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

GB 18209.3-2010

Replacing GB 18209.3-2002

**Electrical safety of machinery -- Indication, marking and
actuation -- Part 3: Requirements for the location and operation
of actuators**

机械电气安全 指示、标志和操作 第3部分：操动器的位置和操作的要求
(English Translation)

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Table of Contents

Foreword
1 Scope
2 Normative references
3 Terms and Definitions
4 General requirements
5 Action and effect
5.1 Principles
5.2 End-effector
5.3 Action
5.4 Correlation between actions and ultimate effects
5.5 Stop

Foreword

All the technical contents of this standard is mandatory.

GB 18209 "Electrical safety of machinery - Indication, marking and operation" into parts intended publication, has released the following sections.

--- Part 1. Requirements for visual, auditory and tactile signals;

--- Part 2. Requirements for marking;

--- Part 3. Actuator location and operational requirements.

This is Part 3 GB 18209's.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This Part replaces GB 18209.3-2002 "Safety of machinery - Indication, marking and actuation - Part 3. actuator for the location and operation Requirements ", compared with GB 18209.3-2002 The main technical changes are as follows.

--- Standard name changed to "mechanical and electrical safety indicators, marking and actuation - Part 3. actuator location and operational requirements";

--- Added technical content, expressed in terms have changed.

This section uses the translation method is equivalent to using IEC 61310-3:2007 "Safety of machinery - Indication, marking and actuation - Part 3. actuator device the location and operation requirements. " Consistency correspondence between this part of international

documents and normative references of our files are as follows.

GB/T 4025-2010 people - basic safety rules and operation of the indicator and machine interface, marking and identification coding rules (IEC 60073:2002, IDT) GB/T 4205-2010 people - basic safety rules and operating rules machine interface, marking and identification (IEC 60447:2004, IDT) GB/T 14777-1993 geometric orientation and direction of movement (neqISO 1503.1997) GB/T 19671-2005 Safety of machinery - hands control devices - Functional aspects and design principles (ISO 13851:2002, MOD) GB 18209.1-2010 Electrical safety of machinery - Indication, marking and actuation - Part 1. Requirements for visual, auditory and tactile signals Requirements (IEC 61310-1:2007, IDT) GB 18209.2-2010 Electrical safety of machinery - Indication, marking and actuation - Part 2. Requirements for marking (IEC 61310-2:2007, IDT) this part made the following editorial changes.

--- Standard name changed to "mechanical and electrical safety indicators, marking and actuation - Part 3. actuator location and operational requirements";

--- Delete international standards foreword.

This part is proposed by China Machinery Industry Federation.

The electrical system in part by the National Machinery Industry Standardization Technical Committee (SAC/TC231) centralized.

This part mainly drafted by. measuring Detection Technology Co., Ltd., Beijing Machine Tool Research Institute, Beijing KND CNC Technology Co., Secretary of Sichuan Changzheng Machine Tool Group Co., Ltd., Shenyang Machine Tool (Group) Co., Ltd.

1 Scope

This section provides the man-machine interface in the hand or other parts of the body to manipulate the relevant safety requirements for operation of the actuator.

This section provides general requirements are as follows.

- General orientation operated actuator movement;
- A actuator device relative to the other actuator arrangement;
- Correlation between action and its ultimate effect.

This part IEC 60477 is based, but also applies to non-electrotechnical processes, such as mechanical and fluid power systems.

This section applies to a single actuator and the components that make up part of the actuator device group.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 15706.2-2007 Safety of machinery - Basic concepts, general principles for design - Part 2. Technical principles and specifications (ISO 12100-2:2003, IDT) ISO 1503. 1977 Geometrical orientation and direction of movement (Geometrical orientation and direction of movements) ISO 9355-2:1999 display and actuator design Ergonomic requirements - Part 2. Monitor (Ergonomic requirements for the design of displays and control actuators - Part 2. Displays) ISO 13851:2002 Safety of machinery - hand control devices - Functional aspects and design principles (Safety of machinery - Two-hand control devices - Functional aspects and design principles) IEC 60073:2002 people - basic encoding rules and safety rules and operation of the device indicator machine interface, marking and identification IEC 60447:2004 people - machine interface, marking and identification of basic safety rules and operating rules IEC 61310-1 Safety of machinery - Indication, marking and actuation - Part 1. Requirements for visual, auditory and tactile signals IEC 61310-2 Safety of machinery - Indication, marking and actuation - Part 2. Requirements for marking

3 Terms and Definitions

And the following terms and definitions defined in IEC 61310-1 and IEC 61310-2 apply to this document.

Action

Part of the human body (for example. fingers, hands, feet) for the manipulator motion actuator is required.

The final effect Operator actions expected results.

4 General requirements

In the early stages of mechanical design should be considered in this section, and the whole process should be in the mechanical assembly to be applied in a clear manner. Coping mechanisms Mechanical and intended application of occasions due to mechanical and geometric to the operator's position, skills, attitude and viewing direction (see IEC 61310-1 in 4.2.2) The restrictions to be considered. See ISO 1503.

Actuator shall be.

--- Clearly identifiable (see IEC 61310-1 and IEC 60073);

- Appropriately done flag (see IEC 61310-2);
- Designed to ensure safe operation and real-time (see IEC 60447);
- According to the relevant ergonomic principles selection and design (see ISO 9355-2);
- Designed and selected to withstand the expected environmental and use conditions;
- Designed to avoid the use of predictable wear and breakage.

Actuating device shall be so arranged.

--- They are outside the danger zone, only those operating the actuator must be placed in the danger zone of exceptions, such as. emergency stop, teach hanging devices.

(See GB/T 15706.2-2007 in 4.11.8c));

- Operation can not cause additional risk;
- The operator can ascertain the end-effector has been achieved (either directly or via a feedback/response means);
- According to Chapter 5, the role of the actuator and its ultimate effect is the same (for more information see IEC 60447);
- Avoid panel mirror symmetrical arrangement.

No matter under what circumstances, the starting position of the actuator should be operated so that the operator can see when manipulating element manipulated (see GB/T 15706.2-2007 in 4.11.8d)).

Stop actuator should be placed close to each starter actuator's place. Start/stop function by holding means running operations performed Case, since the holding operation of actuator malfunction can not be delivered when the stop command may be dangerous, you should configure separate actuator stops if let go (See GB/T in 15706.2-2007 4.11.8b)).

Actuator should logically combined based on their relationship to the operation or function of the control process, machinery or equipment (see IEC 60447).

In operation, the actuator control should not lead to a dangerous state of uncertainty or equipment.

Operated actuator unexpected operations could lead to dangerous situations should be avoided. When necessary, use one or more structural measures.

- Recessed or covered actuator device;
- Increase the actuator operating force;
- Using the locking device;
- Actuator placed can not be accidentally knocked down;