

# Safety of machinery — Electrical equipment of machines —

## Part 31: Particular safety and EMC requirements for sewing machines, units and systems

The European Standard EN 60204-31:1998 has the status of a  
British Standard

ICS 61.080

# National foreword

This British Standard is the English language version of EN 60204-31:1998, including Corrigendum August 2000. It was derived by CENELEC from IEC 60204-31:1996 and should be read in conjunction with BS EN 60204-1:1993. This British Standard supersedes BS EN 60204-3-1:1992 which will be withdrawn on 2002-06-01.

The CENELEC modifications have been implemented at the appropriate places in the text and are indicated by a side line in the margin.

The UK participation in its preparation was entrusted to Technical Committee GEL/44, Safety of machinery — Electrotechnical aspects, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

From 1 January 1997, all IEC publications have the number 60000 added to the old number. For instance, IEC 27-1 has been renumbered as IEC 60027-1. For a period of time during the change over from one numbering system to the other, publications may contain identifiers from both systems.

## Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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

**Compliance with a British Standard does not of itself confer immunity from legal obligations**

## Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 19 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard, having been prepared under the direction of the Electrotechnical Sector Policy and Strategy Committee, was published under the authority of the Standards Committee and comes into effect on 15 December 1998

© BSI 3 July 2002

## Amendments issued since publication

| Amd. No.             | Date        | Comments        |
|----------------------|-------------|-----------------|
| 13713<br>Corrigendum | 3 July 2001 | Change to title |
|                      |             |                 |
|                      |             |                 |

ISBN 0 580 30732 8

# Contents

|                     | Page               |
|---------------------|--------------------|
| National foreword   | Inside front cover |
| Foreword            | 2                  |
| Text of EN 60204-31 | 3                  |



# Safety of machinery — Electrical equipment of machines — Part 31: Particular safety and EMC requirements for sewing machines, units and systems

(IEC 60204-31:1996, modified)

Sécurité des machines — Equipement  
électrique des machines —  
Partie 31: Règles particulières de sécurité et de  
CEM pour machines à coudre, unités et  
systèmes de couture  
(CEI 60204-31:1996, modifiée)

Sicherheit von Maschinen — Elektrische  
Ausrüstung von Maschinen —  
Teil 31: Besondere Sicherheits- und EMK  
Anforderungen an Nähmaschinen,  
Näheinheiten und Nähanlagen (IEC 60204-  
31:1996, modifiziert)

This European Standard was approved by CENELEC on 1998-08-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## 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**

## Foreword

The text of the International Standard IEC 60204-31:1996, prepared by the Technical Committee IEC TC 44, Safety of machinery — Electrotechnical aspects, together with common modifications prepared by the Technical Committee CENELEC TC 44X, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 60204-31 on 1998-08-01.

This European Standard supersedes EN 60204-3-1:1990.

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) 1999-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2002-06-01

This part of EN 60204 is to be used in conjunction with EN 60204-1:1992, Safety of machinery — Electrical equipment of machines — Part 1: General requirements.

This part supplements or modifies the corresponding clauses in EN 60204-1 so as to convert it into the European Standard dealing with requirements for the electrical equipment of sewing machines, units and systems.

Where a particular subclause of part 1 is not mentioned in this part 31, that subclause applies as far as is reasonable. Where this part states “addition”, “modification” or “replacement”, the relevant text in part 1 is to be adapted accordingly.

Subclauses which are additional to those in part 1 are numbered from 101.

Annexes which are additional to those in part 1 are lettered AA, BB, etc. Annexes designated “normative” are part of the body of the standard. Annexes designated “informative” are given for information only. In this standard, Annex AA and Annex ZA are normative and Annex BB is informative. Annex ZA has been added by CENELEC.

This part of EN 60204 fulfils safety objectives of the Low Voltage Directive (73/23/EEC) and the relevant electrotechnical Essential Requirements of the Machinery Directive (89/392/EEC) and the Essential Requirements of the EMC Directive (89/336/EEC).

## Contents

|                                                                                                                        | Page |
|------------------------------------------------------------------------------------------------------------------------|------|
| Foreword                                                                                                               | 2    |
| 1 Scope                                                                                                                | 3    |
| 2 Normative references                                                                                                 | 3    |
| 3 Definitions                                                                                                          | 3    |
| 4 General requirements                                                                                                 | 4    |
| 5 Incoming supply conductor terminations and devices for disconnecting and switching off                               | 4    |
| 6 Protection against electric shock                                                                                    | 5    |
| 7 Protection of equipment                                                                                              | 5    |
| 8 Equipotential bonding                                                                                                | 5    |
| 9 Control circuits and control functions                                                                               | 5    |
| 10 Operator interface and machine mounted control devices                                                              | 7    |
| 11 Control interfaces                                                                                                  | 8    |
| 12 Electronic equipment                                                                                                | 8    |
| 13 Controlgear: location, mounting and enclosures                                                                      | 8    |
| 14 Conductors and cables                                                                                               | 8    |
| 15 Wiring practices                                                                                                    | 8    |
| 16 Electric motors and associated equipment                                                                            | 9    |
| 17 Accessories and lighting                                                                                            | 9    |
| 18 Warning signs and item designations                                                                                 | 9    |
| 19 Technical documentation                                                                                             | 10   |
| 20 Testing                                                                                                             | 10   |
| Annex AA (normative) Electromagnetic compatibility requirements                                                        | 11   |
| Annex BB (informative) Bibliography                                                                                    | 17   |
| Annex ZA (normative) Normative references to international publications with their corresponding European publications | 19   |
| Figure AA.1 — Standard sewing unit for EMC tests                                                                       | 13   |
| Table AA.1 — Emission — Radiated (enclosure) and conducted (AC mains)                                                  | 14   |
| Table AA.2 — Immunity — Enclosure port                                                                                 | 14   |
| Table AA.3 — Immunity — Ports for signal lines and data buses not involved in process control, etc.                    | 15   |
| Table AA.4 — Immunity — Ports for process, measurement and control lines and long bus and control lines                | 15   |
| Table AA.5 — Immunity — DC input and DC output power levels                                                            | 16   |
| Table AA.6 — Immunity — AC input and AC output power ports                                                             | 16   |
| Table AA.7 — Immunity — Earth port                                                                                     | 16   |

