

Guide to Selecting Residential Generators

Information Sheet # 29

1.0 Introduction:

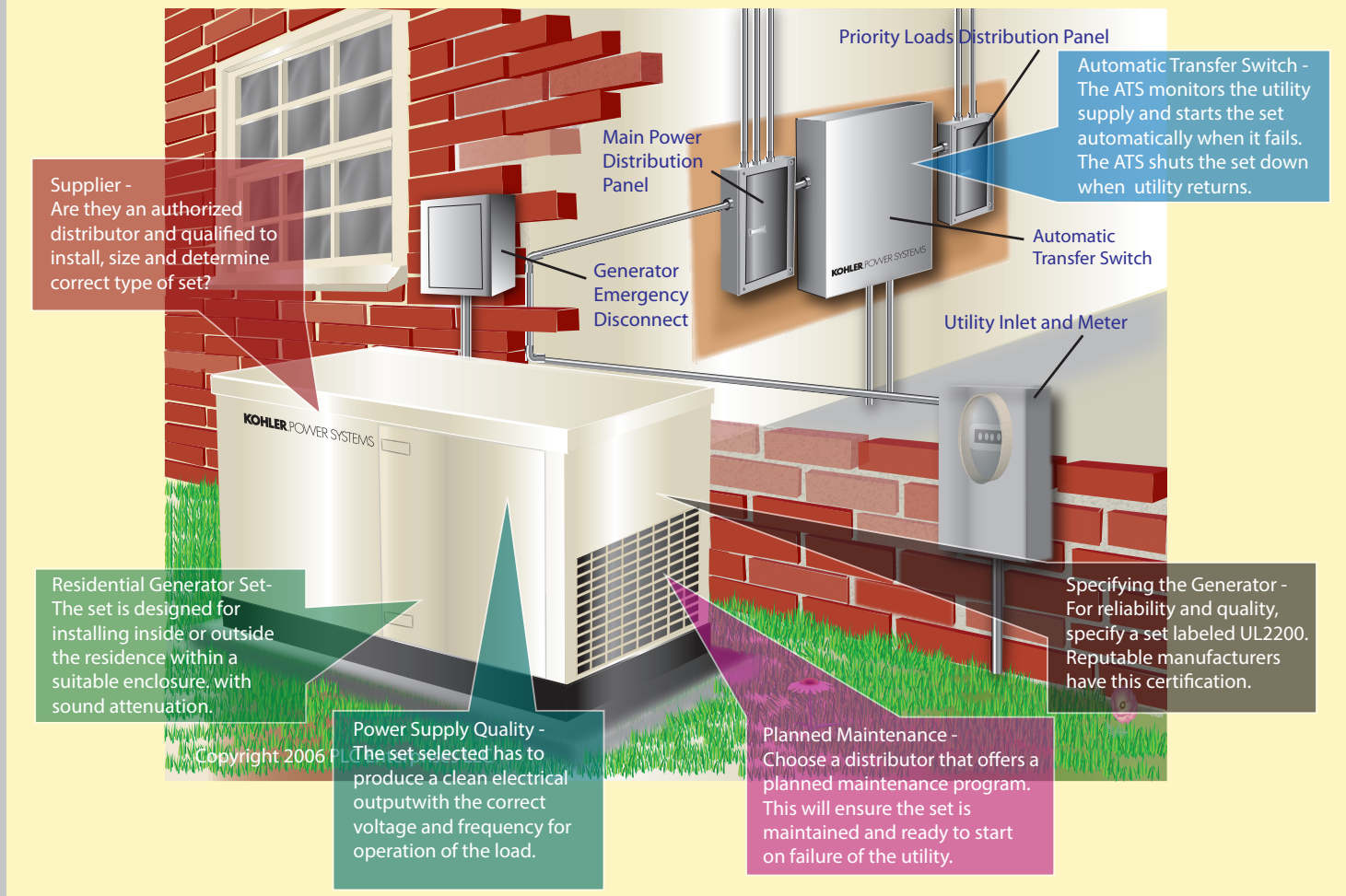
When selecting a generator set to supply standby power for a residence the primary consideration are to choose between a portable or permanently installed unit designed for residential use and how to determine the kW size.

This information sheet discusses the advantages of permanent installation, sizing criteria and preferable supply sources.

2.0 Portable Units:

These are normally limited to about 8kW maximum and have to be placed outside the residence (including a garage) during operation, in a well ventilated spot, and at least 15ft away from any windows or doors.

