

ICS 43.040

T 35



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

中华人民共和国国家标准

GB/T 18488.1-2015

Replace GB/T 18488.1-2006

**Drive motor system for electric vehicles -
Part 1: Specification**

电动汽车用驱动电机系统 第 1 部分:技术条件

Issued on February 04, 2015

Implemented on September 01, 2015

**Issued by General Administration of Quality Supervision, Inspection
and Quarantine of the People's Republic of China**

**Standardization Administration of the People's Republic of
China**

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Foreword

GB/T 18488 *Drive Motor System for Electric Vehicles* is divided into two parts:

- Part 1: General specification;
- Part 2: Test methods.

This part is Part 1 of GB/T 18488.

This part is drafted in accordance with the rules provided by GB/T 1.1—2009.

This part replaces GB/T 18488.1—2006 *The Electrical Machines and Controllers for Electric Vehicles - Part 1: General Specification*. Compared with GB/T 18488.1—2006, in addition to the editing modifications, the main technical changes in this part are as follows:

- Increased “terms and definitions”;
- Revised the provision of “working system”, replaced the original S1-S9 working system with “formulated by manufacturer and user by reference to GB 755”;
- Revised the provision of “voltage class”, increased six classes of “60 V, 72 V, 80 V, 650 V, 700 V, 750 V” based on the original voltage classes, and stipulated “144 V, 288 V, 312 V, 336 V, 384 V, 600 V” as preferred gradations;
- Increased the provision of “type designation for drive motor and drive motor controller”;
- Revised the provision of “mechanical strength of drive motor controller shell”, changed “gravity generated by adding 100 kg mass on an area of 30 cmX30 cm” to “not lower than 10 kPa pressure”;
- Revised the provision of “sealing performance for cooling circuit of liquid cooling system”, changed the pressure limit reflecting sealing state from “(40±5) kPa” to “not lower than 200 kPa”;
- Revised the provision of “insulation resistance of drive motor stator winding for enclosure”, prescribing that “when insulation resistance calculated by formula (1) is lower than 0.38 MD, examined by 0.38 Mn”, and changed “rated voltage” in the original formula to “maximum voltage”;
- Increased the provision of “insulation resistance of drive motor stator winding for

temperature sensor”;

——Revised the provision of “drive motor controller insulation resistance”, revised the original “hot insulation resistance is not lower than 1 Mn” to “cold and hot insulation resistance are both not lower than 1 Ma”;

——Revised the provision of “interturn impact withstand voltage of drive motor winding”, formulated specific provisions for drive motor armature winding, drive motor exciting winding, brushed DC motor armature winding respectively;

——Increased the provision of power frequency withstand voltage of motor winding for temperature sensor;

——Revised the provision of “power frequency withstand voltage of drive motor winding for enclosure” and “power frequency withstand voltage of drive motor controller”, changed the characters of “nominal voltage” to “maximum voltage”;

——Revised the provision of “temperature rise”, changed the quoted standard from “GB 755—2000” to “GB 755—2008”, meanwhile, deleted the provision of controller temperature rise;

——Revised “voltage fluctuation”, changed “voltage fluctuation” to “voltage range”, and revised the provision of voltage range, changed “drive motor system under rated supply voltage of 125% is decreased to 75% of rated voltage” to “voltage range of drive motor system shall meet provisions of product technical documents.

——Increased the provision of “continuous torque”, “continuous power”, “peak torque”, “peak power”, “peak efficiency of drive motor system”, “high-efficient working area of drive motor system”, “speed control accuracy”, “torque control accuracy”, “respond time of speed”, “respond time of torque”, “drive motor controller continuous current”, “drive motor controller short-time current”, “controller maximum current”;

——Revised “regenerated energy feedback characteristics”, changed “regenerated energy feedback characteristics” to “feeding characteristics”;

——Increased the provision of “drive motor controller support capacitor discharge duration”;

——Increased the provision of “low temperature storage”;

——Revised the provision of “low temperature operation”, changed low temperature limit

from “-20 °C” to “-40 °C”, changed “4 h of normal operation under low temperature” to “retest insulation resistance in box after test”;

——Increased the provision of “high temperature storage”;

——Revised the provision of “high temperature operation”, changed high temperature limit from “+ 40 °C” to “+55 °C”, prescribing that “in case of special requirements, the temperature limits specified in Table 3 shall be followed, additional tests shall be made according to the test requirements determined by manufacturer and user through consultation”;

