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

GB/T 19436.1-2025

Replacing GB/T 19436.1-2013

**Electrical safety of machinery - Electro-sensitive protective
equipment - Part 1: General requirements and tests**

机械电气安全 电敏保护设备 第1部分：一般要求和试验

(English Translation)

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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 1 of GB (T) 19436 "Electrical Safety of Machinery - Electrically Sensitive Protective Equipment". GB (T) 19436 has been published.

The following parts were included.

---Electrical and mechanical safety - Sensitive protective equipment - Part 1: General requirements and tests (GB/T 19436.1);

---Mechanical and Electrical Safety Sensitive Protection Equipment Part 2: Special Requirements for Equipment Using Active Photoelectric Protective Devices (AOPDs) (GB/T 19436.2);

---Mechanical and Electrical Safety Sensitive Protection Devices Part 3: Equipment Using Active Optical Diffuse Reflection Protection Devices (AOPDDR) Special requirements (GB 19436.3);

---Mechanical and Electrical Safety Sensitive Protection Devices Part 4: Special Requirements for Devices Using Visual Protection Devices (VBPDs) (GB/T 19436.4).

This document supersedes GB/T 19436.1-2013 "Electrical Safety of Machinery - Sensitive Protective Equipment - Part 1: General Requirements and Tests".

Compared with GB/T 19436.1-2013, apart from structural adjustments and editorial changes, the main technical changes are as follows.

---The scope of the document has been changed (see Chapter 1, Chapter 1 of the 2013 edition);

---The term "hidden disappearance" and its definition have been changed (see 3.1, 2013 edition 3.1);

---The definition of the term "fault" has been changed (see 3.9, 2013 edition 3.9);

---The term "final switching device" and its definition have been changed (see 3.10, 2013 edition of 3.10);

---The term "output signal switching device" has been changed (see 3.19, 2013 edition 3.19);

- The term "system overall stopping performance" has been changed (see 3.20, 2013 version 3.20);
- The term "auxiliary switching device" has been changed (see 3.24, 2013 edition);
- The term "stop performance monitoring" has been changed (see 3.27, 2013 version 3.27);
- The term "type testing" has been added (see 3.31);
- Added the definition and explanation of "normal operation" in the "Functional Requirements" section (see 4.1.1);
- Added "Types and requirements of safety performance" (see 4.1.4);
- Added "Required PLr or SIL and corresponding ESPE type" (see 4.1.5);
- The technical requirements for "Power Supply" have been changed; "Rated" has been changed to "Nominal" (see 4.2.1, 2013 version 4.2.1);
- The provisions of the "General Rules" in the "Fault Detection Requirements" have been revised, along with several rules regarding fault identification and occurrence (see 4.2.2.1, 2013 version).
- 4.2.2.1);
- The description of the periodic inspection method in "Special Requirements for Type 2 ESPE" has been revised (see 4.2.2.3, 2013 version 4.2.2.3);
- The special requirement in "Special Requirements for Type 4 ESPE" that causes the ESPE to immediately enter a locked state due to a fault has been modified (see 4.2.2.5).
(2013 version 4.2.2.5)
- Added "Protection against fire and flame" (see 4.2.3.7);
- The general provisions for output signal switching devices (OSSD) (see 4.2.4.1, 4.2.4 of the 2013 edition) and the technical specifications for solid-state forms have been revised.
(See 4.2.4.3, 2013 version 4.2.4.3);
- "Indicator lights and displays" has been changed to "Indicator lights and displays" (see 4.2.5 and 5.2.5, 2013 versions of 4.2.5 and 5.2.5);
- "Disconnection of subsystem" has been changed to "disconnection of electrical components," with corresponding technical changes (see 4.2.7, 2013 version 4.2.7);
- The requirements for multi-channel systems in "Common Cause Failure" have been changed (see 4.2.9, 2013 version 4.2.9);
- Several requirements for "Software, Programming, and Functional Design of Integrated

Circuits" have been revised (see 4.2.11.2, 2013 version 4.2.11.2);

---Added "ESPE detection capability integrity" (see 4.2.12);

---Added "Test Specimen" (see 4.2.13);

---The technical requirements for ambient air temperature range, humidity, and electrical interference in the "Environmental Requirements" section have been revised (see 4.3, 2013 version 4.3).

And the technical details of the corresponding environmental tests (see 5.4, 2013 edition 5.4);

---Requirements for several conditions in the "Type Testing" working conditions have been added (see 5.1.1.2);

---The verification process for limited functionality testing has been modified (see 5.2.3, version 5.2.3 of 2013);

---Added fault requirements for OSSD(s) (see 5.2.8.1);

---Some specific requirements for performance testing under failure conditions of Type 2 ESPE have been modified (see 5.3.3, 2013 version 5.3.3);

---The requirements for performance testing under failure conditions for Type 4 ESPEs have been changed to include failure accumulation testing (see 5.3.5, 2013 version 5.3.5);

---A section on "Optical Interference" has been added (see 5.4.6);

---The requirements for several technical aspects of the random file have been changed (see Chapter 7 of the 2013 edition);

---The technical content of "General Principles," "Stop Performance Monitoring (SPM)," and "Suppression" in Appendix A has been revised (see Appendix A, 2013 edition).

Appendix A);

---A section on "Setting the detection area and/or other relevant parameters" has been added (see Appendix A);

---A General Provisions section, Appendix B, has been added, and the specific requirements for the considered faults and troubleshooting methods have been revised (see Appendix B);

---The requirements for testing and evaluation in Appendix C have been revised to be based on this document (see Appendix C, Appendix C of the 2013 edition);

---Added references (see References).

This document is equivalent to IEC 61496-1:2020 "Safety of machinery - Electrically sensitive protective equipment - Part 1: General requirements and tests".