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

GB/T 12602-2020

Replacing GB/T 12602-2009

Safety devices against overloading for lifting appliances

起重机械超载保护装置

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1 Scope

GB/T 12602-2020 is the Chinese national standard on safety devices against overloading for lifting appliances, in the field of materials handling equipment. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 31 March 2020 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 October 2020. Classification: ICS 53.020.30, CCS J80. 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 standard specifies the terms and definitions, technical requirements, test methods, inspection rules, markings, packaging, transportation and storage of overload protection devices for lifting appliances. This standard applies to overload protection devices (hereinafter referred to as "devices") used by electric hoists, bridge cranes, gantry cranes,

mobile cranes, tower cranes and jib cranes. The overload protection devices used by other types of lifting appliances may refer to it.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 2423.4-2008 Environmental testing for electric and electronic products - Part 2: Test method - Test Db: Damp heat, cyclic (12h + 12h cycle)

GB/T 3811-2008 Design rules for cranes

GB/T 4208-2017 Degrees of protection provided by enclosure (IP code)

GB/T 8923.1-2011 Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness - Part 1: Rust grades and preparation grades of uncoated steel surface and steel surface after comprehensive removal of the original coating GB/T 13306 Plates

GB/T 13384 General specifications for packing of mechanical and electrical product

GB/T 14048.1-2012 Low-voltage switchgear and control equipment - Part 1: General

GB/T 17626.5 Electromagnetic compatibility - Testing and measurement techniques - Surge immunity test

3.6 Configuration For mobile cranes, tower cranes and jib cranes, etc., the combination and arrangement of structural parts, counterweights, supports or outriggers, hook pulley block winding systems, as well as the combinations, positioning and installation of similar members as carried out according to the manufacturer's instructions and operation preparations.

3.7 Dangerous directions When the lifting appliance is overloaded, the direction which makes the load or torque increase and other directions that aggravate dangerous actions.

3.8 Safety directions When the lifting appliances is overloaded, the direction which makes the load or torque decrease and other directions that reduce dangerous actions.

4 Technical requirements

4.1 Environmental conditions The device shall work normally under the following environmental conditions:

a) Temperature: -20 °C ~ 60 °C;

b) Relative humidity: 90% at 20 °C;

c) Altitude: Not more than 2000 m.

Note: When the above environmental conditions are exceeded, the user and the manufacturer shall negotiate and resolve it.

4.2 Basic requirements

4.2.1 Component identification The exposed operable elements (switches, knobs, etc.) of the device shall have clear and permanent external markings. The identification shall be clear. The text identification shall have at least simplified Chinese.

4.2.2 Material and structure

4.3.2.3 If the power supply is interrupted, the limiter shall retain its settings.

4.3.2.4 The limiter shall have the function of recording dangerous conditions such as working hours, working cycles and overloading actions of the lifting appliances.

4.3.2.5 The limiter with recording function shall have a communication output interface. When a digital communication interface is used, the communication protocol shall conform to the open protocol stipulated by the current national standards, to facilitate users to obtain basic data such as weight/torque.

4.4.1 Rated lifting capacity indicator

4.4.1.1 The rated lifting weight indicator shall have the following functions:

- a) When the load reaches 90% ~ 95% of the rated lifting weight, a visual and/or audible warning signal shall be issued;
- b) When the load reaches the alarm action value, a visual and/or audible alarm signal shall be issued.

4.4.1.2 The visual and/or audible signals shall be clear and continuous. Once the signal is triggered, it shall be maintained continuously during a working cycle of the lifting appliances, until the overload is removed. Audio warning and alarm signals shall be different, meanwhile there is a clear difference from the environmental noise of lifting appliances. It shall be not less than 75 dB(A) at a position 1 m from the sound-issuing part as well as the position of the operator. The light early-warning signal shall be yellow; the light warning signal shall be red, which shall be clearly visible in the driver's field of vision.

4.4.1.3 The crane operator shall not be able to cancel the warning from the control station, unless the audible and visual warnings are used at the same time under the same condition, in which case the audible warning can be cancelled by operating the manual cancellation device 5 s after its action. If this kind of cancellation device is used, it shall act

automatically when the lifting appliances needs to resume the audible warning. The audible warning can be cancelled during the calibration and test of the lifting appliance.

4.4.2 Numerical information indicator

4.4.2.1 Indicators that provide numerical information shall meet the following basic requirements:

5.1.1 Visually inspect the device samples:

- a) The structure is firm; whether the assembly parts are loose;
- b) Whether the shell has cracks, blisters, scratches and other defects;
- c) Whether the assembly positions of sensors, connectors and other components conform to the instruction manual;
- d) Whether there are waterproof measures for each connection part and cable hole;
- e) Check the quality certificates of the materials used in the main components and check whether they meet the requirements of the design calculations;
- f) Whether the exposed operable elements are marked;
- g) Whether to install a power supply switch;
- h) If the function release switch and audio signal cancellation device are set, check whether they meet the requirements.

5.1.2 Check whether the device samples meet the following requirements:

- a) For the parts of the device installed in the lifting appliance's load-bearing system, check the corresponding material quality certificates, design drawings and design calculations, to confirm that their strength shall not be less than the strength of the load-bearing parts in the system.
- b) Have the analysis, calculation and processing functions of the dynamic load status of the equipped crane. When necessary, use a signal generator to simulate the dynamic load state, to input the dynamic load signal to the limiter sample.

5.1.3 For the limiter with a force sensor as a force measuring element, connect the sample parts according to the wiring diagram, to form a complete system; check whether it has a self-check function when starting up.

5.2.6 Voltage fluctuation test When supplied by AC power, apply

0.9 times ~

1.1 times the rated voltage for 10 min and 60 min. When supplied by DC power, apply