

ICS 45.020
CCS S 61

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**RAILWAY INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

TB/T 3539-2018

**Equipment for Electric Point Heating System
(English Translation)**

Issued on: December 20, 2018

Implemented on: July 1, 2019

Issued by: National Railway Administration

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1 Scope

This Standard specifies the technical requirements, test methods, inspection rules, marking, packaging, transportation and storage of relevant products of equipment for electric heating turnout snow-melting system (hereinafter referred to as snow-melting equipment).

This Standard is applicable to the design, manufacture and inspection of electric heating turnout snow-melting system.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

GB/T 191 Packaging - Pictorial Marking for Handling of Goods (GB/T 191-2008, ISO 780:1997, MOD)

GB/T 2423.17 Environmental Testing for Electric and Electronic Products - Part 2: Test Method - Test Ka: Salt Mist (GB/T 2423.17-2008, IEC 60068-2-11:1981, IDT)

GB 2894 Safety Signs and Guideline for the Use

GB/T 4208-2017 Degrees of Protection Provided by Enclosure (IP Code) (IEC

60529:2013, IDT)

GB/T 5013.4 Rubber Insulated Cables of Rated Voltages up to and Including 450/750V - Part 4: Cords and Flexible Cables (GB/T 5013.4-2008, IEC 60245-4:2004, IDT)

GB/T 5169.16-2017 Fire Hazard Testing for Electric and Electronic Products - Part 16: Test Flames - 50 W Horizontal And Vertical Flame Test Methods (IEC 60695-11-10:2013, IDT)

GB/T 6388 Transport Package Shipping Mark

GB/T 6461-2002 Methods for Corrosion Testing of Metallic and Other Inorganic Coatings on Metallic Substrates - Rating of Test Specimens and Manufactured

TB/T 3074 Technical Specification for Protection against Lightning

Electromagnetic Impulse on Railway Signaling Equipment

TB/T 3498 Lightning Strike Test method for Railway Communication Signal Equipment

3 Terms and Definitions

For the purpose of this document, the following terms and definitions apply.

3.1 Equipment for electric point heating

Technology that uses electric heating to melt snow at the turnout switch.

3.2 Electric control cabinet for defrosting the switch

The control equipment that introduces and distributes the snow-melting power supply, switches on and off the snow-melting heating circuit of each turnout according to the control conditions.

3.3 Rail temperature sensor

The device that measures the rail temperature.

3.4 Mounting clip

The device that clip and fix the heating elements onto the rail.

3.5 Grip force

Pressure of the mounting clip body on both ends of the rail bottom.

3.6 Clamp pressure

The force that presses the heating elements of strip and lead onto the rail.

3.7 Isolating transformers for defrosting the switch

In order to insulate the heating circuit from the ground, and isolate the different heating circuits from each other, a transformer connected between the heating power supply and the heating circuit.

4.1 Composition of snow-melting equipment

requirements.

5.2.2 Snow-melting equipment shall be suitable for centralized and decentralized power supply.

5.2.3 Snow-melting equipment shall meet the requirements of local control, station control, and remote control; the system shall have functions such as diagnosis, alarm, remote monitoring, and management; it can be selected as required.

5.2.4 Snow-melting equipment shall have protection measures against over-current and short-circuit.

5.2.5 Snow-melting equipment shall have reliable safety protection and flame-retardant measures; the flame-retardant shall meet the requirements of Level V-2 in

GB/T 5169.16-2017.

5.2.6 The lightning protection devices and components of snow-melting equipment

shall conform to the provisions of TB/T 2311.

5.2.7 Vibration shall meet the following requirements:

a) The electric heating elements, mounting fixtures of electric heating elements, rail temperature sensor shall meet the requirements of Type-4 vibration test specified in TB/T 2846-2015. After the vibration test, the equipment shall be free of damage, no falling off, and can work normally;

b) The isolating transformer, monitoring module and the other devices shall meet the requirements of Type-2 vibration test specified in TB/T 2846-2015. After the vibration test, the equipment shall be free of damage, and can work normally.

5.2.8 After the electromagnetic compatibility test, the snow-melting equipment shall conform to the provisions of performance criterion B specified in GB/T 24338.5.

5.2.9 After the lightning protection test, the snow-melting equipment shall conform to the provisions of Type-B judgment conditions specified in TB/T 3498.

5.2.10 In the section with track circuit, isolation measures shall be adopted for heating circuits directly connected to electric heating elements. If an isolating transformer is used for isolation, the heating circuits on both sides of the turnout shall not share the same secondary coil of the transformer; neither shall it affect the working status of the track circuit.

5.2.11 The reliability and life of the snow-melting equipment shall meet the following requirements:

a) Mean time between failures (MTBF) is greater than or equal to 5×10^4 h;

5.4.3 The control cabinet, control terminal and work station shall have the functions of setting relevant parameters, starting and closing the system or a single heating circuit.

5.4.4 The control terminal and workstation shall be able to monitor the following information of the control cabinet in real time:

- a) Input voltage, current, frequency of the power supply;
- b) Input power supply failure alarm;
- c) Display the measurement data of the rail temperature sensor and failure alarm;
- d) The working status, working voltage, current and failure alarm of each heating circuit;
- e) Records of working status of contactors, circuit breakers and leakage protectors;
- f) Control cabinet door status and door-opening alarm.

5.4.5 The storage time of various real-time information records of control terminals and

workstations shall be no less than 12d; after the snow-melting equipment is powered off, the recorded information shall not be lost, and shall have the following management functions:

- a) Input power supply voltage, current, frequency and failure alarm records;
- b) Working status of heating circuit and failure alarm record;
- c) Monitoring data record and failure alarm record of rail temperature sensor;
- d) Operation records of the user;
- e) Statistics of heating time, number of heating and total power consumption of each