

Cat® C32

Diesel Generator Sets



Image shown may not reflect actual configuration

Bore – mm (in)	145 (5.7)
Stroke – mm (in)	162 (6.4)
Displacement – L (in ³)	32.1 (1959)
Compression Ratio	15.0:1
Aspiration	TA
Fuel System	EUI
Governor Type	ADEM™ A4

Standby 60 Hz ekW (kVA)	Mission Critical 60 Hz ekW (kVA)	Prime 60 Hz ekW (kVA)	Continuous 60 Hz ekW (kVA)	Emissions Performance
1000 (1250)	1000 (1250)	910 (1137)	830 (1038)	U.S. EPA Certified for Emergency Stationary Applications (Tier 2)

Standard Features

Cat® Diesel Engine

- Designed and tested to meet the U.S. EPA Emergency Stationary (Tier 2) emissions
- Reliable and consistent performance proven in thousands of applications worldwide

Generator Set Package

- Accepts 100% block load in one step and meets NFPA 110 loading requirements
- Conforms to ISO 8528-5 G3 load acceptance requirements.
- Reliability is verified through prototype testing, which includes torsional vibration, fuel consumption, oil consumption, transient performance, and endurance testing

Alternators

- Superior motor starting capability minimizes the need for oversizing the generator
- Designed to match the performance and output characteristics of Cat diesel engines

Cooling System

- Cooling systems available to operate in ambient temperatures up to 50°C (122°F)
- Tested to ensure proper generator set cooling

EMCP 4 Control Panels

- User-friendly interface and navigation
- Scalable system to meet a wide range of installation requirements
- Expansion modules and site specific programming for specific customer requirements

Warranty

- 24 months/1000-hour warranty for standby and mission critical ratings
- 12 months/unlimited hour warranty for prime and continuous ratings
- Extended service protection is available to provide extended coverage options

Worldwide Product Support

- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

Financing

- Caterpillar offers an array of financial products to help you succeed through financial service excellence
- Options include loans, finance lease, operating lease, working capital, and revolving line of credit
- Contact your local Cat dealer for availability in your region

Optional Equipment

Engine

Air Cleaner

- Single element
- Dual element
- Heavy duty

Muffler

- Industrial grade (15 dB)

Starting

- Standard batteries
- Oversized batteries
- Standard electric starter
- Dual electric starter
- Jacket water heater

Alternator

Output voltage

- 220V
- 480V
- 240V
- 600V
- 380V
- 2400V
- 400V
- 4160V

Temperature Rise (over 40°C ambient)

- 150°C
- 125°C/130°C
- 105°C
- 80°C

Winding type

- Random wound
- Form wound

Excitation

- Self excited
- Internal excitation (IE)
- Permanent magnet (PM)

Attachments

- Anti-condensation heater
- Stator and bearing temperature monitoring and protection

Power Termination

Type

- Bus bar
- Circuit breaker
- 400A
- 800A
- 1200A
- 1600A
- 2000A
- 2500A
- 3000A
- 3200A
- UL
- IEC
- 3-pole
- 4-pole
- Manually operated
- Electrically operated

Trip Unit

- LSI
- LSI-G
- LSI-G-P

Factory Enclosure

- Weather protective
- Sound attenuated

Attachments

- Cold weather bundle
- DC lighting package
- AC lighting package
- Motorized louvers

Fuel Tank

- Sub-base
- 1000 gal (3875 L)
- 2000 gal (7570 L)
- 3600 gal (13627 L)

Control System

Controller

- EMCP 4.2B
- EMCP 4.3
- EMCP 4.4

Attachments

- Local annunciator module
- Remote annunciator module
- Expansion I/O module
- Remote monitoring software

Charging

- Battery charger – 10A

Vibration Isolators

- Rubber
- Spring
- Seismic rated

Cat Connect

Connectivity

- Ethernet
- Cellular
- Satellite

Extended Service Options

Terms

- 2 year (prime)
- 3 year
- 5 year
- 10 year

Coverage

- Silver
- Gold
- Platinum
- Platinum Plus

Ancillary Equipment

- Automatic transfer switch (ATS)
- Uninterruptible power supply (UPS)
- Paralleling switchgear
- Paralleling controls

