SVENSK STANDARD SS-EN 60204-32

Fastställd	Utgåva	Sida	Ansvarig kommitté
2008-11-17	2	1 (1+133)	SEK TK 44

Maskinsäkerhet – Maskiners elutrustning – Del 32: Särskilda fordringar på maskiner för lyftning

Safety of machinery – Electrical equipment of machines – Part 32: Requirements for hoisting machines

Som svensk standard gäller europastandarden EN 60204-32:2008. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60204-32:2008.

Nationellt förord

Europastandarden EN 60204-32:2008

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC

– **IEC 60204-32, Second edition, 2008 - Safety of machinery - Electrical equipment of machines - Part 32: Requirements for hoisting machines**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60204-32, utgåva 1, 1999, gäller ej fr o m 2011-07-01.

ICS 29.020; 53.020.01

Denna standard är fastställd av SEK Svensk Elstandard,
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Telefon: 08 - 444 14 00. *Telefax*: 08 - 444 14 30
E-post: sek@elstandard.se. *Internet*: www.elstandard.se

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SEK Svensk Elstandard
Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard se

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60204-32

September 2008

ICS 29.020; 53.020.01

Supersedes EN 60204-32:1998

English version

Safety of machinery - Electrical equipment of machines - Part 32: Requirements for hoisting machines

(IEC 60204-32:2008)

Sécurité des machines - Équipement électrique des machines - Partie 32: Exigences pour les appareils de levage (CEI 60204-32:2008)

Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 32: Anforderungen für Hebezeuge (IEC 60204-32:2008)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 60204-32:2008 E

SEK Svensk Elstandard

Foreword

The text of document 44/574/FDIS, future edition 2 of IEC 60204-32, prepared by IEC TC 44, Safety of machinery - Electrotechnical aspects, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60204-32 on 2008-07-01.

This European Standard supersedes EN 60204-32:1998.

EN 60204-32:2008 includes the following significant technical changes with respect to EN 60204-32:1998.

a) Changes to EN 60204-1:2006 have been incorporated, especially:

- deletion of Clause 11 of EN 60204-1:1997;
- modification of the structure of equipotential bonding (Clause 8);
- separation of control functions (Clause 9) and devices (Clause 10);
- structure of technical documentation (Clause 17);
- verification of protection by automatic disconnection of supply (18.2).

b) Subclause 9.2.7 on cableless controls has been modified.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2009-04-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2011-07-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directives 98/37/EC and 2006/42/EC. See Annex ZZ.

