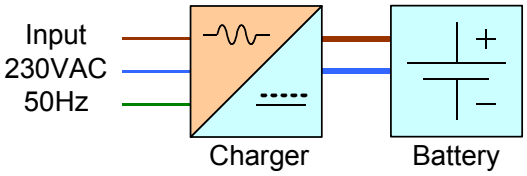
powerguard

CHARGERS

Stand-alone Chargers

General Information

Powerguard Battery Chargers are conceived as a total charging system and are designed to ensure the maximum life and reliability from the battery. The chargers are used mainly in stand-by systems but can be configured to charge all lead acid and Nickel Cadmium batteries used in many diverse applications.



There are three standard modes for the chargers as follows:

- Float
- Float with a standing load
- Three stage

Three stage charges the battery quicker and is the standard charger on most stand-by systems. Powerguard are the largest OEM manufacturer of Static Inverter Emergency Lighting Systems in the UK. In fact most of the chargers we manufacture are used in these systems. They have to rugged and reliable because they are installed in critical applications where safety is the paramount concern. They are installed in hospitals, theatres, cinemas, office blocks, factories and many other public buildings.

Powerguard chargers are very reliable and will give long and trouble free service with the minimum maintenance.

They use thyristors to control the charge rate and this is the preferred method for the following reasons:

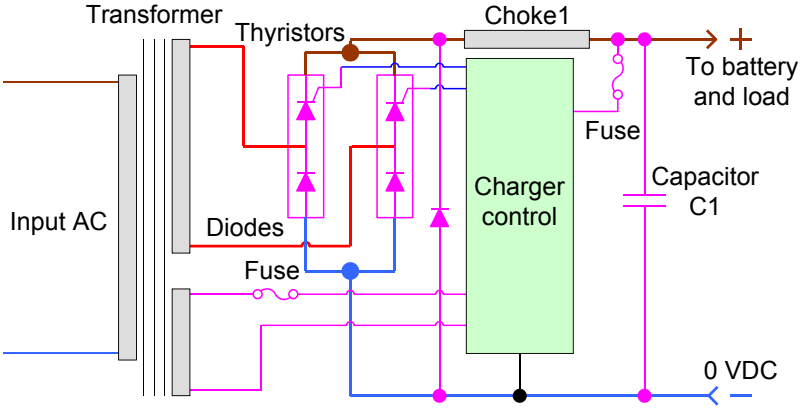
- Reliability - this type of charger is proved to be very rugged.
- Scalability - the design allows chargers to be built to suit many different applications quickly and economically.
- Cost - it is a very economical way to produce relatively small quantities of special chargers.

The chargers can have multiple individually controlled outputs for keeping emergency vehicle batteries fully charged.

- **RUGGED & RELIABLE**
- **EASY TO OPERATE**
- **VIRTUALLY SILENT**
- **SAFE OPERATION**
- **LONG LIFE**
- **LOW MAINTENANCE**
- **VRLA BATTERIES**
- **WET CELL LA BATTERIES**
- **NICKEL CADMIUM BATTERIES**
- **TRACTION BATTERIES**
- **FLOAT & THREE STAGE**
- **TEMPERATURE COMPENSATED**

Charger System

The simplified schematic below shows the basic elements of the charger. The input AC is fed into the transformer. Output 1 feeds the thyristor controlled bridge rectifier and output 2 provides power for the control board. The charger is microprocessor controlled and has many standard functions. The control alters the phase angle of the thyristors to regulate the voltage and limit the current.



The output of the thyristor controlled bridge rectifier is fed into a critical inductance choke filter to minimise the ripple on the battery and the interference sent back into the AC supply. The output goes the battery.

POWER IS OUR BUSINESS

Float Charge

Most lead acid and nickel cadmium batteries have a voltage per cell that when applied keeps the battery fully charged and at the same time minimises the gas generated reducing the need to add water. In the case of Valve Regulated Lead Acid batteries (VRLA) the voltage applied has to be closely regulated because the gasses are recombined within the battery. If the voltage is too high pressure will rise and the gas will be vented to the atmosphere. This will reduce the life of the battery significantly.

Powerguard chargers maintain an accurate float charge voltage enhancing battery life.

The float charge method is usually chosen if there is a load connected to the battery. The charger must be rated to supply the load and charge the battery.

Three Stage Charging

Three stage charging is the normal method used for stand-by systems because it will charge the battery faster restoring the emergency cover in the minimum time.

When the charger is powered up into a discharged battery it is in current mode maintaining a constant current at a pre-set level. In this mode the voltage is also set higher to ensure the current level is maintained for longer even when the voltage on the battery starts to rise. As the battery becomes charged the voltage rises and starts to reduce the current. The current is monitored and when it falls to a pre-determined level a timed period starts. When the timed period has elapsed the charger goes into voltage mode and floats the battery at the correct voltage. The battery is kept fully charged without causing damage by excessive charging.

Temperature Compensation

Batteries are rated at a temperature of 20°C or 25°C. As the temperature rises above this median point the electrochemical activity in the battery increases and, conversly decreases as the temperature falls. To prevent damage due to over or under charging of the battery the charge voltage must be compensated. Powerguard chargers measure the ambient temperature and for every °C change will adjust the voltage by a pre-set amount.

The chargers are also factory set to stop the charge at temperatures over 40°C and below 0°C. Alternative settings can be provided if required.

Auto Check

Auto Check is in addition to the many checks that the control carries out to make sure the charger is functioning properly. Every four hours the charger shuts down for twenty seconds to check that the battery is connected properly. If there was a bad connection, a contactor open or a fuse blown it gives a visual and audible alarm.

Conclusion

Powerguard chargers are the result of many years of design, development and experience. Battery life, reliability, performance and efficiency are the three most important design criteria with battery life and reliability top of the list. We believe these machines should give long and trouble free service.

Careful design has resulted in robust performance and long battery life.

Powerguard chargers are ideal for many applications where batteries need charging. They are already used extensively for Emergency Lighting, Inverter/Generator Systems, Standby Systems, Remote Power Systems and Vehicle Power Systems.

Powerguard chargers are designed for "fit and forget" and will give many years of reliable service even in the most demanding environments.

Powerguard Inverter Range

Powerguard chargers can be supplied with power output ratings as follows:

Charge current up to 600 Amps

The DC output can be specified between 2VDC and 600VDC

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