Planning Your Lister Petter Power Supply

Having decided to utilise a Lister Petter Generating Set it is important to take great care in planning the correct size. Maximum efficiency, and thus maximum economy can only be gained with the correct size of set running at its optimum level.

The most certain way to determine the correct unit for your application is to contact your Lister Petter distributor for advice and to discuss some of the problems that may arise.

Planning Your Supply

Is the set to be a prime source of power or is it providing standby protection for some other source?

Where it is to provide base power think carefully about the appliances you are going to buy. Take a domestic situation as an example.

Choosing Your Electrical load

You can go 'all electric' if you wish but you may improve efficiency if you choose your electrical load with discretion. The list below shows various appliances which tend to consume a lot of power and may considerably increase the size of the set you require. Appliances such as refrigerators and central heating pumps operate intermittently via a thermostat often when there is no other electrical load connected and therefore necessitate the running of non-automatic sets continuously or result in very frequent starting and stopping of automatic sets. Thus solid fuel central heating/cooking/hot water systems together with bottled gas or kerosene refrigerators are recommended when no mains electricity supply is available.

Approximate Consumption in Watts

Razor	5
Radio	50
Record player	50
Light bulb	40-150
Health Lamp	150
Television	150-300
Oil fired boiler	200
Central heating pump	300
Refrigerator	200
Deep freeze	400
Vacuum cleaner	250-550
Food mixer	100-450
Domestic water pump	500
Hair dryer	350-500
Washing machine	
- without heater	500
- with heater	3000
Iron	750-1200
Toaster	750-1250
Kettle	1000-3000
Fire	1000-3000
Window type air conditioner	2500
Immersion heater	3000
Dish washer	3000
Cooker	3000-12000
Rotary iron	1200
Infra-red wall heater	1200-1750
Coffee pot	590
Infra-red cooker	1200-1750
Liquidiser	300
Personal Computer	300-350
Inkjet printer	100-200
Laserjet printer	1000-1500

The Size of Set Required

Your set must be large enough to cater for your maximum demand for power at any one time. This is not necessarily the same as your total electrical load.

It is recommended you follow these steps:

1 Make a list of all your electrical appliances and their actual power consumption in watts (this is usually marked on the rating plate).

2 Consider all the conditions when your demand for power is likely to be high and pick out the items which might be in use at any one time under each.

3 Determine which combination results in the biggest number of watts. This is your maximum demand.

4 Add an allowance for future additions and divide by 1000 to convert your total to kilowatts (kW).

5. Specify the next convenient size of Lister Petter generating set.

Typical Electrical Load

10 x 60W lights	600W
5 x 100W lights	500W
Record player	50W
Kettle	2000W
Coffee pot	690W
Iron	1200W
Food mixer	450W
Domestic water pump	500W
Washing machine/heater	3000W
Hair dryer	350W
Space heater	2000W
Toaster	1000W
Television	200W
Vacuum cleaner	550W
PC and inkjet printer	400W
Total Electrical Load	**13490W**

Typical Maximum Power Required

2 x 60w lights	120W
1 x 100w light	100W
Kettle	2000W
Iron	1200W
Domestic water pump	500W
PC and printer	400W
Space heater	2000W
Plus 10% for future additions	632W
Total Demand	**6.952kW**
Minimum Set Requirement	**7.0kW**

Protecting Essential Loads

If the set is providing standby protection, can you select essential loads from those that could be allowed to lapse?

For instance, in an intensive chicken farm, the cooling fans must continue running but, perhaps, lights could stay off or be reduced.

This could save a great deal of capital investment.

Motor Loads

Perhaps the biggest single problem area when sizing a set is that of motor loads. Electric motors require more power to start than to run, but the difference varies between types of motor starting.

In addition, a portion of the surge may be so transient that it need not be taken into account. A 'rule of thumb' is often used to calculate the surge requirement but it should be stressed, ask your Lister Petter Distributor for advice.

Multiple Motor Loads

Some saving may be made where multiple motors are in operation by 'staggering' the start.

Example:

If 3 x 2hp motors are used, the starting surge of each may be 6kVA and starting all three together would require 18kVA.

Set 'A' starts:
6kVA falling to 2kVA

Set 'A' running, Set 'B' starting:
8kVA falling to 4kVA

Sets 'A' and 'B' running, Set 'C' starting:
10kVA falling to 6kVA

The running load in the above example would fall to 6kVA leaving a spare capacity of 4kVA, assuming that other loads are added in after all the motors are started.

Voltage and Frequency

Ensure that the voltage and frequency of any appliance you propose to use are the same as the voltage and frequency of your Lister Petter Generating Set.

For outputs up to 10.5kW 50Hz (12.5kW 60Hz) single phase is often most convenient. Above this size, particularly if the load includes motors of more than 1 horsepower, 3 phase sets may be preferred.

Your Local Lister Petter Distributor

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