Annexes ZA and ZZ have been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60204-32:2008 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60038	NOTE	Harmonized as HD 472 S1:1989 (modified).
IEC 60204-11	NOTE	Harmonized as EN 60204-11:2000 (not modified).
IEC 60204-31	NOTE	Harmonized as EN 60204-31:1998 (modified).
IEC 60228	NOTE	Harmonized as EN 60228:2005 (not modified).
IEC 60269-1	NOTE	Harmonized as EN 60269-1:2007 (not modified).
IEC 60320-1	NOTE	Harmonized as EN 60320-1:2001 (not modified).
IEC 60335	NOTE	Harmonized in EN 60335 series (partially modified).
IEC 60364	NOTE	Harmonized in EN/HD 60364 series (modified).
IEC 60870-5-1	NOTE	Harmonized as EN 60870-5-1:1993 (not modified).
IEC 60898	NOTE	Harmonized in EN 60898 series (modified).
IEC 60909	NOTE	Harmonized in EN 60909 series (not modified).
IEC 60947-5-2	NOTE	Harmonized as EN 60947-5-2:2007 (not modified).
IEC 61000-6-1	NOTE	Harmonized as EN 61000-6-1:2007 (not modified).
IEC 61000-6-2	NOTE	Harmonized as EN 61000-6-2:2005 (not modified).
IEC 61000-6-3	NOTE	Harmonized as EN 61000-6-3:2007 (not modified).
IEC 61000-6-4	NOTE	Harmonized as EN 61000-6-4:2007 (not modified).
IEC 61180-2	NOTE	Harmonized as EN 61180-2:1994 (not modified).
IEC 61496-1	NOTE	Harmonized as EN 61496-1:2004 (modified).
IEC 61557	NOTE	Harmonized in EN 61557 series (not modified).
IEC 61558-2-17	NOTE	Harmonized as EN 61558-2-17:1997 (not modified).
IEC 61800	NOTE	Harmonized in EN 61800 series (not modified).
IEC 61984	NOTE	Harmonized as EN 61984:2001 (not modified).
IEC 62305	NOTE	Harmonized in EN 62305 series (not modified).
ISO 14122-1	NOTE	Harmonized as EN ISO 14122-1:2001 (not modified).
ISO 14122-2	NOTE	Harmonized as EN ISO 14122-2:2001 (not modified).
ISO 14122-3	NOTE	Harmonized as EN ISO 14122-3:2001 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60034-1	- [1)]	Rotating electrical machines - Part 1: Rating and performance	EN 60034-1	2004 [2)]
IEC 60034-5	- [1)]	Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification	EN 60034-5	2001 [2)]
IEC 60034-11	- [1)]	Rotating electrical machines - Part 11: Thermal protection	EN 60034-11	2004 [2)]
IEC 60068-2-27	1987	Basic environmental testing procedures - Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993
IEC 60068-2-32 + A2	1975 1990	Environmental testing - Part 2: Tests. Test Ed: Free fall	EN 60068-2-32	1993
IEC 60072-1	- [1)]	Dimensions and output series for rotating electrical machines - Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1 080	-	-
IEC 60072-2	- [1)]	Dimensions and output series for rotating electrical machines - Part 2: Frame numbers 355 to 1 000 and flange numbers 1 180 to 2 360	-	-
IEC 60073	- [1)]	Basic and safety principles for man-machine interface, marking and identification - Coding principles for indicators and actuators	EN 60073	2002 [2)]
IEC 60309-1	- [1)]	Plugs, socket-outlets and couplers for industrial purposes - Part 1: General requirements	EN 60309-1 + A11	1999 [2)] 2004
IEC 60332	Series	Tests on electric and optical fibre cables under fire conditions	EN 60332	Series
IEC 60364-1 (mod)	- [1)]	Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions	HD 60364-1	2008 [2)]
IEC 60364-4-41 (mod)	2005	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41 + corr. July	2007 2007
IEC 60364-4-42	2001	Electrical installations of buildings - Part 4-42: Protection for safety - Protection against thermal effects	-	-

[1)] Undated reference.

[2)] Valid edition at date of issue.

