

Record

Submittal Package
for
Ventura County Fire Protection District

Equipment:

(1) New Caterpillar Model D100-6S Diesel Generator Set,
Standby Power Rated 100kW at 1800 RPM with Fan,
120/240 VAC, 1 Phase, 60Hz

(1) ASCO Series 3000 ATS. 400 Amp, 120/240 VAC
2 Pole, Solid Neutral, NEMA 1

Contractor:
Ventura County

Job# FE11509

Equipment Supplier:



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GENERATOR BILL OF MATERIAL

(1) New Caterpillar Model D100-6S Diesel Generator Set. Standby Rated 100kW, with fan, 60Hz, 120/240 volt, 1 phase, at 1800 RPM. UL Listing on generator package. Generator includes standard equipment and accessories listed in the attached bill of materials.

Engine

Heavy duty Caterpillar industrial diesel engine
Model C6.6, in-line, 6 cylinder, 6.6 liter

Governor

Electronic, isochronous

Electrical

12 VDC, energized to run shutdown solenoid
Lead acid battery
Battery rack & cable

Cooling

Radiator and cooling fan, 122 Deg F
Anti-freeze and corrosion inhibitor

Filtration

Dry air filters w/restriction indicator
Fuel filters
Full flow oil filters

Exhaust

Residential silencer, shipped loose on open units
Installed inside enclosure on enclosed units

Alternator

Drip proof self excited, brushless, 12 lead reconnectable
Class H insulation
Automatic, fully sealed, voltage regulator, +/- 1.5% regulation

Baseframe

Fabricated steel base
Lifting holes and anchor holes
Circuit breaker stub-up area

Coupling

Single bearing generator with flexible drive plate

Mounts

Anti-vibration mounting pads between engine and base frame

Guards

Fan, fan drive, alternator pulley and belt guards
Radiator stone guard
Exhaust manifold heat guard

Fuel System

Fuel supply and return lines (internal to enclosure between base and engine) terminated at base frame, with NPT threads.

Controls

Automatic start/stop control panel
AC voltmeter, ammeter, frequency, tachometer
Hour meter
Coolant temperature gauge
Oil pressure gauge
Battery voltmeter
Off/On/Auto switch

- Emergency stop button
- Phase selector switch
- Cycle crank timer
- Common fault alarm contacts

Shutdown

- Fail to start
- High coolant temperature
- Low oil pressure
- Over-speed

Wiring

- AC and DC wiring looms w/multi-pin connectors

Circuit Breaker

- UL listed, molded case circuit breaker mounted in NEMA 1 enclosure

Manuals

- (1) Set Operation & Maintenance, wiring diagrams, trouble shooting leaflets

Tests

- Factory load test, control and device checks

Finish

- Sheet metal is degreased, phosphated and chromated with polyester powder finish. Engine and alternator are cleaned and finished with a baked industrial high gloss polyurethane paint.

- Additional Optional Generator Set Equipment Included -

Enclosure

- Weather protective & sound attenuated enclosure (includes internal silencer system)
- Panel viewing window
- External emergency stop button

Generator

- Anti condensation heater
- Permanent magnet generator

Control System (Upgraded control panel EMCP 4.2 with options)

- Voltage adjustment potentiometer
- Speed adjust potentiometer
- Generator running relay
- Volt free contacts generator run
- Overload shutdown via breaker
- Panel mounted alarm
- 16 channel remote annunciator panel (supplied loose, installed by others)

Cooling System

- Coolant heater
- Low coolant temperature alarm
- Low coolant level shutdown

Fuel System

- No fuel tank provided (hook up by others labor and parts)

Battery Charger

- Battery charger, 3 Amp, UL listed

Miscellaneous Accessories

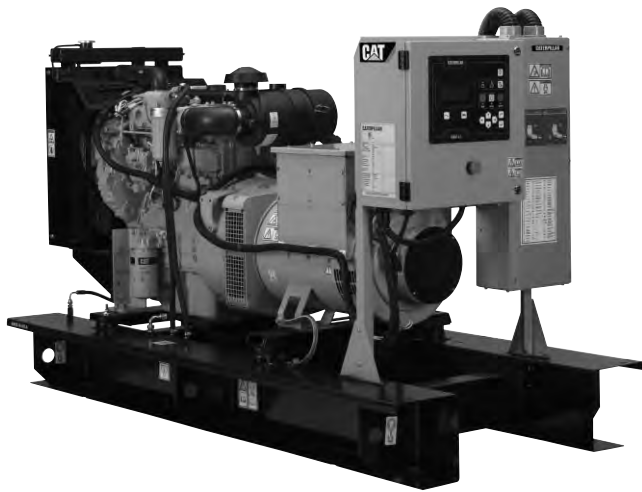
- UL2200 Certification
- NFPA 110 upgrade

Quinn Power Systems Services Include:

- Equipment prep & assembly
- Load bank test (2 hour)
- Freight allowed to job site
- Field start up inspection service

Items not included:

- Unloading, crane services, installation
- Building and/or air quality permits
- Exhaust treatment (if required)
- Additional fuel alarms and shut downs
- Fuel fill spill bucket
- Fuel venting (if required)
- Additional fuel containment (if required)



STANDBY 80-100 kW
PRIME 72-90 kW
60 Hz

Model	Standby kW (kVA)	Prime kW (kVA)
D80-6	80 (100)	72 (90)
D80-2S	80 (80)	72 (72)
D100-6	100 (125)	90 (112.5)
D100-6S	100 (100)	90 (90)

Tier 3 EPA Approved, Emissions Certified

FEATURES

GENERATOR SET

- Complete system designed and built at ISO 9001 certified facilities
- Factory tested to design specifications at full load conditions

ENGINE

- Governor, electronic
- Electrical system, 12 VDC
- Cartridge type filters
- Battery rack and cables
- Coolant and lube drains piped to edge of base

GENERATOR

- Insulation system, class H
- Drip proof generator air intake (NEMA 2, IP23)
- Electrical design in accordance with BS5000 Part 99, EN61000-6, IEC60034-1, NEMA MG-1.33

CONTROL SYSTEM

- EMCP 4.2 digital control panel
- Vibration isolated NEMA 1 enclosure with lockable hinged door
- DC and AC wiring harnesses

MOUNTING ARRANGEMENT

- Heavy-duty fabricated steel base with lifting points
- Anti-vibration pads to ensure vibration isolation
- Complete OSHA guarding
- Stub-up pipe ready for connection to silencer pipework
- Flexible fuel lines to base with NPT connections

COOLING SYSTEM

- Radiator and cooling fan complete with protective guards
- Standard ambient temperatures up to 50° C (122° F)

CIRCUIT BREAKER

- UL/CSA listed
- 3-pole with solid neutral
- NEMA 1 steel enclosure, vibration isolated
- Electrical stub-up area directly below circuit breaker

AUTOMATIC VOLTAGE REGULATOR

- Voltage within ± 0.5% 3-phase and ± 1.0% single phase at steady state from no load to full load
- Provides fast recovery from transient load changes

EQUIPMENT FINISH

- All electroplated hardware
- Anticorrosive paint protection
- High gloss polyurethane paint for durability and scuff resistance

QUALITY STANDARDS

- BS4999, BS5000, BS5514, EN61000-6, IEC60034, NEMA MG-1.33, NFPA 110 (with optional equipment)

DOCUMENTATION

- Operation and maintenance manuals provided
- Wiring diagrams included

WARRANTY

- All equipment carries full manufacturer's warranty.

OPTIONAL EQUIPMENT*

ENCLOSURE

- B Series weather protective enclosure (includes internal silencer system)
 - Single point lift
 - Panel viewing window
 - External emergency stop pushbutton
- • Sound attenuated enclosure (includes internal silencer system)

SILENCER SYSTEM – OPEN UNIT

- Level 1 silencer
- Level 2 silencer
- Level 3 silencer
- Mounting kit
- Through-wall installation kits

ENGINE

- Battery heater
- Lube oil drain pump
- High lube oil temperature shutdown
- Lube oil sump heater

CIRCUIT BREAKER

- • Auxiliary voltfree contacts
- • Shunt trip (100+ amp breakers)

GENERATOR

- • Anti-condensation heater
- • Permanent magnet generator
- AREP excitation system (3-Phase only)
- Generator upgrade 1 size (3-Phase only)

CONTROL SYSTEM

- ~~No control system~~
- ~~EMCP 3.2 digital control panel~~
- • **EMCP 4.2 Digital Control Panel**

MOUNTING ACCESSORIES

- Seismic (Zone 4) vibration isolators

FUEL SYSTEM

- UL listed closed top-diked skid-mounted fuel tank base (12/24-hour capacity) with fuel alarm (low level/leak detected)
- Critical high fuel alarm
- Critical low fuel level shutdown

COOLING SYSTEM

- • Coolant heater
- • Low coolant temperature alarm
- • Low coolant level shutdown
- Radiator transition flange

REMOTE ANNUNCIATORS

- • 16-channel remote annunciator panel (supplied loose)

MISCELLANEOUS ACCESSORIES

- Toolkit
- Additional operator's manual pack
- Special enclosure color
- • UL listing
- CSA certification
- French or Spanish language labels

EXTENDED SERVICE CONTRACTS

- Extended Service Coverage available

TESTING

- Factory test and report at both 1.0 pf and 0.8 pf

* Some options may not be available on all models. Not all options are listed.

STANDBY **80-100 kW**
PRIME **72-90 kW**
60 Hz



GENERATOR SET DIMENSIONS AND WEIGHTS

SEE MECHANICAL INSTALLATION DRAWING FOR PROJECT SPECIFIC WEIGHT AND DIMENSION INFORMATION.

**SPECIFICATIONS
GENERATOR**

Voltage regulation ± 0.5% 3-phase and ± 1.0% single phase at steady state from no load to full load

Frequency ± 0.25% for constant load, no load to full load

Waveform distortion THD < 4%, at no load

Radio interference Compliance with EN61000-6

Telephone interference TIF < 50, THF < 2%

Overspeed limit 2250 rpm

Insulation Class H

Temperature rise Within Class H limits

Available voltages 1-phase – 120/240, 115/230, 110/220
3-phase – 277/480, 266/460, 120/240, 127/220, 120/208, 347/600

Deration Consult factory for available outputs

Ratings At 30° C (86° F), 152.4 m (500 ft), 60% humidity, 1.0 pf (1-phase), 0.8 pf (3-phase)

ENGINE

Manufacturer Caterpillar

Type 4-cycle

Bore – mm (in) 105.0 (4.13)

Stroke – mm (in) 127.0 (5.00)

Governor Type Electronic

Class G2

Piston speed – m/sec (ft/sec) 7.62 (25.0)

Engine speed – rpm 1800

Air cleaner type Dry, replaceable paper element type with restriction indicator

~~**D80-6, D80-2S – C4.4**~~

~~Aspiration Turbocharged~~

~~Cylinder configuration In-line 4~~

~~Displacement – L (cu in) 4.4 (269)~~

~~Compression ratio 19.2:1~~

~~Max power at rated rpm – kW (hp)~~

~~Standby 97 (130)~~

~~Prime 88 (118)~~

~~BMEP – kPa (psi)~~

~~Standby 1476 (213)~~

~~Prime 1335 (194)~~

~~Regenerative power – kW (hp) 13.8 (18.5)~~

D100-6, D100-6S – C4.4

Aspiration Turbocharged

Cylinder configuration In-line 4

Displacement – L (cu in) 4.4 (269)

Compression ratio 19.2:1

Max power at rated rpm – kW (hp)

Standby 117 (156.9)

Prime 106 (142.1)

BMEP – kPa (psi)

Standby 1612 (233)

Prime 1771 (257)

Regenerative power – kW (hp) 13.8 (18.5)

CONTROL PANEL

- Heavy duty sheet steel enclosure with lockable hinged door
- Vibration isolated from generating set
- LCD display
- AC metering
- DC metering
- Fail to start shutdown
- Low oil pressure shutdown
- High engine temperature
- Low/high battery voltage
- Underspeed/overspeed
- Loss of engine speed detection
- 2 spare fault channels
- 20 event fault log
- 2 LED status indicators
- Lockdown emergency stop push button

RATING DEFINITIONS AND CONDITIONS

Standby – Applicable for supplying continuous electrical power (at variable load) in the event of a utility power failure. No overload is permitted on these ratings. The generator is peak rated (as defined in ISO8528-3).

Prime – Applicable for supplying continuous electrical power (at variable load) in lieu of commercially purchased power. There is no limitation to the annual hours of operation and the generator set can supply 10 percent overload power for 1 hour in 12 hours.

D100-6S (1-Phase)

Materials and specifications are subject to change without notice.

Generator Set Technical Data – 1800 rpm/60 Hz			Standby		Prime	
Power Rating (at 240V)	kW	kVA	100	100	90	90
Lubricating System Type: full pressure Oil filter: spin-on, full flow Oil cooler: watercooled Oil type required: API CH4 Total oil capacity Oil pan	L	U.S. gal	8	2.1	8	2.1
	L	U.S. gal	7	1.9	7	1.9
Fuel System Generator set fuel consumption	L/hr	gal/hr	29.7	7.8	27.3	7.2
100% load	L/hr	gal/hr	23.7	6.3	21.9	5.8
75% load	L/hr	gal/hr	17.6	4.6	16.3	3
50% load						
Engine Electrical System Voltage/ground: 12/negative Battery charging generator ampere rating	amps		65		65	
Cooling System Water pump type: centrifugal Radiator system capacity incl. engine Maximum coolant static head Coolant flow rate Minimum temperature to engine Temperature rise across engine Heat rejected to coolant at rated power Total heat radiated to room at rated power Radiator fan load	L	U.S. gal	17.0	4.5	17.0	4.5
	m H ₂ O	ft H ₂ O	10.2	33.5	10.2	33.5
	L/hr	U.S. gal/hr	10 140	2,679	10 140	2,679
	°C	°F	70	158	70	158
	°C	°F	7	44.6	7	44.6
	kW	Btu/min	61.0	3,472	57.0	3,244
	kW	Btu/min	18.0	1,025	15.0	854
	kW	hp	4.8	6.4	4.8	6.4
Air Requirements Combustion air flow Maximum air cleaner restriction Radiator cooling air (zero restriction) Generator cooling air Allowable air flow restriction (after radiator) Cooling airflow (@ rated speed) Rate with restriction	m ³ /min	cfm	8.4	297	8.5	300
	kPa	in H ₂ O	8	32	8	32
	m ³ /min	cfm	230	8,135	230	8,135
	m ³ /min	cfm	26.4	933	26.4	933
	kPa	in H ₂ O	0.120	0.48	0.120	0.48
	m ³ /min	cfm	192	6,780	192	6,780
Exhaust System Maximum allowable backpressure Exhaust flow at rated kW Exhaust temperature at rated kW – Dry exhaust	kPa	in/mercury	15	4.4	15	4.4
	m ³ /min	cfm	22.5	794	20.0	705
	°C	°F	580	1,076	540	1,004
Generator Set Noise Rating* (without attenuation) at 1 m (3 ft)	dB(A)		98		97	

Generator Technical Data		120/240V	115/230V	110/220V
Motor Starting Capability: (kVA) (30% voltage dip)	Self excited	187	175	162
	PM excited**	187	175	162
Full Load Efficiencies:	Standby	90.5	90.0	89.4
	Prime	90.9	90.4	89.4
Reactances (per unit): Reactances shown are applicable to the standby rating.	X _d	2.67	2.91	3.18
	X' _d	0.21	0.23	0.25
	X'' _d	0.127	0.138	0.151
	X _q	1.60	1.74	1.90
	X'' _q	0.151	0.164	0.180
Time Constants:	t' _d	t'' _d	t' _{do}	t _a
	165 ms	13 ms	2734 ms	20 ms

* dB(A) levels are for guidance only
 ** With PMG Excited Option AVR12



Shown with
Optional
Equipment

CAE – SOUND ATTENUATED WEATHERPROOF ENCLOSURES

D25-8 to D100-6

D25-8S to D100-6S

These fully weatherproof, sound attenuated, factory installed, enclosures incorporate internally mounted exhaust silencers that reduce engine noise by -25 dBA and fabricated steel skidbase. Optional UL listed tanks are available. These enclosures are of extremely rugged construction to withstand outdoor exposure and rough handling common on many construction sites. They are designed on modular principles with many interchangeable components permitting on-site repair.

FEATURES

HIGHLY CORROSION RESISTANT CONSTRUCTION

- Stainless steel flush fitting latches and hinges tested and proven to withstand extreme conditions of corrosion
- Zinc plated or stainless steel fasteners
- Body made from steel components treated with polyester powder coating

EXCELLENT ACCESS

- Full length extra wide doors on each side
- Doors top hung and supported by gas struts
- Radiator fill access
- Lube oil and cooling water drains piped to exterior of the enclosure skidbase

SECURITY AND SAFETY

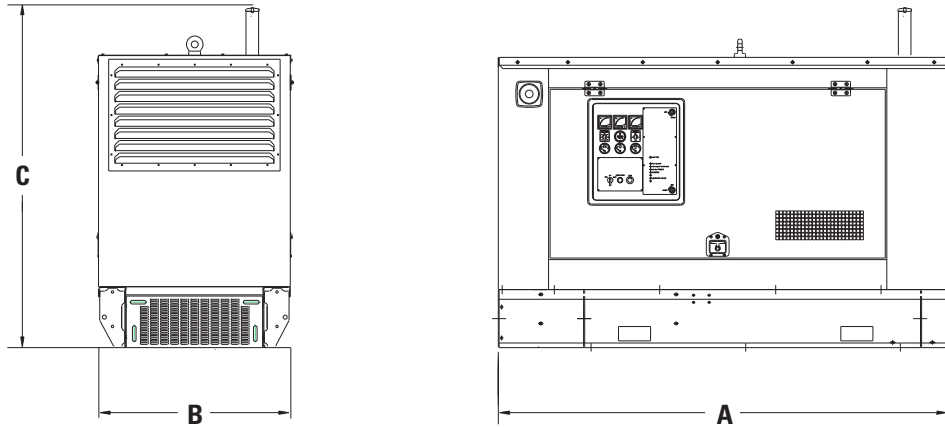
- Lockable access doors
- Stub-up cover sheets for “rodent proofing”
- Cooling fan and battery charging alternator fully guarded
- Fuel fill and battery can only be reached via lockable access doors (only provided when optional fuel tank is ordered)
- Exhaust silencing system totally enclosed for operator safety

TRANSPORTABILITY

- Lifting points on baseframe
- Tested and certified single point lifting facility

OPTIONS

- Control panel viewing window
- Emergency stop push button (red) mounted flush on exterior enclosure wall
- Seismic certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007
- IBC certifiable for 90 mph wind loading
- Special Seismic Certification OSHPD Pre-Approval OSP-0084-10



FSK SKIDBASE WITH SOUND ATTENUATED ENCLOSURE DIMENSIONS AND WEIGHTS

Generator Set Model	Length A mm (in)	Width B mm (in)	Height C mm (in)	Weight* kg (lb)
D25-8	2100 (82.7)	970 (38.2)	1565 (61.6)	864 (1,904.8)
D25-8S	2100 (82.7)	970 (38.2)	1565 (61.6)	864 (1,904.8)
D30-10	2100 (82.7)	970 (38.2)	1565 (61.6)	874 (1,926.8)
D30-8S	2100 (82.7)	970 (38.2)	1565 (61.6)	874 (1,926.8)
D40-6	2275 (89.6)	1100 (43.3)	1614 (63.5)	1150 (2,535.3)
D40-6S	2275 (89.6)	1100 (43.3)	1614 (63.5)	1150 (2,535.3)
D50-6	2275 (89.6)	1100 (43.3)	1614 (63.5)	1150 (2,535.3)
D50-6S	2275 (89.6)	1100 (43.3)	1614 (63.5)	1150 (2,535.3)
D60-6	2275 (89.6)	1100 (43.3)	1614 (63.5)	1150 (2,535.3)
D60-8S	2275 (89.6)	1100 (43.3)	1614 (63.5)	1150 (2,535.3)
D80-6	2804 (110.4)	1100 (43.3)	1635 (64.4)	1302 (2,870)
D80-2S	2804 (110.4)	1100 (43.3)	1635 (64.4)	1278 (2,818)
D100-6	2804 (110.4)	1100 (43.3)	1635 (64.4)	1349 (2,967)
D100-6S	2804 (110.4)	1100 (43.3)	1635 (64.4)	1410 (3,109)

*Net weight with lube oil and coolant, no fuel.

ENCLOSURE SOUND LEVELS

Generator Set Model	1800 rpm (60 Hz)					
	15 m (50 ft)		7 m (23 ft)		1 m (3 ft)	
	No Load (dBA)	Full Load (dBA)	No Load (dBA)	Full Load (dBA)	No Load (dBA)	Full Load (dBA)
D25-8	57.3	59.6	63.3	65.6	73.3	76.0
D25-8S	57.3	59.6	63.3	65.6	73.3	76.0
D30-10	57.4	57.7	63.4	63.7	74.0	74.6
D30-8S	57.4	57.7	63.4	63.7	74.0	74.6
D40-6	63.5	63.8	69.5	69.8	79.2	79.6
D40-6S	63.6	64.0	69.6	70.0	79.3	79.9
D50-6	63.8	64.2	69.8	70.2	79.5	80.2
D50-6S	63.9	64.3	69.9	70.3	79.7	80.5
D60-6	65.5	66.4	71.5	72.4	81.7	82.4
D60-8S	65.7	66.7	71.7	72.7	81.9	82.6
D80-6	65.3	67	71.3	73	82.7	83.4
D80-2S	65.3	67	71.3	73	82.7	83.4
D100-6	65.3	67.7	71.3	73.7	82.7	83.9
D100-6S	65.3	67.7	71.3	73.7	82.7	83.9

The sound pressure level data shown is quoted as free field and is for guidance only. Actual levels produced may vary according to site conditions.

Information contained in this publication may be considered confidential.

Discretion is recommended when distributing.

Materials and specifications are subject to change without notice.

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www.Cat-ElectricPower.com

Market: N. America

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Image shown may not reflect actual package

EMCP 4.2 GENERATOR SET CONTROLLER

Caterpillar is leading the power generation market place with power solutions engineered to deliver unmatched performance, reliability, durability and cost-effectiveness.

FEATURES

GENERAL DESCRIPTION

The Cat® EMCP 4.2 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 4.2.

