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

GB/T 43022.1-2023

Replacing GB/T 25890.5-2010

**Railway applications - DC surge arresters and voltage limiting
devices - Part 1: Metal-oxide surge arresters without gaps**

轨道交通 直流避雷器和电压限制装置 第1部分：无间隙金属氧化物避雷器

(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 43022 "Rail Transit DC Arresters and Voltage Limiting Devices": GB/T 43022 has been the following sections were published:

---Part 1: Gap-free metal oxide surge arresters;

---Part 2: Voltage limiting device:

This document and Part 2 of GB/T 43022 jointly replace GB/T 25890.5-2010 "Direct Current Opening of Rail Transit Ground Installations" Related Equipment Part 5: DC Arrester and Low Voltage Limiter", compared with GB/T 25890.5-2010, except for structural adjustments and editorial changes in addition, the main technical changes are as follows:

- a) Changed the scope (see Chapter 1, Chapter 1 of GB/T 25890.5-2010);
- b) Added terms and definitions (see Chapter 3);
- c) The gapped nonlinear resistor arrester is deleted (see Chapter 4 of GB/T 25890.5-2010);
- d) The artificial contamination test of lightning arresters has been deleted (see Chapter 5 of GB/T 25890.5-2010);
- e) The logo has been changed (see 4.1, 6:1 of GB/T 25890.5-2010);
- f) The preferred rating value is deleted (see 6.2:1, 6:2:2, and 6:2:3 of GB/T 25890.5-2010);
- g) The use conditions such as temperature, altitude, pollution, shock and vibration have been changed (see 4.2, 6:2:4 of GB/T 25890.5-2010);
- h) The technical requirements such as the insulation withstand capacity, reference voltage, operating load, and mechanical properties of the arrester jacket have been changed (see 4.3, 6:3 of GB/T 25890.5-2010);
- i) Added arrester classification (see Chapter 5);
- j) The inspection rules and test methods have been changed (see Chapter 6, 6:4, 6:5, and 6:6 of GB/T 25890.5-2010);
- k) The acceptance test is deleted (see 6.6 of GB/T 25890.5-2010):

This document is modified to adopt IEC 62848-1:2016 "Rail transit DC arresters and voltage limiting devices - Part 1: Gap-free metal Belongs to oxide surge arrester":

Compared with IEC 62848-1:2016, this document has made the following structural adjustments:

---Added 4:3:11~4:3:14;

---Added 6:12~6:17;

---Deleted Chapter 7;

---Added Appendix A;

---Appendix C corresponds to Appendix A of IEC 62848-1:2016:

There are technical differences between this document and IEC 62848-1:2016: Use vertical single words in the outer margins of the clauses involved:

The line (I) is marked: The specific technical differences and their reasons are as follows:

---Added normative reference documents GB/T 1402 and GB/T 2900.12-2008 (see Chapter 3) to apply to my country's technical regulations components to increase operability;

---Deleted the terms "maximum continuous voltage", "rated insulation voltage", "rated impulse withstand voltage", "switching overvoltage" and "lightning overvoltage" "Acceptance Test" (see Chapter 3), not used in this document;

---Added the DC 1mA reference voltage Uref and the residual voltage under the nominal discharge current (see 4.1), because the basic parameters are added to facilitate detection:

Repair reference;

---Changed the upper limit of ambient temperature to 45°C, and the pollution level of indoor devices to not exceed PD3 (see 4.2:1, 4:2:2, 6:10:3:4) to suit Suitable for our country's national conditions;

---Replaced IEC 61373 (see 4.2:1, 6:11) with normatively cited GB/T 21563-2018, and replaced GB/T 16927.1 IEC 60060-1 (see 6.2:1, 6:2:2, 6:2:4), GB/T 7354 replaced IEC 60270 (see 6.7), GB/T 19519 replaced IEC 61109 (see 6.10:1:2), GB/T 16422.1 replaced ISO 4892-1 (see 6.10:2:1), GB/T 16422.2 replaced Replaced ISO 4892-2 (see 6.10:2:1), GB/T 16422.3 replaced ISO 4892-3 (see 6.10:2:1), GB/T 2423.22-2012 replaced IEC 60068-2-14 (see 6.10:3:4) to adapt to my country's technical conditions and increase operability:

work nature;

---Replaced IEC 62498-1:2010 with normatively cited GB/T 32347.1-2015 (see 4.2:1), the difference between the two documents the degree of consistency is modified to adapt to my country's technical conditions and increase operability;

---Replaced IEC 62498-2:2010 with normatively cited GB/T 32347.2-2015 (see 4.2:1), the difference between the two documents the degree of consistency is modified to adapt to my country's technical conditions and increase operability;

---The reference current per square centimeter of circular area has been changed (see 4.3:2), and the reference voltage requirements have been added: According to industry

actual Use parameters;

--- Added that the residual voltage value of a typical arrester (single column, classification level DC-B) under steep waves, lightning, and operating impulse currents should not be greater than the table the provisions of A:1 (see 4.3:3) are based on the actual parameters used in the industry;

---The seal leakage rate has been changed to sealing performance (see 4.3:5), because specifying the leakage rate will limit other testing methods of sealing performance:

method, so it is changed to sealing performance;

---Added the current uneven coefficient should not be greater than 1:10 and the current uneven coefficient formula (see 4.3:6), quantified according to industry level the technical requirements of this article;

---Increased the steep wave, lightning and operational impact protection level (maximum residual voltage value) of typical arresters (single column, classification level DC-B):

It should be greater than the requirements in Table A:1 (see 4.3:10), and should be specified in accordance with the actual parameters used in the industry;

---The leakage current increased by 0.75 times the DC reference voltage usually does not exceed 50 μ A: The leakage current of each column of the multi-column arrester should not Exceeds the 50 μ A requirement (see 4.3:11), because this indicator can test the performance and quality of the arrester and quantify it according to the industry level:

technical requirements;

---Added pollution resistance performance requirements (see 4.3:12), and put forward specific requirements for designing the insulation distance of the jacket to adapt to the pollution environment, so as to facilitate use;

---Added mechanical performance requirements (see 4.3:13) for ease of use;

---Added appearance, size and weight requirements (see 4.3:14), because composite jacket arresters need to constrain the appearance quality;

---Changed the requirements for type inspection (see 6.1) to comply with the requirements of the domestic industry;

---Inspection items numbered 11 to 16 have been added (see Table 3 in 6:1), corresponding to the technical requirements;

---Added factory inspection and technical requirements and arranged them according to the corresponding relationship (see 6.1 Table 3), in line with domestic standards;

---The test item "sealing leakage rate test" was changed to "sealing test" (see 6.1 Table 3 and 6:9), because there are also indirect tests for leakage the leakage rate is used to verify