

Part 1 General

1.1 REFERENCES

- .1 CAN/CSA-C282 latest adopted edition - Emergency Electrical Power Supply for Buildings.
- .2 CSA C22.1 latest adopted edition - Canadian Electrical Code, Part I, Safety Standard for Electrical Installations.
- .3 CSA C22.2 No. 100-04 latest adopted edition - Motors and Generators.

Note: It is Contractor responsibility to be familiar with above standards.

1.2 SYSTEM DESCRIPTION

- .1 Standby generator system in winterized sound enclosure completes with the following equipment:
 - CSA approved.
 - Extended warranty (5-year minimum).
- .2 Diesel engine.
 - To ISO 3046-1.
 - Turbocharged, charge air-cooled, 4-cycle, rated power @1800RPM.
 - Block heater (1800W minimum).
 - Unit mounted radiator.
 - Standard duty air intake.
 - Air cleaner restriction indicator.
 - Initial fill of all fluids.
- .3 Alternator.
 - Rotating-field, 4-pole
 - Brushless, rare-earth permanent magnet
 - Insulation material/temperature rise: ANSI/NEMA MG1 Class H/130°C, Standby
 - 100% of rated standby current
 - Single-sealed bearing, flexible disc coupling
 - Designed to sustain short circuit at 300% of rated current for up to 10 seconds
- .4 Digital Genset Controller.
 - Colour touch screen (7.5" minimum)
 - Alarms and shutdowns per CAN/CSA-C282 latest adopted edition.
 - Local emergency stop
 - Communicate with personal computer via Ethernet network supporting Modbus protocol

- Load management to control up to 16 loads
 - Integral paralleling capabilities
 - Integrated voltage regulator with +/-0.25% regulation
 - UL classified Overcurrent Protection Device
 - UL6200 recognized device
 - Run relay
 - Failure relay
 - Contact relay board (15 contacts minimum)
- .5 Line circuit breaker types
- 600 A circuit breaker, 100% rated, LSI, electronic trip
 - Auxiliary contacts, breaker separators, shunt trip and wiring
 - 600A load bank breaker, 100% rated, LSI, electronic trip
- .6 Automatic transfer equipment with integral/manual bypass.
- Automatic mechanism is compatible with alternator.
 - Integral bypass
 - Programmed transition
 - Microprocessor ATS controls
 - 600A, 120/208V, 3-pole, 4-wire, solid neutral, 60Hz current rating
 - Standard power connections
- .7 Remote Annunciator.
- .8 Battery and battery charger.
- Battery-wet, 2/12V, (925CCA minimum)
 - Fully automatic, high efficiency battery charger, float with alarms, (24V-10A), designed for industrial environments.
- .9 Fuel supply system.
- Subbase fuel tank, rated and certified as per CAN/ULC-S601 and CSA B139.
 - Capacity, approx. 1100 litres, capable of 24-hour run time at 100% load (worst case).
 - Double wall construction.
 - Standard emergency pressure relief vent.
 - Standard low fuel level and leak detection switches.
 - Flexible fuel lines.
 - Inner tank leak alarm and low level detection switch.
 - Provide full tank of diesel.
- .10 Exhaust system.
- Designed to provide minimum sound pressure noted below.
 - Provide rigid/expansion supports/joints without fatigue and allow expansion of system.
 - Extension exhaust to clear nearby building air intakes minimizing fumes into building.

- .11 Steel mounting base.
 - Installed on existing site concrete pad.
 - Designed to withstand transportation, installation and normal operation of unit on concrete pad.
 - Vibration isolators.
 - Sound isolation pads between isolators and concrete base.
 - Adjustable to level unit.
- .12 Winterized sound enclosure:
 - Sound pressure at 7 meters: 75dB(A).
 - Internally mounted critical silencer.
 - Inlet and outlet snow hoods are installed to remove snow and ice accumulation with 90° (degree) angles to redirect air and reduce noise.
 - Motorized inlet and outlet dampers to comply with CSA B139, damper operation.
 - Acoustic insulation meets UL 94 HF1 flammability classification and repels moisture absorption.
 - Thermostatically controlled space heater to ensure internal temperature does not fall below 10°C at any time as per CSA 282 latest requirements based on project site location.
 - Enclosure is completely sealed from outdoor elements with lockable access doors.
 - Switch to control light fixture(s).
 - Install GFI receptacle(s).
 - 100A distribution panel installed to accommodate heaters, lights, GFCI receptacles and battery chargers.
 - All wiring in Teck cables and components are pre-wired to panel(s).
 - Provide weather-tight electrical feeder pathways and protect from corrosion into building.
 - Feeder(s) to exit from bottom of enclosure via supplied knockouts.
- .2 System designed to operate unattended as emergency standby power source.
- .3 The engine, alternator, and all major items of auxiliary equipment shall be products of manufacturers regularly engaged in the production of such equipment. The assembly shall be made up of coordinated components by an organization regularly engaged in assembling such equipment. The assembler or his authorized distributor shall maintain a Parts and Services Facility satisfactory to the Contract Administrator.
- .4 Supply and install surge arrestors on M.I. cable from control panel as recommended by cable manufacturer.
- .5 Before submitting tender, the manufacturers shall ensure the requirements of the specifications are met and the equipment to be supplied can be accommodated on the standby generator concrete pad with clearances to meet code requirements.

1.3 SPARE PARTS

- .1 Include:
 - .1 Two sets of filters are required for maintenance (e.g. air filter, oil filter, fuel filter, etc.)
 - .2 One set of belts.
 - .3 Two sets of consumable fuses.
 - .4 Special tools for maintenance and servicing.