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, 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 28 languages, including character languages such as Arabic, Chinese, and Japanese.
- Advanced engine monitoring is available on systems with an electronic engine control module.
- Integration with the Cat Digital Voltage Regulator (CDVR) 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.
- 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.
- Reduced power mode offers a low power state to minimize battery power requirements.
- Three levels of security allow for configurable operator privileges.
- Selectable units
 - Temperature: °C or °F
 - Pressure: psi, kPa, bar
 - Fuel Consumption: Gal/hr or Liter/hr

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

EMCP 4.2 GENERATOR SET CONTROLLER

STANDARD FEATURES

Generator Monitoring	<ul style="list-style-type: none"> • 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) • Generator stator and bearing temp (with optional module)
Generator Protection	<ul style="list-style-type: none"> • 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)
Engine Monitoring	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
Control	<ul style="list-style-type: none"> • Run / Auto / Stop control • Speed and voltage adjust • Local and remote emergency stop • Remote start/stop • Cycle crank
Inputs & Outputs	<ul style="list-style-type: none"> • Two dedicated digital inputs • Six programmable digital inputs • Six programmable form A dry contacts • Two programmable form C dry contacts • Two digital outputs
Communications	<ul style="list-style-type: none"> • Primary and accessory CAN data links • RS-485 annunciator data link • Modbus RTU (RS-485 Half duplex)
Language Support	<p>Arabic, Bulgarian, Chinese, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Icelandic, Italian, Latvian, Lithuanian, Japanese, Norwegian, Polish, Portuguese, Romanian, Russian, Slovak, Slovene, Spanish, Swedish, Turkish</p>
Environmental	<ul style="list-style-type: none"> • 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

EMCP 4.2 GENERATOR SET CONTROLLER

OPTIONAL MODULES

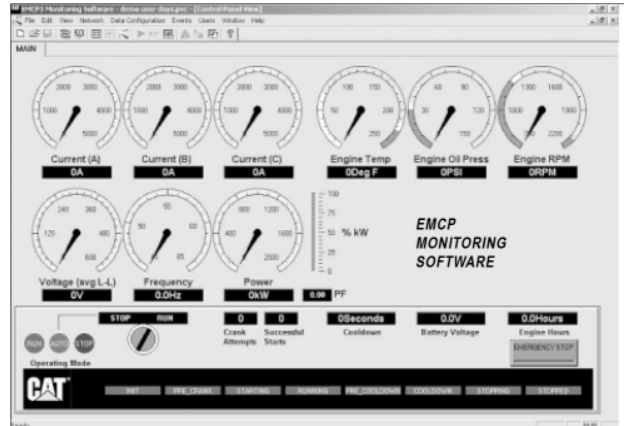


CAN ANNUNCIATOR

The EMCP 4 CAN Annunciator serves to display genset 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 three annunciators may be used with a single EMCP 4.2.

~~RS-485 ANNUNCIATOR~~

The EMCP 4 RS-485 Annunciator serves to display genset 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.



~~REMOTE MONITORING SOFTWARE~~

The EMCP 4 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 genset data.

EMCP 4.2 GENERATOR SET CONTROLLER

OPTIONAL MODULES



~~DIGITAL INPUT/OUTPUT MODULE~~

The Digital Input/Output (DI/O) module serves to provide expandable Input and Output 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. A maximum of four DI/O modules may be used with a single EMCP 4.2.

~~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 4.2.

~~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 accessory communication Network and 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 4.2 on each datalink.

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CIRCUIT BREAKERS



Diesel Single Phase (100% Rated)

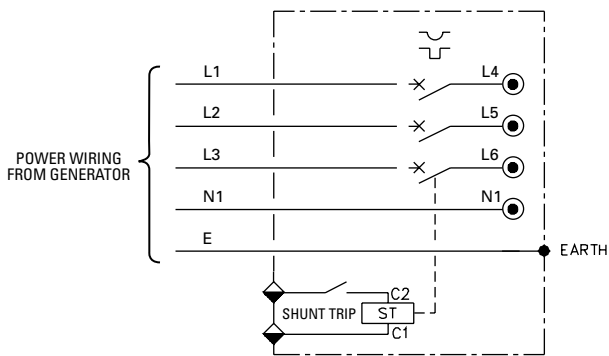
VOP622 (240/120V)

MODEL		Standard Alternator	Single Oversize Alternator
D13-4	PRIME	60	-
	STANDBY	60	-
D20-6	PRIME	100	-
	STANDBY	100	-
D25-8	PRIME	90	-
	STANDBY	90	-
D30-10	PRIME	100	-
	STANDBY	100	-
D40-6S	PRIME	150	150
	STANDBY	150	250
D50-6S	PRIME	150	250
	STANDBY	250	250
D60-6S	PRIME	250	250
	STANDBY	250	250
D80-2S	PRIME	250	400
	STANDBY	250	400
D100-6S	PRIME	400	400
	STANDBY	400	400

Values of breaker frame sizes shown in amps

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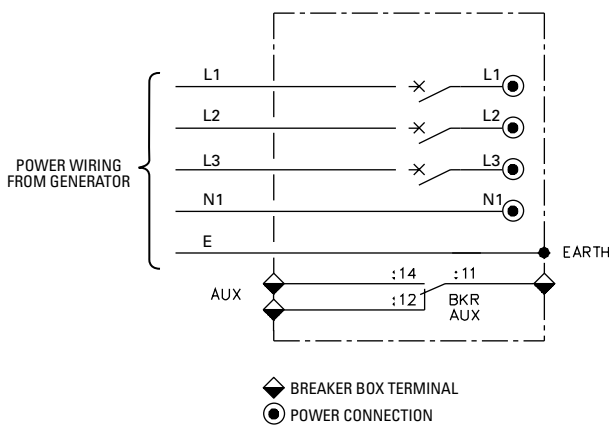
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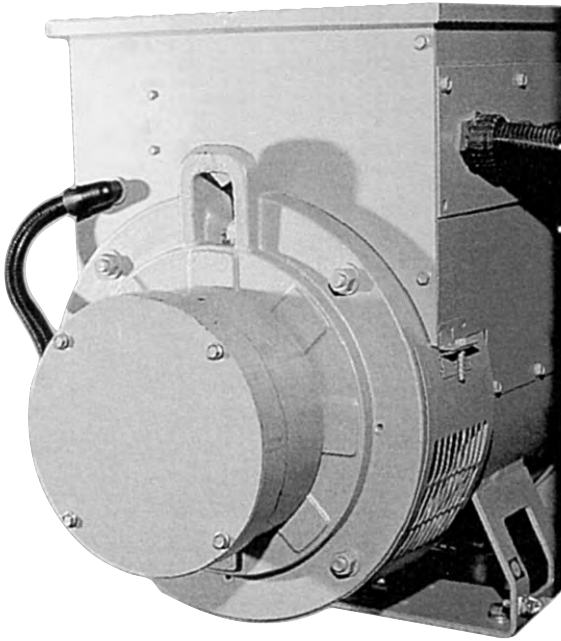
AUX - AUXILIARY CONTACTS SHT2 - 12/24 V SHUNT TRIP

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).

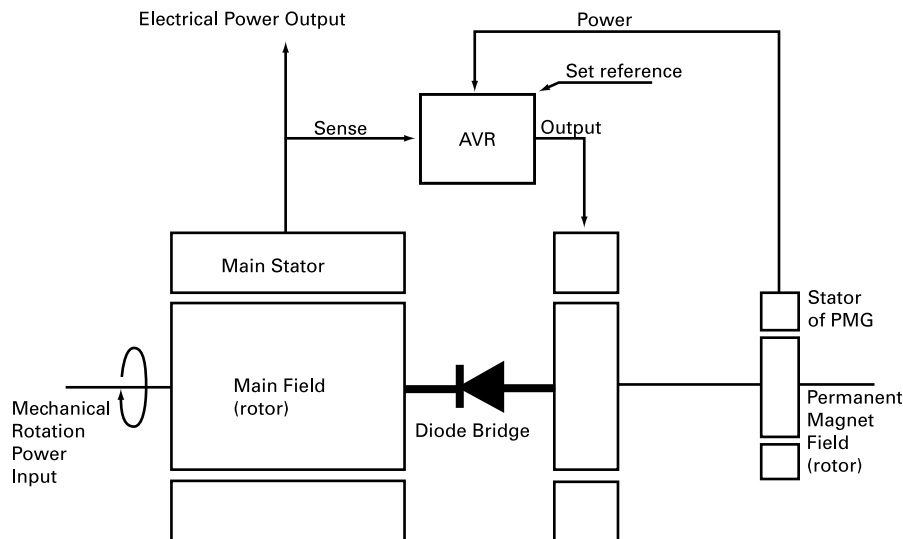
Option AUX adds an auxiliary changeover switch which can be used for remote indication of the circuit breaker status.



AVR12 – PERMANENT MAGNET GENERATOR

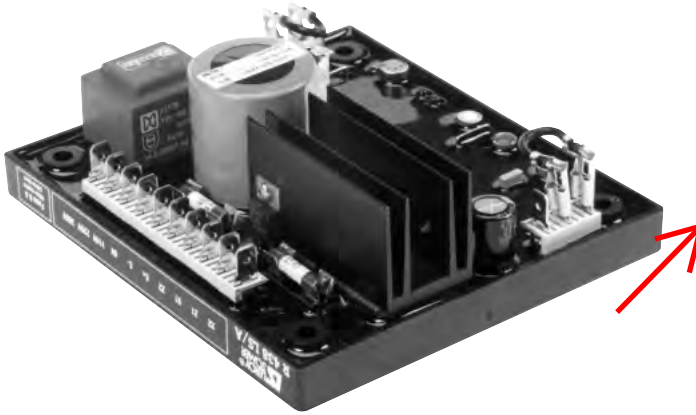


The permanent magnet generator (PMG) option upgrades the excitation system of the generator from the standard self-excited system to a separately-excited system. The PMG couples to the non-drive end of the generator and provides an independent source of excitation power that ensures initial voltage build-up.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



BLOCK DIAGRAM OF PMG

AUTOMATIC VOLTAGE REGULATOR – R438



The R438A Automatic Voltage Regulator (AVR) is an advanced electronic component that provides closed loop control of the generator output voltage. Used when the generator is configured with the AREP excitation system (Option **AVR14**) or the Permanent Magnet Generator (**PMG**) system (Option **AVR12**) on the following generators:

- 1000 Series Generators
- 2000 Series Generators
- 3000 Series Generators

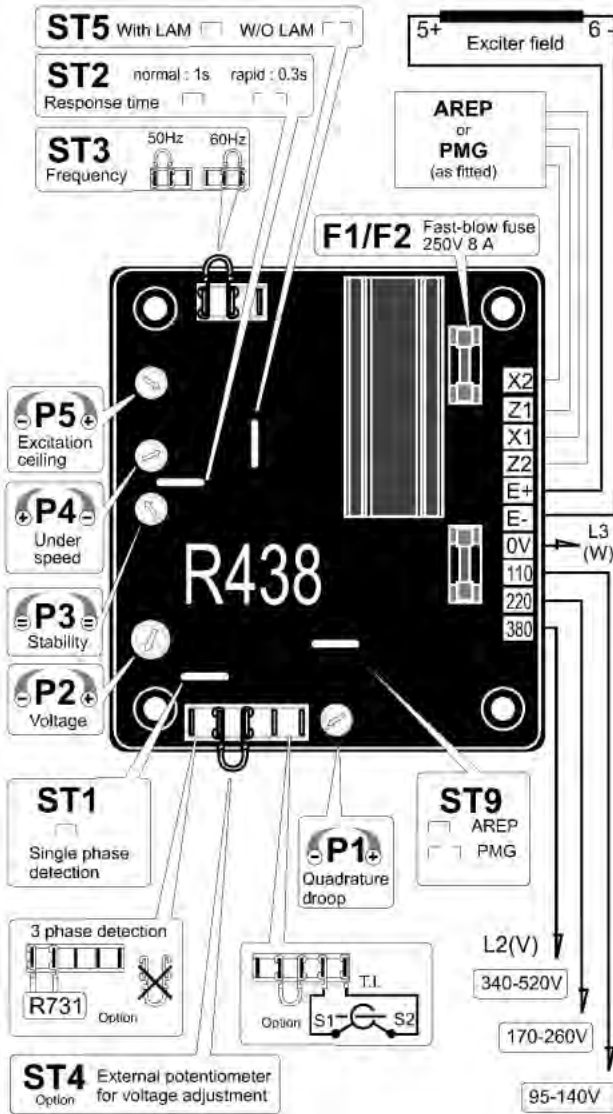
With the AREP excitation system the R438 AVR is powered by two auxiliary windings which are independent of the voltage detection circuit. With the PMG option the R438 AVR is powered by the PMG which is fitted at the rear of the generator.

SPECIFICATION:

- Voltage regulation $\pm 0.5\%$
- Short circuit capability: 300% of I-rated for 10 seconds when in AREP or PMG configuration
- Voltage sensing:
 - 95 to 140 volts (50/60 Hz) or
 - 170 to 260 volts (50/60 Hz) or
 - 340 to 520 volts (50/60 Hz)
- Response time:
 - Normal (1 sec) for $\pm 20\%$ voltage variation or
 - Rapid (0.3 sec) for $\pm 20\%$ voltage variation
- Capable of remote voltage adjustment: $\pm 5\%$

LOAD ADJUSTMENT MODULE (LAM):

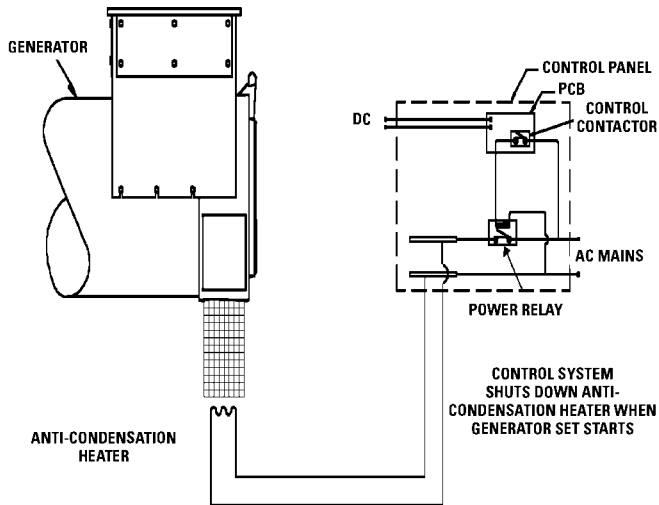
On load impact, the rotation speed of the generator set decreases. When it passes below the preset frequency threshold, the LAM is activated and causes the voltage to drop by approximately 15% and consequently the amount of active load applied is reduced by approximately 25% until the speed reaches it's rated value again.



ADJUSTMENT CAPABILITY:

- Potentiometer **P1** – Quadrature Droop Adjustment
- Potentiometer **P2** – Voltage Adjustment
- Potentiometer **P3** – Stability Adjustment
- Potentiometer **P4** – Underspeed/LAM Threshold Adjustment
- Potentiometer **P5** – Excitation ceiling
- Link **ST1** – Link IN for single phase voltage detection (standard)
- Link **ST2** – Link IN for Normal response time or CUT for Rapid response time
- Strap **ST3** – Strap between middle and left terminal for 50 Hz or between middle and right terminal for 60 Hz
- Strap **ST4** – Strap IN for no remote voltage adjustment or OUT and potentiometer (470Ω, 0.5W min., adjustment range ± 5%) connected to the terminals for remote voltage adjustment
- Link **ST5** – Link IN for LAM or CUT to disable LAM
- Link **ST9** – Link IN for AREP or CUT for PMG

GENERATOR ANTI-CONDENSATION HEATER AH1H



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

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

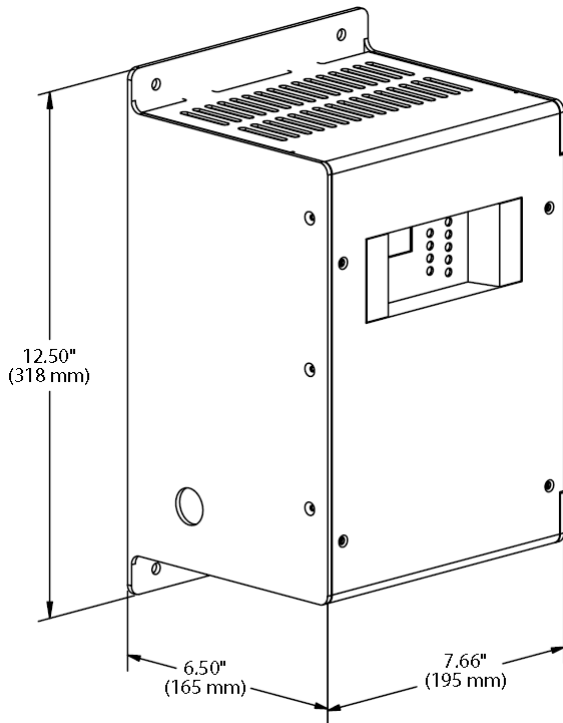


Image Shown may not Reflect Actual Package

UL 10 AMP BATTERY CHARGER

60 Hz only

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.

SPECIFICATION

Input Supply	→ 110-120 V 208-240 V
AC and DC Fuses	(2 input and 2 output)
Output voltage	12V
Frequency	60 Hz
Operating temperature	-20°C (-4°F) to +60°C (140°F)

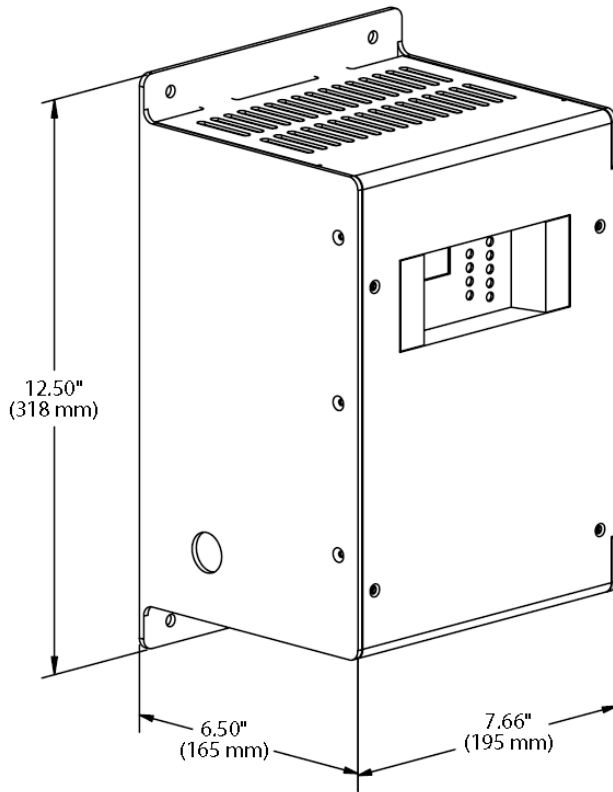
Housing constructed of rustproof anodized aluminum.

STANDARDS

- C-UL listed to UL 1236
- NFPA 70, NFPA 110
- CSA 22.2 No 107 certified
- UL 1564
- CE DOC to EN 60335
- IBC Seismic Certification

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
- AC isolated from DC
- Temperature Compensation
 - On board temperature sensor with remote port
- Auto AC line compensation
- Output regulated by sensed battery voltage



Output		Input	
Amps	Volts	Hz	Volts
10	12	60	110-120 208-240
Width	Depth	Height	Weight
195 mm (7.66")	165 mm (6.50")	318 mm (12.50")	10.4 kg (23 lb)
Feature code			
PBC10NU			

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 contact
- High Battery Volts Red led and Form C contact
- Charger fail Red led and Form C contact
- Battery fault Red led and Form C contact
 - Battery disconnected
 - Battery polarity reversed
 - Mismatched charger battery voltage
 - Open or high resistance charger to battery connection
 - Open battery cell or excessive internal resistance

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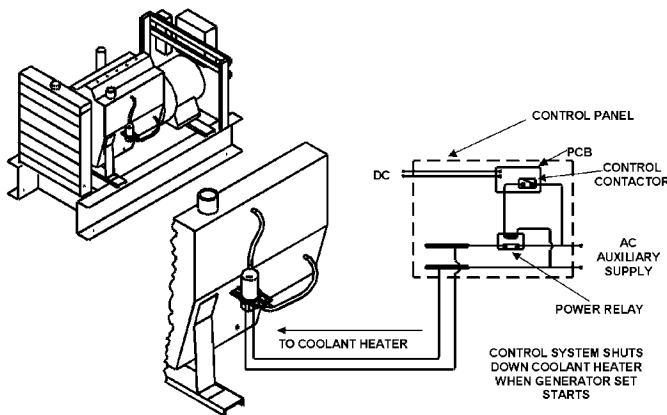
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COOLANT HEATER WHH

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

The heater itself is powered by a 110/120 volt (VAC 120) ~~or 208/240 volt (VAC 240)~~ AC auxiliary supply protected by a safeguard breaker inside the main control panel. A thermostatic controller is included to regulate the output temperature to within safe limits. When the generator set is not running, the heater is automatically connected to the AC supply through a power relay mounted in the control panel. Upon receiving a start signal, the AC supply is automatically disconnected by the power relay and automatically reconnected when the start signal is removed and the engine has stopped.



FEATURES

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

VAC 120

3 Phase Generator Set Models Diesel	Nominal Coolant Heater Power Consumption (Watts)	
	208 Volts	240 Volts
D13-4, D20-6, D25-8, D30-10, XQ20, XQ30, XQ45	750	1000
D40-6, D50-6, D60-6, D80-6, D100-6, XQ60, XQ80, XQ100	750	1000
D125-6, D150-8, D175-2	1125	1500
Single Phase Generator Set Models Diesel	Nominal Coolant Heater Power Consumption (Watts)	
	208 Volts	240 Volts
D13-4S, D20-6S, D25-8S, D30-8S	750	1000
D40-6S, D50-6S, D60-8S, D80-2S	750	1000
D100-6S	750	1000

~~VAC 240~~

3 Phase Generator Set Models Diesel	Nominal Coolant Heater Power Consumption (Watts)	
	208 Volts	240 Volts
D25-8, D30-10, D40-6, D50-6	750	1000
D60-6, D80-8, D100-8	750	1000
D125-6, D150-8	1125	1500
Single Phase Generator Set Models Diesel	Nominal Coolant Heater Power Consumption (Watts)	
	208 Volts	240 Volts
D25-8S, D30-8S, D40-6S, D50-6S	750	1000
D60-8S, D80-2S, D100-6S	750	1000

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Cat® DEO™

Diesel Engine Oil for North America (Canada, Mexico, United States).

SAE 15W-40, SAE 10W-30



Recommended Use

- Cat earthmoving, commercial, marine* and on-highway truck diesel engines
- Low-emission diesel engines including Cat engines with ACERT® Technology
- Heavy-duty diesel engines made by other manufacturers that recommend API CI-4 PLUS, CH-4 or CG-4 category oil (See “Typical Characteristics” on page 2 for more information)
- Automotive gasoline engines that require API SL category oils

* Excluding 3600, C280, 3126 and 3116 MUI Marine and MaK diesel engines. The 3116 and 3126 MUI Marine diesel engines with closed crankcase ventilation systems should use Cat SAE0™.

Discover the Difference

Cat DEO is developed, tested and approved by Caterpillar to meet the same high standards as all Genuine Cat Parts.

Factory-Fill—Used as standard factory-fill for Cat machines.

