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

GB/T 38834.3-2023

**Robotics - Performance criteria and related test methods for
service robots - Part 3: Manipulation**

机器人 服务机器人性能规范及其试验方法 第3部分：操作

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Foreword

This document was issued on 7 September 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 April 2024.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 25.040.30, Chinese classification J28.

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 3 of GB/T 38834 "Performance Specifications and Test Methods for Robotic Service Robots". GB/T 38834

The following sections have been published.

---Part 1. Wheeled robot motion;

---Part 2. Navigation;

---Part 3. Operation.

This document is equivalent to ISO 18646-3:2021 "Performance Specifications and Test Methods for Robotic Service Robots Part 3. Operation"

do".

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

This document is proposed by China Machinery Industry Federation.

This document is under the jurisdiction of the National Robot Standardization Technical Committee (SAC/TC591).

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Introduction

In addition to the test methods specified in this document, the test of the position and trajectory accuracy of the manipulator specified in ISO 9283 can also be use.

GB/T 38834 "Performance Specifications and Test Methods for Robotic Service Robots" aims to standardize the performance and test methods of service robots.

The law is intended to consist of four parts.

---Part 1.Wheeled robot locomotion. The purpose is to specify the motion performance characteristics and test methods of wheeled robots.

---Part 2.Navigation. The purpose is to specify the navigation performance characteristics and test methods of mobile service robots.

---Part 3.Operation. The purpose is to specify the operational performance characteristics and test methods of service robots.

---Part 4.Waist support robot. The purpose is to specify the performance characteristics and test methods of lumbar support robots.

Performance specifications and test methods for robotic service robots

Part 3.Operations

1 Scope

GB/T 38834.3-2023 measures what a service robot can pick up and handle, as Part 3 of the GB/T 38834 series on service robot performance and its test methods. The test conditions come first - the operating mode the robot is placed in, and the configuration under which a run is made. Three grasping characteristics follow, each set out with its own

purpose, test facilities, test steps and results: grasp size, grip force, and resistance to the grasped object sliding. Two use cases close the document, again as complete test procedures: opening a hinged door, and opening a sliding door. Manufacturers' claims about manipulation are otherwise impossible to check. A holding force quoted on a datasheet says nothing about whether an object stays put once the arm is moving, which is why sliding resistance is measured apart from grip force, and a robot that opens a swing door has not thereby shown it can open a sliding one. Fixing the apparatus, the steps and the reported result is what makes two robots from two suppliers comparable at all. It is written for service robot builders, the laboratories that test them, and buyers drafting procurement specifications.

This document describes service robot operational performance indicators and evaluation methods, in particular.

---Fetch size;

---Grab force;

---grab sliding resistance;

---Open the hinged door;

---Open the sliding door.

Additional crawling features and use cases for service robot operations will be included in future revisions.

This document is intended for indoor environments only. However, the experiments described can also be used for robots used in outdoor environments.

This document does not apply to the verification and validation of safety requirements.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

GB/T 29555-2013 Door opening and closing force test method (ISO 9379.2005, MOD)

Note. There is no technical difference between the quoted content of GB/T 29555-2013 and the quoted content of ISO 9379.2005.