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Performance evaluation methods of robots for household and similar use

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Performance evaluation methods of robots for household and similar use

FOREWORD

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IEC 62849 has been prepared by IEC technical committee 59: Performance of household and similar electrical appliances. It is an International Standard.

This second edition cancels and replaces the first edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) the title has been changed to "Performance evaluation methods of robots for household and similar use";
b) the scope is more clearly defined and the physical specifications of robots for household and similar use covered by this document are clearly defined;
c) new evaluation methods for 6 performance items have been added, including obstacle avoidance, managing a ramp, lighting effects, transition overcome, threshold overcome, energy consumption of robots;

d) new structure has been introduced, which provides basic common test methods in each category and can be used by other robotics standards, including the following:
   1) mobility,
   2) navigation,
   3) energy use,
   4) effects on environment,
   5) other/miscellaneous.

The text of this International Standard is based on the following documents:

Draft	Report on voting
59/857/FDIS	59/860/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

In this standard, the following print types are used:

– terms defined in Clause 3: **bold type**.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

As stated in the Foreword, this document has made adjustments and improvements in terms of name, scope, performance items, overall structure, etc. and will cover the generic performance test methods of robots for household and similar use within one document.

The needs in terms of environmental effects (noise, photoelectric pollution, etc.), other/miscellaneous (human-robot interface, facial recognition, voice recognition, information security, reliability, AI, etc.) linked to the increasing performance and demand for robots used outdoors will be taken into account in a future version of this document.

1 Scope

This document provides performance testing and evaluation methods for the common features of robots for household and similar use, their physical specifications satisfying the following:

– height: maximum 1,75 m,
– dimensions: maximum 700 mm wide (to be able to fit through doorways),
– speed: maximum 1,5 m/s,
– floor supported wheeled or wheel-track robots.

This document is neither concerned with safety nor with performance requirements.

This document is applicable for indoor floor use robots.

This document is not applicable to the following products:

Wet and dry surface-cleaning robots or combination of such functions.

NOTE If different testing and evaluating methods are given in other standards for specific robots，these methods can be considered for priority use.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TS 61496-4-3, *Safety of machinery - Electro-sensitive protective equipment - Part 4-3: Particular requirements for equipment using vision based protective devices (VBPD) - Additional requirements when using stereo vision techniques (VBPDST)*

IEC TS 62885-1, *Surface cleaning appliances - Part 1: General requirements on test material and test equipment*

IEC/ASTM 62885-7:2020, *Surface cleaning appliances - Part 7: Dry-cleaning robots for household or similar use - Methods for measuring the performance*
IEC/ASTM 62885-7:2020/AMD1:2022

ISO 554, *Standard atmospheres for conditioning and/or testing - Specifications*

ISO 2768-1:1989, *General tolerances - Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 13856-3, *Safety of machinery - Pressure-sensitive protective devices - Part 3: General principles for design and testing of pressure-sensitive bumpers, plates, wires and similar devices*