Increased Engine Life—Resists oxidation and prevents build-up of deposits on pistons and rings.

Longer Intervals—Extends oil drain intervals while providing excellent engine protection and performance when used in conjunction with our S•O•SSM Services oil analysis program.

Proven Performance—Tested thoroughly in Cat diesel engines including Cat engines with ACERT Technology to ensure excellent engine life and performance.

Long-Lasting Protection—Improved soot control and enhanced shear stability enable oil to maintain proper viscosity for longer operating periods in Cat engines with ACERT Technology, especially those equipped with HEUI systems.

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 investment.

CATERPILLAR®

Cat DEO

Cat DEO Performance

Performance Requirements	Test	Commercial ECF-1	Cat DEO
Cat 3406E Endurance Test	Cat Proprietary		
Cat C13 ACERT Endurance Test	Cat Proprietary		
Cat 3500 Series Test	Cat Proprietary		
Cat C13 ACERT Wheel Loader Test	Cat Proprietary		
Improved Soot-Viscosity & Shear Control			
High Temperature Shear			
Elastomer Compatibility			
Piston ring & Cylinder liner wear			
Valve train wear, sludge, oil filter plugging			
Aeration Control			
Bearing Corrosion			
Cam roller follower pin wear			
Copper, lead and tin erosion			
Foaming Control			
Viscosity Shear loss			
Viscosity Increase from soot			
Oxidation			
Piston deposits and oil control			

Tested Beyond Industry Standards

In addition to the tests required for the ECF-1 classification, Cat DEO undergoes four proprietary multi-cylinder endurance tests, a variety of quality assurance tests and thousands of hours of field service. Only when it has passed all these tests can it be approved by Caterpillar. The chart to the left indicates the differences between ECF-1 standards and the proprietary standards of Caterpillar.

Typical Characteristics*

SAE Viscosity Grade	15W-40	10W-30
API Service Classification		
Diesel	CI-4 PLUS, CI-4, CH-4, CG-4, CF-4/CF	CI-4, CH-4, CG-4, CF-4/CF
Gasoline	SL	SL
OEM Performance Level:		
Caterpillar	ECF-1	ECF-1
Volvo	VDS-3	VDS-2
DDC	93K214	
Cummins	CES 20071/76/78	CES 20071/76
Mack	EO-NPP '03, EO-M Plus	EO-M Plus
Flash Point, °C (ASTM D92)	224	227
Pour Point, °C (ASTM D97)	-30	-33
Viscosity		
cSt @ 40°C (ASTM D445)	120.5	76
cSt @ 100°C (ASTM D445)	15.5	11.5
Viscosity Index (ASTM D2270)	135	145
Sulfated Ash, % wt. (ASTM D874)	1.3	1.3
TBN (ASTM D2896)	11.3	11.3
Zinc, % wt. (ASTM D4951)	0.146	0.146
Gravity @ 16°C		
API (ASTM D287)	29.3	31.8
Specific	0.880	0.867

*The values shown are typical values and should not be used as quality control parameters to either accept or reject product. Specifications are subject to change without notice.

Other Recommended Oils

Cat DEO SYN™ 5W-40

For engines that must be started in extremely low temperatures down to -30°C(-22°F) consider using Cat DEO SYN 5W-40. This is a full synthetic diesel engine oil.

S•O•S Services for early problem detection

Protect your investment with Cat S•O•S oil analysis, the ultimate detection and diagnostic tool for your equipment. S•O•S helps you detect potential problems before they can lead to major failures and costly, unscheduled downtime.

Cat Filters: Complete protection for your machine

Combine Cat Fluids with Cat Filters for the highest level of contamination control and protection for your machine. We recommend Cat Filters for all Cat machine applications.

Health and Safety

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. Read and understand the Material Safety Data Sheet (MSDS) before using this product. For a copy of the MSDS, visit us on the web at www.catmsds.com.

CATERPILLAR®

Cat[®] ELC[™]

Extended Life Coolant for Caterpillar and original equipment manufacturer (OEM) diesel and gasoline engines.

50/50 Premix



Recommended Use

Cat ELC meets or exceeds the requirements of the following specifications:

- Cat EC-1
- TMC RP-329
- TMC RP-338
- ASTM D-3306
- ASTM D-6210
- SAE J1034

Cat ELC also meets the performance requirements of Cummins, Detroit Diesel, International, Mack and Volvo.

Discover the Difference

Cat ELC is developed, tested and approved by Caterpillar to meet the same high standards as Genuine Cat Parts.

Factory-Fill—Used as standard factory-fill for all Cat machine cooling systems.

Lower Maintenance Costs—Reduces engine coolant and additive costs by as much as 500% compared to conventional coolants. It eliminates the need for supplemental coolant additives, extends coolant change-out intervals and reduces disposal requirements.

Advanced Metal Protection—Incorporates an advanced formula technology with organic acid additive corrosion inhibitors, such as a combination of mono and dicarboxylates for maximum protection of copper, solder, brass, steel, cast iron and aluminum.

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 investment.

CATERPILLAR[®]

Cat ELC

Cat ELC for Maximum Coolant Life


Cat DEAC™

 **3000 Hour Life or 333,000 km (200,000 miles)**
Cat Supplemental Coolant Additives Every 250 Hours or 25,000 km (15,000 miles)

Cat ELC (Machines and Commercial Engines)

 **12,000 Hour Life or 6 Years***
(whichever comes first)
Cat Extender Every 6000 Hours

Cat ELC (Truck Engines)

 **1,000,000 km (600,000 miles) or 6 Years***
(whichever comes first)
Cat Extender Every 500,000 km (300,000 miles)

* These coolant change intervals are only possible with annual S•O•S Level 2 coolant sampling and analysis.

Cat ELC Extender for Longer Life

- Exceeds Cat EC-1 performance requirements
- Protects against cylinder liner/block pitting and cavitation erosion
- Should be added at 500,000 km (300,000 miles) for Cat powered on-highway trucks and 6,000 hours for commercial engines
- Extender is only necessary once during the life of the coolant
- Ensures Cat ELC performance to 1,000,000 km (600,000 miles) or 12,000 hours

Available Pre-Mixed or in Concentrate

Cat ELC 50/50 Premix is provided in standard English and metric container sizes. Cat ELC Concentrate is only available in 1- and 55-gallon sizes for radiator top-off. Coolant Conditioner and ELC Dilution Test kits are also available.

ELC Extender and Flush Intervals

Cat ELC Extender should be added after 6,000 hours or 300,000 miles (500,000 km) of operation, and the system should be drained and flushed with clean water after 12,000 hours or 600,000 miles (1,000,000 km). No cleaning agents are needed. If S•O•SSM Services are used regularly, safe operation with Cat ELC may extend beyond 12,000 hours.

Typical Characteristics*

Color	Strawberry Red
Boiling protection with 15 psi (1 bar) radiator cap	
50% Cat ELC/50% water	129°C (265°F)
60% Cat ELC/40% water (ELC concentrate added)	132°C (270°F)
Freezing protection	
50% Cat ELC/50% water	-37°C (-34°F)
60% Cat ELC/40% water (ELC concentrate added)	-52°C (-62°F)
Nitrite (50% solution)	500 ppm
Molybdate (50% solution)	530 ppm

*The values shown are typical values and should not be used as quality control parameters to either accept or reject product. Specifications are subject to change without notice.

S•O•S Services for early problem detection

Protect your investment with Cat S•O•S Coolant Analysis, the ultimate detection and diagnostic tool for your engines. We recommend S•O•S Level 1 Coolant Analysis according to the engine's Operation and Maintenance Manual, or Level 2 Coolant Analysis annually for all your Cat equipment.

Cat Filters: Complete protection for your machine

Combine Cat Fluids with Cat Filters for the highest level of contamination control and protection for your machine. We recommend Cat Filters for all Cat machine applications.

Health and Safety

For information on proper use for health, safety, and environment, please refer to the Material Safety Data Sheet (MSDS). Read and understand the MSDS before using this product. Always observe good hygiene measures. For a copy of the MSDS, contact us or visit the web at www.catmsds.com.

CATERPILLAR®

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

UL Listing is available on all diesel fuelled generator sets up to 175 kW at 60 Hz, 600 vac maximum.

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Effective with sales to the first user on or after June 1, 2012

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 electric power generators 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 Caterpillar Motoren (CM) product; CG132, CG170 and CG260 model gensets; 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. These products are covered by other Caterpillar warranties.

This warranty is subject to the following:

Warranty Period

- For new 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 new 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 electric power generation products 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 all Remanufactured Generator (GenEnds) products 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 all Remanufactured engines, the warranty period is 6 months (12 months for mobile agricultural and standby electric power generation applications) after date of delivery to the first user.
- 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 electric power generation products (including 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.

(continued on reverse side...)

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 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.

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 (800) 447-4986. If you have questions concerning this warranty or its applications, call or write:

In USA and Canada: Caterpillar Inc., Engine Division, P. O. Box 610, Mossville, IL 61552-0610, Attention: Customer Service Manager, Telephone (800) 447-4986. Outside the USA and Canada: Contact your Cat dealer.

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

THIS WARRANTY IS IN ADDITION TO WARRANTIES AND CONDITIONS IMPLIED BY STATUTE AND OTHER STATUTORY RIGHTS AND OBLIGATIONS THAT BY ANY APPLICABLE LAW CANNOT BE EXCLUDED, RESTRICTED OR MODIFIED ("MANDATORY RIGHTS"). ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED (BY STATUTE OR OTHERWISE), ARE EXCLUDED.

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.

TO THE EXTENT PERMITTED UNDER THE MANDATORY RIGHTS, IF CATERPILLAR IS THE SUPPLIER TO THE USER, CATERPILLAR'S LIABILITY SHALL BE LIMITED AT ITS 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.

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.



PARTS AND SERVICE STATEMENT

QUINN POWER SYSTEMS Associates was organized on August 1, 2003 by the QUINN Company and is the only factory-authorized Caterpillar and Olympian Engine Distributor serving Monterey, San Benito, Fresno, Madera, Kings, Tulare, Inyo, San Luis Obispo, Santa Barbara, Venture, Kern, Los Angeles, and Orange Counties in Central and Southern California.

Two years later the word Associates was drop from it's name. QUINN POWER SYSTEMS is the successor to POWER SYSTEMS Associates, that was established in 1972 from the former Industrial Division of Shepherd Machinery Company. QUINN Company, serving Central California, was founded in 1919 and is the oldest Caterpillar dealer in California and the western states. We are Caterpillar's parts, service and sales representative.

QUINN POWER SYSTEMS offers genuine Caterpillar / Olympian parts and factory-trained mechanics. These are available on a 24-hour basis through our main office and some branch locations:

Quinn Power Systems
3500 Shepherd St.
City of Industry, CA 90601
(562) 463-6000

Quinn Company
1300 Abbott St.
Salinas, California 93902
(408) 758-8461

GENERATOR DATA**MARCH 28, 2013**For Help Desk Phone Numbers [Click here](#)**Selected Model**

Engine: C4.4 **Generator Frame:** LC3034B **Genset Rating (kW):** 100.0 **Line Voltage:** 240
Fuel: Diesel **Generator Arrangement:** 2679912 **Genset Rating (kVA):** 125.0 **Phase Voltage:** NA
Frequency: 60 **Excitation Type:** Permanent Magnet **Pwr. Factor:** 0.8 **Rated Current:** 300.7
Duty: STANDBY **Connection:** SERIES DELTA **Application:** EPG **Status:** Current

Version: 39458 /38397 /39521 /980

Spec Information

Generator Specification			Generator Efficiency		
Frame: LC3034B	Type: LC	No. of Bearings: 1	Per Unit Load	kW	Efficiency %
Winding Type: RANDOM WOUND	Flywheel: 11.5		0.25	25.0	90.0
Connection: SERIES DELTA	Housing: 3		0.5	50.0	91.8
Phases: 3	No. of Leads: 12		0.75	75.0	91.2
Poles: 4	Wires per Lead: 1		1.0	100.0	90.1
Sync Speed: 1800	Generator Pitch: 0.6667				

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.1109	0.0511
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.1378	0.0635
TRANSIENT - SATURATED X'_d	0.1864	0.0859
SYNCHRONOUS - DIRECT AXIS X_d	4.7721	2.1990
SYNCHRONOUS - QUADRATURE AXIS X_q	2.8635	1.3195
NEGATIVE SEQUENCE X_2	0.1248	0.0575
ZERO SEQUENCE X_0	0.0063	0.0029

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	2.5550
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.1000
OPEN CIRCUIT SUBTRANSIENT - DIRECT AXIS T''_{d0}	0.0160
SHORT CIRCUIT SUBTRANSIENT - DIRECT AXIS T''_d	0.0100
OPEN CIRCUIT SUBTRANSIENT - QUADRATURE AXIS T''_{q0}	0.2070
SHORT CIRCUIT SUBTRANSIENT - QUADRATURE AXIS T''_q	0.0100
EXCITER TIME CONSTANT T_e	0.0540
ARMATURE SHORT CIRCUIT T_a	0.0150

Short Circuit Ratio: 0.21

Stator Resistance = 0.0307 Ohms

Field Resistance = 2.58 Ohms

Voltage Regulation		Generator Excitation		
Voltage level adjustment: +/-	5.0%	No Load	Full Load, (rated) pf	
Voltage regulation, steady state: +/-	0.5%		Series	Parallel
Voltage regulation with 3% speed change: +/-	0.5%	Excitation voltage:	3.5 Volts	Volts 23.3 Volts
Waveform deviation line - line, no load: less than	2.0%	Excitation current	0.76 Amps	Amps 4.17 Amps
Telephone influence factor: less than	50			

Selected Model

Engine: C4.4 **Generator Frame:** LC3034B **Genset Rating (kW):** 100.0 **Line Voltage:** 240
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Generator Mechanical Information

Center of Gravity		
Dimension X	-335.0 mm	-13.2 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.

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

Generator WT = 385 kg	* Rotor WT = 141 kg	* Stator WT = 245 kg
849 LB	311 LB	540 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
0.5 LB IN. s ²	11.9 MLB IN./rad	3.5 IN.	6.2 LB IN. s ²	15.1 MLB IN./rad	2.8 IN.	0.6 LB IN. s ²
0.056 N m s ²	1.34 MN m/rad	90.0 mm	0.703 N m s ²	1.71 MN m/rad	70.0 mm	0.063 N m s ²
Total J						
7.3 LB IN. s ²						
0.822 N m s ²						

Selected Model

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Fuel: Diesel **Generator Arrangement:** 2679912 **Genset Rating (kVA):** 125.0 **Phase Voltage:** NA
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**Generator Cooling Requirements -
Temperature - Insulation Data**

Cooling Requirements:		Temperature Data: (Ambient 40 °C)	
Heat Dissipated: 11.0 kW		Stator Rise:	150.0 °C
Air Flow: 26.4 m ³ /min		Rotor Rise:	150.0 °C
Insulation Class: H			
Insulation Reg. as shipped: 100.0 MΩ minimum at 40 °C			

Thermal Limits of Generator

Frequency:	60 Hz
Line to Line Voltage:	240 Volts
B BR 80/40	98.0 kVA
F BR -105/40	111.0 kVA
H BR - 125/40	122.0 kVA
F PR - 130/40	122.0 kVA
H PR - 150/40	129.0 kVA
H PR27 - 163/27	134.0 kVA

Selected Model

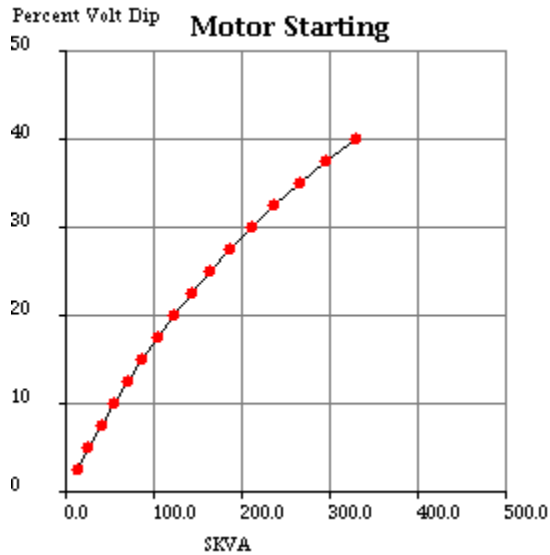
Engine: C4.4 **Generator Frame:** LC3034B **Genset Rating (kW):** 100.0 **Line Voltage:** 240
Fuel: Diesel **Generator Arrangement:** 2679912 **Genset Rating (kVA):** 125.0 **Phase Voltage:** NA
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Duty: STANDBY **Connection:** SERIES DELTA **Application:** EPG **Status:** Current

Version: 39458 /38397 /39521 /980

Starting Capability & Current Decrement

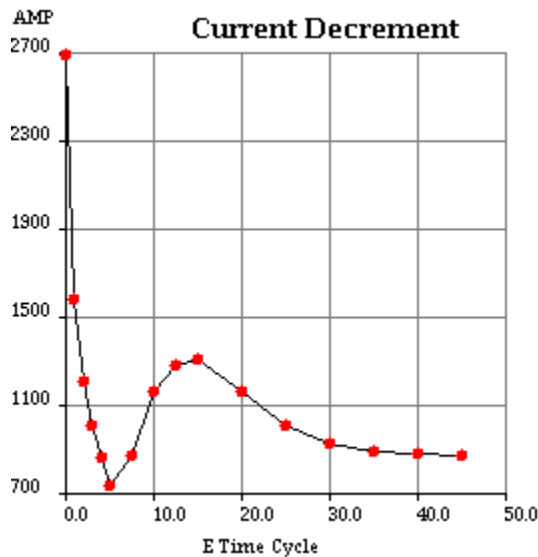
Motor Starting Capability (0.6 pf)

SKVA	Percent Volt Dip
13	2.5
26	5.0
40	7.5
55	10.0
70	12.5
87	15.0
105	17.5
123	20.0
143	22.5
164	25.0
187	27.5
211	30.0
237	32.5
265	35.0
296	37.5
329	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	2,688
1.0	1,582
2.0	1,213
3.0	1,011
4.0	861
5.0	738
7.5	870
10.0	1,160
12.5	1,280
15.0	1,307
20.0	1,165
25.0	1,009
30.0	926
35.0	891
40.0	879
45.0	876



Instantaneous 3 Phase Fault Current: 2688 Amps **Instantaneous Line - Line Fault Current:** 2191 Amps
Instantaneous Line - Neutral Fault Current: 3696 Amps

Selected Model

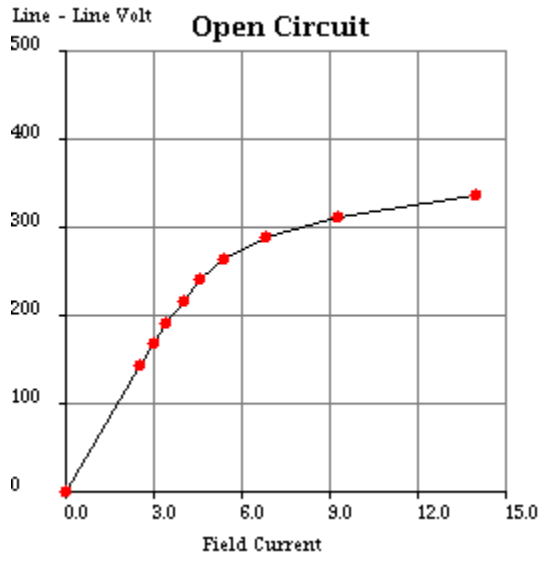
Engine: C4.4 **Generator Frame:** LC3034B **Genset Rating (kW):** 100.0 **Line Voltage:** 240
Fuel: Diesel **Generator Arrangement:** 2679912 **Genset Rating (kVA):** 125.0 **Phase Voltage:** NA
Frequency: 60 **Excitation Type:** Permanent Magnet **Pwr. Factor:** 0.8 **Rated Current:** 300.7
Duty: STANDBY **Connection:** SERIES DELTA **Application:** EPG **Status:** Current

Version: 39458 /38397 /39521 /980

Generator Output Characteristic Curves

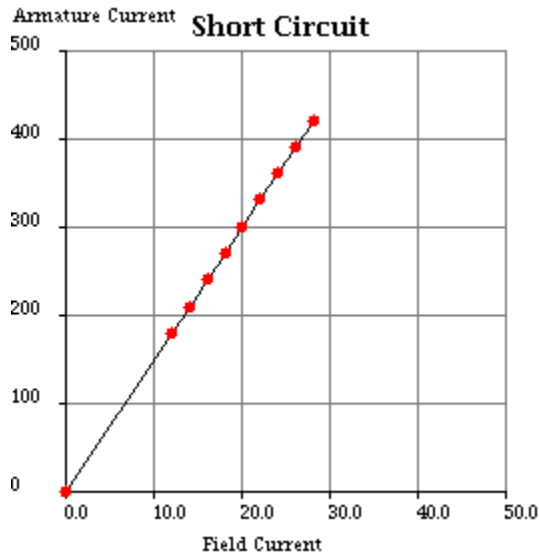
Open Circuit Curve

Field Current	Line - Line Volt
0.0	0
2.5	144
3.0	168
3.4	192
4.0	216
4.6	240
5.4	264
6.8	288
9.3	312
14.0	336



Short Circuit Curve

Field Current	Armature Current
0.0	0
12.1	180
14.1	210
16.1	241
18.1	271
20.1	301
22.1	331
24.2	361
26.2	391
28.2	421



Selected Model

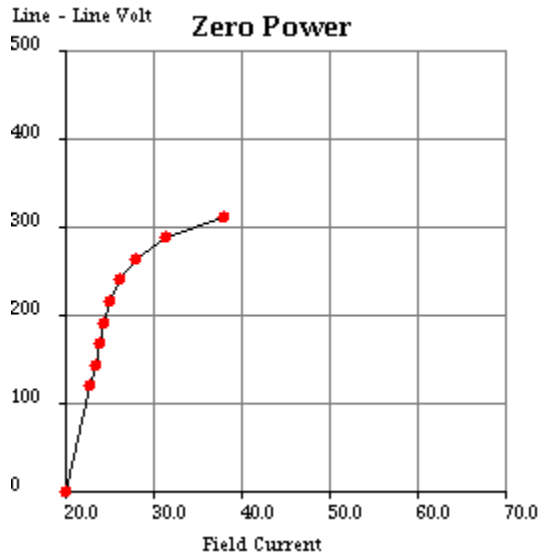
Engine: C4.4 **Generator Frame:** LC3034B **Genset Rating (kW):** 100.0 **Line Voltage:** 240
Fuel: Diesel **Generator Arrangement:** 2679912 **Genset Rating (kVA):** 125.0 **Phase Voltage:** NA
Frequency: 60 **Excitation Type:** Permanent Magnet **Pwr. Factor:** 0.8 **Rated Current:** 300.7
Duty: STANDBY **Connection:** SERIES DELTA **Application:** EPG **Status:** Current

