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

GB/T 18802.12-2024

**Low-voltage surge protective device (SPD) - Part 12: Surge
protective devices connected to low-voltage power systems -
Selection and application principles
(English Translation)**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 12 of GB/T 18802. GB/T 18802 has been published in the following parts.

- Low voltage surge protective devices (SPD) Part 11: Performance requirements and test methods for surge protective devices for low voltage power supply systems;
- Low voltage surge protective devices (SPD) Part 12: Guidelines for the selection and use of surge protective devices for low voltage distribution systems;
- Low voltage surge protective devices Part 21: Surge protective devices (SPD) for telecommunication and signalling networks Performance requirements and test methods;
- Low voltage surge protective devices Part 22: Guidelines for the selection and use of surge protective devices for telecommunication and signalling networks;
- Low voltage surge protective devices Part 31: Performance requirements and test methods for surge protective devices for photovoltaic systems;
- Low voltage surge protective devices Part 32: Guidelines for the selection and use of surge protective devices for photovoltaic systems;
- Low voltage surge protective device components Part 311: Performance requirements and test circuits for gas discharge tubes (GDT);
- Low voltage surge protective device components Part 312: Guidelines for the selection and use of gas discharge tubes (GDTs);
- Low voltage surge protective device components Part 321: Avalanche breakdown diode (ABD) specification;
- Low voltage surge protective device components Part 331: Specification for Metal Oxide Varistors (MOV);
- Low voltage surge protective device components Part 341: Surge suppression thyristor (TSS) specification;
- Low voltage surge protective device components Part 351: Performance requirements and specifications for surge isolation transformers (SIT) for telecommunication and signalling networks experiment method;
- Low voltage surge protective device components Part 352: Selection and use of surge isolation transformers (SIT) for telecommunication and signalling networks Guidelines.

This document replaces GB/T 18802.12-2014 "Low voltage surge protective devices (SPD) Part 12: Surge protection devices for low voltage power distribution systems" Guidelines for the selection and use of protective devices.

Compared with GB/T 18802.12-2014, the main technical changes of this document are as follows.

- Changed the scope (see Chapter 1, Chapter 1 of the 2014 edition);
- Added terms and definitions "impact voltage rating", "overvoltage category", "effective voltage protection level", "short-circuit SPD", "state "State indicator", "open circuit voltage", "short circuit current of composite wave generator", "(alarm) output terminal", "multi-mode SPD", "total discharge Current", "Reference test voltage", "Rated switching surge current of short-circuit type SPD", "Determine electrical clearance voltage", "Varistor voltage" (See 3.1.43, 3.1.44, 3.1.46, 3.1.47, 3.1.48, 3.1.49, 3.1.50, 3.1.51, 3.1.52, 3.1.53, 3.1.54, 3.1.55, 3.1.56, 3.1.57);
- Changed the terms and definitions "voltage protection level", "compound wave", "SPD disconnecter", "type test", "rated short-circuit current", "overcurrent...compound wave", "compound wave Current protection" (see 3.1.4, 3.1.11, 3.1.15, 3.1.16, 3.1.20, 3.1.45, 2014 edition 3.1.4, 3.1.11, 3.1.16, 3.1.17, 3.1.24, 3.1.38);
- Deleted the terms and definitions "thermal breakdown", "routine test", "acceptance test" and "insertion loss" (see 3.1.14, 2014 edition 3.1.18, 3.1.19, 3.1.22);
- Added abbreviations and acronyms "short-circuit current ICW of composite wave generator", "rated short-circuit current ISCCR", "multi-mode SPD Total discharge current I_{Total}", "Rated switching surge current I_{trans} of short-circuit type SPD", "TOV application time t_T during test" "Probability of equipment damage PSPD" "Effective voltage protection level U_{p/f}" "Specific energy W/R" "Varisto voltage V_v" "Double-fed induction power generation DFIG", "DUT", "Equipotential Bonding Strip EB", "Insulated Gate Bipolar Transistor IGB T", "Lightning Electromagnetic Impact LEMP", "Pulse Width Modulation PWM", "Surge Protection Component SPC", "SPD Special Protection Device SSD" (see 3.2);
- Deleted the abbreviations and acronyms "impact current peak value I_{peak}", "CWG short-circuit current I_{sc}", "limit voltage U_m", "high voltage A (Medium voltage, < 50kV) HVA "Zinc Oxide ZnO" (see 3.2 of the 2014 edition);
- Increased protection requirements (see Chapter 4);
- Deleted the maximum value diagram of UTOV according to GB/T 16895.10-2010 (see Figure 4 of the 2014 edition);
- Changed the selection of SPD parameters, temporary overvoltage characteristics, limp preferred value table, ISCCR. rated short-circuit current, I_{fi}. rated disconnection Continued

flow (see 6.4.2, 6.5.1.2, Table 4, 6.5.5, 5.4.2, 5.5.1.2, Table 2, 5.5.5 of the 2014 edition);

--- Delete the relationship diagram between UP, U0, UC and UCS (see Figure 6 of the 2014 edition);

--- Changed the flow chart of SPD application and the flow chart of SPD selection (see Figure 7, Figure 13, Figure 9, Figure 14 of the 2014 edition);

--- Deleted the fault status (see 6.2.4.2 of the 2014 edition);

---Increased the influence of the internal induced voltage of the device, the voltage protection level, the coordination and separation of the SPD and the expected short-circuit current of the installation location Device information (see 7.4.3, 7.4.5, 7.5.2.4, 7.6.1).

This document is modified to adopt IEC 61643-12:2020 "Low-voltage surge protective devices Part 12: Surge protective devices for low-voltage power supply systems" Guidelines for selection and use.

Compared with IEC 61643-12:2020, this document has a structural adjustment. Appendix A lists the differences between this document and IEC 61643-12.

Comparison table of changes in chapter and article numbers in 2020.

This document has technical differences compared to IEC 61643-12:2020. Appendix B provides the corresponding technical differences and their reasons.

List.

The following editorial changes were made to this document.

--- Deleted E.7, E.8.2, E.8.3, Appendix L and Appendix Q which are not relevant to my country's use;

--- Added notes on grounding of buildings in I.2;

--- Figure I.3 and Figure L.11 have been revised;

--- In reference number F of Figures L.1 to L.4, SSD is added to the backup protector example.

0.1 Overview

GB/T 18802 aims to establish the performance requirements, test methods and selection of low-voltage surge protectors and low-voltage surge protector components.

Thirteen parts.

--- Low voltage surge protective devices (SPD) Part 11: Performance requirements and test methods for surge protective devices for low voltage power supply systems;

--- Low voltage surge protective devices (SPD) Part 12: Guidelines for the selection and use