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

GB/T 31487.1-2025

Replacing GB/T 31487.1-2015

Direct current deicers - Part 1: System design

直流融冰装置 第1部分：系统设计

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Table of Contents

1.Scope	1
2 Normative References	1
3.Terms and Definitions	2
4 Design conditions	7
4.1 Ice Melting Line	7
4.2 DC ice melting device configuration station	7
5 Complete design	8
5.1 General Rules	8
5.2 Methods for melting ice on conductors and ground wires	8
5.3 Main Circuit Parameter Design	8
5.4 System Access Method	9
5.5 Types and Main Electrical Wiring of DC De-icing Devices	9
5.6 Induced voltage and induced current in the ice-melting circuit	10
5.7 Ground wire insulation design for applications requiring de-icing	11
5.8 Overvoltage protection and insulation coordination of DC de-icing device	12
5.9 Connection between DC de-icing device and circuit	13
6.Functional and Performance Requirements	14
6.1 Normal operating conditions of DC de-icing device	14
6.2 Grid-commutated DC de-icing device	15
6.3 Modular Multilevel DC De-icing Device	19
7.Inspection Rule	21
7.1 General Provisions	21
7.2 Type testing and routine testing	22
7.3 Field Test	25
8.Operation and Maintenance	29
8.1 General Rules	29
8.2 Operating Mode	29
95 Appendix G (Informative) Typical Protection Configuration for DC De-icing Devices	
99 G.1 Typical Protection Configuration of DC De-icing Device with Power Grid	
Phase Commutation 99 G.2 Modular Multilevel DC Ice Melting Device Typical	
Protection Configuration 100 Appendix H (Informative) DC De-icing Procedure for	
Conductors and Ground Wires 103 H.1 Line De-energization Conductor DC De-icing	
Process 103 H.2 Line power outage ground wire DC de-icing process 104 H.3 Line	
Uninterrupted Grounding DC De-icing Process 105 References	106

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 31487 "DC De-icing Devices". GB/T 31487 has the following parts published.

1. System Design;

1 Scope

GB/T 31487.1-2025 is the Chinese national standard covering designing a deicing installation - the current needed to melt ice off a given conductor at a given temperature and wind, the connection to the line and the switching, the interaction with the network and the protection while a transmission line is deliberately short-circuited through a converter. At 50,500 words it is the largest of the three parts. It replaces GB/T 31487.1-2015, revised with Parts 2 and 3. It was issued on 31 December 2025 and has been in force since 1 July 2026, replacing GB/T 31487.1-2015. The document is under the responsibility of the China Electrical Equipment Industry Association. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document defines the terminology for DC ice-melting device system design and specifies the design conditions, complete system design, functions, and... Performance requirements, inspection rules, operation and maintenance requirements. This document applies to the de-icing of conductors and ground wires of 110kV and above AC transmission lines, and the de-icing of ground wires of DC transmission lines, for grid phase-change DC transmission. The de-icing device and modular multilevel DC de-icing device are used as references for other voltage level transmission lines and other types of DC de-icing devices.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 311.1 Insulation Coordination Part

3 Experiment. This document replaces GB/T 31487.1-2015 "DC De-icing Devices Part

1. System Design and Application Guidelines", and is consistent with GB/T 31487.1-2015. Compared to 2015, aside from structural adjustments and editorial changes, the main technical changes are as follows:

---The scope has been changed (see Chapter 1, Chapter 1 of the 2015 edition);

---Added terms "line de-icing during power outages", "line de-icing without power outages", "valve", "converter", "grid phase-commutation converter", and "modularization". "Multi-level converter", "ice-melting bus", "ground wire ice-melting lead wire", "grid phase-commutated DC ice-melting device", "modular multi-level DC ice-melting device" "Ice-melting device", "Design ice-melting voltage", "Isolating switch on the ice-melting busbar device side", "Isolating switch on the ice-melting busbar line side", "Conductors and ground" "Line connection disconnect switch", "Ground wire and lead wire connection disconnect switch", "Conductor short-circuit disconnect switch", "Ground wire short-circuit disconnect switch", "Replacement" "DC-side grounding switch of converter", "AC-side grounding switch of converter", "DC pole bus grounding switch", "Ice melting bus grounding switch" "Grounding switch", "Maintenance status", "Cold standby status", "Hot standby status", "AC side hot standby status", "Operating status", "When" "Pre-state", "Target state", "De-icing sequence control", "Equivalent test", "Maintenance test", "Field test", "Equipment test", "Subsystem test" "System test" (see 3.1.1, 3.1.2, 3.2.1~3.2.4, 3.2.6, 3.2.7, 3.2.9, 3.2.10, 3.3.4, 3.4.1~3.4.11) 3.5.1~3.5.5, 3.6.1~3.6.3, 3.7.3~3.7.8);

---Terms changed to "DC de-icing device", "minimum de-icing current", "design de-icing current", "induced voltage", "induced current", and "maximum allowable". "Xu Rongbing current", "rated input voltage", "rated output current", "rated output voltage", "rated output power", "minimum operating voltage" The definition of "flow" (see 3.2.8, 3.3.1~3.3.3, 3.3.5~3.3.11, and 3.2, 3.7~3.10, 3.14,

3.18 in the 2015 edition) 3.19);

---The term "subsystem" has been removed (see 3.4 in the 2015 edition);

---The design conditions have been changed (see Chapter 4, 4.1-4.3 of the 2015 edition);

---Changes have been made to the "General Rules for Complete Set Design", "Main Circuit Parameter Design", "System Connection Method", and "DC Ice Melting Device Type and Electrical Main Connection". The regulations regarding "Line", "Overvoltage Protection and Insulation Coordination of DC De-icing Device", and "Connection of DC De-icing Device to Line" (see 5.1, 5.3~5.5, 5.8, and 5.9 (5.1-

5.6 in the.2015 edition);

---Added "Methods for melting ice in conductors and ground wires", "Induced voltage and induced current in ice melting circuits", and "Insulation of ground wires requiring ice melting". The design specifications are detailed in sections 5.2, 5.6, and 5.7.

---The provisions regarding "installation," "fire prevention," and "ventilation" have been removed (see sections

5.8 of the.2015 edition);

6 Reactors

GB/T 1094.10-2022 Power Transformers - Part

10 Sound Level Measurement

GB/T 1984 High Voltage AC Circuit Breakers

GB/T 1985-2023 High-voltage AC disconnect switches and grounding switches

GB 3096 Environmental Quality Standard for Noise

GB/T 7261 Basic Test Methods for Relay Protection and Safety Automatic Devices
Common technical requirements for

GB/T 11022 High-voltage AC switchgear and controlgear standards

GB/T 11024.1 Parallel capacitors for AC power systems with nominal voltage above 1000V
- Part