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

GB/T 20234.2-2015

Replacing GB/T 20234.2-2011

**Connection sets for conductive charging of electric vehicles -
Part 2: AC charging couplers**

电动汽车传导充电用连接装置 第2部分：交流充电接口

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Foreword

GB/T 20234 "Connection Set of Conductive Charging for Electric Vehicles" consists of 3 parts. - Part

1.General Requirements; - Part 2: AC charging coupler; - Part 3: DC charging coupler. This Part is Part 2 of GB/T 20234. This Part was drafted in accordance with the rules given in GB/T 1.1-2009. This Part replaces "Connection Set of Conductive Charging for Electric Vehicles - Part 2: AC Charging Coupler" (GB/T 20234.2-2011). Compared with GB/T 20234.2-2011, the main technical changes are as follows: - The requirement "the rated current shall not exceed 32A" was modified to "the rated current shall not exceed 63A" (see Chapter 1); - 10A and 63A were added among the rated current values of charging coupler (see Table 1); - The function of spare contact was extended to three-phase charging function (see Table 2); - R4 resistance was added (see Figure 3); - The content of control pilot circuit and control principle was deleted (see Appendix A of 2011 edition); - Some dimensions of control pilot contact and mechanical lock of charging coupler were modified; drainage holes (optional) in socket were added; seal ring was modified as optional (see Appendix A); - The spatial size requirements of plug were modified and adjusted as a normative appendix (see Appendix C). This Part was proposed by the Ministry of Industry and Information Technology of the People's Republic of China. This Part shall be under the jurisdiction of the National Technical Committee on Automobiles of Standardization Administration of China (SAC/TC 114). Main drafting organizations of this Part. China Automotive Technology & Research Center, State Grid Corporation of China AND China National Electric Apparatus Research Institute Co., Ltd. Participating drafting organizations of this Part. China Electricity Council, Nanjing Nari Group Corporation, BYD Auto Industry

Company Limited, SAIC Motor Corporation Limited R&D Center, Xuji Group Corporation, China Electric Power Research Institute, BYD Daimler New Technology Co., Ltd., Suzhou Chilye Environmental Protection Science and Technology Co., Ltd., China FAW Group Corporation R&D Center, Chongqing Chang'an New Energy Automobile Co., Ltd., Amphenol PCD Shenzhen Co., Ltd., Nanjing Phoenix Contact Co., Ltd., Potevio New Energy Co., Ltd. AND Anhui Jianghuai Automobile Co., Ltd. Chief drafters of this Part. Lian Yubo, Zhou Rong, Wu Bin, Wang Hongjun, Zhu Daoping, Zhao Xiang, Yin Jiatong, Huang Wei, Liu Yongdong, Shao Zehai, Meng Xiangfeng, Zhang Tianqiang, Shi Shuanglong, Lv Guowei, Yuan Changrong, Wang Zhicheng, Xu Xiao, Zhou Guangrong, Shuai Qiangjun, Chen Ling, Tang Wuwu, Li Xiaoqiang, Chen Xiaonan, Zhao Jiuzhi and Wu Zhiqiang. The previous edition replaced by this Part is. - GB/T 20234.2-2011. Connection Set for Conductive Charging of Electric Vehicles - Part 2: AC Charging Coupler

1 Scope

China's national standard for the AC charging coupler of an electric vehicle - the connector at both ends of an AC charging cable, and one of the three national plug systems in the world. It is Part 2 of GB/T 20234 and specifies the general requirements, the function definitions, the type structures, the parameters and the dimensions of AC charging couplers for conductive charging, applying to couplers rated at not more than 440 V AC, 50 Hz and not more than 63 A. Where the supply-side coupler uses standardised domestic plugs and socket-outlets, this part does not apply to those. A charging coupler is a connector that carries a heavy current, outdoors, handled daily by untrained people, for the life of a vehicle - and it also carries the control circuit that tells the vehicle how much current the installation can supply and tells the charging equipment that the plug is fully engaged. That control function is the reason the coupler cannot be an ordinary industrial connector. The pilot contact must make last and break first, so that the current is switched off before the power contacts separate, and the proximity contact must inform the vehicle when the plug is being withdrawn. The dimensions are therefore normative in the strictest sense: the pin positions, the diameters, the engagement lengths and the sequence of contact are what make a Chinese vehicle and a Chinese wallbox from different manufacturers work together, and what prevents a connector from another system being forced into place. The normative annex gives the structural dimensions of the coupler, with further annexes covering the vehicle inlet and supply socket-outlet in charging mode 3. Issued on 28 December 2015 and in force since 1 January 2016, it replaces GB/T 20234.2-2011.

