can be used with a PLC or a meter.

FEATURES & BENEFITS

Benefits

- Trip setting based on input CT primary, allows use with any CT. Minimum 50 mA with EFCT Series.
- Adjustable trip delay allows quick protection and system coordination
- Form A and Form B ground-fault output contacts for operation of separate annunciation and trip circuits
- Alarms when CT is not connected
- Compatible with variable-speed drives
- Eliminates nuisance tripping
- Retains trip state while de-energized to simplify troubleshooting
- No calibration required, saves on maintenance cost
- Allows operation in application where one side of PT is faulted, provides flexibility for numerous applications

Features

- Adjustable pickup (1-99%)
- Adjustable time delay (50 ms - 2.5 s)
- Output contacts
- Analog output (0 - 5 V)
- CT-Loop monitoring
- Selectable DFT or peak detection filtering
- Harmonic filtering
- Non-volatile trip memory
- Microprocessor based
- Universal power supply

FRONT-PANEL CONTROLS

Ground-fault trip level

The % CT PRIMARY selector switches are used to set the ground-fault trip level as a percentage of the CT-primary rating.
In tripping systems, a ground-fault trip level of 10 to 20% of the prospective ground-fault current is often used. In alarm-only systems, a value of 50% of the prospective ground-fault current is often used. To avoid sympathetic tripping, the trip level must be above the charging current of the protected feeder.
A 0% selection provides protection at 1%.

Ground-fault trip time

GFR has a definite-time trip characteristic. The TIME (s) selector switch is used to set the ground-fault trip delay time for coordination with upstream and downstream ground-fault devices. Coordination requires the same trip level for all ground-fault devices in a system and the trip time to progressively increase upstream. The amount of equipment removed from the system will be a minimum if the first ground-fault device to operate is the one immediately upstream from the fault.

Reset

If the Reset Mode switch is in the LATCHING position, a trip remains latched until the RESET button is pressed or the remote-reset terminals are momentarily connected. In the non-fail-safe mode, cycling the supply voltage will also reset the GFR.
If the Reset Mode switch is in the AUTORESET position, a trip will reset when the fault is removed. The reset circuit responds only to a momentary closure so that a jammed or shorted button will not prevent a trip. The front-panel RESET button is inoperative when the remote-reset terminals (6 and 7) are connected

Test

The TEST button is used to test the ground-fault circuit, the indication, and the output relay. When the TEST button is pressed for one second, a test signal is applied to the ground-fault-detection circuit, the circuit will trip, the TRIP LED will light, and the output relay will operate. If high-current inhibit has been selected, the INHB LED will light.

Front-panel indication

- **Power**
  The green LED labelled PWR indicates the presence of supply voltage.

- **Trip**
  The red LED labelled TRIP indicates a trip. A solid red LED indicates a ground-fault trip. A flashing LED indicates a trip initiated by a CT fault. Two fast flashes indicate a diagnostic trip.

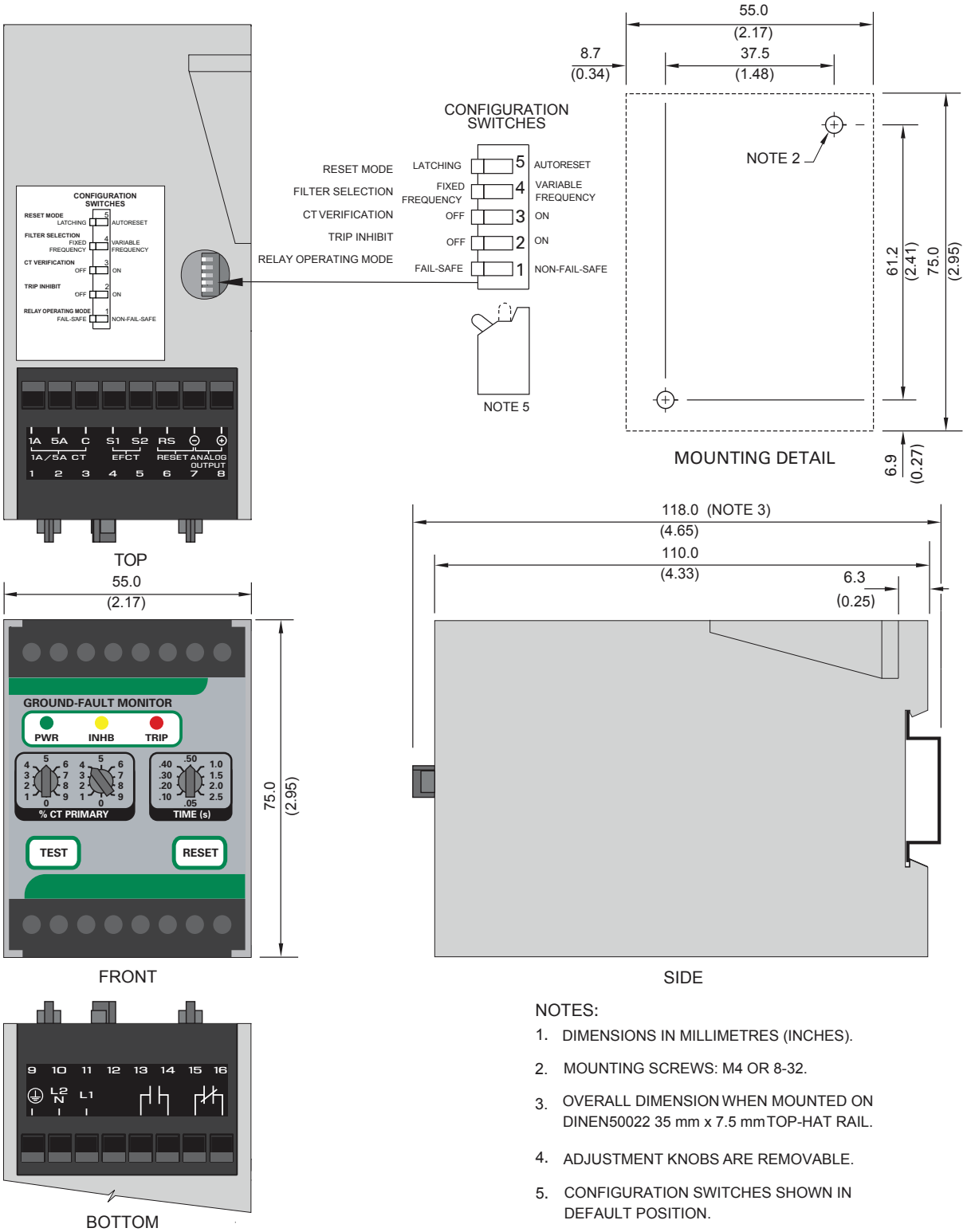
  Self diagnostics
  A diagnostic trip is indicated by two fast flashes of the TRIP LED. It can be caused by a diagnostic problem detected by the watchdog timer or from an incorrect reading from non-volatile memory. Press RESET or cycle supply voltage.

- **Trip inhibit**
  The yellow LED labelled INHB indicates that output relay operation was inhibited during a high-current ground fault. When a ground-fault trip occurs during a high-current ground fault, both the TRIP and INHB LED's will be ON. Inhibit indication is reset when the ground-fault trip is reset. Inhibit operation and indication will not respond if the trip-inhibit switch is in the OFF position.

SPECIFICATIONS

- IEEE Device Numbers - Ground fault (50G/N, 51G/N)
- Dimensions
  - H 75 mm (3.0")
  - W 55 mm (2.2")
  - D 115 mm (4.5")
- Trip Level Settings - 1-99% CT-Primary Rating
- Trip Time Settings - 0.05-2.5 s
- Contact Operating Mode - Selectable fail-safe or non-fail-safe
- Output Contacts Isolated Form A and Form B
- Approvals CSA certified, UL Listed (E340889), CE (European Union), C-Tick (Australian)
- Analog Output 0-5 V

OUTLINE AND MOUNTING DETAILS



NOTES:

1. DIMENSIONS IN MILLIMETRES (INCHES).
2. MOUNTING SCREWS: M4 OR 8-32.
3. OVERALL DIMENSION WHEN MOUNTED ON DINEN50022 35 mm x 7.5 mm TOP-HAT RAIL.
4. ADJUSTMENT KNOBS ARE REMOVABLE.
5. CONFIGURATION SWITCHES SHOWN IN DEFAULT POSITION.

Picture shown may not reflect actual configuration.
Shown with Optional Equipment.

EMCP 4

RS-485 Annunciator

The EMCP 4 RS-485 annunciator serves to display generator set system alarm conditions and status indications. The annunciator has been designed for use on the EMCP 4 RS-485 annunciator data link for remote applications, providing customers with enhanced site flexibility.

The EMCP 4 annunciator is configurable to the standards of NFPA 99/110 for emergency standby generator systems.

Features

- The EMCP 4 annunciator provides sixteen (16) individual points of annunciation, with two (2) LED's included for each point.
- An additional pair of LED's provides status indication of the RS-485 communication network.
- Includes alarm horn with lamp test and alarm acknowledge pushbuttons.
- Configurable to NFPA 99/110 requirements for local and remote annunciation on emergency standby generator systems.
- Provides custom label kit including software for customer's specific alarms and arrangement
- Designed and tested to meet stringent impulse shock and operating vibration requirements
- Uses high quality shielded twisted-triad cable for robust remote communications
- Graphic symbols are provided next to each pair to indicate various alarms and events
- The annunciator can be mounted remotely up to 1200 m (4,000 ft).
- Provides superior visibility of the LED's in direct sunlight.

Specifications

Technical Data

Electrical
- Battery Voltage Functional Range: 9 to 32 VDC
- Power Consumption
  - Maximum: _ 12 watt at 24 VDC
  - Standby: _ 5 watt at 24 VDC
  - Control Power: 12-24 VDC
- Communication: RS-485
- Single, 8-pin Connector
- Alarm
  - Sound Level 80 db

Physical

Weight	2.5 lb or _ 1.13 kg

Environmental

Operating Temperature	–40° C to 70° C –40° F to 158° F
Storage Temperature	–50° C to 70° C –58° F to 158° F
Relative Humidity	90%

Certifications

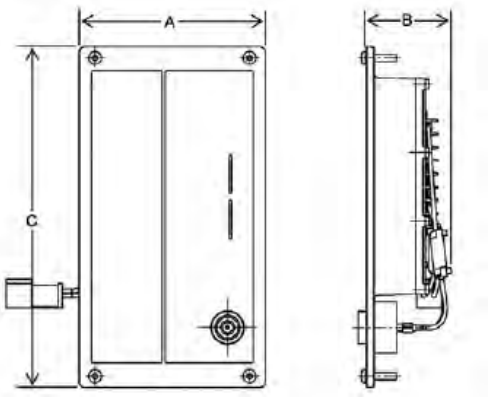
UL Recognized

LED Color Scheme

Each pair of LED's on the annunciator consists of two of three colors: green, yellow and red, which allows for custom configuration of status, warning and shutdown conditions.

The available colors and combinations are:

Row	LED 1	LED 2
1	Red	Yellow
2	Red	Yellow
3	Red	Yellow
4	Red	Yellow
5	Red	Yellow
6	Red	Green
7	Red	Yellow
8	Red	Yellow
9	Red	Yellow
10	Red	Yellow
11	Red	Yellow
12	Red	Yellow
13	Green	Yellow
14	Green	Yellow
15	Red	Green
16	Red	Yellow



LED Color Scheme

- Emergency stop shutdown
- Overcrank shutdown
- Low coolant temperature warning
- High coolant temperature warning/shutdown
- Low oil pressure warning/shutdown
- Overspeed warning/shutdown
- Low coolant level warning/shutdown
- Low fuel level warning/shutdown
- EPS supplying load status
- Control switch not in auto warning
- High battery voltage warning/shutdown
- Low battery voltage warning/shutdown
- BATT charger AC failure warning/shutdown
- Low cranking voltage
- Engine running
- Tier 4 SCR

Annunciator Dimensions		
A	158 mm	6.22 in
B	60 mm	2.37 in
C	288 mm	11.34 in

125 Amp Load Center

Image shown may not reflect actual package.

SPECIFICATIONS

Line Rated Current	125 A
Number of spaces	8
Number of circuits	16
Number of tandem circuit breakers	8
System Voltage	120/240 V AC
NEMA degree of protection	NEMA 3R outdoor
Electrical connection	Lugs
Wiring configuration	3-wire
Material	Tin plated aluminium busbar
Enclosure material	Galvannealed steel
Cover finish	Gray baked enamel
Product certifications	UL Listed

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.

Cat® PL444 4G LTE Radio (Model: PL444 NA) Telematics Hardware

Product Description

The Caterpillar PL444 system is a Telematics product that is designed to record and store data from multiple datalinks (CAN J1939, Modbus RS485) present on higher level systems, then transmit the data offboard via wireless communications (cellular) to back office systems for end customer use.

Features

Design Specifications:

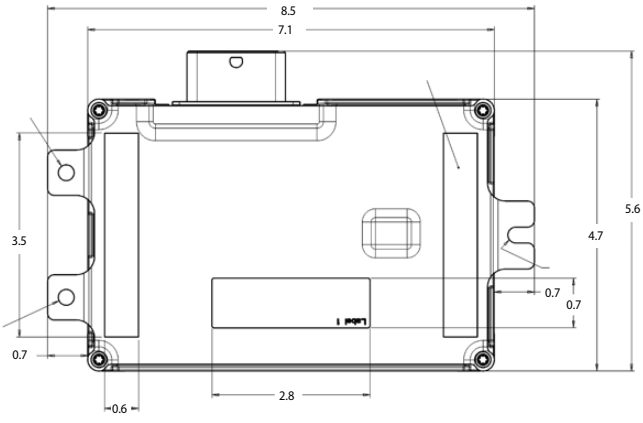
- 4G LTE Category 4 Radio
- GNSS signal tracking
- CAN datalink communication
- Modbus datalink communication
- Durable IP66/67-rated enclosure

Radio Connections / Pinout

	A	B	C	D	E	F	G	K	L	M
1	CAN_H	CAN_L	Not used	Not used	Not used	Not used	Not used	Not used	KSW	Batt+
2	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Wireless Disable	Not used	Batt-
3	RS485 RTN	Not used	Not used	Not used	Not used	Not used	LSD1	Not used	Not used	Not used
4	RS485_A	RS485_B	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used

CAN_H: CAN High
CAN_L: CAN Low
KSW: Keyswitch (Ignition) – Wakes the device up when tied to Batt+ voltage
Batt+: 12/24V Input
Batt-: Ground/Return
Wireless Disable: When pulled to ground, disables all RF transmissions (Cellular)
LSD1/2: Low Side Drivers 1 and 2. Connects a load with a voltage source, to ground when enabled, completing the circuit
RS485 RTN: RS-485 Shield
RS485A/B: RS-485 Modbus connections

Radio Dimensions



*All dimensions are in inches.

Technical Specifications

Input Voltage
Voltage Range ..... 9 to 32V DC
Protection ..... Reverse polarity

Current Consumption
Idle Current (non-transmitting) ..... < 300 mA
Peak Current ..... < 6A
Sleep Current ..... <3 mA

Physical Specifications
Enclosure Material ..... Plastic (PBT+ASA GF30 FR)
Aluminum (AIMg2.5 / H22; H23)
Dimensions (in) ..... 8.5 x 5.6 x 1.4
Weight ..... 0.45 kg
Interface Connectors ..... 48 pin Molex

Environment
Operating/Storage Temp ..... -40°C to +85°C
Ingress Protection IP66/67
Humidity ..... SAE J1455
Vibration ..... 9.8 Grms random (24-2000 Hz), up to 0.5 g^2/Hz

Regulatory Compliance
FCC, IC, CE RED, EN/UL/CSA 62368-1, RoHS, WEEE, REACH

LEDs
Orange — GNSS (Solid: GNSS Fix, 1Hz: Searching/no lock, Off: Fault)
Blue — Datalink (Flashing: Activity on J1939 or Modbus Off: Fault or No Connection)
Yellow — Cellular (Solid: Data connection established, Flashing: Searching for signal, Off: Modem off or Fault)
White — Bluetooth® (Solid: Connection established, Flashing: Advertising mode, Off: Bluetooth off or Fault)

Secure Key Injection
Security ..... Unique and cryptographic identity

Communications
Datalink J1939/CAN
Datalink ..... Modbus (RS-485)
Wireless ..... 4G LTE with 2G/3G fallback
Wireless ..... Bluetooth®/BLE 5.0

I/O
Low Side Drivers (300 mA max) 2
Switch to Ground 1
Keyswitch 1

Positioning (GNSS)
Signal Tracking ..... GPS/Galileo/GLONASS/BeiDou
Antenna ..... Internal

Cellular Communications

LTE Bands/Frequencies

Band	Frequencies (Uplink / Downlink) (MHz)
2	1850-1910 / 1930-1990
4	1710-1755 / 2110-2155
5	824-849 / 869-894
7	2500-2570 / 2620-2690
12/17	699-716 / 729-746
13	777-787 / 746-756

3G (UMTS) Bands/Frequencies

Band	Frequencies (Uplink / Downlink) (MHz)
2	1850-1910 / 1930-1990
4	1710-1755 / 2110-2155
5	824-849 / 869-894

2G (GSM) Bands/Frequencies

Band	Frequencies (Uplink / Downlink) (MHz)
2	1850-1910 / 1930-1990
5	824-849 / 869-894

Antennas ..... 2x internal (Primary + Diversity) to support 2x2 MIMO
SIM ..... eUICC chip
Operating Temperature ..... -30°C to +70°C

Bluetooth® Communications
Frequencies ..... 2402 – 2480 MHz
Version ..... BLE 5.0
Antenna ..... internal

LET'S DO THE WORK.™

LEHE20361-00 (06/21)

Circuit Breakers

Picture shown may not reflect actual configuration

Molded Case Circuit Breakers:
100A - 3000A
200 kW - 750 kW Gensets

Features

- 100% UL Listing
- Electronic Trip Units
- Double insulation
- Clear indication of breaker status
- Can be used in normal operation in an ambient of –25°and+70° C
- Auxiliary contacts available
- Insulating case constructed from fiberglass reinforced synthetic resin
- Anti-corrosion treatment on all metal parts
- Optional 2 or 3 Circuit Breakers

Conformity with International Standards

Circuit Breakers have been designed to comply with these major standards:

- UL 489
- CSA22.2 No.5
- IEC 60947-2
- NEMA AB1

C9, C13, C15, C18 Circuit Breakers

Manually Operated Circuit Breakers

Current (A)	Frame	Number of Poles	Interrupting Ratings (kA rms)			Trip Units	(Lugs) Cable Size Range / Phase	Auxiliary Options
			240V	480V	600V			
100	H	3	65	35	18	Electronic LSI	8-3/0 AWG	Form C (1NO + 1NC) Shunt Trip 24VDC
250	J	3	65	35	18		(2) 3/0 – 250 kcmil	
400	T5N	3	65	25	18	Electronic LS/I (S or I) or LSI	(2) 3/0 – 250 kcmil	1 Form C + 1 Bell Alarm 250VAC/VDC Shunt Trip 24VDC
600	T6N	3	65	35	20		(3) 2/0 – 400 kcmil	
800	T6N	3	65	35	20		(3) 2/0 – 400 kcmil	1 Form C + 1 Bell Alarm 400VAC / 250VDC Shunt Trip 24VDC
1200	T7S	3	65	50	25		(4) 2/0 – 500 kcmil	
1600	R	3	65	35	18	Electronic LSI	BUS BAR	Form C (1NO + 1NC) Shunt Trip 24VDC
2000	R	3	65	35	18		BUS BAR	
2500	R	3	65	35	18		BUS BAR	
3000	R	3	65	35	18		BUS BAR	

Single Breaker Options (250 – 3000A)

Model	Current (A)	Operation
C9 ACERT	100	Manually Operated
C9 ACERT	250	Manually Operated
C9 ACERT	400	Manually Operated
C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT	600	Manually Operated
C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT	800	Manually Operated or Electrically Operated
C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT	1200	Manually Operated or Electrically Operated
C13 ACERT, C15 ACERT, C18 ACERT	1600	Manually Operated
C15 ACERT, C18 ACERT	2000	Manually Operated or Electrically Operated
C18 ACERT	2500	Manually Operated
C18 ACERT	3000	Manually Operated or Electrically Operated

Multiple Breaker Options

Model	Main Breaker Box		Auxiliary Box
	1st Breaker (Amps)	2nd Breaker (Amps)	Breaker (Amps)
	Manually Operated	Manually Operated	Manually Operated
C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT	100	100, 250, 400, 600, 800, or 1200	3rd Breaker: 100, 250 or 400 (Not available if 1st & 2nd Breaker = 1200A)
C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT	250		
C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT	400		
C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT	600		
C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT	800		
C9 ACERT, C13 ACERT, C15 ACERT, C18 ACERT	1200		
C13 ACERT, C15 ACERT, C18 ACERT	1600	Not Available	2nd Breaker: 100, 250 or 400
C15 ACERT, C18 ACERT	2000		
C18 ACERT	2500		
C18 ACERT	3000		

Full Load Current

Full Load Current Table for the Circuit Breakers

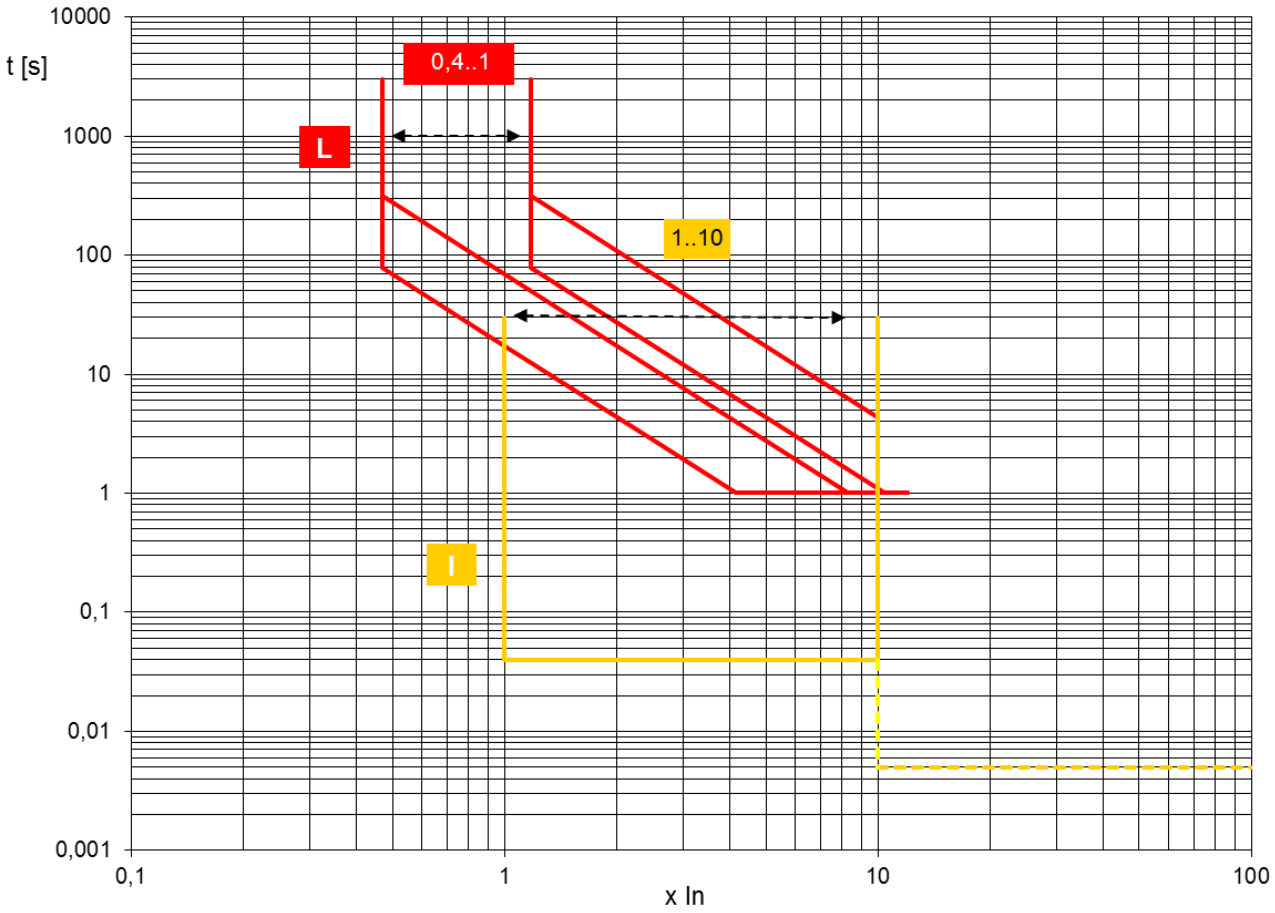
Three Phase – 60 Hz

Power		Voltage				
kW	KVA	600 V	480 V	240 V	220 V	208 V
		FLC	FLC	FLC	FLC	FLC
40.0	50.0	48.1	60.1	120.3	131.2	138.8
50.0	62.5	60.1	75.2	150.4	164.0	173.5
60.0	75.0	72.2	90.2	180.4	196.8	208.2
80.0	100.0	96.2	120.3	240.6	262.4	277.6
100.0	125.0	120.3	150.4	300.7	328.0	347.0
125.0	156.3	150.4	187.9	375.9	410.1	433.7
150.0	187.5	180.4	225.5	451.1	492.1	520.5
175.0	218.8	210.5	263.1	526.2	574.1	607.2
200.0	250.0	240.6	300.7	601.4	656.1	694.0
250.0	312.5	300.7	375.9	751.8	820.1	867.4
300.0	375.0	360.9	451.1	902.1	984.1	1040.9
350.0	437.5	421.0	526.2	1052.5	1148.2	1214.4
400.0	500.0	481.1	601.4	1202.8	1312.2	1387.9
500.0	625.0	601.4	751.8	1503.6	1640.2	1734.9
550.0	687.5	661.6	827.0	1653.9	1804.3	1908.4
600.0	750.0	721.7	902.1	1804.3	1968.3	2081.9
635.0	793.8	763.8	954.8	1909.5	2083.1	2203.3
650.0	812.5	781.9	977.3	1954.6	2132.3	2255.3
680.0	850.0	817.9	1022.4	2044.8	2230.7	2359.4
700.0	875.0	842.0	1052.5	2105.0	2296.3	2428.8
750.0	937.5	902.1	1127.7	2255.3	2460.4	2602.3

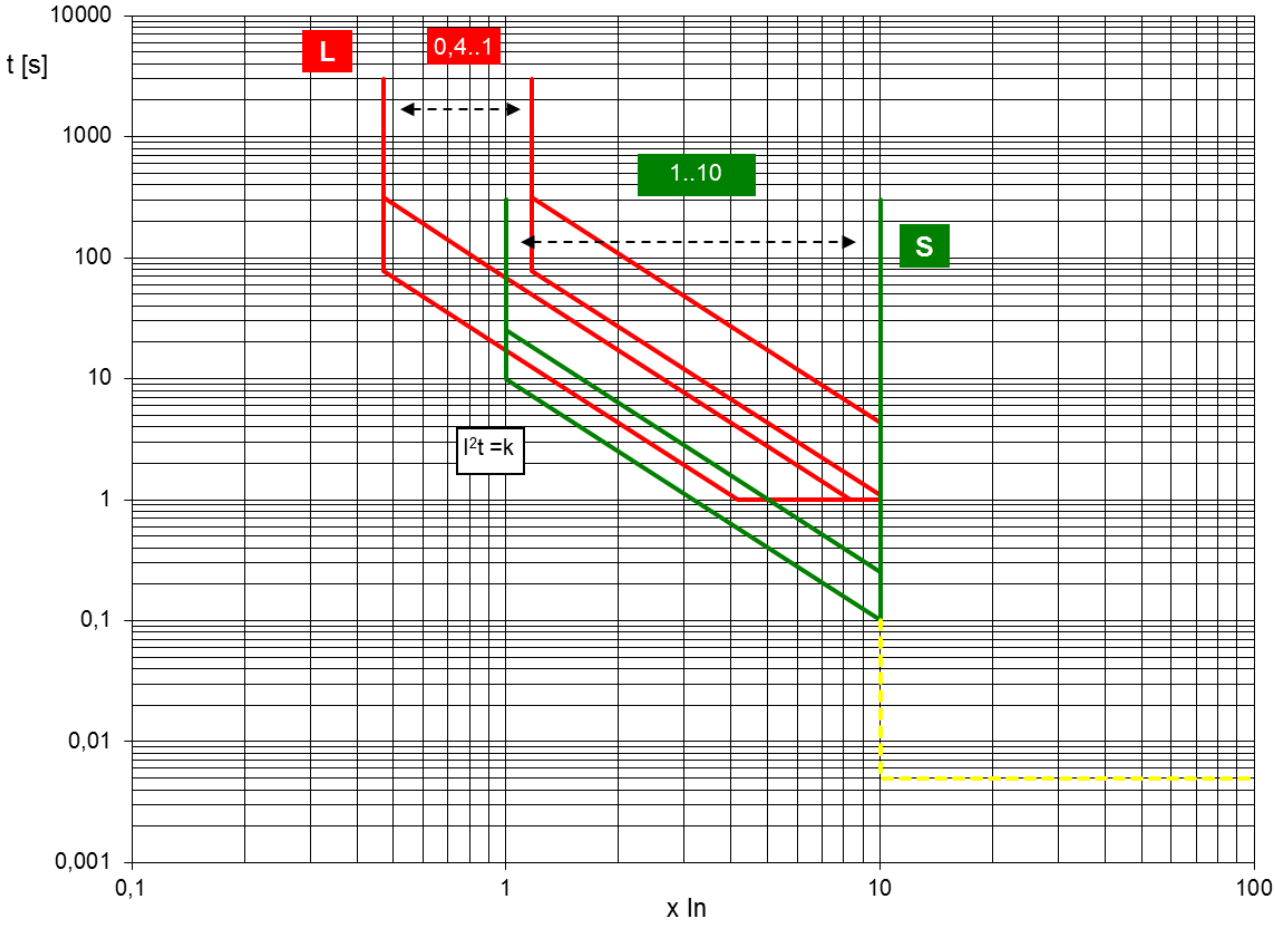
Single Phase – 60 Hz

Power		Voltage
kW	KVA	240 V
		FLC
40.0	50.0	166.67
50.0	50.0	208.33
57.0	57.0	237.50
60.0	60.0	250.00
80.0	80.0	333.33
100.0	100.0	416.67

Tmax T7 PR231/P Functions L-I Trip curves

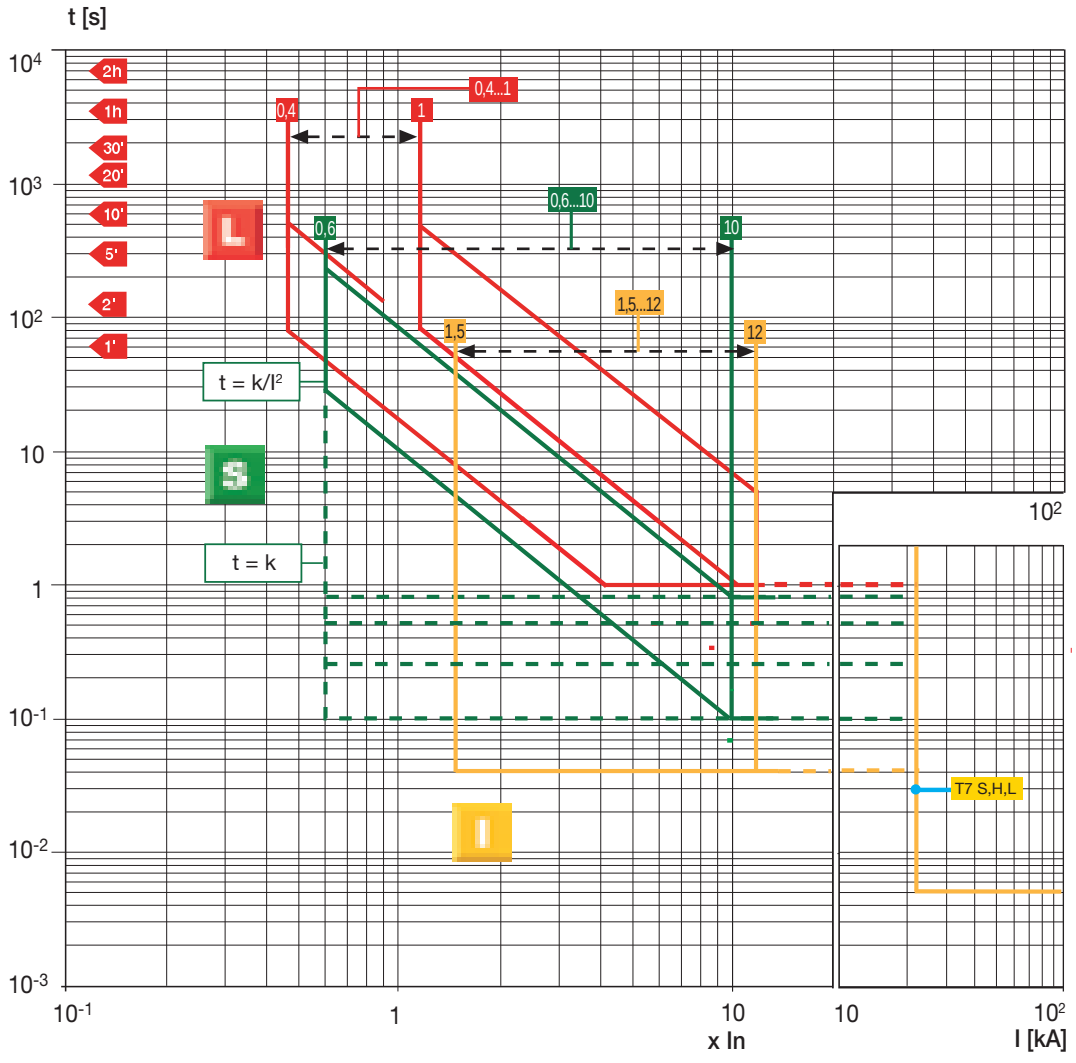


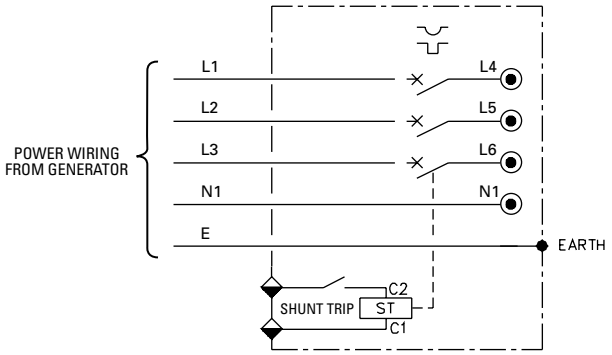
Tmax T7 PR231/P Functions L-S Trip curves

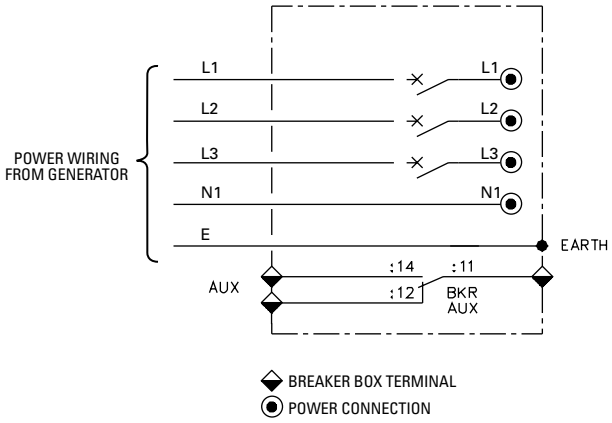


T7 1000/1200 – PR232/P

L-S-I Functions







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

Image shown may not reflect actual package.

