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

GB/T 32593-2016

**Railway applications -- Fixed installations -- Electronic power
converters for substations**

轨道交通 地面装置 变电所用电力电子变流器

(English Translation)

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Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the re-drafting method to amend the use of IEC 62590.:2010 "rail transit equipment for substation power electronics Flow device ".

There is a technical difference between this standard and IEC 62590.:2010, and these differences involve the use of vertical single-line (-) Line markings. The technical differences between this standard and IEC 62590.:2010 are.

--- on the normative reference documents, this standard has made a technical differences in the adjustment to meet China's technical conditions, adjust the situation the situation is reflected in Chapter 2, "Normative references", as follows.

Replace GB 60850..2007 with GB/T 1402;

Replace IEC 60050-551.:1998 with GB/T 2900.33;

Replace GB 60000-811...1991 with GB/T 2900.36;

- replace GB 60146-1-1 with GB/T 3859.1;

Replace GB 608-1-1..2011 with GB/T 3859.2-2013;

- replace GB 60146-1-3 with GB/T 3859.3;

- replace GB 608..2000 with GB/T 3859.4;

Replace GB 607-6..1992 with GB/T 17950;

- Replace the IEC 62236 (all parts) with GB/T 24338 rail traffic electromagnetic compatibility (all parts), two standards the degree of consistency between the parts is as follows.

Railways - Electromagnetic compatibility - Part 1. General principles (IEC 62236-1.:2003, IDT);

GB/T 24338.2-2011 Electromagnetic compatibility for rail transit Part 2. Launch of the entire track system to the outside world (IEC 62236-2.:2003, IDT);

Railways - Electromagnetic compatibility - Part 3-1. Locomotives and rolling stock - Trains and vehicles - GB/T 24338.3-2009.

(IEC 62236-3-1.:2003, IDT);

Railways - Electromagnetic compatibility - Part 3-2. Locomotives and rolling stock equipment GB/T 24338.4-2009 (IEC 62236-3-2.:2003, MOD);

Electromagnetic compatibility for rail transit - Part 4. Launch and resistance of signaling and communication equipment GB/T 24338.5-2009 Disturbance (IEC 62236-4.:2003, IDT);

Railways - Electromagnetic compatibility - Part 5. Launch of ground power installations and equipment GB/T 24338.6-2009 and Immunity (IEC 62236-5.:2003, IDT).

Replace GB 618-2-7..2006 with GB/T 25890.7;

Replace IEC 62497-1.:2010 with GB/T 32350.1-2015.

- modified normative reference document IEC 60271, replaced by IEC 62498, since IEC 62498 is a ring dedicated to rail transit Conditions of environmental conditions;

- added the term definition "3.3.11 inverter", a clear distinction between the converter and inverter;

- modified 5.2.2.2 storage temperature of "-40 °C ~ 55 °C" and increase the ambient temperature "-25 °C ~ 40 °C", and track Traffic and electrical equipment commonly used temperature requirements uniform;

- modified in Table 4 on the current capacity of the converter test mode, and GB/T 3859.1 converter current capability test Unite;

- In 7.2.1.1, "Insulation resistance measurement is not required as a required test item" at the time of factory inspection, because the insulation resistance measurement the insulation resistance of each product can be checked for the inspection of the factory.

This standard has made the following editorial changes.

--- deleted the original introduction;

--- "the equipment in this standard is specifically referred to as the converter" at the end of the original Chapter 1, and the other parts refer to the "device" of the converter as "converter" to avoid misunderstanding;

--- removed in Chapter 2 in IEC 62236-5.:2008, since all parts of GB/T 24338 have been referenced as a whole;

- modify 4.3.1 in paragraph 1 of paragraph 1, "calculated by the following formula" as "the following formula ($p = q \times s$)", supplementary description q and s with the formula p Relationship in order to understand;

--- modified the full text of many paragraphs, the original sub-clause under the single sentence paragraph merger, to reduce the paragraph structure;

--- modify the 7.2.1.1 paragraph, to increase the number of untitled, to solve too many paragraphs, to facilitate the reference;

- Fixed footnote b in Table 6 "See 3.3.1" and should be "see 6.3.1";

--- Amend the converter type in Appendix A "see 4.3.1" and shall be "see 4.1.1";

--- modify the appendix C for the index to meet the Chinese habit.

