

Low-voltage switchgear and controlgear

Part 5-5. Control circuit devices and
switching elements — Electrical
emergency stop devices with
mechanical latching function

ICS 29.130.20

National foreword

This British Standard is the UK implementation of EN 60947-5-5:1998+A11:2013. It is derived from IEC 60947-5-5:1997, incorporating amendment A1:2005. It supersedes BS EN 60947-5-5:1998, which will be withdrawn on 3 December 2015.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\overline{A1}$ $\overleftarrow{A1}$. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by $\overline{A1}$ $\overleftarrow{A1}$.

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

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Niederspannungsschaltgeräte
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Foreword

The text of document 17B/837/FDIS, future edition 1 of IEC 60947-5-5, prepared by SC 17B, Low-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60947-5-5 on 1997-10-01.

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This standard is to be used in conjunction with EN 60947-1 : 1997 and EN 60947-5-1 : 1997.

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annex A is informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of International Standard IEC 60947-5-5:1997 was approved by CENELEC as a European Standard without any modification.

Foreword to amendment A1

The text of document 17B/1389/FDIS, future amendment 1 to IEC 60947-5-5:1997, prepared by SC 17B, Low-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60947-5-5:1997 on 2005-03-01.

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ⓘ This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2006/42/EC.

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

This document covers the principle elements of the safety objectives for electrical equipment designed for use within certain voltage limits (LVD - 2006/95/EC).

Annexes ZA and ZZ have been added by CENELEC. **ⓘ**

Endorsement notice

The text of amendment 1:2005 to the International Standard IEC 60947-5-5:1997 was approved by CENELEC as an amendment to the European Standard without any modification.

Foreword to amendment 1:2005

This document (EN 60947-5-5:1997/A11:2013) has been prepared by CLC/TC 17B "Low-voltage switchgear and controlgear".

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For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

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INTRODUCTION

The present IEC 60947-5-5 deals specifically with electrical emergency stop devices with mechanical latching function and gives additional electrical and mechanical requirements to those given in the following International Standards:

- ISO 13850 giving requirements for the emergency stop function of a machine, whatever be the energy used;
- IEC 60204-1 giving additional requirements for an emergency stop function realized by the electrical equipment of a machine;
- IEC 60947-5-1 specifying electrical characteristics of electromechanical control circuit devices.

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 5-5: Control circuit devices and switching elements – Electrical emergency stop device with mechanical latching function

1 Scope

This section of IEC 60947-5 provides detailed specifications relating to the electrical and mechanical construction of emergency stop devices with mechanical latching function and to their testing.

[A1] This standard is applicable to electrical control circuit devices and switching elements which are used to initiate an emergency stop signal. Such devices may be either provided with their own enclosure, or installed according to the manufacturer's instructions. **[A1]**

This standard does not apply to:

- emergency stop devices for non-electrical control circuit, for example hydraulic, pneumatic;
- emergency stop devices without mechanical latching function.

An emergency stop device may also be used to provide an emergency switching off function (see annex A).

[C11] This European Standard does not deal with any specific requirements on noise as the noise emission of electrical emergency stop devices with mechanical latching function is not considered to be a relevant hazard. **[C11]**

2 Normative references

[A1] 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. **[A1]**

IEC 60050(441):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 441: Switchgear, controlgear, fuses*

[A1] Amendment 1 (2000) **[A1]**

IEC 60068-2-1:1990, *Environmental testing – Part 2: Tests – Test A: Cold*

[A1] Amendment 1 (1993)

Amendment 2 (1994) **[A1]**

IEC 60068-2-2:1974, *Environmental testing – Part 2: Tests – Test B: Dry heat*

[A1] Amendment 1 (1993)

Amendment 2 (1994) **[A1]**

IEC 60068-2-6:1995, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-11:1981, *Environmental testing – Part 2: Tests – Test Ka: Salt mist*

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

IEC 60068-2-30:1980, *Environmental testing – Part 2: Tests – Test Db and guidance: Damp heat, cyclic (12+12-hour cycle)*

Amendment 1 (1985)

IEC 60073:2002, *Basic and safety principles for man-machine interface, marking and identification – Coding principles for indicators and actuators*

IEC 60204-1:1997, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements*

Amendment 1 (1999) A1

IEC 60721-3-3:1994, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 3: Stationary use at weather protected location*

Amendment 1 (1995)

Amendment 2 (1996)

IEC 60947-1:2004, *Low-voltage switchgear and controlgear – Part 1: General rules*

IEC 60947-5-1:2003, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices* A1

IEC 61310-1:1995, *Safety of machinery – Indication, marking and actuation – Part 1: Requirements for visual, auditory and tactile signals*

ISO 3864:1984, *Safety colours and safety signs*

ISO 13850:1996, *Safety of machinery – Emergency stop – Principles for design*

3 Definitions

For the purpose of this section of IEC 60947-5, the following definitions apply in addition to those given in IEC 60947-1 and in IEC 60947-5-1.

	Reference
A1 A	
Actuated position.....	3.6
Actuating system (of an emergency stop device).....	3.3
Actuator (of an emergency stop device).....	3.4
D	
Direct opening action (positive opening action) (of a contact element).....	3.9
E	
Emergency stop (function or signal).....	3.1
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L	
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A1 R

Resetting (of an emergency stop device)	3.8
Rest position	3.5
T	
Trip wire switch	3.10 A1

3.1

emergency stop (function or signal)

function or signal which is intended:

- to avert or to reduce hazards to persons, damage to machinery or to work in progress;
- to be initiated by a single human action.

[ISO/IEC 13850:3.1, modified]

3.2

emergency stop device

a manually operated control circuit device used to initiate an emergency stop function

[ISO/IEC 13850:3.2, modified]

NOTE An emergency stop device may also provide auxiliary functions, for example for redundancy and/or for signalling through additional contact element(s). Such additional contact(s) may be normally open and/or normally closed.