Certifications

- UL 2200 Listed
- CSA
- IBC seismic certification
- OSHPD pre-approval

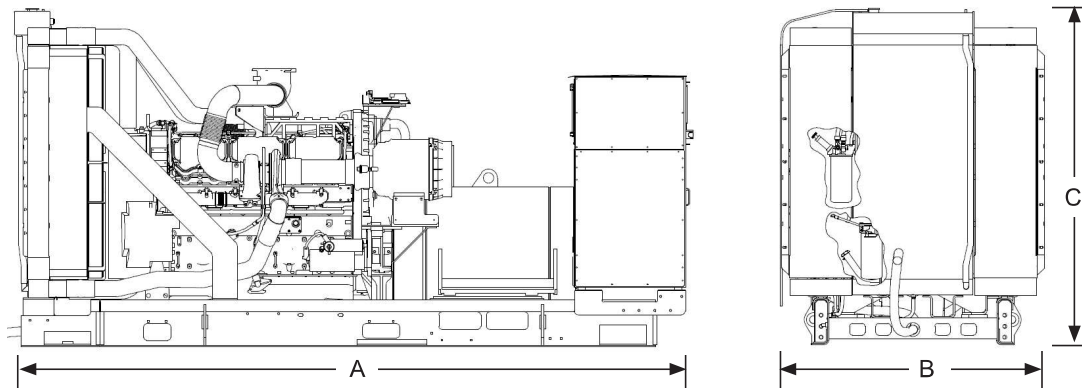
Note: Some options may not be available on all models. Certifications may not be available with all model configurations. Consult factory for availability.

Package Performance

Performance	Standby	Mission Critical	Prime	Continuous
Frequency	60 Hz	60 Hz	60 Hz	60 Hz
Gen set power rating with fan	1000 ekW	1000 ekW	910 ekW	830 ekW
Gen set power rating with fan @ 0.8 power factor	1250 kVA	1250 kVA	1138 kVA	1038 kVA
Fueling strategy	EPA ESE (Tier 2)	EPA ESE (Tier 2)	EPA ESE (Tier 2)	EPA ESE (Tier 2)
Performance number	DM9933-03	EM0449-00	DM9934-04	DM9935-03
Fuel Consumption				
100% load with fan – L/hr (gal/hr)	272.1 (71.9)	272.1 (71.9)	248.6 (65.7)	232.1 (61.3)
75% load with fan – L/hr (gal/hr)	213.4 (56.4)	213.4 (56.4)	197.0 (52.0)	176.5 (46.6)
50% load with fan – L/hr (gal/hr)	144.7 (38.2)	144.7 (38.2)	134.2 (35.5)	122.9 (32.5)
25% load with fan – L/hr (gal/hr)	82.6 (21.8)	82.6 (21.8)	78.5 (20.7)	73.4 (19.4)
Cooling System				
Radiator air flow restriction (system) – kPa (in. water)	0.12 (0.48)	0.12 (0.48)	0.12 (0.48)	0.12 (0.48)
Radiator air flow – m ³ /min (cfm)	1175 (41494)	1175 (41494)	1175 (41494)	1175 (41494)
Engine coolant capacity – L (gal)	55.0 (14.5)	55.0 (14.5)	55.0 (14.5)	55.0 (14.5)
Radiator coolant capacity – L (gal)	36.0 (9.0)	36.0 (9.0)	36.0 (9.0)	36.0 (9.0)
Total coolant capacity – L (gal)	91.0 (23.5)	91.0 (23.5)	91.0 (23.5)	91.0 (23.5)
Inlet Air				
Combustion air inlet flow rate – m ³ /min (cfm)	87.6 (3094.1)	87.6 (3094.1)	83.7 (2954.5)	80.0 (2825.6)
Exhaust System				
Exhaust stack gas temperature – °C (°F)	476.4 (889.5)	476.4 (889.5)	459.5 (859.1)	461.2 (862.1)
Exhaust gas flow rate – m ³ /min (cfm)	228.4 (8065.3)	228.4 (8065.3)	212.1 (7488.7)	204.8 (7231.2)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	6.7 (27.0)	6.7 (27.0)	6.7 (27.0)	6.7 (27.0)
Heat Rejection				
Heat rejection to jacket water – kW (Btu/min)	352 (20033)	352 (20033)	327 (18624)	307 (17468)
Heat rejection to exhaust (total) – kW (Btu/min)	1024 (58206)	1024 (58206)	933 (53072)	896 (50940)
Heat rejection to aftercooler – kW (Btu/min)	288 (16385)	288 (16385)	255 (14526)	230 (13082)
Heat rejection to atmosphere from engine – kW (Btu/min)	127 (7238)	127 (7238)	116 (6625)	114 (6486)
Heat rejection from alternator – kW (Btu/min)	55 (3131)	55 (3131)	50 (2846)	45 (2561)
Emissions* (Nominal)				
NOx mg/Nm ³ (g/hp-h)	2348.6 (4.93)	2348.6 (4.93)	2293.5 (4.81)	1969.0 (4.23)
CO mg/Nm ³ (g/hp-h)	62.1 (0.13)	62.1 (0.13)	59.2 (0.12)	52.5 (0.11)
HC mg/Nm ³ (g/hp-h)	5.5 (0.01)	5.5 (0.01)	7.0 (0.02)	12.7 (0.03)
PM mg/Nm ³ (g/hp-h)	7.2 (0.02)	7.2 (0.02)	6.6 (0.02)	7.1 (0.02)
Emissions* (Potential Site Variation)				
NOx mg/Nm ³ (g/hp-h)	2841.6 (5.97)	2841.6 (5.97)	2775.2 (5.83)	2382.5 (5.11)
CO mg/Nm ³ (g/hp-h)	116.1 (0.24)	116.1 (0.24)	110.6 (0.23)	98.1 (0.21)
HC mg/Nm ³ (g/hp-h)	10.3 (0.03)	10.3 (0.03)	13.2 (0.03)	24.1 (0.06)
PM mg/Nm ³ (g/hp-h)	14.1 (0.04)	14.1 (0.04)	12.9 (0.03)	13.9 (0.04)

