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

**中华人民共和国国家标准**

GB/T 10228-2008

Replace GB/T 10228-1997

**Specification and technical requirements for dry-type  
power transformers**

**干式电力变压器技术参数和要求**

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## Foreword

This standard replaces GB/T 10228-1997, *Specification and technical requirements for dry-type power transformers*

The main technical differences between this standard and the GB/T 10288-1997 are as follows:

- The drafting format is prepared in accordance with GB/T 1.1-2000, *Directives for standardization - Part 1: Rules for the structure and drafting of standards*
- Introduction is added;
- The performance parameter tables for all types of transformer with unwrapped winding and transformer with wrapped winding are respectively consolidated and the performance parameters for transformer with unwrapped winding and transformer with wrapped winding are not differentiated any longer.
- The loss parameters and no-load current of all types of transformer are adjusted as follows;
  - The loss parameters and no-load current for 10 kV class of voltage-regulated distribution transformer without excitation are given by Groups A and B, where, compared to the original voltage-regulated distribution transformer with wrapped winding without excitation, the no-load loss and load loss Group A are down by 10% averagely and for the Group B, averagely the load loss is down by 20%, load loss down by 5%, and no-load current down by 20% and above.
  - For the other transformers, compared to the original transformer with wrapped winding, averagely the no-load loss and load loss are down by 10% respectively and the no-load current down by 20% and above.
- Performance parameters for 20 kV class of dry voltage-regulated distribution transformer without excitation are added;
- Performance parameters for 35kV class of on-load voltage-regulated electric power transformer are added;
- Some specifications of capacity are added on the basis of original specifications of capacity for 10 kV class of voltage-regulated distribution transformer without excitation and 35 kV class of voltage-regulated electric power transformer without excitation.
- Technical requirements and test items are adjusted.

The Annex A of this standard is information.

This standard was proposed by China Electrical Equipment Industrial Association.

This standard is under the jurisdiction of National Technical Committee on Transformer of Standardization Administration of China (SAC/TC44).

The drafting organizations of this standard include Shenyang Transformer Research Institute, Wuhan High Voltage Research Institute, Shunte Electrical Co., Ltd, China Electric Equipment Group Co., Ltd, Jiangsu Huapeng Transformer Co', Ltd, Kunming SGM Electric Co., Ltd,

Shandong Jinmanke Electric Appliance Group Co., Ltd, Tianjin Tebian Electrotechnical Transformer Co., Ltd, Wujiang Transformer Factory Co. Ltd, Baoding Tianwei Shunda Transformer Co., Ltd, and Jilin Province Electric Power Research Institute

The chief drafting staff of this standard includes Zhang Zhongguo, Fu Xinian, Liu Yan, Xu Zihong, Zhou Guowei, Liu Xi, Niu Yamin, Shi Xiao, Lin Canhua, Hu Zhenzhong, Ao Ming, and Tao Dan

This standard was originally issued in 1988. It was revised for the first time in 1997 and here is the second revision.

## Introduction

GB/T 10228—1997 has been implemented for ten years approximately. It played an important directive role in production and use of dry transformers in China. With continuous development of dry transformer products, it is necessary to revise GB/T 10228—1997 so that it may further be coordinated with the other relevant standards and better guide production and use of dry transformers.

In order implement technical and economic policies for resources saving and comprehensive utilization, this standard was revised by reference to DL/T 985 - 2005, *Guide for determining energy efficiency for distribution transformers* and NEMA TP 1-2002, *Guide for determining energy efficiency for distribution transformers*. The loss parameters of transformers are adjusted.

In this revision, with respect to determination of loss parameters for 10 kV class of voltage-regulated transformer without excitation, such concepts as "annual average load coefficient ( $\beta$ )" and "efficiency of utilization ( $\eta$ )" etc. are introduced for the first time. For 10 kV class of voltage-regulated transformer without excitation, Groups A and B of loss parameters are specified and the relationship curve of "efficiency of utilization ( $\eta$ )" vs. "annual average load coefficient ( $\beta$ )" is plotted. Along with their relevant calculation results, these are given in Annex A, so as to implement this standard in the future.

This standard is a basic national standard for dry transformers in transformer industry, widely applied, with great influence, and promoting energy saving and consumption reduction.

# Specification and technical requirements for dry-type power transformers

## 1 Scope

This standard specifies performance parameter, technical requirements, test times as well as label, package, transportation, and storage for 3-phase dry electric power transformers.

This standard applies to indoor voltage-regulated 3-phase dry electric power transformers without excitation or with load, of which winding has insulation and thermal resistance of Classes B, F, and H, with rated capacity of 30 kVA-20 000 kVA, rated frequency of 50 Hz, and voltage classed of 6 kV, 10 kV, 20 kV, and 35 kV.

NOTE This standard may be referred to for the other products with rated capacity in use.

This standard is not applicable to gas-filled transformers (subject to gases other than air).

## 2 Normative References

The articles contained in the following documents have become this standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this Standard. For the undated documents so quoted, the latest editions shall be applicable to this Standard.

GB/T 191-2000 Packaging - Pictorial marking for handling of good (eqv ISO 780: 1997)

GB 1094.1 Power transformers—Part 1: General (GB 1094.1-1996, eqv IEC 60076-1: 1993)

GB 1094.11 Power transformers—Part 11: Dry-type transformers (GB 1094.11-2007, IEC 60076-11: 2004, MOD)

GB/T 2900.15-1997 Electrotechnical terminology - surge arresters, low-voltage surge protective devices and components (neq IEC 60050-421: 1990, IEC 60050-321: 1986)

GB/T 5273 Terminals for transformers, high-voltage apparatus and bushings (GB/T 5273-1985, neq IEC 60518: 1975)

GB/T 5465.2-1996 Graphical symbols for use on electrical equipment (idt IEC 60417: 1994)

GB/T 17211 Loading guide for dry-type power transformers (GB/T 17211-1998, eqv IEC 60905:



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