Pump Style Jacket Water Heater

Single Phase 2500 Watts Pump style jacket water heater is a complete coolant preheater.
It features an integrated pump that combines the benefits of forced circulation with a compact design that can mount to a variety of small engine applications. Forced circulation of the coolant delivers uniform heating throughout the entire engine, extends element life and offers a significant reduction in electrical consumption.

UL Listed , ULc Listed
240V
Installation provided with shut-off valves

GENERATOR SPACE HEATER

Picture shown may not reflect actual configuration

Generator Space Heater

for C13/C15/C18

GENERAL DESCRIPTION

Humidity is a natural enemy of generators and all electrical equipment.

Space heaters are design to protect generator windings from abnormally high humidity conditions when the generator is idle. The heater maintains the air around the windings at a suitable temperature to prevent winding corrosion due to condensation

Generator space heaters are electrical resistance heater and located within the generator stator housing. Space heaters are particularly recommended for generating located in a low ambient and/or high humidity environment. As a further benefit, space heaters provide an excellent method of drying out a generator after long transit or storage.

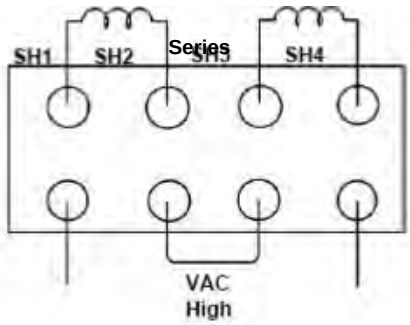
Because space heaters are required only during non-operative periods, they are require availability of a power source separate from the generator itself.

When the generating 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.

The space heater for C13/C15/C18 generator sets uses one heating element. Heater element electrical data: Voltage – 120V/230V, Power - 150W / 250W*.

All space heaters are designed for 120 / 230 Volt operation (50 or 60 Hz) by making series connections at the terminal strip.

Space Heaters Connection Diagram



* for North American Region

LEHE1885-00 (02-19)

www.Cat.com/electricpower

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)

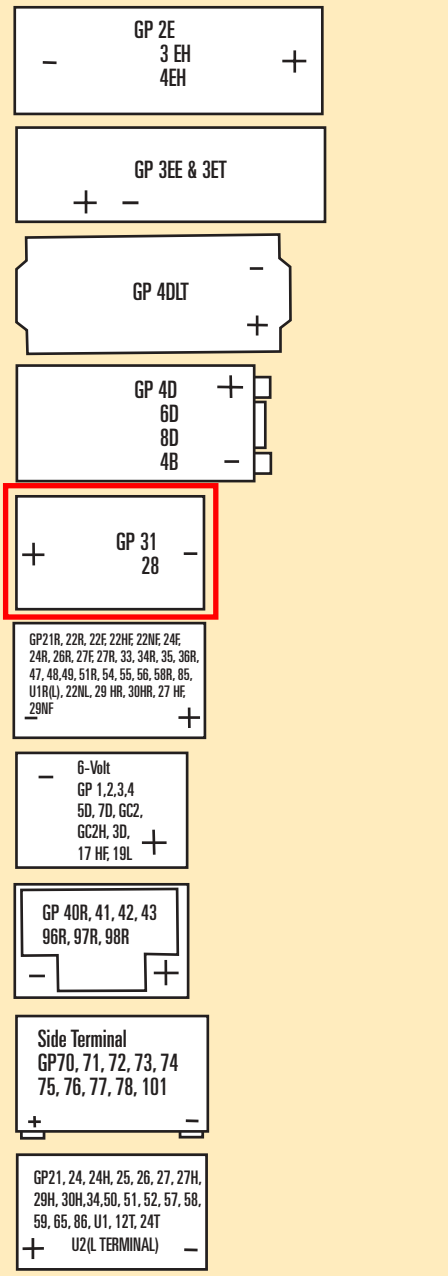
Construction Notes:
LAC = Low Maintenance, Hybrid Construction
C = Calcium Lead Alloy Grid Design
MF = Maintenance Free
MFA = Maintenance Free with Accessible Vent Caps
S = Stud Terminals
+ = Shipped Dry Only
* = Side Terminals
** = Starting and Deep Cycle Battery
*** = Deep Cycle and Starting Battery
" = 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

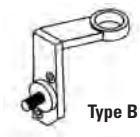
- Positive and Negative plates are anchored to container bottom and locked at the top of cell element for maximum vibration resistance.
- Heavy-duty forged terminal post bushings provide maximum strength and resistance to acid seepage.
- Hefty full-frame grids, no sharp edges, optimum acid/paste combination 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



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

World Wide Application Flexibility

Marine Commercial Vessels
Maintenance Free 4D, 8D and Group 31 Batteries. General Service Line Line valve regulated (VRLA) Gel batteries. High Marine Cranking Amps (MCA) and Deep Cycling capabilities.

Automotive-Truck-Bus & RV
A wide selection of popular BCI group sizes. Maintenance Free, Severe Service and Deep Cycle models. Application Specific Group 31 Truck Batteries.

Commercial & Recreational
A wide selection of premium batteries in most BCI group sizes for light commercial, recreational, agricultural and industrial applications.

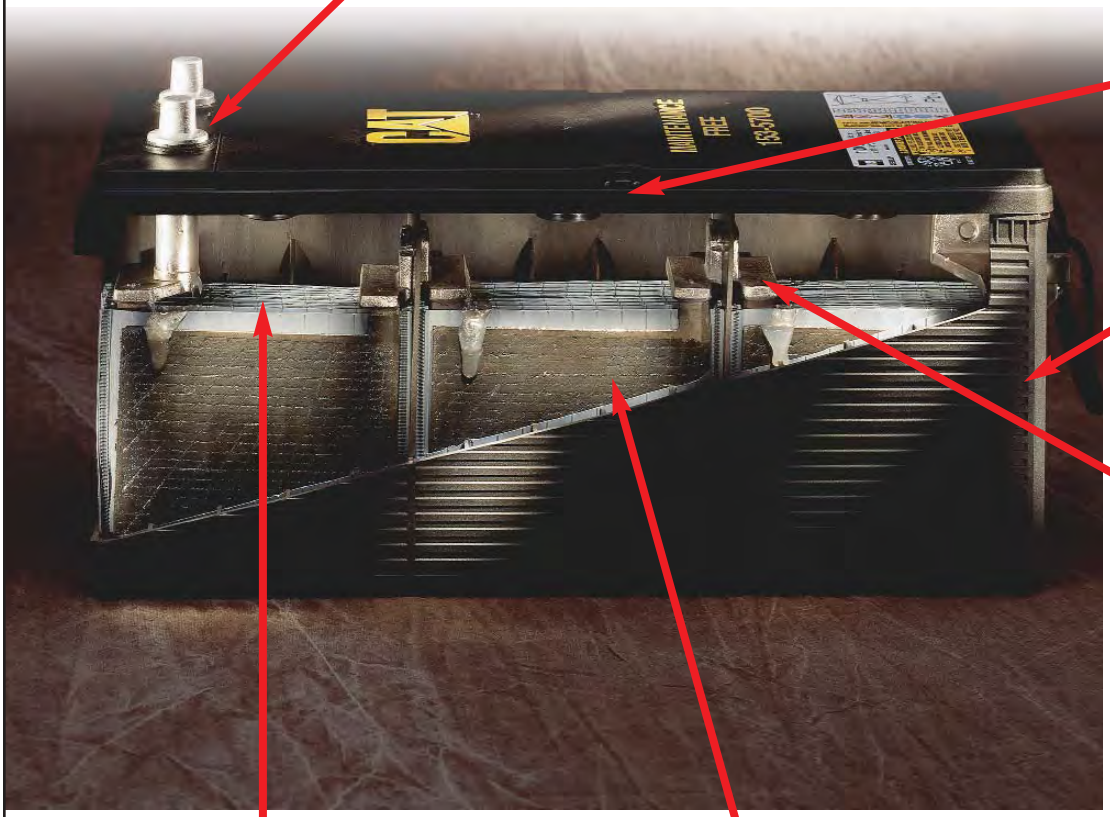
Marine Pleasure Craft
Premium High Output BCI Group 31, Dual Terminal Deep Cycle Batteries. General Service Line BCI group 24M, 27M and 8V sizes.

Electric Power Generation
Premium High Output Maintenance Free and Accessible batteries in BCI group 4D, 8D, & 31 sizes. High Cold Cranking Amp (CCA) Capability. General Service Line valve regulated (VRLA)
AGM batteries for UPS or stationary power applications.

Construction & Mining
Premium High Output Maintenance Free batteries. BCI group 4D, 8D and 31 Sizes. Industry leading cold cranking amps (CCA) and maximum vibration resistance.

Cat Batteries

Heavy-duty Forged Terminal Post Bushings



Built-in Flame Arrestor

Robust Reinforced Case

Vibration Resistant Plates & Elements

Heavy-duty Grids

Rugged Separators

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.

Battery Charger

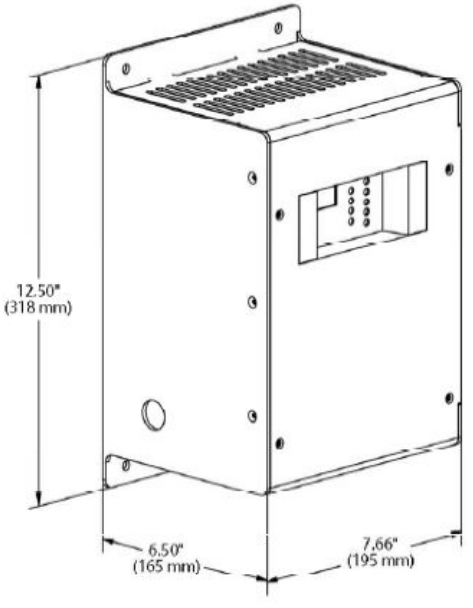


Image Shown may not Reflect Actual Package.

UL 10 Amp

Battery Charger

This battery charger offers accurate, automatic charging of lead-acid and nickel cadmium batteries. The output voltage automatically adjusts to changing input, load, battery and ambient conditions. This prevents battery over-charging and consequent loss of battery electrolyte.

Standard features include AC line compensation, precision voltage regulation, current limiting, automatic 2-rate charging, voltmeter and ammeter, temperature compensation and UL Listing.

The user interface is easy to understand with digital metering, NFPA 110 alarms and a battery fault alarm.

Features

- Electronically current limited at 105% of rated output
- Alarm system
- Digital display
- Lightning and voltage transient protection
- Protection of connected equipment against load dump protection
- Constant voltage, current limited, 4-rate automatic equalization
- IP 20 housing
- Temperature compensation
- On board temperature sensor with remote port
- Auto AC line compensation
- Output regulated by sensed battery voltage

Standards

- C-UL listed to UL 1236
- NFPA 70, NFPA 110
- CSA 22.2 No 107 certified
- CE DOC to EN 60335
- IBC Seismic Certification

Battery Charger

Specifications

Input supply	110 – 120 V 208 – 240 V
AC and DC fuses	2 input and 2 output)
Output voltage	24V
Output amps	10
Frequency	50 / 60 Hz
Operating temperature	-20°C (-4°F) to +60°C (140°F)
Housing constructed of rustproof anodized Aluminum	

Dimensions			
Width	Depth	Height	Weight
195 mm (7.66 in)	165 mm (6.5 in)	318 mm (12.5 in)	10.4 kg (23 lb)

NFPA 110 alarm package as follows:

- AC on Green led (indication)
- AC fail Red led and form C contact (2A)
- Float mode LED
- Fast charge LED
- Temp comp active LED
- Low battery volts Red led and Form C conta
- High Battery Volts Red led and Form C conta
- Charger fail Red led and Form C conta
- Battery fault Red led and Form C conta
- Battery disconnected
- Battery polarity reversed
- Mismatched charger battery voltage
- Open or high resistance charger to battery connection
- Open battery cell or excessive internal resistance

Feature Codes:

BTC1024 BTC1028 BTC1035 BTC1025 BTC1032

LEHE0141-05 (02/19)

NC POWER SYSTEMS

SECTION 3

CATERPILLAR TECHNICAL DATA

GENERATOR DATA

JULY 28, 2022

(AT400240)-ENGINE (BAA126422A)-CEM

For Help Desk Phone Numbers Click here

Selected Model

Engine: C9	**Generator Frame:** LC6114B	**Genset Rating (kW):** 300.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4183863	**Genset Rating (kVA):** 375.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 1040.9
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 41764 /40476 /41800 /10588

Spec Information

Generator Specification

Frame: LC6114B **Type:** LC **No. of Bearings:** 1
Winding Type: RANDOM WOUND **Flywheel:** 14.0
Connection: PARALLEL STAR **Housing:** 1
Phases: 3 **No. of Leads:** 12
Poles: 4 **Wires per Lead:** 2
Sync Speed: 1800 **Generator Pitch:** 0.6667

Generator Efficiency

Per Unit Load	kW	Efficiency %
0.25	75.0	90.3
0.5	150.0	92.9
0.75	225.0	93.5
1.0	300.0	93.1

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.1543	0.0178
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.2089	0.0241
TRANSIENT - SATURATED X'_d	0.2202	0.0254
SYNCHRONOUS - DIRECT AXIS X_d	3.8225	0.4410
SYNCHRONOUS - QUADRATURE AXIS X_q	2.2935	0.2646
NEGATIVE SEQUENCE X_2	0.1812	0.0209
ZERO SEQUENCE X_0	0.0113	0.0013

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	1.7380
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.1000
OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_{d0}	0.0130
SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_d	0.0100
OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_{q0}	0.1100
SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_q	0.0100
EXCITER TIME CONSTANT T_e	0.0300
ARMATURE SHORT CIRCUIT T_a	0.0150

Short Circuit Ratio: 0.28	Stator Resistance = 0.0041 Ohms	Field Resistance = 0.768 Ohms

Voltage Regulation

Voltage level adjustment: +/-	5.0%
Voltage regulation, steady state: +/-	0.5%
Voltage regulation with 3% speed change: +/-	0.5%
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:	7.45 Volts	42.13 Volts	Volts
Excitation current	0.73 Amps	3.4 Amps	Amps

Selected Model

Engine: C9	**Generator Frame:** LC6114B	**Genset Rating (kW):** 300.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4183863	**Genset Rating (kVA):** 375.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 1040.9
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 41764 /40476 /41800 /10588

Generator Mechanical Information

Center of Gravity

Dimension X	-431.0 mm	-17.0 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.

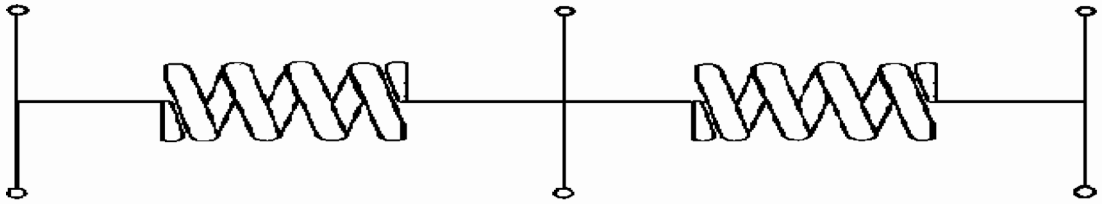
- "X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details
- "Y" is measured vertically from rotor center line. Up is positive.
- "Z" is measured to left and right of rotor center line. To the right is positive.

Generator WT = 996 kg	* Rotor WT = 387 kg	* Stator WT = 609 kg
2,196 LB	853 LB	1,343 LB

Rotor Balance = 0.0508 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
17.1 LB IN. s^2	55.5 MLB IN./rad	4.5 IN.	35.4 LB IN. s^2	40.8 MLB IN./rad	4.3 IN.	1.5 LB IN. s^2
1.93 N m s^2	6.27 MN m/rad	115.0 mm	4.0 N m s^2	4.61 MN m/rad	110.0 mm	0.17 N m s^2

Total J

54.0 LB IN. s^2

6.1 N m s^2

Selected Model

Engine: C9	**Generator Frame:** LC6114B	**Genset Rating (kW):** 300.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4183863	**Genset Rating (kVA):** 375.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 1040.9
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 41764 /40476 /41800 /10588

Generator Cooling Requirements - Temperature - Insulation Data

Cooling Requirements:		**Temperature Data: (Ambient 40 ^{0}C)**	
Heat Dissipated:	22.2 kW	**Stator Rise:**	105.0 ^{0}C
Air Flow:	66.0 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:	208 Volts
B BR 80/40	364.0 kVA
F BR -105/40	414.05 kVA
H BR - 125/40	455.0 kVA
F PR - 130/40	455.0 kVA
H PR - 150/40	482.3 kVA
H PR27 - 163/27	500.5 kVA

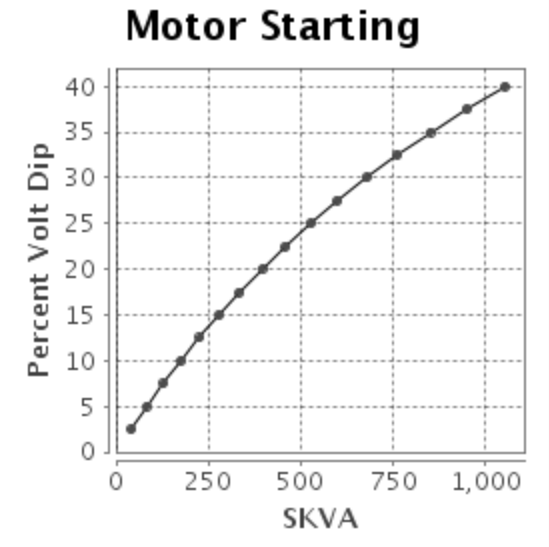
Selected Model

Engine: C9	**Generator Frame:** LC6114B	**Genset Rating (kW):** 300.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4183863	**Genset Rating (kVA):** 375.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 1040.9
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 41764 /40476 /41800 /10588

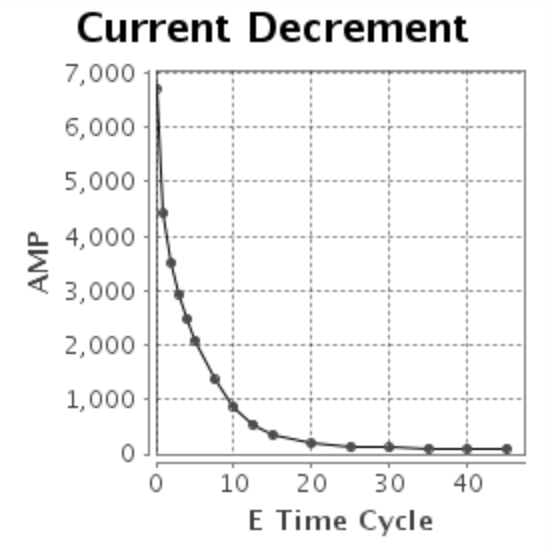
Starting Capability & Current Decrement
Motor Starting Capability (0.6 pf)

SKVA	Percent Volt Dip
41	2.5
83	5.0
128	7.5
176	10.0
226	12.5
279	15.0
335	17.5
395	20.0
459	22.5
527	25.0
599	27.5
677	30.0
761	32.5
851	35.0
948	37.5
1,053	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	6,721
1.0	4,424
2.0	3,514
3.0	2,937
4.0	2,480
5.0	2,095
7.5	1,363
10.0	871
12.5	543
15.0	353
20.0	191
25.0	135
30.0	114
35.0	105
40.0	101
45.0	100



Instantaneous 3 Phase Fault Current: 6721 Amps **Instantaneous Line - Line Fault Current:** 5355 Amps

Instantaneous Line - Neutral Fault Current: 8982 Amps

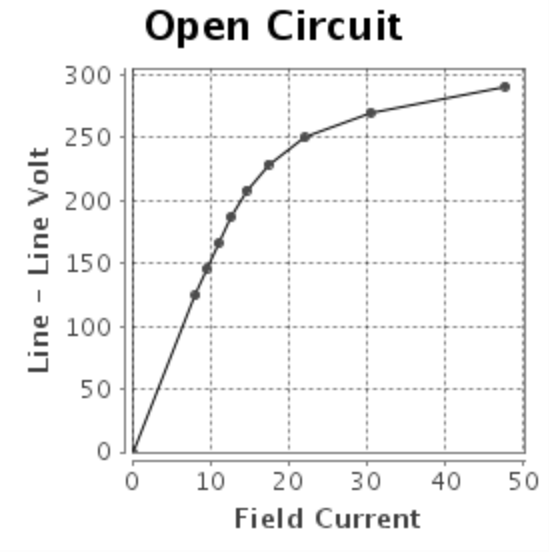
Selected Model

Engine: C9	**Generator Frame:** LC6114B	**Genset Rating (kW):** 300.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4183863	**Genset Rating (kVA):** 375.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 1040.9
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 41764 /40476 /41800 /10588

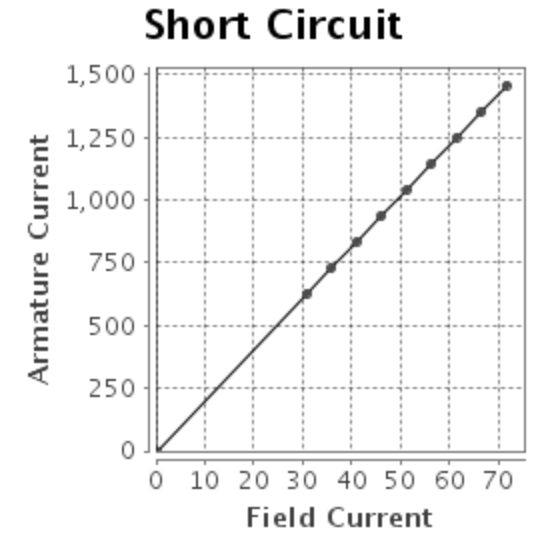
Generator Output Characteristic Curves
Open Circuit Curve

Field Current	Line - Line Volt
0.0	0
8.1	125
9.5	146
11.0	166
12.6	187
14.6	208
17.4	229
22.0	250
30.5	270
47.7	291



Short Circuit Curve

Field Current	Armature Current
0.0	0
30.7	625
35.8	729
40.9	833
46.0	937
51.2	1,041
56.3	1,145
61.4	1,249
66.5	1,353
71.6	1,457



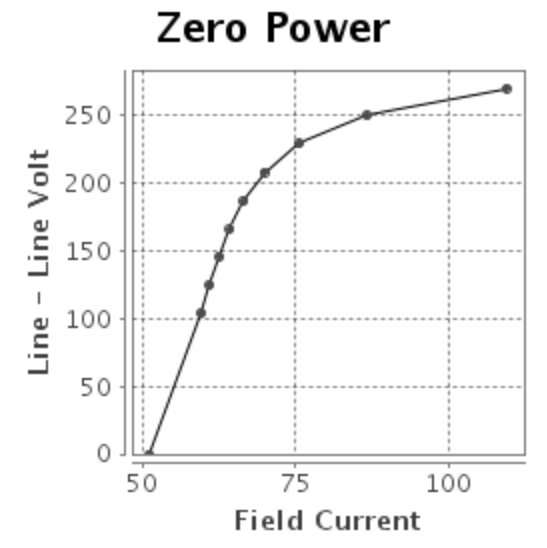
Selected Model

Engine: C9	**Generator Frame:** LC6114B	**Genset Rating (kW):** 300.0	**Line Voltage:** 208
Fuel: Diesel	**Generator Arrangement:** 4183863	**Genset Rating (kVA):** 375.0	**Phase Voltage:** 120
Frequency: 60	**Excitation Type:** Self Excited	**Pwr. Factor:** 0.8	**Rated Current:** 1040.9
Duty: STANDBY	**Connection:** PARALLEL STAR	**Application:** EPG	**Status:** Current

Version: 41764 /40476 /41800 /10588

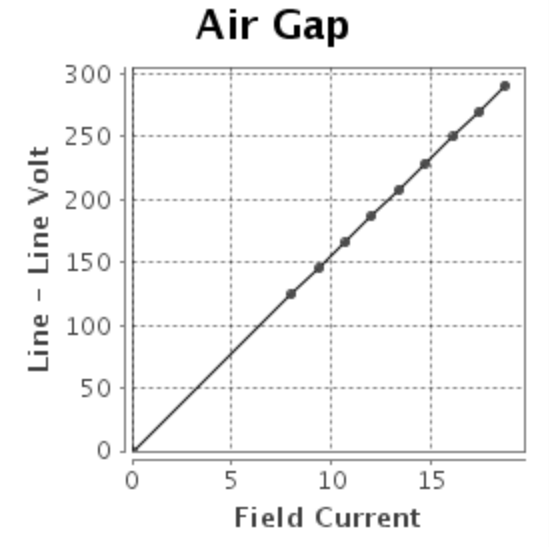
Generator Output Characteristic Curves
Zero Power Factor Curve

Field Current	Line - Line Volt
51.2	0
59.6	104
61.0	125
62.6	146
64.3	166
66.6	187
69.9	208
75.6	229
86.7	250
109.5	270



Air Gap Curve

Field Current	Line - Line Volt
0.0	0
8.0	125
9.4	146
10.7	166
12.0	187
13.4	208
14.7	229
16.1	250
17.4	270
18.7	291



Selected Model

Engine: C9 **Generator Frame:** LC6114B **Genset Rating (kW):** 300.0 **Line Voltage:** 208

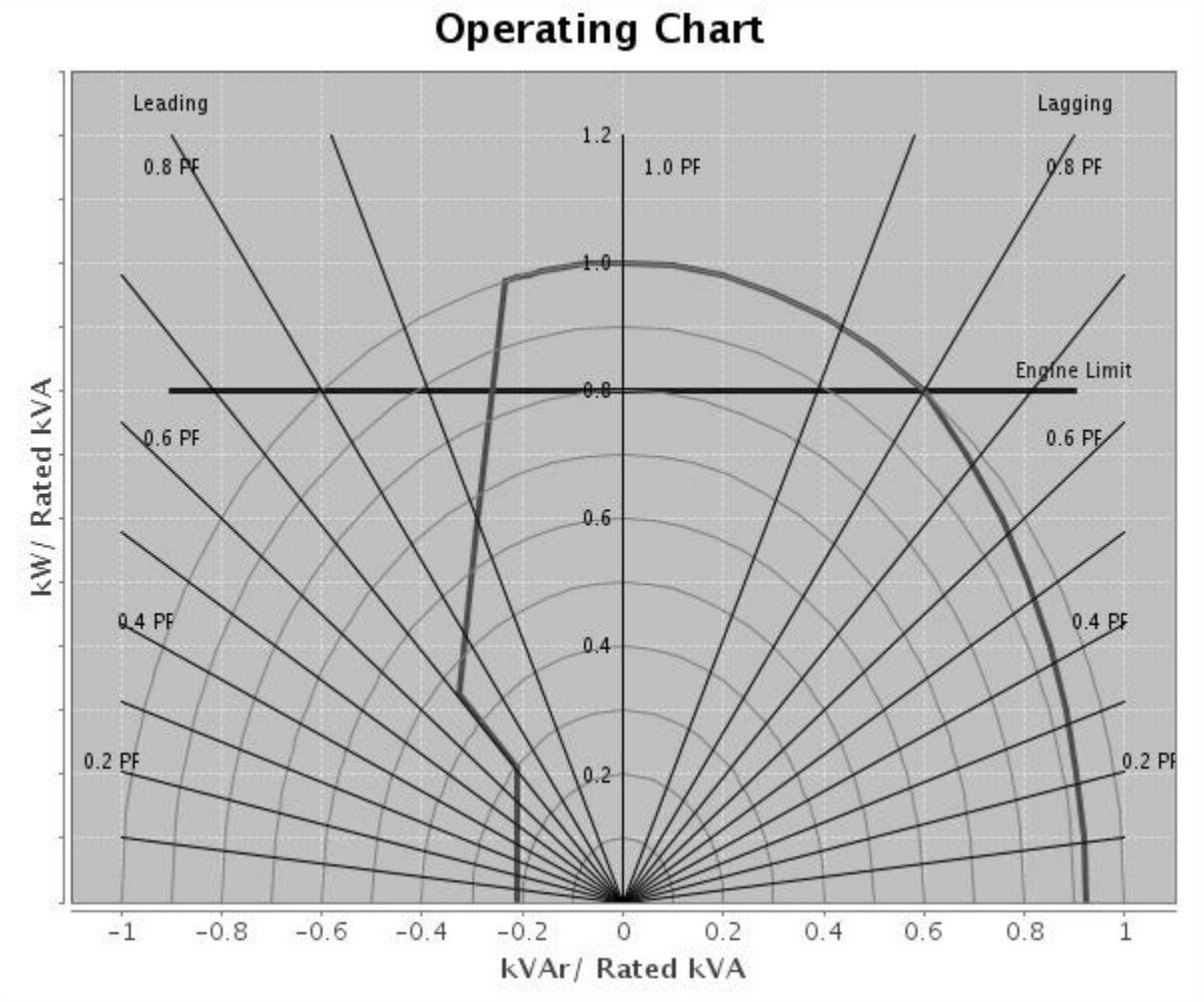
Fuel: Diesel **Generator Arrangement:** 4183863 **Genset Rating (kVA):** 375.0 **Phase Voltage:** 120

Frequency: 60 **Excitation Type:** Self Excited **Pwr. Factor:** 0.8 **Rated Current:** 1040.9

Duty: STANDBY **Connection:** PARALLEL STAR **Application:** EPG **Status:** Current

Version: 41764 /40476 /41800 /10588

Reactive Capability Curve



General Information

GENERATOR INFORMATION (DM7900)

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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.

