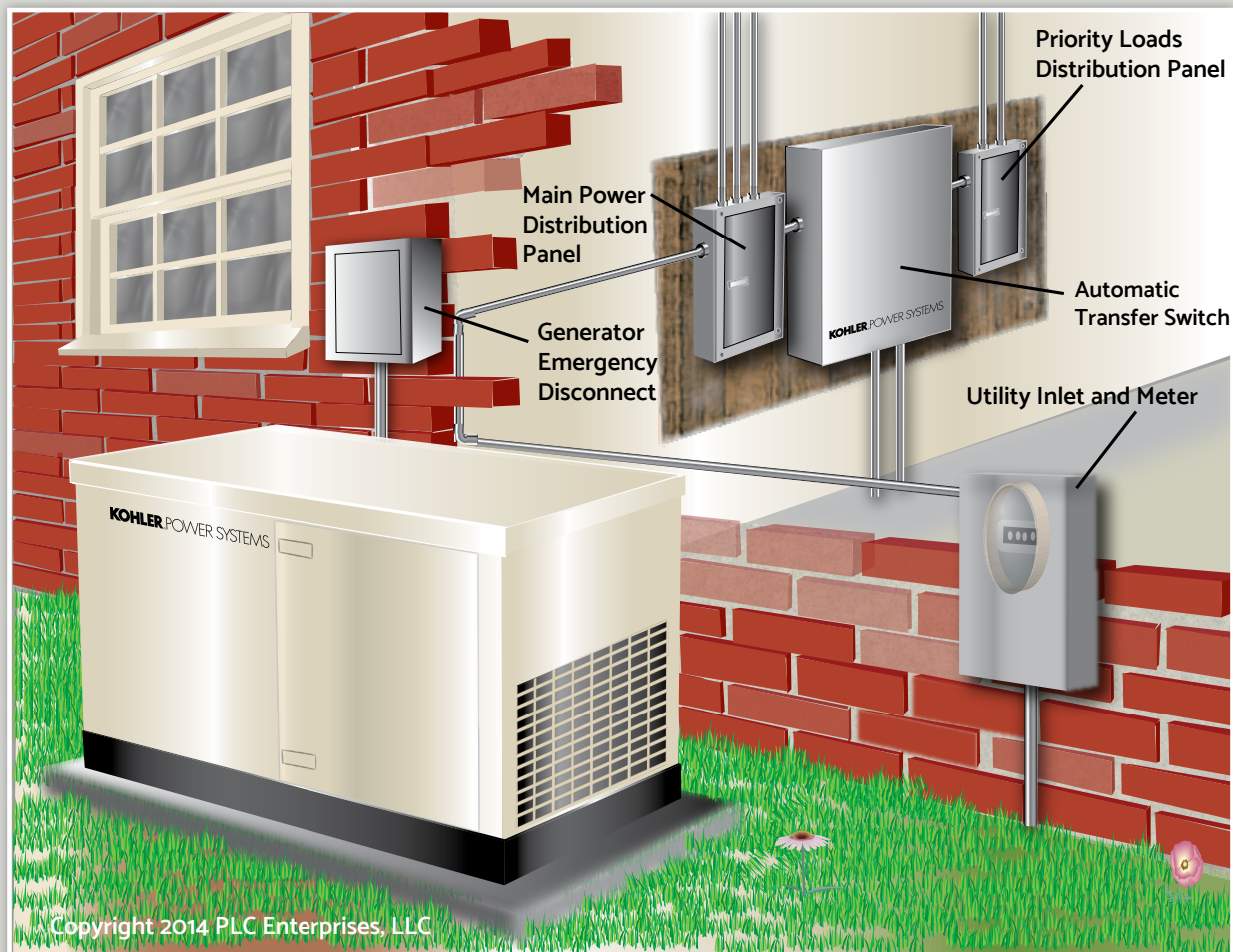


1.0 INTRODUCTION

As electrical demand rises and more utility companies operate at or near maximum output, we can expect to experience more frequent and wide-spread blackouts and brownouts. In addition, forecasters predict a higher incidence of weather-related power outages as changing global temperatures cause more frequent severe weather events, such as ice, snow and wind.

