SIKKERHEDSSTYRELSEN

MEDDELELSE
Elmateriel
nr. 7/09-UK

(Replaces Elmateriel nr. 5/05-uk)

Februar 2009
MVE

Inverters for use in automobiles, caravans, yachts etc. for supply of 230 V appliances from a SELV supply (e.g. from a 12 V accumulator)

Manufacturers of inverters have typically used the European standard for data processing equipment - EN 60950 (The Danish Heavy Current Regulation part 137) - as basis for the preparation of their EU declaration of conformity in accordance with the Low Voltage Directive. The Danish Safety Technology Authority has accepted declarations of conformity in which this standard has been referred to.

According to the standard sub-clause 2.9.5 reinforced insulation (protective separation) is required between SELV circuits and 230 V circuits. This means that if conformity is declared with this standard there must be reinforced insulation between the inverter's primary and secondary side. Furthermore, it means that the inverter must have reinforced insulation from 230 V live parts to exposed conductive parts on the inverter (metal frame), since the inverter's enclosure is either connected to or in another way has connection to minus on the SELV side.

When using this method of protection it is allowed that 230 V socket-outlet is used either with or without earth according to The Danish Heavy Current Regulation part 107-2-D1.

- On transportable inverters, portable socket-outlets according to e.g. standard sheets DK 1-3a, DK 1-1c, DKA 1-3a or DKA 1-4a shall be used.
- On inverters for fixed installation it is allowed to use socket-outlets for fixed installation, according to e.g. standard sheets DK 1-1a (built together with a switch), DK 1-1b or DK 1-1c.

SIKKERHEDSSTYRELSEN
Nørregade 63
6700 Esbjerg

Tlf 33 73 20 00
Fax 33 73 20 99

sik@sik.dk
www.sikkerhedsstyrelsen.dk
CVR-nr. 27 40 31 23

ØKONOMI- OG
ERHVERVSMINISTERIET

If there is no reinforced insulation between the SELV circuit and the 230 V side, it shall be described which precautions have been taken as an alternative to reach the same level of safety. It can for example be the following:

- The inverter's metal enclosure has been connected to minus on the SELV side by the manufacturer. The inverter is in this case only allowed with a 230 V socket-outlet for class II appliances (The Danish Heavy Current Regulation part 107-2-D1, standard sheet DKA 1-4a).

This method of protection gives equipotential bonding between exposed conductive parts. When using socket-outlet for class II equipment it is also prevented that a class I appliance can be connected, without connection between protective earth and the enclosure of the appliance (e.g. an appliance with Schuko plug).

It must appear from the accompanying instructions that it is prohibited and can be connected with risk of electric shock to connect an appliance that is not double insulated by for instance using an illegal extension cord or an illegal supply cord on a class I appliance.

It shall be ensured that the inverter can withstand the influences and external conditions it may be exposed to. Since no safety standard exists, which specifically covers these products and their special use, a risk assessment must be made regarding electrical, thermal and mechanical safety of the product.