

All you need to know about alternators

To quickly charge the batteries while the engine is running we recommend a second 'high output' Mastervolt alternator on the engine.

Why a Mastervolt alternator?

Standard alternators, originally designed for the car industry, only deliver sufficient energy to both charge the batteries and power the various onboard consumers when they reach a very high rpm. These alternators also tend to be temperature-sensitive: In a higher ambient temperature, such as that common in the engine room of a boat, their output quickly falls by up to 50%. This is not a problem in cars as the small amount of energy used during, for instance, starting can be recharged in no time, and windscreen wipers, ventilators and the like do not need a great deal of power. In general, a car engine also runs at a far higher rpm compared to a boat's diesel engine, and the temperature under the bonnet is lower due to the cooling effect of the head wind.

Specially designed for ships

Mastervolt Alpha alternators are specially designed to provide sufficient power even with a low rpm. A pulley ratio of 1:3 and an engine idle speed of around 700-800 rpm will generate substantial current for charging the battery sets and powering the connected equipment. Mastervolt alternators are also resistant to the high temperature of the engine room, allowing the engine to serve as the energy source for onboard consumers and as a quick charger for the service and starter batteries. Make sure you do not choose too small an alternator. A larger one will ensure that the battery is charged faster and engine hours are kept to a minimum - we suggest choosing an amperage of between 30 and 50% of the battery capacity.



Alpha Pro charge regulator, standard with the Mastervolt alternator.



With special voltage regulator

In addition to having to provide high current at low rpm, onboard alternators also require good voltage regulation. The standard alternator designed for road vehicles has a voltage regulator mounted to the alternator and set to 14 or 28 Volt. This is sufficient for a car battery, which is rarely if ever discharged. Furthermore, the voltage regulator of a car is often temperature sensitive and in high temperatures regulates the voltage even further down, often to 13.5 or 26.5 Volt. This is way too low for sufficiently recharging a depleted battery. The maximum remaining battery capacity appropriate for these voltage levels is around 60 to 70%. The lifespan of a battery is therefore significantly lower if it is never properly charged. In order to adequately recharge a partially empty or completely flat battery at 25 °C, voltage would need to be 14.25 Volt for a 12 Volt battery and 28.5 Volt for a 24 Volt one. Once the battery is 100% full, this voltage must be reduced to 13.25 or 26.5 Volt to prevent the batteries from becoming overcharged.

Alpha Pro charge regulator

The Alpha Pro charge regulator, delivered as standard with Mastervolt alternators, automatically adjusts the voltage according to the same charge characteristic as found in Mastervolt battery chargers. The batteries are charged with a high voltage of 14.25 or 28.5 Volt until full, at which point the voltage is reduced to a lower level. The Alpha Pro charge regulator is also equipped with a temperature sensor, which should be attached directly to the batteries. The charge voltage is thus adjusted exactly according to the battery temperature and is not influenced by the ambient temperature of the alternator itself.

Ungrounded - also for aluminium vessels

Mastervolt alternators are delivered ungrounded, i.e. the negative pole of the alternator is not connected to the alternator casing but has a separate connection. This means that they are also suitable for aluminium boats, where the negative pole is not allowed to be connected to the hull.

More output

Mastervolt alternators offer a much higher output than the alternators usually supplied with engines. As a result, the standard single belt is insufficient to transfer the power from the engine to the alternator. Two belts are required and the pulley of the engine will often need to be changed as well. Your engine supplier can help you choose an appropriate double pulley and give advice on setting up the alternator. In order to handle the high output you will also have to adjust the alternator support. More information on alternators and installation diagrams are available at www.mastervolt.com/alternators