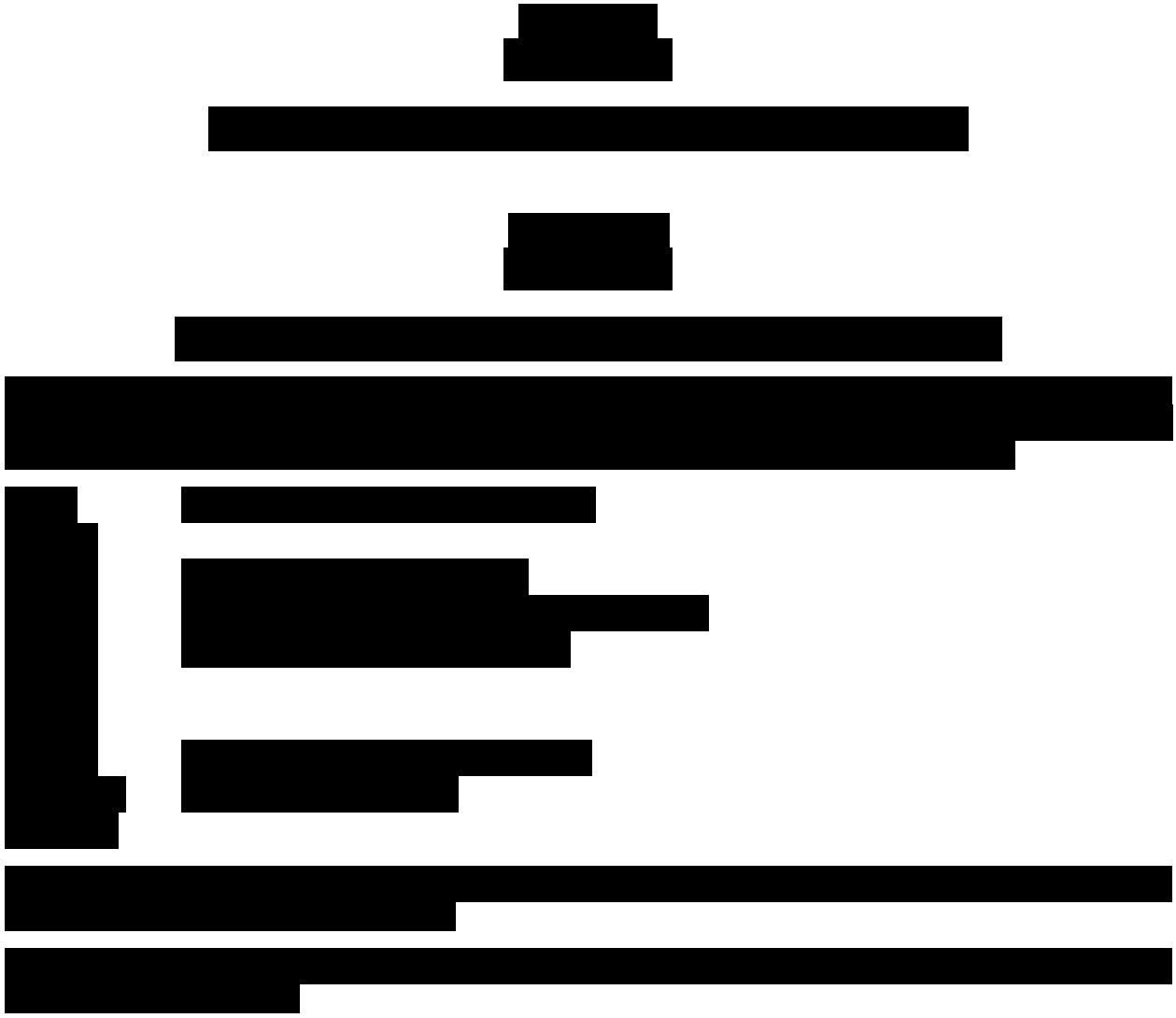
Publication	Year	Title	EN/HD	Year
IEC 60364-4-43	2001	Electrical installations of buildings - Part 4-43: Protection for safety - Protection against overcurrent	-	-
IEC 60364-5-52	2001	Electrical installations of buildings - Part 5-52: Selection and erection of electrical equipment - Wiring systems	-	-
IEC 60364-5-53 + A1 (mod)	2001 2002	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control	- HD 60364-5-534	- 2008 [3)]
IEC 60364-5-54 (mod)	2002	Electrical installations of buildings - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements, protective conductors and protective bonding conductors	HD 60364-5-54	2007
IEC 60364-6 (mod)	2006	Low voltage electrical installations - Part 6: Verification	HD 60364-6	2007
IEC 60417	Data base	Graphical symbols for use on equipment	-	-
IEC 60439-1 A1	1999 2004	Low-voltage switchgear and controlgear assemblies - Part 1: Type-tested and partially type-tested assemblies	EN 60439-1 A1	1999 2004
IEC 60445 (mod)	- [1)]	Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals and conductor terminations	EN 60445	2007 [2)]
IEC 60446	1999	Basic and safety principles for man-machine interface, marking and identification - Identification of conductors by colours or numerals	EN 60446 [4)]	1999
IEC 60447	- [1)]	Basic and safety principles for man-machine interface, marking and identification - Actuating principles	EN 60447	2004 [2)]
IEC 60529 A1	1989 1999	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May A1	1991 1993 2000
IEC 60617	Data base	Graphical symbols for diagrams	-	-
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60898 (mod)	Series	Electrical accessories - Circuit breakers for overcurrent protection for household and similar installations	EN 60898	Series
IEC 60947-1	2007	Low-voltage switchgear and controlgear - Part 1: General rules	EN 60947-1	2007
IEC 60947-2	2006	Low-voltage switchgear and controlgear - Part 2: Circuit-breakers	EN 60947-2	2006

