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## Robots and robotic devices

Guide to the ethical design and application of robots and robotic systems

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 22, an inside back cover and a back cover.

## Foreword

### Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 April 2016. This British Standard has been prepared by Technical Subcommittee AMT/-/2, *Robots and robotic devices*. A list of organizations represented on this committee can be obtained on request to its secretary.

### Information about this document

This is the first edition of a new standard. It addresses issues in a field of technology that is rapidly changing and influencing society. Although efforts have been made to incorporate the anticipated effects of future developments in the standard, it is not possible for all future circumstances to have been considered or covered, for example non-embodied autonomous systems.

### Use of this document

As a guide, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification or a code of practice and claims of compliance cannot be made to it.

### Presentational conventions

The guidance in this standard is presented in roman (i.e. upright) type. Any recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

### Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

## 1 Scope

This British Standard gives guidance on the identification of potential ethical harm and provides guidelines on safe design, protective measures and information for the design and application of robots. It builds on existing safety requirements for different types of robots; industrial, personal care and medical.

This British Standard describes ethical hazards associated with the use of robots and provides guidance to eliminate or reduce the risks associated with these ethical hazards. Significant ethical hazards are presented and guidance given on how they are to be dealt with for various robot applications.

Ethical hazards are broader than physical hazards. Most physical hazards have associated psychological hazards due to fear and stress. Thus, physical hazards imply ethical hazards and safety design features are part of ethical design. Safety elements are covered by safety standards; this British Standard is concerned with ethical elements.

This British Standard is intended for use by designers and managers, amongst others.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN ISO 12100:2010, *Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010)*

BS ISO 8373, *Robots and robotic devices – Vocabulary*

BS ISO 31000, *Risk management – Principles and guidelines*

## 3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS ISO 8373 and the following apply.

### 3.1 autonomous system

system which has the ability to perform intended tasks based on current state, knowledge and sensing, without human intervention

### 3.2 ethical harm

anything likely to compromise psychological and/or societal and environmental well-being

*NOTE* Examples of ethical harm include stress, embarrassment, anxiety, addiction, discomfort, deception, humiliation, being disregarded. This might be experienced in relation to a person's gender, race, religion, age, disability, poverty or many other factors.

### 3.3 ethical hazard

potential source of ethical harm

### 3.4 ethical risk

probability of ethical harm occurring from the frequency and severity of exposure to a hazard

### 3.5 ethics

common understanding of principles that constrain and guide human behaviour