

Why Sungrow SH5K inverters get warm

Low voltage inverters with power outputs of kilowatts will have high currents through relatively small electrical components, thus causing Joule heating (heat due to electrical resistance). The temperature of the heat sink from any inverter manufacturer generally ranges between 50-75°C. Once it exceeds 60°C it becomes rather hot to touch. As the LCD control unit is separated from the inverter and hence there is no reason to touch the inverter body, our design team decided to utilise the whole inverter body in conjunction with the heat sink to facilitate heat dissipation. However, there is rubber between the inverter body and the front door surface, so the front face of the inverter should be warm, while the rest of the body can get hot. This will certainly not impose an additional fire hazard however there is additional risks of pain and burns. 44°C is the temperature of any material that can be safely touched for an unlimited time (Ungar & Stroud 2010). The metal body of the inverter exceeds this temperature during operation. Therefore, we advise not to touch it during operation.

We decided not to use an external fan, unlike previous inverter versions, for several reasons. The inverter does have an internal fan to ensure thermal equilibrium of components and avoid hotspots and component damage. An external fan is more prone to mechanical failure, thus increasing the likelihood of maintenance requirements and costs. Adding an external fan will increase the capital and operational cost of the inverter.

References:

Bradwell, S 2013, IP 68 protected fans from ebm-papst, emp-papst, viewed 29 November 2016,

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