[3)] IEC 60364-5-53:2001/A1:2002, Clause 534: “Devices for protection against overvoltages” is harmonized as HD 60364-5-534.

[4)] EN 60446:1999 is superseded by EN 60446:2007, which is based on IEC 60446:2007.

Publication	Year	Title	EN/HD	Year
IEC 60947-3	- [1)]	Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units	EN 60947-3	1999 [2)]
IEC 60947-4-1 A1	2000 2002	Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor-starters - Electromechanical contactors and motor-starters	EN 60947-4-1 A1	2001 2002
IEC 60947-5-1	2003	Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1 + corr. July	2004 2005
IEC 61082-1	2006	Preparation of documents used in electrotechnology - Part 1: Rules	EN 61082-1	2006
IEC 61140	- [1)]	Protection against electric shock - Common aspects for installation and equipment	EN 61140	2002 [2)]
IEC 61180-2	1994	High-voltage test techniques for low-voltage equipment - Part 2: Test equipment	EN 61180-2	1994
IEC 61310	Series	Safety of machinery - Indication, marking and actuation	EN 61310	Series
IEC 61346	Series	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations	EN 61346	Series
IEC 61557-3	- [1)]	Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 3: Loop impedance	EN 61557-3	2007 [2)]
IEC 61558-1	- [1)]	Safety of power transformers, power supplies, reactors and similar products - Part 1: General requirements and tests	EN 61558-1 + corr. August	2005 [2)] 2006
IEC 61558-2-6	- [1)]	Safety of power transformers, power supply units and similar - Part 2-6: Particular requirements for safety isolating transformers for general use	EN 61558-2-6	1997 [2)]
IEC 61800-5-2	2007	Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional	EN 61800-5-2	2007
IEC 61984	- [1)]	Connectors - Safety requirements and tests	EN 61984	2001 [2)]
IEC 62023	- [1)]	Structuring of technical information and documentation	EN 62023	2000 [2)]
IEC 62027	- [1)]	Preparation of parts lists	EN 62027	2000 [2)]
IEC 62061	- [1)]	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	EN 62061	2005 [2)]
IEC 62079	- [1)]	Preparation of instructions - Structuring, content and presentation	EN 62079	2001 [2)]
ISO 7000	2004	Graphical symbols for use on equipment - Index and synopsis	-	-

Publication	Year	Title	EN/HD	Year
ISO 12100-1	- [1)]	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology	EN ISO 12100-1	2003 [2)]
ISO 12100-2	2003	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles	EN ISO 12100-2	2003
ISO 13849-1	2006	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design	EN ISO 13849-1	2006
ISO 13849-2	2003	Safety of machinery - Safety-related parts of control systems - Part 2: Validation	EN ISO 13849-2	2003
ISO 13850	2006	Safety of machinery - Emergency stop - Principles for design	EN ISO 13850	2008
ISO 13851	2002	Safety of machinery - Two-hand control devices - Functional aspects and design principles	-	-
ISO 13852	1996	Safety of machinery - Safety distances to prevent danger zones being reached by the upper limbs	-	-



CONTENTS

INTRODUCTION

This part of IEC 60204 provides requirements and recommendations relating to the electrical equipment of hoisting machines so as to promote

– safety of persons and property;

– consistency of control response;

– ease of maintenance.

High performance is not to be obtained at the expense of the essential factors mentioned above.