PACKAGE DATA [C09DE48]

JULY 28, 2022

For Help Desk Phone Numbers Click here

Feature Code:	C09DE48	**Rating Type:**	STANDBY	**Sales model Package:**	PGS300
Engine Sales Model:	C9	**Engine Arrangement Number:**	4529685	**Hertz:**	60
EKW W/F:	300.0	**Noise Reduction:**	0 dBA	**Back Pressure:**	0.0 inH2O

Engine Package Information

Engine Package Data

Package Cooling Information

Open Cooling Data

% Load	Airflow Rate scfm			Ambient Capability Sea Level (Deg F)			Ambient Capability 300 m (Deg F)			Ambient Capability 600 m (Deg F)			Ambient Capability 900 m (Deg F)		
	0 inH2O	1/2 inH2O	3/4 inH2O	0 inH2O	1/2 inH2O	3/4 inH2O	0 inH2O	1/2 inH2O	3/4 inH2O	0 inH2O	1/2 inH2O	3/4 inH2O	0 inH2O	1/2 inH2O	3/4 inH2O
100.0	22283	21188	20411	138	136	134	134	132	131	131	129	127	122	122	122
75.0	22283	21188	20411	140	140	140	140	140	140	140	140	140	140	138	136

SA Level 1 Canopy Cooling Data

% Load	Airflow Rate scfm	Ambient Capability Sea Level (Deg F)	Ambient Capability 300 m (Deg F)	Ambient Capability 600 m (Deg F)	Ambient Capability 900 m (Deg F)
100.0	12395	114	111	107	104
75.0	12395	132	129	125	122

SA Level 2 Canopy Cooling Data

% Load	Airflow Rate scfm	Ambient Capability Sea Level (Deg F)	Ambient Capability 300 m (Deg F)	Ambient Capability 600 m (Deg F)	Ambient Capability 900 m (Deg F)
100.0	12395	114	111	107	104
75.0	12395	132	129	125	122

WP Canopy - Industrial Cooling Data

% Load	Airflow Rate scfm	Ambient Capability Sea Level (Deg F)	Ambient Capability 300 m (Deg F)	Ambient Capability 600 m (Deg F)	Ambient Capability 900 m (Deg F)
100.0	18222	120	116	113	109
75.0	18222	138	134	131	127

Package Sound Information

Sound Comments :

SA Level 1 Canopy Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	86.7	93.2	90.0	82.0	79.2	77.0	75.3	70.8
225.0	75.0	85.6	92.3	88.9	80.9	77.8	75.6	74.0	69.2
150.0	50.0	84.7	91.7	88.1	80.3	77.1	74.5	72.5	67.1
75.0	25.0	84.3	91.4	87.7	79.9	77.0	73.9	70.8	64.5

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	75.0	82.6	77.4	70.3	67.2	65.9	63.8	58.2
225.0	75.0	73.8	81.8	76.6	68.5	66.1	64.2	62.6	56.9
150.0	50.0	73.0	81.3	75.9	67.5	65.4	63.0	61.1	55.0
75.0	25.0	72.5	81.1	75.5	67.1	65.2	62.2	59.3	52.4

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	69.0	76.6	71.4	64.3	61.2	59.9	57.8	52.2
225.0	75.0	67.8	75.8	70.6	62.5	60.1	58.2	56.6	50.9
150.0	50.0	67.0	75.3	69.9	61.5	59.4	57.0	55.1	49.0
75.0	25.0	66.5	75.1	69.5	61.1	59.2	56.2	53.3	46.4

SA Level 2 Canopy Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	83.0	90.5	85.6	78.4	76.1	73.4	70.3	66.4
225.0	75.0	82.8	90.2	85.6	78.3	75.9	73.1	69.6	65.7
150.0	50.0	82.7	89.9	85.6	78.4	75.9	73.0	68.8	64.4
75.0	25.0	82.7	89.7	85.6	78.4	76.1	73.1	68.1	62.5

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	71.3	81.2	74.8	66.7	60.3	59.9	57.8	54.9
225.0	75.0	71.2	80.9	75.1	66.5	59.9	60.1	57.3	54.6
150.0	50.0	71.1	80.5	75.2	66.4	59.9	60.2	56.6	53.4

75.0	25.0	70.9	80.2	75.0	66.6	60.2	60.1	55.7	51.2

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	65.3	75.2	68.8	60.7	54.3	53.9	51.8	48.9
225.0	75.0	65.2	74.9	69.1	60.5	53.9	54.1	51.3	48.6
150.0	50.0	65.1	74.5	69.2	60.4	53.9	54.2	50.6	47.4
75.0	25.0	64.9	74.2	69.0	60.6	54.2	54.1	49.7	45.2

WP Canopy - Industrial Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	93.1	95.4	92.8	89.9	88.0	85.2	80.3	74.8
225.0	75.0	93.0	94.9	92.4	89.2	87.6	85.8	81.1	74.9
150.0	50.0	92.8	94.3	91.9	88.8	87.5	85.8	81.3	74.5
75.0	25.0	92.5	93.5	91.4	88.6	87.6	85.2	80.9	73.6

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	82.4	87.8	81.3	79.5	77.3	74.0	69.2	63.5
225.0	75.0	82.1	87.4	80.7	78.9	76.7	74.1	69.6	63.2
150.0	50.0	82.0	86.8	80.1	78.8	76.6	74.3	69.7	62.8
75.0	25.0	82.1	86.1	79.8	79.2	77.0	74.4	69.7	62.4

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	76.4	81.8	75.3	73.5	71.3	68.0	63.2	57.5
225.0	75.0	76.1	81.4	74.7	72.9	70.7	68.1	63.6	57.2
150.0	50.0	76.0	80.8	74.1	72.8	70.6	68.3	63.7	56.8
75.0	25.0	76.1	80.1	73.8	73.2	71.0	68.4	63.7	56.4

WP Canopy - Critical Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	95.8	94.5	94.1	92.3	90.6	88.9	84.4	83.3
225.0	75.0	94.9	93.1	93.3	90.6	90.1	88.3	83.9	82.0

150.0	50.0	94.4	91.3	92.7	89.7	89.9	88.0	83.5	80.4
75.0	25.0	94.3	89.7	92.4	89.5	90.0	88.0	83.3	78.9

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	84.2	85.4	84.7	81.7	78.0	76.1	72.0	72.7
225.0	75.0	83.4	84.3	84.3	79.5	77.9	76.1	71.4	71.2
150.0	50.0	83.2	83.1	84.0	78.2	78.3	76.5	71.2	69.4
75.0	25.0	83.4	81.9	83.7	77.7	78.9	77.0	71.3	67.7

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	78.2	79.4	78.7	75.7	72.0	70.1	66.0	66.7
225.0	75.0	77.4	78.3	78.3	73.5	71.9	70.1	65.4	65.2
150.0	50.0	77.2	77.1	78.0	72.2	72.3	70.5	65.2	63.4
75.0	25.0	77.4	75.9	77.7	71.7	72.9	71.0	65.3	61.7

Open Exhaust Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	124.2	119.4	121.5	118.1	117.9	119.9	112.2	105.0
225.0	75.0	124.2	117.7	121.9	117.7	118.1	119.9	111.9	104.1
150.0	50.0	123.3	118.6	121.1	117.0	116.6	119.0	111.0	103.0
75.0	25.0	120.2	115.1	118.5	115.4	115.9	113.5	107.6	99.0

Open Mechanical Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	101.9	93.2	97.7	94.9	95.0	94.4	93.2	96.7
225.0	75.0	100.7	93.2	97.5	94.8	94.8	93.6	91.2	93.5
150.0	50.0	99.9	92.6	97.4	94.7	94.7	93.0	89.9	90.2
75.0	25.0	99.5	91.5	97.4	94.7	94.8	92.5	89.1	86.8

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB

300.0	100.0	91.9	83.2	87.7	84.9	85.0	84.4	83.2	86.7
225.0	75.0	90.7	83.2	87.5	84.8	84.8	83.6	81.2	83.5
150.0	50.0	89.9	82.6	87.4	84.7	84.7	83.0	79.9	80.2
75.0	25.0	89.5	81.5	87.4	84.7	84.8	82.5	79.1	76.8

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
300.0	100.0	85.9	77.2	81.7	78.9	79.0	78.4	77.2	80.7
225.0	75.0	84.7	77.2	81.5	78.8	78.8	77.6	75.2	77.5
150.0	50.0	83.9	76.6	81.4	78.7	78.7	77.0	73.9	74.2
75.0	25.0	83.5	75.5	81.4	78.7	78.8	76.5	73.1	70.8

PERFORMANCE DATA [C09DE48]

JULY 28, 2022

For Help Desk Phone Numbers Click here

Perf No: DM8168 **Change Level:** 05

General | Heat Rejection | Emissions | Regulatory | Altitude Derate | Cross Reference | Perf Param Ref

View PDF

SALES MODEL:	C9	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	1,800
MACHINE SALES MODEL:		**HERTZ:**	60
ENGINE POWER (BHP):	480	**FAN POWER (HP):**	24.1
GEN POWER W/O FAN (EKW):	319.0	**ADDITIONAL PARASITICS (HP):**	12.3
GEN POWER WITH FAN (EKW):	300.0	**ASPIRATION:**	TA
COMPRESSION RATIO:	16.1	**AFTERCOOLER TYPE:**	ATAAC
RATING LEVEL:	STANDBY	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
PUMP QUANTITY:	1	**INLET MANIFOLD AIR TEMP (F):**	120
FUEL TYPE:	DIESEL	**JACKET WATER TEMP (F):**	192.2
MANIFOLD TYPE:	DRY	**TURBO CONFIGURATION:**	SINGLE
GOVERNOR TYPE:	ELEC	**TURBO QUANTITY:**	1
CAMSHAFT TYPE:	STANDARD	**TURBOCHARGER MODEL:**	S310-1.25
IGNITION TYPE:	CI	**CERTIFICATION YEAR:**	2005
INJECTOR TYPE:	EUI	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	1,759.8
REF EXH STACK DIAMETER (IN):	4		
MAX OPERATING ALTITUDE (FT):	3,281		

INDUSTRY	SUB INDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET

General Performance Data Top

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	ISO BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	ISO VOL FUEL CONSUMPTN (VFC)	ELEC SPEC FUEL CONSUMPTN (ESFC)	ISO ELEC SPEC FUEL CONSUMPTN (ESFC)
EKW	%	BHP	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR	LB/EKW-HR	LB/EKW-HR
300.0	100	480	393	0.332	0.328	22.4	22.2	0.530	0.520
270.0	90	430	352	0.334	0.330	20.2	20.0	0.532	0.522
240.0	80	383	314	0.339	0.335	18.3	18.1	0.541	0.531
225.0	75	361	295	0.342	0.339	17.4	17.2	0.549	0.539
210.0	70	339	277	0.347	0.344	16.6	16.4	0.560	0.550
180.0	60	296	242	0.360	0.357	15.0	14.9	0.592	0.580
150.0	50	253	207	0.376	0.372	13.4	13.3	0.635	0.623
120.0	40	212	173	0.390	0.386	11.6	11.5	0.688	0.675
90.0	30	170	139	0.403	0.400	9.7	9.6	0.762	0.748
75.0	25	149	122	0.411	0.407	8.6	8.5	0.815	0.800
60.0	20	127	104	0.419	0.415	7.5	7.4	0.889	0.872
30.0	10	82.9	68	0.441	0.437	5.2	5.1	1.218	1.195

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
EKW	%	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
300.0	100	480	82.5	122.6	1,247.3	60.6	927.2	83	450.8
270.0	90	430	78.7	121.1	1,179.5	55.9	877.6	80	428.0
240.0	80	383	74.9	121.5	1,120.8	51.5	840.4	76	406.4
225.0	75	361	73.0	121.6	1,094.5	49.4	826.3	74	396.1
210.0	70	339	71.0	121.7	1,071.1	47.3	817.6	72	386.3

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
180.0	60	296	66.4	121.7	1,028.3	43.1	800.8	67	367.7
150.0	50	253	61.1	121.7	988.0	38.7	784.5	62	350.2
120.0	40	212	52.8	121.7	944.9	32.8	768.7	54	321.8
90.0	30	170	42.5	121.6	899.1	25.9	752.9	43	282.8
75.0	25	149	36.9	121.6	875.4	22.3	745.0	38	260.3
60.0	20	127	30.8	121.6	850.8	18.7	737.0	31	235.4
30.0	10	82.9	17.9	121.5	723.0	11.7	650.3	18	178.8

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
300.0	100	480	916.6	2,460.9	3,985.8	4,144.9	872.5	798.0
270.0	90	430	893.4	2,306.9	3,884.5	4,028.0	848.2	780.6
240.0	80	383	870.9	2,173.0	3,772.3	3,902.1	821.8	760.2
225.0	75	361	859.8	2,109.4	3,711.7	3,835.1	806.5	747.8
210.0	70	339	846.8	2,047.1	3,649.5	3,766.9	788.0	732.2
180.0	60	296	814.1	1,926.8	3,499.4	3,605.2	751.6	701.1
150.0	50	253	772.8	1,810.5	3,315.8	3,410.8	715.5	669.7
120.0	40	212	707.1	1,643.7	3,018.0	3,100.6	657.9	617.9
90.0	30	170	623.3	1,424.8	2,642.8	2,711.5	577.7	544.3
75.0	25	149	576.0	1,299.8	2,434.3	2,495.5	530.5	500.6
60.0	20	127	524.5	1,162.9	2,209.5	2,262.9	477.8	451.6
30.0	10	82.9	412.8	851.2	1,728.1	1,764.7	377.1	358.8

Heat Rejection Data Top

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
300.0	100	480	6,838	1,312	18,223	10,196	2,598	5,239	20,357	48,785	51,968
270.0	90	430	6,227	1,100	16,530	8,999	2,344	4,774	18,249	44,009	46,881
240.0	80	383	5,718	954	15,163	8,062	2,120	4,304	16,263	39,804	42,402
225.0	75	361	5,492	885	14,576	7,680	2,017	4,080	15,306	37,868	40,339
210.0	70	339	5,288	827	14,082	7,393	1,922	3,868	14,366	36,078	38,432
180.0	60	296	4,912	823	13,054	6,800	1,739	3,448	12,536	32,644	34,774
150.0	50	253	4,565	786	11,966	6,184	1,555	3,034	10,749	29,195	31,100
120.0	40	212	4,219	770	10,567	5,402	1,348	2,419	8,983	25,307	26,959
90.0	30	170	3,811	699	8,973	4,534	1,120	1,706	7,210	21,028	22,400
75.0	25	149	3,554	623	8,129	4,085	999	1,352	6,312	18,747	19,970
60.0	20	127	3,271	492	7,247	3,625	871	1,008	5,399	16,350	17,417
30.0	10	82.9	2,624	519	4,878	2,172	597	397	3,514	11,200	11,931

Emissions Data Top

Units Filter All Units

DIESEL

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN ENGINE POWER PERCENT LOAD		EKW BHP %	300.0 480 100	225.0 361 75	150.0 253 50	75.0 149 25	30.0 82.9 10
TOTAL NOX (AS NO2)		G/HR	1,881	970	499	267	201
TOTAL CO		G/HR	115	89	129	109	102
TOTAL HC		G/HR	26	29	43	40	35
TOTAL CO2		KG/HR	225	175	135	86	51

GENSET POWER WITH FAN ENGINE POWER		EKW BHP	300.0 480	225.0 361	150.0 253	75.0 149	30.0 82.9
PERCENT LOAD		%	100	75	50	25	10
PART MATTER		G/HR	15.5	15.2	34.2	22.5	14.6
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,196.0	1,456.1	978.0	821.3	1,152.5
TOTAL CO	(CORR 5% O2)	MG/NM3	115.5	117.0	221.7	309.8	521.3
TOTAL HC	(CORR 5% O2)	MG/NM3	23.1	33.0	63.3	96.7	146.2
PART MATTER	(CORR 5% O2)	MG/NM3	12.7	17.6	52.2	50.4	64.7
TOTAL NOX (AS NO2)	(CORR 15% O2)	MG/NM3	814.9	540.3	362.9	304.8	427.7
TOTAL CO	(CORR 15% O2)	MG/NM3	42.9	43.4	82.3	115.0	193.5
TOTAL HC	(CORR 15% O2)	MG/NM3	8.6	12.2	23.5	35.9	54.2
PART MATTER	(CORR 15% O2)	MG/NM3	4.7	6.5	19.4	18.7	24.0
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,070	709	476	400	561
TOTAL CO	(CORR 5% O2)	PPM	92	94	177	248	417
TOTAL HC	(CORR 5% O2)	PPM	43	62	118	180	273
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	397	263	177	148	208
TOTAL CO	(CORR 15% O2)	PPM	34	35	66	92	155
TOTAL HC	(CORR 15% O2)	PPM	16	23	44	67	101
TOTAL NOX (AS NO2)		G/HP-HR	3.95	2.70	1.98	1.79	2.42
TOTAL CO		G/HP-HR	0.24	0.25	0.51	0.73	1.23
TOTAL HC		G/HP-HR	0.06	0.08	0.17	0.27	0.42
PART MATTER		G/HP-HR	0.03	0.04	0.14	0.15	0.18
TOTAL NOX (AS NO2)		G/KW-HR	5.37	3.67	2.69	2.44	3.29
TOTAL CO		G/KW-HR	0.33	0.34	0.70	0.99	1.67
TOTAL HC		G/KW-HR	0.08	0.11	0.23	0.37	0.57
PART MATTER		G/KW-HR	0.04	0.06	0.18	0.21	0.24
TOTAL NOX (AS NO2)		LB/HR	4.15	2.14	1.10	0.59	0.44
TOTAL CO		LB/HR	0.25	0.20	0.29	0.24	0.22
TOTAL HC		LB/HR	0.06	0.06	0.09	0.09	0.08
TOTAL CO2		LB/HR	496	387	297	189	112
PART MATTER		LB/HR	0.03	0.03	0.08	0.05	0.03
OXYGEN IN EXH		%	9.2	11.2	12.6	13.6	15.0
DRY SMOKE OPACITY		%	0.1	0.3	1.0	0.9	0.8
BOSCH SMOKE NUMBER			0.62	0.67	0.96	0.90	0.87

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN ENGINE POWER		EKW BHP	300.0 480	225.0 361	150.0 253	75.0 149	30.0 82.9
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	2,032	1,047	539	288	217
TOTAL CO		G/HR	214	166	242	203	191
TOTAL HC		G/HR	50	54	81	76	65
PART MATTER		G/HR	30.2	29.7	66.7	43.9	28.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,371.7	1,572.5	1,056.2	887.0	1,244.7
TOTAL CO	(CORR 5% O2)	MG/NM3	216.0	218.7	414.7	579.4	974.9
TOTAL HC	(CORR 5% O2)	MG/NM3	43.7	62.4	119.7	182.7	276.3
PART MATTER	(CORR 5% O2)	MG/NM3	24.8	34.3	101.8	98.2	126.1
TOTAL NOX (AS NO2)	(CORR 15% O2)	MG/NM3	880.1	583.5	391.9	329.2	461.9
TOTAL CO	(CORR 15% O2)	MG/NM3	80.2	81.2	153.9	215.0	361.8
TOTAL HC	(CORR 15% O2)	MG/NM3	16.2	23.2	44.4	67.8	102.5
PART MATTER	(CORR 15% O2)	MG/NM3	9.2	12.7	37.8	36.5	46.8
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,155	766	514	432	606
TOTAL CO	(CORR 5% O2)	PPM	173	175	332	464	780
TOTAL HC	(CORR 5% O2)	PPM	82	116	223	341	516
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	429	284	191	160	225
TOTAL CO	(CORR 15% O2)	PPM	64	65	123	172	289
TOTAL HC	(CORR 15% O2)	PPM	30	43	83	127	191
TOTAL NOX (AS NO2)		G/HP-HR	4.27	2.92	2.13	1.94	2.61
TOTAL CO		G/HP-HR	0.45	0.46	0.96	1.36	2.30
TOTAL HC		G/HP-HR	0.11	0.15	0.32	0.51	0.79
PART MATTER		G/HP-HR	0.06	0.08	0.26	0.29	0.34
TOTAL NOX (AS NO2)		G/KW-HR	5.80	3.96	2.90	2.63	3.55
TOTAL CO		G/KW-HR	0.61	0.63	1.30	1.85	3.12
TOTAL HC		G/KW-HR	0.14	0.21	0.43	0.69	1.07
PART MATTER		G/KW-HR	0.09	0.11	0.36	0.40	0.47
TOTAL NOX (AS NO2)		LB/HR	4.48	2.31	1.19	0.64	0.48
TOTAL CO		LB/HR	0.47	0.37	0.53	0.45	0.42
TOTAL HC		LB/HR	0.11	0.12	0.18	0.17	0.14
PART MATTER		LB/HR	0.07	0.07	0.15	0.10	0.06

Regulatory Information Top

EPA TIER 3	2005 - 2010	

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR

EPA TIER 3		2005 - 2010		
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 3	CO: 3.5 NOx + HC: 4.0 PM: 0.20

EPA EMERGENCY STATIONARY	2011 - ----

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 4.0 PM: 0.20

Altitude Derate Data Top

STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)													
0	480	480	480	480	480	477	474	465	452	433	412	395	478
1,000	480	480	480	480	477	475	470	457	441	422	402	386	476
2,000	480	480	479	477	474	470	463	446	427	410	392	376	473
3,000	480	478	475	470	463	457	449	434	418	403	386	370	464
4,000	475	469	463	456	450	444	436	422	407	391	374	358	453
5,000	462	456	449	442	436	430	422	408	393	377	360	343	442
6,000	449	442	435	428	422	416	408	394	379	362	346	329	430
7,000	434	428	421	414	408	402	394	379	364	348	332	315	418
8,000	420	413	406	400	394	387	380	365	350	334	318	302	406
9,000	405	398	392	385	379	373	365	350	335	320	305	289	394
10,000	390	384	377	371	365	359	352	337	322	307	293	278	382
11,000	376	369	363	357	351	345	339	334	320	305	291	277	370
12,000	361	355	348	342	337	331	326	320	315	303	288	270	357
13,000	347	340	334	329	323	318	312	307	302	290	274	257	345
14,000	332	326	321	315	310	304	299	294	289	276	261	246	333
15,000	319	313	307	302	297	291	286	282	276	263	249	235	322

Cross Reference Top

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
0K6616	NAP	2531644	GS279	-	S9L00001	
4150068	PP5547	3950369	GS279	-	S9P00001	
4150068	PP5547	4529865	GS857	LS	S9P00001	
4150068	PP5547	5664658	PG350	G	RG300001	
4150068	PP5547	5664658	PG375	G	RE300001	

Performance Parameter Reference Top

Parameters Reference: DM9600 - 14

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION: Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified

quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS: Power +/- 3% Torque +/- 3% Exhaust stack temperature +/- 8% Inlet airflow +/- 5% Intake manifold pressure-gage +/- 10% Exhaust flow +/- 6% Specific fuel consumption +/- 3% Fuel rate +/- 5% Specific DEF consumption +/- 3% DEF rate +/- 5% Heat rejection +/- 5% Heat rejection exhaust only +/- 10% Heat rejection CEM only +/- 10%
Heat Rejection values based on using treated water.
Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.
On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.
On 3500 and C175 engines, at speeds below Peak Torque these values are provided for reference only, and may not meet the tolerance listed.
These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS: Heat rejection +/- 10% Heat rejection to Atmosphere +/- 50% Heat rejection to Lube Oil +/- 20% Heat rejection to Aftercooler +/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS: Torque +/- 0.5% Speed +/- 0.2% Fuel flow +/- 1.0% Temperature +/- 2.0 C degrees Intake manifold pressure +/- 0.1 kPa
OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR FOR 3500 ENGINES AND SMALLER SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.
FOR 3600 ENGINES Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL DIESEL Reference fuel is #2 distillate diesel with a 35API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 15 deg C (59 deg F), where the density is 850 G/Liter (7.0936 Lbs/Gal).
GAS Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set.
Standard temperature values versus altitude could be seen on TM2001.
When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.
Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.
Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSION CYCLE LIMITS: Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.

WET & DRY EXHAUST/EMISSIONS DESCRIPTION: Wet - Total exhaust flow or concentration of total exhaust flow Dry - Total exhaust flow minus water vapor or concentration of exhaust flow with water vapor excluded

EMISSIONS DEFINITIONS: Emissions : DM1176

EMISSION CYCLE DEFINITIONS
1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS: Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS: 3500: EM1500

RATING DEFINITIONS: Agriculture : TM6008
Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040

Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038

SOUND DEFINITIONS: Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 10/27/21

RADIATOR PERFORMANCE DATA

JULY 28, 2022

For Help Desk Phone Numbers Click here

Component Performance Number: EM0499

Radiator Data

Radiator Part Number: 4490660
Radiator Type: AS13.3CTS
Front Area: 13.24 ft2
Radiator Dry Weight: 269.0 lbs
Radiator Wet Weight: NA lbs
Radiator Water Capacity High Temp Circuit: 6.0 gal
Radiator Water Capacity Low Temp Circuit: NA gal
Center of Gravity (X): 0.00 in (Distance from front face of core)
Center of Gravity (Y): 0.00 in (Distance from bottom of radiator support)
Center of Gravity (Z): 0.00 in (Distance from center line of core)

Engine Data

Performance Number: DM8168
Sales Model: C9
EKW: 300
Rating: STANDBY
Speed: 1800
Settings: NA
IM ATAAC Temp Deg F: 120

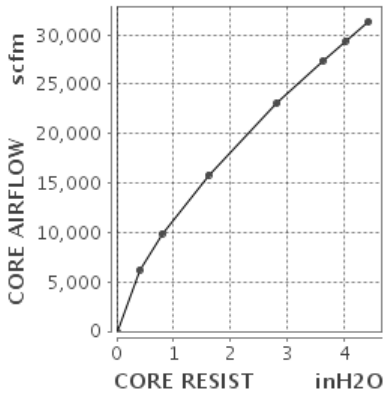
Combination Data

Pully Ratio: 0.76
Fan Power: 22.79734 hp

Ambient Restrictions (1/2 inH2O)			Ambient Restrictions (3/4 inH2O)			Ambient Restrictions (1.00 inH2O)		
984 Feet	2460 Feet	4921 Feet	984 Feet	2460 Feet	4921 Feet	984 Feet	2460 Feet	4921 Feet
--------- Max Ambient Pre-alarm Deg F ---------								
138	132	125	134	129	122	NA	NA	NA

Air Flow Restrictions (1/2 inH2O)	Air Flow Restrictions (3/4 inH2O)	Air Flow Restrictions (1.00 inH2O)
--------- scfm ---------		
21188	20411	NA

CORE RESIST inH2O	CORE AIRFLOW scfm
0	0
0.4	6,179.08
0.8	9,880.77
1.61	15,799.66
2.81	23,080.98
3.62	27,363.24
4.02	29,386.78
4.42	31,346.74



Reference Number: EM0499

No notes found...

Parameters Reference:

No notes found...

Systems Data
Reference Number: DM8168

CATERPILLAR®

July 28, 2022
For Help Desk Phone Numbers
Click Here

AIR INTAKE SYSTEM		
THE INSTALLED SYSTEM MUST COMPLY WITH THE SYSTEM LIMITS BELOW FOR ALL EMISSIONS CERTIFIED ENGINES TO ASSURE REGULATORY COMPLIANCE.		
MAXIMUM ALLOWABLE INTAKE RESTRICTION WITH CLEAN ELEMENT	15	IN-H20
MAXIMUM ALLOWABLE INTAKE RESTRICTION WITH DIRTY ELEMENT	30	IN-H20
MAXIMUM PRESSURE DROP FROM COMPRESSOR OUTLET TO MANIFOLD INLET (OR MIXER INLET FOR EGR)	4.4	IN-HG
MAXIMUM TURBO INLET AIR TEMPERATURE	122	DEG F
MAXIMUM AIR FILTER INLET AIR TEMPERATURE	122	DEG F
CHARGE AIR FLOW AT RATED SPEED	62.8	LB/MIN
TURBO COMPRESSOR OUTLET PRESSURE AT RATED SPEED (ABSOLUTE)	108.8	IN-HG
COOLING SYSTEM		
ENGINE ONLY COOLANT CAPACITY	3.7	GAL
MAXIMUM ALLOWABLE JACKET WATER OUTLET TEMPERATURE	223	DEG F
REGULATOR LOCATION FOR JW (HT) CIRCUIT	OUTLET	
REGULATOR LOCATION FOR SCAC CIRCUIT	INLET	
MAXIMUM UNINTERRUPTED FILL RATE	5.0	G/MIN
MINIMUM COOLANT LOSS WITHOUT IMPACTING RADIATOR PERFORMANCE (PERCENT OF TOTAL)	90	PERCENT
COOLANT LOSS-MAXIMUM PERCENTAGE OF PUMP PRESSURE RISE LOSS	10	PERCENT
AIR VENT CAPABILITY AT 35% PUMP PRESSURE RISE LOSS	3.80	PT/MIN
MAXIMUM PERCENTAGE OF PUMP PRESSURE RISE LOSS (JW PUMP CAVITATION SENSITIVITY)	20	PERCENT
MINIMUM JACKET WATER INLET TEMPERATURE	145	DEG F
JACKET WATER THERMOSTAT START TO OPEN TEMPERATURE (KEEL)	181	DEG F
JACKET WATER THERMOSTAT FULL OPEN TEMPERATURE (KEEL)	198	DEG F
JACKET WATER THERMOSTAT START TO OPEN TEMPERATURE (HEX)	181	DEG F
JACKET WATER THERMOSTAT FULL OPEN TEMPERATURE (HEX)	198	DEG F
ENGINE SPEC SYSTEM		
CYLINDER ARRANGEMENT	INLINE	
NUMBER OF CYLINDERS	6	
CYLINDER BORE DIAMETER	4.4	IN
PISTON STROKE	5.9	IN
TOTAL CYLINDER DISPLACEMENT	538	CU IN
STANDARD CRANKSHAFT ROTATION FROM FLYWHEEL END	CCW	
STANDARD CYLINDER FIRING ORDER	1-5-3-6-2-4	
NUMBER 1 CYLINDER LOCATION	FRONT	
STROKES/COMBUSTION CYCLE	4	
MINIMUM ENGINE SPEED DURING REVERSAL / MINIMUM CLUTCH IN SPEED	400	RPM
EXHAUST SYSTEM		

THE INSTALLED SYSTEM MUST COMPLY WITH THE SYSTEM LIMITS BELOW FOR ALL EMISSIONS CERTIFIED ENGINES TO ASSURE REGULATORY COMPLIANCE.		
MAXIMUM ALLOWABLE SYSTEM BACK PRESSURE	40	IN-H20
MANIFOLD TYPE	DRY	
FUEL SYSTEM		
MAXIMUM FUEL FLOW FROM TRANSFER PUMP TO ENGINE	46.5	G/HR
MAXIMUM ALLOWABLE FUEL SUPPLY LINE RESTRICTION	8.0	IN-HG
MAXIMUM ALLOWABLE FUEL TEMPERATURE AT TRANSFER PUMP INLET	151	DEG F
MAXIMUM FUEL FLOW TO RETURN LINE FROM ENGINE	29.9	G/HR
MAXIMUM ALLOWABLE FUEL RETURN LINE RESTRICTION	14.8	IN-HG
NORMAL FUEL PRESSURE IN A CLEAN SYSTEM	72.5	PSI
FUEL SYSTEM TYPE	HEUI	
MAXIMUM TRANSFER PUMP PRIMING LIFT WITHOUT PRIMING PUMP	12.1	FT
MAXIMUM HEAT REJECTION TO FUEL	250	BTU/MIN
MAXIMUM HEAD PRESSURE AT FUEL TRANSFER PUMP INLET	6	PSI
LUBE SYSTEM		
LUBE SYSTEM OIL COOLER TYPE	PLATE	
CRANKCASE VENTILATION TYPE	TO ATM	
MAXIMUM ENGINE TO OIL BEARING TEMPERATURE	221	DEG F
MAXIMUM OIL FILTER PRESSURE DROP ACROSS A NEW ENGINE OIL FILTER	36.3	PSI
MINIMUM ACCEPTABLE CRANKCASE PRESSURE	-4	IN-H20
MAXIMUM ACCEPTABLE CRANKCASE PRESSURE	12	IN-H20
MOUNTING SYSTEM		
CENTER OF GRAVITY LOCATION - X DIMENSION - FROM REAR FACE OF BLOCK - (REFERENCE TM7077)	16.8	IN
CENTER OF GRAVITY LOCATION - Y DIMENSION - FROM CENTERLINE OF CRANKSHAFT - (REFERENCE TM7077)	8.2	IN
CENTER OF GRAVITY LOCATION - Z DIMENSION - FROM CENTERLINE OF CRANKSHAFT - (REFERENCE TM7077)	0.0	IN
STARTING SYSTEM		
LOWEST AMBIENT START TEMPERATURE WITHOUT AIDS	32	DEG F

