AS 4024.1603—2006

Australian Standard™

Safety of machinery

Part 1603: Design of controls, interlocks and guards—Prevention of unexpected start-up

This Australian Standard was prepared by Committee SF-041, General Principles for the Guarding of Machinery. It was approved on behalf of the Council of Standards Australia on 18 April 2006.
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The following are represented on Committee SF-041:

Australian Chamber of Commerce and Industry
Australian Electrical and Electronic Manufacturers Association
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Department of Consumer and Employment Protection, WorkSafe Division, WA
Department of Primary Industries, Mine Safety, NSW
Engineers Australia
Federal Chamber of Automotive Industries
Human Factors and Ergonomics Society of Australia
Institution of Instrumentation, Control and Automation Australia
National Electrical and Communications Association
National Safety Council of Australia
Office of the Australian Safety and Compensation Council
Safety Institute of Australia
The University of Melbourne
Tractor and Machinery Association of Australia
Victorian WorkCover Authority

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PREFACE

This Standard was prepared by the Standards Australia Committee SF-041, General Principles for the Guarding of Machinery, as revision (in part) of AS 4024.1—1996, *Safeguarding of machinery*, Part 1: *General principles*.

During its work, the Committee considered a number of Standards originating within the European Community in the field of safety of machinery. Many of these European Standards are being adopted virtually unchanged as International Standards by the International Organization for Standardization (ISO) and the Committee has agreed to continue to use material emanating from both CEN and ISO in this new edition. This action will maintain consistency with previous editions of AS 4024.1 and other machine-specific Australian Standards.

This edition has been published as a series of Parts rather than the single Standard previously published as AS 4024.1. In doing this, the Committee has cleared the way for simple revisions in the future. When a new edition of a relevant Standard becomes available at the international level, it will be adopted and published within the framework of AS 4024 with a minimum delay, so ensuring continued international alignment.

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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FOREWORD

Keeping a machine stopped while persons are present in danger zones is one of the most important conditions of the safe use of machinery and hence one of the major aims of the machine designer and machine user.

In the past, the concepts of ‘operating machine’ and ‘stopped machine’ were generally unambiguous; a machine was—

(a) operating when its movable elements, or some of them, were moving; or

(b) stopped when its movable elements were at rest.

Machine automation has made the relationship between ‘operating’ and ‘moving’ on the one hand and ‘stopped’ and ‘at rest’ on the other hand, more difficult to define. Automation has also increased the potential for unexpected start-up, and a significant number of accidents have occurred where machines, stopped for diagnostic work or corrective actions, started up unexpectedly.

Hazards other than mechanical hazards generated by movable elements (e.g. from a laser beam) also need to be taken into account.

The risk assessment relating to the presence of persons in a danger zone of a stopped machine needs to take into account the probability of an unexpected start-up of the hazard-generating elements.

This Standard provides machine designers with a selection of built-in measures which can be used to prevent unexpected start-up.

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1 SCOPE

This Standard specifies designed-in means aimed at preventing unexpected machine start-up (see Clause 4.2) to allow safe human interventions in danger zones.

NOTE: Examples of tasks which can require the presence of persons in danger zones are listed in Appendix A.

This Standard applies to unexpected start-up from all types of energy source, i.e.—

(a) power supply, e.g. electrical, hydraulic, pneumatic;

(b) stored energy due to, for example, gravity, compressed springs; and

(c) external influences, for example, from wind.

2 OBJECTIVE

The objective of this Standard is to enable designers, manufacturers, suppliers, employers and users of machinery to minimize risks to the health and safety of employees by providing technical means of preventing unexpected start-up.

3 REFERENCED DOCUMENTS

The following documents are referenced in this Standard.

AS

4024	Safety of machinery
4024.1101	Part 1101: Terminology—Terminology
4024.1201	Part 1201: General principles—Basic terminology and methodology
4024.1202	Part 1202: General principles—Technical principles
4024.1301	Part 1301: Risk assessment—Principles for risk assessment
4024.1501	Part 1501: Design of safety related parts of control systems—General principles for design
4024.1602	Part 1602: Design of controls, interlocks and guarding—Interlocking devices associated with guards—Principles for design and selection
4024.1904	Part 1904: Displays, controls, actuators and signals—Indication, marking and actuation—Requirements for visual auditory and tactile signals
4024.1905	Part 1905: Displays, controls, actuators and signals—Requirements for marking
60204	Safety of machinery—Electrical equipment of machines
60204.1	Part 1: General requirements (IEC 60204-1, Ed. 5 (FDIS), MOD)

IEC

61496	Safety of machinery—Electro-sensitive protective equipment
61496-1	Part 1: General requirements and tests
61496-2	Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)