Version: 39458 /38397 /39521 /980

Generator Output Characteristic Curves

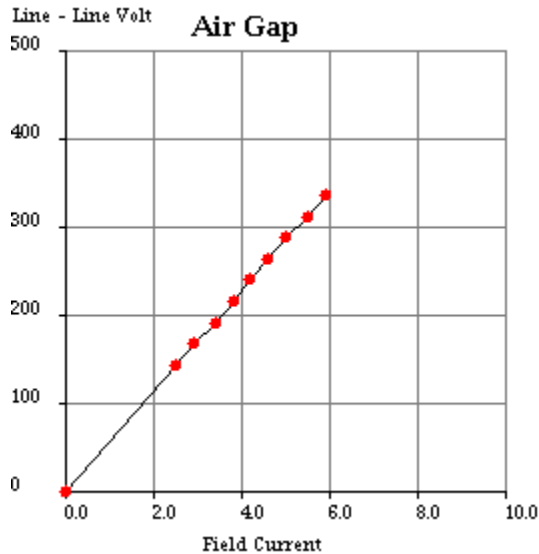
Zero Power Factor Curve

Field Current	Line - Line Volt
20.1	0
22.8	120
23.3	144
23.8	168
24.3	192
25.1	216
26.1	240
27.9	264
31.3	288
38.0	312

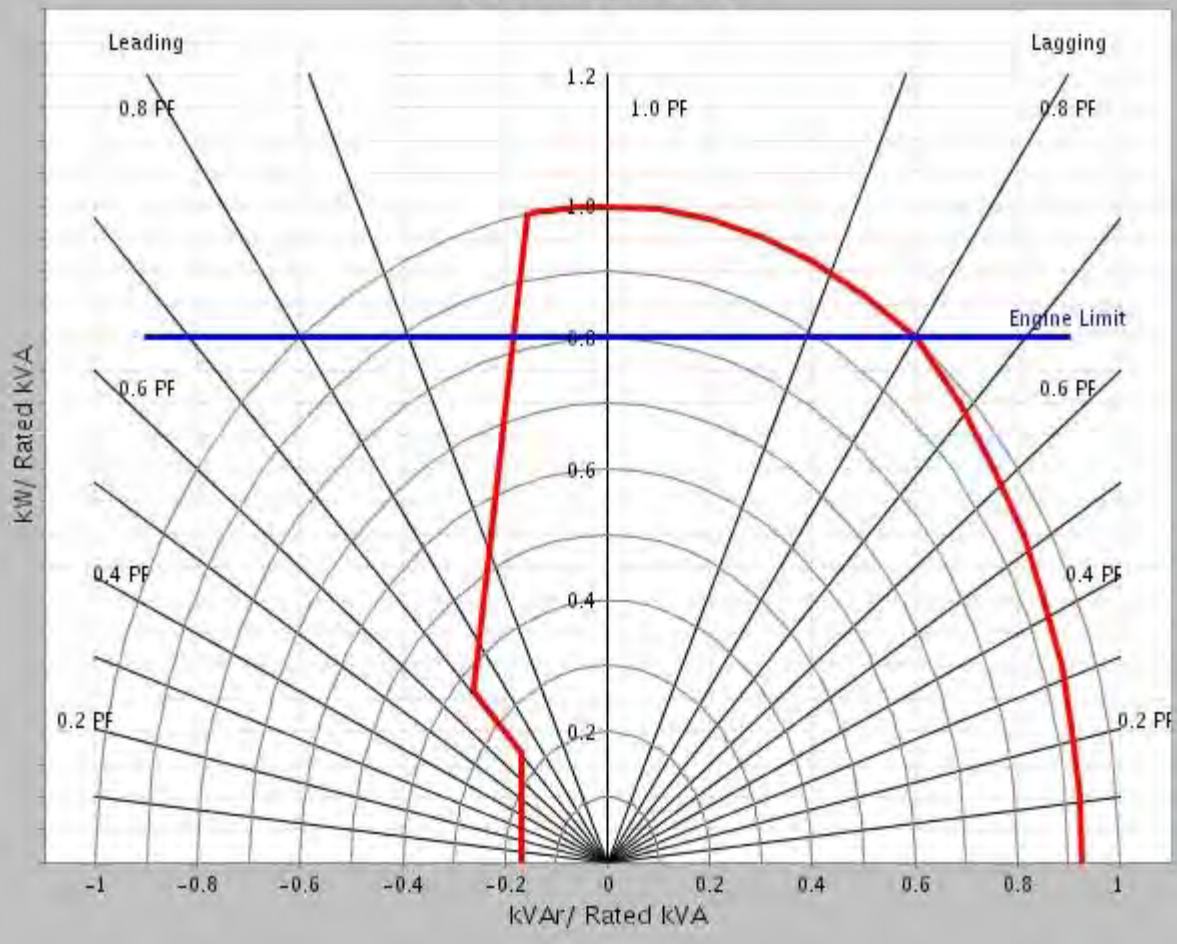


Air Gap Curve

Field Current	Line - Line Volt
0.0	0
2.5	144
2.9	168
3.4	192
3.8	216
4.2	240
4.6	264
5.0	288
5.5	312
5.9	336



Operating Chart



Selected Model

Engine: C4.4	Generator Frame: LC3034B	Genset Rating (kW): 100.0	Line Voltage: 240
Fuel: Diesel	Generator Arrangement: 2679912	Genset Rating (kVA): 125.0	Phase Voltage: NA
Frequency: 60	Excitation Type: Permanent Magnet	Pwr. Factor: 0.8	Rated Current: 300.7
Duty: STANDBY	Connection: SERIES DELTA	Application: EPG	Status: Current

Version: 39458 /38397 /39521 /980

General Information

 GENERATOR INFORMATION (DM7900)

1.Motor Starting

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

2.Voltage Dip

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

3.Definitions

A)Generator Keys

Frame: abbreviation of generator frame size

Freq: frequency in hertz.

PP/SB: prime/standby duty respectively

Volts: line - line terminal voltage

kW: rating in electrical kilo watts

Model: engine sales model

B)Generator Temperature Rise

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

C)Centre of Gravity

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

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

D)Generator Current Decrement Curves

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

E)Generator Efficiency Curves

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



Pre-Commissioning QA Inspection

EP COMMISSIONING & SUPPORT SERVICES

(800) 789-9774 Customer Service

(562) 463-7192 Fax Server

Date

Project Name

Purchase Order #:

iMACs PROJECT #:

Stock Order ID #:

Package Serial #:

EQUIPMENT TYPE:

Generator

Genset MFG:	<input type="text" value="0"/>	Genset Model #:	<input type="text" value="0"/>	Genset Serial #:	<input type="text" value="0"/>
Engine MFG:	<input type="text" value="0"/>	Engine Model #:	<input type="text" value="0"/>	Engine Serial #:	<input type="text" value="0"/>
Radiator MFG:	<input type="text" value="0"/>	Radiator Location:	<input type="text" value="0"/>	Radiator Group #:	<input type="text" value="0"/>
Control Panel MFG:	<input type="text" value="0"/>	Control Panel Model #:	<input type="text" value="0"/>	Control Panel Serial #:	<input type="text" value="0"/>
Arrangement #:	<input type="text" value="0"/>	Service Meter units:	<input type="text" value="0"/>	Fuel Type:	<input type="text" value="0"/>
Rated Kilowatts:	<input type="text" value="0"/>	Rated kV Amps:	<input type="text" value="0"/>	Rated Phase:	<input type="text" value="0"/>
Emission Tier:	<input type="text" value="0"/>	Rated Power Factor:	<input type="text" value="0"/>	Rated Volts AC:	<input type="text" value="0"/>

Open & Enclosed Generator Sets

Applications Requirements-Liquid Cooled Generator Sets

The installing contractor should complete the installation of the generator, including the following items listed below, prior to the scheduled arrival of our field service technicians at the generator installation site for initial start up & commissioning procedures and any applicable testing required. Please mark any items below that do not apply to a specific installation with "N/A". Once complete, please fax to **562-463-7192**. All scopes of work below must be completed and documented upon this form, and returned to the fax number above at least 48 hours in advance prior to the scheduling of any commissioning services. This form is required for each individual piece of equipment requiring start up and commissioning services. This checklist should be used to validate the completion of generator set installation prior to the scheduling of pre-commissioning services. A check-list must be completed for each generator set of a multiple installation.

Project Details

Company Name:

Customer (End User):

Site Address:

City: State: Zip:

Customer Phone #:

Office Cellphone Fax Email:

Electrical Contractor

Contractor Company: CA State License:

Contractor Name: Account #:

Street:

City: State: Zip:

Contractor Phone #:

Office Cellphone Fax Email:

Check List Completed By: Date:

Print Name:

Company:

Any item(s) listed below deemed incomplete and/or needing attention by the Quinn Power Systems Technician(s) to attain the recommended start-up ready status will delay the completion of your generator start up until these correction(s) have been completed. If the above scopes of work are incomplete, you may, at your discretion, request the Quinn Power Systems Technician to perform the corrective action(s) required to attain start-up ready status at the current Time and Material rate. However, if you choose not to have the Quinn Power Systems Technician perform the corrective action(s) needed, you will be billed for any labor, travel or mileage incurred for that site visit. It will then be contractor's responsibility to contact Quinn Power Systems EP Commissioning and Support Services Customer Service to reschedule commissioning services.

Equipment Site Location and Services

	COMPLETED?
Building & Installation work complete	<input type="text"/>
Site clean & access clear from obstruction	<input type="text"/>
Building services complete & commissioned (lighting, electrical auxiliary supplies, water, etc.)	<input type="text"/>

Observations

Date	
Project Name	
Purchase Order #:	0

iMACs PROJECT #:	
Stock Order ID #:	
Package Serial #:	0

EQUIPMENT TYPE:

Generator

Please select (Yes, No, Not Applicable, Need Assistance)

Room General	COMPLETED?
Generator set clean with all guards in place	
No loose materials near to generator set	
Air ducts clear and clean	
Access & egress routes unobstructed & labelled	
Control & maintenance positions unobstructed	
Room secure – no unauthorised access	
Generator set is level – holding down bolts secure	
Pipework and cables are secure with no trip hazards	
Overhead obstructions clearly marked and labelled	
All key components are labelled	
Pipework and services colour coded & labelled	
Electrical bonding complete	
0	
Cooling System	
Set mounted radiator	
Radiator clean, free from obstruction	
Radiator air outlet connected to outlet duct	
Check for possibility of hot air recirculation	
Access to coolant top-up	
Engine vent pipes inclined toward radiator	
Pipework secure and undamaged	
Overflow clear and routed to avoid spillage	
Remote mounted radiator systems	
Header tank is of adequate size	
Overflow is clear and routed to avoid spillage	
Static/friction head is within engine/system capability	
Engine vent pipes inclined toward radiator	
Fuel cooler installed if required	
Pipework avoids air locks – air bleed valves provided	
Pipework isolated from generator set vibration	
Pipework complete, cleaned, tested & painted	
Auxiliary supply to fans correctly installed	
Electrical bonding completed	
Heat exchanger & cooling tower systems	
Header tank is of adequate size	
Overflow is clear and routed to avoid spillage	
Static/friction head is within engine/system capability	
Engine vent pipes inclined toward header tank	
Fuel cooler installed if required	
Pipework avoids air locks – air bleed valves provided	
Pipework isolated from generator set vibration	
Pipework complete, cleaned, tested & painted	
Secondary cooling system is complete	
Cooling tower make up supply is complete	
Auxiliary supply to fans correctly installed	
Electrical bonding completed	
0	

Date	
Project Name	
Purchase Order #:	0

iMACs PROJECT #:	
Stock Order ID #:	
Package Serial #:	0

EQUIPMENT TYPE:

Generator

0

(Yes, No, Not Applicable, Need Assistance)

Liquid fuel system

Bulk storage facility

	COMPLETED?
Bulk storage tank installation complete	
Bulk tank incorporates water trap	
Spillage containment complete	
Isolating valves correctly positioned	
Tank contents gauge installed	
Content alarm contacts fitted & wired	
Transfer pump installed and connected	
Solenoid & pre-filter between bulk & service tank	
Pipework correct material, cleaned tested & painted	
Vent installed, piped to safe area and open	
Electrical bonding complete	
Insulation & pipeline heating installed	
Fill point installed & alarm fitted	
Storage facility secure	

Day tank (if none, complete check for bulk supply)

Positive head at engine for critical applications	
Fuel inlet head/restriction within engine limits	
Fuel return head/restriction within engine limits	
Isolating and solenoid valves fitted	
Check for no valves in spill return	
Flexible connections to engine	
Connection to fill, overflow & vent lines completed	
Overflow head of fuel within tank pressure limits	
Tank contents gauge installed	
Contents alarm contacts fitted & wired	
Electrical bonding complete	
Spillage containment complete	
Fire valves & contacts installed & wired	

0

Gaseous fuel system

Pipework complete, material and construction correct	
Regulator and shut off valves in correct locations	
Leak test and certification complete	

0

Fire alarm / suppression system

Fire alarm / suppression system complete	
Sensors protected from radiant heat	
Labelling and lock off system complete	

0

Starting system

Battery starting

Starting batteries correct & installed on tray or stand	
Battery cables routed correctly	
Battery charger installed & wired	

Compressed air / hydraulic starting

Compressor set installed and wired	
Compressed air pipework correctly rated & installed	
Isolating valves correctly positioned & labelled	
Pipework tested, painted & labelled	
Correct pressure regulator & HP/LP safety valves	
Flexible connection to engine fitted	

0

Date _____
Project Name _____
Purchase Order #: _____ **0**

iMACs PROJECT #: _____
Stock Order ID #: _____
Package Serial #: _____ **0**

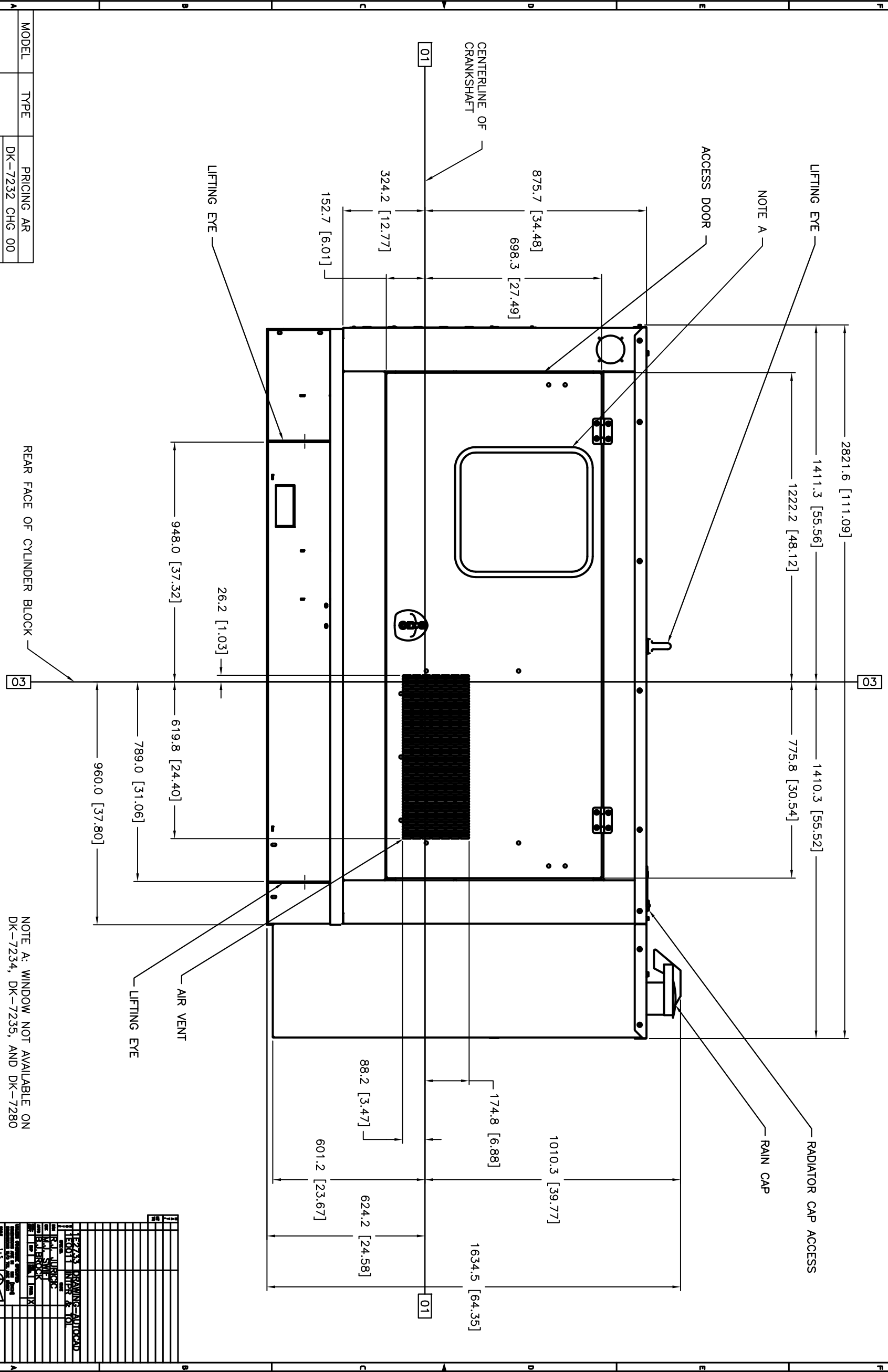
EQUIPMENT TYPE:

Generator

0

(Yes, No, Not Applicable, Need Assistance)

<u>Exhaust system</u>	COMPLETED?
Installation design prevents exhaust recirculation	
Flexible connection to engine	
Support prevents load on turbocharger/manifold	
Installation allows for pipework expansion	
Pipework / muffler supported at required intervals	
Joints welded or flanges secure with correct gaskets	
Stack/tail pipe prevents rain/snow ingress	
Flues are not combined in stack	
Condensate drain provided	
Exit directed away from buildings / personnel	
System is lagged & clad as required	
Building penetration & weathering complete & sealed	
Flammable materials properly protected	
Fill point installed & alarm fitted	
Storage facility secure	
0	
<u>Ventilation & Attenuation</u>	
Air intake is at least 150% area of air outlet	
Design prevents hot air recirculation & rain ingress	
Design accounts for prevailing wind	
Air flow direction is from alternator to radiator	
Radiator outlet is ducted to attenuator / louver	
Attenuator / louvers complete & sealed to building	
Louver mechanisms complete & wired as required	
Electrical bonding completed	
Forced ventilation provided for remote cooled sets	
Bird guard is fitted to intake & outlet	
0	
<u>Electrical system</u>	
<u>Control system</u>	
Field wiring to set mounted control complete	
Customer wiring to set mounted control complete	
Interconnection to remote control complete	
Emergency stop controls wired	
<u>Set / Switchgear / Changeover / Transfer</u>	
Means of disconnection / isolation provided	
Switchgear installation & pre-testing completed	
Cables installed correctly, marked, allow movement	
Power connections complete & torque-marked	
Cable tests complete & certificates available	
<u>Electrical general</u>	
All electrical boxes clean & covers replaced	
Auxiliary electrical supply complete	
Grounding system complete & tested	
Electrical bonding of services / assemblies complete	
Utility supply available as required	
Small power & lighting circuits tested & certificated	



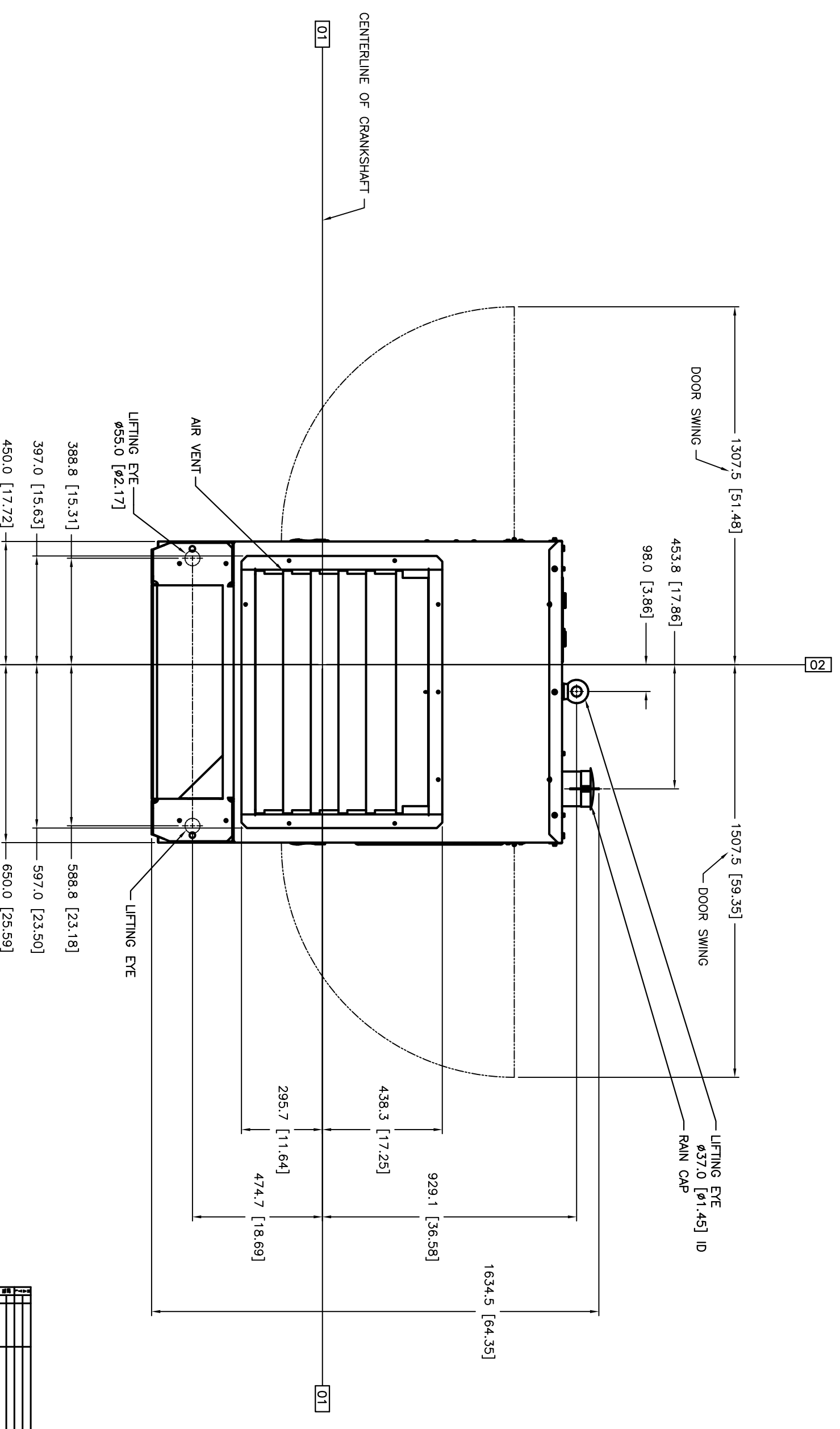
MODEL	TYPE	PRICING	AR
C4.4	Y	DK-7232	CHG 00
		DK-7233	CHG 00
		DK-7234	CHG 00
		DK-7235	CHG 00
		DK-7279	CHG 00
		DK-7280	CHG 00

