Selection of Rental Generator Sets

Information Sheet # 17 | **Your Reliable Guide for Generator Maintenance**

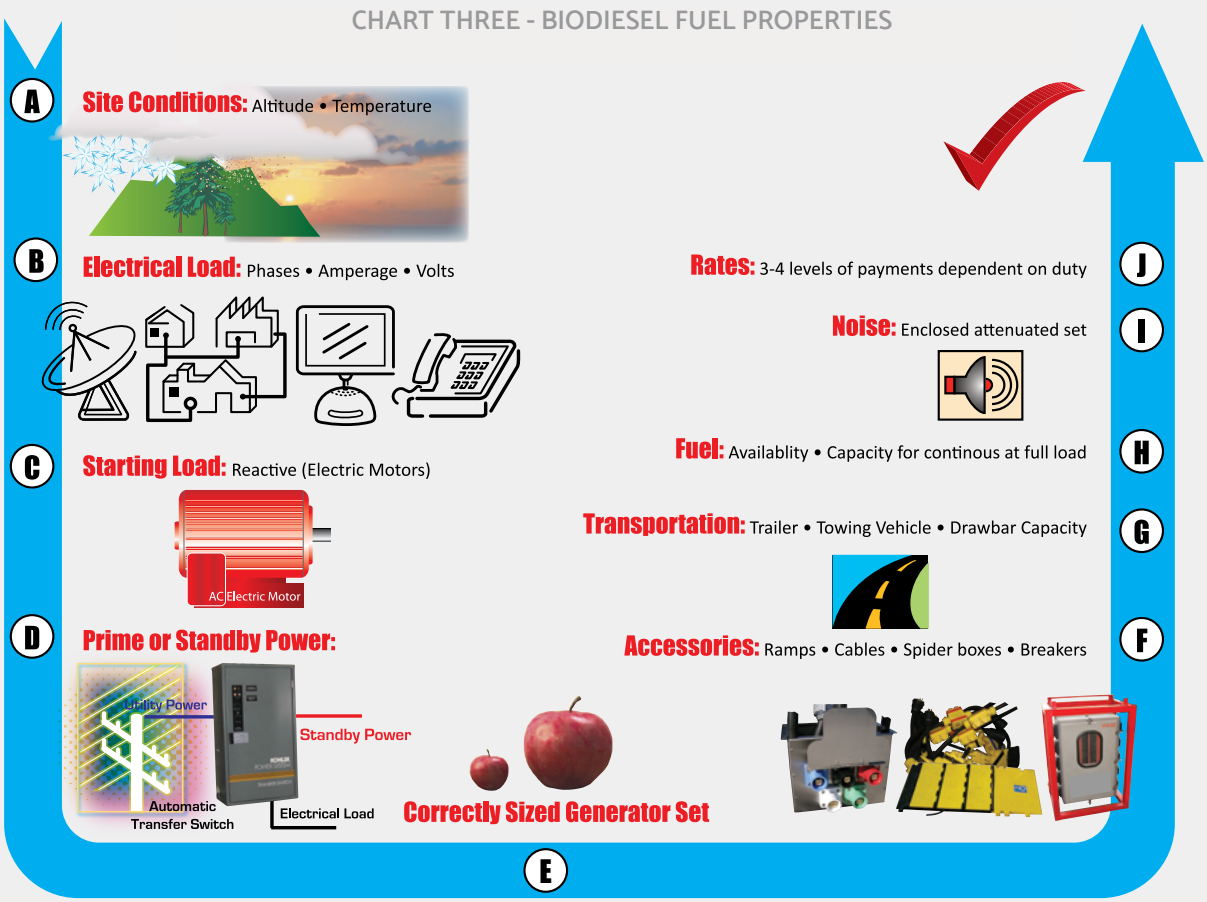
1.0 INTRODUCTION

Rental generator sets are available from power system providers for many purposes, including backup power while a critical standby installation is being serviced, emergency power due to weather related outages and power for special events.

This information sheet discusses key factors a power system manager considers when specifying and sizing a rental generator set.

