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

GB/T 25122.5-2018

**Railway applications - Power converters installed on board
rolling stock - Part 5: Traction converters for urban rail vehicles**

轨道交通 机车车辆用电力变流器 第5部分：城轨车辆牵引变流器

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Foreword

GB/T 25122 "Power converter for rail transit vehicles" is divided into five parts.

--- Part 1. Characteristics and test methods;

--- Part 2. Supplementary technical information;

--- Part 3. Locomotive traction converters;

--- Part 4. Electric vehicle unit traction converter;

--- Part 5. Urban rail vehicle traction converter. This part is the fifth part of GB/T 25122. This part is drafted in accordance with the rules given in GB/T 1.1-2009. Please note that some of the contents of this document may involve patents. The issuing organization of this document is not responsible for identifying these patents. This part is proposed by the National Railway Administration. This part is under the jurisdiction of the National Traction Electrical Equipment and Systems Standardization Technical Committee (SAC/TC278). This section is responsible for drafting the unit. CRRC Zhuzhou Electric Locomotive Research Institute Co., Ltd. Participated in the drafting of this section. CRRC Qingdao Sifang Vehicle Research Institute Co., Ltd., China Railway Science Research Institute, Locomotive and Rolling Stock Institute, CRRC Qingdao Sifang Locomotive & Rolling Stock Co., Ltd. and Xiangtan Electric Co., Ltd. The main drafters of this section. Feng Jianghua, Wan Weiwei. Participated in the drafting of this section. Liu Haitao, Xia Meng, Song Shuquan, Wu Donghua, Chen Hongwei. Power converter for rail transit vehicles Part 5. Urban rail vehicle traction converter

1 Scope

China's national standard for the traction converters of urban rail vehicles. It is Part 5 of GB/T 25122 and specifies the service conditions, the technical requirements, the type tests and the routine tests for the traction converters of metro and light rail vehicles. Urban rail is the third case in the series and it is the one defined by duty rather than by power. A metro train accelerates and brakes at every station, which on a busy line is every ninety seconds for eighteen hours a day, so the converter performs a full traction and braking cycle more times in a week than a locomotive converter does in a year. Its rating is therefore set by thermal cycling and by the fatigue of the semiconductor bond wires and solder layers under repeated thermal expansion rather than by continuous power - a device that would run indefinitely at rated current will fail after a finite number of cycles, and that number is the design life. The second defining feature is regenerative braking. Almost all the braking on a metro is electrical, and the energy returned is substantial; whether it can be used depends on whether another train is drawing power at that moment on the same section, so the converter must handle the case where the line will not accept the energy - by resistor braking, by storage, or by blending in the friction brake - and do it seamlessly, because the passenger must not feel the transition. Around those sit a direct current supply that varies widely, a vehicle profile that leaves little space, the noise limits of an underground environment, and electromagnetic compatibility with signalling in a confined tunnel. Issued on 28 December 2018 and in force since 1 July 2019.

This part of GB/T 25122 stipulates the use conditions, system composition, technical requirements, inspection methods and inspection of the traction converter of urban rail vehicles. Rules, signs, packaging, transportation and storage. This section applies to urban rail vehicle traction converters (hereinafter referred to as converters).

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 1402 rail transit traction power supply system voltage

GB/T 2423.1-2008 Environmental testing of electric and electronic products - Part 2. Test methods Test A. Low temperature

GB/T 2423.2-2008 Environmental testing of electrical and electronic products - Part 2. Test methods Test B. High temperature

GB/T 2900.32 Electrotechnical terminology power semiconductor device

GB/T 2900.33 Electrotechnical terminology power electronics technology

GB/T 4208-2017 enclosure protection grade (IP code)

GB/T 21413.1-2008 Railway applications -- Electrical equipment for rolling stock -- Part 1 .

General conditions and general rules

GB/T 21414 Regulations for the protection of electrical hazards in railway applications

GB/T 21563-2018 Impact and vibration test of rail transit locomotive equipment

GB/T 24338.4-2018 Electromagnetic compatibility of rail transit - Part 3-2. Equipment for rolling stock

GB/T 25119 rail transit rolling stock electronic device

GB/T 25122.1-2018 Power converters for railway rolling stock -- Part 1 . Characteristics and test methods

GB/T 25343.3 Railway applications - Welding of rail vehicles and their components - Part 3. Design requirements

3 Terms and definitions

The terms and definitions defined in GB/T 2900.32, GB/T 2900.33 and GB/T 25122.1-2018 apply to this document.

4 Conditions of use

4.1 Environmental conditions The converter should work properly under the following environmental conditions.