——Revised the provision of “damp heat”, changed “shall be able to bear a 48 h steady-state damp heat test under 40 °C with relative humidity of 95%” to “shall be able to bear a 48 h steady-state damp heat test under $(40\pm 2)^{\circ}\text{C}$ with relative humidity of 90%-95%”, prescribing that “shall be able to conduct normal operation under rated voltage, continuous torque and continuous power upon return to normal state”;

——Revised the provision of “vibration resistance”, deleted “constant frequency vibration”, increased the provision of “random vibration”;

——Revised the provision of “waterproof, dustproof”, changed “GB/T 4942.2” to “GB 4208”;

——Revised the duration of “salt spray” test, changed from 16 h to 48 h;

——Revised the provision of “electromagnetic radiation”, changed “electromagnetic radiation” to “electromagnetic radiation disturbance”, changed the limits to “subject to provision of product technical documents”;

——Revised the provision of “electromagnetic radiation immunity degree”, changed “electromagnetic radiation immunity degree” to “electromagnetic radiation immunity”, changed the limits to “subject to provision of product technical documents”;

——Revised the provision of “inspection rules”, changed “type inspection of 2 sets of prototypes” to “send 3 sets as samples, 2 sets for type inspection, 1 for standby”, grouping provisions of relevant test items in type inspection of 2 sets of prototypes were conducted;

——Revised the provision of “signs, packaging, transportation and storage” to “signs and labels”, increased the provision of “lead-out wire and terminal”, increased the provision of “danger warning”, deleted the provision of “packaging, transportation and storage”;

- Deleted the provision of “vehicle working conditions”;
- Deleted the provision of “power rating of motor, capacity rating of controller”;
- Deleted the provision of “impact withstand voltage of motor winding, wiring board and other insulating parts for enclosure”;
- Deleted the provision of “locked-rotor current”;
- Deleted the provision of “pick-up current”;
- Deleted the provision of “noise”;
- Deleted the provision of “vibration”.

This part is proposed by Ministry of Industry and Information Technology of the People’s Republic of China.

This part is under the jurisdiction of National Technical Committee of Auto Standardization (SAC/TC 114).

The participation drafting organizations of this part are: Shanghai Edrive Co., Ltd., CSR Zhuzhou Electric Locomotive Research Institute Co., Ltd., China Automotive Technology&Research Center, Beijing Institute of Technology, Tianjin Qingyuan Electric Vehicle Co., Ltd., Shanghai E-Propulsion Auto Technology Co. Ltd., Chery Automobile Co., Ltd., Chongqing Changan New Energy Automobile Co., Ltd., Zhongshan Broad-Ocean Motor Co., Ltd., Zhengzhou Yutong Group Co., Ltd.

The chief drafting staff of this part includes: Gong Jun, Guo Shuying, Jia Aiping, Li Yifeng, Wang Zhengyu, Song Qiang, Dou Ruzhen, Fu Zhenxing, Li Bo, Xiao Wei, Bi Ronghua, Huang Qi, Ying Hongliang, Meng Xiangfeng, Lin Weiyi, Peng Nengling.

Previous versions that this part replaces are as follows:

- GB/T 18488.1—2001, GB/T 18488.1—2006.

Drive motor system for electric vehicles

Part 1: General specification

1 Scope

This part of GB/T 18488 prescribed the working system, voltage class, type designation, requirements, inspection rules, signs and labels, etc. of drive motor system for electric vehicles.

This part is applicable to drive motor system for electric vehicles, drive motors and drive motor controllers. Vehicle motors and their controllers that only possess power generation function may refer to this part for implementation.

2 Normative references

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

GB 755 - 2008 Rotating electrical machines - Rating and performance

GB1971 Rotating electrical machines - Terminal markings and direction of rotation

GB/T 2423.17 Environmental testing for electric and electronic products - Part 2: Test method - Test Ka: Salt mist

GB 2894 Safety signs and guideline for the use

GB/T 2900.25 Electrotechnical terminology - Rotating electrical machines

GB/T 2900.33 Electrotechnical terminology - Power electronics

GB 4208 Degrees of protection provided by enclosure (IP code)

GB/T 4942.1 Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification

GB/T 19596 Terminology of electric vehicles

GB/T 28046.3 - 2011 Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 3: Mechanical loads



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