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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 25840-2010

**Guidance concerning the permissible temperature rise for parts
of electrical equipment, in particular for terminals**

规定电气设备部件（特别是接线端子）允许温升的导则

(English Translation)

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Preface

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2 On the nature of the electrical contact resistance ohmic contacts and calculation and measurement of general considerations

Aging mechanism 3 contacts and connecting terminals

Foreword

This standard is equivalent to using IEC/T R60943.2009 "provides that the electrical equipment components (especially terminals) allows the temperature rise Guidelines" (Version 2.1).

For ease of use, this standard made the following editorial changes.

--- Delete foreword international standards;

--- According to GB/T 1.1 requirements, delete the international standards set in the articles and the criteria concerning discussion papers and notes;

--- The "Report" to "this standard";

--- Table 9 thetaa and thetan position is wrong, they will swap position Table 8 format;

--- 5.2.3.3 of "if the temperature rise ΔT_e increase 6.5K", where " ΔT_e " error, to " ΔT_i ";

--- Table E.1 and K values \u200b\u200bin Table E.2 and K 'value of 1.0 under the existing "conditions specified in 4.3.1," description. Since no standard 4.3.1 Paragraph, so its deletion;

--- Figure E.1 lower figure "T" is wrong, to "T3".

The Standard Appendix A, Appendix B, Appendix C, Appendix D, Appendix E, Appendix F and Appendix G is an informative annex.

The standard proposed by China Electrical Equipment Industrial Association.

This standard by the National Standardization Technical Committee fuse (SAC/TC340) centralized.

Introduction

a) electrical equipment of temperature rise is caused by various losses wires, contacts, and other internal magnetic circuit, with the structure and operation of the equipment Development of new technology, temperature rise issues become increasingly prominent.

In the equipment, the temperature rise more and more attention. In these devices, many energy-consuming components (contactors, fuses, electrical Resistors, etc.), especially some modular electrical assembly in a housing made of synthetic material, in which case some of the poor heat dissipation.

The temperature rise caused by the basic electrical contact member constituting a relatively high temperature. high temperature accelerated oxidation, increasing the contact resistance of the interface, thereby it leads to further heating, resulting in a higher temperature. If the material constituting the contact without proper or adequate protection, the device pre Before the useful life of the contacts may be irreparably damaged.

Temperature also affects the terminals and the wires are connected, in order to ensure that the insulated wire during the life of the equipment remains intact, should be limited Systems on the rise.

b) Taking into account the above-mentioned problems, the present standard for the following purposes.

--- Analysis of various heating contacts, terminals and wires connected to the terminals (according to their environment and arrangement) occurred and oxidation;

--- Products to provide the Committee with the basic rules, so that they can allow a predetermined temperature and temperature rise.

c) When the various component parts are housed in the same housing, deal with them to take preventive measures.

Users with particular attention to the following facts. terminals by the switching equipment standards specified allowable temperature rise is from a type testing agreement Under testing conditions. These conditions may be encountered in the practical application and conditions vary greatly. Special attention should also be in practical use Insulated wires to the terminals normally connected to the allowable temperature.

d) should focus on the following facts. in the relevant product standard external terminals and allows the temperature rise in the convention Type Test Measured, so they may not reflect the normal use of the actual situation.

Should take appropriate protective measures to prevent the element terminals near the material exposed to temperatures that may affect their life.

Considering the above, the key is the "outside ambient temperature" and "the temperature

of the fluid surrounding the element" concept distinguished, the former master Refers to the temperature outside the enclosure, which is coupled with an external ambient temperature of the internal temperature of the element and produce. These concepts and their He added concepts (such as case thermal resistance) the provisions in Chapter 5, and illustrated by the figures, for example.

To facilitate the complete calculation, the present standard by introducing the concept of "fill factor" will focus on the fluid temperature of the element and the external surroundings Temperature combined and illustrated in figures (5.2.3.2) specified in the value of the fill factor of several practical applications.

Due to the different physical conditions and the degree of contamination of the contact surface, calculations involving a large parameter variation centralized contact resistance. Count alone the resulting accuracy of the count almost equal to the contact resistance of an order of magnitude.

As the actual situations often difficult to calculate the deterioration mechanism dominates, it is more accurate values \u200b\u200bin parts of electrical equipment the measured directly.

This standard is not used for guiding element derating.

This standard is particularly recommended before using this standard data to solve practical problems, to study attached to the back of the reference standard.

Provision of electrical equipment components (especially terminals) Permissible temperature rise Guidelines

1.1 Scope and purpose

This standard is used to guide the electrical equipment to estimate their component parts and temperature rise allowable value under steady operating conditions.

This standard applies to electrical and electrical connections nearby materials.

This standard relates to thermal effects generated by the current connection, and therefore no limit to the voltage applied.

This standard is appropriate only when the reference product standards apply.

The technical committee responsible for the use and scope of the present standard content in the standard.

This standard "allowed" value is the relevant product standard allowable value.

The criteria include the following.

--- Electrical integrated data structure and calculation of the ohmic resistance of the contact;

- Basic aging mechanisms contacts;
- Temperature Calculation contacts and terminals;
- Various elements (in particular contact, terminals and terminals connected to the wires) of maximum "allowed" and the temperature rise;
- Product Board regulations allow the general procedure to be followed for temperature and temperature rise.

1.2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 4797.1-2005 electric and electronic products natural environmental conditions of temperature and humidity (IEC 60721-2-1:2002, MOD) GB/T 11021-2007 heat resistance, electrical insulation rating (IEC 60085:2004, IDT) GB/T 11022-1999 high-voltage switchgear and control equipment standard common technical requirements (eqv IEC 60694:1996) Aging procedures and evaluation of test results. GB/T 11026.1-2003 heat resistance, electrical insulating materials - Part 1 (IEC 60216-1:2001, IDT) GB 14048.1-2006 Low-voltage switchgear and control equipment Part 1. General (IEC 60947-1:2001, MOD) Part 4-42 GB 16895.2-2005 Electrical installations of buildings. Protection against thermal effects --- safety (IEC 60364-4-42.

2001, IDT)

IEC 60050 (441). 1984 International Electrotechnical Vocabulary (IEV) Chapter 441. Switchgear and control devices and fuses IEC 60890. 1987 Assessment extrapolation rise type test low-voltage switchgear and control equipment in combination with the parts of the device

1.3 Terms and Definitions

The standard terms used and defined in the International Electrotechnical Vocabulary (IEV), the following terms and definitions apply in this standard.

1.3.1

Ambient air temperature θ_{aa} Under specified conditions to determine the temperature of the air around the entire electrical [IEV441-11-13].

Note: for electrical installations in the housing, this temperature is the air temperature outside the enclosure.