NOTE A: WINDOW NOT AVAILABLE ON DK-7234, DK-7235, AND DK-7280

RIGHT SIDE VIEW

DK-7232 SHOWN

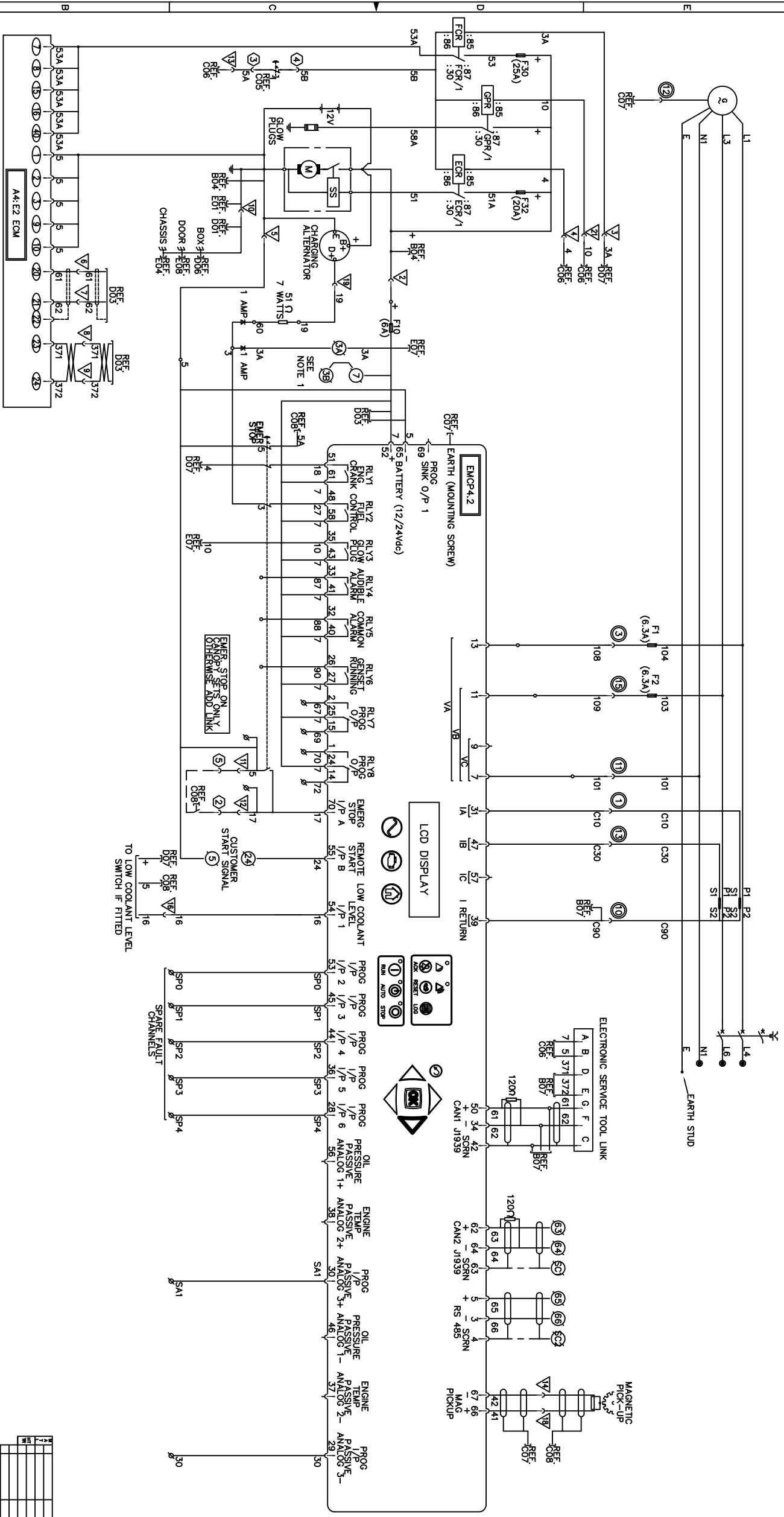
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2	DOOR	1	EA
3	WHEEL	4	EA
4	WHEEL MOUNTING BRACKET	4	EA
5	WHEEL NUT	4	EA
6	WHEEL WASHER	4	EA
7	WHEEL LOCK	4	EA
8	WHEEL LOCK PIN	4	EA
9	WHEEL LOCK SPRING	4	EA
10	WHEEL LOCK SHOCK	4	EA
11	WHEEL LOCK BUSH	4	EA
12	WHEEL LOCK PIN	4	EA
13	WHEEL LOCK SPRING	4	EA
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CATERPILLAR INC.
319-8102



NOTE 1: LINK TERMINALS 7 & 3B FOR NORMAL OPERATION
LINK TERMINALS 7 & 3A FOR COMMUNICATION WITH THE SERVICE TOOL.
GENSET MUST NOT BE STARTED WITH 7 AND 3A LINKED

NO.	REVISION	DATE	BY	CHKD	DESCRIPTION
1					
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1E0198R LETTERS
1E0013V CONFIDENTIALITY
1E2733 DRAWING - AUTOCAD
1E0011 INTR & TOL


DATE: NONE
SCALE: NONE
SHEET: 1 OF 1
DRAWING: 373-6511-1
CATERPILLAR INC.
DIAGRAM - WIRING
EMCP 4.2 (23V ELEC) (C4.4)
373-6511 (DK) (REV) (1/93) (E)

CATERPILLAR: CONFIDENTIAL YELLOW

ABBREVIATIONS

A.V.R.	AUTOMATIC VOLTAGE REGULATOR
AC	ALTERNATING CURRENT
DC	DIRECT CURRENT
SRN	SCREEN FROM SCREEN CABLE
RLY	RELAY
I/P	INPUT
ALR	ALARM RELAY
GRR	GENERATOR RUN RELAY
FCS	FUEL CONTROL SOLENOID
FCR	FUEL CONTROL RELAY
ECR	ENGINE CRANK RELAY
GPR	GLOW PLUG RELAY

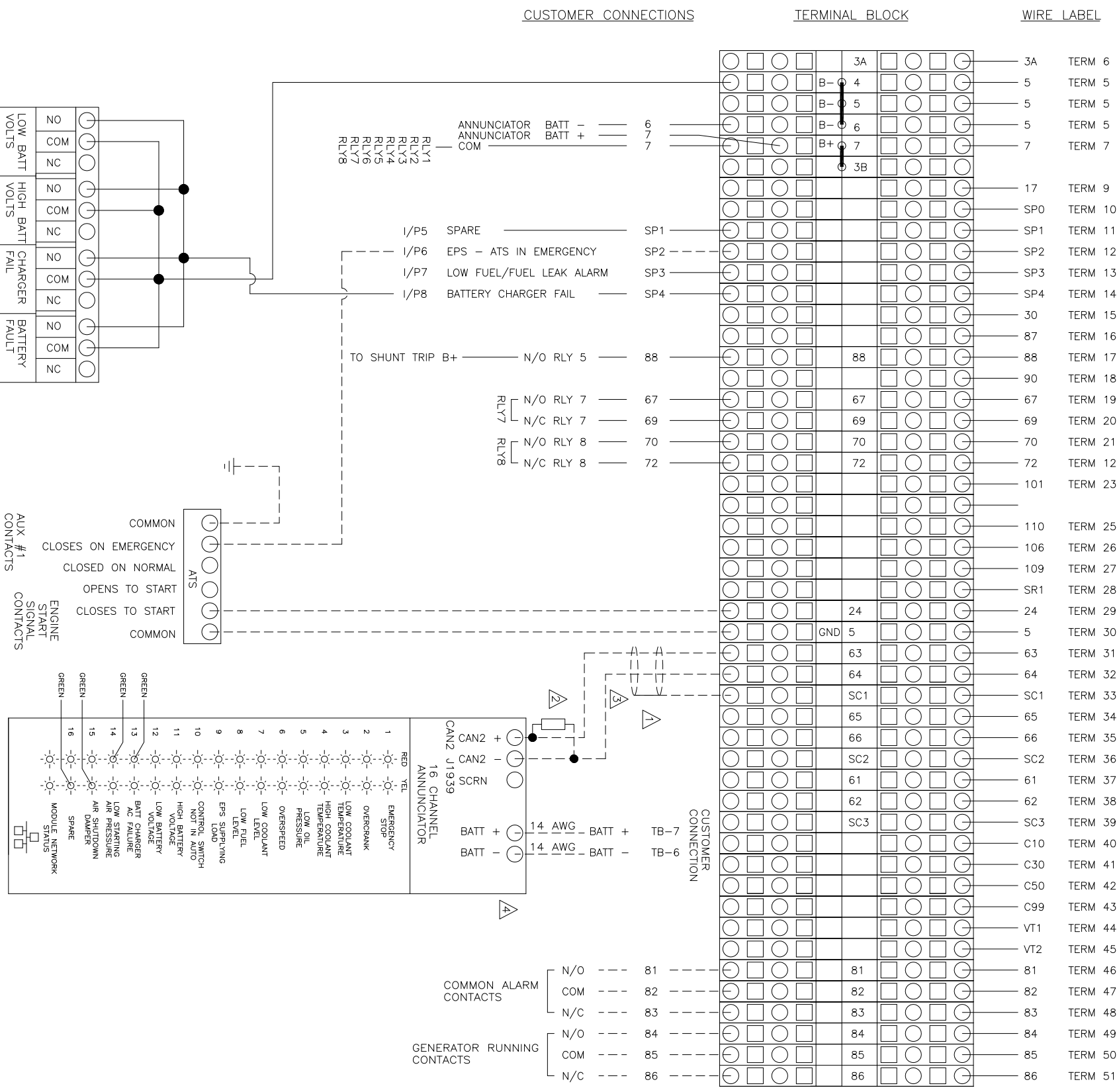
SYMBOLS

	FUSE		CUSTOMER TERMINAL
	EMERGENCY STOP PUSHBUTTON		INTERNAL PANEL TERMINAL
	RELAY COIL		OUTGOING/INCOMING PANEL TERMINAL
	SCREEN CABLE		CONTROLLER 70-WAY CONNECTOR
	DIODE		ENGINE SOCKET
	RELAY CONTACT N/O		POWER TERMINAL
	EARTH		INTERNAL AC TERMINAL BLOCK
	CIRCUIT BREAKER		GENERATOR SOCKET
	RESISTOR		CANOPY E-STOP SOCKET
	CURRENT TRANSFORMER		ECM SOCKET
	BUZZER / SIREN		
	SOLENOID		

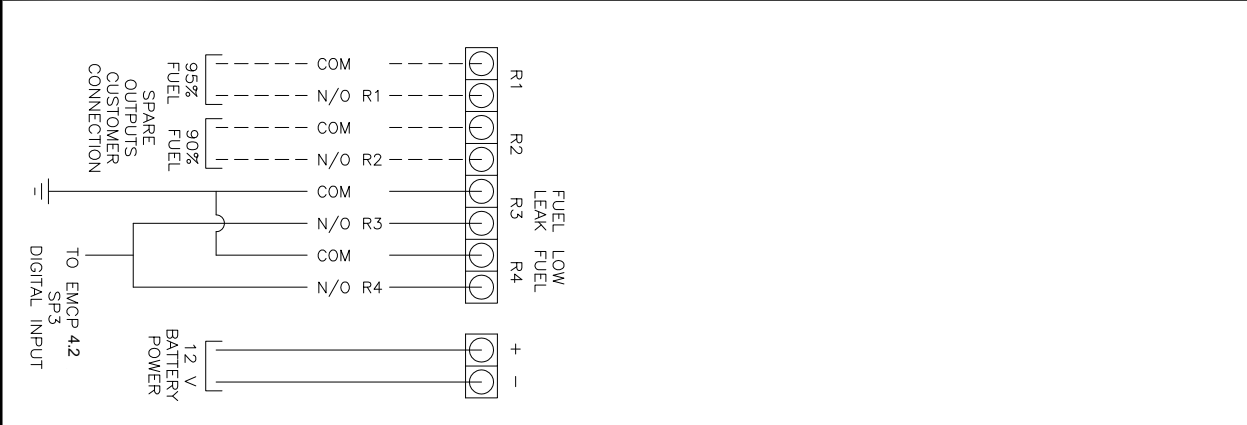
REV	DESCRIPTION	DATE

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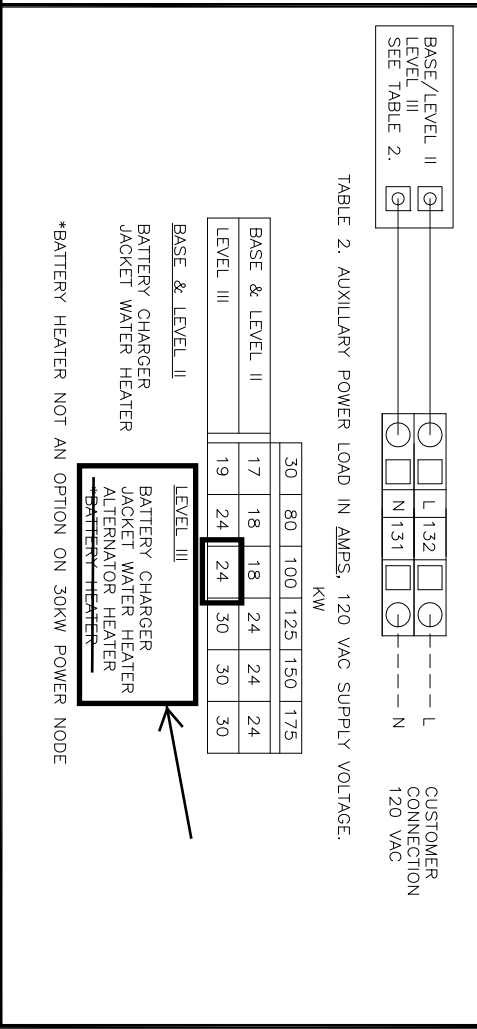
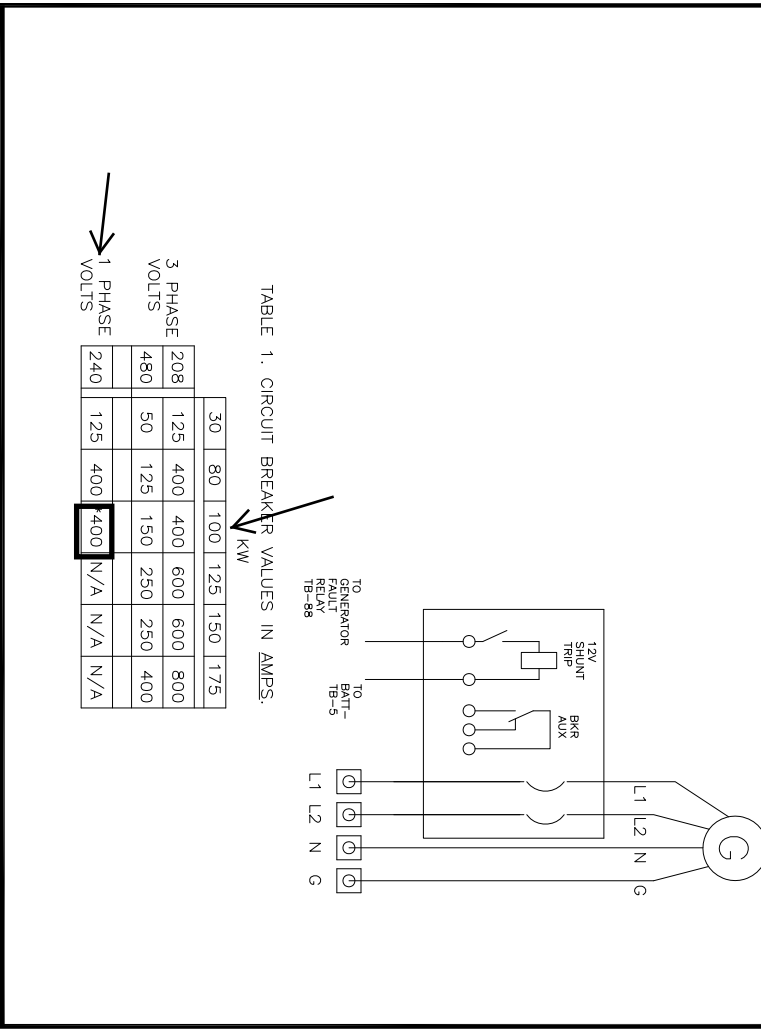
EMCP 4.2 CONTROL PANEL CIRCUIT



CA FIRE CODE NOT INCLUDED



CAT GENERATOR AC CIRCUIT



CONTRACTOR WIRING

CAT/QUINN WIRING

DC CIRCUIT (18 - 16 AWG WIRE) UNLESS OTHERWISE SPECIFIED

NOTES:

- GROUND SHIELD ON GENERATOR END ONLY.
- REMOVE RESISTOR AND INSTALL ON REMOTE ANNUNCIATOR.
- SHIELDED CABLE SPECIFICATION: LENGTH NOT TO EXCEED 800 FEET
- CONDUCTOR W/ DRAIN AND SHIELD CONDUCTOR: 0.75-0.85 SQ. MM (COOPER 16 OR 19 STRAND) WIRE INSULATION: POLYALKENE OR CELLULAR XLPE SHIELD: ALUMINUM POLYESTER FOL OPERATING TEMP RANGE: -40C TO 125C IMPEDANCE: 120+/-12 OHMS AT 1 MHZ

NOTES: (CONTINUED)

SUGGESTED SHIELDED CABLE SUPPLIER: NORTHWIRE, INC. 110 PROSPECT WAY OSCEOLA, WI 54020 TEL (715) 294-2121

4. REMOVE ANNUNCIATOR INSTALLED BY OTHERS

REVISION	DATE	DESCRIPTION
A	5/5/11	NEW RELEASE

QUINN POWER SYSTEMS

3500 SHEPHERD STREET WHITTIER, CA 90601

SCALE: NONE

30KW-175 KW, 480/277-3 PH, 208/120-3 PH 240/120 VAC-1 PHASE AC AND DC SCHEMATIC

JOB: VENTURA CTY

DWG NO: FE11509-B2

**VENTURA COUNTY FIRE PROTECTION
FIRE STATION No. 30**

Automatic Transfer Switch

**Quinn Power Syst. PO# E37194810
SO# 1268434**

Submittal for Record

Peter Amato
Tel # (714)283-4000 x 1402

ASCO Power Technologies L.P
ASCO Pacific Southwest District Sales Office
120 S. Chaparral Court, Suite 110
Anaheim, CA 92808

Automatic Transfer Switch Bill of Material
VENTURA COUNTY FIRE PROTECTION
FIRE STATION No. 30

Customer: Quinn Power Syst. PO# E37194810

ATS DESIGNATION	QTY	AMPS/ POLES	BYPASS	TRANSITION	CATALOG NUMBER	OPTIONAL ACC.	ENCL. DRG.	WIRING DRG.	BOM #
-	1	400 / 2	NO	OPEN	E 300 2 400 F1XC	11BG,14AA,14BA	738647	733500	754409

**VENTURA COUNTY FIRE PROTECTION
 FIRE STATION No. 30
 Amp/Pole: 400/2
 Open Transition
 Automatic Transfer Switch**

ATS	AMPS : 0400	QTY : 1
Bulletin Number : Series 300 Transfer Switches	Catalog Number: E00300020400F1XC,11BG,14AA,14BA	
Service Voltage / Hz : 240V/60Hz	Optional Accessories : 1 1 B G , 1 4 A A , 1 4 B A	
By-pass Isolation : Not Applicable	Product Description : Open Transition Series 300	
No. of Switched Poles : 2	Neutral Configuration : Solid [A]	
Withstand Rating : 200,000 (With Current Limiting Fuses), A @ 480V 42,000 (Specific Breaker), N/A (Any Breaker) Other Ratings May Apply. Contact ASCO For Details.	No. of Cables & Lug Size: 2, #1/0 AWG to 250 MCM Or (1) #4 AWG to 600MCM	
Enclosure : (C) – Type 1 enclosure	Service : Single Phase, 3-wire	

ACCESSORIES DESCRIPTION

#	Accessory Code	Description
1	11BG	Programmable engine exerciser & source available signal modules - 300
2	14AA/14BA	(2) Auxiliary contacts closed on Normal - 14AA. (2) Auxiliary contacts closed on Emergency - 14AB

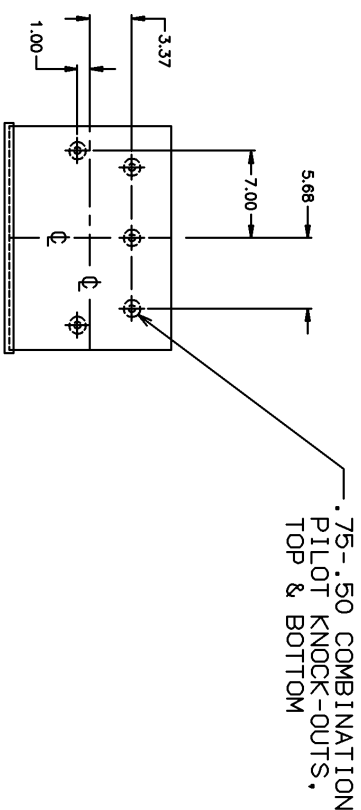
RECORD DRAWINGS

Drawing Number	Description
738647	Composite Enclosure Outline and Mounting Diagram
733500	Single Phase Wiring Diagram

