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

GB/T 14598.181-2021

**Measuring relays and protection equipment - Part 181:
Functional requirements for frequency protection**

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Standardization Administration**

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foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules of Standardization Documents"

drafted:

This document is part 181 of GB/T 14598 "Measuring relays and protective devices": GB/T 14598 has issued the following

part:

- GB/T 14598:2 Measuring relays and protection devices - Part 1: General requirements;
- GB/T 14598:3 Electrical Relays Part 5: Insulation coordination requirements and tests for measuring relays and protective devices;
- GB/T 14598:8 Electrical Relays Part 20: Protection Systems;
- GB/T 14598:23 Electrical relays - Part 21: Vibration, shock, collision and earthquake measuring relays and protective devices

Test Part 3: Earthquake Test;

---GB/T 14598:24 Measuring relays and protection devices - Part 24: Power system transient data exchange

(COMTRADE) common format;

--- GB/T 14598:26 Measuring relays and protection devices - Part 26: Electromagnetic compatibility requirements;

--- GB/T 14598:27 Measuring relays and protection devices - Part 27: Product safety requirements;

--- GB/T 14598:118 Measuring relays and protection devices - Part 118: Synchronous phasor measurement of power systems;

--- GB/T 14598:121 Measuring relays and protection devices - Part 121: Functional

requirements for distance protection;

---GB/T 14598:127 Measuring relays and protection devices - Part 127: Functional requirements for over/under voltage protection;

--- GB/T 14598:149 Measuring relays and protection devices - Part 149: Functional requirements for electric thermal relays;

--- GB/T 14598:151 Measuring relays and protection devices - Part 151: Functional requirements for over/under current protection;

--- GB/T 14598:181 Measuring relays and protection devices - Part 181: Functional requirements for frequency protection;

--- GB/T 14598:300 General technical requirements for transformer protection devices;

---GB/T 14598:301 Technical Requirements for Continuous Recording Devices in Power Systems;

---GB/T 14598:302 Technical requirements for arc protection devices;

---GB/T 14598:303 General technical conditions for digital motor comprehensive protection device:

This document uses the translation method equivalent to IEC 60255-181:2019 "Measuring relays and protection devices - Part 181: Frequency protection

Functional Requirements":

The Chinese documents that have a consistent correspondence with the international documents normatively cited in this document are as follows:

---GB/T 2900:50-2008 Electrical Terminology General Terminology for Power Generation, Transmission and Distribution (IEC 60050-601:1985, MOD);

---GB/T 2900:92-2015 Electrical terminology Mathematical functions (IEC 60050-103:2009, IDT);

---GB/T 14598:2-2011 Measuring relays and protection devices - Part 1: General requirements (IEC 60255-1:2009, IDT);

---GB/T 20840 (all parts) Transformer [IEC 61869 (all parts)];

---DL/T 860 (all parts) Power automation communication networks and systems [IEC 61850 (all parts)]:

The following editorial changes have been made to this document:

- Add footnote d in Table 4 "f_{accuracy} is the declared frequency accuracy:";
- Add footnote c in Table 7 "f_{accuracy} is the stated frequency change rate accuracy:";
- In Table 26 Note 2 "When testing the digital interface, and the sampling frequency of the digital interface is equal to 4800Hz (that is, specified in IEC 61869-9)

When the recommended standard value of the

40]" and add "" For 50Hz system, the sampling frequency can be 4000Hz: " to adapt to the Chinese 50Hz system;

---In many places in the original text, " $\omega(t)$ " is used to represent the time-varying phase, and now it is changed to " $\phi(t)$ " to conform to standard habits and facilitate reading:

Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents:

Introduction

The IEC 60255 series of standards specifies the technical requirements and power system solutions for measuring relays and protection devices, as well as related

technical requirements for control, monitoring and process interface equipment: IEC 60255-1~IEC 60255-99 specifies the basic general purpose of relays and protection

Requirements, mainly including basic functions, mechanical properties, electromagnetic compatibility performance, product safety requirements, general format for transient data exchange, etc.;

IEC 60255-100~IEC 60255-199 specifies frequency protection, overcurrent/undercurrent protection, overvoltage/undervoltage protection, distance protection

Functional performance requirements and test methods of main protection modules such as IEC 60255-200~IEC 60255-299 in the form of technical reports

A special study has been carried out to specify the technical requirements for other protection equipment and related control, monitoring and process interface equipment:

The purpose of formulating GB/T 14598 is to specify unified principles consistent with the above characteristics, which are applicable to power generation, transmission and distribution systems:

measuring relays and protection devices used in the system: GB/T 14598 is intended to be composed of 17 parts:

--- Part 2: General requirements for measuring relays and protection devices: The purpose is to specify the measurement of relays and protective devices and by this

General rules and requirements for power system protection schemes such as control, monitoring and process interface equipment composed of these devices:

--- Part 3: Insulation coordination requirements and tests for measuring relays and protection devices: The purpose is to specify the measurement of relays and protection

General requirements for insulation coordination of installations, including how to choose clearances and creepage distances, voltage tests, insulation resistance measurements, etc:

--- Part 8: Protection systems: The purpose is to specify the performance requirements of the entire protection system and its components, which are applicable to various types of protection systems:

protective device and devices connected to the protective device that affect it:

--- Part 23: Seismic tests: The purpose is to specify the test methods, test conditions, Test severity levels, test procedures and acceptance criteria:

--- Part 24: Power system transient data exchange (COMTRADE) general format: The purpose is to define a common data

Interchange format for storing data files and exchange media for various types of faults, tests, and simulations: Define data exchange generic

It is beneficial to improve the analysis, testing, evaluation and simulation of power system and its protection control measures under fault disturbance conditions:

animation level:

--- Part 26: Electromagnetic compatibility requirements: The purpose is to specify electromagnetic compatibility requirements for measuring relays and protective devices, including electromagnetic

emissions and immunity:

--- Part 27: Product safety requirements: The purpose is to specify the basic safety requirements for measuring relays and protective devices so that

Hazard from fire, electric shock, or injury to the user is minimal: This section also applies to use with measuring relays and protective devices

Test and auxiliary equipment used:

--- Part 118: Power system synchrophasor measurement: The purpose is to specify the performance classification of synchrophasor measurements and the performance of each

Evaluation methods and performance indicators of steady-state performance and dynamic performance of energy categories:

--- Part 121: Functional requirements for distance protection: The purpose is to specify the