

ICS 29.240.10

CCS K 43



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

GB/T 33977-2017

**Methods to quantify the steady state, power-frequency
electromagnetic fields generated by HV switchgear assemblies
and HV/LV prefabricated substations**

高压成套开关设备和高压低压预装式变电站产生的稳态、工频电磁场的量化方法

(English Translation)

Issued on: July 12, 2017

Implemented on: February 1, 2018

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

Preface
Introduction
1 Scope
2 Normative reference document
3 Terms and definitions
4 Assessment requirements
4.1 Overview
4.2 Assessment method
4.3 Evaluation of electric field
4.4 Evaluation of magnetic field
5 Measurements
5.1 Overview
5.2 Measuring instruments
5.3 Measurement procedures
5.4 Measurement arrangement
6 Calculate
6.1 Overview
6.2 Software
6.3 Calculation procedures
6.4 Results
6.5 Validity
7 File

Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the re-drafting method to modify the use of IEC/T R62271-208..2009 "High Voltage Switchgear and Control Equipment Section 208 Points. high-voltage switchgear and high-voltage/low-voltage pre-installed substation generated steady-state, power frequency electromagnetic field quantification method.

The technical differences between this standard and IEC/T R62271-208..2009 are as follows.

--- on the normative reference documents, this standard has made a technical differences in the adjustment to meet China's technical conditions, adjust the situation the situation is reflected in Chapter 2, "Normative references", as follows.

Replace the IEC 62271-200 with the modified GB/T 3906 using the international standard (see Chapter 1);

Replace IEC 62271-202 (see Chapter 1) with GB/T 17467 with an international standard;

Replace IEC 61000-6-2 (see 5.2) with GB/T 17799.2 equivalent to the international standard.

--- Applicable voltage range, the applicable rated voltage from 52kV and below to 40.5kV and below.

Introduction

It may be desirable for the manufacturer of the power supply equipment to provide information about the characteristics of the electromagnetic field so that the user can.

- Evaluate electromagnetic field conditions to assist in planning, installation, instructions and operation;
- to take measures to meet the electromagnetic field environmental management requirements and regulations;
- Comparison of the different products involved in the electromagnetic field level involved.

The purpose of this standard is to describe the method of measurement (measurement or calculation) of the electromagnetic field generated by the device.

The electromagnetic field characteristics of the device include the value of the electric field and the magnetic field around the surface of the device.

The electromagnetic field characteristics defined in this standard are limited to the single product specified in the scope of this standard. In the actual facility, several field sources may be Superimposed, so that the final field of electromagnetic field may be with a single product characteristics are very different.

This standard does not impose a mandatory test on the products in its scope.

The content or purpose of this standard does not include the determination of the limits of the electromagnetic field generated by the equipment, nor does it include the exposure of personnel to the electromagnetic environment the establishment of assessment methods.

High voltage switchgear and high pressure/low voltage preloaded Substation generated by the steady state, frequency electromagnetic field Quantification method

1 Scope

This standard gives an assessment and documentation of external electromagnetic fields generated by high voltage switchgear and high pressure/low voltage preloaded substations the practice of the guidelines. Measurement and calculation of the basic requirements of the electric field and magnetic field, for the complete set of switching equipment included in the GB/T 3906 and IEC 62271-201, for high voltage/low voltage preloaded substations included in GB/T 17467.

Note 1: The method described in this standard is for three-phase equipment. However, this method can also be used accordingly for all single or multiphase devices covered by this standard.

This standard applies to rated voltage 40.5kV and below, rated frequency 15Hz ~ 60Hz equipment. Harmony is not considered in this standard and the electromagnetic field generated by the transient. However, the method described therein is equally applicable to the harmonic field of the power frequency.

The detailed general information on the requirements and measurements of low frequency electromagnetic fields is given in IEC 61786.

This standard includes assessment at factory, laboratory conditions, or prior to installation. The electric field and the magnetic field can either be measured or passed Calculated for evaluation.

Note 2: If applicable, the methods described in this standard may also be used for field facilities.

The determination of the limits of the electromagnetic field produced by the equipment, or the establishment of the method of assessment by the person exposed to the electromagnetic environment.

Inside.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 3906 3.6kV ~ 40.5kV AC metal enclosed switchgear and control equipment (GB 3906-2006, IEC 62271-200.:2003, MOD) GB/T 17467 High Voltage/Low Voltage Prefabricated Substation (GB 17467-2010, IEC 62271-202.:2006, MOD) GB/T 17799.2 Electromagnetic compatibility - General standards - Immunity test in industrial environments (GB/T 17799.2-2003, IEC 61000-6-2.:1999, IDT) IEC 61786 Measurement of low frequency magnetic fields and electric fields in respect of personnel exposure - Particular requirements for measuring instruments and guidance (Meas-urementoflow-frequency magnetic and electric fields with regard to exposure of human being

gs-Special requirements for instruments and guidance for measurements IEC 62271-201 High voltage switchgear and controlgear - Part.201. Rated voltages above 1 kV and above 52 kV AC solid insulated switchgear and control equipment (High-voltage switchgear and controlgear-Part.201. AC solid-insulation enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV)

3 Terms and definitions

The following terms and definitions apply to this document.