



**CLIFFORD**  
POWER

The power of dependability™

## Information Sheet # 28

Your Reliable Guide for Power Solutions

# Reliable Residential Power During Extended Outages

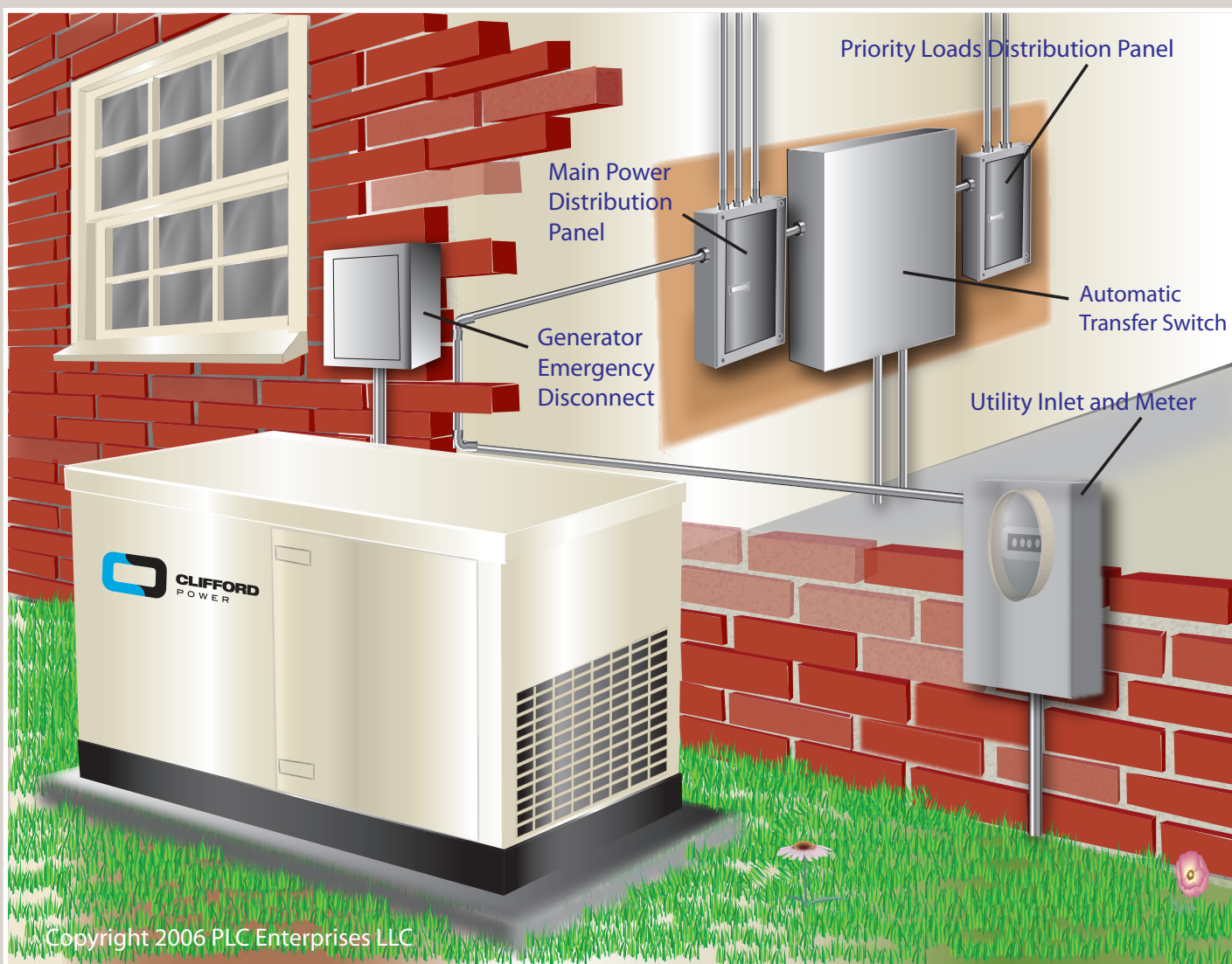
### 1.0 Introduction:

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.

*For full details of the best system to select for any residential application, you should consult a reputable distributor or dealer in your area.* (Continued over)



To fulfill our commitment to be the leading supplier and preferred service provider in the Power Generation Industry, the Clifford Power Systems, Inc. team maintains up-to-date technology and information standards on Power Industry changes, regulations and trends. As a service, our **Information Sheets** are circulated on a regular basis, to existing and potential Power Customers to maintain awareness of changes and developments in engineering standards, electrical codes, and technology impacting the Power Generation Industry.

The installation information provided in this information sheet is informational in nature only, and should not be considered the advice of a properly licensed and qualified electrician or used in place of a detailed review of the applicable National Electric Codes and local codes. Specific questions about how this information may affect any particular situation should be addressed to a licensed and qualified electrician.



Tulsa, OK  
(918) 836-0066

Oklahoma City, OK  
(405) 440-9201

Little Rock, AR  
(501) 907-5884

Dallas-Ft Worth  
(817) 640-5544

Longview, TX  
(903) 291-8305

Austin, TX  
(512) 477-6937

San Antonio, TX  
(210) 333-0377

Kansas City, MO  
(913) 312-2031

Houston, TX  
(346) 980-0266



## 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 automotive type 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
<b>Fuel</b>  Note: The home owner has to ensure there is sufficient fuel for the set to run for 120 hours	Gasoline (not available or recommended)	Readily Available	Dangerous to Store
		Does not gel at low temps	Short fuel storage life
	LPG	Long life fuel	Evaporation of vapor fuel in very cold climates
		On site storage	Finite tank capacity
	Natural Gas	No fuel storage	Potential fuel interruptions
		Already in residential use	Site availability/capacity
	Diesel 1,800 rpm	Greater fuel efficiency	Gels without additives
		Less volatile than gas	Finite tank capacity
		Lower CO than gas	

### 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	Highest
Quality of voltage and wave form	Lowest	Highest
Power outages of several days		Recommended
Life of equipment (based on areas prone to outages)	Lowest	Highest

## 3.0 The importance of regular DAILY maintenance of residential power DURING EXTENDED RUN TIMES:

***During extended power outages, consult your owner's manual for manufacturer recommendations on daily maintenance checks.***

## 4.0 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 planned 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 planned 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. Oil & Filter Changes** - The manufacturer's recommended maintenance schedule should be followed.

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.

***Careful selection and continued maintenance of your generator set will make it more likely the generator starts when needed and continues to run through an extended power outage.***