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GB/T 46568.2-2025

Intelligent instruments reliability - Part 2: Reliability enhancement test method of electrical system

智能仪器仪表可靠性 第2部分：电气系统可靠性强化试验方法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. This document is Part 2 of GB/T 46568 "Reliability of Intelligent Instruments". GB/T 46568 has already published the following parts.

1.Reliability Testing and Evaluation Methods;

2.Test methods for enhancing the reliability of electrical systems. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document is under the jurisdiction of the National Technical Committee on Standardization of Industrial Process Measurement, Control and Automation (SAC/TC124). This document was drafted by: Mechanical Industry Instrumentation Comprehensive Technology and Economic Research Institute, Chongqing Science and Technology Testing Center, and Guangdong Kejian Testing Engineering. Technology Co., Ltd., Shenzhen Wanxun Automation Co., Ltd., Zhejiang Wansheng

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High stability, high reliability, and high intelligence are the main trends in the development of modern instrumentation. Through reliability testing and evaluation, the intelligence level can be clearly defined. The reliability level of instruments and meters reveals weaknesses and hidden dangers in the design of intelligent instruments and meters, providing direction for decision-making and improvement. The "Reliability of Intelligent Instruments" series of standards provides unified objectives and standardized testing methods for reliability testing and evaluation of intelligent instruments. The evaluation procedures and specific operational methods ensure the scientific rigor, completeness, and operability of the testing and evaluation process. Because there are many types of reliability tests for intelligent instruments and meters, and the methods vary greatly, GB/T 46568 "Intelligent Instruments and Meters" is used as the standard. The "Reliability" standard specifies the testing and evaluation methods for different types of intelligent reliability. It is proposed to consist of four parts.

1.Reliability Testing and Evaluation Methods. The purpose is to specify general reliability testing and evaluation methods for intelligent instruments. method.

2.Reliability Enhancement Test Methods for Electrical Systems. The purpose is to introduce newly introduced reliability enhancement test methods. Detailed regulations and requirements shall be provided.

3.System Reliability Assessment Methods. The aim is to provide systematic reliability

assessments for relatively complex intelligent instruments. The evaluation methodology is specified.

4.Fault Diagnosis and Health Management Methods. The purpose is to specify fault diagnosis and health management methods for intelligent instruments and meters. This method aims to improve the quality and reliability of instruments throughout their entire lifecycle. GB/T 46568 is formulated specifically for the characteristics, basic functions, and technical performance of intelligent instruments and meters. For similar intelligent non-instrumental instruments... For the table, the relevant parts of GB/T 46568 can be used for reliability testing and evaluation. Reliability of intelligent instruments and meters Part

1 Scope

GB/T 46568.2-2025 is the Chinese national standard covering reliability enhancement testing - stepping temperature and vibration beyond the specification until the instrument fails, finding the operating and destruct limits, fixing what broke and repeating, rather than waiting for field failures to reveal the same weaknesses. At 20,000 words. Part 2 of the series, first edition. In force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026.

This document specifies the general requirements and test procedures for conducting reliability enhancement tests on instrument and meter electrical systems, their electronic components, and circuit board assemblies. The test report requires a description of the test methods and troubleshooting methods. This document is primarily applicable to electrical systems and their electronic components, as well as circuit board assemblies, in instruments and meters.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 46568.1-2025 Reliability of Intelligent Instruments and Meters - Part

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 electrical system The electrical and electronic components of an instrument or meter that perform functions such as analysis, control, drive, communication, signal and data processing.

3.2 Tested prototype A prototype of the complete machine or electrical system in an instrument used for reliability enhancement testing.

3.3 Step stress testing The test stress value is gradually increased on the test specimen machine according to the specified stress step size until it malfunctions or reaches the predetermined stress. Horizontal test.

Note. This typically includes low-temperature step test, high-temperature step test, and vibration step test. For other test stresses, when the withstand capability of the testing machine is uncertain, it is also... A step stress test can be used. [Source: GB/T 34986-2017, 3.1.2, with modifications]

3.4 When the bandwidth approaches zero and the average time approaches infinity, the acceleration of the narrowband filter passing through the center frequency per unit bandwidth... The mean square of the degree signal. [Source: GB/T 29309-2012, 3.4, with modifications]

3.5 A vibration consisting of linear motion along three orthogonal axes X, Y, and Z, and rotational motion centered on the X, Y, and Z axes.