1.4 SUBMITTALS

- .1 Submit as per drawings/specifications.
- .2 Product Data: Provide catalogue and data sheets of above equipment (SYSTEM DESCRIPTION) showing electrical characteristics and connection requirements. Include unit ratings, dimensions, arrangement drawing showing generator system mounted on steel mounting base, vibration isolators, exhaust system, drip trays, total weight and finishes. Also include:
 - .1 Performance test data/curves with shop drawings prior to manufacture of equipment.
 - .2 Procedures and tests by independent testing laboratory/agency to obtain certification.
 - .3 Short circuit capabilities.
 - .4 Operating charts.
 - .5 Schematic diagrams and controls; mechanical and electrical.
 - .6 Sequence of operation including:
 - .1 Detection/time in seconds of auto start and transfer to load and reverting back to normal power from cranking of engine to rated voltage and frequency.
 - .2 Manual starting.
 - .3 Auto shut down.
 - .4 Equipment alarms.
- .3 Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.
- .4 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.
- .5 Maintain one hard copy of document on site. Other hardcopies and PDF (thumb drive) to Contract Administrator to distribute.

1.5 OPERATION AND MAINTENANCE DATA

- .1 Four hardcopy sets and PDF version of Operation and Maintenance Manual

(supplied model unit) to include Operation and Maintenance data diesel generator and auxiliary equipment listed in above section SYSTEM DESCRIPTION.

- .2 Operation and Maintenance Manuals contain information for operation, maintenance and repair with following technical data:
 - .1 Certified copy of factory test data including test report.
 - .2 Certified copy of site test data.
 - .3 Maintenance instructions with schedules.
 - .4 Overhaul instructions and schedules.
 - .5 Site adjustments require for tune-up (e.g., setting of time delay relays, sensor calibrations).
 - .6 Exploded type drawings showing part numbers with part lists.
 - .7 Engine system diagram.
 - .8 Fuel system diagram.
 - .9 Exhaust system diagram.
 - .10 Electrical wiring diagram.
 - .11 Spare parts list.
- .3 Maintenance Data: Include battery maintenance and unit testing procedures.

1.6 WARRANTY

- .1 Full warranty on complete system, parts and labour etc. for a full one year from Substantial Performance sign-off acceptance date, except if 5-year extended warranty is included.

1.7 DESIGN/APPROVAL OF MATERIALS

- .1 Request for approval of material as equals or alternates to specified shall be submitted to the Contract Administrator in accordance with Tender Section B7 SUBSTITUTES.
- .2 Supplier to fully review Tender including all engineering discipline documents and parameters to ensure generator set design fully operates and provides all required components.

1.8 QUALITY ASSURANCE

- .1 Perform Work to CAN/CSA-C282.
- .2 Prior to shipping system, provide certified test results and copy/photos of certification labels to Contract Administrator.

1.9 QUALIFICATIONS

- .1 Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience, and with service facilities within 60 kilometres of Project.

1.10 REGULATORY REQUIREMENTS

- .1 Provide Products listed and classified by Canadian Standards Association, Underwriters Laboratories of Canada, Underwriters Laboratories and/or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.

Part 2 Products

2.1 MANUFACTURERS

- .1 Kohler Model 150REOZJF, 120/208V, 60Hz, 3Ph, 4W, 154kW/193kVA, output 534A
- .2 Acceptable Alternates: Caterpillar
- .3 Substitutions: Refer to Section DESIGN/APPROVAL OF MATERIALS

2.2 EMERGENCY POWER SUPPLY

2.3 RATINGS

- .1 Input Voltage: Volts as noted on drawings.
- .2 Output Power: VA as noted on drawings at 0.8 power factor.
- .3 Output Voltage: Volts as noted on drawings.

- .4 Inverter Output Frequency: 60 Hz
- .5 Efficiency: 90 percent minimum.
- .6 Battery: sealed type battery.
- .7 Accessories: As noted in Section SYSTEM DESCRIPTION.
- .8 Instrumentation and Alarms: CAN/CSA-C282 latest adopted edition
- .9 Charger: Dual rate, designed to maintain battery in full-charge condition during normal conditions.

2.4 REMOTE TROUBLE MONITOR

- .1 Instrumentation and Alarms: CAN/CSA-C282 latest adopted edition
- .2 Enclosure: Surface mounted with factory finish.

Part 3 Execution

3.1 INSTALLATION

- .1 Coordinate with other trades.
- .2 Install to manufacturer's instructions.
- .3 Install system secure, plumb and level.
- .4 Provide interconnection between panels/cabinets.
- .5 Provide wiring and pathways from generator control panels to automatic transfer switch as per drawings.

3.2 ONSITE TEST

- .1 Provide minimum seven days' notice to Contract Administrator of onsite test.
- .2 Perform test in accordance with CSA C282 latest adopted edition - Emergency Electrical Power Supply for Buildings.
 - .1 Provide test report to Contract Administrator for review and include with Operation and Maintenance Manuals.
- .3 Generator system supplier to provide factory-trained representative with:
 - .1 Travel to/from site.
 - .2 Inspect installation.
 - .3 Program controls.
 - .4 Verify, record and submit reports on all system operations.
 - .5 Setup and takedown of testing equipment.
 - .6 Load test (4-hour) at 100% rated load with readings taken at 30-minute intervals.

- .7 Verify operation by simulating outage.
- .8 Demonstrate normal operation of unit.

3.3 TRAINING

- .1 Generator system supplier factory-trained representative to include:
 - .1 A minimum of six hours “hands-on” training of all aspects/scenarios of the operation and maintenance (review of manual, automatic operation, review of controls, maintenance procedures, troubleshooting, etc.) of the generator system to personnel identified by the City.
 - .2 Digital recording of each training session to be submitted for future reference use.

END OF SECTION