NC POWER SYSTEMS

CAT

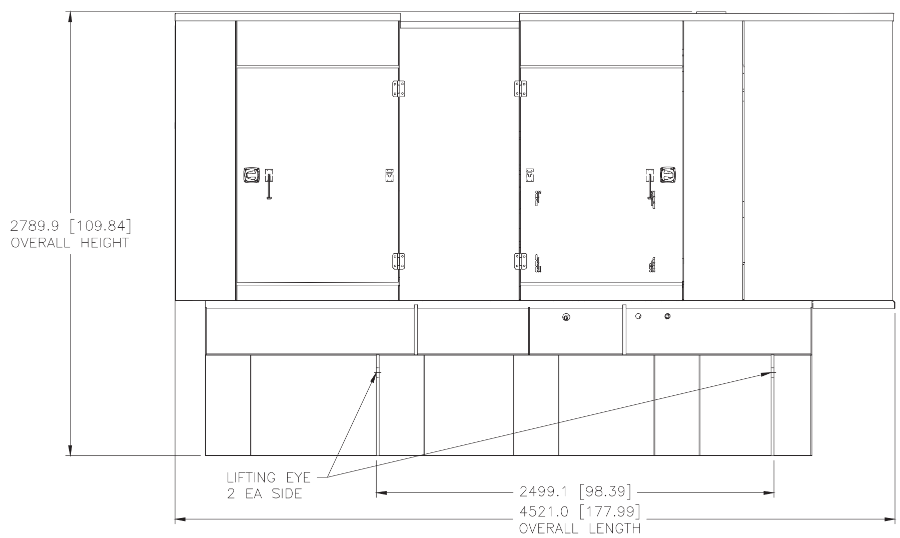
SECTION 4

ENGINEERING DRAWINGS

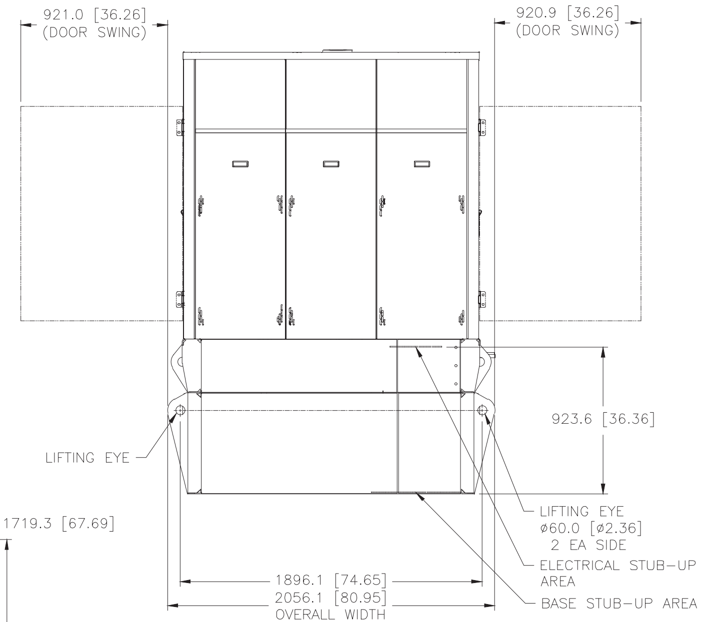
METRIC 519-3219

QTY	ENGINE CONNECTIONS	SIZE	SHEET
1	EXHAUST	ø127.0 [ø5.00] O.D.	2
1	OIL DRAIN	ø15.9 [0.63] I.D.	2
1	COOLANT DRAIN	ø19.1 [0.75] I.D.	2

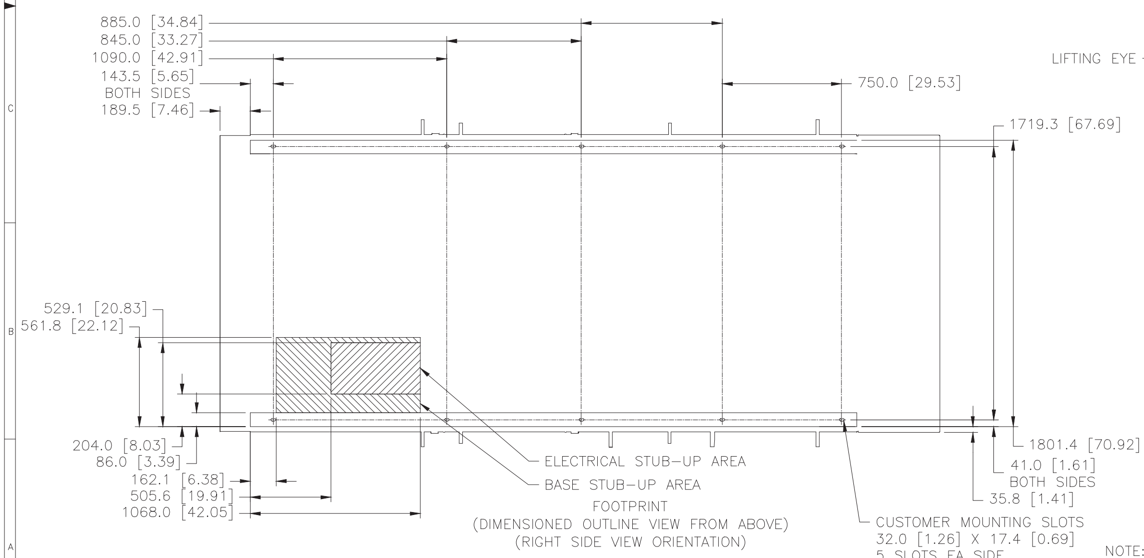
QTY	POSSIBLE TANK CONNECTIONS	SIZE	SHEET
1	MAIN TANK EMERGENCY VENT	5" NPT THD	3
1	BASIN TANK EMERGENCY VENT	5" NPT THD	3
1	FUEL FILLER	4" NPT THD	3
2	CUSTOMER CONNECTIONS	2" NPTF THD	3
1	SPARE PORT	1" NPTF THD	3



RIGHT SIDE VIEW



REAR VIEW



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

NOTE: ENCLOSURE ARRANGEMENTS LS-1876 & LS-1877 COME WITH WINDOW

PACKAGE LIFTED IN 4 PLACES

PACKAGE SHOWN WITH MORE DETAIL ON SHEETS 2 & 3

MODEL	TYPE	ENGINE	TANK	ENCLOSURE
C9	Y	LS-0249 CHG 02	LS-1845 CHG 00	LS-1875 CHG 01
				LS-1876 CHG 01
				LS-1877 CHG 01
				LS-1878 CHG 01

SPEC NO.	NAME
1E2733	DRAWING-AUTOCAD
1E0198W	BRAND MARKINGS
1E0013G	CONFIDENTIALITY
1E0012A	INTERPRETATION
1E0011	INTPR & TOL

DRN B.R.VILLENA
CHK M.J.SWIFT
APPD N.P. MOUNTJOY
CONCEPT EXP PRE PROD. PROD.
OTHER RECORDS X

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MM [INCH]
DIMENSIONS W/O TOL ARE BASIC

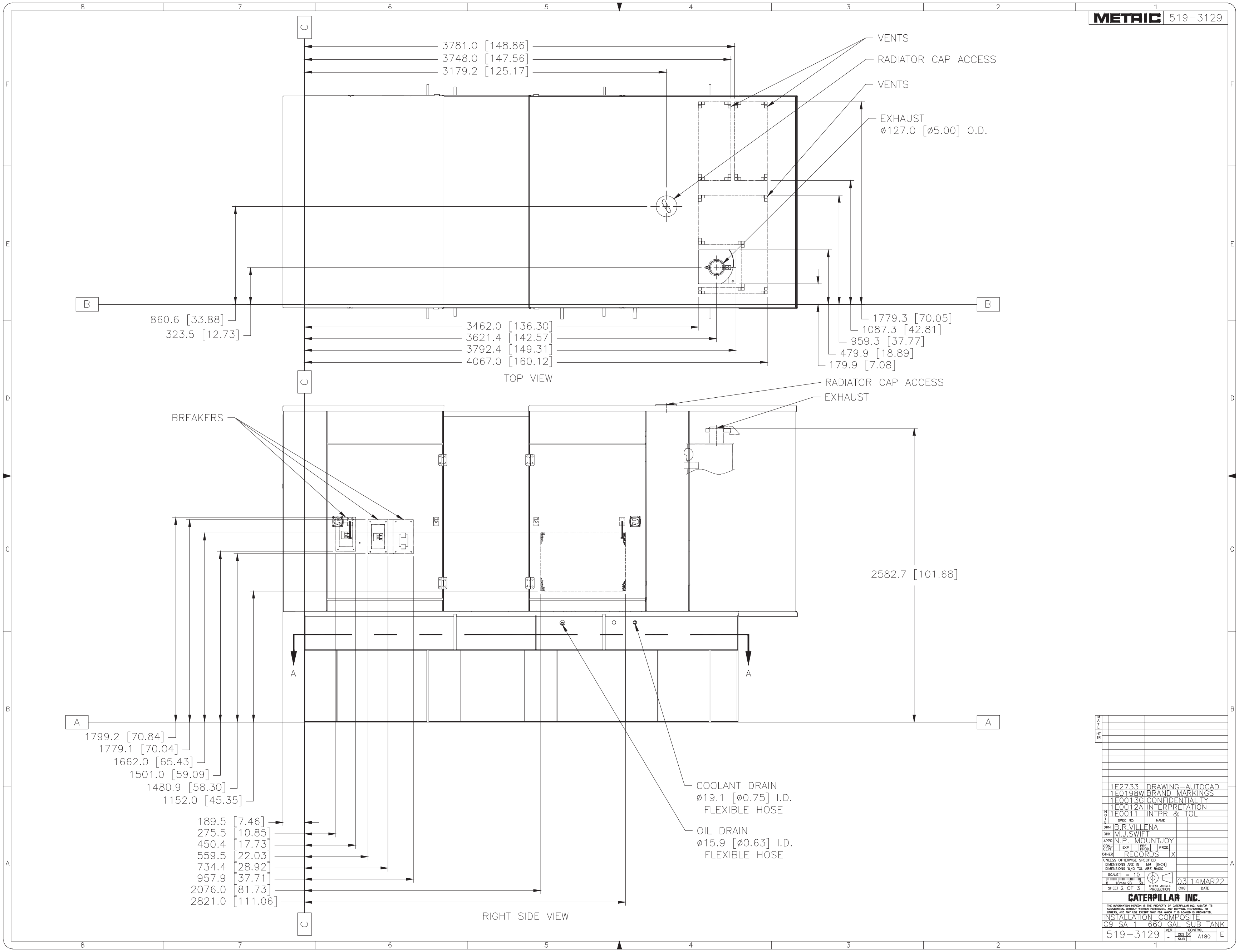
SCALE 1 = 10
SHEET 1 OF 3
THIRD ANGLE PROJECTION

CHG	DATE
03	14MAR22

CATERPILLAR INC.

INSTALLATION_COMPOSITE
C9 SA 1 660 GAL SUB TANK

519-3219 VER - CONTROL DES SUB A180 E


METRIC 519-3129
VENTS
RADIATOR CAP ACCESS
VENTS
EXHAUST
ø127.0 [ø5.00] O.D.
3781.0 [148.86]
3748.0 [147.56]
3179.2 [125.17]
860.6 [33.88]
323.5 [12.73]
3462.0 [136.30]
3621.4 [142.57]
3792.4 [149.31]
4067.0 [160.12]
1779.3 [70.05]
1087.3 [42.81]
959.3 [37.77]
479.9 [18.89]
179.9 [7.08]
TOP VIEW
RADIATOR CAP ACCESS
EXHAUST
BREAKERS
2582.7 [101.68]
1799.2 [70.84]
1779.1 [70.04]
1662.0 [65.43]
1501.0 [59.09]
1480.9 [58.30]
1152.0 [45.35]
189.5 [7.46]
275.5 [10.85]
450.4 [17.73]
559.5 [22.03]
734.4 [28.92]
957.9 [37.71]
2076.0 [81.73]
2821.0 [111.06]
COOLANT DRAIN
ø19.1 [ø0.75] I.D.
FLEXIBLE HOSE
OIL DRAIN
ø15.9 [ø0.63] I.D.
FLEXIBLE HOSE
RIGHT SIDE VIEW
1E2733 DRAWING-AUTOCAD
1E0198W BRAND MARKINGS
1E0013G CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL
SPEC NO. NAME
DRN B.R.VILLENA
CHK M.J.SWIFT
APPD N.P. MOUNTJOY
CONCEPT EXP PRE PROD. PROD.
OTHER RECORDS X
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MM [INCH]
DIMENSIONS W/O TOL ARE BASIC
SCALE 1 = 10
SHEET 2 OF 3
THIRD ANGLE PROJECTION
03 14MAR22
CHG DATE
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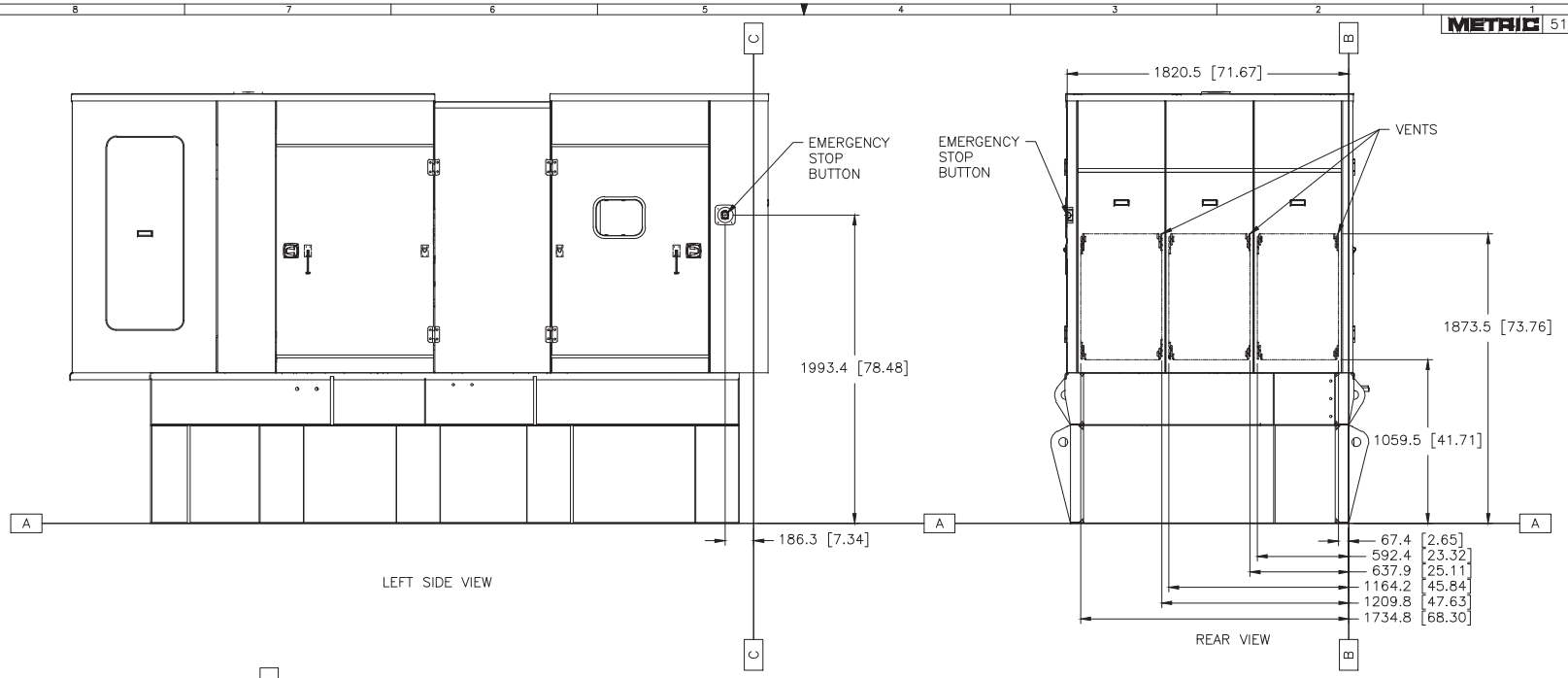
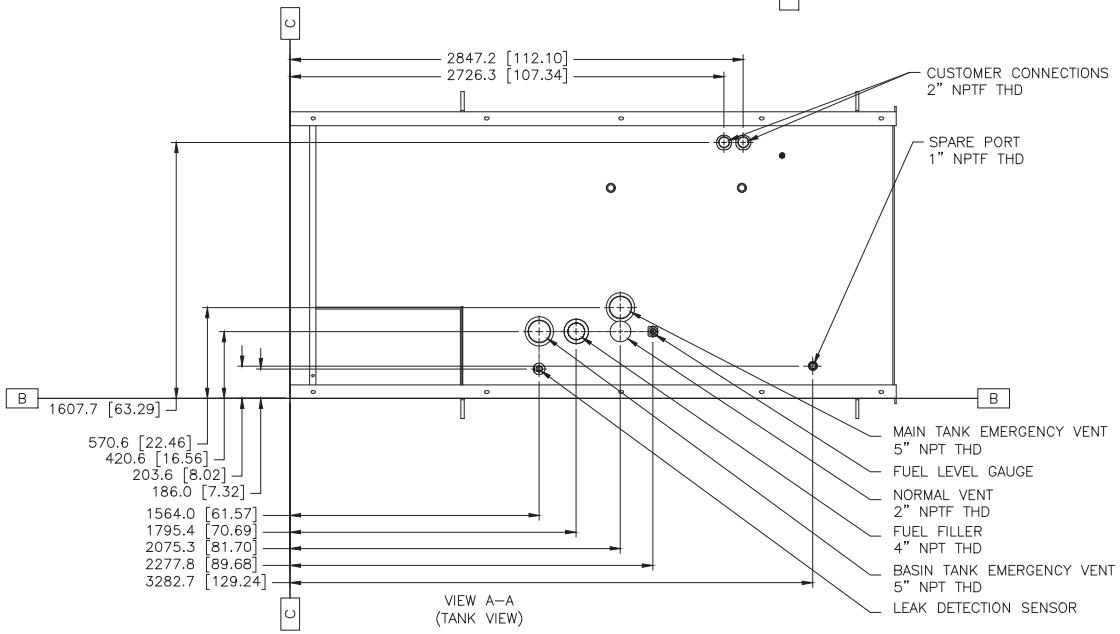
INSTALLATION_COMPOSITE
C9 SA 1 660 GAL SUB TANK
519-3129
VER -
CONTROL DES SUB A180
E

METRIC 519-3219





1E2733 DRAWING-AUTOCAD
1E0136W BRAND MARKINGS
1E0013G CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL

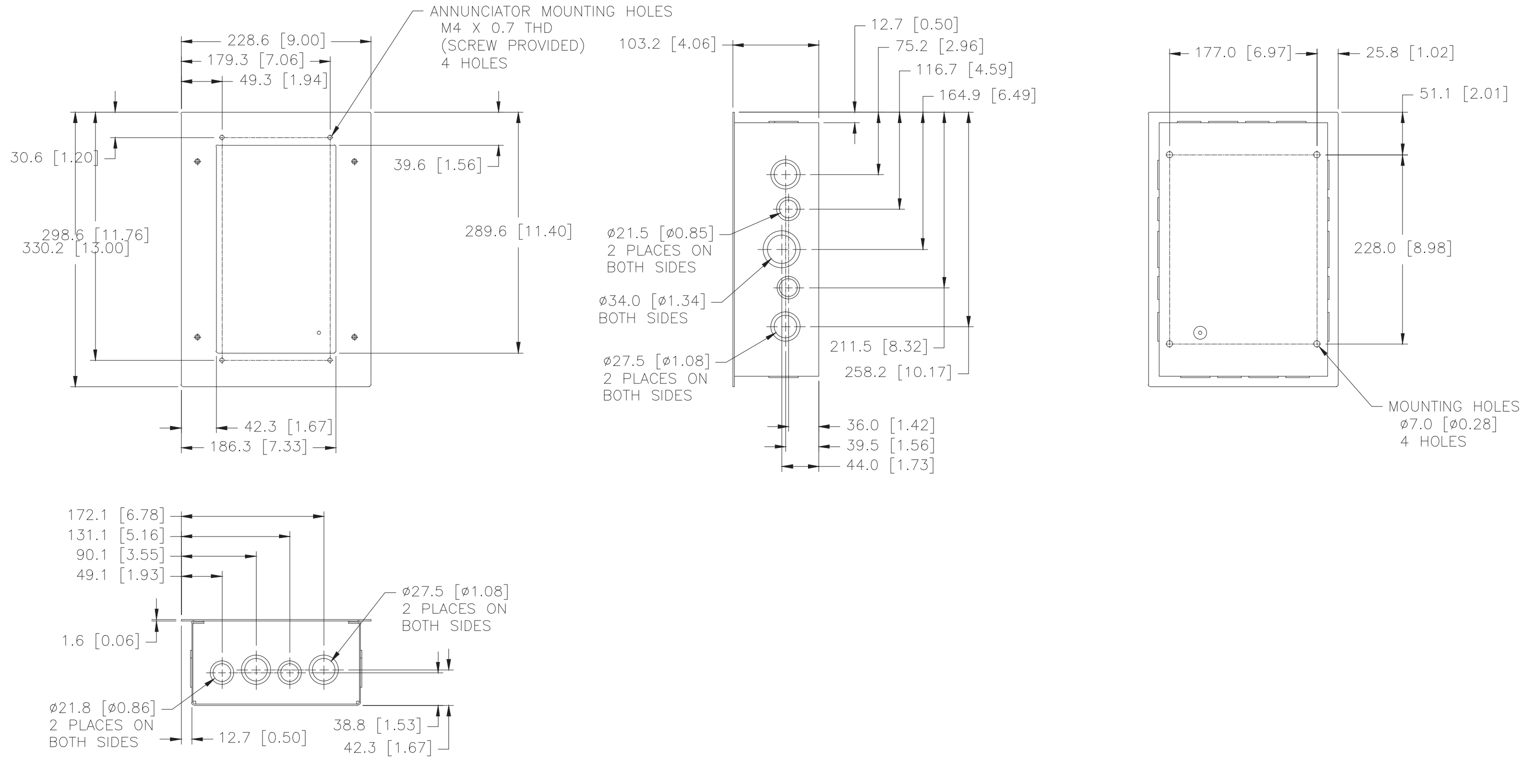
DRN B.R.VILLENA
CHK M.J.SWIFT
APVD N.P. MOUNTJOY

RECORDS IX

UNLESS OTHERWISE SPECIFIED
SCALE 1 = 10
SHEET 3 OF 3
THIRD ANGLE PROJECTION
03 14MAR22

CATERPILLAR INC.

INSTALLATION COMPOSITE
C9 SA 1 660 GAL SUB TANK
519-3219 - REV E
SIZE A1 80



MODEL	TYPE	PRICING AR
C4.4	Y	463-2675 CHG 00
C7.1		
C9		
C13		
C15		
C18		

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

DRN M.J. SWIFT
CHK M.J. SWIFT
APPD N.P. MOUNTJOY
OTHER RECORDS X

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM [INCH] DIMENSIONS W/O TOL ARE BASIC.
SCALE 1 = 2
SHEET 1 OF 1
THIRD ANGLE PROJECTION
00 12JUN17

CATERPILLAR INC.

INSTALLATION-ATTACHMENT
ANNUNCIATOR BOX

542-1897 VER - W973 E

CIRCUIT DESCRIPTION TABLE Model: 3001189.DGM		
CIRCUIT #	COLOR	DESCRIPTION
12	WH	AREP 12
9	WH	AREP 9
10	WH	AREP 10
11	WH	AREP 11
14	WH	PWG A
16	WH	PWG C
13	WH	PWG B
14	WH	PWG A
A1	RD	ANALOG INPUT 1 (+)
A1	BK	ANALOG INPUT 1 (-)
A2	RD	ANALOG INPUT 2 (+)
A2	BK	ANALOG INPUT 2 (-)
SH1	CU	ANLG INP SHIELD 1
SH2	CU	ANLG INP SHIELD 1
FS	BU	EXCITER S+
F6	WH	EXCITER 6-
AC199	WH	AC NEUTRAL
AC200	GN	CUSTOMER AC GROUND
AC715	WH	CB-JWH L2 TO RLY
AC702	WH	JWH RLY TO HTR L2
AC701	WH	JWH RLY TO HTR L1
AC717	WH	CB-JWH L1 TO RLY
AC720	WH	CB-AUX L2 TO HTR
AC703	WH	ALT HTR RLY TO HTR L1
AC704	WH	RLY TO HTR L2
AC705	WH	RLY TO HTR L1
AC719	WH	CB-AUX L1 TO RLY
AC102	WH	AC LINE INPUT L2
AC101	WH	AC LINE INPUT L1
AC103	WH	CB TO RLY L1
AC104	WH	CB TO RLY L2
AC105	WH	GFCI L1
AC106	WH	GFCI L2
AC107	WH	CB TO L1
AC108	WH	POWER SUPPLY L1
AC109	WH	AC STANDARD L2
100	WH	UNFUSED BTRY (+)
103	WH	+24V BTRY (EMCP)
104	WH	+24V BTRY (AEM)
106	WH	+24V ALTERNATOR
108	WH	+24V BTRY
148	WH	+24V BTRY FUSED
154	WH	POWER SUPPLY +V
200	WH	GROUND
203	WH	-24V BTRY (EMCP)
208	WH	-24V BTRY
229	WH	CLEAN GROUND
C249	WH	POWER SUPPLY -V
304	WH	ENGINE CRANK
344	WH	E-STOPS LINK 1
345	WH	E-STOPS LINK 2
347	WH	REMOTE E-STOP LINK
348	WH	REMOTE E-STOP
380	WH	AEM KEY SWITCH
A309	WH	FUEL ENABLE
A338	WH	JWH REMOTE T-STAT SIGNAL
A339	WH	JWH REMOTE T-STAT RETURN
A380	SH	RS485 ANN. SHLD
E486	WH	SENSING VOLTAGE - PHASE A
E487	WH	SENSING VOLTAGE - PHASE B
E488	WH	SENSING VOLTAGE - PHASE C
E494	WH	CT SENSING - PHASE A
E495	WH	CT SENSING - PHASE B
E496	WH	CT SENSING - PHASE C
E497	WH	DROOP SENSING CT
E498	WH	CT RETURN COMMON
F409	WH	SENSING VOLTAGE NEUTRAL
F410	WH	DROOP SENSING CT RETURN
F412	WH	BUSS PHASE A
F413	WH	BUSS PHASE B
F430	WH	GROUND FAULT
F434	WH	GENERATOR PHASE A
F435	WH	GENERATOR PHASE B
F436	WH	GENERATOR PHASE C
0407	RD	RS485 ANN. B (+)
D408	BK	RS485 ANN. A (-)
0409	GY	RS485 ANN. REF
D410	WH	BUSS N
D419	WH	GND FAULT RESET N/C

CIRCUIT DESCRIPTION TABLE Model: 3001189.DGM		
CIRCUIT #	COLOR	DESCRIPTION
D420	WH	GND FAULT 4 POLE SW LINK
E553	WH	MOTOR +24V
E560	WH	RLY7 SPARE - CM
E561	WH	RLY7 SPARE - NC
E562	WH	RLY7 SPARE - NO
E563	WH	RLY8 SPARE - CM
E564	WH	RLY8 SPARE - NC
E565	WH	RLY8 SPARE - NO
F526	WH	HEATER/MOTOR RELAY
F547	SH	ANALOG INP SHLD 1
F548	WH	+5V ANLG SNSR SUPP
A666	WH	LIGHTS +
A667	WH	LIGHTS -
A774	WH	E-STOP
A779	WH	CB BELL ALARM N/O
A780	WH	CB BELL ALARM N/C
A782	WH	CB BELL ALARM COMMON
C722	WH	S-SPD
F733	BK	P-SPD
L729	WH	CB UNDER VOLTAGE SIGNAL TO CB
M755	GN	CAN (J1939) (+)
M756	YL	CAN (J1939) (+)
M757	SH	CAN (J1939) REF
N762	WH	PMG PHASE A / AREP 11
N763	WH	PMG PHASE B / AREP 9 / SH 14
N764	WH	PMG PHASE C / AREP 12
N765	WH	EXCITER (+)
N766	WH	EXCITER (-)
N713	WH	+/- 10VDC INPUT (A)
N714	WH	+/- 10VDC INPUT (B)
N715	WH	FAULT RESET
N716	WH	EXCITATION DISABLE
N717	WH	VAR/PF ENABLE
N718	WH	VOLTS ADJUST COMMON
N719	WH	VOLTS ADJUST RAISE
N720	WH	VOLTS ADJUST LOWER
N752	WH	ALARM OUTPUT DRIVER
P733	WH	ANALOG INPUT 1 (+)
P734	WH	ANALOG INPUT 1 (-)
X709	WH	CKT BRKR AUX CONTACT (COMMON)
X710	WH	CKT BRKR AUX CONTACT (NO)
X711	WH	CKT BRKR AUX CONTACT (NC)
X713	WH	CKT BRKR CLOSE
879	WH	REMOTE START
892	GN	CAT DATA LINK (-)
893	Y	CAT DATA LINK (+)
P853	WH	BRKR SHUNT TRIP
P854	WH	BRKR SHUNT TRIP
X900	WH	STARTER MAGNETIC SWITCH CB
X861	WH	STARTER MAGNETIC SWITCH PS1
X863	WH	STARTER MAGNETIC COIL (+)
F874	WH	TIMER TO SWITCH +24V
J804	WH	FAULT SHUTDOWN DRIVER
J805	WH	DRIVER SUPPLY (50)
L923	WH	SPEED BRICK 1
L932	WH	SPEED BRICK 2
L941	WH	SPEED BRICK 3
L950	WH	MOTOR LIMIT SW (NC)
R951	RD	MODBUS (+)
R952	BK	MODBUS (-)
R953	GY	MODBUS REF
R956	WH	RLY3 SPARE
R957	WH	RLY4 SPARE
R958	WH	RLY5 SPARE (COM SD)
R959	WH	RLY6 SPARE (GRR SW)
Y953	WH	DI-01 (LOW COOLANT)
Y954	WH	DI-02 (FUEL LEAK)
Y955	WH	DI-03 SPARE
Y956	WH	DI-04 SPARE
Y957	WH	DI-05 SPARE (BTRY CHGR FAIL)
Y958	WH	DI-06 SPARE (GND FAULT)

HARNESS DESCRIPTION TABLE		
IDENT	PART NUMBER	DESCRIPTION
AH	399-9190	ALTERNATOR SPACE HEATER HARNESS
AN	399-9192	RS485 ANNUNCIATOR HARNESS
AX	399-9196	CB AUX CONTACTS HARNESS
BA	461-6374	RTD HARNESS
CA	503-8965	MOTORIZED DAMPERS HARNESS-C13 & C9
CC	502-8962	SOURCE LIGHTS HARNESS
CD	502-8963	20A GFCI (POWER CENTER) HARNESS
CE	502-8966	20A GFCI (CONTROL) HARNESS
CF	502-8964	ENCLOSURE SPACE HEATER HARNESS
CG	502-8968	COLD WEATHER BATTERY HARNESS
CH	502-8970	MOTORIZED DAMPERS HARNESS-C15 & C18
CK	523-9034	MOTORIZED DAMPER SWITCH HARNESS
CW	502-8960	LOAD CENTER HARNESS
EM	399-9211	EM-10 JUMPER HARNESS
EN	390-1198	ENGINE INTERFACE HARNESS
EN	449-0626	ENGINE HARNESS (C9 ENGINE)
EP	N/A	EPIC FIELD INTERCONNECTION
ER	399-9218	BATTERY CHARGER HARNESS
ET	390-1219	ENCLOSURE E-STOP HARNESS
EV	399-9212	EM-10 PWM HARNESS
FF	399-9201	SHUNT TRIP CONTROL HARNESS
FL	399-9200	FUEL TANK OPTIONS HARNESS
FT	399-9202	SHUNT TRIP HARNESS
GR	399-9204	GEN ALARM RELAYS HARNESS
JP	390-1201	JACKET WATER HEATER CORD
JW	399-9208	JACKET WATER HEATER HARNESS
PQ	443-0637	IVR WITH PMG HARNESS
PL	390-1192	EMCP 4.2 INTERFACE HARNESS
RA	N/A	REMOTE ANNUNCIATOR REPRESENTATION
RC	399-9210	SHORE POWER CONTROL HARNESS
RF	399-9197	R-FRAME CB HARNESS
VA	399-9216	AC SENSING HARNESS
R	453-9691	OPTIONAL DIO MODULE
DS	443-7021	OPTIONAL DEVICE SERVER
GF	390-1197	OPTIONAL GROUND FAULT INDICATION
YH	453-9692	HARNESS AS
DC	N/A	OPTIONAL DEVICE SERVER
JK	121-3365	LOW COOLANT LVL HARNESS C18PD
SM	525-8343	JUMPER HARNESS STARTER MOTOR C18PD
T	541-1578	PL08xx HARNESS

SYMBOL	DESCRIPTION	ABBREV	COLOR
	BLADE, SPADE, RING, OR SCREW TERMINAL	RD	RED
		WH	WHITE
	CIRCUIT CONNECTED	OR	ORANGE
		YL	YELLOW
	CIRCUIT NOT CONNECTED	CL	CLEAR
		BK	BLACK
	EARTH GROUND	GY	GRAY
		CU	COPPER
	CONNECTOR	BR	BROWN
	ATOH WIRE, CABLE & COMPONENT	GN	GREEN
		BU	BLUE
		GN_YL	GREEN/YELLOW
	MULTI-CONDUCTOR CABLE	VI	VIOLET
		BK_WH	BLACK/WHITE
	NORMALLY CLOSED CIRCUIT		
	NORMALLY OPEN CIRCUIT		

METRIC 390-1189

INDEX TABLE	
SHEET INDEX	DESCRIPTION
1	CROSS REF, SHEET INDEX & NOTES
2	COMPONENT LAYOUT
3	CUSTOMER CONNECTION
4	AC-WIRING
5	INPUT/OUTPUT - WIRING
6	ENGINE INTERFACE - WIRING
7	COMMUNICATION - WIRING
8	DC/CIRCUIT BREAKERS OPTIONAL - WIRING
9	AC/SHORE POWER OPTIONAL - WIRING C9
10	AC/SHORE POWER OPTIONAL - WIRING C15 & C18
11	OPTIONS-DIO MODULE AND GROUND FAULT
12	OPTIONAL DEVICE SERVER
13	COLD WEATHER OPTIONAL-C13 & C9
14	COLD WEATHER OPTIONAL-C15 & C18
15	EPIC FIELD INTERCONNECTION
16	TELEMATICS PLG601 & PLG641
17	BREAKER CIRCUIT (250 A) J FRAME
18	PUMP STYLE JWH OPTIONS
19	EMCP BASE GFI

SECTION, VIEW, AND DETAIL INDEX	
F-F	(03C1)
E-E	(02C1)
D-D	(02D3)
C-C	(02E5)
B	(03A4)
A	(03A7)
IDENT	SH/LOC

WIRE NAME DEFINITION:
XXXX-XX# XX-XX-XX-UL
- WIRE GAUGE
- WIRE COLOR
- WIRE NUMBER
- HARNESS IDENT
- CIRCUIT IDENT

NOTE A: REMOVE AND DISCARD THIS JUMPER WHEN INSTALLING REMOTE E-STOP OPTION. REPLACE WITH REMOTE E-STOP WIRES.