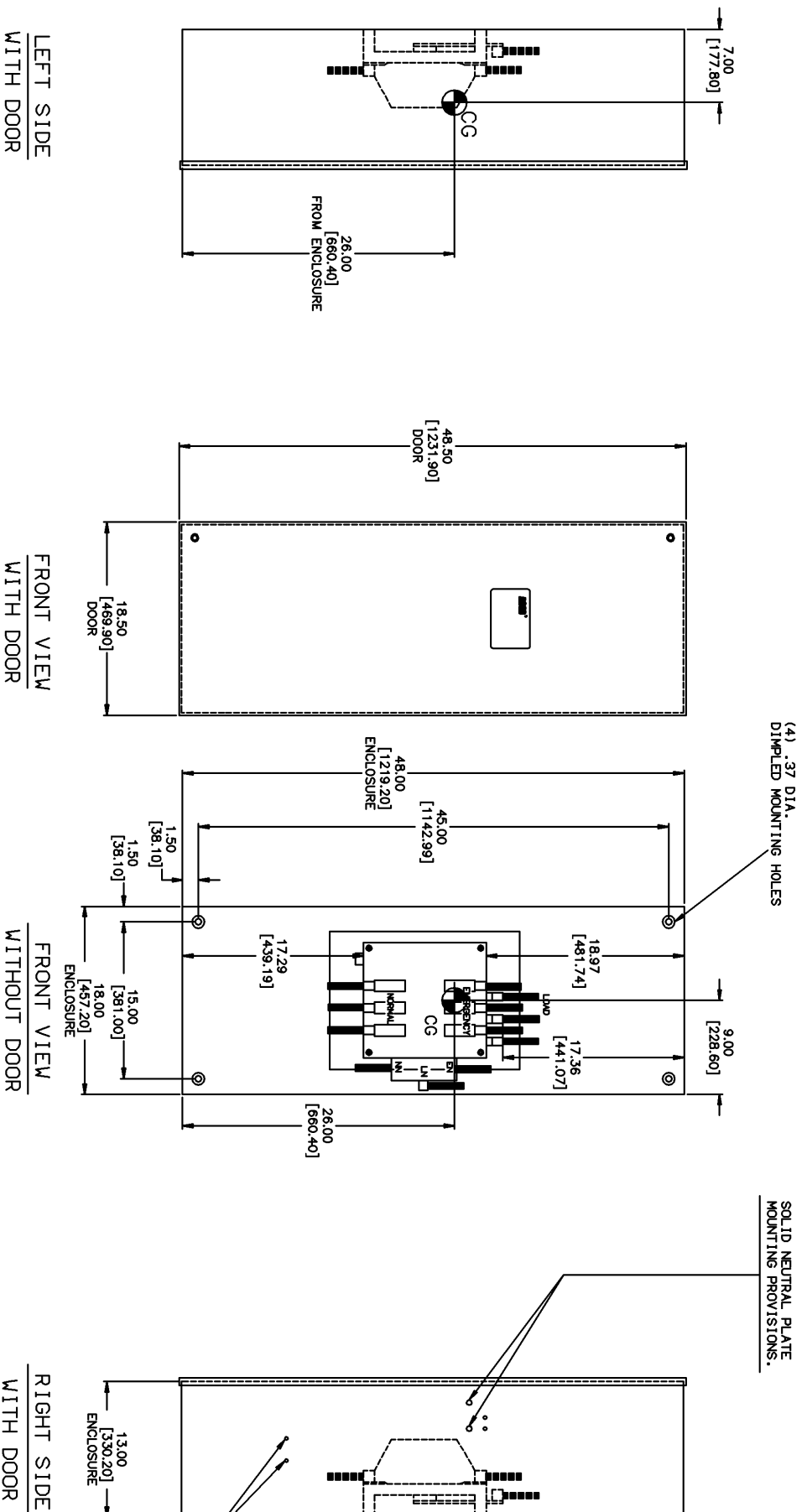
OUTLINE & MOUNTING FOR ASGO® (150, 300, 386) SERIES TRANSFER SWITCHES, RATED 225, 260, & 400 AMPERES

GENERAL NOTES

1. TYPE 1 WALL MOUNTED ENCLOSURE.
2. STANDARD FINISH - LIGHT GREY, ANSI 61.
3. KEY LOCKABLE HANDLE.
4. SINGLE DOOR HINGED ON RIGHT.
5. TERMINALS - SCREW TYPE LUGS FOR EXTERNAL POWER CONNECTIONS.
6. THREE POLE SWITCH WITH SOLID NEUTRAL SHOWN FOR REFERENCE.
7. NEUTRAL CONFIGURATIONS:
 A FULL RATED NEUTRAL CONNECTION FOR EACH SOURCE AND THE LOAD IS OPTIONAL. WHEN PROVIDED IT IS IN ONE OF THE FOLLOWING FORMATS AS SPECIFIED BY THE CATALOG NUMBER NEUTRAL TYPE:
 (A) SOLID NEUTRAL BUS (PROVIDED STANDARD ON 150/300)
 (B) SWITCHED NEUTRAL POLE
 (C) OVERLAPPING NEUTRAL POLE



TYP TOP & BOTTOM
TOP VIEW



RIGHT SIDE WITH DOOR

SWITCH RATING (AMPS)	RANGE OF AL-CU WIRE SIZE
225, 260, 400	(2) 1/0 TO 250 MCM AWG OR (1) #4 TO 600 MCM AWG

APPROXIMATE SHIPPING WEIGHT, LBS (KG)

POLES	WEIGHT
2	117 (53)
B2 *	125 (57)
C2 *	125 (57)
3	125 (57)
B3 *	NOT AVAILABLE
C3 *	133 (61)

8. \odot_{CG} CENTER OF GRAVITY.
9. THE STANDARD SWITCH CONFIGURATION IS FOR TOP EMERGENCY & LOAD AND BOTTOM NORMAL. OPTIONALLY, THE SWITCH MAY BE SUPPLIED WITH REVERSE SOURCES AND/OR BOTTOM LOAD. (REFER TO THE WIRING DIAGRAM FURNISHED WITH EACH TRANSFER SWITCH TO DETERMINE TERMINATION POSITIONS).

E00300020400F1XC, 11BG, 14AA, 14BA
 Ventura County Fire Protection
 Fire Station No. 30
 03/27/13

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8 7 6 5 4 3 2 1

CATALOG NO. _____
 CERTIFIED TO ASGO® S.O. _____
 DATE _____ BY _____

PROJECT NAME: _____
 MOUNTING: _____

150-300-386
 225-400 AMPERS TYPE 1

DATE	3/03	ISSUED	3/03
BY	WIK	BY	WIK

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH THE ASGO DRAWING SPECIFICATIONS. ASGO SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL PARTS AND MATERIALS. ALL RIGHTS OF INVENTION ARE RESERVED.

ASGO® ASGO Power Technologies, L.P.
 Dallas, Texas 75243

738647
 SHEET 1 OF 1

SINGLE PHASE WIRING FOR ASCO® SERIES 300 AUTOMATIC TRANSFER SWITCHES RATED 225, 260, & 400 AMPERES WITH GROUP I CONTROLS

CONTROL FEATURES

FIELD CONNECTIONS

- VOLTAGE AND FREQUENCY SENSING**
- DROPOUT SETTING SELECTABLE ON ALL PHASES OF NORMAL SOURCE. FACTORY SET AT 85%. PICKUP VOLTAGE ADJUSTABLE AT 90 OR 95% OF NOMINAL. (DEFAULT IS 93% IF DROPOUT IS SET TO 90%).
 - SINGLE PHASE VOLTAGE SENSING OF EMERGENCY SOURCE. NON-ADJUSTABLE DROPOUT SETTING AT 75% OF NOMINAL. NON-ADJUSTABLE PICKUP SETTING AT 90% OF NOMINAL.
 - FREQUENCY SENSING OF EMERGENCY SOURCE. NON-ADJUSTABLE DROPOUT SETTING AT 85% OF NOMINAL. NON-ADJUSTABLE PICKUP SETTING AT 95% OF NOMINAL.
- TIME DELAYS**
- MOMENTARY NORMAL SOURCE OUTAGE DELAY - ACTIVATED WHEN THE NORMAL SOURCE FAILS. DEACTIVATED WHEN THE NORMAL SOURCE IS ACCEPTABLE. PROVIDES A SELECTABLE (1 OR 3 SECOND) DELAY ON TRANSFER AND ENGINE STARTING SIGNAL. FACTORY SET AT 3 SECONDS. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).
 - TRANSFER TO EMERGENCY DELAY - ACTIVATED AFTER THE MOMENTARY NORMAL SOURCE OUTAGE DELAY EXPIRES AND THE EMERGENCY SOURCE IS SENSED TO BE ACCEPTABLE. TRANSFER TO EMERGENCY IS COMMITTED TO ON INITIATION OF DELAY. DEACTIVATED WHEN THE EMERGENCY SOURCE IS UNACCEPTABLE. PROVIDES AN ADJUSTABLE DELAY FROM 0 TO 5 MINUTES. FACTORY SET AT 0 MINUTES. (REFER TO OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).
 - RETRANSFER TO NORMAL DELAY - ACTIVATED WHEN THE NORMAL SOURCE IS ACCEPTABLE. DEACTIVATED WHEN THE NORMAL SOURCE FAILS WITH NO TRANSFER TO NORMAL. ALSO DEACTIVATED WHEN THE EMERGENCY SOURCE FAILS WHILE THE NORMAL SOURCE IS ACCEPTABLE WITH TRANSFER TO NORMAL. ADJUSTABLE DELAY FROM 1 SECOND TO 30 MINUTES. FACTORY SET TO 30 MINUTES. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).
 - UNLOADED RUNNING (ENGINE COOL DOWN) DELAY - ACTIVATED ON EXPIRATION OF RETRANSFER TO NORMAL DELAY OR FOLLOWING EXPIRATION OF THE NORMAL SOURCE OUTAGE DELAY WITHOUT A COMMIT TO TRANSFER TO EMERGENCY. NON-ADJUSTABLE DELAY OF 5 MINUTES.
 - MOMENTARY EMERGENCY SOURCE OUTAGE DELAY. ACTIVATED WHEN THE SWITCH IS IN THE EMERGENCY POSITION AND THE EMERGENCY SOURCE FAILS. FACTORY SET AT 4 SECONDS. RESET IF EMERGENCY RESTORES WITHIN 4 SECONDS.

- ENGINE CONTROL CONTACTS**
- ONE SET OF FORM C CONTACTS (1 N/O & 1 N/C) THAT CHANGE POSITION ON EXPIRATION OF THE NORMAL SOURCE OUTAGE DELAY AND RESET ON EXPIRATION OF THE UNLOADED RUNNING (ENGINE COOL DOWN) DELAY. OUTPUT CONTACTS (N/R) ARE RATED 5 AMPS RESISTIVE AT 28V DC OR 120V AC MAXIMUM.
- OPERATOR INTERFACE INDICATORS & CONTROLS**
- MEMBRANE TYPE**
- TRANSFER SWITCH TEST - MOMENTARY PUSH-BUTTON TO SIMULATE NORMAL SOURCE FAILURE SEQUENCE OF OPERATION. PRESS AND HOLD FOR AT LEAST 15 SECONDS TO ALLOW TIME FOR ENGINE-GENERATOR SET TO START.
 - BYPASS TIME DELAY - MOMENTARY PUSH-BUTTON. TO BYPASS EITHER THE TRANSFER TO NORMAL DELAY DEPENDING ON WHICH DELAY IS ACTIVE AT THE TIME. THE PUSH-BUTTON IS ACTIVATED.
 - SET ENGINE EXERCISER - MOMENTARY PUSH-BUTTON TO ACTIVATE A SEVEN (7) DAY TIMER FOR AUTOMATIC WEEKLY TESTING OF THE ENGINE GENERATOR SET EITHER WITH OR WITHOUT LOAD TRANSFER. THE TIMER IS POWERED BY A NON-RECHARGEABLE 9V BATTERY WHEN NORMAL AND EMERGENCY SOURCES ARE UNAVAILABLE. DEPRESSING THE MOMENTARY PUSH-BUTTON FOR 5 SECONDS SETS THE TIME OF WEEK AT WHICH TESTING IS TO OCCUR. THE FEATURE IS ACTIVATED BY SETTING A DIP SELECTOR SWITCH ON THE CONTROL PANEL. ENGINE START WITH OR WITHOUT LOAD TRANSFER IS SELECTED WITH A SECOND DIP SELECTOR SWITCH ON THE CONTROL PANEL. FACTORY SET TO DISABLED. NO LOAD. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).
 - LOAD CONNECTED TO INDICATORS GREEN LED INDICATOR TO INDICATE WHEN THE TRANSFER SWITCH LOAD IS CONNECTED TO THE NORMAL SOURCE. RED LED INDICATOR TO INDICATE WHEN THE TRANSFER SWITCH IS CONNECTED TO THE EMERGENCY SOURCE.
 - SOURCE AVAILABLE INDICATORS GREEN LED INDICATOR TO INDICATE WHEN THE NORMAL SOURCE IS AVAILABLE. RED LED INDICATOR TO INDICATE WHEN THE EMERGENCY SOURCE IS AVAILABLE.

- LOAD DISCONNECT FEATURE**
- ONE SET OF FORM C CONTACTS (1 N/O & 1 N/C) THAT CHANGE POSITION ON ACTIVATION OF SELECTABLE TIME DELAY BEFORE TRANSFER (LD TDB) AND RESET EITHER IMMEDIATELY FOLLOWING TRANSFER OR FOR THE SAME DELAY AS SET FOR PRE-SIGNAL BEFORE TRANSFER. SELECTABLE AS 0, 3, 10 OR 20 SECONDS. FACTORY SET AT 0. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).
- OUTPUT CONTACTS (OP) ARE RATED 5 AMPS RESISTIVE AT 28 VDC OR 120 VAC MAXIMUM.**
- MOTOR LOAD TRANSFER FEATURE**
- INPHASE TRANSFER CONTROL LOGIC TO INITIATE AN INPHASE TRANSFER OF MOTOR LOADS BETWEEN LIVE SOURCES. USED TO HELP PREVENT NUISANCE TRIPPING OF DISTRIBUTION CIRCUIT BREAKERS AND POSSIBLE DAMAGE TO MECHANICAL LOADS ASSOCIATED WITH OUT OF PHASE TRANSFER. ACTIVATED BY SETTING A DIP SWITCH ON THE CONTROL PANEL. FACTORY SET AS DISABLED. (REFER TO OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).

REMOTE CONTROL FEATURES

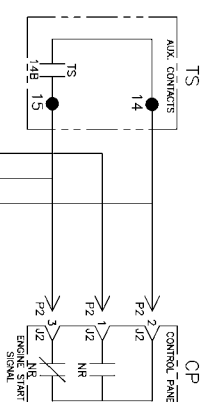
- THE FOLLOWING CONTROL PANEL INPUTS PROVIDE REMOTE CONTROL FUNCTIONS AND BE IMPLEMENTED BY THE SUPPLIER. EACH CONTROL FUNCTION AND CONTACT DESCRIBED EACH CONTROL FEATURE IS ACTIVATED BY SETTING A DIP TYPE SELECTOR SWITCH ON THE CONTROL PANEL. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).
- REMOTE TEST FEATURE - REQUIRES A CUSTOMER SUPPLIED, REMOVE NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT SIMULATES A FAILURE OF THE NORMAL SOURCE. SIMILAR TO THE SEQUENCE OUTLINED FOR THE TRANSFER SWITCH TEST PUSH-BUTTON. THE TRANSFER SWITCH WILL REMAIN CONNECTED TO THE EMERGENCY SOURCE UNDER ALL CONDITIONS WHILE THE CONTACT IS OPEN.
 - RETRANSFER TO EMERGENCY FEATURE - REQUIRES A CUSTOMER SUPPLIED, REMOVE, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT CAUSES ENGINE START AND TRANSFER TO THE EMERGENCY SOURCE. RECLOSURE OF THE CONTACT ACTIVATES THE RETRANSFER TO NORMAL DELAY PRIOR TO RETRANSFER. IN THE EVENT THAT THE EMERGENCY SOURCE FAILS WHILE THE TRANSFER SWITCH IS OPEN, THE TRANSFER SWITCH AND THE RETRANSFER CONTACT IS OPEN, THE TRANSFER SWITCH WILL AUTOMATICALLY RETRANSFER TO THE NORMAL SOURCE.
 - INHIBIT TRANSFER TO EMERGENCY FEATURE - REQUIRES A CUSTOMER SUPPLIED, REMOVE, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT WILL PREVENT THE TRANSFER SWITCH FROM TRANSFERRING TO THE EMERGENCY SOURCE WHILE CONNECTED TO THE NORMAL SOURCE.
 - BYPASS TRANSFER TIME DELAY FEATURE - REQUIRES A CUSTOMER SUPPLIED, REMOVE, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT BYPASSES THE RETRANSFER TO NORMAL DELAY IF ACTIVE.

GENERAL NOTES

- SWITCH SHOWN DE-ENERGIZED CONNECTED TO NORMAL SOURCE. DEVICE SYMBOLS AND DESIGNATIONS ARE IN ACCORDANCE WITH NEMA PUB. ICS 1-1993, PART 1-101A.
- ALL WIRING IS #16 AWG, TINED, STRANDED COPPER UNLESS OTHERWISE INDICATED.
- INDICATES CUSTOMER CONNECTION POINTS.
- INDICATES FACTORY CONNECTION POINTS.
- CONNECTION POINTS THAT HAVE BOTH CUSTOMER CONNECTIONS AND FACTORY CONNECTIONS ARE SHOWN OPEN AS CUSTOMER CONNECTION POINTS.
- ARE SHOWN OPEN AS MOUNTED ON THE BACK INSIDE SURFACE OF THE ENCLOSURE.
- THE TRANSFER PANEL AND ANY OPTIONAL ACCESSORIES ARE MOUNTED ON THE INSIDE SURFACE OF THE DOOR.
- AN OPERATOR'S MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.
- GROUND STRAP ON CONTROL PANEL IS AFFIXED TO CHASSIS (ENCLOSURE) AT LOWER LEFT CONTROL PANEL MOUNTING STUD.

OPTIONAL ACCESSORIES

- ACCESSORY 11BG - PROGRAMMABLE ENGINE EXERCISER & SOURCE AVAILABILITY SIGNAL MODULES**
- PROGRAMMABLE ENGINE EXERCISER. A PROGRAMMABLE SEVEN (7) DAY OR FOURTEEN (14) DAY ELECTRONIC TIME SWITCH FOR AUTOMATIC WEEKLY TESTING OF THE ENGINE GENERATOR SET EITHER WITH OR WITHOUT LOAD. EACH DAY OF THE WEEK IS INDIVIDUALLY PROGRAMMABLE. THE TIME OF DAY IS PRESERVED BY A BATTERY BUILT INTO THE GROUP I PROGRAMMABLE SWITCH CONTROL PANEL. THE FEATURE IS ACTIVATED BY SETTING A DIP SELECTOR SWITCH ON THE CONTROL PANEL. ENGINE START WITH OR WITHOUT LOAD TRANSFER IS SELECTED WITH A SECOND DIP SELECTOR SWITCH ON THE CONTROL PANEL. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL AND TIMER SETTINGS).
- SERIAL COMMUNICATIONS INTERFACE (ACCESSORY 72A)**
- RS-485 SERIAL INTERFACE TO CONTROL PANEL. FOR REMOTE MONITORING AND CONTROL FROM ASCO COMMUNICATIONS BASED PRODUCTS.
- ACC. 14AA (2) AUXILIARY CONTACT CLOSED ON NORMAL.
ACC. 14BA (2) AUXILIARY CONTACT CLOSED ON EMERGENCY.
ACC. 44A STRIP HEATER, THERMOSTAT & TB. CUSTOMER POWER SUPPLY 120VAC.
ACC. 44G STRIP HEATER, THERMOSTAT & TRANSFORMER. POWER SUPPLY FROM LOAD TERMINALS OF TRANSFER SWITCH. (OPTIONAL)



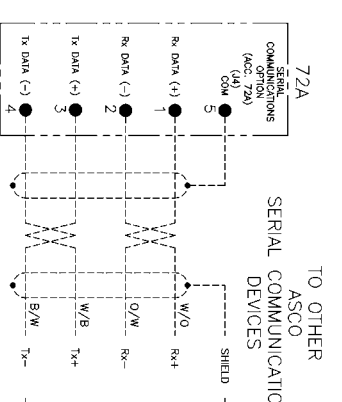
COMMON
ENGINE STARTING SIGNALS
(10 AMPS, 32VDC)

AUXILIARY CONTACTS FEATURE 14A & 14B
(10 AMPS, 32VDC)
(10 AMPS, 480VAC)
GENERAL PURPOSE

ACCESSORY 14A CLOSED ON NORMAL

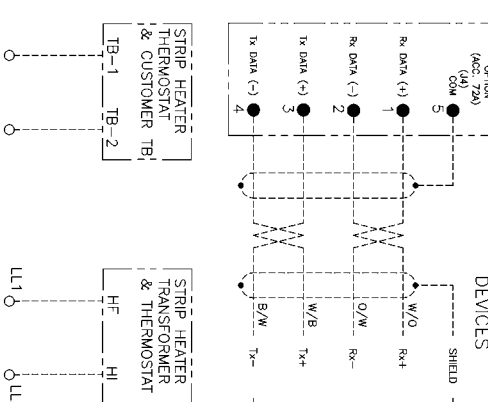
OPTIONAL TS AUXILIARY CONTACTS ACCESSORIES 14AA & 14BA (10 AMPS, 32VDC)
(10 AMPS, 480VAC)
GENERAL PURPOSE

ACC. 72A SERIAL COMMUNICATIONS OPTION

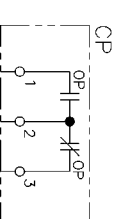


72A NOTES:
1. EARTH GROUND SHIELD AT HOST DEVICE ONLY.
2. TWISTED PAIRS: USE UL LISTED, STRANDED DRAIN WIRE SUITABLE FOR RS-485 EQUIVALENT TO (STANDARD 807) BELDEN 9642 OR 9629 OR ALPHA 6202C OR 6222C (PLENUM RATED) BELDEN 89729 OR 82729 OR ALPHA 59802

SERIAL COMMUNICATIONS TO OTHER ASCO DEVICES

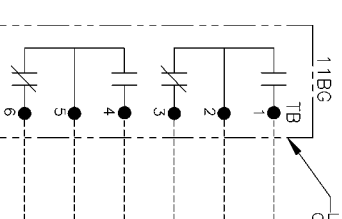


ACCESSORY 44A STRIP HEATER, THERMOSTAT & TB. CUSTOMER POWER SUPPLY 120 VAC (OPTIONAL)
ACCESSORY 44G STRIP HEATER, THERMOSTAT & TRANSFORMER. POWER SUPPLY FROM LOAD OF TS (OPTIONAL)



LOAD DISCONNECT
5 AMPS RESISTIVE
28 VDC OR 120 VAC MAX.
(LOCATED ON CONTROL PANEL)

CUSTOMER SUPPLIED CONTACTS FOR FEATURES AS DESCRIBED IN STANDARD CONTROL FEATURES NOTES. CONTACT MUST BE SUITABLE FOR 5V DC LOW ENERGY CIRCUIT. ACTIVATED BY SETTING OF DIP SELECTOR SWITCHES ON CONTROL PANEL. (REFER TO OPERATOR'S MANUAL FOR REQUIRED SETTINGS).