This information sheet discusses how a higher level of power outages coupled to an extended period of outage will affect the selection of residential power systems. Not all residential sets are designed for continuous operation. The user and system designer should be aware of the requirements of a set that may have to run longer than 24 hours.

The diagram below details the arrangement for a typical residential generator standby system. The chart on page 2 summarizes the factors that should be taken into consideration when selecting a residential set for extended power outages.



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.

2.0 RESIDENTIAL GENERATOR OPTIONS

The residential generator set market can be split into two basic categories, 3,600 rpm and 1,800 rpm models.

- 3,600 rpm** - Generator sets running at 3,600 rpm are coupled to 2-pole generator ends. A 3,600 set is more compact, incorporating an engine commonly found in lighter duty consumer applications such as lawn mowers and snow blowers. A 2-pole set relies on speed to attain the maximum power out of a smaller cube. Increased speed means the engine is under greater stress, which results in less hours between maintenance cycles. Increased speed also results in higher frequency vibration that has to be isolated from the residence.
- 1,800 rpm** - Generator sets running at 1,800 rpm are coupled to 4-pole generator ends. Engines designed to operate at lower speeds are primarily for industrial heavy-duty applications. The lower speed ensures longer periods of operation between maintenance cycles such as oil and filter changes. Lower speed results in less vibration and noise. 4-pole generator ends usually have a better wave form and closer voltage regulation than 2-pole machines.

FACTORS IN SELECTING A RESIDENTIAL SET TO RUN UNATTENDED IN OUTAGES EXCEEDING 120 HOURS

SPECIFICATION	TYPE	ADVANTAGE	DISADVANTAGE
Fuel: N.B. The home owner has to ensure there is sufficient fuel for the set to run for 120 hours	Gasoline	Readily Available	Dangerous to Store
		Does not gel at low temps	CO gas poisoning risk
	LPG/Natural Gas	120h capacity LPG tanks	
		Already in residential use	
	Diesel 1,800 rpm	Greater fuel efficiency	Gels without additives
		Less volatile than gas	
Oil and Filter Changes	3,600 rpm	Lower CO than gas	
			Oil change every 30 hours
	Diesel/LPG/NG	Oil will last for 1000 hrs	Filter replacement 30 hrs

RECOMMENDED RESIDENTIAL SET FOR OUTAGES EXCEEDING 120 HOURS

APPLICATION FOR GENERATOR	2-POLE 3,600 RPM	4-POLE 1,800 RPM
Short duration power outages under 24 hours	Yes	Yes
Purchase Cost per kW	Lowest	Higher
Quality of voltage and wave form	Lower	Higher
Power outages of several days	Unsuitable	Recommended
Life of equipment (based on areas prone to outages)	Lowest	Highest

3.0 THE IMPORTANCE OF REGULAR MAINTENANCE OF RESIDENTIAL POWER INSTALLATIONS

The most common reason for a generator set failing to start during a power outage is lack of maintenance. A qualified distributor of residential generator sets will offer to their customers a preventive maintenance program that looks to prevent the issues that lead to generator set failure.

A standby generator system sits stationary until the utility power fails. The following items have to be monitored while the unit is in the stationary mode and will be part of a distributor's preventive maintenance program.

1. **Battery condition** - Manufacturers and distributors maintaining systems highly recommend an automatic battery charger to maintain the battery in a fully charged condition. A battery will lose its charge over time.
2. **Exercise timer** - Most manufacturers incorporate into their automatic controls an exerciser timer that starts the set once a week to ensure all the controls are functioning properly.
3. **Fuel condition** - Both the amount of available fuel and its condition should be regularly monitored.

For maximum reliability in power outages longer than 120 hours, or even as low as 30 hours, a home owner should select a 1,800 rpm, 4-pole residential power system fueled by LPG, natural gas or diesel. For full details of the best system to select for any residential application, you should consult a reputable distributor or dealer in your area. Careful selection and continued maintenance of your generator set will make it more likely the generator starts when needed and continue to run through an extended power outage.

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