NOTE B: RELOCATE TERMINATING RESISTOR FROM TERMINAL STRIP TO FURTHEST REMOTE ANNUNCIATOR OR REMOTE I/O MODULE TO EXTEND ACCESSORY DATA LINK TO ADD REMOTE ANNUNCIATOR(S) AND REMOTE I/O MODULES.

NOTE C: REMOVE AND DISCARD THIS JUMPER WHEN INSTALLING ENCLOSURE E-STOP. REPLACE WITH ENCLOSURE E-STOP WIRES.

NOTE D: TERMINAL BLOCK RAIL IS FUW 250 A TO 800 A CIRCUIT BREAKERS AND IS LOCATED EXTERNAL TO THE CIRCUIT BREAKER. 1200 A CIRCUIT BREAKER HAS TERMINALS LOCATED ON THE CIRCUIT BREAKER. SECOND BREAKER (250 A-800 A) USES THE SECOND SET OF AUX AND SHUNT HARNESS.

NOTE E: USE PIN 24 WITH SECOND CIRCUIT BREAKER

NOTE F: SUPPLY APPROPRIATE VOLTAGE AND SIZE THE WIRE AWG ACCORDINGLY

NOTE G: MCP1: E1TB / E1-CBT FOR GEN 1
E2TB / E2-CTB FOR GEN 2
GCP: E1TB: E-CTB

NOTE H: REQUIRES EMCP4.2 PROGRAMMING

NOTE J: ONLY ONE TYPE OF SPEED BIAS SHOULD BE USED:
IF THE ANALOG SPEED BIAS IS USED, THE SPEED POT ON THE EPIC PANEL WILL NOT OPERATE.
IF THE PWM SPEED BIAS IS USED, THE SPEED BRICK (9W-9697) IS REQUIRED

NOTE K: "YU" COIL HAS TO BE POWERED FOR THE BREAKER TO OPERATE, REMOVING POWER TO "YU" COIL WILL TRIP THE BREAKER.

CROSS REF, SHEET INDEX & NOTES

REVISIONS		
LTR		
	1E5167A	INT-PROP
	1E2722F	DRAWING
	1ED198W	BRAND MARKINGS
	1E0013Y	CONFIDENTIALITY
	1E0012A	INTERPRETATION
	1E0011	INTPR & TOL

Caterpillar: Confidential Yellow

PROD. X OTHER

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS N/S TOL ARE BASIC

VERSION TYPE: PRIMARY X SECONDARY

THIRD ANGLE PROJECTION

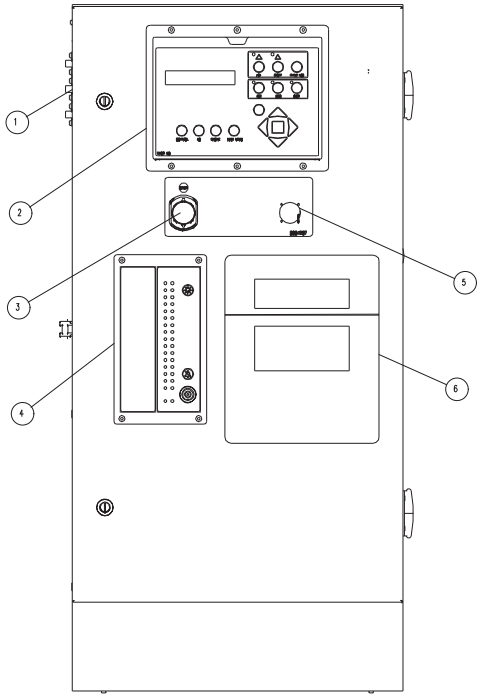
SHEET 1 OF 19

DWG CONTROL W973

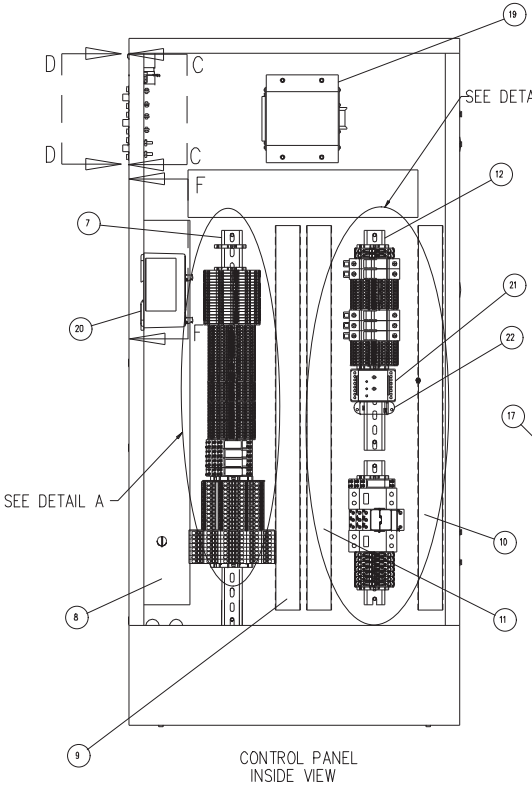
CATERPILLAR

DIAGRAM-WIRING
(EMCP4.2, 4.2B)

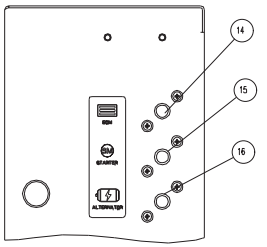
390-1189 SIZE - DWG 13 REV E



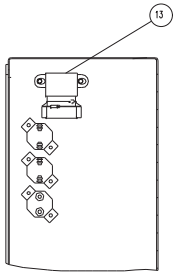
CONTROL PANEL
FRONT VIEW



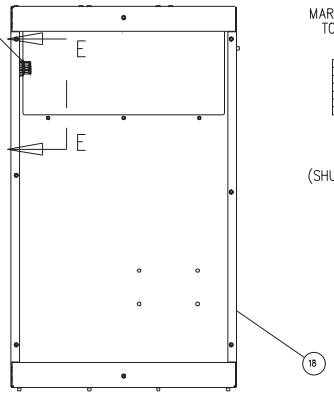
CONTROL PANEL
INSIDE VIEW



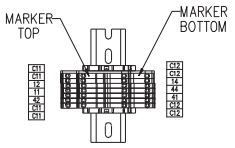
SECTION D-D
(DC-POWER DISTRIBUTION)
(CIRCUIT BREAKERS)
(02E6)



SECTION C-C
(DC-POWER DISTRIBUTION)
(CIRCUIT BREAKERS)
(02E5)



BREAKER BOX



SECTION E-E
(SHUNT TRIP CB & AUX CONTACTS)
(374-5756 & 374-5746)
(02C3)

1	EMCP 4.2 CONTROL PANEL
2	EMCP 4.2, EMCP4.2B CONTROLLER
3	ESTOP PUSH BUTTON
4	RS485 ANNUNCIATOR (OPTIONAL)
5	SERVICE TOOL CONNECTOR
6	DOCUMENT HOLDER
7	LOW ENERGY TERMINAL STRIP (DI,DO,RO,AI)
8	LOW ENERGY-DC CONTROL PANEL WIRING DUCT
9	LOW ENERGY-DC CUSTOMER WIRING DUCT
10	HIGH ENERGY AC/DC CONTROL PANEL WIRING DUCT
11	HIGH ENERGY AC/DC CUSTOMER CONNECTION DUCT
12	HIGH ENERGY TERMINAL AC/DC STRIP
13	SMMS RELAY
14	CIRCUIT BREAKER-ECM
15	CIRCUIT BREAKER-STARTER
16	CIRCUIT BREAKER-ALTERNATOR
17	BREAKER TERMINAL STRIP (OPTIONAL BREAKER)
18	BREAKER BOX
~~19~~	~~OPTIONAL DIO MODULE~~
~~20~~	~~OPTIONAL DEVICE SERVER~~
21	OPTIONAL GROUND FAULT RELAY
22	TRANSDUCER-GFI

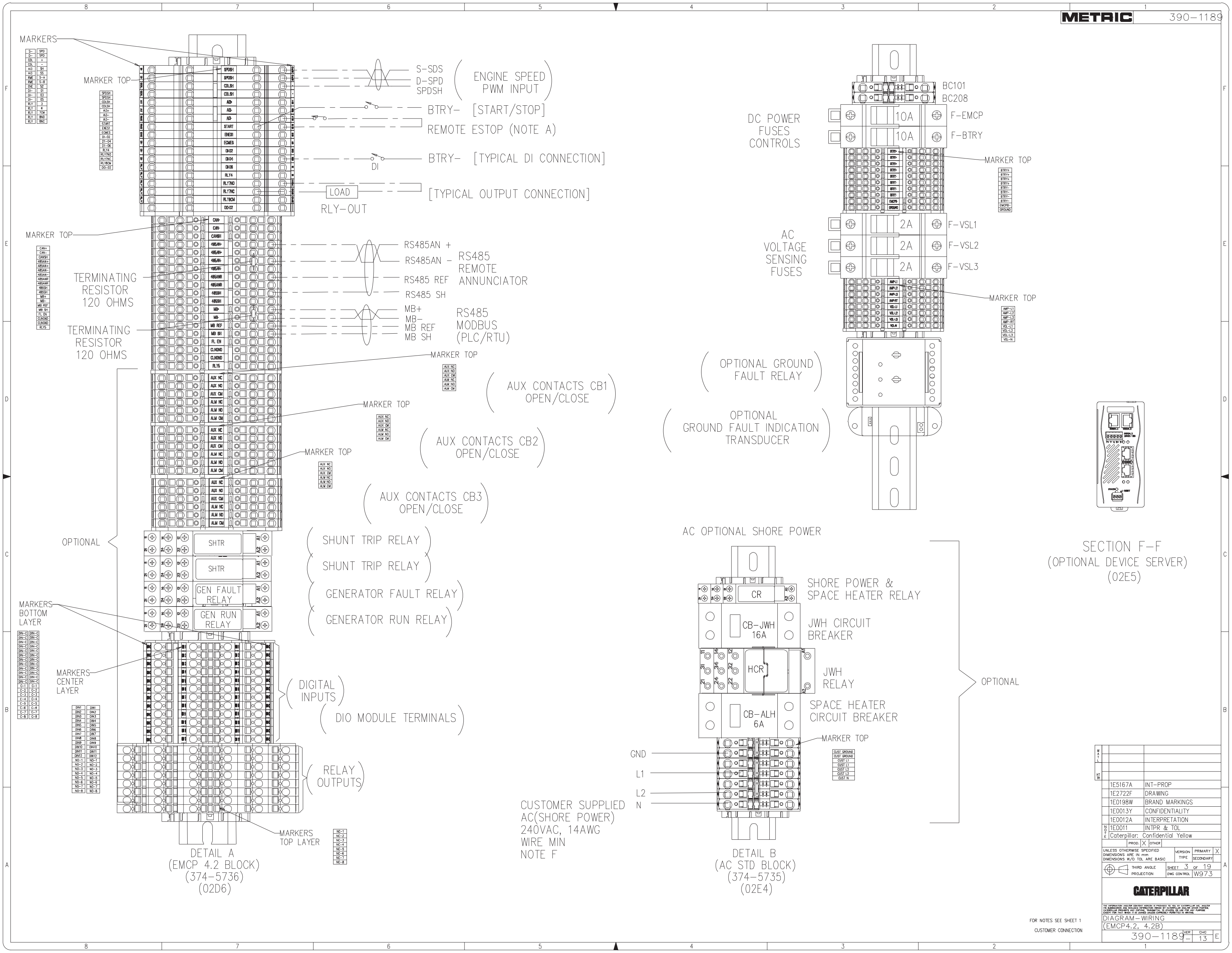
FOR NOTES SEE SHEET 1
COMPONENT LAYOUT

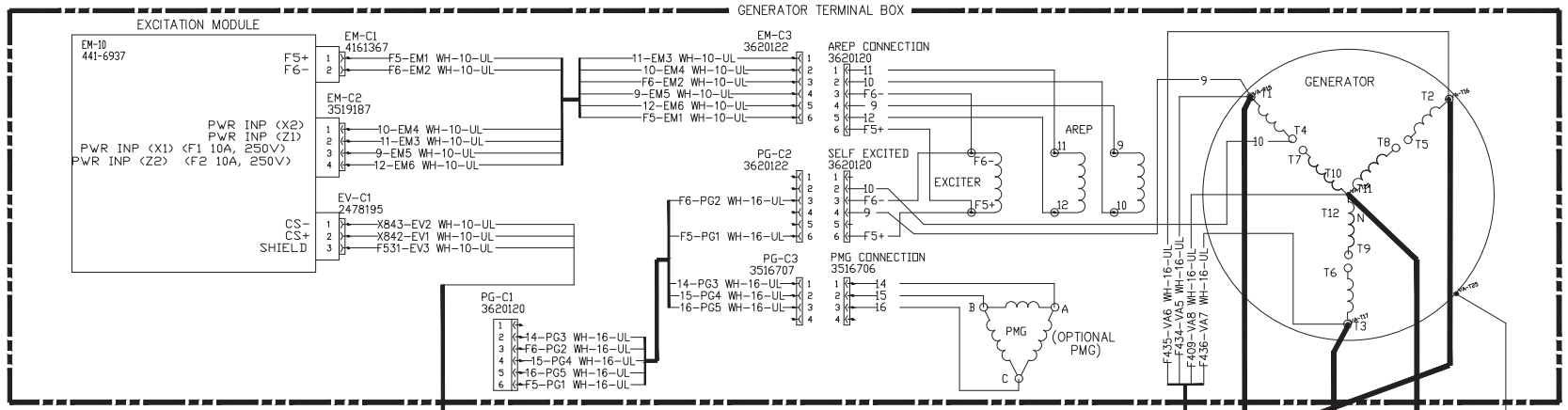
1E5167A	INT-PROP
1E2722F	DRAWING
1ED198W	BRAND MARKINGS
1E0013Y	CONFIDENTIALITY
1E0012A	INTERPRETATION
1E0011	INTPR & TOL
Caterpillar: Confidential Yellow	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS W/O TOL ARE BASIC
PROD. X OTHER
VERSION TYPE PRIMARY X SECONDARY
THIRD ANGLE PROJECTION
SHEET 2 OF 19
DWG CONTROL W973

CATERPILLAR

DIAGRAM-WIRING
(EMCP4.2, 4.2B)
390-1189 DASH - DWG 13 E


METRIC
390-1189
MARKERS
MARKER TOP
S-SDS
D-SPD
SPDSH
ENGINE SPEED PWM INPUT
BTRY- [START/STOP]
REMOTE ESTOP (NOTE A)
DI
BTRY- [TYPICAL DI CONNECTION]
LOAD
RLY-OUT
[TYPICAL OUTPUT CONNECTION]
RS485AN +
RS485AN -
RS485 REF
RS485 SH
RS485 REMOTE ANNUNCIATOR
TERMINATING RESISTOR 120 OHMS
TERMINATING RESISTOR 120 OHMS
MB+
MB-
MB REF
MB SH
RS485 MODBUS (PLC/RTU)
AUX CONTACTS CB1 OPEN/CLOSE
AUX CONTACTS CB2 OPEN/CLOSE
AUX CONTACTS CB3 OPEN/CLOSE
OPTIONAL
SHTR
SHUNT TRIP RELAY
SHUNT TRIP RELAY
GEN FAULT RELAY
GENERATOR FAULT RELAY
GEN RUN RELAY
GENERATOR RUN RELAY
MARKERS BOTTOM LAYER
MARKERS CENTER LAYER
DIGITAL INPUTS
DIO MODULE TERMINALS
RELAY OUTPUTS
MARKERS TOP LAYER
DETAIL A
(EMCP 4.2 BLOCK)
(374-5736)
(02D6)
BC101
BC208
DC POWER FUSES CONTROLS
10A F-EMCP
10A F-BTRY
AC VOLTAGE SENSING FUSES
2A F-VSL1
2A F-VSL2
2A F-VSL3
OPTIONAL GROUND FAULT RELAY
OPTIONAL GROUND FAULT INDICATION TRANSDUCER
SECTION F-F
(OPTIONAL DEVICE SERVER)
(02E5)
AC OPTIONAL SHORE POWER
CR
SHORE POWER & SPACE HEATER RELAY
CB-JWH 16A
JWH CIRCUIT BREAKER
HCR
JWH RELAY
CB-ALH 6A
SPACE HEATER CIRCUIT BREAKER
OPTIONAL
GND
L1
L2
N
CUSTOMER SUPPLIED AC(SHORE POWER) 240VAC, 14AWG WIRE MIN NOTE F
DETAIL B
(AC STD BLOCK)
(374-5735)
(02E4)
1E5167A INT-PROP
1E2722F DRAWING
1E0198W BRAND MARKINGS
1E0013Y CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL
Caterpillar: Confidential Yellow
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm
THIRD ANGLE PROJECTION
SHEET 3 OF 19
W973
CATERPILLAR
FOR NOTES SEE SHEET 1
CUSTOMER CONNECTION
DIAGRAM-WIRING
(EMCP4.2, 4.2B)
390-1189
13
E



FOR NOTES SEE SHEET 1
AC-WIRING

1E5167A	INT-PROP
1E2722F	DRAWING
1ED198W	BRAND MARKINGS
1E0013Y	CONFIDENTIALITY
1E0012A	INTERPRETATION
1E0011	INTPR & TOL

Caterpillar: Confidential Yellow

PROD. X OTHER

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS N/S TOL ARE BASIC

VERSION TYPE PRIMARY X SECONDARY

THIRD ANGLE PROJECTION

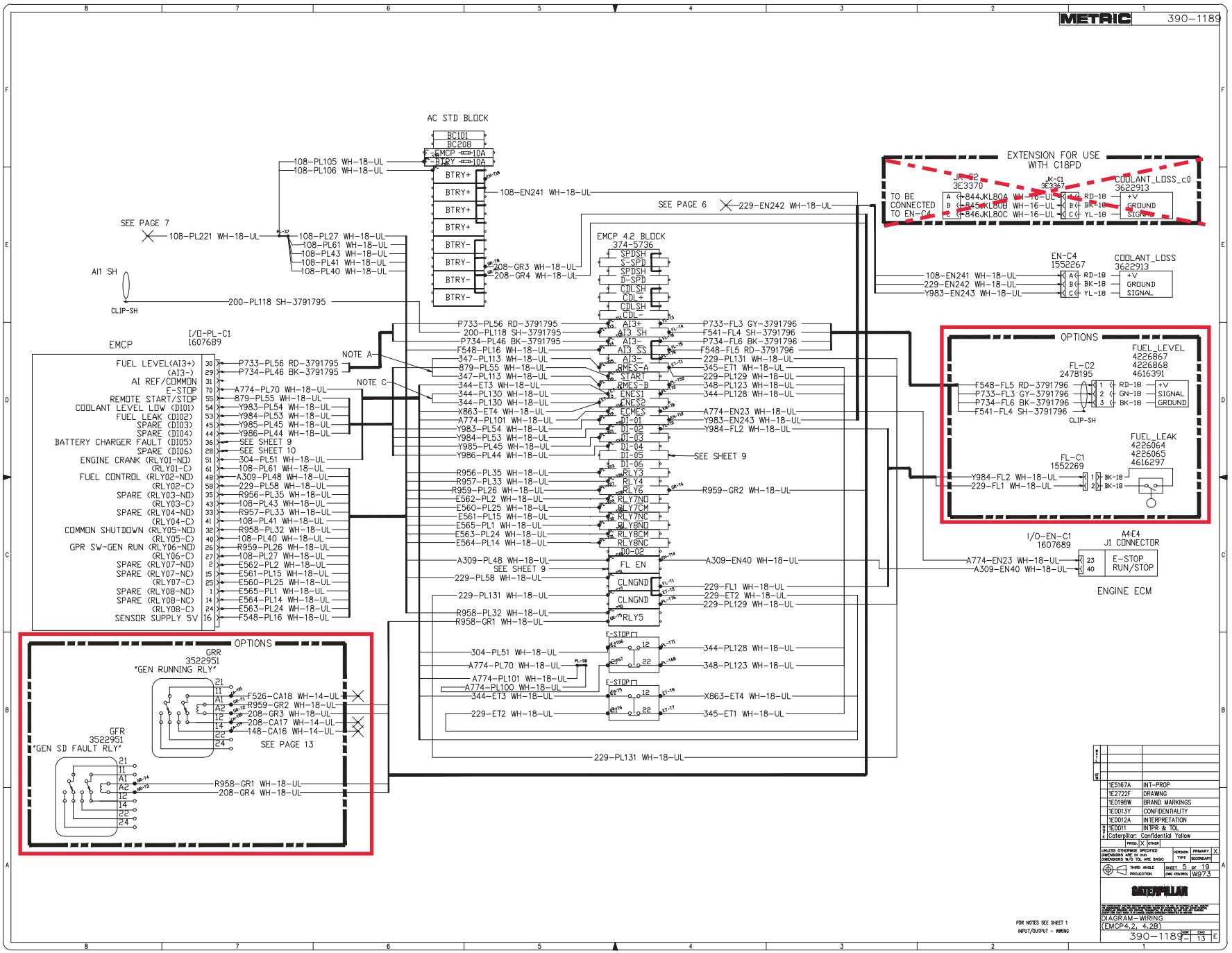
SHEET 4 OF 19

DWG CONTROL W973

CATERPILLAR

DIAGRAM—WIRING
(EMCP4.2, 4.2B)

390-1189 - 13 E


METRIC
390-1189
AC STD BLOCK
BC101
BC208
EMCP 10A
BTRY 10A
BTRY+
BTRY-
108-PL105 WH-18-UL
108-PL106 WH-18-UL
108-EN241 WH-18-UL
SEE PAGE 7
108-PL221 WH-18-UL
108-PL27 WH-18-UL
108-PL61 WH-18-UL
108-PL43 WH-18-UL
108-PL41 WH-18-UL
108-PL40 WH-18-UL
AI1 SH
CLIP-SH
200-PL118 SH-3791795
208-GR3 WH-18-UL
208-GR4 WH-18-UL
SEE PAGE 6
229-EN242 WH-18-UL
EMCP 4.2 BLOCK
374-5736
SPDSH
S-SPD
SPDSH
D-SPD
CDLSH
CDL+
CDLSH
CDL-
EXTENSION FOR USE WITH C18PD
JK-C2
3E3370
JK-C1
3E3367
COOLANT_LOSS_C0
3622913
TO BE CONNECTED TO EN-C4
844JKL80A WH-16-UL
845JKL80B WH-16-UL
846JKL80C WH-16-UL
RD-18
BK-18
YL-18
+V
GROUND
SIGNAL
EN-C4
1552267
COOLANT_LOSS
3622913
108-EN241 WH-18-UL
229-EN242 WH-18-UL
Y983-EN243 WH-18-UL
I/O-PL-C1
1607689
EMCP
NOTE A
NOTE C
FUEL LEVEL(AI3+) 30
(AI3-) 29
AI REF/COMMON 31
E-STOP 70
REMOTE START/STOP 55
COOLANT LEVEL LOW (DI01) 54
FUEL LEAK (DI02) 53
SPARE (DI03) 45
SPARE (DI04) 44
BATTERY CHARGER FAULT (DI05) 36
SPARE (DI06) 28
ENGINE CRANK (RLY01-NO) 51
(RLY01-C) 61
FUEL CONTROL (RLY02-NO) 48
(RLY02-C) 58
SPARE (RLY03-NO) 35
(RLY03-C) 43
SPARE (RLY04-NO) 33
(RLY04-C) 41
COMMON SHUTDOWN (RLY05-NO) 32
(RLY05-C) 40
GPR SW-GEN RUN (RLY06-NO) 26
(RLY06-C) 27
SPARE (RLY07-NO) 2
SPARE (RLY07-NC) 15
(RLY07-C) 25
SPARE (RLY08-NO) 1
SPARE (RLY08-NC) 14
(RLY08-C) 24
SENSOR SUPPLY 5V 16
P733-PL56 RD-3791795
P734-PL46 BK-3791795
A774-PL70 WH-18-UL
879-PL55 WH-18-UL
Y983-PL54 WH-18-UL
Y984-PL53 WH-18-UL
Y985-PL45 WH-18-UL
SEE SHEET 9
SEE SHEET 10
304-PL51 WH-18-UL
108-PL61 WH-18-UL
A309-PL48 WH-18-UL
229-PL58 WH-18-UL
R956-PL35 WH-18-UL
108-PL43 WH-18-UL
R957-PL33 WH-18-UL
108-PL41 WH-18-UL
R958-PL32 WH-18-UL
108-PL40 WH-18-UL
R959-PL26 WH-18-UL
108-PL27 WH-18-UL
E562-PL2 WH-18-UL
E561-PL15 WH-18-UL
E560-PL25 WH-18-UL
E565-PL1 WH-18-UL
E564-PL14 WH-18-UL
E563-PL24 WH-18-UL
F548-PL16 WH-18-UL
P733-PL56 RD-3791795
200-PL118 SH-3791795
P734-PL46 BK-3791795
F548-PL16 WH-18-UL
347-PL113 WH-18-UL
879-PL55 WH-18-UL
347-PL113 WH-18-UL
344-ET3 WH-18-UL
344-PL130 WH-18-UL
344-PL130 WH-18-UL
X863-ET4 WH-18-UL
A774-PL101 WH-18-UL
Y983-PL54 WH-18-UL
Y984-PL53 WH-18-UL
Y985-PL45 WH-18-UL
Y986-PL44 WH-18-UL
R956-PL35 WH-18-UL
R957-PL33 WH-18-UL
R959-PL26 WH-18-UL
E562-PL2 WH-18-UL
E560-PL25 WH-18-UL
E561-PL15 WH-18-UL
E565-PL1 WH-18-UL
E563-PL24 WH-18-UL
E564-PL14 WH-18-UL
A309-PL48 WH-18-UL
SEE SHEET 9
229-PL58 WH-18-UL
229-PL131 WH-18-UL
R958-PL32 WH-18-UL
R958-GR1 WH-18-UL
AI3+
AI3 SH
AI3-
AI3 SS
AI3-
RMES-A
START
RMES-B
ENES1
ENES2
ECMES
DI-01
DI-02
DI-03
DI-04
DI-05
DI-06
RLY3
RLY4
RLY6
RLY7ND
RLY7CM
RLY7NC
RLY8ND
RLY8CM
RLY8NC
DO-02
FL EN
CLNGND
CLNGND
RLY5
P733-FL3 GY-3791796
F541-FL4 SH-3791796
P734-FL6 BK-3791796
F548-FL5 RD-3791796
229-PL131 WH-18-UL
229-PL129 WH-18-UL
348-PL123 WH-18-UL
344-PL128 WH-18-UL
A774-EN23 WH-18-UL
Y983-EN243 WH-18-UL
Y984-FL2 WH-18-UL
SEE SHEET 9
R959-GR2 WH-18-UL
A309-EN40 WH-18-UL
229-FL1 WH-18-UL
229-ET2 WH-18-UL
229-PL129 WH-18-UL
E-STOP
344-PL128 WH-18-UL
348-PL123 WH-18-UL
A774-PL70 WH-18-UL
A774-PL101 WH-18-UL
A774-PL100 WH-18-UL
344-ET3 WH-18-UL
229-ET2 WH-18-UL
X863-ET4 WH-18-UL
345-ET1 WH-18-UL
304-PL51 WH-18-UL
229-PL131 WH-18-UL
OPTIONS
FUEL_LEVEL
4226867
4226868
4616391
FL-C2
2478195
F548-FL5 RD-3791796
P733-FL3 GY-3791796
P734-FL6 BK-3791796
F541-FL4 SH-3791796
CLIP-SH
+V
SIGNAL
GROUND
FUEL_LEAK
4226064
4226065
4616297
FL-C1
1552269
Y984-FL2 WH-18-UL
229-FL1 WH-18-UL
BK-18
I/O-EN-C1
1607689
A4:E4
J1 CONNECTOR
A774-EN23 WH-18-UL
A309-EN40 WH-18-UL
E-STOP
RUN/STOP
ENGINE ECM
OPTIONS
GRR
3522951
"GEN RUNNING RLY"
GFR
3522951
"GEN SD FAULT RLY"
F526-CA18 WH-14-UL
R959-GR2 WH-18-UL
208-GR3 WH-18-UL
208-CA17 WH-14-UL
148-CA16 WH-14-UL
SEE PAGE 13
R958-GR1 WH-18-UL
208-GR4 WH-18-UL
1E5167A INT-PROP
1E2722F DRAWING
1ED198W BRAND MARKINGS
1ED013Y CONFIDENTIALITY
1ED012A INTERPRETATION
1E0011 INTPR & TOL
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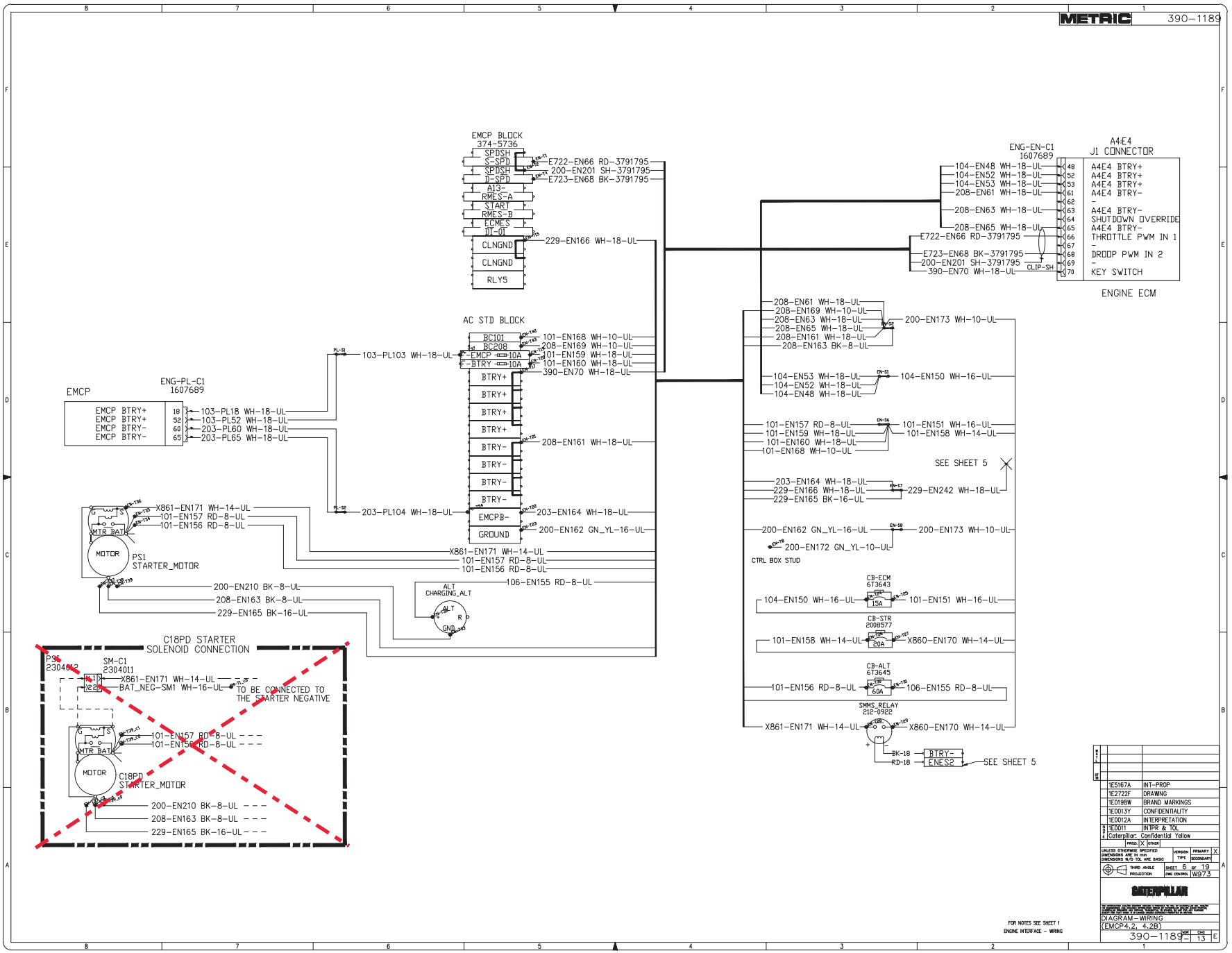
THIRD ANGLE PROJECTION
SHEET 5 OF 19
DWG CONTROL W973
CATERPILLAR
DIAGRAM-WIRING
(EMCP4.2, 4.2B)
390-1189 - 13 E
FOR NOTES SEE SHEET 1
INPUT/OUTPUT - WIRING


