Low-voltage switchgear and controlgear –

Part 8:
Control units for built-in thermal protection (PTC) for rotating electrical machines

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The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 1.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

This standard shall be used in conjunction with IEC 60947-1: General rules.
The provisions of the general rules dealt with in IEC 60947-1 are applicable to this standard, where specifically called for. Clauses and subclauses, tables, figures and annexes of the general rules thus applicable are identified by reference to IEC 60947-1 (e.g. 1.2.3 of IEC 60947-1, Table 4 of IEC 60947-1 or Annex A of IEC 60947-1, etc.).

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- amended.
INTRODUCTION

Thermal protection systems which are based on the principle of monitoring the temperature of the protected parts constitute a simple and effective means of protecting rotating electrical machines against excessive temperature rises, including those caused by faults in the cooling system, or excessively high ambient temperature, whereas systems of protection based only on monitoring the current absorbed may not ensure this type of protection.

Since the operating temperature and response times of thermal protection systems are fixed in advance, they may not be adjusted in relation to the conditions of use of the machine and they may not be completely effective for all fault conditions or improper use of the machine.

A thermal protection system in accordance with this standard may consist of a characteristic change thermal detector which has an associated control unit to convert a point on the characteristic of the detector to a switching function. A very large number of thermal protection systems are in use and, in all cases, the machine manufacturer will fit the detectors in the machine. The machine manufacturer will either supply the control unit with the machine or specify particulars of the control unit to be used.

It is also customary for the control units to be considered as part of the control system and not necessarily supplied with the machine. For this reason it is considered necessary to have an interchangeable system, where the characteristics of association between the detector and the control unit are specified. This particular system is not considered superior in any way to other systems complying with the requirements of this standard, but in some fields the practice is likely to be that this interchangeable system will be used, as indicated by the designation “Mark A”.

1 Scope

This part of IEC 60947 specifies rules for control units, which perform the switching functions in response to the thermal detectors incorporated in rotating electrical machines according to IEC 60034-11, and the industrial application.

It specifies rules for that type of system comprising a positive temperature coefficient (PTC) thermistor detector having particular characteristics, and its associated control unit.

The PT100 detectors are covered by IEC 60751, where the resistor values are given according to the temperatures of the detector.

The present rules lay down the characteristics of association of this particular positive temperature coefficient thermistor detector and its associated control unit (designated “Mark A detector” and “Mark A control unit”), when they are used in thermal protection systems.

NOTE It is not possible to specify all the requirements for the operating characteristics of a control unit, as they are dependent on some aspects of the thermal detectors. Some aspects of the requirements of the thermal protector system can only be specified when account is taken of the characteristics of the rotating machine to be protected and the method of installation of the detector within the machine.

For these reasons, for each characteristic it is necessary to specify who is responsible for stating the required values and who is responsible for compliance with the requirement and for carrying out any confirmatory test.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- IEC 60410:1973, Sampling plans and procedures for inspection by attributes
- IEC 60417:2002, Graphical symbols for use on equipment