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Determination of temperature rise of the synchronous 50kW e-motor depending on the duty cycles

Druh úkolu: scientific research
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Annotation

This report is focused to thermal model of the synchronous machine, which has been designed and calculated in report no. 22160 – 019 – 2011, 22160 – 020 – 2011 and 22160 – YYY – 2011.

Work deals with definition of thermal resistances, thermal capacities and heat flow in thermal network model of synchronous motor.

Model is based on a lumped-parameters thermal model. Thermal model provides results of transient thermal analysis. The model is sufficiently complex to identify the temperatures at most locations in the machine, including the peak temperatures in the stator winding and the rotor excitation winding. It is formulated out of purely dimensional information and constant thermal coefficients and is therefore easily adapted to a range of frame size. The model is therefore suitable for application to online temperature estimation for protection and duty – cycle evaluation.