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

GB/T 19436.2-2025

Replacing GB/T 19436.2-2013

**Electrical safety of machinery - Electro-sensitive protective
equipment - Part 2: Particular requirements for equipment using
active opto-electronic protective devices (AOPDs)**

机械电气安全 电敏保护设备 第2部分：使用有源光电保护装置（AOPDs）设备的
特殊要求

(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 2 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);

---Electrical and mechanical equipment sensitive protection devices, Part 3: Equipment using active photoelectric diffuse reflection protection devices (AOPDDR) Special requirements (GB/T 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 replaces GB/T 19436.2-2013 "Electrical Safety of Machinery - Sensitive Protective Equipment - Part 2: Use of Active Photoelectric Protection".

The "Special Requirements for AOPDs" standard, compared with GB/T 19436.2-2013, differs mainly in structural adjustments and editorial changes.

The changes are as follows.

---The definition of the term "beam apparatus" has been changed (see 3.204, 2013 edition);

---The term "surveillance blocking" has been removed (see 3.207 of the 2013 version);

---The term "geometrically constrained optical design" has been added (see 3.207);

---Several technical requirements in the "Sensitive Functions" and "General Principles" sections of the "Functional Requirements" have been revised (see 4.1.2.1, 2013 version 4.1.2.1);

--- "Optical performance" has been removed (see 4.1.2.2 in the 2013 version);

---The supplementary requirements for "AOPDs using reflective technology" and "AOPDs with transmitters and receivers in the same device" have been removed.

Supplementary requirements (see sections 4.1.2.3 and 4.1.2.4 of the 2013 edition);

---Added "AOPDs using retroreflective technology and AOPDs using hybrid transmitters and receivers in the same component".

Additional requirements (see 4.1.2.2);

---Several provisions in "Types of ESPE" have been changed (see 4.1.3, Chapter 4 of the 2013 edition);

---The provisions regarding "Special Requirements for Type 2 ESPEs" have been amended (see 4.2.2.3, 2013 version 4.2.2.3);

---Changed the requirements for maintaining AOPD detection capability integrity, as well as the design and manufacturing requirements (see 4.2.12, 2013 version).

4.2.12);

---Added requirements for test specimens for AOPDs using retroreflective technology and for AOPDs with transmitters and receivers in the same device.

(See 4.2.13);

---The requirements for "Radiation Intensity" regarding the different technologies used by the emitting device have been changed (see 4.2.15, 2013 version).

4.2.15);

---Added the correspondence between experiments and AOPD designs in the "General Principles" section of the "Experiments" section (see 5.1);

---The supplement to "Experimental Conditions" in the "Experiment" section has been deleted (see 5.1.2 in the 2013 version);

---The requirements and regulations for "functional testing" have been revised (see 5.2, 2013 version 5.2);

---The definition of wavelength in the "wavelength" test has been changed from "transmission wavelength" to "emission wavelength" (see 5.2.9, 2013 version).

5.2.9);

---The requirements for the "Radiation Intensity" test have been changed (see 5.2.10, 2013 version 5.2.10);

---The technical content in "Environmental Testing" has been changed and replaced with a new "Light Interference" test (see 5.4, 2013 version 5.4);

---Several technical terms in the "Random Documents" section have been changed, and new technical requirements have been added (see Chapter 7, Chapter 7 of the 2013 edition);

---The terms, technical requirements, and content of "Optional Functions of ESPE" have been revised (see Appendix A, Appendix A of the 2013 edition);

---Appendices B, D, E, and F have been deleted, including the "List of Single Faults Affecting ESPE Electrical Equipment" and "[List of Faults]".

"Compatibility assessment", "Verification of effective aperture angle using prism method", "Verification of optical performance using mirror method and deviation test" and "Base" "AOPD detection capability under complete occlusion" (see Annexes B, D, E and F of the 2013 edition).

This document is equivalent to IEC 61496-2:2020 "Safety of machinery - Electrically sensitive protective equipment - Part 2: Use of active photoelectric protective devices".

Special requirements for (AOPDs) equipment.

The following minimal editorial changes have been made to this document.

---The word order of the scope has been changed (see Chapter 1);

---Some translations have been changed. "element" is now consistently translated as "元件" (yùnjiàn), "assembly" as "单元" (dānwèi), and "systematic" as "系统" (xìtǒng).

The translation of "analysis" is now consistently "systematic analysis," and the translation of "retro-reflective" has been revised from "reflection" to "return reflection." "Mirror" is also included.

The translation was revised from "mirror" to "reflector";

---The description of the selective feature "mask" has been changed to "hide" (see Appendix A).

This document was proposed by the China Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Electrical Systems for Industrial Machinery (SAC/TC231).

Introduction

Electrically sensitive protective devices (ESPEs) are suitable for machinery that poses a risk of injury to humans. They can restore the machinery to its original state before a person is in a dangerous situation.

To reach a safe state, thereby providing protection.

This document specifies the special requirements for the design, manufacture, and testing of electrically sensitive protective devices (ESPEs) used as mechanical protection equipment.

This applies only to ESPEs that use active photoelectric protection devices (AOPDs) to perform sensitive functions.

Each type of machinery has its own specific hazards, and this document is not intended to recommend the use of electrically sensitive protective devices (ESPEs) on any particular type of machinery.

For the purpose of application, the use of electrically sensitive protective devices (ESPEs) should be jointly coordinated among the suppliers of such devices, the users of the machinery, and the mandatory regulatory authorities.

Regarding this point, it is necessary to pay attention to relevant guidelines that have been