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

GB/T 16896.1-2024

Replacing GB/T 16896.1-2005

**Instruments and software used for measurements in
high-voltage and high-current tests - Part 1: Requirements for
instruments for impulse tests**

(English Translation)

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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 for standardization documents" Drafting.

This document is part 1 of GB/T 16896 "Instruments and software for high voltage and high current test measurements". GB/T 16896 has been the following parts were published.

--- Part 1: Requirements for impact test instruments;

--- Part 2: Requirements for impulse voltage and impulse current test software;

--- Part 3: Requirements for hardware for AC and DC voltage and current tests.

This document replaces GB/T 16896.1-2005 "High voltage impulse measurement instruments and software Part 1: Requirements for instruments" Compared with GB/T 16896.1-2005, in addition to structural adjustments and editorial changes, the main

technical changes are as follows.

- Deleted the terms and definitions of analog oscilloscope, peak voltmeter, warm-up time, amplitude nonlinearity and scale factor (see 2005 edition 3.1.2, 3.1.3, 3.1.4, 3.1.9 and 3.1.10);
- Added the terms and definitions of recognized digital recorders, raw data and processed data (see 3.1.2, 3.1.7 and 3.1.8);
- Added calibration of scale factor and time base (see 5.1);
- Deleted the relevant content of rise time and voltage deflection characteristics of analog oscilloscopes (see 5.5 and 5.6 of the 2005 edition);
- Changed the content of the impact scale factor nonlinear test (see 5.6, 5.7 and 5.8 of the 2005 edition);
- Changed the time parameter requirements for operating shock waves in standard shock generators (see Table 2, Table 2 of the 2005 edition);
- Changed the test items for approval of digital recorders (see 6.2, 7.1.2 of the 2005 edition);
- Added requirements for digital recorders for standard measurement systems (see 6.3.2 to 6.3.9);
- Changed the performance requirements of impulse peak voltmeter (see Chapter 7, Chapter 9 of the 2005 edition);
- Deleted the relevant content of analog oscilloscope for shock measurement (see Chapter 8 of the 2005 edition).

This document is equivalent to IEC 61083-1:2021 "Instruments and software for high voltage and high current tests and measurements Part 1: Measurement of impulse Requirements for Testing Instruments.

The following minimal editorial changes were made to this document.

- Change some measurement units used in IEC standard documents to legal measurement units of my country;
- Added Appendix B (informative) "Example of calibration of scale factor of digital recorder";
- Added Appendix C (informative) "Example of uncertainty assessment".

Introduction

The impulse test instrument is an important part of the impulse voltage and impulse current measurement system.

The analog voltage signal output by the device is converted into a digital signal, and the data is stored and processed, so its measurement accuracy directly affects the entire measurement system.

Electrical equipment of different voltage levels, lightning protection equipment, etc. need to carry out impulse voltage withstand test or impulse current withstand test.

Therefore, impact test instruments are widely used in electrical equipment manufacturers, colleges and universities, power grid companies, testing and inspection institutions, etc.

It has the characteristics of multiple application fields, large demand and high performance requirements.

In 2005, my country revised and adopted IEC 61083-1:2001 and issued GB/T 16896.1-2005 "High Voltage Surge Measurement Instruments and Software" with the development of measuring instrument manufacturing technology, the impact measuring instrument currently used in China is mainly the types of instruments have changed. Analog oscilloscopes are basically no longer used. Digital recorders, including digital oscilloscopes, are the most widely used.

The technical progress of the integrated conversion unit has greatly reduced the quantization error introduced. Therefore, many technical clauses involved in GB/T 16896.1-2005 and performance requirements are no longer applicable due to technological developments and it is necessary to revise them.

In 2021, the International Electrotechnical Commission (IEC) released IEC 61083-1:2021 "Instruments and software for high voltage and high current tests and measurements".

The requirements for impact test instruments were revised to ensure the safety of impact test instruments.

The accuracy of voltage and current value measurement in high voltage and impulse high current withstand tests is of great significance to promoting the development and production of electrical equipment and power systems.

The safe operation is of great significance.

my country has revised GB/T 16896.1-2005 according to IEC standards, which is conducive to the internationalization of the testing capabilities of my country's testing institutions.

Mutual recognition promotes the technological progress of impulse voltage and impulse current test instruments in my country.

GB/T 16896 "Instruments and software for high voltage and high current test measurements" is planned to consist of four parts.

--- Part 1: Requirements for instruments used in impulse tests. The purpose is to specify the