METRIC
390-1189
EMCP BLOCK
374-5736
SPDSH
S-SPD
SPDSH
D-SPD
A13-
RMES-A
START
RMES-B
ECMES
DI-01
CLNGND
CLNGND
RLY5
E722-EN66 RD-3791795
200-EN201 SH-3791795
E723-EN68 BK-3791795
229-EN166 WH-18-UL
ENG-EN-C1
1607689
A4:E4
J1 CONNECTOR
104-EN48 WH-18-UL
104-EN52 WH-18-UL
104-EN53 WH-18-UL
208-EN61 WH-18-UL
208-EN63 WH-18-UL
208-EN65 WH-18-UL
E722-EN66 RD-3791795
E723-EN68 BK-3791795
200-EN201 SH-3791795
390-EN70 WH-18-UL
CLIP-SH
A4:E4 BTRY+
A4:E4 BTRY+
A4:E4 BTRY+
A4:E4 BTRY-
A4:E4 BTRY-
SHUTDOWN OVERRIDE
A4:E4 BTRY-
THROTTLE PWM IN 1
DROOP PWM IN 2
KEY SWITCH
ENGINE ECM
AC STD BLOCK
BC101
BC208
EMCP 10A
BTRY 10A
BTRY+
BTRY+
BTRY+
BTRY+
BTRY-
BTRY-
BTRY-
BTRY-
EMCPB-
GROUND
101-EN168 WH-10-UL
208-EN169 WH-10-UL
101-EN159 WH-18-UL
101-EN160 WH-18-UL
390-EN70 WH-18-UL
208-EN161 WH-18-UL
203-EN164 WH-18-UL
200-EN162 GN_YL-16-UL
103-PL103 WH-18-UL
203-PL104 WH-18-UL
EMCP
ENG-PL-C1
1607689
EMCP BTRY+ 18
EMCP BTRY+ 52
EMCP BTRY- 60
EMCP BTRY- 65
103-PL18 WH-18-UL
103-PL52 WH-18-UL
203-PL60 WH-18-UL
203-PL65 WH-18-UL
MTR BAT
MOTOR
PS1
STARTER_MOTOR
X861-EN171 WH-14-UL
101-EN157 RD-8-UL
101-EN156 RD-8-UL
106-EN155 RD-8-UL
200-EN210 BK-8-UL
208-EN163 BK-8-UL
229-EN165 BK-16-UL
ALT
CHARGING_ALT
C18PD STARTER
SOLENOID CONNECTION
PS1
2304013
SM-C1
2304011
X861-EN171 WH-14-UL
BAT_NEG-SM1 WH-16-UL
TO BE CONNECTED TO
THE STARTER NEGATIVE
C18PD
STARTER_MOTOR
208-EN61 WH-18-UL
208-EN169 WH-10-UL
208-EN63 WH-18-UL
208-EN65 WH-18-UL
208-EN161 WH-18-UL
208-EN163 BK-8-UL
200-EN173 WH-10-UL
104-EN53 WH-18-UL
104-EN52 WH-18-UL
104-EN48 WH-18-UL
104-EN150 WH-16-UL
101-EN157 RD-8-UL
101-EN159 WH-18-UL
101-EN160 WH-18-UL
101-EN168 WH-10-UL
101-EN151 WH-16-UL
101-EN158 WH-14-UL
SEE SHEET 5
203-EN164 WH-18-UL
229-EN166 WH-18-UL
229-EN165 BK-16-UL
229-EN242 WH-18-UL
200-EN162 GN_YL-16-UL
200-EN172 GN_YL-10-UL
200-EN173 WH-10-UL
CTRL BOX STUD
CB-ECM
6T3643
15A
104-EN150 WH-16-UL
101-EN151 WH-16-UL
CB-STR
2008577
20A
101-EN158 WH-14-UL
X860-EN170 WH-14-UL
CB-ALT
6T3645
60A
101-EN156 RD-8-UL
106-EN155 RD-8-UL
SMMS_RELAY
212-0922
X861-EN171 WH-14-UL
X860-EN170 WH-14-UL
BK-18
RD-18
BTRY-
ENES2
SEE SHEET 5
FOR NOTES SEE SHEET 1
ENGINE INTERFACE - WIRING
1E5167A INT-PROP
1E2722F DRAWING
1ED198W BRAND MARKINGS
1E0013Y CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL
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DIMENSIONS N/S TOL ARE BASIC
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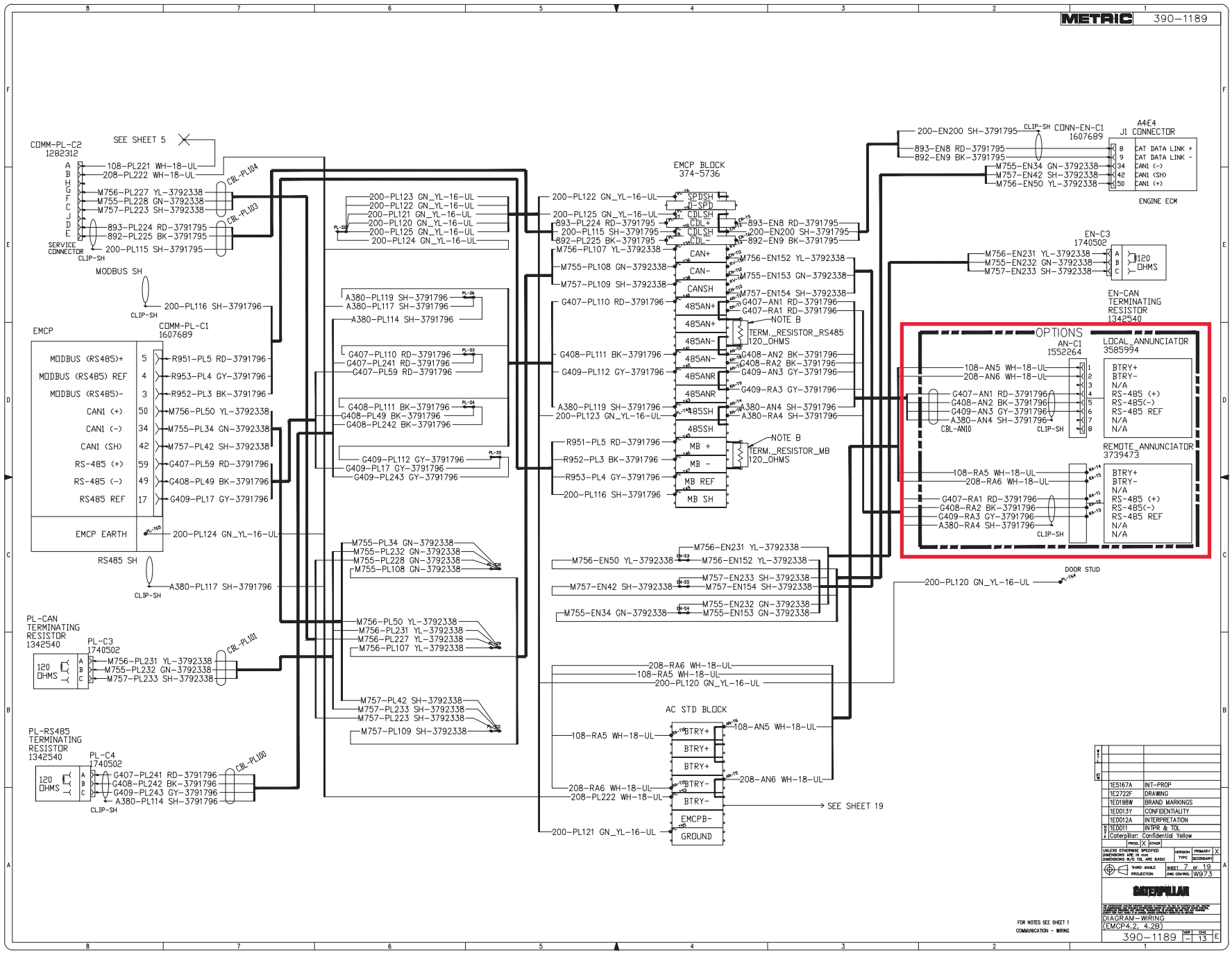
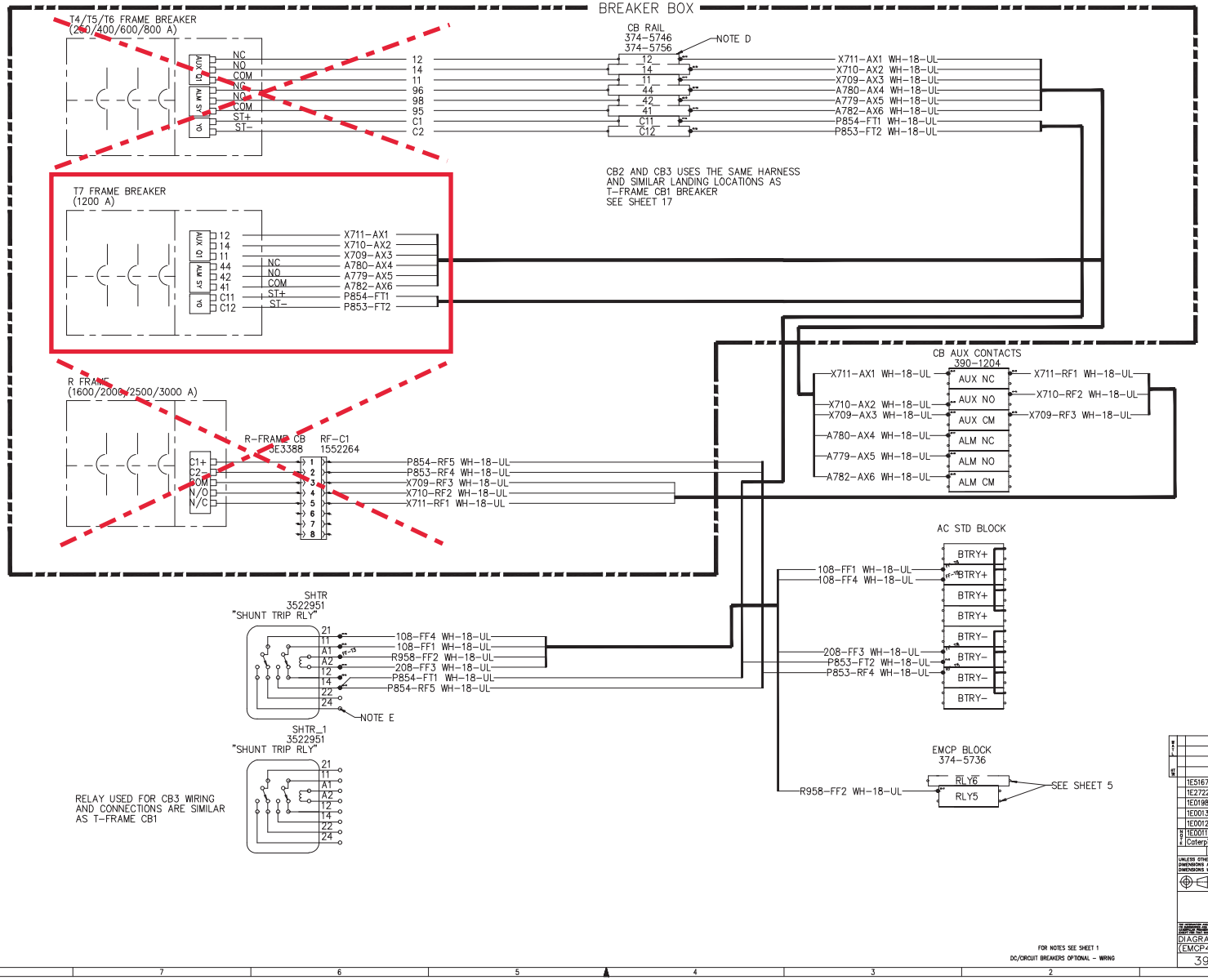
THIRD ANGLE PROJECTION
SHEET 6 OF 19
DWG CONTROL W973
CATERPILLAR
DIAGRAM - WIRING
(EMCP4.2, 4.2B)
390-1189 - 13 E


METRIC
390-1189
SEE SHEET 5
COMM-PL-C2
1282312
108-PL221 WH-18-UL
208-PL222 WH-18-UL
M756-PL227 YL-3792338
M755-PL228 GN-3792338
M757-PL223 SH-3792338
893-PL224 RD-3791795
892-PL225 BK-3791795
200-PL115 SH-3791795
SERVICE CONNECTOR
CLIP-SH
CBL-PL104
CBL-PL103
MODBUS SH
200-PL116 SH-3791796
EMCP
COMM-PL-C1
1607689
MODBUS (RS485)+ 5 R951-PL5 RD-3791796
MODBUS (RS485) REF 4 R953-PL4 GY-3791796
MODBUS (RS485)- 3 R952-PL3 BK-3791796
CAN1 (+) 50 M756-PL50 YL-3792338
CAN1 (-) 34 M755-PL34 GN-3792338
CAN1 (SH) 42 M757-PL42 SH-3792338
RS-485 (+) 59 G407-PL59 RD-3791796
RS-485 (-) 49 G408-PL49 BK-3791796
RS485 REF 17 G409-PL17 GY-3791796
EMCP EARTH
200-PL124 GN_YL-16-UL
RS485 SH
A380-PL117 SH-3791796
PL-CAN TERMINATING RESISTOR 1342540
PL-C3
1740502
120 OHMS
M756-PL231 YL-3792338
M755-PL232 GN-3792338
M757-PL233 SH-3792338
CBL-PL101
PL-RS485 TERMINATING RESISTOR 1342540
PL-C4
1740502
G407-PL241 RD-3791796
G408-PL242 BK-3791796
G409-PL243 GY-3791796
A380-PL114 SH-3791796
CBL-PL100
200-PL123 GN_YL-16-UL
200-PL122 GN_YL-16-UL
200-PL121 GN_YL-16-UL
200-PL120 GN_YL-16-UL
200-PL125 GN_YL-16-UL
200-PL124 GN_YL-16-UL
A380-PL119 SH-3791796
A380-PL117 SH-3791796
A380-PL114 SH-3791796
G407-PL110 RD-3791796
G407-PL241 RD-3791796
G407-PL59 RD-3791796
G408-PL111 BK-3791796
G408-PL49 BK-3791796
G408-PL242 BK-3791796
G409-PL112 GY-3791796
G409-PL17 GY-3791796
G409-PL243 GY-3791796
M755-PL34 GN-3792338
M755-PL232 GN-3792338
M755-PL228 GN-3792338
M755-PL108 GN-3792338
M756-PL50 YL-3792338
M756-PL231 YL-3792338
M756-PL227 YL-3792338
M756-PL107 YL-3792338
M757-PL42 SH-3792338
M757-PL233 SH-3792338
M757-PL223 SH-3792338
M757-PL109 SH-3792338
EMCP BLOCK
374-5736
SPDSH
J-SPD
CDLSH
CDL+
CDLSH
CDL-
CAN+
CAN-
CANSH
485AN+
485AN+
485AN-
485AN-
485ANR
485ANR
485SSH
485SSH
MB +
MB -
MB REF
MB SH
M756-PL107 YL-3792338
M755-PL108 GN-3792338
M757-PL109 SH-3792338
G407-PL110 RD-3791796
G408-PL111 BK-3791796
G409-PL112 GY-3791796
A380-PL119 SH-3791796
200-PL123 GN_YL-16-UL
R951-PL5 RD-3791796
R952-PL3 BK-3791796
R953-PL4 GY-3791796
200-PL116 SH-3791796
893-PL224 RD-3791795
200-PL115 SH-3791795
892-PL225 BK-3791795
893-EN8 RD-3791795
200-EN200 SH-3791795
892-EN9 BK-3791795
M756-EN152 YL-3792338
M755-EN153 GN-3792338
M757-EN154 SH-3792338
G407-AN1 RD-3791796
G407-RA1 RD-3791796
NOTE B
TERM._RESISTOR_RS485 120_OHMS
G408-AN2 BK-3791796
G408-RA2 BK-3791796
G409-AN3 GY-3791796
G409-RA3 GY-3791796
A380-AN4 SH-3791796
A380-RA4 SH-3791796
NOTE B
TERM._RESISTOR_MB 120_OHMS
M756-EN231 YL-3792338
M756-EN50 YL-3792338
M756-EN152 YL-3792338
M757-EN42 SH-3792338
M757-EN233 SH-3792338
M757-EN154 SH-3792338
M755-EN34 GN-3792338
M755-EN232 GN-3792338
M755-EN153 GN-3792338
208-RA6 WH-18-UL
108-RA5 WH-18-UL
200-PL120 GN_YL-16-UL
AC STD BLOCK
BTRY+
BTRY+
BTRY+
BTRY-
BTRY-
EMCPB-
GROUND
108-RA5 WH-18-UL
208-RA6 WH-18-UL
208-PL222 WH-18-UL
200-PL121 GN_YL-16-UL
108-AN5 WH-18-UL
208-AN6 WH-18-UL
SEE SHEET 19
200-EN200 SH-3791795
CLIP-SH
CONN-EN-C1
1607689
893-EN8 RD-3791795
892-EN9 BK-3791795
M755-EN34 GN-3792338
M757-EN42 SH-3792338
M756-EN50 YL-3792338
A4E4
J1 CONNECTOR
8 CAT DATA LINK +
9 CAT DATA LINK -
34 CAN1 (-)
42 CAN1 (SH)
50 CAN1 (+)
ENGINE ECM
EN-C3
1740502
M756-EN231 YL-3792338
M755-EN232 GN-3792338
M757-EN233 SH-3792338
120 OHMS
EN-CAN TERMINATING RESISTOR 1342540
OPTIONS
AN-C1
1552264
108-AN5 WH-18-UL
208-AN6 WH-18-UL
G407-AN1 RD-3791796
G408-AN2 BK-3791796
G409-AN3 GY-3791796
A380-AN4 SH-3791796
CBL-AN10
CLIP-SH
LOCAL_ANNUNCIATOR
3585994
BTRY+
BTRY-
N/A
RS-485 (+)
RS-485(-)
RS-485 REF
N/A
N/A
REMOTE_ANNUNCIATOR
3739473
108-RA5 WH-18-UL
208-RA6 WH-18-UL
G407-RA1 RD-3791796
G408-RA2 BK-3791796
G409-RA3 GY-3791796
A380-RA4 SH-3791796
CLIP-SH
BTRY+
BTRY-
N/A
RS-485 (+)
RS-485(-)
RS-485 REF
N/A
N/A
DOOR STUD
200-PL120 GN_YL-16-UL
FOR NOTES SEE SHEET 1
COMMUNICATION - WIRING
1E5167A INT-PROP
1E2722F DRAWING
1ED198W BRAND MARKINGS
1E0013Y CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL
Caterpillar: Confidential Yellow
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN mm
DIMENSIONS N/S TOL ARE BASIC
THIRD ANGLE PROJECTION
VERSION PRIMARY X
TYPE SECONDARY
SHEET 7 OF 19
DWG CONTROL W973
CATERPILLAR
DIAGRAM-WIRING
(EMCP4.2, 4.2B)
390-1189 DWG -- SHT 13 E



	1E5167A	INT-PROP
	1E2722F	DRAWING
	1ED198W	BRAND MARKINGS
	1E0013Y	CONFIDENTIALITY
	1E0012A	INTERPRETATION
	1E0011	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

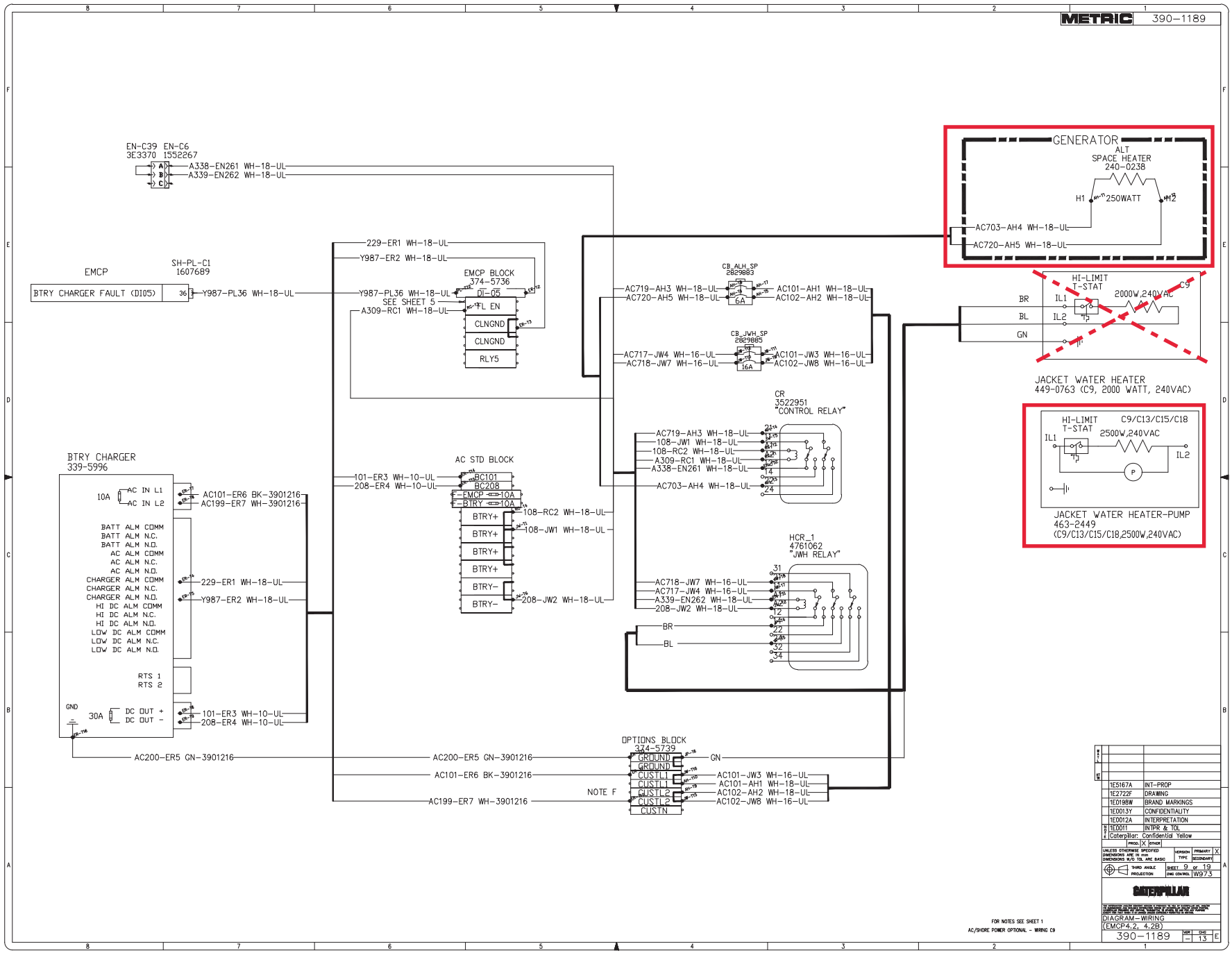
SHEET 8 OF 19

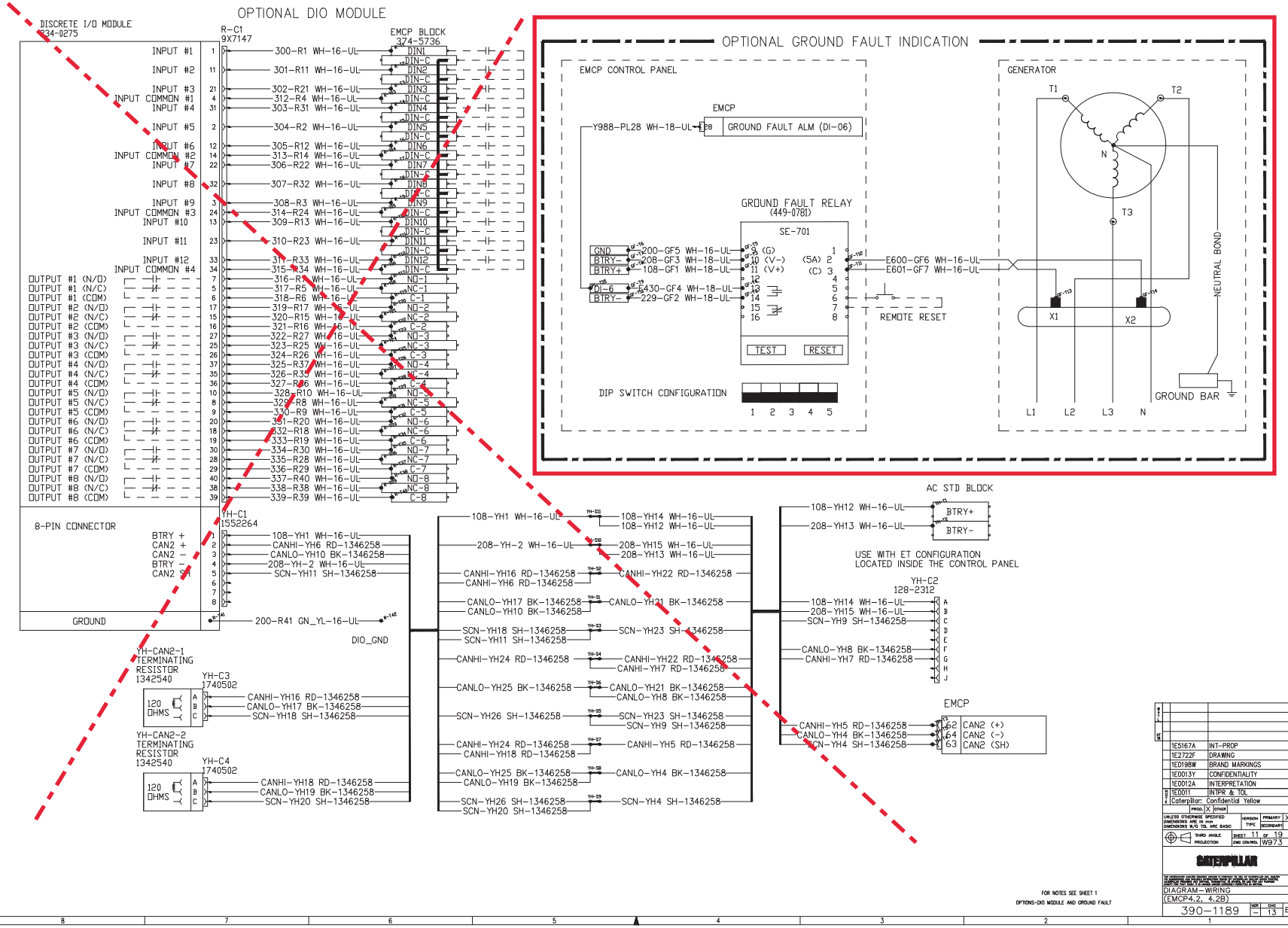
DWG CONTROL W973

CATERPILLAR

DIAGRAM-WIRING
(EMCP4.2, 4.2B)

390-1189 VER -- DWG 13 E


METRIC 390-1189
EN-C39 EN-C6
3E3370 1552267
A338-EN261 WH-18-UL
A339-EN262 WH-18-UL
GENERATOR
ALT
SPACE HEATER
240-0238
H1
250WATT
H2
AC703-AH4 WH-18-UL
AC720-AH5 WH-18-UL
EMCP
SH-PL-C1
1607689
BTRY CHARGER FAULT (DI05)
36
Y987-PL36 WH-18-UL
229-ER1 WH-18-UL
Y987-ER2 WH-18-UL
EMCP BLOCK
374-5736
DI-05
SEE SHEET 5
A309-RC1 WH-18-UL
FL EN
CLNGND
CLNGND
RLY5
CB_ALH_SP
2829883
6A
AC719-AH3 WH-18-UL
AC720-AH5 WH-18-UL
AC101-AH1 WH-18-UL
AC102-AH2 WH-18-UL
CB_JWH_SP
2829885
16A
AC717-JW4 WH-16-UL
AC718-JW7 WH-16-UL
AC101-JW3 WH-16-UL
AC102-JW8 WH-16-UL
HI-LIMIT
T-STAT
2000W,240VAC
C9
BR
BL
GN
IL1
IL2
JACKET WATER HEATER
449-0763 (C9, 2000 WATT, 240VAC)
CR
3522951
"CONTROL RELAY"
AC719-AH3 WH-18-UL
108-JW1 WH-18-UL
108-RC2 WH-18-UL
A309-RC1 WH-18-UL
A338-EN261 WH-18-UL
AC703-AH4 WH-18-UL
HI-LIMIT
T-STAT
C9/C13/C15/C18
2500W,240VAC
IL1
IL2
P
JACKET WATER HEATER-PUMP
463-2449
(C9/C13/C15/C18,2500W,240VAC)
BTRY CHARGER
339-5996
10A
AC IN L1
AC IN L2
AC101-ER6 BK-3901216
AC199-ER7 WH-3901216
BATT ALM COMM
BATT ALM N.C.
BATT ALM N.O.
AC ALM COMM
AC ALM N.C.
AC ALM N.O.
CHARGER ALM COMM
CHARGER ALM N.C.
CHARGER ALM N.O.
HI DC ALM COMM
HI DC ALM N.C.
HI DC ALM N.O.
LOW DC ALM COMM
LOW DC ALM N.C.
LOW DC ALM N.O.
229-ER1 WH-18-UL
Y987-ER2 WH-18-UL
RTS 1
RTS 2
GND
30A
DC OUT +
DC OUT -
101-ER3 WH-10-UL
208-ER4 WH-10-UL
AC STD BLOCK
101-ER3 WH-10-UL
208-ER4 WH-10-UL
BC101
BC208
EMCP 10A
BTRY 10A
BTRY+
BTRY+
BTRY+
BTRY+
BTRY-
BTRY-
108-RC2 WH-18-UL
108-JW1 WH-18-UL
208-JW2 WH-18-UL
HCR_1
4761062
"JWH RELAY"
AC718-JW7 WH-16-UL
AC717-JW4 WH-16-UL
A339-EN262 WH-18-UL
208-JW2 WH-18-UL
BR
BL
OPTIONS BLOCK
324-5739
GROUND
GROUND
CUSTL1
CUSTL1
CUSTL2
CUSTL2
CUSTN
GN
AC101-JW3 WH-16-UL
AC101-AH1 WH-18-UL
AC102-AH2 WH-18-UL
AC102-JW8 WH-16-UL
NOTE F
AC200-ER5 GN-3901216
AC101-ER6 BK-3901216
AC199-ER7 WH-3901216
FOR NOTES SEE SHEET 1
AC/SHORE POWER OPTIONAL - WIRING C9
1E5167A INT-PROP
1E2722F DRAWING
1E0198W BRAND MARKINGS
1E0013Y CONFIDENTIALITY
1E0012A INTERPRETATION
1E0011 INTPR & TOL
Caterpillar: Confidential Yellow
PROD. X OTHER
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS N/S TOL ARE BASIC
VERSION TYPE PRIMARY X SECONDARY
THIRD ANGLE PROJECTION
SHEET 9 OF 19
DWG CONTROL W973
CATERPILLAR
DIAGRAM-WIRING
(EMCP4.2, 4.2B)
390-1189
VER -
SHT 13
E



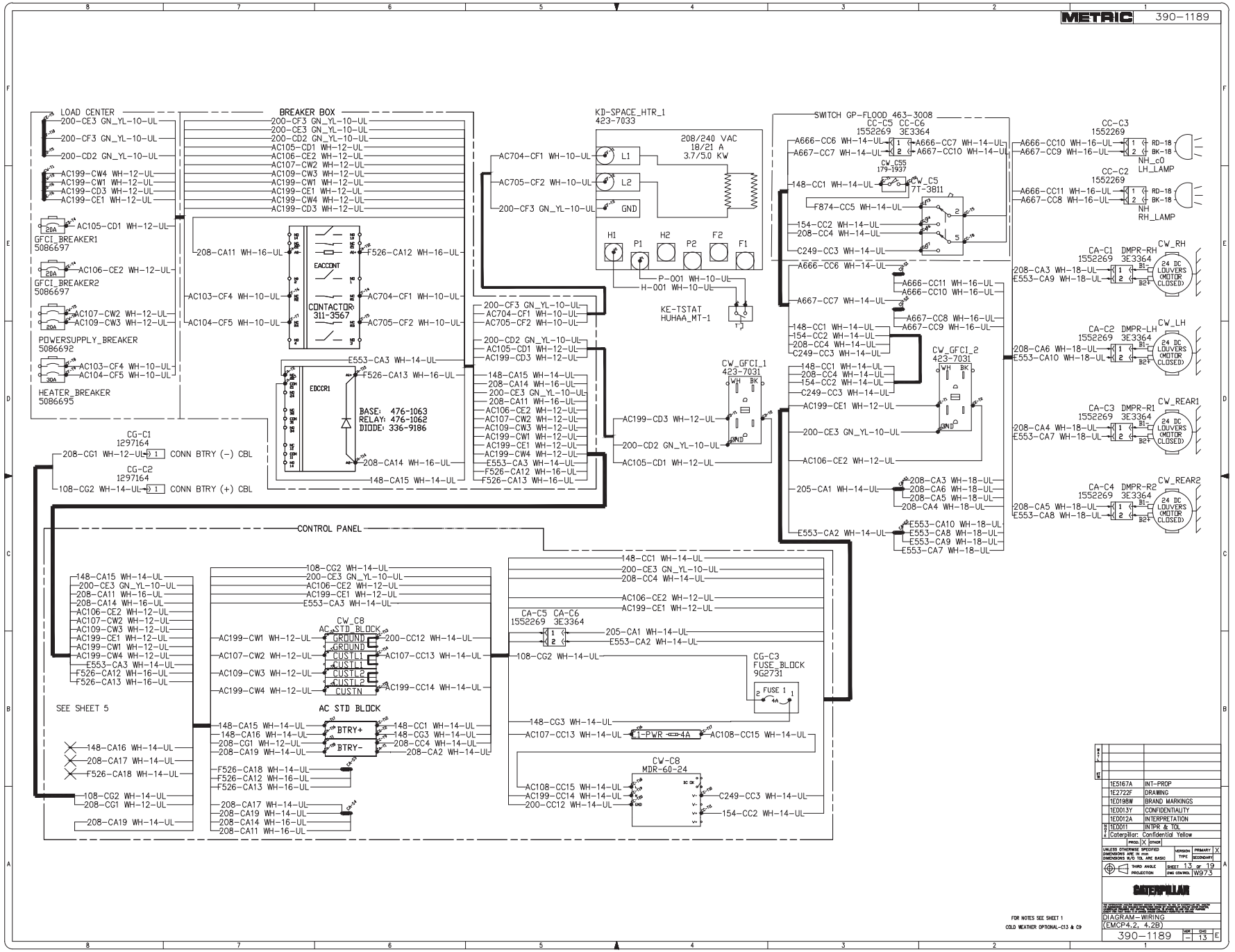
1E5167A	INT-PROP
1E2722F	DRAWING
1ED198W	BRAND MARKINGS
1E0013Y	CONFIDENTIALITY
1E0012A	INTERPRETATION
1E0011	INTPR & TOL
Caterpillar: Confidential Yellow	