ACC. 11BG SOURCE AVAILABILITY SIGNALS
LOCATED ON INSIDE OF DOOR BEHIND OPERATOR INTERFACE ON "ENGINE EXERCISER" MODULE

NO NORMAL AVAILABLE
COMMON
NC NORMAL NOT AVAILABLE
NO EMERGENCY AVAILABLE
COMMON
NC EMERGENCY NOT AVAILABLE

SOURCE AVAILABILITY SIGNALS (2 AMPS @ 30VDC, RESISTIVE) (0.5 AMPS @ 125 VAC, RESISTIVE)
CONTACTS SHOWN DE-ENERGIZED

BASE CATALOG NUMBER

TS FRAME	CATALOG NUMBER	NEUTRAL PHASE TYPE	POLES	AMPS	VOLTI CODE	CONTROL CODE	OPTIONAL ACCESSORY	ENCLOSURE CODE	NEUTRAL TYPE	DESCRIPTION	VOLTAGE CODES (2 OF 3 WIRE)	CODE	TYPE	ENCLOSURE CODES	DESCRIPTION
E	300	C	2	225	F	H	X	C	BLANK SOLID	OVERLAPPING	208 220 240	G	1	BLANK	GENERAL PURPOSE, INDOOR
											380 400 415 440 480				INDOOR, INDUSTRIAL ENVIRONMENTS, OUTLIGHT & DUSTLIGHT

EXPLANATION OF CATALOG NUMBER CODES

TS	FRAME	CATALOG NUMBER	NEUTRAL PHASE TYPE	POLES	AMPS	VOLTI CODE	CONTROL CODE	OPTIONAL ACCESSORY	ENCLOSURE CODE	NEUTRAL TYPE	DESCRIPTION	VOLTAGE CODES (2 OF 3 WIRE)	CODE	TYPE	ENCLOSURE CODES	DESCRIPTION
E	300	C	2	225	F	H	X	C	BLANK SOLID	OVERLAPPING	208 220 240	G	1	BLANK	GENERAL PURPOSE, INDOOR	
											380 400 415 440 480				INDOOR, INDUSTRIAL ENVIRONMENTS, OUTLIGHT & DUSTLIGHT	

CATALOG NUMBER

ASCO® CERTIFIED TO S.O. _____

DATE _____

FORM REV. D

PROJECT NAME: _____

WIRING SERIES E300 ATS 1PH 225-400 AMPS

"H" FRAME, GROUP I CONTROLS

DATE	BY	REVISION
6/02	SDH	1
6/02	SDH	2

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11455 North Central Expressway, Dallas, TX 75243
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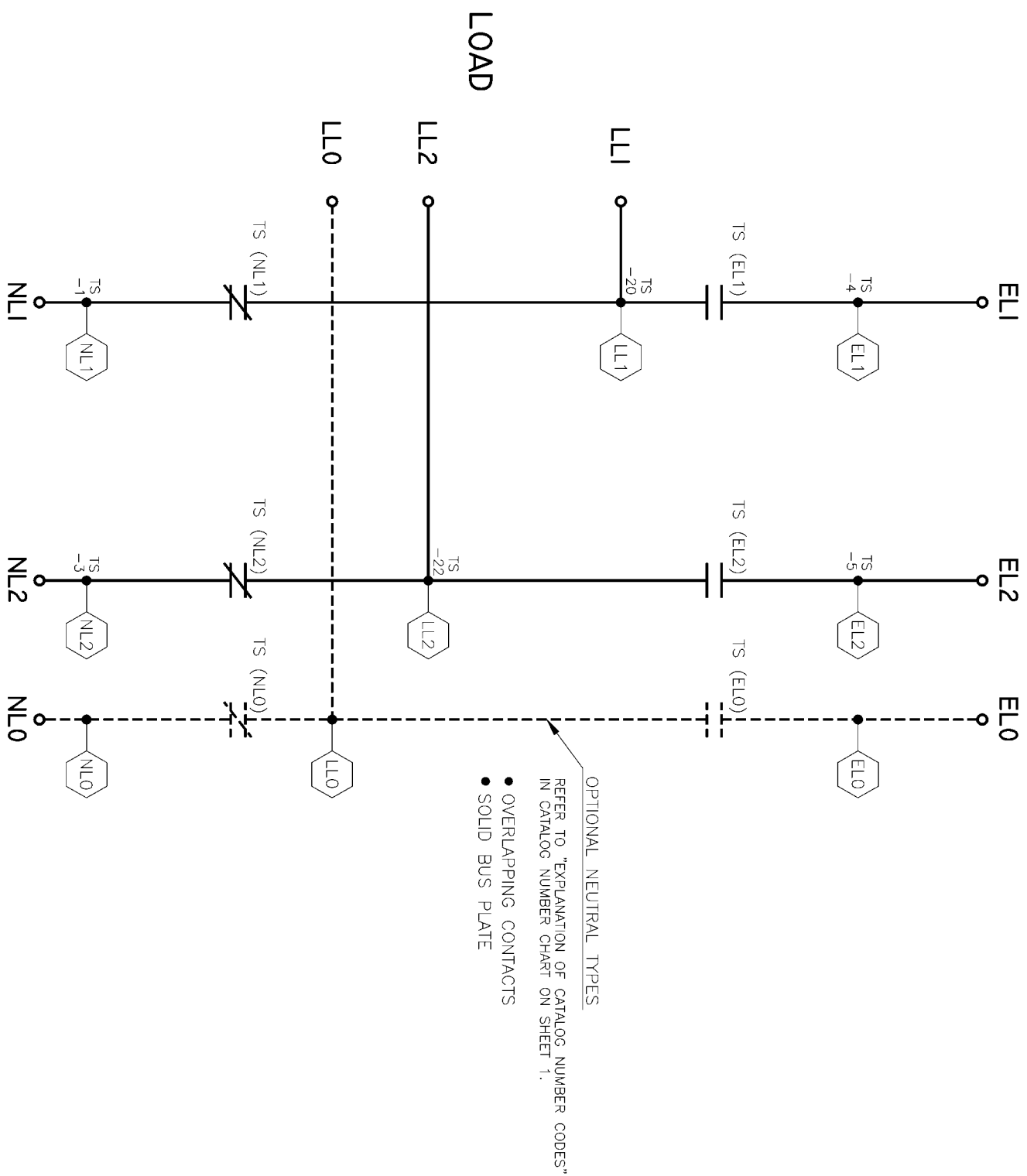
DIAGRAM

REV.	DATE	DESCRIPTION
A	5/02	ADDITIONAL WIRING TO BE IN ACCORDANCE WITH ASCO PROCEDURE UP-1-003
B	6/02	PROPERTY OF ASCO PATENT TECHNOLOGIES. USE RESTRICTED FOR OUR PROPRIETARY SYSTEMS. ALL RIGHTS OF DESIGN OR PATENT ARE RESERVED.
C	6/02	COMPUTER GENERATED DRAWING
D	6/02	THIRD ANGLE PROJECTION
E	6/02	733500

E00300020400F1XC.11BG.14AA.14BA
Ventura County Fire Protection
Fire Station No. 30
03/27/13

MAIN POWER POLES

EMERGENCY

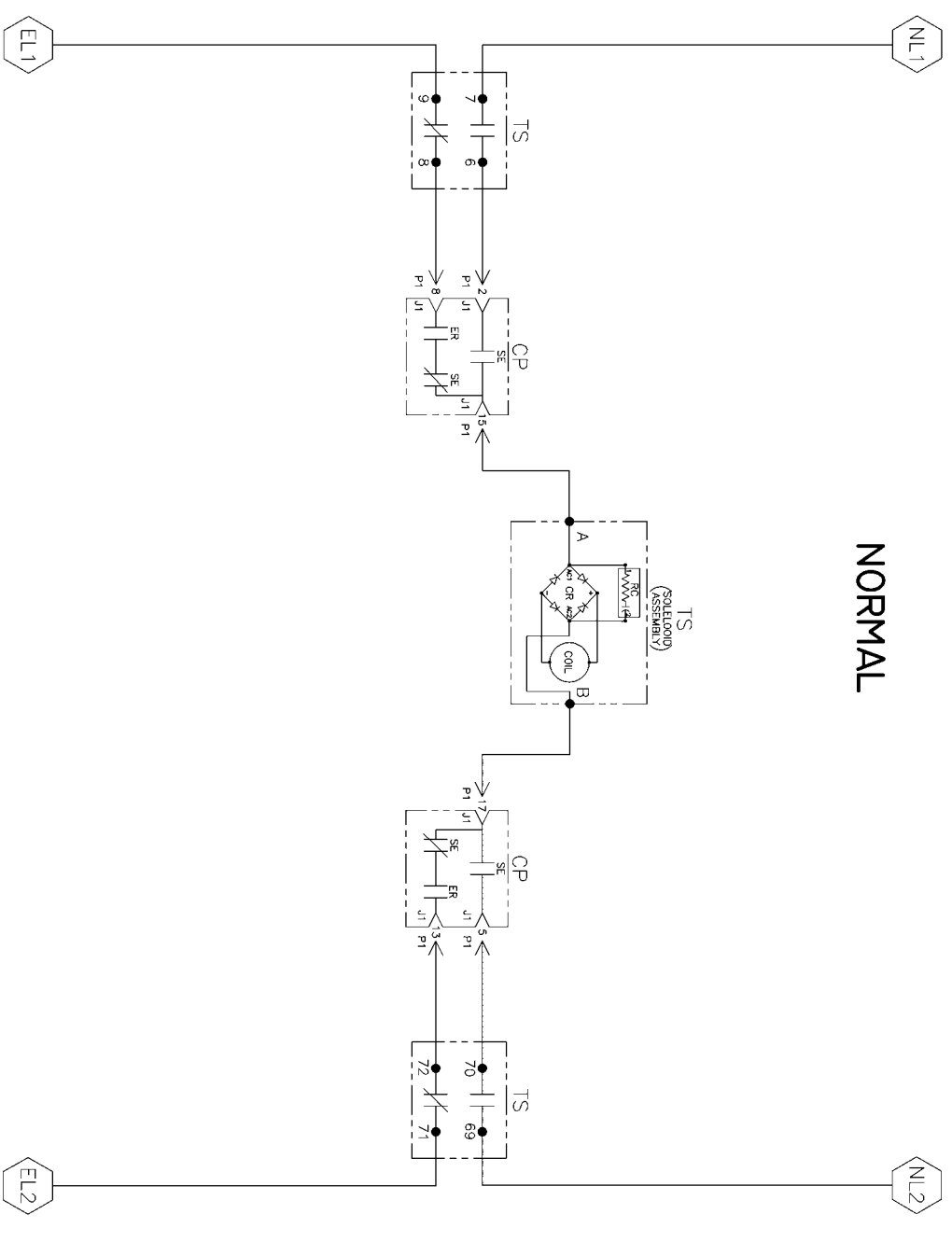


OPTIONAL NEUTRAL TYPES
 REFER TO "EXPLANATION OF CATALOG NUMBER CODES"
 IN CATALOG NUMBER CHART ON SHEET 1.
 • OVERLAPPING CONTACTS
 • SOLID BUS PLATE

NORMAL

NOTE:
 ATS SHOWN CLOSED ON NORMAL SOURCE.

TS OPERATOR CIRCUIT



NORMAL

EMERGENCY

E003000220400F1XC, 11BG, 14AA, 14BA
 Ventura County Fire Protection
 Fire Station No. 30
 03/27/13

TS	SOLENOID POSITION
6-7	CLOSED BEFORE
69-70	NORMAL IDXC
8-9	EMERG
71-72	

NOTE: TOP (RED CENTER) TRANSFER SWITCH TEST & ADJUSTMENT PROCEDURE SPECIFICS CONTROL OUT-OFF (CONTACT OPENING) SETTINGS.

PROJECT NAME: DIAGRAM	
SERIES: E300 ATS 1PH 225-400 AMPS	
"E" FRAME, GROUP 1 CONTROLS	
DESIGNED BY: RMH	DATE: 6/02
CHECKED BY: SDH	DATE: 6/02
PROJECT APPROVAL: SDH	DATE: 6/02
MANUFACTURING INSTRUCTIONS TO BE IN ACCORDANCE WITH ASCO PROCEDURE WP-1-003 FOR "E" FRAME TYPES SEE WP-1-003	
PROPERTY OF ASCO POWER TECHNOLOGIES, USE RESTRICTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.	
SCALE: DS	SIZE: DS
PROJECT NO.: 733500	DATE: 03/27/13
ASCO Power Technologies, L.P. 150489 BMW SDH 5/02	
ASCO Power Technologies, L.P. 150489 BMW SDH 5/02	
SHEET 2 OF 4	

A

B

C

D

A

B

C

D

61

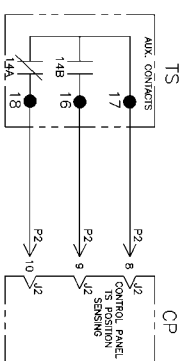
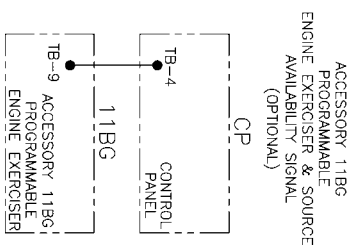
WIRE RUN LISTING

CONTROL SIGNALS & INDICATION

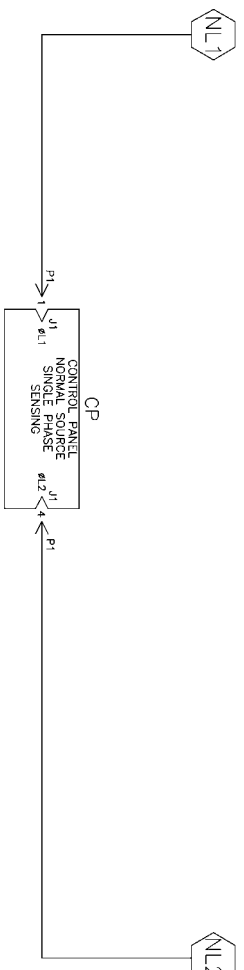
NORMAL SOURCE CIRCUITS

FOR 225-400 AMPS

WIRE No.	DESCRIPTION	CLR	AWG
1	TS-8-PT-8		18
2	TS-A-PT-15		
3	TS-6-PT-2		
4	TS-3-PT-4		
5	TS-B-PT-17		
6	TS-5-PT-12		
7	TS-4-PT-7		
8	TB-14-PT-2		
9	TB-15-PT-3		
10	TS-1-PT-10		
11	TS-2-PT-10		
12	TS-1-PT-1		
13	TS-16-PT-9		
14	TS-18-PT-10		
15	TS-70-PT-5		
16	TS-72-PT-13		
17	TS-4-1S-9		
18	TS-7-1S-1		
19	TS-3-1S-69		
20	TS-5-1S-71		
21	TS-4-1B-14		
22	TS-1-9-1B-15		
23	TB-16-PT-1		
11	TS-2-PT-10		

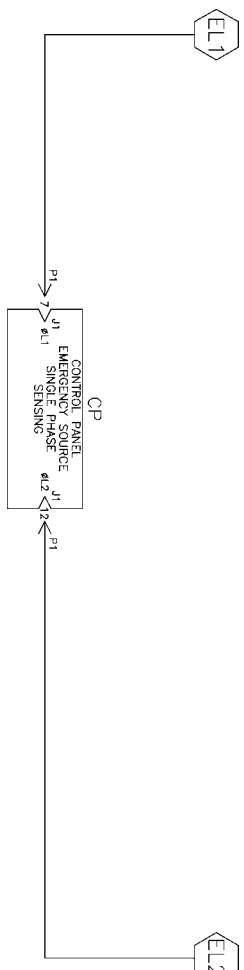


NORMAL



EMERGENCY SOURCE CIRCUITS

EMERGENCY



LOAD TERMINAL CIRCUITS

LOAD



E00300020400F1XC.11BG.14AA.14BA
 Ventura County Fire Protection
 Fire Station No. 30
 03/27/13

REV.	ISSUE	DATE
E	234078 BK	10/07/11
F	SEE ECN	
D	213453 WK	05/21/07
C	SEE ECN	
B	167603 BK	07/22/04
A	164762 BMW WK	9/03
	ADD 11BG	
	167248 BMW WK	7/02
	ADD PHYSICAL	
	159489 BMW SDH	5/02

PROJECT NAME: **DIAGRAM**

SERIES E300 ATS 1PH 225-400 AMPS

"E" FRAME GROUP 1 CONTROLS

MANUFACTURING INSTRUCTIONS TO BE IN ACCORDANCE WITH ASCO PROCEDURE WP-1-003 FOR CABLE TYPING SEE WP-1-003

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DATE: 5/02

SCALE: 733500

COMPUTER GENERATED DRAWING

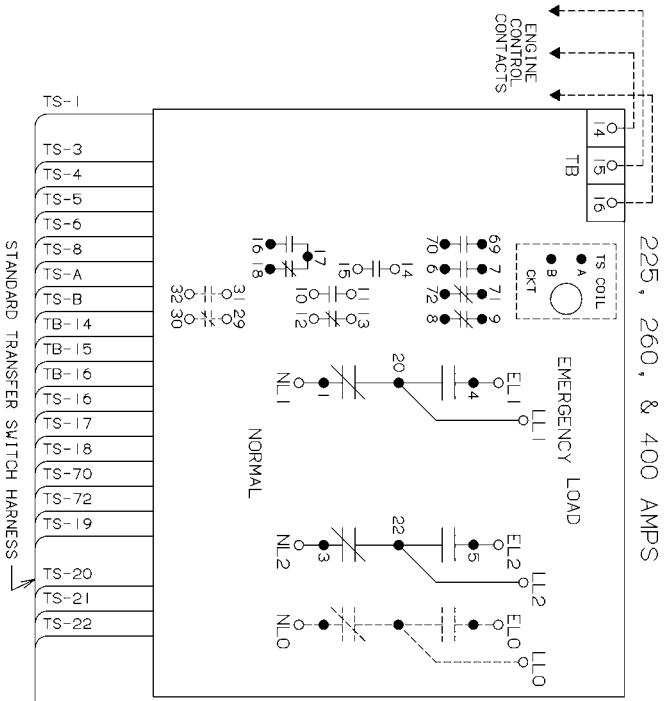
THIRD ANGLE PROJECTION

ASCO Power Technologies, L.P.
 14080 PARK NEW AVE. SUITE 0132 U.S.A.

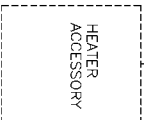
PHYSICAL DIAGRAM

ENCLOSURE

TS (TRANSFER SWITCH)
VIEW FROM INSIDE FRONT



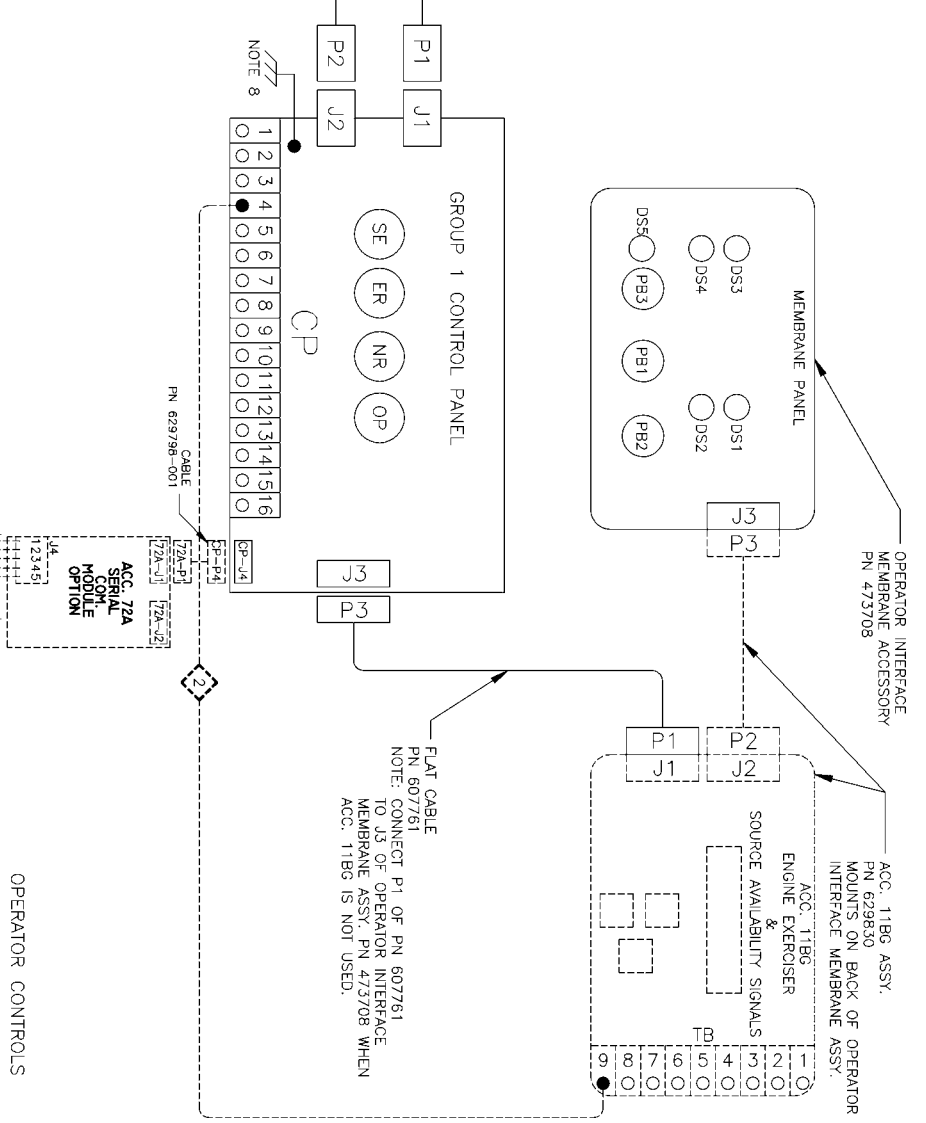
TO LOAD OF ATS
(OPTIONAL ACC. 446)
OR
TO CUSTOMER POWER
SUPPLY 120VAC
(OPTIONAL ACC. 44A)



DOOR HINGE

BONDING STRAP
PN 098323-019

DOOR (INSIDE)



63

OPERATOR CONTROLS

ID	DESCRIPTION
DS1	TS CONNECTED TO NORMAL
DS2	TS CONNECTED TO EMERGENCY
DS3	NORMAL SOURCE AVAILABILITY
DS4	EMERGENCY SOURCE AVAILABILITY
DS5	ENGINE EXERCISER
PB1	BYPASS TIME DELAY
PB2	TRANSFER SWITCH TEST
PB3	SET ENGINE EXERCISER

E00300020400F1XC, 11BG, 14AA, 14BA
Ventura County Fire Protection
Fire Station No. 30
03/27/13

PROJECT NAME: DIAGRAM									
SERIES E300 ATS 1PH 225-400 AMPS									
"E" FRAME, GROUP 1 CONTROLS									
DRAWN BY		DATE		MANUFACTURING INSTRUCTIONS TO BE IN ACCORDANCE WITH ASCO PROCEDURE WP-1-000		ASSM REF. NO.		SCALE	
RM/ML		5/02		SEE DRAWING		ASCO		DS	
CHECKED BY: SDH 5/02									
APPROVED BY: SDH 5/02									
PROPERTY OF ASCO POWER TECHNOLOGIES, USE RESTRICTED FOR OUR CUSTOMERS. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.									
FIRM: ASCO		DATE: 5/02		PROJECT NO.: 733500		SHEET NO.: 4 OF 4		SHEET TITLE: THIRD ANGLE PROJECTION	
FURNISHED BY: ASCO Power Technologies, L.P. FORTSMITH, ARK. NEW ABBEY 0732 USA.									