Selecting the Right Generator Set for a Residential Application



To fulfill our commitment to be the leading supplier and preferred service provider in the Power Generation Industry, the Nixon Power Services 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.



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Principal characteristics of portable sets are:

- Portable generator usually operate on gasoline and will run certain major appliances using electrical extension cords from the generator, passing through an opening to the appliance.
- Most portable units only run at 3,600rpm and are therefore noisier and have relatively short lives. *(Continued over)*
- The gas tank will have to be replenished every 6 to 8 hours of operation. It is advisable to shut the generator off with sufficient time to cool down before attempting to refill the tank to avoid any risk of fire.
- Strict care must be taken to avoid any deadly carbon monoxide poisoning.

3.0 Sets Designed for Residential Use:

Residential sets are designed to be permanently installed outside the home and are offered in two power ranges, 8 to 17kW to operate selected loads during the emergency and up to 125kW with sufficient capacity to power the whole home if so desired.

Principal characteristics of residential sets are:

- They come with an automatic transfer switch mounted either inside or outside the house.
- This ATS constantly monitors the utility electrical supply for failure or interruption and will automatically start the generator within 10 seconds or less, if it detects any failure and transfer the loads to the generator once it has reached nominal voltage and frequency.
- Auto shut-down will take place once the utility has been restored with load transfer back to the mains. The unit will be run for several minutes to cool down.
- The most popular size today is 12kW and this will probably increase in future years.

Generator sets specifically designed for residential use will provide many years of protection and can operate essential services automatically, even while you are away from the house. We will cover the latter type of standby or emergency generators to a greater extent, with considerations and recommendations of major points and decisions that need to be taken into account during the purchasing process. Normal fuels are: a) natural gas, or b) liquid petroleum gas (LPG). Larger sets are also available as diesel powered.

4.0 Selecting a Supplier:

When selecting a residential power system it is very important to use the services of a reputable and authorized local dealer.

A dealer will offer to the householder the following services and resources:

- Carry out a careful study to ensure that you select the correct kW size of residential set that will have adequate electrical power to best meet your requirements during a power outage.
- Assist with the complete installation, fuel hook-up, and start-up by qualified technicians.
- Provide planned maintenance service every six or twelve months to ensure the generator is kept in its best operational condition minimizing possible failures during an outage.
- Ensure compliance with all local codes, noise and emission restrictions and permits that must be obtained for these units.
- Factory warranty from the manufacture.

While new homes can be designed and built pre-wired for a residential set a dealer is fully experienced in applying a generator set to a residence not having a built in system.

5.0 Specifying a Residential Generator Set:

The majority of residential generators are supplied with a weather-proof, rodent-resistant metal housing, either in steel or aluminum. Sound attenuation material is fitted to reduce the noise levels – normally about 65dBA's at 7-meters, at full load.

The following should also be considered when selecting and specifying a residential set:

- While kW size is a determining cost factor, it is best to specify a quality generator brand with necessary accessories within the budget.
- A quality set with an UL2200 label will assure trouble-free life, durability and increase the resale value of the home.
- Specify a set that gives clean, stable and safe electrical power is essential, particularly with today's sensitive electronics.
- An auto exerciser should be included to start and run the set each week.

6.0 Location of Generator Set:

The generator should be installed at a reasonable distance from the house with good air flow for proper ventilation and the USDA Forest Service-approved exhaust facing away from any prevailing winds and windows/doors.

7.0 Essential Loads:

At a minimum the kW rating of the set should have sufficient power for applications like: refrigerator, freezer, air-conditioning, dehumidifier, water heater, furnace fan, fans, sump and/or well pump, garage door opener, personal computer and/or home office, lighting, radio and TV, and security system. This is particularly important for the protection of the elderly and young children and will also avoid the possibility of water pipes bursting with freezing, food damage and spoiling, etc.

8.0 Standard Accessories:

Supply normally includes: engine and alternator, base without need for concrete mounting pad, battery cables and static charger, line circuit breaker, ATS, critical silencer, and all necessary controls and fittings for its correct operation.

9.0 Optional Accessories:

In selecting a generator set the dealer will recommend and advise of the following accessories:

- Battery
- Carburetor heater (recommended for reliable starts at temperatures below 0°C (32°F))
- Battery blanket or heater for low temperature sites
- Braided steel flexible fuel lines
- Gas strainers
- High wind enclosure doors
- Selection of ATS choices with: built-in load center, digital controls
- Different ATS amp sizes to suit loads
- Remote monitoring devices and annunciators
- External alarm modules
- Maintenance kits