## 1 Scope

*This clause of part 1 is replaced by:*

This part of IEC 204 applies to the application of electrical and electronic equipment to sewing machines, units and systems, designed specifically for professional use in the sewing industry.

NOTE See IEC 335-2-28 for requirements for sewing machines for household and similar use.

The equipment covered by this part commences at the point of connection of the supply to the electrical equipment of the machine. This part is applicable to equipment or parts of equipment which operate with nominal supply voltages not exceeding 1 000 V a.c. or 1 500 V d.c. between lines, and nominal frequencies not exceeding 200 Hz.

It does not cover all requirements (such as guarding, interlocking, control) which are necessary to safeguard persons from hazards other than electrical and which are specified in other standards.

This part applies to sewing units and systems which are installed in dry and well-kept clean locations and which process dry sewing material, as in the clothing industry. Where sewing units and systems are used in other than dry and well-kept clean locations, more stringent measures may be necessary, which need to be agreed.

## 2 Normative references

*This clause of part 1 is applicable except as follows:*

*Additional references:*

IEC 664-1:1992, *Insulation coordination for equipment within low voltage systems — Part 1: Principles, requirements and tests.*

IEC 721-3-3:1994, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 3: Stationary use at weather-protected locations.*

IEC 1000-4-2:1995, *Electromagnetic compatibility (EMC) — Part 4: Testing and measurement techniques — Section 2: Electrostatic discharge immunity test. Basic EMC publication.*

IEC 1000-4-3:1995, *Electromagnetic compatibility (EMC) — Part 4: Testing and measurement techniques — Section 3: Radiated, radio-frequency, electromagnetic field immunity test.*

IEC 1000-4-4:1995, *Electromagnetic compatibility (EMC) — Part 4: Testing and measurement techniques — Section 4: Electrical fast transient/burst immunity test. Basic EMC publication.*

IEC 1058-1:1990, *Switches for appliances — Part 1: General requirements.*

ISO 4915:1991, *Textiles — Stitch types — Classification and terminology.*

ISO 4916:1991, *Textiles — Seam types — Classification and terminology.*

ISO/FDIS 7115, *Sewing machines — Vocabulary, classification and technical characteristics.*<sup>1)</sup>

## 3 Definitions

*This clause of part 1 is applicable except as follows:*

*Additional definitions:*

### 3.101

#### sewing machine

machine designed to produce one or more stitch types (see ISO 4915) with one or more sewing threads (see 4.1 of ISO 7115). In producing a seam (see ISO 4916) the machine can perform one or more sewing functions

NOTE Previously, the term “sewing machine head” was used instead of “sewing machine”.

### 3.102

#### sewing machine stand

item, for example designed as a table, on which the sewing machine is arranged to enable optimum operation

<sup>1)</sup> At present at the stage of Final Draft International Standard.

### 3.103

#### **sewing machine drive**

equipment that drives a sewing machine, such as an electric motor, which is speed-controlled by electrical and/or mechanical means with or without a positioning device and with or without control of machine functions

### 3.104

#### **sewing unit**

equipment consisting of at least a sewing machine, a sewing machine stand and a sewing machine drive. One or several devices incorporated in and/or attached to the sewing machine or sewing unit, for example for sewing, cutting, feeding, etc. the sewing material, as well as the sewing machine itself, are controlled by the operator or automatically

### 3.105

#### **sewing system**

equipment consisting of at least two sewing units or parts of them, which are functionally interlinked

## **4 General requirements**

*This clause of part 1 is applicable except as follows:*

### **4.4.1 Electromagnetic compatibility**

See Annex AA.

### **4.4.3 Humidity**

*Modification:*

*Instead of the first paragraph, the following applies:*

The electrical equipment shall be capable of operating in the intended manner in the humidity conditions covered by class 3K3 as specified in IEC 721-3-3.

## **5 Incoming supply conductor terminations and devices for disconnecting and switching off**

*This clause of part 1 is applicable except as follows:*

### **5.1 Incoming supply conductor terminations**

*Modification:*

*Add after the first sentence of the first paragraph:*

Each sewing unit shall have only one incoming supply connection.

Each sewing system consisting of at least two sewing units may have its own incoming supply connection for each sewing unit; however, if a failure of one sewing unit can cause a hazard, the sewing system shall have only one incoming supply connection.

*Replacement of the first sentence of the third paragraph:*

A neutral conductor may be used.

### **5.3 Supply disconnecting (isolating) device**

#### **5.3.1 General**

*Addition:*

When sewing units are interconnected by means of control systems to form sewing systems, only one supply disconnecting device shall be provided.

#### **5.3.2 Type**

*Addition to item d):*

On sewing units and systems which are started and stopped by actuating a hold-to-run control device (e.g. pedal), an isolating switch according to IEC 947-3 for utilization categories AC-3 or DC-3, or a built-in switch according to IEC 1058-1, shall be used.