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

GB/T 36530-2018

**Robots and robotic devices -- Safety requirements for personal
care robots**

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard adopts the translation method equivalent to ISO 13482.2014 "Robot and robot equipment personal assistant robot safety

begging".

The documents of our country that have a consistent correspondence with the international documents referenced in this standard are as follows.

GB 2893.1-2002 Graphical symbols - Safety colours and safety signs - Part 1 . Design principles for safety and safety markings

(ISO 3864-1.2002, MOD);

GB/T 3766-2015 General rules and safety requirements for hydraulic drive systems and their components (ISO 4413.2010, MOD);

GB/T 3768-2017 Acoustic sound pressure method for the determination of noise source sound power level and sound energy level using the envelope measurement surface above the reflective surface

Simple method (ISO 3746.2010, IDT);

GB/T 4208-2017 enclosure protection class (IP code) (IEC 60529..2013, IDT);

GB/T 7932-2017 General rules and safety requirements for pneumatic systems and their components (ISO 4414.2010, IDT);

GB/T 8196-2003 General requirements for the design and manufacture of fixed and movable protective devices for mechanical safety devices

(ISO 14120.2002, MOD);

GB/T 13441 (all parts) Mechanical vibration and impact Human body exposure to whole body vibration evaluation [ISO 2631 (all parts)

Minute)];

GB/T 14574-2000 Identification and verification of noise emission values for acoustic machines and equipment (eqv ISO 4871.1996);

GB/T 16754-2008 Mechanical safety emergency stop design principle (ISO 13850.2006, IDT);

GB/T 17045-2008 General part of electric shock protection devices and equipment (IEC 61140.2001, IDT);

GB/T 17454 (all parts) mechanical safety pressure sensitive protection device [ISO 13856 (all parts)];

GB/T 18717 (all parts) Ergonomic design for mechanical safety [ISO 15534 (all parts)];

GB/T 18831-2010 Principles for the design and selection of interlocks for mechanical safety belt guards (ISO 14119.1998,

MOD);

GB/T 19436 (all parts) Mechanical and electrical safety electro-sensitive protective equipment [IEC 61496 (all parts)];

GB/T 19670-2005 Mechanical safety to prevent accidental start-up (ISO 14118.2000, MOD);

GB/T 19876-2012 Positioning of safety devices related to mechanical safety and approach speed of human body parts (ISO 13855.

2010, IDT);

GB/T 23821-2009 Mechanical safety to prevent the upper and lower limbs from reaching the safe distance of the danger zone (ISO 13857.2008, IDT).

This standard was proposed by the China Machinery Industry Federation.

This standard is under the jurisdiction of the National Automation System and Integration Standardization Technical Committee (SAC/TC159).

This standard was drafted. Beijing Machinery Industry Automation Research Institute, Na Enbo (Tianjin) Technology Co., Ltd., Jiangsu Cobos Robotics Unit

Co., Ltd., Zibo (Jiangsu) Robot Co., Ltd., Zhongde Yunge Robot (Suzhou) Co., Ltd., Harbin Institute of Technology, Shanghai Transportation

the University.

1 Scope

This standard specifies the requirements and guidelines for the intrinsic safety design,

protection measures and usage information of personal assistant robots. This standard is special

For the following three types of personal assistant robots.

---Mobile servant robot;

---Body assisted robots;

--- Manned robot.

These robots typically perform tasks to improve the quality of life of a predetermined user regardless of the age or ability of the user. This standard describes the

Use the dangers of these robots and propose to eliminate and reduce them to acceptable levels. This standard deals with human-computer physical contact applications.

This standard covers the major hazard types and hazardous treatments for each type of personal assistant robot.

This standard also applies to robotic devices in personal assistant applications and as a personal assistant robot.

This standard is limited to ground robots.

This standard does not apply to.

---Robots with a walking speed greater than 20km/h;

---Robot toy;

---Underwater robots and flying robots;

---Industrial robot, please refer to GB 11291;

--- Robots used as medical devices;

--- Military or police use robots.

Note. The safety principles established in this standard can be applied to the above robots.

The scope of use of this standard is mainly for the reasonable installation and maintenance of personal assistant robots, and for the intended use and other reasonable

Under the foreseeable conditions, there is a risk associated with the personal assistant, including the risk of domestic animals or property, as appropriate (defined as "safety related pairs"

Like").

This standard does not apply to robots manufactured prior to the standard release.

This standard covers all major hazards, hazardous conditions or hazardous events

described in Appendix A. Please note that when this standard is published, the impact is dangerous.

Risks (such as collisions) do not have internationally recognized detailed data (such as pain or injury limits).

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 12643-2013 Vocabulary for robots and robotics (ISO 8373:2012, IDT)

GB/T 15706-2012 Mechanical Safety Design General Risk Assessment and Risk Reduction (ISO 12100:2010, IDT)

ISO 2631 (all parts) Mechanical vibration and impact Human body exposure to whole body vibration evaluation (Mechanical vibration and

shock-Evaluation of human exposure to whole-body vibration)

ISO 3746 Acoustic Sound Pressure Method for the Determination of Noise Sources Sound Power Levels A simple method for measuring the surface above the envelope surface (Acous-

tics-Determination of sound power levels and sound energy levels of noise sources using sound pressure-

sure-Survey method using an enveloping measurement surface over a reflecting plane)

ISO 3864-1 Graphical symbols - Safety colours and safety signs - Part 1. Design principles for safety and safety markings

(Graphical symbols-Safety colours and safety signs-Part 1. Design principles for safety signs and Safety markings)

General rules and safety requirements for ISO 4413 hydraulic drive systems and their components (Hydraulic fluid power-General

Rules and safety requirements for systems and their components)

ISO 4414 Pneumatics for general rules and safety requirements for systems and their components (Pneumatic fluid power-General rules

And safety requirements for systems and their components)

ISO 4871 Identification and verification of noise emission values for acoustic machines and