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

GB/T 36229-2018

**Reliability assessment methods and indices for active
opto-electronic protective devices**

光电保护装置可靠性考核方法和指标

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1 Scope

China's national standard for assessing the reliability of active opto-electronic protective devices. It specifies the terms and definitions, the assessment conditions, the assessment method, the test methods, the assessment indices and the determination of results. These devices are the light curtains and laser scanners that guard a machine without a physical barrier: a beam array across the opening of a press, or a scanner sweeping the floor around a robot, that stops the machine when something enters. They are safety components in the strict sense - the machine's safe operation depends on them working - and unlike a fixed guard they can fail invisibly. A light curtain whose beam is blocked and whose electronics have failed to notice looks exactly like one that is clear. That is why the reliability figure is what the device is really sold on, and why it must be assessed against a defined method: the number is used in the safety calculation for the whole machine, and an unfounded figure invalidates it.

This Standard specifies assessment conditions, assessment methods, test methods, assessment indicators, assessment results and assessment records for reliability of active optoelectronic protective device. This Standard is applicable to reliability assessment of active optoelectronic protective device.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest

edition of the referenced document (including any amendments) applies.

GB/T 2900.13, Electrotechnical terminology - Dependability and quality of service

GB/T 4584, Specification of active opto-electronic protective devices for presses

GB/T 17626.2-2006, Electromagnetic compatibility(EMC) - Testing and measurement techniques - Electrostatic discharge immunity test

GB/T 17626.4-2008, Electromagnetic compatibility - Testing and measurement techniques - Electrical fast transient/burst immunity test

GB/T 17626.5-2008, Electromagnetic compatibility - Testing and measurement techniques - Surge immunity test

3 Terms and definitions

For the purposes of this document, the terms and definitions specified in GB/T 2900.13, GB/T 4584 apply.

5.5.3 Detection after test After the test, the sample shall be subjected to the sensing function, response time and anti-electromagnetic interference detection test according to the requirements of Clause 6. If the test result does not meet the requirements after the test, it is considered that the sample is invalid. The expiration time is based on the number of times at the end of the test.

6.1 Induction function

6.1.1 Light-passing function Under the conditions of use specified by the sample, the active optoelectronic protective device shall have a light-passing function, that is, when there is no shade in the light curtain area, the light curtain shall continue to pass light, and the active optoelectronic protective device outputs an "on" switch state signal. The active optoelectronic protective device shall have an induction function under the conditions of use specified in the sample. When the light-shielding rod (test piece) enters the light curtain area, the active optoelectronic protective device shall respond within the response time and output an "off" switch status signal. When the light-shielding rod (test piece) is removed from the light curtain area, the light curtain shall be re-transmitted, and the active optoelectronic protective device output switch status signal shall change from "off" to "on".

6.1.2 Light-passing test (A test) The light curtain of the active optoelectronic protective device is illuminated within the rated protection length without interference or other specified events in the detection zone. Observe the output status signal of the active optoelectronic protective device for at least 5s. Unless otherwise specified, OSSD(s) shall be on during this period and shall not be disconnected.

6.1.3 Induction function test (B test)

6.1.3.1 The light curtain of the active optoelectronic protective device is illuminated within the rated protection length without interference or other specified events in the detection zone. Observe the output status signal of the active optoelectronic protective device for at least 5s. Unless otherwise specified, OSSD(s) shall be on during this period and shall not be disconnected.

6.1.3.2 Put the test piece into the detection area or start the specified event. During the response time, the output status signal of the active optoelectronic protective device shall be switched from the on state to the off state. Observe the output status signal for at least 5s. Unless otherwise specified, the output optoelectronic protective device is not less than 106 times.

8 Determination of assessment results

8.1 The average number of trouble-free operations (life) per sample is the number of trials at the time of failure.

8.2 The average number of trouble-free operations (life) of the active optoelectronic protective device is based on the average of all test samples.

8.3 There is no sample failure during the reliability assessment, and the service life is the set test time (number of times).

9 Assessment record

9.1 An assessment record shall be established for each sample. And perform test data recording in sequential order. The content of the record shall be.

- a) Sample name, model, specification;
- b) Manufacturer and date of manufacture;
- c) Test date and number of samples;
- d) Test conditions;
- e) Failure sample number and related test times;
- f) Failure phenomenon;
- g) Failure analysis and judgment;