Figures 1 and 2 have been provided as an aid to understanding the interrelationship of the various elements of a hoisting machine and its associated equipment. Figure 1 is an overall block diagram of a typical material handling system (a group of cranes working together in a coordinated manner) and Figure 2 is a block diagram of a typical crane and associated equipment showing the various elements of the electrical equipment addressed in this standard.

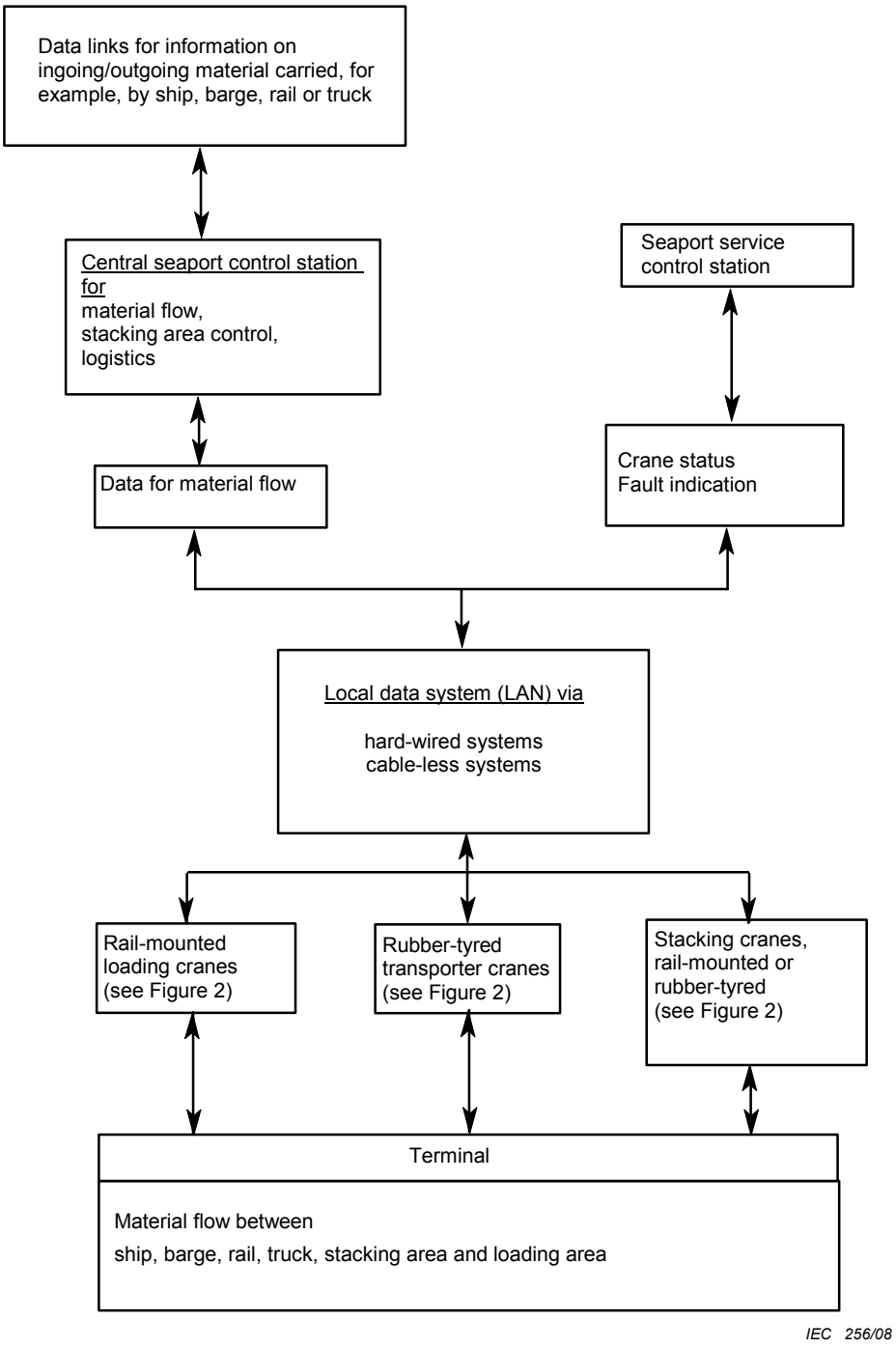


Figure 1 – Block diagram of combined working cranes in a typical material handling system in a seaport