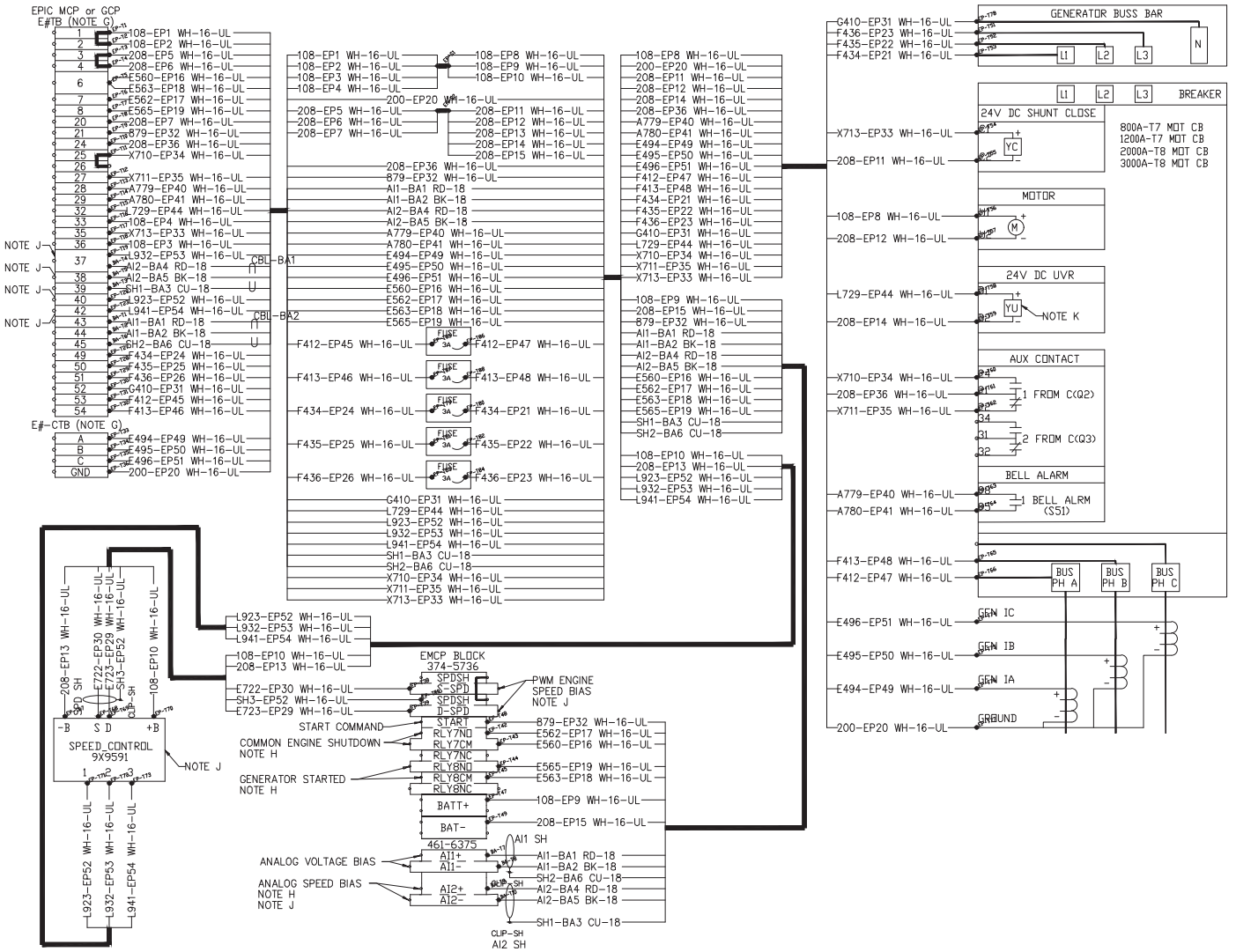
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS W/O TOL ARE BASIC
PROD. X OTHER
VERSION TYPE PRIMARY X SECONDARY
THIRD ANGLE PROJECTION
SHEET 11 OF 19
DWG CONTROL W973

CATERPILLAR

DIAGRAM-WIRING
(EMCP4.2, 4.2B)

390-1189 VER – DWG 13 E


METRIC
390-1189
LOAD CENTER
BREAKER BOX
GFCI_BREAKER1
5086697
GFCI_BREAKER2
5086697
POWERSUPPLY_BREAKER
5086692
HEATER_BREAKER
5086695
CONTACTOR
311-3567
EDCCR1
BASE: 476-1063
RELAY: 476-1062
DIODE: 336-9186
KD-SPACE_HTR_1
423-7033
208/240 VAC
18/21 A
3.7/5.0 KW
KE-TSTAT
HUHAA_MT-1
CW_GFCI_1
423-7031
CW_GFCI_2
423-7031
SWITCH GP-FLOOD 463-3008
CW_C5
7T-3811
CW_C55
179-1937
CC-C5 CC-C6
1552269 3E3364
CC-C3
1552269
CC-C2
1552269
NH_CO
LH_LAMP
NH
RH_LAMP
CA-C1 DMPR-RH
CA-C2 DMPR-LH
CA-C3 DMPR-R1
CA-C4 DMPR-R2
24 DC LOUVERS (MOTOR CLOSED)
CW_RH
CW_LH
CW_REAR1
CW_REAR2
CG-C1
1297164
CONN BTRY (-) CBL
CG-C2
1297164
CONN BTRY (+) CBL
CONTROL PANEL
SEE SHEET 5
CW_C8
AC STD BLOCK
GROUND
CUSTL1
CUSTL2
CUSTN
BTRY+
BTRY-
CA-C5 CA-C6
1552269 3E3364
CG-C3
FUSE_BLOCK
9G2731
FUSE 1
4A
C1-PWR
CW-C8
MDR-60-24
FOR NOTES SEE SHEET 1
COLD WEATHER OPTIONAL-C13 & C9
1E5167A INT-PROP
1E2722F DRAWING
1ED198W BRAND MARKINGS
1ED013Y CONFIDENTIALITY
1ED012A INTERPRETATION
1E0011 INTPR & TOL
Caterpillar: Confidential Yellow
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN mm
DIMENSIONS W/O TOL ARE BASIC
THIRD ANGLE PROJECTION
VERSION TYPE PRIMARY X SECONDARY
SHEET 13 OF 19
2ND CONTROL W973
CATERPILLAR
DIAGRAM-WIRING
(EMCP4.2, 4.2B)
390-1189
VER -
SHT 13
E



FOR NOTES SEE SHEET 1

FOR MORE REFERENCE SEE DIAGRAM EPIC FIELD INTERCONNECTION

	1E5167A	INT-PROP
	1E2722F	DRAWING
	1ED198W	BRAND MARKINGS
	1E0013Y	CONFIDENTIALITY
	1E0012A	INTERPRETATION
DOC	1E0011	INTPR & TOL
	Caterpillar: Confidential Yellow	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS N/S TOL ARE BASIC

PROD. X OTHER

VERSION TYPE PRIMARY X SECONDARY

THIRD ANGLE PROJECTION

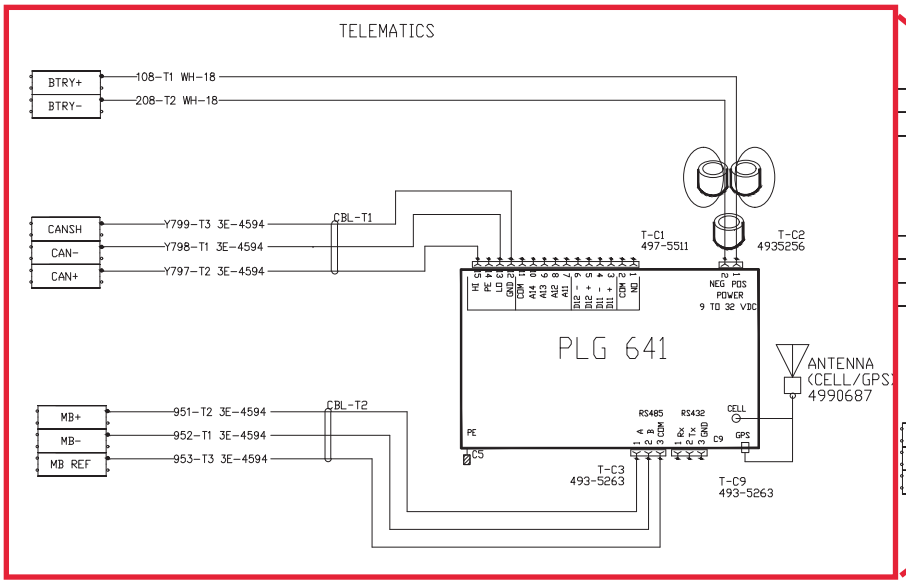
SHEET 15 OF 19

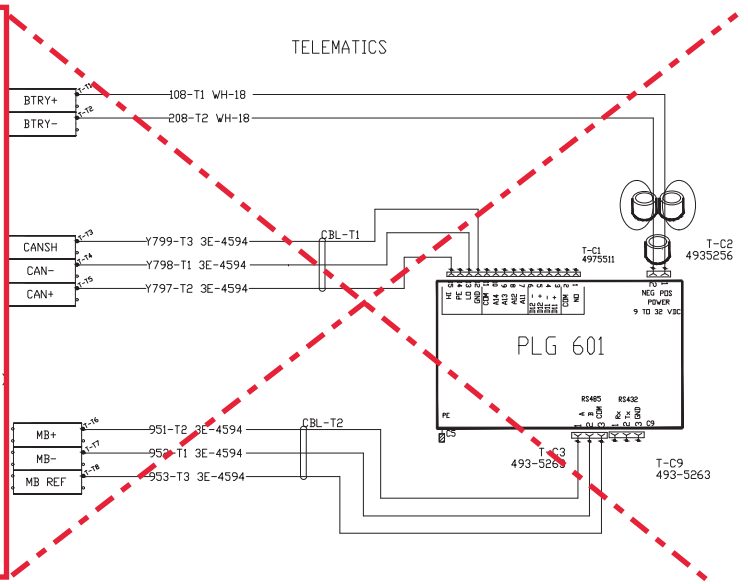
DWG CONTROL W973

CATERPILLAR

DIAGRAM-WIRING (EMCP4.2, 4.2B)

390-1189 DOC - DWG 13 E





FOR NOTES SEE SHEET 1

TELEMATICS PLG601 & PLG641

	1E5167A	INT-PROP
	1E2722F	DRAWING
	1E0198W	BRAND MARKINGS
	1E0013Y	CONFIDENTIALITY
	1E0012A	INTERPRETATION
	1E0011	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

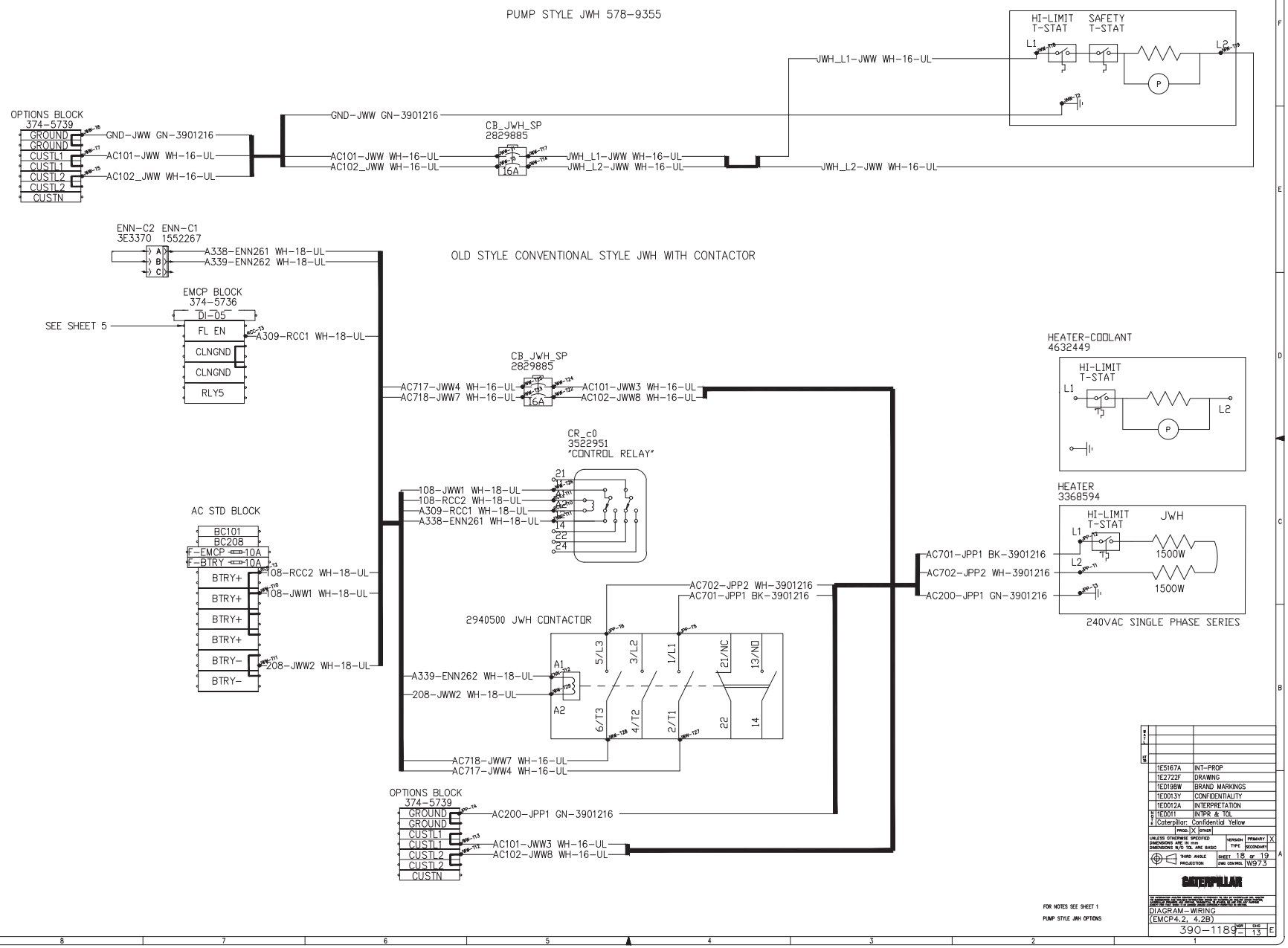
SHEET 16 OF 19

DWG CONTROL W973

CATERPILLAR

DIAGRAM-WIRING
(EMCP4.2, 4.2B)

390-1189 DOC - SHT 13 E



	1E5167A	INT-PROP
	1E2722F	DRAWING
	1ED198W	BRAND MARKINGS
	1E0013Y	CONFIDENTIALITY
	1E0012A	INTERPRETATION
REV	1E0011	INTPR & TOL
	Caterpillar: Confidential Yellow	

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

PROD. X OTHER

VERSION TYPE PRIMARY X SECONDARY

THIRD ANGLE PROJECTION

SHEET 18 OF 19

DWG CONTROL W973

CATERPILLAR

DIAGRAM-WIRING
(EMCP4.2, 4.2B)

390-1189 REV - SHT 13 E

EMCP BASE GROUND FAULT INDICATION

CONTROL PANEL

TERMINAL-BLOCK
5612891

DI4
B-
AI 1-
AI 1+

100-A5 WH-16-UL

PUSH_BUTTON
SCDF

101-A1 WH-16-UL
101-A9 WH-16-UL
101-A2 WH-16-UL
101-A3 WH-16-UL
102-A4 WH-16-UL

TRANSDUCER-CUR
5921202

105-A8 WH-16-UL
105-A9 WH-16-UL

TBCTX2
TBCTX1

104-A7 WH-16-UL
103-A6 WH-16-UL

ALTERNATOR TERMINAL BOX

T1
T2
N
T3
X1
X2
L1
L2
L3
N
GND

FOR NOTES SEE SHEET 1

EMCP BASE GFI

	1E5167A	INT-PROP
	1E2722F	DRAWING
	1ED198W	BRAND MARKINGS
	1E0013Y	CONFIDENTIALITY
	1E0012A	INTERPRETATION
DOC	1E0011	INTPR & TOL
	Caterpillar: Confidential Yellow	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN mm DIMENSIONS N/S TOL ARE BASIC

PROD. X OTHER

VERSION TYPE PRIMARY X SECONDARY

THIRD ANGLE PROJECTION

SHEET 19 OF 19

DWG CONTROL W973

CATERPILLAR

DIAGRAM-WIRING
(EMCP4.2, 4.2B)

390-1189 - 13 E

NC POWER SYSTEMS CAT

SECTION 5

AUTOMATIC TRANSFER SWITCH

Picture shown may not reflect actual configuration

Cat® ATC Contactor-based Automatic Transfer Switch (ATS)

Cat® transfer switches are designed for a variety of standby power applications. They provide flexibility, reliability, and value in a compact package and are available from 40-3000A. The open and delayed transition contactor-based ATS provides fully functioning transfer in applications where a momentary loss of power is acceptable during transfer and retransfers between normal and emergency power supply.

The closed transition contactor-based ATS is designed to meet application requirements where emergency backup power is required with no momentary loss of power by connecting both sources before the transfer occurs. Closed transition also permits periodic testing of the emergency power source without interrupting power to the loads.

Features

- ATC-300+ or ATC-900 microprocessor-based controller
- Voltage and frequency sensing
- High withstand and closing ratings
- Multiple field programmable set points
- Status display including switch position indication
- Source availability indication
- Source 1 and Source 2 auxiliary contacts
- True RMS voltage and frequency sensing
- Programmable plant exerciser
- System test pushbutton
- Mimic diagram
- Double-throw, mechanically interlocked transfer mechanism
- Switch position indication
- Status display
- Double-throw UL 1008 2- and 3-position contactors

Options

- 2- or 4-position test switch
- Multiple metering options available
- Delayed transition and closed transition
- Selectable automatic or non-automatic operation
- Space heaters (recommended for use in outdoor enclosures)
- Surge suppression
- Remote communications
- Load shed from emergency
- Field-selectable, multi-ratio, control voltage transformer 50/60 Hz

Optional Delayed Transition Includes:

- Time delay neutral
- Pre-transfer signal with 1 N.O. and 1 N.C. contacts

Ratings

- Wall mount 40-400A, 2-, 3- or 4-pole
- Floor-standing 600-1600A 2-, 3-, or 4-pole
- Open, delayed, or closed transition 2000-3000A, 480V, 3- or 4-pole in a floor-standing enclosure
- Up to 600 VAC, 50/60 Hz for 40-1200A
- 100% rated
- UL 1008 listed
- CSA C22.2 No. 178 certified
- Seismic IBC 2006, CBC 2007 and OSHPD

Contact Composition

Caterpillar uses silver composition contacts designed to meet the stringent requirements of UL 1008. All contactors are designed so that the contacts can be visually inspected without major disassembly and are protected by arcing contacts.

Controls and Wiring

All control relays and industrial-grade relays are totally encapsulated to minimize exposure to dust and dirt. Lugs are 90ºC rated and all control wire is #16 AWG, type XLPE with a 125°C temperature rating.

Enclosure

The ATS is housed in rugged steel NEMA 1, 3R, or 12 enclosure which is seismic qualified (BOCA, CBC, IBC, UBC, OSHPD). ATS enclosures have three door hinges to ensure proper support of the door and door-mounted devices. The hinges have removable hinge pins to facilitate door removal for easy wall mounting or service and are supplied with padlockable latches.

Testing Standards

- UL 991 UL standards for safety tests for safety-related controls employing solid-state devices
- UL 1008 dielectric test (endurance, withstand, etc.)
- IEEE® 472 (ANSI C37.90A) ringing wave immunity/voltage surge test
- EN55022 (CISPR11): conducted and radiated emissions
- EN61000-4-2 Class B Level 4 ESD immunity test
- EN61000-4-3 (ENV50140) radiated RF, electromagnetic field immunity test
- EN61000-4-4 electrical fast transient/burst immunity test
- EN61000-4-5 IEEE C62.41: surge immunity test
- EN61000-4-6 (ENV50141) conducted immunity test
- EN61000-4-11 voltage dips and interruption immunity
- FCC Part 15 conducted/radiated emissions (Class A)
- CISPR 11 Conducted/radiated emissions (Class A)
- IEC 1000-2 electrostatic discharge test
- IEC 1000-3 radiated susceptibility test
- IEC 1000-4 fast transient tests
- IEC 1000-5 surge withstand tests
- NEMA® ICS 109.21 impulse withstand test
- CSA® conformance C22.2 No. 178-1978 (reaffirmed 1992)
- UL 869A reference standard for service equipment
- UL 50/508 enclosures
- NEMA ICS 1 general standards for industrial control system
- NEMA ICS 2 standards for industrial control devices, controllers, and assemblies
- NEMA ICS 6 enclosures for industrial controls and systems
- NEMA ICS 10-1993 AC automatic transfer switches
- ANSI C33.76 enclosures
- NEC® 517, 700, 701, and 702 National Electrical Code
- NFPA® 70 National Fire Protection Agency
- NFPA 99 health care facilities
- NFPA 101 life safety code
- NFPA 110 emergency and standby power systems
- EGSA 100S standard for transfer switches
- CSA C22.2 No. 178-1978 Canadian Standards Association

Open Transition Contactor-based Transfer Switch 40-3000A

Ampere Rating	Number of Poles	Height inches (mm)	Width inches (mm)	Depth inches (mm)	Standard Terminals*		
					Load Side, Normal and Standby Source	Neutral Connection	Shipping Weight Lbs (kg)
40-100 @ 120-480V	2 3 4	38.68 (982.5) 38.68 (982.5) 38.68 (982.5)	18.31 (465.1) 18.31 (465.1) 18.31 (465.1)	13.34 (338.8) 13.34 (338.8) 13.34 (338.8)	(1) #14-2/0 kcmil	(1) #14-1/0 kcmil	156 (70.8) 156 (70.8) 156 (70.8)
40-100 @ 600V	2 3 4	38.68 (982.5) 38.68 (982.5) 38.68 (982.5)	18.31 (465.1) 18.31 (465.1) 18.31 (465.1)	13.34 (338.8) 13.34 (338.8) 13.34 (338.8)	(1) #14-2/0 kcmil	(1) #14-1/0 kcmil	156 (70.8) 160 (72.6) 164 (74.4)
150-200 @ 120-480V	2 3 4	38.68 (982.5) 38.68 (982.5) 38.68 (982.5)	18.31 (465.1) 18.31 (465.1) 18.31 (465.1)	13.34 (338.8) 13.34 (338.8) 13.34 (338.8)	(1) #6-300 kcmil	(3) 1/0-250 kcmil	156 (70.8) 160 (72.6) 164 (74.4)
150-200 @ 600V	3 4	52.00 (1321) 52.00 (1321)	19.81 (503) 19.81 (503)	16.75 (425) 16.75 (425)	(1) #6-250 kcmil	(3) 1/0-250 kcmil	250 (113.4) 260 (117.9)
225-400 @ 120-480V	2 3 4	52.00 (1321) 52.00 (1321) 52.00 (1321)	19.81 (503) 19.81 (503) 19.81 (503)	16.75 (425) 16.75 (425) 16.75 (425)	(2) 3/0-250 kcmil	(6) 250-500 kcmil	240 (108.9) 250 (113.4) 260 (117.9)
225-1200 @ 600V◊	3 4	79.41 (2017) 79.41 (2017)	29.19 (741.4) 29.19 (741.4)	22.46 (570.5) 22.46 (570.5)	(4) 1/0-750 kcmil	(12) 1/0-750 kcmil	650 (294.8) 650 (294.8)
600-1200 @ 120-480V	2 3 4	79.41 (2017) 79.41 (2017) 79.41 (2017)	25.25 (648.2) 25.25 (648.2) 29.19 (741.4)	22.46 (570.5) 22.46 (570.5) 22.46 (570.5)	(4) 1/0-750 kcmil	(12) 1/0-750 kcmil	590 (267.6) 600 (272.2) 650 (294.8)
1600 @ 120-480V	2 3 4	90.00 (2288) 90.00 (2288) 90.00 (2288)	40.00 (1016) 40.00 (1016) 40.00 (1016)	26.73 (730) 26.73 (730) 26.73 (730)	Contact Factory		
2000 @ 120-480V	3 4	90.00 (2288) 90.00 (2288)	40.00 (1016) 40.00 (1016)	40.00 (1016) 40.00 (1016)	Contact Factory		
2600 @ 120-480V	3 4	90.00 (2288) 90.00 (2288)	40.00 (1016) 40.00 (1016)	40.00 (1016) 40.00 (1016)	Contact Factory		
3000 @ 120-480V	3 4	90.00 (2288) 90.00 (2288)	40.00 (1016) 40.00 (1016)	40.00 (1016) 40.00 (1016)	Contact Factory		

NEMA 1 dimensions and weights shown are approximate, subject to change without notice, and are not for construction use.

*Standard Terminals – ( ) indicate the quantity terminals (cables) per pole.

◊ For 3-position contactor

ATC Contactor Type Switches (Wall-Mount & Bypass Isolation) Up To 600V

Wall-Mount Transfer Switch Amperes	Number of Switched Poles	When Protected by **Any Breaker**		When Protected by **Specific Listed Breaker**		When Protected by Current Limiting Fuses			
		Test Voltage		Test Voltage					
		3-Cycle 480V (kA)	3-Cycle 600V (kA)	480V (kA)	600V (kA)	Rating (kA)	Test Voltage	Fuse Type	Maximum Fuse Amperes
40	2, 3, 4	10	10	30	22	100	480	RK5	200A
80	2, 3, 4	10	10	30	22	100	480	RK5	200A
100	2, 3, 4	10	10	30	22	100	480	RK5	200A
150	2, 3, 4	10	22	30	35	200	600	RK5	400A
200	2, 3, 4	10	22	30	35	200	600	RK5	400A
225	2, 3, 4	30	50	50	65	200	600	RK5	600A
260	2, 3, 4	30	50	50	65	200	600	RK5	600A
400	2, 3, 4	30	50	50	65	200	600	RK5	600A
600	2, 3, 4	50	50	65	65	200	600	L, R, J, T	1600A
800	2, 3, 4	50	50	65	65	200	600	L, R, J, T	1600A
1000	2, 3, 4	50	50	65	65	200	600	L, R, J, T	1600A
1200	2, 3, 4	50	50	65	65	200	600	L, R, J, T	1600A
1600	2,3,4	50	-	65	-	200	480	L, R, J, T	2000A

Bypass Isolation Transfer Switch Amperes	Number of Switched Poles	When Protected by **Any Breaker**		When Protected by **Specific Listed Breaker**		When Protected by Current Limiting Fuses			
		Test Voltage		Test Voltage					
		3-Cycle 480V (kA)	3-Cycle 600V (kA)	480V (kA)	600V (kA)	Rating (kA)	Test Voltage	Fuse Type	Maximum Fuse Amperes
100	2, 3, 4	30	22	50	35	200	600	RK5	600A
150	2, 3, 4	30	22	50	35	200	600	RK5	600A
200	2, 3, 4	30	22	50	35	200	600	RK5	600A
225	2, 3, 4	30	42	50	65	200	600	RK5	600A
260	2, 3, 4	30	42	50	65	200	600	RK5	600A
400	2, 3, 4	30	42	50	65	200	600	RK5	600A
600	2, 3, 4	50	42	65	65	200	600	L, R, J, T	1600A
800	2, 3, 4	50	42	65	65	200	600	L, R, J, T	1600A
1000	2, 3, 4	50	42	65	65	200	600	L, R, J, T	1600A
1200	2, 3, 4	50	42	65	65	200	600	L, R, J, T	1600A
1600	2, 3, 4	50	-	65	-	-	-	-	-

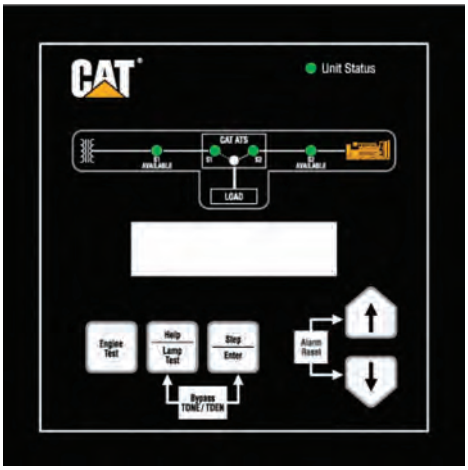


Image shown may not reflect actual package

Cat® ATC-300+ Controller

The ATC-300+ is a comprehensive and multifunctional microprocessor-based ATS controller. It is a compact and self-contained panel-mounted device that is designed to replace traditional relay and solid-state logic panels.

The ATC-300+ controller provides programmed flexibility to address the needs of any system. It operates from all system voltages between 120 to 600V, single-phase and three-phase at 50 or 60 Hz. In addition, a period of no control power is provided. The controller monitors the condition of the three-phase line-to-line voltage and frequency of Source 1 and Source 2 power sources and can be programmed for single-phase operation. The ATC-300+ Controller provides the intelligence to ensure that the ATS operates properly through a series of programmed sensing and timing functions.

