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**On-site testing instruments of off-board charger for electric
vehicles**

电动汽车非车载充电机现场检测仪

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives

for standardization - Part

1. Rules for the structure and drafting of standardizing documents". Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing authority shall not be held responsible for identifying any or all such patent rights. This document was proposed by China Machinery Industry Federation. This document shall be under the jurisdiction of National Technical Committee on Electrical Instruments of Standardization Administration of China (SAC/TC 104). The drafting organizations of this document. Power Supply Service Management Center of State Grid Jiangxi Electric Power Co., Ltd., Harbin Electric Instrument Research Institute Co., Ltd., Shenzhen Xinglong Technology Co., Ltd., China Electric Power Research Institute Co., Ltd., Marketing Service Center of State Grid Zhejiang Electric Power Co., Ltd., Measurement Center of Guangdong Power Grid Co., Ltd., China Southern Power Grid Research Institute Co., Ltd., Marketing Service Center of State Grid Jiangsu Electric Power Co., Ltd., Marketing Service Center (Metering Center) of State Grid Hubei Electric Power Co., Ltd., Zhejiang Ju Magnetic Intelligent Technology Co., Ltd., Shenzhen Kelu Electronic Technology Co., Ltd., Marketing Service Center of State Grid Chongqing Electric Power Company, Henan Xuji Instrument Co., Ltd., Marketing Service Center of State Grid Sichuan Electric Power Company, Yunnan Power Grid Co., Ltd., Zhejiang Hanpu Electric Technology Co., Ltd., Ningbo Canaan Intelligent Electric Co., Ltd., Shenzhen Saite New Energy Technology Co., Ltd., Shenzhen Sikanda Electronics Co., Ltd., Zhejiang Grete Electric Co., Ltd., Huali Technology Co., Ltd., Marketing Service Center (Metering Center) of State Grid Shandong Electric Power Company, Marketing Service Center of State Grid Tianjin Electric Power Company, Measurement Center of State Grid Jibei Electric Power Co., Ltd., Zhejiang Chint Instrument Co., Ltd., Shanghai Instrument and Meter Research Institute Co., Ltd., State Grid Electric Power Research Institute Wuhan Nanrui Co., Ltd., Shandong Jicheng Zhitong New Energy Co., Ltd., Qingdao Hi-Tech Communication Co., Ltd., Yantai Dongfang Weston Electric Co., Ltd., Changyuan Shenrui Energy Technology Co., Ltd., Shenzhen Guodian Technology Communication Co., Ltd., Taiyuan Youte Aoke Electronic Technology Co., Ltd., Guangzhou Maisbao New Energy Technology Co., Ltd., Shenzhen Xingka Technology Co., Ltd., Shenzhen Ruikainuo Technology Co., Ltd., Zhongren Guochuang Testing Technology (Jiangsu) Co., Ltd., Zhejiang Jiachen New Energy Development Co., Ltd., State Grid Ningxia Electric Power Co., Ltd. Marketing Service Center (State Grid Ningxia Electric Power Co., Ltd. Measurement Center), Harbin Institute of Technology, Hunan Jingneng New Energy Technology Co., Ltd., Zhejiang Anfu New Energy Technology Co., Ltd., Zhejiang Wansheng Intelligent Technology Co., Ltd., Beijing Jingyi Northern On-site testing instruments of off-board charger for electric vehicles

1 Scope

China's national standard for the on-site testing instruments used on electric vehicle off-board chargers. A DC rapid charger is a measuring instrument in law as well as in fact -

the customer is billed for the energy it registers - and like any trade instrument it must be verified periodically. It cannot be brought to a laboratory: it is bolted down, connected to the grid, and worth more standing than the cost of testing it. So verification happens in the field with a portable instrument that connects in place of a vehicle, presents a load, and measures the energy the charger delivers against its own reference. The requirements are demanding for the same reason: the instrument must be accurate enough to judge the charger while being carried around in a van, and it must handle currents of hundreds of amperes at up to 1000 V. The standard covers terminology, technical requirements, test methods, inspection rules and packaging.

This document specifies the terms and definitions, technical requirements, test methods, inspection rules and packaging, transportation and storage requirements for on-site testing instruments of off-board charger for electric vehicles. This document applies to the design, manufacture, procurement and acceptance of on-site testing instruments of off-board charger of 1000 V and below.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 2423.1-2008, Environmental testing for electric and electronic products -- Part

4 Technical requirements

4.1 Environmental conditions The environmental conditions for normal use of the testing instrument shall meet the following requirements.

- a) Ambient temperature. $-25^{\circ}\text{C}\sim 55^{\circ}\text{C}$;
- b) Ambient humidity. relative humidity does not exceed 95%;
- c) Altitude is not more than 2000 m;
- d) Under special environmental conditions, it is necessary to consult and confirm with the testing instrument manufacturer or take corresponding measures.

4.2 Structure and mechanical properties

4.2.1 Impact After the testing instrument housing has been subjected to the impact test in 5.2.1, its appearance shall be intact and its measurement performance shall meet the requirements of 4.5.

4.2.2 Vibration After the testing instrument has been subjected to the vibration test in 5.2.2, its appearance shall be intact. The measurement performance shall meet the requirements

of 4.5.

4.2.3 Heat resistance and flame retardancy The testing instrument shall be able to withstand the glow wire test at 750°C. The test results shall comply with the provisions of Chapter 10 of GB/T 5169.11-2017.

4.2.4 Protection level The protection level of the testing instrument shall not be lower than the IP30 requirement in GB/T 4208-2017.

4.2.5 Grounding terminal The testing instrument shall have a protective grounding terminal with an obvious grounding mark, and have a reliable electrical connection with the metal casing that can be touched by the testing instrument. The resistance between the grounding terminal and each connection point shall not be greater than 0.1 Ω .

4.2.6 Marks The nameplate of the testing instrument shall have at least the following markings.

- a) Product name;
- b) Manufacturer name and trademark;
- c) Accuracy level;
- d) Measuring range;
- e) Product model;
- f) Exit-factory date and serial number;
- g) Rated supply voltage parameters.

4.3 Electrical performance

4.3.1 Power supply If the testing instrument is powered by an AC power supply, the power supply requirements are as follows:

- a) Rated voltage. single-phase 220 V, allowable deviation. -20%~15%;
- 50 Hz; allowable deviation. $\pm$

0.5 Hz. If the testing instrument is powered by a DC power supply, the power supply voltage range required is. 9 V~36 V. If the testing instrument has a built-in battery power supply function, it can work continuously for at least 4 hours when fully charged.

4.3.2 Power consumption The power consumption of the testing instrument shall not exceed 120 W.

4.3.3 Insulation resistance One minute after the test voltage in Table 4 is applied between each non-electrically connected live circuit and between each independent live circuit and ground (metal casing), the insulation resistance shall not be less than 10 M Ω .