

B & C Specialty Products Inc

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Installation Instructions for the PMR1C Voltage Regulator

The B&C Specialty Products PMR1 Regulator has been re-designed to permit continuous operation at full alternator output for any of the B&C, single phase, permanent magnet, alternators (i.e., SD8, 200G, SK10). These regulators handle the alternator's full output current as opposed to a small controlling current and, therefore, generate more heat. Certain precautions should be observed in their application:

- 1) The PMR1C does not contain over-voltage protection. Use of the 504-1 (14V) or 504-2 (28V) over-voltage protection kit is required. Consult B&C drawing 504-500 (included with the kit) for proper wiring.
- 2) Although it has been tested at higher temperatures, the PMR1C external case temperature should be limited to 175°F for reliability. If, after abiding by the following mounting instructions, there is doubt as to whether this limit may be exceeded, use a small thermocouple under one of the mounting screws and a digital thermometer to determine actual operating temperature. Consideration should be given to the ambient temperature at which the test is run and correction made to a 100°F ambient temperature as necessary.
- 3) Due to the PMR1C's limited size, it has a limited surface area for dissipation of heat. The aluminum case is of sufficient thickness to serve as good thermal conductor for heat transfer to a mounting surface. It is not recommended to mount the PMR1C to a composite surface that is a poor heat conductor. Aluminum is preferred. Steel may be acceptable. In addition, contact area with the mounting surface is a major factor in heat transfer. If you are mounting the regulator to a thin fuselage bulkhead or former that is not perfectly flat because of previous forming operations, it may be possible to use a piece of .125 thick aluminum cut to the size of the regulator base on the opposite side of the mounting surface to hold the mounting surface flatly against the regulator base.
- 4) Ambient air movement greatly affects regulator cooling. Even a small amount of air circulation can make a significant difference in ultimate case temperature. If possible, use a SCAT or a small radio fan to circulate air. Alternately, if a majority of the heat can be transferred to the airframe's outer skin, external air movement will help cool the regulator.
- 5) The following test results are given as a guide to mounting and operating the regulator. The tests were run in still, ambient, open air (not in a confined space). The "unmounted" test was run with the regulator lying on an insulating surface. The "mounted" tests were run with the regulator bolted to a vertical piece of .040 Aluminum sheet approximately 1.5 square foot in area. No backing plate or thermal transfer compounds were used. Ambient temperature during the tests was 69°F.

Mounting	Bus Voltage	Continuous Output Amps	Ultimate Case Temperature (°F)
Unmounted	14.4 V	6.8	195
Mounted	14.4 V	8.0	125
Mounted	14.4 V	12.0	146
Mounted	14.4 V	15.0	161

In most cases, simply mounting the regulator to an aluminum structure or stainless steel firewall will be adequate to assure reliable operation. The final responsibility for determining that the ultimate operating temperature is within the specified limit lies with the airplane builder.

