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**NATIONAL STANDARD OF THE  
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**GB/T 31487.3-2015**

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**Direct current de-icing devices -- Part 3: Tests  
(English Translation)**

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### Foreword

GB/T 31487 Direct current de-icing devices is divided into 3 parts.

- Part 1. System design and application guide;
- Part 2. Thyristor valves;
- Part 3. Tests.

This Part is Part 3 of GB/T 31487.

This Part is drafted based on the provisions provided in GB/T 1.1-2009.

This Part was proposed by China Electrical Equipment Industrial Association.

This Part shall be under the jurisdiction of National Technical Committee of Power Electronics Standardization (SAC/TC 60).

The drafting organizations of this Part. Southern Power Grid Research Institute Co., Ltd., Nanjing Nari-Relays Electric Co. Ltd., Southwest Electric Power Design Institute, Xi'an High Voltage Apparatus Research Institute Co., Ltd., China Southern Power Grid EHV Power Transmission Company, Guizhou Electric Power Test Research Institute, Yunnan Electric Power Test Research Institute, Xian XD Power Systems Co., Ltd., Yunnan Power Grid Zhaotong Power Supply Bureau, Electric Power Research Institute of Guangdong Power Grid Co., Ltd., Zhejiang Electric Power Corporation Electric Power Research Institute, China EPRI Science & Technology Co., Ltd., Rongxin Power Electronic Co., Ltd., Xuji Flexible Transmission System company, Changzhou Borui Electric Power Automation

Equipment Co., Ltd. and Zhejiang Guirong Xieping Technology Co., Ltd.

## 1 Scope

This Part of GB/T 31487 specifies the basic requirements of type tests, routine tests, field tests, periodical tests and equivalent tests of direct current [Translator. hereafter abbreviated as DC] de-icing devices.

This Part applies to thyristor-based DC de-icing devices of 500kV and below AC transmission lines. For the DC de-icing devices of other voltage classes and based on other power devices, it may reference to this Part.

## 2 Normative references

The following documents are indispensable for application of this document. For the dated documents so quoted, only the dated versions apply to this document. For the undated documents so quoted, the latest versions (including all modification sheets) apply to this document.

GB 1094.1-2013 Power transformers - Part 1. General

GB/T 1094.6-2011 Power transformers - Part 6. Reactors

GB/T 1094.10 Power transformers - Part 10. Determination of sound levels

GB 1984-2014 High-voltage alternating-current circuit-breakers

GB 1985-2014 High-voltage alternating-current disconnectors and earthing switches

GB/T 3859.1-2013 Semiconductor converters - General requirements and line commutated converters - Part 1-1. Specification of basic requirements

GB/T 7261-2008 Basic testing method for relaying protection and security automatic equipment

GB/T 11022-2011 Common specifications for high-voltage switchgear and controlgear standards

GB/T 11024.1-2010 Shunt capacitors for a.c. power systems having a rated voltage above 1 000 V - Part 1. General

GB/T 17623 Determination of componental contents of gases dissolved in insulating oil by gas chromatography method

GB/T 18494.2-2007 Converter transformers - Part 2. Transformers for HVDC applications

GB/T 20297 Static Var Compensator field tests

GB/T 20840.8-2007 Instrument transformers - Part 8. Electronic current transformers

GB/T 20990.1-2007 Thyristor valves for high voltage direct current (HVDC) power transmission - Part 1. Electrical testing

GB/T 26216.1-2010 DC current measuring device for HVDC transmission system - Part 1. Electronic DC current measuring device

GB/T 26217-2010 DC voltage measuring device for HVDC transmission system

GB/T 29629-2013 Water cooling equipment for static var compensators

GB 50150-2006 Standard for hand-over test of electric equipment electric equipment installation engineering

GB 50171 Erection works of electrical installations - Code for construction and acceptance of switchboard outfit, complete cubicle and secondary circuit

GB/T 31487.1-2015 Direct current de-icing devices - Part 1. System design and application guide

### **3 Terms and definitions**

The following terms AND definitions defined in GB/T 21487.1-2015 apply to this document.

For ease of use, some terms and definitions in GB/T 21487.1-2015 are listed here.

#### **3.1**

DC de-icing

DC is applied to the wires or ground wires of iced transmission lines to remove line icing by current's heating effect.

[GB/T 31487.1-2015, definition 3.1]

#### **3.2**

DC de-icing device

A device to provide steady and adjustable DC to iced transmission lines, so as to heat the line and melt the covering ice.

[GB/T 31487.1-2015, definition 3.2]

### 3.3

zero power test

The DC de-icing device is shorted at its DC side by a reactor to rise the DC to the set point, so as to check the DC control function and current withstand capability of the DC de-icing device.

[GB/T 31487.1-2015, definition 3.17]

### 3.20

induced voltage of power frequency

A power frequency voltage that is induced in DC de-icing circuits by AC line operating nearby during the de-icing period.

[GB/T 31487.1-2015, definition 3.18]

### 3.21

induced current of power frequency

A power frequency current that is induced in DC de-icing circuits by AC line operating nearby during the de-icing period.

[GB/T 31487.1-2015, definition 3.19]

### 3.22

coefficient of current distribution

The ratio OF the mean of the parallel operating branch current TO the maximum branch current, when the thyristor valve of DC de-icing device adopts a dual-bridge parallel type.

[GB/T 31487.1-2015, definition 3.20]

## 4.1.1 Test Items

The type test and routine test of the thyristor valve of a DC de-icing device is shown as Table 1.

Table 1 Test Items of the Thyristor Valve

| Name of Test                             | Type of Test | Test Methods and Criteria         | Type Test | Routine Test |
|------------------------------------------|--------------|-----------------------------------|-----------|--------------|
| Insulation DC voltage test of valve sqrt | -            | Carried out according to 6.3.1 of |           |              |