*mg/Nm³ levels are corrected to 5% O₂. Contact your local Cat dealer for further information.

Weights and Dimensions



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
4165 (164.0)	1684 (66.3)	2162 (85.1)	6668 (14,700)

Note: For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.

Ratings Definitions

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.

Mission Critical

Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical power rating. Typical peak demand up to 100% of rated power for up to 5% of the operating time. 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 kW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Continuous

Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous power rating. Typical peak demand is 100% of continuous rated kW for 100% of the operating hours.

Applicable Codes and Standards

AS 1359, CSA C22.2 No. 100-04, UL 142, UL 489, UL 869, UL 2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC, IEC 60034-1, ISO 3046, ISO 8528, NEMA MG1-22, NEMA MG1-33, 2014/35/EU, 2006/42/EC, 2014/30/EU.

Note: Codes may not be available in all model configurations. Please consult your local Cat dealer for availability.

Data Center Applications

- ISO 8528-1 Data Center Power (DCP) compliant per DCP application of Cat diesel generator set prime power rating.
- All ratings Tier III/Tier IV compliant per Uptime Institute requirements.
- All ratings ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centers.

Fuel Rates

Fuel rates are based on fuel oil of 35° API [16°C (60°F)] gravity having an LHV of 42,780 kJ/kg (18,390 Btu/lb) when used at 29°C (85°F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.)

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Materials and specifications are subject to change without notice.
 The International System of Units (SI) is used in this publication.

ATTACHMENTS



ULCERT UL 2200 LISTING

INCLUDES THE FOLLOWING:

ALTERNATOR

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

WIRE HARNESS

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

CONTROL PANEL

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

CIRCUIT BREAKER

Output circuit breaker is 100% rated and UL Listed.

TESTING

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

LABELING

Labeling meets UL requirements.

MECHANICAL OPTIONS

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

FUEL TANKS

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

ENCLOSURES

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

ELECTRICAL OPTIONS

The table below shows electrical options that meet UL requirements:

EBH	Battery Heater
EOS	Lube Oil Sump Heater
WCA1	Low Coolant Level Shutdown
WSS1	Low Coolant Temperature Alarm
AH1H	Anti-Condensation Heater
WHH	Coolant Heater
GOVE5	Electronic Governor (Fully Adjustable)
FSS1	Critical Low Fuel Level Shutdown
FSS2	Low Fuel Level Alarm
FSS5	Critical High Fuel Alarm
PBC5UL	UL Listed Battery Charger
PBC10NU	NFPA Battery Charger, UL Listed

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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

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.

