



33-980505-CLN-01

TO: R PARSELLS
FROM: C NEUMEYER
SUBJECT: CENTER STACK BAKEOUT OHMIC HEATING

Reference:

NSTX-CALC-33-1, "Center Stack Bakeout Ohmic Heating"

Per the reference calculation the ohmic resistance of the center stack casing (CSC), in series with the return path through the vacuum vessel, is expected to fall in the range of 0.79 to 0.82 mΩ over the range of temperature 20 to 350C.

To apply 5kW of ohmic heating to this circuit a power supply able to produce around 3VDC, and on state current around 3.75kADC, with rms current 2.6kA DC, is suitable. To produce 5kW such a supply would operate at a duty cycle of $(2.6/3.75)^2 = 48\%$. The higher the voltage, the lower the duty cycle to produce the same average power.

The power supply would require an on/off signal from a thermostat type of controller.

Attached are some catalog sheets from Rapid Electric which show the type of power supply which could be used.

S Ramakrishnan received from Rapid a verbal quotation of a cost of \approx \$12.5K for a 0-6V, 6kA thyristor power supply. Based on the subject calculations, a 4kA unit would suffice for our application. However, the \$12.5k budget should be maintained to allow for leads (rated 2.6kA rms) and controls.

cc:

S Ramakrishnan

NSTX File