AS/NZS 4024.2901:2021

STANDARDS NEW ZEALAND
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Australian/New Zealand Standard™

Safety of machinery

Part 2901: Electrical equipment of machines — Requirements for equipment for voltages above 1 000 V AC or 1 500 V DC and not exceeding 36 kV (IEC 60204 11:2018, MOD)

AS/NZS 4024.2901:2021

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Australian/New Zealand Standard™

Safety of machinery

Part 2901: Electrical equipment of machines — Requirements for equipment for voltages above 1 000 V AC or 1 500 V DC and not exceeding 36 kV (IEC 60204 11:2018, MOD)

First published as AS 60204.11-2006.
Jointly revised and redesignated as AS/NZS 4024.2901:2021.

Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee SF-041, Safety of Machinery, to supersede AS 60204.11-2006, *Safety of machinery — Electrical equipment of machines, Part 11: Requirements for HV equipment for voltages above 1 000 V a.c. or 1 500 V d.c and not exceeding 36 kV (IEC 60204-11, Ed. 1.0 (2000) MOD).*

The objective of this document is to provide requirements and recommendations relating to electrical and electronic equipment and systems to machines, including a group of machines working together in a coordinated manner, which operate at nominal voltages above 1 000 V AC or 1 500 V DC and not exceeding 36 kV AC or DC with nominal frequencies not exceeding 60 Hz.

This document is a generic safety standard. It does not cover all the requirements (e.g. guarding, interlocking or control) which are needed or required by other standards or regulations in order to safeguard personnel from hazards other than electrical hazards. Each type of machine has unique requirements to be accommodated to provide adequate safety. Hazards as a result of noise and vibration are excluded from the scope of this document.

This document is an adoption with national modifications, and has been reproduced from, IEC 60204-11:2018, *Safety of machinery — Electrical equipment of machines — Part 11: Requirements for equipment for voltages above 1 000 V AC or 1 500 V DC and not exceeding 36 kV.* The modifications are additional requirements and are set out in Appendix ZZ, which has been added at the end of the source text.

Appendix ZZ lists the variations to IEC 60204-11:2018 for the application of this document in Australia and New Zealand.

As this document has been reproduced from an International Standard, the following applies:

(a) In the source text "this part of IEC 60204" should read "this document".

(b) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms "normative" and "informative" are used in Standards to define the application of the appendices or annexes to which they apply. A "normative" appendix or annex is an integral part of a Standard, whereas an "informative" appendix or annex is only for information and guidance.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SAFETY OF MACHINERY – ELECTRICAL EQUIPMENT OF MACHINES –

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FOREWORD

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International Standard IEC 60204-11 has been prepared by IEC technical committee 44: Safety of machinery – Electrotechnical aspects.

This second edition cancels and replaces the first edition, published in 2000. This edition constitutes a technical revision.

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

– aspects of risk assessment, which are mirrored from ISO 12100;
– equipotential bonding and earthing;
– EMC and power quality;
– HV switchgear and controlgear;

– creepage distances for conductors and slip-ring assemblies;

– a list of machinery using HV equipment, in Annex A.

This second edition of IEC 60204-11 has been updated and improved to reflect the experience gained with the first edition and the evolution of high-voltage equipment reflected in the relevant standards.

Regarding formal requirements, IEC 60204-11 has been aligned with

– IEC 60204-1:2016,

– IEC 61936-1:2010 and IEC 61936-1:2010/AMD1:2014,

– IEC 62271 (all parts).

This document is intended to be used in conjunction with IEC 60204-1.

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

FDIS	Report on voting
44/819/FDIS	44/828/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60204 series, published under the general title *Safety of machinery – Electrical equipment of machines,* can be found on the IEC website.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 60204 provides requirements and recommendations relating to the high-voltage electrical equipment (HV equipment) of machines together with its associated low-voltage electrical equipment (LV equipment) so as to promote

– safety of persons and property,

– consistency of control response,

– maintainability.

Figure 1 is a block diagram of a machine and associated equipment showing the various elements of the electrical equipment addressed in this document. Numbers in parentheses (…) refer to clauses and subclauses in this document. It is understood that all of the elements taken together including the safeguards, software and the documentation constitute the machine or group of machines working together with usually at least one level of supervisory control.

This document should be used in conjunction with IEC 60204-1. HV equipment can include LV control parts in the same general enclosure or in separate compartments.