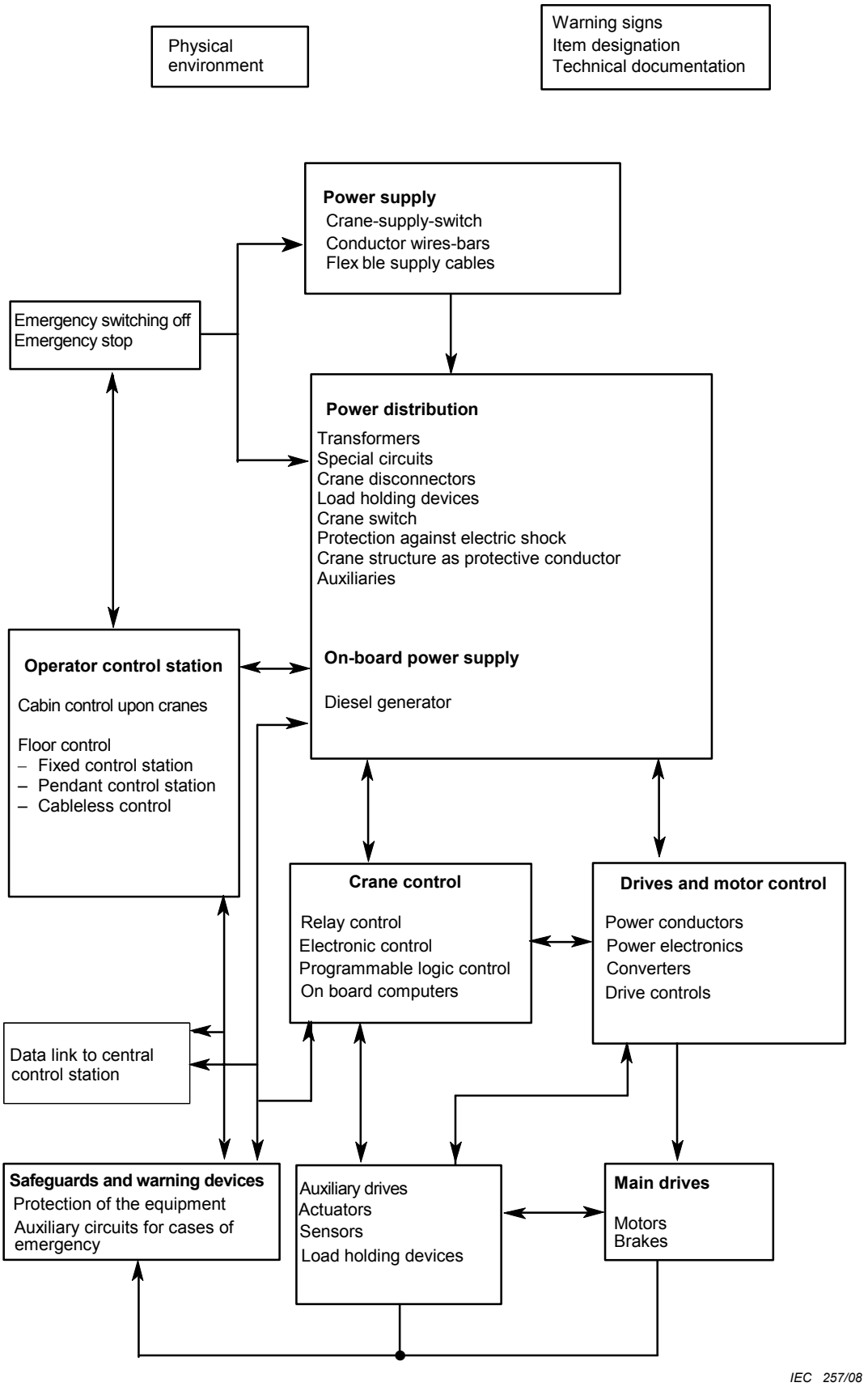


Figure 2 – Block diagram of a typical crane and its associated electrical equipment

