



OceanPlanet Energy

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**Mark Grasser DC Power Solutions
Remote Alternator Rectifier**

The concept behind the remote rectifier comes from a couple of things:

1. More than 50% of the heat within an alternator comes from the rectifier. Within the rectifier there are six diodes. Any two are on at a time. There is approximately a 0.9 volt drop across each diode. 0.9 times two times 100 for a 100 amp alternator comes to 180 watts of heat. This is 180 watts that need to be dissipated for just the diodes. Then there is almost as much heat being made by the stator. At 100 amps of output there is almost 300 watts of pure heat that needs to be dissipated.
2. The best diode available for the rectifier within these alternators is a 70 amp unit. Times three, this equals 210 amps. Not a lot of extra current capability left when building a high current alternator.
3. What needs to be done is separate the rectifier from the alternator. This allows more airflow in the alternator for the field and stator. It also allows us to fit an industrial grade 300 amp three phase bridge rectifier to a large heat sink with a high volume 50,000 hour cooling fan.

Measurement is 8.5" long x 4.5" wide x 4" tall.



The fan is driven by the output of the alternator so as soon as current is flowing from the alternator the fan is running. As a safety backup there is a thermal switch mated to the heat sink which opens if the heat sink temperature exceeds 260degF. This temperature was chosen simply because a full current alternator mounted to an engine will run this hot but testing shows this could be lowered some, maybe 200degF in the future.

The enclosure and heat sink are primed with zinc chromate and then painted with Marine outboard white, and marine outboard black.

Testing and customer feedback shows that when separated like this the two devices run at a temperature rise over ambient of less than 50degF and that the rectifier assembly stays below the 70degC limit set by ABYC standards.



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View of rectifier without cover