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.

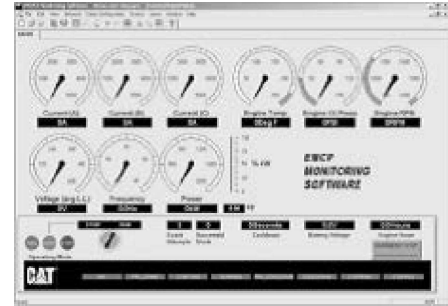
RS-485 annunciator



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.

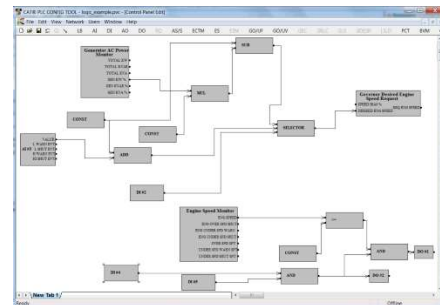
The remote monitoring software allows the user to configure data monitoring and data acquisition processes for monitoring, graphing, and logging of generator set data.

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.

Optional Modules (Continued)

Digital input/output module



The Digital Input/Output (DI/O) module serves to provide expandable Input and Output event capability of the EMCP 4 and is capable of reading 12 digital inputs and setting 8 relay outputs.

The DI/O module 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.

RTD module

The RTD module serves to provide expandable generator temperature monitoring capability of the EMCP 4 and is capable of reading up to eight type 2-wire, 3-wire and 4-wire RTD inputs.

The RTD Module 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 one RTD Module may be used with a single EMCP 4.

Thermocouple module

The thermocouple module serves to provide expandable engine and generator temperature monitoring capability of the EMCP 4 and is capable of reading up to twenty Type J or K thermocouple inputs.

The thermocouple module has been designed for use on the primary communication network for engine information and the accessory communication network for generator information. It may be used in either local (package mounted) or remote (up to 800 feet) application. A maximum of one thermocouple modules may be used with a single EMCP 4 on each datalink.

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CIRCUIT DESCRIPTION TABLE Model: 390189JDDM

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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 FURTHER REMOTE ANNUNCIATOR OR REMOTE I/O MODULE TO EXTEND ACCESSORY DATA LINK TO ADD REMOTE ANNUNCIATORS AND REMOTE I/O MODULES.

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

NOTE D: TERMINAL BLOCK RAIL IS FWH 250 A. TO 800 A CIRCUIT BREAKERS AND IS LOCATED EXTERNAL TO THE CIRCUIT BREAKER. 200 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: MCP: E1TB / E1-CBT FOR GEN 1 E2TB / E2-CBT FOR GEN 2 GCP: E1TB; E-CBT. NOTE H: REQUIRES EMP42 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 (9X-959) IS REQUIRED. NOTE K: 'YU' COIL HAS TO BE POWERED FOR THE BREAKER TO OPERATE. REMOVING POWER TO 'YU' COIL WILL TRIP THE BREAKER.

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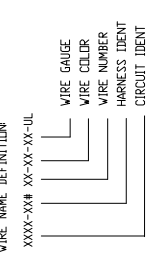
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NOTE D: TERMINAL BLOCK RAIL IS FWH 250 A. TO 800 A CIRCUIT BREAKERS AND IS LOCATED EXTERNAL TO THE CIRCUIT BREAKER. 200 A CIRCUIT BREAKER HAS TERMINALS LOCATED ON THE CIRCUIT BREAKER. SECOND BREAKER (250 A-800 A) USES THE SECOND SET OF AUX AND SHUNT HARNESS.

NOTE E: USE PIN 24 WITH SECOND CIRCUIT BREAKER. NOTE F: SUPPLY APPROPRIATE VOLTAGE AND SIZE THE WIRE AWG ACCORDINGLY. NOTE G: MCP: E1TB / E1-CBT FOR GEN 1 E2TB / E2-CBT FOR GEN 2 GCP: E1TB; E-CBT. NOTE H: REQUIRES EMP42 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 (9X-959) 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



WIRE NAME DEFINITION XXXX-XX# XX-XX-XX-UL



DIAGRAM-WIRING (EMCP42-EMCP42.B)