This standard is proposed by the National Railway Administration.

This standard is nationalized by the National Technical Committee for Traction Electrical Equipment and Systems (SAC/TC278).

The main drafting unit of this standard. Zhuzhou converter technology National Engineering Research Center Co., Ltd.

This standard participates in the drafting unit. Yongji new speed motor electrical limited liability company, CSR Nanjing Puzhen Vehicle Co., Ltd., CSR Zhuzhou Electric Locomotive Co., Ltd., China Railway Fourth Survey and Design Institute Group Co., Ltd.

1 Scope

This standard specifies the technical requirements for the use of controlled or non-controllable power valves to provide ground power supply for traction power.

This standard applies to devices where the device is controlled by current, voltage, or light, and assumes that the non-bistable device is in switch mode.

This standard applies to railways and guided large traffic systems (eg trams, light rail systems, elevated railways and subways, mountain areas Rail, trolleybus) ground equipment.

This standard applies to diode rectifiers, controllable rectifiers, inverters and frequency converters.

This standard does not apply to cranes, rail transit platforms and similar transport equipment, suspended vehicles and cable railways.

2 Normative reference documents

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

GB/T 1402 Rail Transit Traction Power Supply System Voltage (IEC 60850.:2007, MOD)
 GB/T 2900.33 Electrical terminology Power electronics technology (IEC 60050-551.:1998, IDT) GB/T 2900.36 Electrical terminology Electric traction (IEC 60050 (811)..1991, MOD)
 GB/T 3859.1 General Requirements for Semiconductor Converters and Grid Replacement Converters - Part 1-1. Basic Requirements Specifications (IEC 60146-1-1.:1991, MOD)
 GB/T 3859.2-2013 General Requirements for Semiconductor Converters and Grid Replacement Converters - Part 1-2. Application Guidelines (IEC 60146-1-2.:2011, MOD)
 GB/T 3859.3 General requirements for semiconductor converters and grid commutators - Part 1-3. Transformers and reactors (IEC 60146-1-3.:1991, MOD) GB/T 3859.4
 Semiconductor converters include semiconductor direct commutators for direct DC converters (IEC 60146-2.:1999, IDT) GB 4208-2008 enclosure protection class (IP code) (IEC 60529.:2001, IDT) GB/T 17950 Semiconductor converters - Part 6. Guidelines for the use of fuses to protect semiconductor converters against overcurrent (IEC 60146-6.:1992, IDT) GB/T 18039.4 Electromagnetic compatibility environment Factory low frequency transmission disturbance compatibility level (GB/T 18039.4-2003, IEC 61000-2-4.:1994, IDT) GB/T 24338 (all parts) Rail traffic Electromagnetic compatibility [IEC 62236 (alpart)]
 GB/T 25890.7 Metro equipment - DC switchgear - Part 7-1. DC traction power supply system - Special measurement, Control and Protection Device Application Guide (IEC 61992-7-1.:2006, IDT) GB/T 32350.1-2015 Rail traffic insulation fits Part 1. Basic requirements Electrical and electronic equipment, electrical clearance and creepage distance (IEC 62497-1.:2010, MOD) Electromagnetic compatibility (EMC) - Part 2-12. Ambient in low - frequency conducted disturbances in a public medium - voltage power supply system IEC 61000-2-12 and the level of compatibility of the signal transmission (Electromagneticcompatibility (EMC) -Part 2-12.
 Environment-Compati-bilitylevelsforlow-frequencyconducteddisturbancesandsignalinginpubl
 icmedium-voltagepower