Features

- Source 1 and source 2 sensing:
  - Undervoltage/underfrequency
  - Overvoltage/overfrequency
  - Three-phase rotation protection
  - Three-phase voltage unbalance/loss
- Pre-transfer signal contacts 1NO and 1NC
- Go to emergency (Source 2)
- Seven field-programmable time delays
- Auxiliary relay contacts:
  - Source 1 present 2NO and 2NC (optional)
  - Source 2 present 2NO and 2NC (optional)
- LCD-based display for programming, system diagnostic and help message display
- Mimic diagram with source available and connected LED indication
- Time-stamped history log
- System test pushbutton
- Programmable plant exercise (off, daily, 7, 14, and 28 day) interval selectable run time 0-600 minutes no load/load with fail-safe
- Integral overcurrent protection (optional)
- In-phase transition
- Stainless steel cover for controller (optional)
- Communications via RS-232 or Modbus through an integrated RS-485 port (optional)

ATC-300+ Controller Specifications

Description	Specification
Input Control Voltage	65 to 145 VAC 50/60 Hz
Voltage Measurements of	Source 1 V_{AB} Source 2 V_{AB} Source 1 V_{BC} Source 2 V_{BC} Source 1 V_{CA} Source 2 V_{CA}
Voltage Measurement Range	0 to 790 VAC RMS (50/60 Hz)
Voltage Measurement Accuracy	±2% of Nominal Input Voltage
Frequency Measurement for	Source 1 and Source 2
Frequency Measurement Range	40 Hz to 70 Hz
Frequency Measurement Accuracy	±0.1 Hz
Undervoltage Dropout Range	50 to 90% of Nominal Voltage
Undervoltage Pickup Range	(Dropout +2%) to 99% of Nominal System Voltage
Overvoltage Dropout Range	105 to 120% Nominal Voltage
Overfrequency Dropout Range Overfrequency Pickup Range	103 to 110% of the Nominal System Frequency 101% to (Dropout -1 Hz) of Nominal System Frequency
Underfrequency Dropout Range	90 to 97% of the Nominal System Frequency
Underfrequency Pickup Range	(Dropout +1 Hz) to 99% of Nominal System Frequency
Overfrequency Pickup Range	101% to (Dropout -1 Hz) of Nominal System Frequency
Operating Temperature Range	-20°C to +70°C (-4°F to +158°F)
Storage Temperature Range	-30°C to +85°C (-22°F to +185°F)
Operating Humidity	0 to 95% Relative Humidity (noncondensing)
Operating Environment	Resistant to Ammonia, Methane, Nitrogen, Hydrogen, and Hydrocarbons
Generator Start Relay	5A, 1/6 hp @ 250 VAC 5A @ 30 VDC with a 150W Maximum Load
K1, K2, Pre-transfer, Alarm Relays	10A, 1-3 hp @ 250 VAC 10A @ 30 VDC
Applicable Testing	UL Recognized Component Meets Intent of UL 991 1008 Meets IEC 1000-4-2, 1000-4-3, 1000-4-4, 1000-4-5, 1000-4-6, 10004-11 Meets CISPR 11, Class A Complies with CSA 22.2-178 Complies with FCC Part 15, Class A
Enclosure Compatability	NEMA 1, NEMA 3R, and NEMA 12 UV-resistant ATC-300+ Faceplate

ATC-300+ Controller Specifications (continued)

Parameter Setpoints	Description
TDNE	0 to 1800 seconds
TDEN	0 to 1800 seconds
TDEC	0 to 1800 seconds
TDES	0 to 120 seconds
TDN	0 to 120 seconds
TDEF	0 to 6 seconds
In-phase	Enabled or Disabled
In-phase Frequency Difference	0.0 to 3.0 Hz
Sync Time	1 to 60 minutes
Pre-transfer Signal Service	0 to 120 seconds
Plant Exerciser	Disabled, 7-, 14-, or 28-day intervals, 0-600 minutes, load or no load
Sensing	Three-phase or Single-phase
System Selection	Utility – utility or utility – generator
Engine Test Mode	Disabled, Load or No Load

ATC-300+ Controller Setpoints

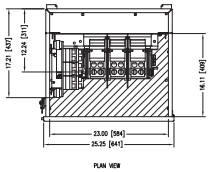
Setpoint	Units	Description	Range	Factory Default
New password	Four digits	Set new password	0000 to 9999	300
TDES	Minutes: seconds	Time delay engine start	0 to 120 seconds	0:03
TDNE	Minutes: seconds	Time delay normal to emergency	0 to 1800 seconds	0:00
TDEN	Minutes: seconds	Time delay emergency to normal	0 to 1800 seconds	5:00
TDEC	Minutes: seconds	Time delay engine cool off	0 to 1800 seconds	5:00
NOM FREQ	Hertz	Nominal frequency	50 or 60 Hz	As ordered
NOM VOLTS	Volts	Nominal voltage	120 to 600 volts	As ordered
S1 UV DROP	Volts	Source 1 undervoltage dropout range	78 to 97% of nominal system voltage	85%
S2 UV DROP	Volts	Source 2 undervoltage dropout range	78 to 97% of nominal system voltage	85%
S1 UV PICK	Volts	Source 1 undervoltage pickup range	(Dropout +2%) to 99% of nominal system voltage	90%
S2 UV PICK	Volts	Source 2 undervoltage pickup range	(Dropout +2%) to 99% of nominal system voltage	90%
S1 OV DROP	Volts	Source 1 overvoltage dropout range	105 to 110% of nominal system voltage	110%
S2 OV DROP	Volts	Source 2 overvoltage dropout range	105 to 110% of nominal system voltage	110%
S1 OV PICK	Volts	Source 1 overvoltage pickup range	103% to (dropout -2%) of nominal system voltage	105%
S2 OV PICK	Volts	Source 2 overvoltage pickup range	103% to (dropout -2%) of nominal system voltage	105%
S1 UF DROP	Hertz	Source 1 underfrequency dropout range	90 to 97% of nominal system voltage	90%
S2 UF DROP	Hertz	Source 2 underfrequency dropout range	90 to 97% of nominal system voltage	90%
S1 UF PICK	Hertz	Source 1 underfrequency pickup range	(Dropout +1 Hz) to 99% of nominal system voltage	90%
S2 UF PICK	Hertz	Source 2 underfrequency pickup range	(Dropout +1 Hz) to 99% of nominal system voltage	90%
S1 OF DROP	Hertz	Source 1 overfrequency dropout range	103 to 105% of nominal system frequency	105%

ATC-300+ Controller Setpoints (continued)

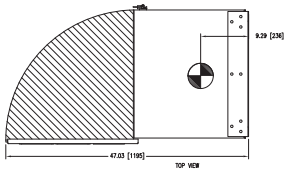
Setpoint	Units	Description	Range	Factory Default
S2 OF DROP	Hertz	Source 2 overfrequency dropout range	103 to 105% of nominal system frequency	105%
S1 OF PICK	Hertz	Source 1 overfrequency pickup range	103% to (dropout -1 Hz) of nominal system frequency	102%
S2 OF PICK	Hertz	Source 2 overfrequency pickup range	103% to (dropout -1 Hz) of nominal system frequency	102%
PLANT EXER	Days	Plant exerciser programming	Off, daily 7-, 14-, or 28-day	OFF
PE LOAD XFR		Plant exerciser load transfer	0 or 1 (1 = yes)	0
PE DAY	Days	Plant exerciser day of the week	1 Sun, 2 Mon, 3 Tues, 4 Wed, 5 Thu, 6 Fri, or 7 Sat	
PE HOUR	Hours	Plant exerciser hour	0 to 23	0
PE MINUTE	Minutes	Plant exerciser minute	0 to 59	0
TEST MODE		Test mode	0, 1, or 2 (2 = no load engine test 1 = load engine test, 2 = disabled)	0
TER	Hours: minutes	Engine run test time	0 to 600	5:00
TPRE	Minutes: seconds	Pre-transfer delay timer	0 sec to 120 sec	0:00
PHASES		Three-phase or single-phase	1 or 3	As ordered
VOLT UNBAL	Volts	Volts unbalanced	0 or 1 (1 = enabled)	0:00
UNBAL DROP %	Percent	Percent for unbalanced voltage dropout	5 to 20% of phase-to-phase voltage unbalances	20%
UNBAL PICK %	Percent	Percent for unbalanced voltage pickup	Dropout minus (UNBAL DROP % -2) to 3%	10%
UNBAL DELAY	Seconds	Unbalanced delay timer	10 to 30	0:20
TDEF	Seconds	Time delay emergency fail timer	0 to 6 sec	6
IP FREQ DIFF	Hertz	In-phase transition frequency difference	0.0 Hz to 3.0 Hz	1
SYNC TIME	Minutes	In-phase transition synchronization timer	1 min to 60 min	5
PHASE REV		Phase reversal	OFF, ABC, CBA	OFF

ATC-300+ Controller Setpoints (continued)

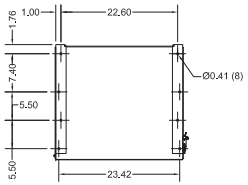
Setpoint	Units	Description	Range	Factory Default
DST ADJUST		Daylight savings	0 or 1 (1 = enabled)	1
LANGUAGE		Selected language	English French, or Spanish	English
CHANGE TIME/DATE?	Hours Minutes Weekday Month Day Year	Set time and date Set hour Set minute Set weekday Set month Set day Set year	0 to 23 0 to 59 Sun, Mon, Tues Wed, Thu, Fri, or Sat Jan or 01 1 to 31 Current year	Eastern Standard Time Eastern Standard Time Eastern Standard Time Eastern Standard Time Eastern Standard Time Eastern Standard Time
RESET SYSTEM COUNTERS?			Yes or no	No
RESET ALL?		Resets all system counters	Yes or no	No
RESET ENGINE RUN?	Hours	Resets ENGINE RUN counter	0 to 9999	XXXX
RESET S1 CONN	Hours	Resets SI CONN counter	0 to 9999	XXXX
RESET S2 CONN	Hours	Resets S2 CONN counter	0 to 9999	XXXX
RESET S1 AVAIL	Hours	Resets SI AVAIL counter	0 to 9999	XXXX
RESET S2 AVAIL	Hours	Resets S2 AVAIL counter	0 to 9999	XXXX
RESET LOAD ENERG	Hours	Resets LOAD ENERG counter	0 to 9999	XXXX
RESET TRANSFERS	Hours	Resets TRANSFERS counter	0 to 9999	XXXX
SAVE SETPOINTS		Save changed setpoints	Yes or no	Yes



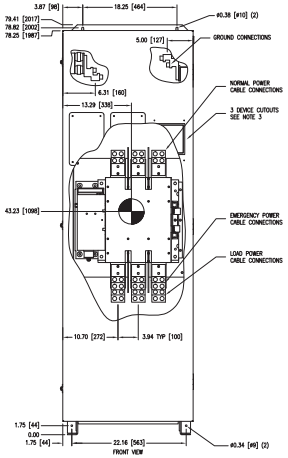
PLAN VIEW



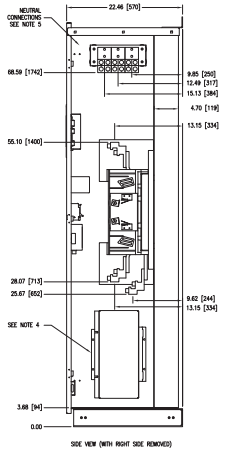
TOP VIEW



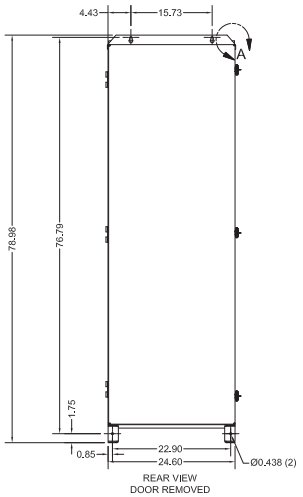
BOTTOM VIEW
DOOR
REMOVED



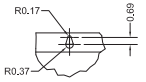
FRONT VIEW



SIDE VIEW (WITH RIGHT SIDE REMOVED)



REAR VIEW
DOOR REMOVED



DETAIL A
SCALE 0.18 : 1

ATC3C5X31200BSU

AUTOMATIC OPEN TRANSFER CONTACTOR SWITCH
ATC-300+ CONTROL, 3 POSITION CONTACTOR
FIXED MOUNTED
3 POLE, 1200 AMPS
208/120V 60HZ, 3 PHASE, 4 WIRE
TYPE-1 ENCLOSURE, UL 1008 LISTED

FEATURES INCLUDED:

1A	TIME DELAY NORMAL TO EMERGENCY ADJ 0-1800 sec
2A	TIME DELAY ENGINE START ADJ 0-120 sec
3A	TIME DELAY EMERGENCY TO NORMAL ADJ 0-1800 sec
4A	TIME DELAY ENGINE COOL-OFF ADJ 0-1800 sec
5H	EMERGENCY (S2) SENSING PHASE REVERSAL
5J	EMERGENCY (S2) SENSING ALL PHASE UNDERVOLTAGE/UNDER FREQ
5K	EMERGENCY (S2) SENSING ALL PHASE OVERVOLTAGE/OVER FREQ
5L	EMERGENCY (S2) SENSING ALL PHASE VOLTAGE UNBALANCE
6B	ENGINE TEST PUSHBUTTON
7A	TIME DELAY ENGINE FAIL ADJ 0-6 sec
8C	BYPASS TIME DELAY EMERGENCY TO NORMAL
8D	BYPASS TIME DELAY NORMAL TO EMERGENCY
12C	NORMAL (S1) CONNECTED INDICATION
12D	EMERGENCY (S2) CONNECTED INDICATION
12G	NORMAL (S1) PRESENT INDICATION
12H	EMERGENCY (S2) PRESENT INDICATION
14L	AUX RELAY CONTACTS NORMAL (S1) PRESENT 2 FORM C
14M	AUX RELAY CONTACTS EMERGENCY (S2) PRESENT 2 FORM C
15E	POSITION INDICATION CONTACT NORMAL (S1) 1 FORM C
15F	POSITION INDICATION CONTACT EMERGENCY (S2) 1 FORM C
22	GROUND BAR
23K	PLANT EXERCISER 7/14/28 DAY LOAD/NO LOAD 0-600 min
26D	GO TO EMERGENCY (S2) INPUT
26H	NORMAL (S1) SENSING PHASE REVERSAL
26J	NORMAL (S1) SENSING ALL PHASE UNDERVOLTAGE/UNDER FREQ
26K	NORMAL (S1) SENSING ALL PHASE OVERVOLTAGE/OVER FREQ
26L	NORMAL (S1) SENSING ALL PHASE VOLTAGE UNBALANCE
32D	IN-PHASE TRANSITION DEFAULTS TO TIME DELAY NEUTRAL
35A	PRE-TRANSFER SIGNAL CONTACTS 1 FORM C
42	IBC/CBC SEISMIC QUALIFIED
48F	COMMUNICATIONS MODBUS
49C	MULTI-TAP VOLTAGE TRANSFORMER

REQUIRED FOR SEISMIC, RECOMMENDED FOR ALL APPLICATIONS:
USE 4, 5/16-13 UNC GRADE 5 OR BETTER HEX HEAD BOLTS AND WASHERS. THESE BOLTS ARE TO BE TORQUED TO 75 FT. LBS. (102 NM).

TERMINALS:
NORMAL: (4) 1/0-750 CU/AL PER POLE
EMERGENCY: (4) 1/0-750 CU/AL PER POLE
LOAD: (4) 1/0-750 CU/AL PER POLE
NEUTRAL: (12) 1/0-750 CU/AL

NOTES:
1 APPROXIMATE SHIPPING WEIGHT = 600 LBS [272 KG]
2 DIMENSIONS SHOWN IN INCHES [MILLIMETERS]
3 CONTROLS PROVIDED BASED ON CUSTOMER ORDER INFORMATION.
4 TRANSFORMER INCLUDED
5 FOR SWITCHED NEUTRAL APPLICATIONS CONNECT TO TERMINALS MARKED 'NN', 'EN', AND 'TN'. NEUTRAL ASSEMBLY IS NOT PROVIDED. FOR 3 PHASE 3 WIRE SYSTEMS NEUTRAL ASSEMBLY IS NOT PROVIDED.

CG CENTER OF GRAVITY

DESIGNATION

CAGE CODE 88725

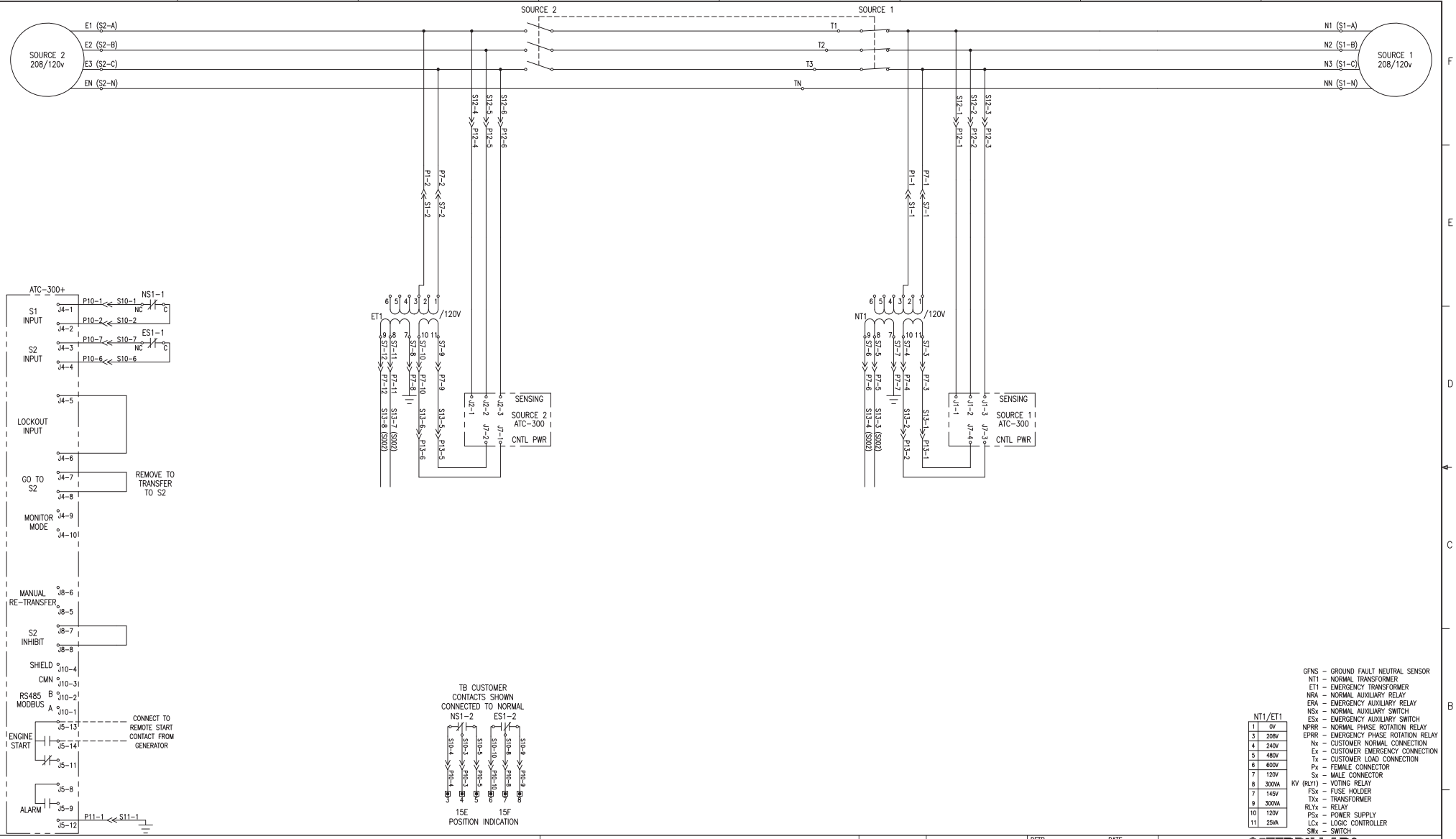
DFTR Michael J Harper DATE 4/21/2022
APPD DATE
PRODUCT CODE AT
S.O. DCAK0118X2K3
REVISION 1
G.O. –
DWG 01
SHEET 1 OF 6

CATERPILLAR®

TITLE AUTOMATIC OPEN TRANSFER | CONTACTOR SWITCH
480V 3 POSITION | 40-1200 AMP | ATC-300+ CONTROLLER

TYPE ATC3C5X31200BSU
OUTLINE

COEFtBL_R7



NT1/ET1	
1	0V
3	208V
4	240V
5	480V
6	600V
7	120V
8	300VA
7	145V
9	300VA
10	120V
11	25VA

GFNS – GROUND FAULT NEUTRAL SENSOR
NT1 – NORMAL TRANSFORMER
ET1 – EMERGENCY TRANSFORMER
NRA – NORMAL AUXILIARY RELAY
ERA – EMERGENCY AUXILIARY RELAY
NSx – NORMAL AUXILIARY SWITCH
ESx – EMERGENCY AUXILIARY SWITCH
NPRR – NORMAL PHASE ROTATION RELAY
EPRR – EMERGENCY PHASE ROTATION RELAY
Nx – CUSTOMER NORMAL CONNECTION
Ex – CUSTOMER EMERGENCY CONNECTION
Tx – CUSTOMER LOAD CONNECTION
Px – FEMALE CONNECTOR
Sx – MALE CONNECTOR
KV (RLY1) – VOTING RELAY
FSx – FUSE HOLDER
TXx – TRANSFORMER
RLYx – RELAY
PSx – POWER SUPPLY
LCx – LOGIC CONTROLLER
SWx – SWITCH

DESIGNATION

CAGE CODE 88725

DFTR Michael J Harper DATE 4/21/2022

APPD DATE

PRODUCT CODE AT

S.O. DCAK0118X2K3

REVISION 1

G.O. –

CATERPILLAR®

TITLE AUTOMATIC OPEN TRANSFER | CONTACTOR SWITCH
480V 3 POSITION | 40–1200 AMP | ATC–300+ CONTROLLER

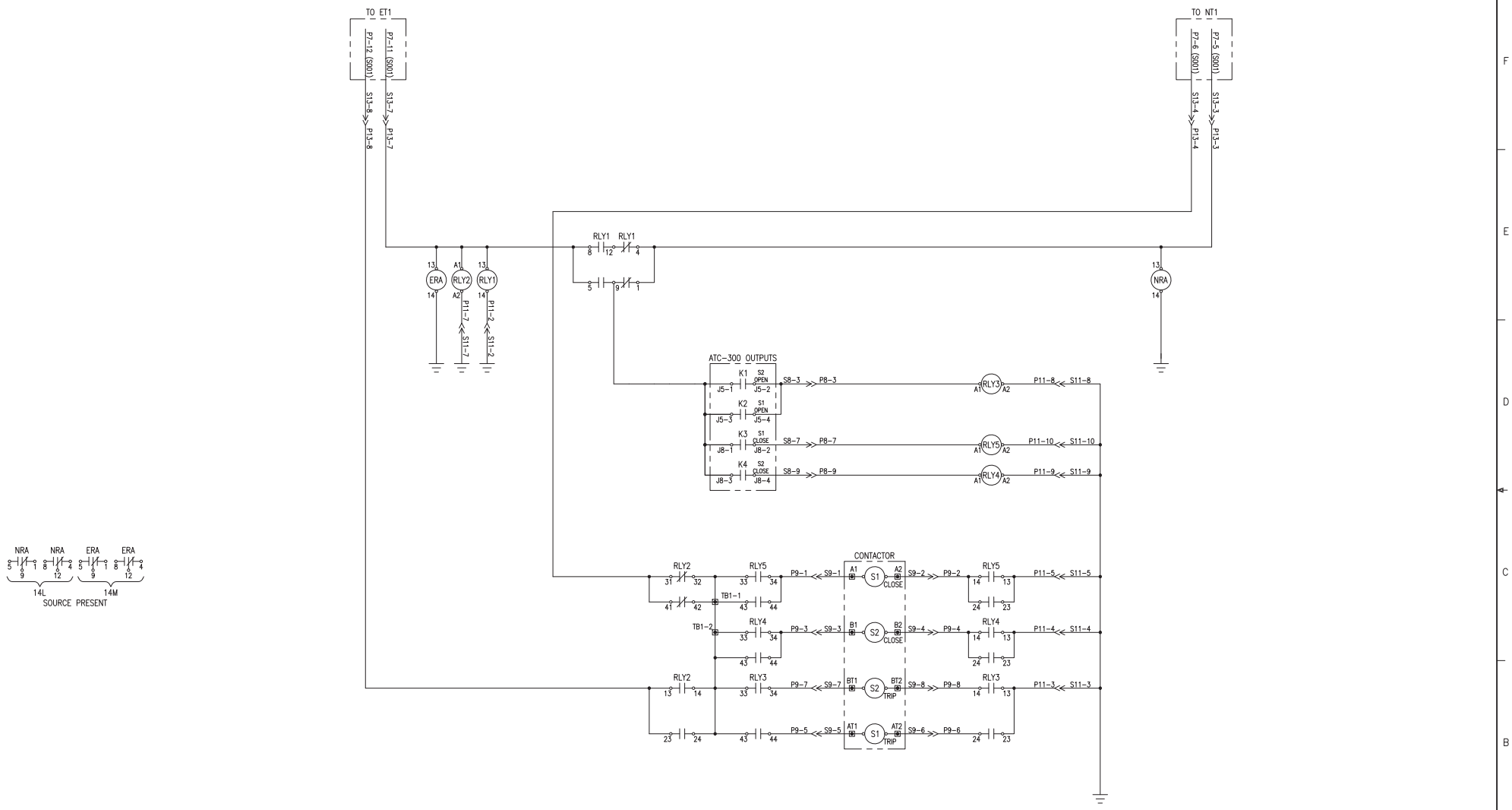
TYPE ATC3C5X31200BSU

SCHEMATIC

DWG — S 1

SHEET 2 OF 6

COEFtBL_R7



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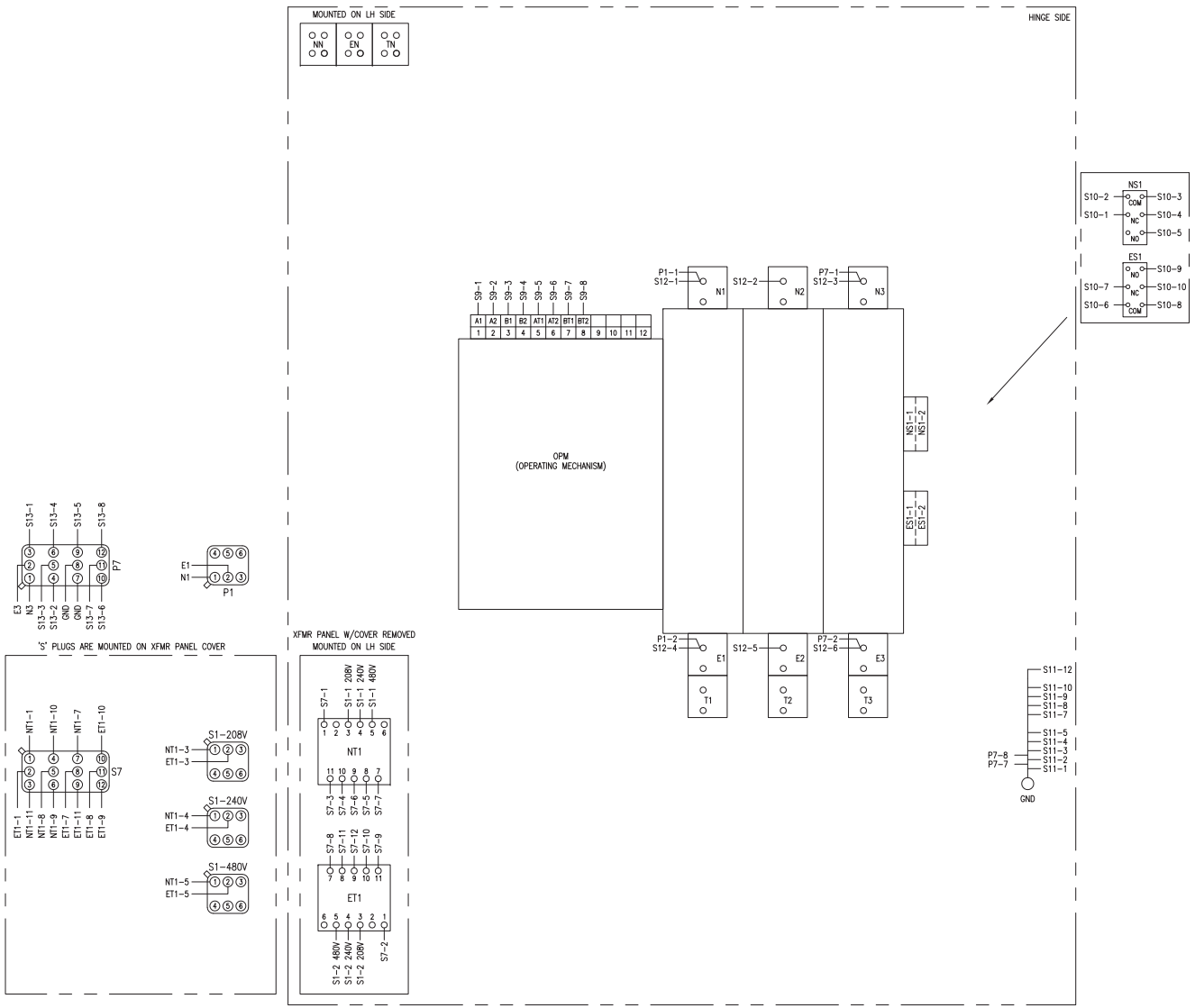
				APPD	DATE	TITLE AUTOMATIC OPEN TRANSFER | CONTACTOR SWITCH 480V 3 POSITION | 40–1200 AMP | ATC–300+ CONTROLLER		
	DESIGNATION			PRODUCT CODE AT	S.O. DCAK0118X2K3	TYPE ATC3C5X31200BSU		SCHEMATIC
			CAGE CODE 88725	REVISION 1		G.O. –	DWG S2	SHEET 3 OF 6

COEFtBL_R7



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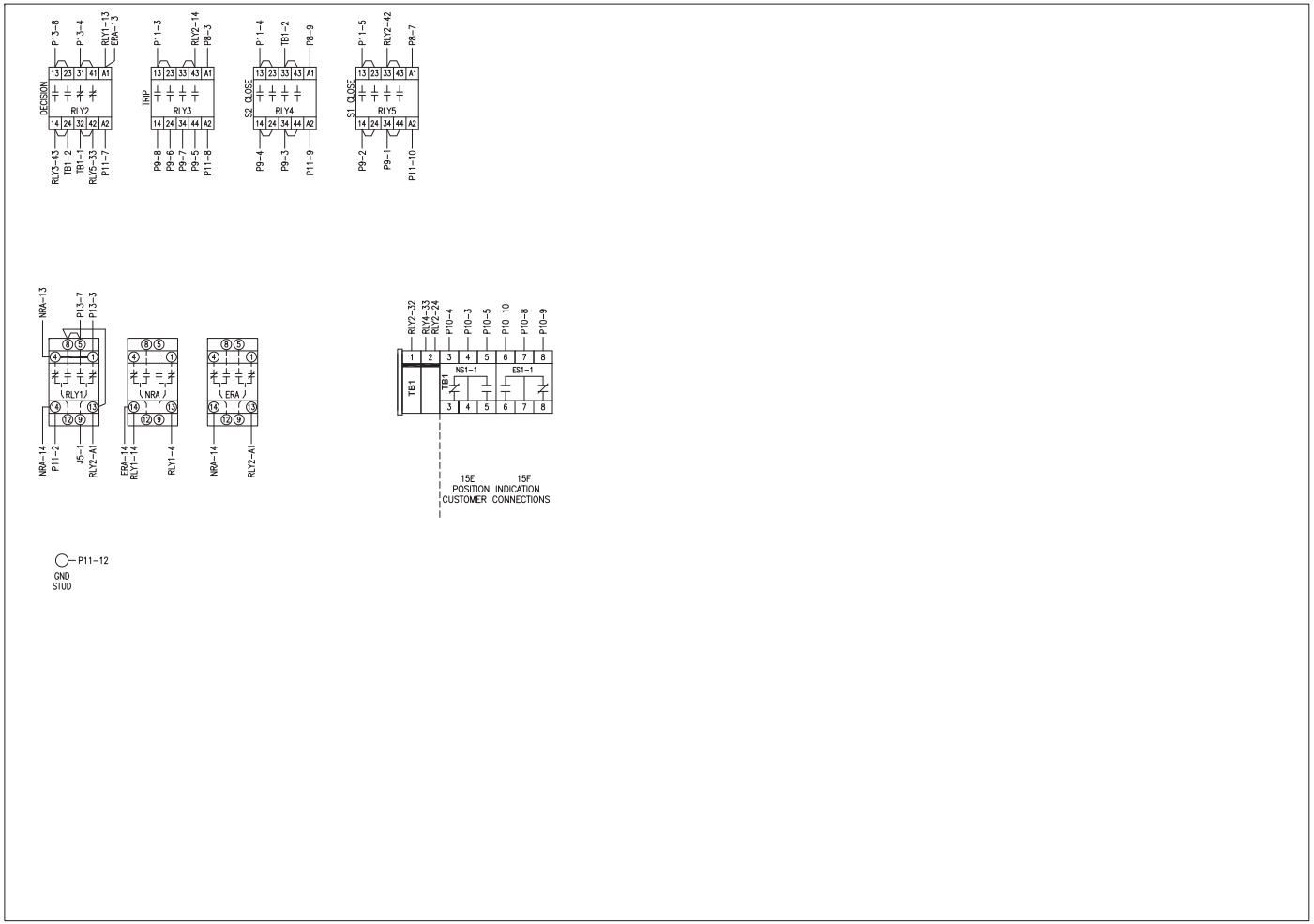

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	DESIGNATION		CAGE CODE 88725	REVISION 1		G.O. –	DWG W2	SHEET 5 OF 6

COEFtBL_R7

HINGE SIDE

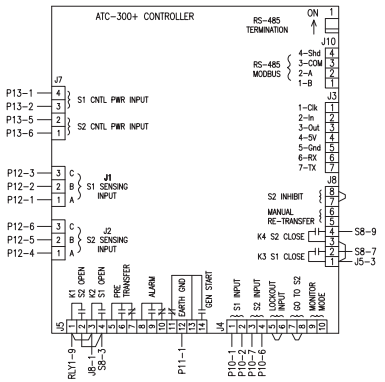
ENCLOSURE DOOR (REAR VIEW)

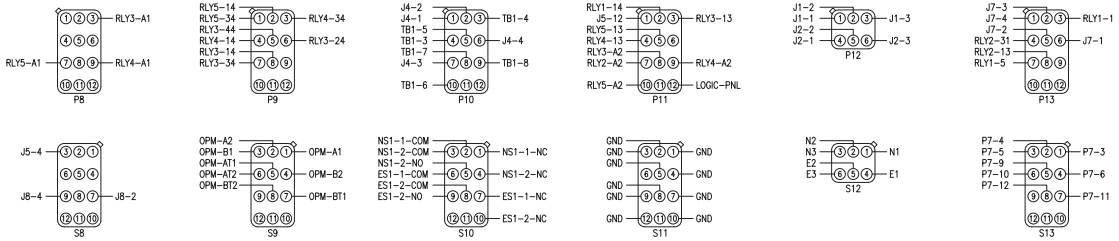
FIG 1

RELAY PANEL SEE –W002

**REFER TO ENCLOSURE DOOR REAR VIEW FOR DEVICE PLACEMENT

**FIG 1





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DFTR	Michael J Harper
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TYPE	ATC3C5X31200BSU
DIAGRAM	
G.O.	–
DWG	W3
SHEET	6 OF 6

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