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PEOPLE'S REPUBLIC OF CHINA**

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Robots and robotic devices -- Collaborative robots

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Foreword

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

This standard uses the translation method equivalent to the use of ISO /T S15066.2016 "robots and robots equipped with robots."

The Chinese documents that have a consistent correspondence with the normatively cited international documents in this standard are as follows.

---GB/T 15706-2012 General principles of mechanical safety design risk assessment and risk reduction (ISO 12100.2010, IDT)

--- GB/T 16754-2008 Mechanical Safety Emergency Stop Design Principles (ISO 13850.2006, IDT)

---GB/T 19876-2012 Positioning of Safety Devices Related to Proximity Speed of Human Body (ISO 13855.2010, IDT)

--- GB 5226.1-2008 Electrical equipment for electrical safety machinery - Part 1. General technical conditions (IEC 60204-1.2005, IDT)

This standard is proposed by 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 by. Beijing Institute of Mechanical Industry Automation, Zibo (Beijing) Intelligent Technology Co., Ltd., Beijing University of Aeronautics and Astronautics,

Beijing Union University, Lihong Safety Equipment Engineering (Shanghai) Co., Ltd., Capital Normal University.

Introduction

The purpose of the collaborative robot is to integrate the robot's repetitive work characteristics and human skills. Humans have a good solution to uncertain movements

Ability; while the robot's work shows accuracy, strength and endurance.

In order to achieve safety, in the traditional application of the robot, the robot is operated to exclude the operator from entering its operation area. This kind of needs

Manual interventions often cannot be automated using robotic systems.

This standard provides guidance for the operation of a collaborative robot that uses the same work area as a human-machine. In this type of operation, safety-related

The integration of control systems is of great importance, especially when controlling process parameters such as speed and force.

Provides an easy-to-understand risk assessment that assesses not only the robot system itself, but also the environment in which they operate, such as work

space. In implementing applications where humans collaborate with a robotic system, ergonomics may also be involved, such as improving the worker's working posture.

This standard supplements and supports the industrial robot safety standards ISO 10218-1:2011 and GB 11291.2-2013 and provides collaboration.

The robot has identified additional instructions for operating the function.

The collaborative robots described in this standard are used in accordance with the requirements of ISO 10218-1:2011 and their integration conforms to the requirements.

GB 11291.2-2013.

Note. Cooperative robots are a developing area. The limits of power and force listed in this standard are expected to improve in future versions.

Robot and robot equipment cooperation robot

1 Scope

This standard specifies the safety requirements for collaborative industrial robots and their working environment, and is ISO 10218-1:2011 and GB 11291.2-

The collaborative industrial robot operation described in 2013 supplements the requirements and guidance.

This standard applies to industrial robots described in ISO 10218-1:2011 and GB 11291.2-2013, but not to non-industrial machines.

People, although their proposed security principles can also be used for other types of robots.

Note. This standard does not apply to collaborative applications designed prior to its release.

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 version (including all amendments) applies to this document.

GB 11291.2-2013 Safety requirements for industrial robots for robots and robotics. Part 2. Robot systems and collections

Cheng (ISO 10218-2:2011, IDT)

ISO 10218-1:2011 Safety requirements for industrial robots for robots and robotics. Part 1. Robots (Robots)

and robotic devices-Safety requirements for industrial robots-Part 1. Robots)

ISO 12100 Safety Design General Rules for Risk Assessment and Risk Reduction (Safety of machinery-General

guidelines for design-Risk assessment and risk reduction)

ISO 13850 Mechanical Safety Emergency Stop Function Design Principle
(Safety of machinery-Emergency stop function-

Principles for design)

ISO 13855 Positioning of safety devices related to mechanical safety and proximity speed of human body parts (Safety of machinery-

Positioning of safeguards with respect to the approach speeds of parts of the human body)

IEC 60204-1 Safety equipment for mechanical safety machinery. Part 1. General requirements (Safety of machinery-Electrical

equipment of machines-Part 1. General requirements)

3 Terms and definitions

The definitions of ISO 10218-1:2011, GB 11291.2-2013, ISO 12100 and the following terms and definitions apply to this document.

3.1

Cooperative operation

Defines the behavior of a specially designed robotic system and an operator working in a collaborative workspace.

Note. Rewrite ISO 10218-1:2011, definition 3.4.

3.2

Power power

Mechanical power mechanical power

The mechanical efficiency of work, or energy consumption per unit of time.

Note. The power is not equivalent to the rated power of electronic devices, such as motors.