This Part of GB/T 20234 specifies the general requirements, function definitions, type structures, parameters and dimensions of AC charging coupler for conductive charging of electric vehicles This Part is applicable to AC charging coupler for conductive charging of electric vehicles, of which the rated voltage shall not exceed 440V(AC), the frequency shall be 50Hz, and the rated current shall not exceed 63A(AC).

Note. If the supply coupler of AC charging coupler adopts the standardized plugs and socket-outlets complying with GB 2099.1 and GB 1002, then this Part is not applicable to these plugs and socket-outlets.

2 Normative References

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

GB/T 18487.1 Electric Vehicle Conductive Charging System - Part

3 Terminologies and Definitions

For the purposes of this document, the terminologies and definitions defined in GB/T 20234.1 apply.

4 General Requirements

The technical requirements and test methods of AC charging coupler shall meet the requirements of GB/T 20234.1.

5 Rated Values of AC Charging Coupler

The rated values of AC charging coupler are detailed in Table 1.

6 Functions of Charging Coupler

6.1 Electrical parameters and functions 7 pairs of contacts are respectively included in vehicle-coupler and supply-coupler in charging mode 3, and their electrical parameters and function definitions are detailed in Table 2.

6.2 Contact arrangement mode The contact arrangement modes of the vehicle-coupler and supply-coupler in charging mode 3 are shown in Figure 1 and Figure 2.

6.3 Charging connection coupler In the process of connection for charging, the protective earthing contact shall be connected at first, the control pilot contact and the contact of charging connection confirmation shall be connected lastly. In the process of disconnection, the control pilot contact and the contact of charging connection confirmation shall be disconnected at first, and the protective earthing contact shall be disconnected lastly. The electrical connection of vehicle-coupler is shown in Figure 3, the electrical connection of supply- socket in charging mode 3 is shown in Figure

4.The control pilot circuit and control principle of AC charging are detailed in GB/T 18487.1.

7 Dimensions

The structure dimensions of AC charging coupler shall meet the requirements of Appendix A; the installation dimensions are detailed in Appendix B; and the spatial size Vehicle coupler Vehicle-plug Vehicle-socket 1- AC power supply (L1) 2- AC power supply (L2) 3- AC power supply (L3) 4- neutral line (N) 5- equipment earth () 6- charging connection confirmation (CC) 7- control pilot (CP) 1- AC power supply (L1) 2- AC power supply (L2) 3- AC power supply (L3) 4- neutral line (N) 5- electrical chassis () 6- charging connection confirmation (CC) 7- control pilot (CP) Electronic locking device Supply coupler Supply-plug Supply-socket 1- AC power supply (L1) 2- AC power supply (L2) 3- AC power supply (L3) 4- neutral line (N) 5- electrical chassis () 6- charging connection confirmation (CC) 7- control pilot (CP) 1- AC power supply (L1) 2- AC power supply (L2) 3- AC power supply (L3) 4- neutral line (N) 5- equipment earth () 6- charging connection confirmation (CC) 7- control pilot (CP)

Appendix A

(Normative) Structure Dimensions of Charging Coupler A.1 Structure dimensions of vehicle coupler The structure dimensions of vehicle-plug are detailed in Figure A.1.

Appendix B

(Informative) Examples for Installation Dimensions of Vehicle-socket and Supply-socket in Charging Mode 3 B.1 Examples for installation of vehicle-socket B.1.1 Front installation mode Installation example for front installation mode of vehicle-socket is shown in Figure B.1. Figure B.1 Installation Example for Front Installation Mode of Vehicle-socket B.1.2 Back installation mode Installation example for back installation mode of vehicle-socket is shown in Figure B.2. B.2 Examples for installation of supply-socket in charging mode 3 B.2.1 Front installation mode Installation example for front installation mode of supply-socket in charging mode 3 is shown in Figure B.3. B.2.2 Back installation mode Installation example for back installation mode of supply-socket in charging mode 3 is shown in Figure B.4.

Appendix C

(Normative) Spatial Size Requirements of Vehicle-plug and Supply-plug in Charging Mode 3 Spatial size requirements of vehicle-plug and supply-plug in charging mode 3 are detailed in Figure C.1.