24-hour protection no matter when trouble strikes

ASCO SERIES 300 Power Transfer Switches for Power Outage Protection

Where would you be without a constant flow of electrical power? We often take for granted that power will always be around when we need it. In reality, power failures are very common. And when the power goes out, your business suffers. Power failures are unpredictable. They can occur at any time and for any number of reasons—a bolt of lightning, a power surge, a blackout, an accident or even equipment failure. They come without warning and often at the most inconvenient times.

It's for this reason that many businesses and other entities have invested in emergency power backup systems. Typically, the system consists of an engine

generator and an automatic transfer switch (ATS) which transfers the load from the utility to the generator.

An ATS with built-in control logic monitors your normal power supply and senses any interruptions. When the utility power fails, the ATS automatically starts the engine and transfers the load after the generator has reached proper voltage and frequency. This happens in a matter of seconds after the power failure occurs. When the utility power has been restored, the ATS will automatically switch the load back, and after a time delay, it will shut down the engine. With an Automatic Transfer Switch, you are protected 24 hours a day, seven days a week.





Typical Applications

Telecom

In the telecommunications industry, providing a high level of service and dependability is crucial. Lost power means an interruption in service for your customers and lost business for your company. For instance, with cell sites scattered across a wide geographical region and in many remote areas, the chances of an interruption in power are increased, making Automatic Transfer Switches a valuable resource at each location. To maintain dependable service, each cell site must be monitored 24 hours a day. This can be very difficult without some type of remote monitoring and testing capability. The SERIES 300 Transfer Switch, combined with ASCO's monitoring and control management system, is a cost-effective, packaged solution which can help meet both of these challenging objectives without a major investment at each cell site. With ASCO's connectivity solutions you can remotely monitor and control numerous sites from around the corner or around the world.

Agriculture

Maintaining electrical power is vital to an agriculture operation. If the flow of power is interrupted, your operation could be at risk unless the backup generator is quickly activated. A prolonged power outage can affect numerous aspects of the operation, from housing and feeding livestock to processing and producing the end product. With an ASCO SERIES 300 Transfer Switch, power will automatically be transferred over to your backup generator, eliminating the need to manually switch from utility to generator. When power is restored, the ASCO SERIES 300 Transfer Switch will, after an adjustable time delay to allow for utility stabilization, automatically switch the load back to the utility service.

Commercial / Retail, Light Industrial

The retail industry is very competitive. An electrical power failure can have a dramatic impact on a retailer's bottom line. If power is interrupted during peak shopping times, the effect could be extremely damaging to present and future business. A power interruption will not only suspend shopping, it can also create safety problems, result in lost transaction data, lost account information and damage to data collection equipment. In addition, retailers who rely on controlled climates to protect valuable inventory could suffer even greater losses, especially if the power failure occurs at a time when no one is available to rectify the situation. To avoid any of these power outage problems, simply install a backup generator with an ASCO SERIES 300 Transfer Switch and power outage concerns will be a thing of the past.

Municipal

The ASCO SERIES 300 Transfer Switch can be a critical component of a municipal government's emergency power backup system. Residents of townships, cities and counties rely on police, fire, ambulance/first aid and other critical public sector services. An interruption in power would affect the ability of emergency services to effectively respond to the needs of the community. When time is a critical factor, such as when responding to a fire alarm or an emergency call, an ASCO SERIES 300 Transfer Switch can be a lifesaver, switching power to the backup generator. While not all municipal services are a matter of life and death, they are always expected to be there.

Maximum Reliability & Excellent Value

With a SERIES 300 Transfer Switch, you get a product backed by ASCO Power Technologies, the industry leader responsible for virtually every major technological advance in the Transfer Switch industry.

The ASCO SERIES 300 was designed for one purpose—to automatically transfer critical loads in the event of a power outage. Each and every standard component was designed by ASCO engineers for this purpose.

The rugged construction and proven performance of the ASCO SERIES 300 assure the user of many years of complete reliability. The SERIES 300 is even designed to handle the extraordinary demands placed on the switch when starting or restarting stalled motors and switching high inrush loads.

ASCO's SERIES 300 modular, compact design makes it easy to install, inspect and maintain. All parts are accessible from the front so switch contacts can be easily inspected.

Features

- The SERIES 300 is listed to UL 1008 standard for Transfer Switch Equipment and CSA standard C22.2 for automatic transfer switches.
- Meets NFPA 110 for Emergency and Standby Power Systems and the National Electrical Code (NEC) Articles 700, 701 and 702.
- 30 through 3000 amps in a compact design.
- Available to 600 VAC, single or three phase.
- True double-throw operation: The single solenoid design is inherently inter-locked and prevents contacts from stopping between sources or from being in contact with both sources at the same time.

UL Listed Withstand & Close-On Ratings

Switch Ratings Amps	Available Symmetrical Amperes RMS		
	When Used With Current Limiting Fuses	Maximum Voltage	When Used With Specific Circuit Breakers
30	100,000	480v/60Hz	10,000
70 - 200	200,000	480v/60Hz	22,000
230	100,000	480v/60Hz	22,000
260, 400	200,000	480v/60Hz	42,000
600	200,000	600v/60Hz	42,000
600	200,000	480v/60Hz	50,000
600	200,000	240v/60Hz	65,000
800,1000,1200	200,000	600v/60Hz	65,000
1600, 2000	200,000	600v/60Hz	85,000
2600, 3000	200,000	600v/60Hz	100,000

Notes: 1. Current – limiting fuse should be Class J type through 400 amps: use Class L type above 400 - amp fuse rating
2. Refer to publication 1128 for specific manufacturer's breakers



Fig. 1: ASCO Power Transfer Switch rated 200 amperes shown in Type 3R enclosure

- There's no danger of the SERIES 300 ATS transferring loads to a dead source because the unique ASCO single-solenoid operator derives power to operate from the source to which the load is being transferred.
- Easy-to-read flush-mounted control and display panel provides LED indicators for switch position and source availability. It also includes test and time-delay bypass switches as standard features.
- Standard engine exerciser for weekly automatic testing of engine generator set with or without load.
- Adjustable time-delay feature prevents switch from being activated due to momentary utility power outages and generator dips.
- Supplied with solid neutral termination.
- Optional switched neutral pole available.
- Accessory kits available.
- Available for immediate delivery.
- Now available for service entrance applications. Contact ASCO for assistance.

ASCO[®] SERIES 300 Power Transfer Switches

Designed to Fit Anywhere

The ASCO SERIES 300 product line represents the most compact design of automatic power transfer switches in the industry. With space in electrical closets being at a premium, the use of wall or floor-mounted ASCO Power Transfer Switches assures designers optimum utilization of space.

All transfer switches through 2000 amps are designed to be completely front accessible. This permits the enclosures to be installed flush to the wall and still allows installation of all power cabling and connections from the front of the switch. Cable entrance plates are also standard on the 1600 and 2000 amp units to install optional side-mounted pull boxes for additional cable bending space.



Fig. 2: ASCO Power Transfer Switch rated 200 amperes



Fig. 3: ASCO Power Transfer Switch rated 400 amperes



Fig. 4: ASCO Power Transfer Switch rated 600 Amperes



Fig. 5: ASCO Power Transfer Switch rated 1000 amperes



Fig. 6: ASCO Power Transfer Switch rated 2000 amperes shown in Type 3R enclosure



Fig. 7: ASCO Power Transfer Switch rated 3000 amperes

ASCO[®] SERIES 300 Microprocessor Controller

The ASCO Microprocessor Controller is used with all sizes of Power Transfer Switches. It represents the most reliable microprocessor controller in the industry and includes, as standard, all of the voltage, frequency, control, timing and connectivity functions required for most emergency and standby power applications.



Fig. 8: ASCO SERIES 300 Microprocessor Controller

Voltage & Frequency Sensing

- Adjustable three-phase, close-differential voltage sensing on normal source.
- Normal source pickup voltage is adjustable to 95% of nominal; drop-out is adjustable from 70% to 90% of nominal.
- Frequency sensing on emergency source. Pickup at 95% and dropout at 85% of nominal.

Time Delays

- Adjustable time delay to override momentary normal source outages to delay all transfer switch and engine-starting signals.
- Transfer to emergency time delay--Adjustable from 0 to 5 minutes for controlled timing of load transfer to emergency.
- Re-transfer to normal time delay--Adjustable to 30 minutes.
- Five-minute unloaded running time delay for emergency engine generator cool down.
- Four-second time delay to ignore momentary voltage and frequency transients during initial genset loading.

Standard Selectable Features

- Inphase monitor to transfer motor loads, without any intentional off time, to prevent inrush currents from exceeding normal starting levels.
- Engine exerciser to automatically test backup generator each week--Includes control switch for testing with or without load.
- Selective load disconnect, double-throw contact to operate at an adjustable 0 to 20 second adjustable time delay prior to transfer and reset 0 to 20 seconds after transfer.
- 60 Hz or 50 Hz selectable switch.
Three-phase/single-phase selectable switch.

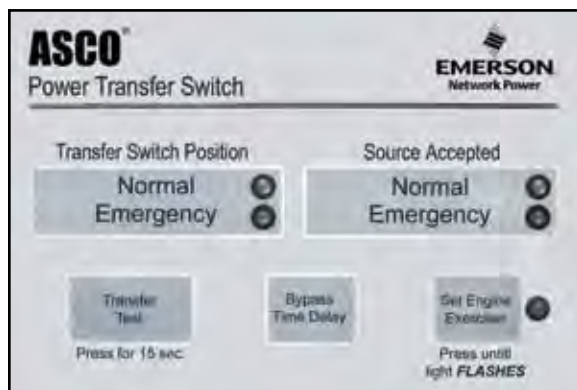


Fig. 9: Door-Mounted Control & Display Panel

Control and Display Panel

- Easy-to-read flush-mounted control and display panel provides LED indicators for switch position and source availability. It also includes test and time-delay bypass switches.

Remote Control Features

Terminal provisions for connecting:

- Remote test switch.
- Remote contact for test or for peak shaving applications. Circuit will be automatically bypassed if emergency source fails.
 - Remote time-delay bypass switch.

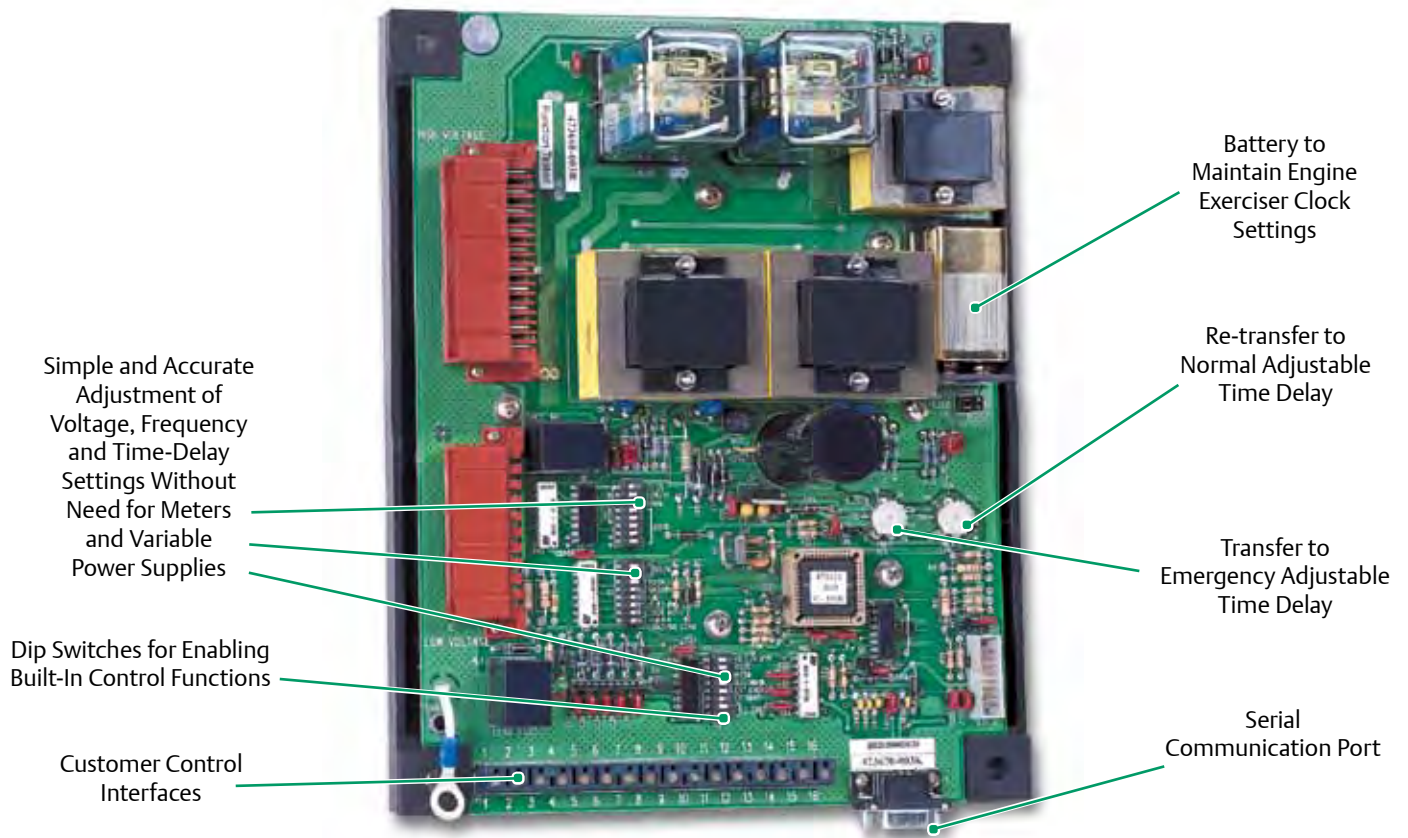


Fig. 10: Microprocessor Controller

Performance Features

- 600 volt spacing per UL and CSA standards.
 - Interfacing relays are industrial grade, plug-in type with dust covers.
 - Meets or exceeds the requirements for Electromagnetic Compatibility (EMC).
- | | |
|---|---|
| <ul style="list-style-type: none"> ● ANSI C37.90A/IEEE472 Voltage Surge Test ● NEMA ICS-109.21 Impulse Withstand Test ● Digital circuitry isolated from line voltages ● IEC 801-2 Electrostatic discharge (ESD) immunity ● ENV50140 and IEC 803-1: Radiated electromagnetic field immunity | <ul style="list-style-type: none"> ● IEC 801-4 Electrical fast transient (EFT) immunity ● ENV50142 Surge transient immunity ● ENV50141: Conducted radio-frequency field immunity ● EN55011: Group 1, Class A conducted and radiated emissions ● Optically isolated RS-485 Serial Port ● EN61000- 4-11 voltage dips and interruptions immunity |
|---|---|

Limited Warranty
ASCO Power Technologies®
300, 386, 4000 Series
Power Transfer Switches

This Warranty is given ONLY to purchasers who buy for commercial or industrial use in the ordinary course of each purchaser's business.

General:

ASCO Power Technologies, LP products and systems are in our opinion the finest available. We take pride in our products and are pleased you have chosen them. Under certain circumstances we offer with our products the following Twenty Four Month Limited Warranty Against Defects in Material and Workmanship.

Please read your Warranty carefully. This Warranty sets forth our responsibilities in the unlikely event of defect and tells you how to obtain performance under this Warranty.

TWENTY FOUR MONTH LIMITED WARRANTY AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP ASCO PRODUCTS COVERED:

Products Covered	Series 300/300SE/300L/ 386/4000
Automatic Transfer Switch	150, 200, 300
Service Entrance Transfer Switches	3AUS/3APS
Power Transfer Load Center Switch	300L
Non Automatic Transfer Switch - Electrically Operated	386
Automatic Transfer Switches, Open, Delayed, Closed Transition	4ATS,4ADTS,4ACTS
Non-Automatic Transfer Switches – Electrically Operated, Open, Delayed, Closed Transition	4NTS,4NDTS,4NCTS

LIMITED WARRANTY:

ASCO warrants that the ATS will be free from defects in material and workmanship and will conform to ASCO's standard specifications for the ATS for a period of eighteen (18) months from product purchase but in no case to exceed twenty four (24) months from the date of shipment from ASCO (the "Warranty Period"). This Limited Warranty does not extend to subsequent owners of the structure during the Warranty Period.

Terms of Warranty:

The foregoing Limited Warranty is conditioned upon User's compliance with the following:

1. The ASCO Power Transfer Switch is installed in accordance with ASCO specifications and state and local codes and standards by an electrician licensed in the state of installation.
2. The ASCO Power Transfer Switch is maintained in accordance with ASCO instructions and used under normal conditions for the purposes intended by ASCO.

All warranty field-related repairs, replacements or adjustments must be made by ASCO Services Inc. or its duly authorized representative.

Optional Available Extended Warranty

Optional extended warranty coverage may be purchased from ASCO for a specified fee at the time of the original sale. If purchased, warranty period shall be extended up to an additional thirty - six (36) months beyond the standard twenty - four (24) months to provide up to five (5) year coverage applicable to the above referenced products. The length of optional extended coverage shall be reflected on the ASCO invoice and/or order acknowledgement document.

Warranty Extends to First Purchaser for Use, Non-transferable:

This Warranty is extended to the first person, firm, association or corporation for whom the ASCO product specified herein is originally installed for use (the "User") in the fifty United States or Canada. This Warranty is not transferable or assignable without the prior written permission of ASCO.

Assignment of Warranties:

ASCO assigns to User any warranties which are made by manufacturers and suppliers of components of, or accessories to, the ASCO product and which are assignable, but ASCO makes NO REPRESENTATIONS as to the effectiveness or extent of such warranties, assumes NO RESPONSIBILITY for any matters which may be warranted by such manufacturers or suppliers and extends no coverage under this Warranty to such components or accessories.

Drawings, Descriptions:

ASCO warrants for the period and on the terms of the Warranty set forth herein that the ASCO product will conform to the descriptions contained in the certified drawings, if any, applicable thereto, to ASCO's final invoices, and to applicable ASCO product brochures and manuals current as of the date of product shipment ("Descriptions"). ASCO does not control the use of any ASCO product. Accordingly, it is understood that the Descriptions are NOT WARRANTIES OF PERFORMANCE and NOT WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE.

Warranty Claims Procedure:

Within a reasonable time, but in no case to exceed thirty (30) days, after User's discovery of a defect, User shall contact **ascopowerwarranty@emerson.com**. Subject to the limitations specified herein, an ASCO Services field service representative will repair the non-conforming ASCO product warranted hereunder, without charge for parts, labor, or travel expenses. Warranty coverage will apply only after ASCO's inspection discloses the claimed defect and shows no signs of treatment or use that would void the coverage of this Warranty. All defective products and component parts replaced under this warranty become the property of ASCO.

Warranty Performance of Component Manufacturers:

It is ASCO's practice, consistent with its desire to remedy Warranty defects in the most prompt and effective manner possible, to cooperate with and utilize the services of component manufacturers and their authorized representatives in the performance of work to correct defects in the product components. Accordingly, ASCO may utilize third parties in the performance of Warranty work, including repair or replacement hereunder, where, in ASCO's opinion, such work can be performed in less time, with less expense, or in closer proximity to the ASCO product.

Items Not Covered By Warranty:

THIS WARRANTY DOES NOT COVER DAMAGE OR DEFECT CAUSED BY misuse, improper application, wrong or inadequate electrical current or connection, negligence, inappropriate on site operating conditions, repair by non-ASCO designated personnel, accident in transit, tampering, alterations, a change in location or operating use, exposure to the elements, water, or other corrosive liquids or gases, Acts of God, theft or installation contrary to ASCO's recommendations or specifications, or in any event if the ASCO serial number has been altered, defaced, or removed.

THIS WARRANTY DOES NOT COVER shipping costs, installation costs, external circuit breaker resetting or maintenance or service items and further, except as may be provided herein, does NOT include labor costs or transportation charges arising from the replacement of the ASCO product or any part thereof or charges to remove or reinstall same at any premises of User.

REPAIR OR REPLACEMENT OF A DEFECTIVE PRODUCT OR PART THEREOF DOES NOT EXTEND THE ORIGINAL WARRANTY PERIOD.

THE PRODUCTS LISTED IN THIS WARRANTY ARE NOT FOR USE IN THE CONTROL AREA OR ANY REACTOR CONNECTED OR SAFETY APPLICATIONS OR WITHIN THE CONTAINMENT AREA OF A NUCLEAR FACILITY OR FOR INTEGRATION INTO MEDICAL DEVICES.

Limitations:

THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

USER'S SOLE AND EXCLUSIVE REMEDY IS REPAIR OR REPLACEMENT OF THE ASCO PRODUCT AS SET FORTH HEREIN.

IF USER'S REMEDY IS DEEMED TO FAIL OF ITS ESSENTIAL PURPOSE BY A COURT OF COMPETENT JURISDICTION, ASCO'S RESPONSIBILITY FOR PROPERTY LOSS OR DAMAGE SHALL NOT EXCEED THE NET PRODUCT PURCHASE PRICE.

IN NO EVENT SHALL ASCO ASSUME ANY LIABILITY FOR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES OF ANY KIND WHATSOEVER, INCLUDING WITHOUT LIMITATION LOST PROFITS, BUSINESS INTERRUPTION OR LOSS OF DATA, WHETHER ANY CLAIM IS BASED UPON THEORIES OF CONTRACT, NEGLIGENCE, STRICT LIABILITY, TORT, OR OTHERWISE.

Miscellaneous:

NO SALESPERSON, EMPLOYEE OR AGENT OF ASCO IS AUTHORIZED TO ADD TO OR VARY THE TERMS OF THIS WARRANTY. Warranty terms may be modified, if at all, only in writing signed by an ASCO officer.

ASCO obligations under this Warranty are conditioned upon ASCO timely receipt of full payment of the product purchase price and any other amounts due. ASCO reserves the right to supplement or change the terms of this Warranty in any subsequent warranty offering to User or others.

In the event that any provision of this Warranty should be or becomes invalid and/or unenforceable during the warranty period, the remaining terms and provisions shall continue in full force and effect.

This Warranty shall be governed by, and construed under, the laws of the State of New Jersey, without reference to the conflict of laws principles thereof.

This Warranty represents the entire agreement between ASCO and User with respect to the subject matter herein and supersedes all prior or contemporaneous oral or written communications, representations, understandings or agreements relating to this subject.