

ICS 43.140
CCS Y14



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

GB 42295-2022

Safety requirements for electric bicycles electrical

电动自行车电气安全要求

Issued on: December 29, 2022

Implemented on: January 1, 2024

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

Table of Contents

1	Scope
2	Normative references
3	Terms and definitions
4	Requirements
4.1	General
4.2	Signs and warnings
4.3	Wiring, wires and connections
5	Test methods
5.1	Test conditions
5.3	Wiring, wires and connections
5.8	Protection test
5.9	Temperature and humidity resistance test
5.10	Vibration and shock test
32	Amendment 1 [2024XG1]...

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". This document and GB 17761-2018 "Safety technical specification for electric bicycle" together constitute the safety standard system for electric bicycle products. 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 and shall be under the jurisdiction of Ministry of Industry and Information Technology of the People's Republic of China. Safety requirement for electric bicycles electrical

1 Scope

GB 42295-2022 is the Chinese national standard on safety requirements for electric bicycles electrical, in the field of road vehicles engineering. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 29 December 2022 by the State Administration for Market Regulation; Standardization

Administration of China, and has been in force since 1 January 2024. Classification: ICS 43.140, CCS Y14. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the requirements for electrical safety signs, warnings, wiring, wires, connections, voltage, insulation resistance, electric strength, heat generation, protection, temperature and humidity resistance, vibration and shock. It describes the corresponding test methods. This document applies to electric vehicles (hereinafter referred to as the vehicle) included in power-assisted bicycles defined in QB/T 1714. This document does not apply to vehicles with an on-board charger.

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, Environmental testing for electric and electronic products - Part 2. Test methods - Tests A. Cold

GB/T 2423.2, Environmental testing for electric and electronic products - Part 2. Test methods - Tests B. Dry heat

GB/T 2423.3, Environmental testing - Part

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB 17761 as well as the followings apply.

3.1 main circuit The circuit that transmits the power and electric energy at the output end of the battery system (3.13) to drive the motor.

3.2 secondary circuit Other circuits except the main circuit (3.1), including control circuits, sound and light circuits, etc.

3.3 main circuit cable Wires that make up the circuit that drives the motor.

3.4 maximum operating current of main circuit The larger value of the actual measured operating current limit value of the vehicle main circuit (3.1) and the upper limit value of the product's express current-limiting protection.

3.5 discharge current The current output by the battery during discharge.

4.1 General

4.1.1 The vehicle shall meet the relevant electrical safety requirements of GB 17761.

4.1.2 Lead-acid batteries for vehicles shall meet the requirements of 4.3, 4.4, 4.6, 4.7, 4.12 in GB/T 32504-2016 and

4.15 in GB/T 22199.1-2017. Lithium-ion batteries shall meet the requirements of 5.3 in GB/T 36972-2018.

4.2 Signs and warnings

4.2.1 For the main circuit and battery system whose vehicle voltage is higher than the extra-low voltage

16.0 V (AC), the protective cover of its easy-to-contact live parts shall be clearly and firmly marked with the sign shown in Figure 1 at an easily visible position.

4.2.2 The outer surface of the battery system shall have a striking warning statement "Non-professionals are forbidden to open it".

4.2.3 The outer surface of the battery system shall clearly and visibly indicate its operating temperature range for charging and discharging, the maximum charging and discharging current, the minimum discharge termination voltage, the maximum charge termination voltage and other parameters for identification.

4.3 Wiring, wires and connections

4.3.1 Wiring Vehicle wiring shall meet the following requirements.

4.3.2 Wires Wires with a maximum operating current greater than 200 mA in the vehicle circuit shall be copper conductor wires. The technical requirements shall meet the requirements of the fifth conductor in Chapter 6 of GB/T 3956-2008.

4.3.3 Connection The vehicle wire connection shall meet the following requirements.

4.3.4 Contact resistance If the current limiting protection value of the vehicle is greater than 10.0 A, all connections of the main circuit cables shall be permanent connections or terminal loose connections. The contact resistance value shall not be greater than the wire resistance of the same contact length.

4.4 Voltage Vehicle voltage shall meet the following requirements.

4.5 Insulation resistance When the electrical components and circuits of the vehicle are at room temperature, after undergoing heating, high temperature, low temperature storage and constant damp heat tests respectively, the insulation resistance values shall not be less

than the values shown in Table 2.

4.6 Electric strength After the vehicle is subjected to the constant heat and humidity test, carry out the electric strength test on the electrical components according to the method described in 5.6. There shall be no breakdown or flashover between the battery system, control system, etc. and exposed conductive parts.

5.1 Test conditions

5.1.1 Test environment Unless otherwise specified, the test environment meets the following conditions.

5.1.2 Measurement accuracy error During the measurement process, the accuracy error of all control values (actual values) relative to the specified value shall be.

5.2 Labels and warnings Check by visual inspection.

5.3 Wiring, wires and connections

5.3.1 Wiring Check by visual inspection and touch method.

5.3.3 Connection test The vehicle wire connection test method is as follows:

5.3.4 Contact resistance measurement Use a low resistance tester with an accuracy of $\pm 0.2\%$ to test vehicle contact resistance. Measure as follows:

5.4 Voltage measurement The vehicle voltage is measured with a voltage measuring instrument according to the following method.

5.5 Insulation resistance measurement Use an insulation resistance meter with a DC voltage of 500 V to measure the insulation resistance value of the electrical components of the vehicle. Measure the insulation resistance value of each electrical component as follows:

5.6 Electric strength test After each electrical component of the vehicle has passed the constant heat and humidity test, conduct the electric strength test at the following test points (non-metallic components covered with metal foil) according to the values shown in Table 3.

5.9 Temperature and humidity resistance test

5.9.1 Constant heat and humidity test Before the test, according to the manufacturer's indicated requirements, the specimen battery system shall be fully charged and then put aside for 1h before carrying out the test of this item.

5.9.2 High temperature resistance test The electrical components on the vehicle shall be subjected to the high temperature resistance test according to the method described in "Test Bd" in GB/T 2423.2.