

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Safety of machinery – Electrical equipment of machines –
Part 11: Requirements for equipment for voltage above 1 000 V AC or 1 500 V
DC and not exceeding 36 kV**

**Sécurité des machines – Équipement électrique des machines –
Partie 11: Exigences pour les équipements fonctionnant à des tensions
supérieures à 1 000 V en courant alternatif ou 1 500 V en courant continu et ne
dépassant pas 36 kV**



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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	10
2 Normative references.....	11
3 Terms and definitions	12
4 General requirements	18
4.1 General.....	18
4.2 Selection of electrical equipment	19
4.3 Electrical power supply.....	20
4.3.1 General	20
4.3.2 Voltage characteristics	20
4.3.3 On-board power supply	20
4.4 Physical environment and operating conditions	20
4.4.1 General	20
4.4.2 Electromagnetic compatibility (EMC)	20
4.5 Transportation and storage.....	21
4.6 Provisions for handling	21
4.7 Installation	21
4.7.1 General	21
4.7.2 Assembly and mounting	21
5 Incoming supply conductor terminations and devices for disconnecting and switching off	21
5.1 Incoming high-voltage conductor terminations.....	21
5.2 Earthing terminal of high-voltage equipment	21
5.3 Supply disconnecting devices and means for earthing.....	22
5.3.1 General	22
5.3.2 Type	22
5.3.3 Requirements for disconnectors	23
5.3.4 Requirements for earthing and short-circuiting	23
5.3.5 Arrangement of disconnecting and earthing devices.....	24
5.4 Devices for switching off for prevention of unexpected start-up.....	24
5.5 Devices for disconnecting and means for earthing HV equipment	24
5.6 Protection against unauthorized, inadvertent and/or mistaken operation	25
6 Protection against electric shock.....	25
6.1 General.....	25
6.2 Protection against direct contact.....	26
6.3 Protection against indirect contact	26
6.3.1 General	26
6.3.2 Measures to prevent the occurrence of a hazardous touch voltage for an unlimited time of fault duration	26
6.3.3 Protection by automatic disconnection of supply within a limited time of fault duration.....	27
6.3.4 Protection for mobile machines.....	27
7 Protection of HV equipment	28
7.1 General.....	28
7.2 Overcurrent protection.....	28

7.2.1	General	28
7.2.2	Supply conductors	28
7.2.3	Power circuits	28
7.2.4	Transformers	28
7.2.5	Overcurrent protective devices	29
7.2.6	Rating and setting of overcurrent protective devices	29
7.3	Protection of motors against overheating	29
7.4	Protection against abnormal temperature	29
7.5	Protection against the effects of supply interruption or voltage reduction and subsequent restoration	29
7.6	Motor overspeed protection	29
7.7	Earth fault protection	30
7.8	Protection against overvoltage due to lightning and switching surges	30
7.9	Protection against hazards due to arc faults	30
7.10	Protection against overpressure and leakage	30
7.11	Protection against fire	30
8	Equipotential bonding	30
8.1	General	30
8.2	Protective bonding circuit	33
8.2.1	General	33
8.2.2	Protective conductors	34
8.2.3	Continuity of the protective bonding circuit	34
8.2.4	Mobile machines	35
8.2.5	Protective bonding circuit connecting points	35
8.2.6	Supplementary protective bonding conductors	36
9	Control systems, control circuits and control functions	36
10	Operator interface and machine-mounted control devices	36
11	Electronic equipment	36
12	Controlgear: location, mounting and enclosures	36
12.1	General requirements	36
12.2	Location and mounting	37
12.2.1	Accessibility and maintenance	37
12.2.2	Physical separation	37
12.3	Degrees of protection	37
12.4	Enclosures, doors and openings	38
12.5	Access to HV equipment	39
13	Conductors and cables	39
13.1	General requirements	39
13.2	Conductors	39
13.3	Insulation and sheath materials	40
13.4	Current-carrying capacity in normal service	40
13.5	Conductor and cable voltage drop	40
13.6	Minimum cross-sectional area	40
13.7	Flexible cables	40
13.7.1	General	40
13.7.2	Mechanical rating	41
13.7.3	Current-carrying capacity of cables wound on drums	41
13.8	Conductor wires, conductor bars and slip-ring assemblies	41

13.8.1	Protection against direct contact.....	41
13.8.2	Protective bonding circuit	42
13.8.3	Protective conductor current collectors	42
13.8.4	Clearances in air.....	42
13.8.5	Creepage distances	42
13.8.6	Conductor system sectioning.....	43
13.8.7	Construction and installation of conductor wire, conductor bar systems and slip-ring assemblies.....	43
14	Wiring practices.....	44
14.1	Connections and routing.....	44
14.1.1	General requirements.....	44
14.1.2	Cable runs	44
14.2	Identification of conductors.....	45
14.3	Flexible cables	45
14.4	Plug-socket combinations.....	46
14.5	Dismantling for shipment	46
14.6	Cable trays	46
15	Electric motors and associated equipment.....	46
15.1	General.....	46
15.2	Motor connection boxes	46
16	Means to protect persons working on electrical installations	47
16.1	General.....	47
16.2	Equipment for isolating installations or apparatus	47
16.3	Devices to prevent reclosing of isolating devices.....	47
16.4	Devices for determining the de-energized state.....	47
16.5	Devices for earthing and short-circuiting	47
16.6	Equipment acting as protective barriers against adjacent live parts	47
16.7	Storage of personal protective equipment.....	47
17	Marking, warning signs and reference designations	47
17.1	General.....	47
17.2	Warning signs	47
18	Technical documentation	48
18.1	General.....	48
18.2	Instructions for use.....	48
18.2.1	General	48
18.2.2	Provisions for handling.....	48
18.2.3	Assembly and mounting	48
18.2.4	Connections.....	49
18.2.5	Final installation inspection	49
18.2.6	Warning sign.....	49
19	Testing and verification.....	49
19.1	General.....	49
19.2	Earthing system tests	49
19.3	Insulation resistance tests	50
19.4	Voltage tests.....	50
19.5	Functional tests.....	50
19.6	IP tests for HV equipment outside electrical operating areas	50
19.7	Retesting	50