SAFETY OF MACHINERY – ELECTRICAL EQUIPMENT OF MACHINES –

Part 32: Requirements for hoisting machines

1 Scope

This part of IEC 60204 applies to the application of electrical and electronic equipment and systems to hoisting machines and related equipment.

NOTE 1 In this standard, the term “electrical” includes both electrical and electronic matters (i.e., “electrical equipment” means both the electrical and the electronic equipment).

NOTE 2 In the context of this standard, the term “person” refers to any individual and includes those persons who are assigned and instructed by the user or user’s agent(s) in the use and care of the hoisting machine in question.

The equipment covered by this standard commences at the point of connection of the supply to the electrical equipment of the hoisting machine (crane-supply-switch) including systems for power supply and control feeders situated outside of the hoisting machine, for example, flexible cables or conductor wires or conductor bars (see Figure 3).

NOTE 3 For the requirements for the electrical supply installation in buildings, see IEC 60364.

This standard is applicable to equipment or parts of equipment not exceeding 1 000 V a.c. or 1 500 V d.c. between lines and with nominal frequencies not exceeding 200 Hz.

NOTE 4 For higher voltages, see IEC 60204-11.

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

– are intended for use in open air (i.e., outside buildings or other protective structures);
– handle or transport potentially explosive material (for example, paint or sawdust);
– are intended for use in potentially explosive and/or flammable atmospheres;
– are intended for use in mines.

For the purposes of this standard, hoisting machines include cranes of all types, winches of all types, and storage and retrieval machines. The following product groups are included:

– overhead travelling cranes;
– mobile cranes;
– tower cranes;
– slewing luffing cranes;
– gantry cranes;
– offshore cranes;
– floating cranes;
– winches of all types;
– hoists and accessories;
– loader cranes;
– cable cranes;
– load holding devices;
– storage and retrieval machines;

– monorail hoists;
– straddle carriers;
– rubber tyred gantry cranes (RTGs).

This standard does not cover individual items of electrical equipment other than their selection for use and their erection.

2 Normative references

The following referenced documents are indispensable for the application 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 60034-1, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-5, *Rotating electrical machines – Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) – Classification*

IEC 60034-11, *Rotating electrical machines – Part 11: Thermal protection*

IEC 60068-2-27:1987, *Basic environmental testing procedures – Part 2-27: Tests –Test Ea and guidance: Shock*

IEC 60068-2-32:1975, *Basic environmental testing procedures – Part 2-32: Tests – Test Ed: Free fall*
Amendment 2 (1990)

IEC 60072-1, *Dimensions and output series for rotating electrical machines – Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080*

IEC 60072-2, *Dimensions and output series for rotating electrical machines – Part 2: Frame numbers 355 to 1000 and flange numbers 1180 to 2360*

IEC 60073, *Basic and safety principles for man-machine interface, marking and identification – Coding principles for indicators and actuators*

IEC 60309-1, *Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements*

IEC 60332 (all parts), *Tests on electric and optical fibre cables under fire conditions*

IEC 60364-1, *Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions*

IEC 60364-4-41:2005, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-42:2001, *Electrical installations of buildings – Part 4-42: Protection for safety – Protection against thermal effects*

IEC 60364-4-43:2001, *Electrical installations of buildings – Part 4-43: Protection for safety – Protection against overcurrent*

IEC 60364-5-52:2001, *Electrical installations of buildings – Part 5-52: Selection and erection of electrical equipment – Wiring systems*