2.0 SITE CONDITIONS

It is vital to know site conditions in order to calculate any generator derating factors that must be applied, especially for altitude and temperature. This will allow the rental company to compensate for any such output rating changes by supplying a larger or oversized generator than would be used if the set was operating under normal temperature and elevation conditions. Another factor to consider is the actual space available for the rental unit to be sure it can be accommodated at the site.



To fulfill our commitment to be the leading supplier in the power generation industry, the Loftin Equipment team ensures they are always up-to-date with the current power industry standards as well as industry trends. As a service, our **Information Sheets** are circulated on a regular basis to existing and potential power customers to maintain their awareness of changes and developments in standards, codes and technology within the power industry.

3.0 LOADS TO BE CONNECTED

The customer must provide details of all potential electrical loads that will be connected during rental, together with specific data including all voltages, amps, and the locked rotor kVA and power factor for starting any electrical motors:

- **Single-Phase Circuits -** Guide - (Volts X Amps)/1000 = k
- **Three-Phase Circuits** - Guide - Volts X Amps X 1.73 X 0.8pf = kW
- **Squirrel Cage Electric Motors -** Establish specific characteristics, including NEMA locked rotor code letter for calculation of starting kVA per horsepower of each motor. Available as: (a) direct-on-line with high resultant starting current – 6 to 10 times rated current, (b) Star-Delta, with starting current about 30% of (a), (c) Frequency Drives - where the electrical frequency to the motor is modulated between typical 0-250 Hz and the starting current is low - ranging from 0.5 to 1 times the rated motor current, and (d) Soft Start - where thyristors are used to reduce starting voltage.
- **Starting Of Electrical Loads -** If all electrical loads are required to start simultaneously, the generator will have to be a larger kW unit than if the loads can be started one after another. A rule of thumb in this case is to start the largest motor first and add the others one at a time, until all are running.
- **Prime or Standby -** Is the generator set going to be the only source of power, for example to provide an off-utility load, or will the generator set be used for backup standby power if the utility is not available?

4.0 SIZING

It is very important to correctly size the rental generator so that it meets the customer's actual needs. Over-sizing the unit could result in light loading of generator and possible wet stacking of the diesel engine, which can also cause damage and deterioration of the unit if the generator is run over long periods of time. Under-sizing the generator will cause the generator to provide insufficient power and therefore will not satisfy the customer.

5.0 ACCESSORIES

Where electrical cables, distribution lines, panels and other accessories are required, it is important to draw a sketch of the particular site with accurate measurements and locations of all loads. Cable runs should be designed not to exceed 300 feet due to line voltage drop. You should recommend the best positions for distribution and spider boxes. All cables must be correctly sized to carry the electrical loads without overheating or causing other problems. Cable ramps should be placed where the public will be walking over such cabling.

6.0 TRANSPORTATION

If the correct rental unit is a portable one, it is very important that it be towed to site by a towing vehicle with adequate capacity and drawbar pull, fitted with the correct ball joint to match the unit, and with electrical feed plug-in boxes to connect trailer lights and brakes.

7.0 DIESEL FUEL

Most rental generators have 'built-in' fuel tanks of a size that will allow continuous operation at full load. If the job entails longer operation, it is important that the customer consider arrangements to deliver supplies for on-site refueling. In such instances, portable, skid-base auxiliary fuel tanks may be the best cost-effective solution so all the generator equipment can be delivered to site at one time.

8.0 RATES

Many rental companies have a three- or four-level payment system dependent on the usage. The lowest is for standby duty, then single 8-hour shift, a 24-hour operation rate and high demand occasions (floods, hurricanes, earthquakes, tornados, ice storms, etc.).

9.0 SITE SERVICE

For long-term rentals, it is important to arrange for any service maintenance by qualified technicians on site, such as oil changes (normally after 250 hours operation), etc. Easy, safe technician access to the generator is important.

10.0 LOCATION AND PLACEMENT

The generator should be positioned out of high traffic areas wherever possible for easier fuel delivery and maintenance staff access. It must not be located too close to building air intakes, loading docks, or areas of poor access or ventilation.

11.0 NOISE REDUCTION

Question whether there are any special ultra-quiet requirements. Most rental generators are sound-attenuated for 68 to 70 dBA at 21 feet levels.