

References

 Standard(s)
(incl. year)

[IEC 60947-4-1:2009+AMD1:2012]

 Subclause(s): 8.2.2 –
Table 5

Subject

 [Temperature rise limits for insulated
coils in air and in oil

 Formulated by:
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 Date:
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Question

The limits given for insulated air/oil coils are normally measured by means of the variation of resistance

Table 5 – Temperature rise limits for insulated coils in air and in oil

Class of insulating material (according to IEC 60085)	Temperature rise limit (measured by resistance variation) K	
	Coils in air	Coils in oil
A	85	60
E	100	60
B	110	60
F	135	–
H	160	–

NOTE 2 The temperature rise limits given in Table 5 of this standard and in 7.2.2.2 of IEC 60947-1 only if the ambient air temperature remains within the limits –5 °C, +40 °C.

The IEC 60947-1: 2009 + AMD1: 2010 par. 8.3.3.3.2 states "... When measured by another method than the resistance method the limits of temperature rise permitted shall be adjusted accordingly. The product standard shall state the method and the limits."

Question:

The product standard does not prescribe any value and therefore what are the limits to be applied when the method of variation of resistance is not used, for example in the presence of electronically controlled coils?

In this case can we refer directly to IEC 60085 for absolute temperatures of the insulation class and subtract 40 °C, which is the maximum ambient temperature considered in note 2 (or higher if the manufacturer declares a higher operating temperature)? For a class F insulator, the maximum acceptable temperature rise in air measured directly with a thermocouple would be 115K.

Analysis

It is confirmed that the general standard IEC 60947-1 considers the case (par. 9.3.3.3.2) referring to the product standard but the product standard IEC 60947-4-1 indicates other suitable methods but does not give specific temperature rise references (par. 8.2.2.1).

Decision

ACAE TC will ask to CEI for question resolution.

In order not to interrupt the activities, the following solution will be proposed to CEI, as discussed in TC.

IEC 60947-1 defines the temperature limits with reference to the product terminals (tables 2/3).

Furthermore, par. (7.2.2.8-other parts) requires that the insulating materials used do not cause damage to the product and indicate the option to refer to the method (IEC 60216) or to the conformity (IEC 60085) by the manufacturer.

Date: [2018/08/31]

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 Approved by: [ACAE Technical Committee
2018/05/31]