Annex A (informative) Examples of machines covered by IEC 60204-11.....	51
Annex B (informative) Inquiry form for the HV equipment of machines.....	52
Annex C (informative) Relationship between cable rated voltages and highest voltage for HV equipment.....	56
Bibliography	57
Figure 1 – Block diagram of a machine containing HV equipment.....	9
Figure 2 – Example of equipotential bonding for electrical equipment of a machine	33
Figure 3 – Symbol for protective earth (protective ground)	35
Figure 4 – Warning sign “high voltage”	48
Figure 5 – DANGER hazard severity panel	48
Table 1 – Maximum allowable conductor temperatures under normal and short-circuit conditions.....	39
Table 2 – De-rating factors for cables wound on drums.....	41
Table 3 – Selection of the pollution level depending on the degree of pollution and insulator material	43
Table 4 – Minimum creepage distance of conductor lines and slip ring assemblies	43
Table B.1 – Overvoltage protection for HV equipment of machinery.....	54
Table C.1 – Rated voltages of cable and highest voltage for HV equipment.....	56

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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**

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.

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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.

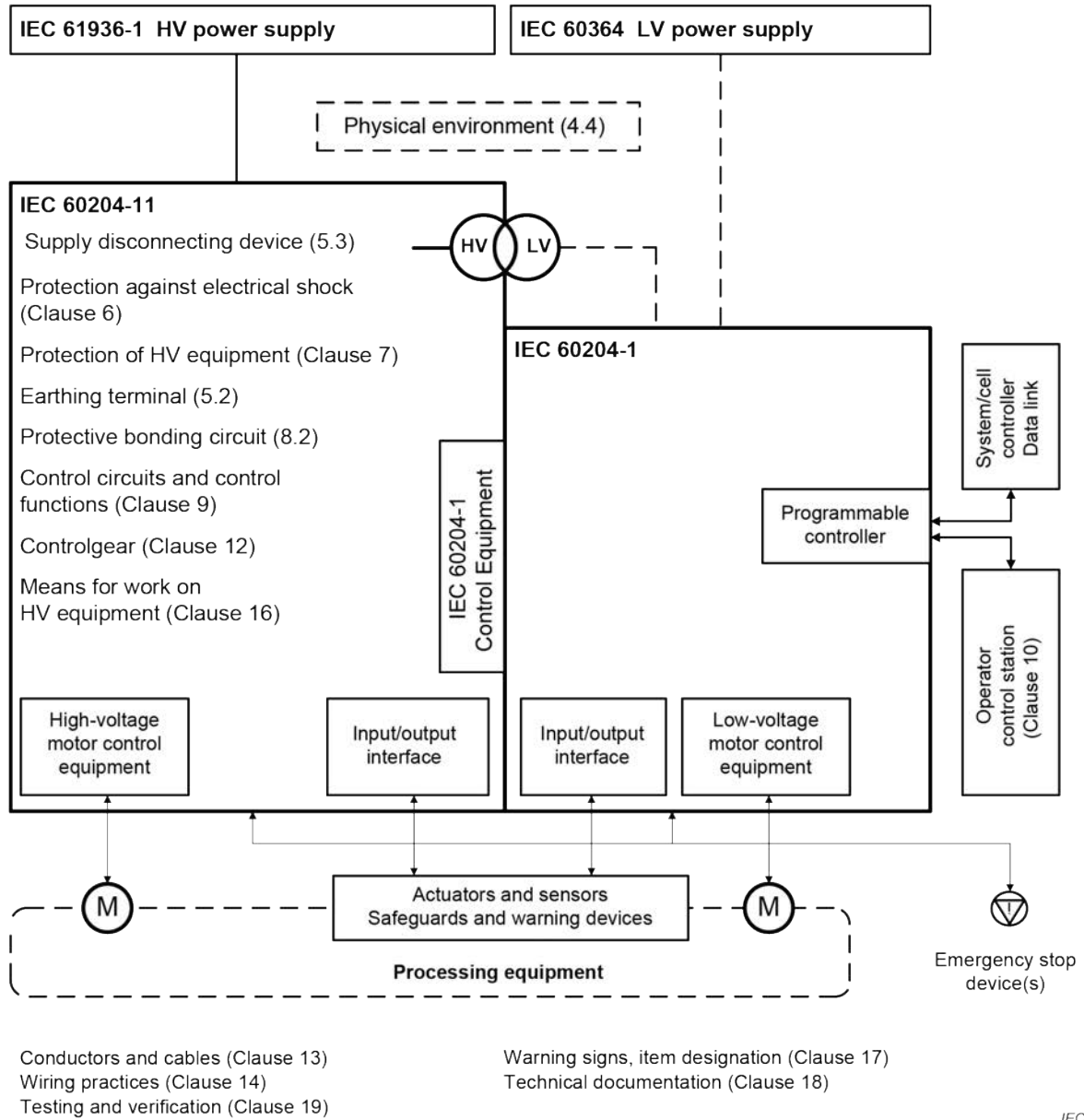


Figure 1 – Block diagram of a machine containing HV equipment

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;