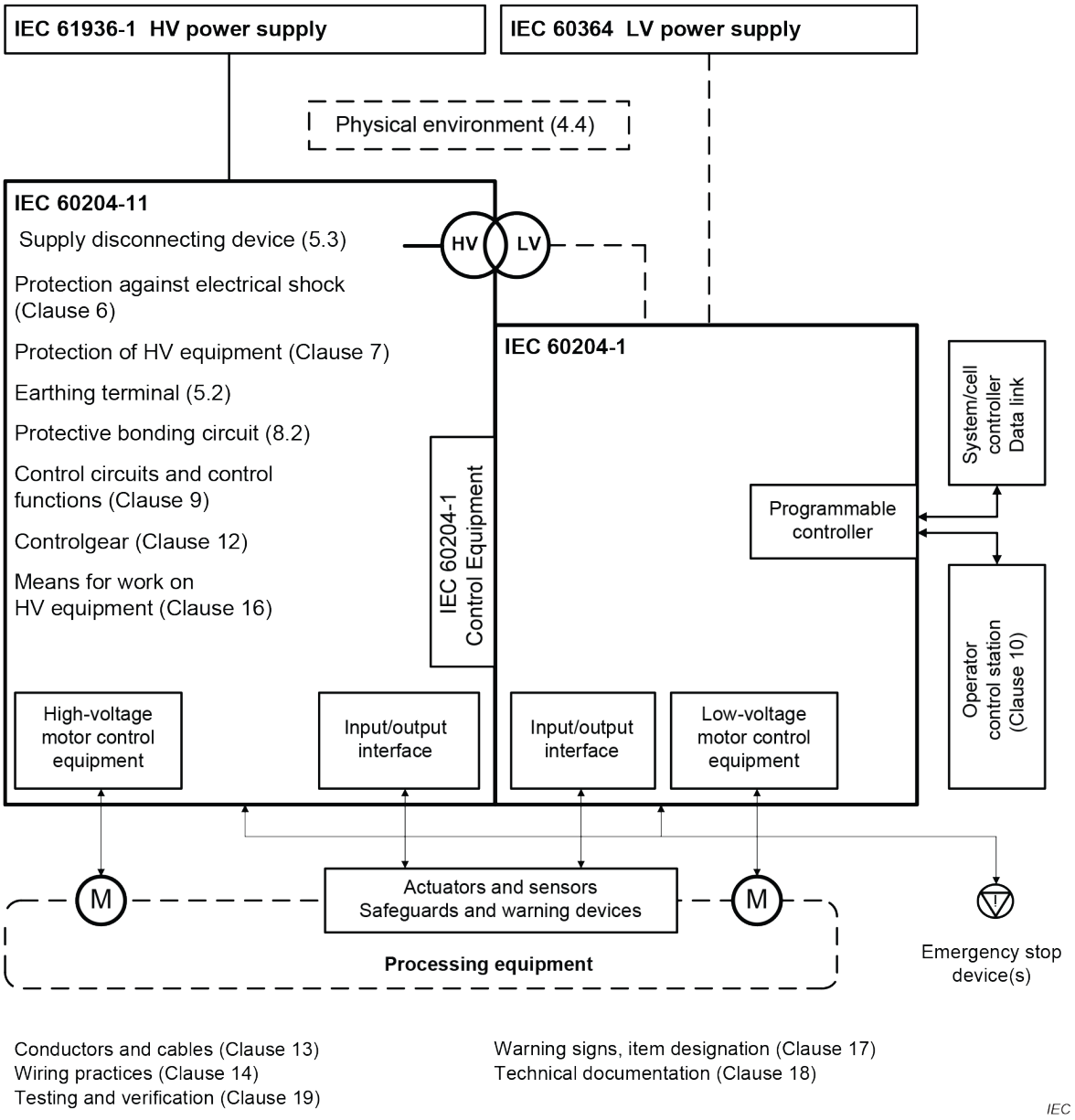

Figure 1 – Block diagram of a machine containing HV equipment

SAFETY OF MACHINERY – ELECTRICAL EQUIPMENT OF MACHINES –

Part 11: Requirements for equipment for voltages above 1 000 V AC or 1 500 V DC and not exceeding 36 kV

1 Scope

This part of IEC 60204 applies to electrical and electronic equipment and systems to machines, including a group of machines working together in a co-ordinated manner, which operate at nominal voltages above 1 000 V AC or 1 500 V DC and not exceeding 36 kV AC or DC with nominal frequencies not exceeding 60 Hz.

In this document, the term HV equipment also covers the LV equipment forming an integral part of the equipment operating at high voltage. The requirements in this document primarily cover the parts operating at high-voltage except where explicitly stated otherwise.

NOTE 1 LV equipment not forming part of the HV equipment is covered by IEC 60204-1:2016.

NOTE 2 In this document, the term "electrical" includes both electrical and electronic matters (i.e. electrical equipment means both the electrical and the electronic equipment).

NOTE 3 This document does not apply to independent high-voltage power supply installations for which separate IEC standards exist.

The electrical equipment covered by this document commences at the point of connection of the supply to the electrical equipment of the machine (see 5.1).

NOTE 4 For the requirements for high-voltage power supply installations, see IEC 61936-1.

This document is a generic safety standard. It does not cover all the requirements (e.g. guarding, interlocking or control) which are needed or required by other standards or regulations in order to safeguard personnel from hazards other than electrical hazards. Each type of machine has unique requirements to be accommodated to provide adequate safety.

NOTE 5 In some machines the high-voltage power supply can be produced by a step-up transformer (autotransformer), supplied by a low-voltage system (e.g. by a LV generator).

NOTE 6 In the context of this document, the term "person" refers to any individual; "personnel" are those persons who are assigned and instructed by the user or his agent(s) in the use and care of the machine in question.

This part of IEC 60204 specifically includes, but is not limited to, machines as defined in 3.29 (Annex A lists examples of machines whose electrical equipment can be covered by this document).

For protection against electric shock from high-voltage equipment, this document refers to IEC 61936-1. When it comes to low-voltage equipment, this document refers to IEC 60204-1:2016.

NOTE 7 High- and low-voltage standards use different terms regarding protection against electric shock. Whereas high-voltage standards use the terms “direct contact” and “indirect contact”, low-voltage standards correspondingly use “basic protection” and “fault protection”.

Additional and special requirements can apply to the electrical equipment of machines that

– are used in the open air (i.e. outside buildings or other protective structures);
– use, process or produce potentially explosive material (e.g. paint or sawdust);
– are used in potentially explosive and/or flammable atmospheres;