3.3

actuating system (of an emergency stop device)

the mechanical parts which transmit the actuating force to the contact elements

[IEV 441-15-21 modified]

3.4

actuator (of an emergency stop device)

the part of the actuating system which is actuated by a part of the human body

[IEV 441-15-22 modified]

NOTE 1 Examples of an actuator may be a button, a wire, a rope, a bar, a foot pedal.

A1 Note deleted **A1**

3.5

rest position

the position of an emergency stop device, or of a part of it, which has not been actuated

NOTE In rest position, the machine (or equipment) may work.

3.6

actuated position

the position of an emergency stop device, or of a part of it, after it has been actuated

NOTE In the actuated position of the emergency stop device the machine (or equipment) remains at rest.

3.7

latching (of an emergency stop device)

A1 function or means which engages and maintains the actuating system in the actuated position until reset by a separate manual action

3.8

resetting (of an emergency stop device)

manual action to return the actuating system of the emergency stop device from the actuated position to the rest position

NOTE Examples of resetting include the rotation of a key or of the actuator, pulling the actuator or pushing a special reset button. **A1**

3.9

direct opening action (positive opening action) (of a contact element)

the achievement of contact separation as a direct result of a specified movement of the switch actuator through non-resilient members (e.g. non dependent upon springs)

[K.2.2 of IEC 60947-5-1]

A1 3.10

trip wire switch

rope pull switch

pull cord operated switch

emergency stop device in which the actuator is a rope, a wire or similar means **A1**

4 Marking and product information

4.1 General

Information for installation, operation, maintenance and/or periodic testing shall be provided when necessary on or with the emergency stop device.

The verification of clause 4 shall be conducted according to 7.2.1.

NOTE 1 In certain circumstances, it may be necessary to provide additional information, for example:

- by labels,
- by marker flags attached to wires or ropes to improve their visibility,
- by the graphical symbol 60417-IEC-5638 (see Table 6 of IEC 61310-1).

NOTE 2 See also 9.2.5.4 of IEC 60204-1.

4.2 Indications on buttons

4.2.1 Buttons used as actuators of an emergency stop device shall be coloured red. When a background exists behind the actuator, and as far as it is practicable, it shall be coloured yellow.

4.2.2 The direction of unlatching shall be clearly identified when resetting is achieved by rotation of the button.

NOTE See also IEC 60073 and ISO 3864.

4.3 Additional requirements for trip wire switches

Information provided by the manufacturer shall include:

- the maximum length of wire or rope;
- the correct tension of wire or rope;
- the distances between supports;
- recommendation to use only straight runs of wire or rope;
- if applicable, guidance on maintenance for pulleys and eyelets, and the measures necessary to ensure that the wire or rope remains in proper position.

4.4 Additional requirements for colour coding

A resetting button, for example, where applicable with a trip wire switch, shall be coloured blue.

When a colour coding is used for setting a trip wire switch:

- green shall indicate the correct setting of the rest position; and
- yellow shall indicate the correct setting of the actuated position.

5 Electrical requirements

5.1 The utilization categories shall be AC-15 and/or DC-13 and/or DC-14 in accordance with IEC 60947-5-1.

5.2 All normally closed contact elements of an emergency stop device shall have a direct opening action (positive opening action), according to annex K of IEC 60947-5-1.

The tests shall be conducted according to annex K of IEC 60947-5-1.

5.3 The degree of protection provided by the emergency stop device shall be stated by the manufacturer in accordance with annex C of IEC 60947-1.

5.4 Tests for electrical characteristics shall be conducted according to IEC 60947-5-1.

[A1] NOTE Subclause 7.2.7 of IEC 60947-5-1 only applies to control switches suitable for isolation. **[A1]**

6 Mechanical requirements

6.1 General requirements

6.1.1 Means shall be provided to enable the emergency stop device to be securely installed in its intended mounting position.

The test shall be conducted according to 7.2.1.

[A1] **6.1.2** The emergency stop device shall meet the requirements of 7.3, 7.4, 7.5, 7.6 and, where applicable, of 7.7.5.

6.1.3 It shall be possible to operate and reset the emergency stop device under all normal service conditions.

The test shall be conducted according to 7.2 to 7.7.4. **[A1]**

6.1.4 Vibration or shocks shall not cause the opening of the contacts in the closed position or the closing of the contacts in the open position, nor operation of the latching mechanism.

A1 The tests shall be conducted according to 7.5 and 7.6. **A1**

6.2 Latching

6.2.1 In accordance with 4.4.4 of ISO 13850*, when the emergency stop signal has been generated during actuation of the emergency stop device, the emergency stop function shall be maintained by latching of the actuating system. The emergency stop signal shall be maintained until the emergency stop device is reset (disengaged). It shall not be possible for the emergency stop device to latch-in without generating the emergency stop signal.

In case of failure in the emergency stop device (including the latching means), the generation of the emergency stop signal shall have priority over the latching function.

The tests shall be conducted according to 7.2, 7.7.2 and 7.7.3.

6.2.2 The latching shall operate correctly when the emergency stop device is used under conditions, specified either in 7.4 or by the manufacturer, whichever is more severe.

The test shall be conducted according to 7.3, 7.4, 7.5, 7.6 and 7.7.

A1 *Text deleted* **A1**

6.3 Additional requirements for button type emergency stop device

6.3.1 The resetting of the latching means shall be by turning a key, by rotation of the button in the designated direction, or by a pulling motion.

The test shall be conducted according to 7.2.1 and 7.2.2.1.

6.3.2 The emergency stop device shall be so designed that removal of the actuator is from the inside of the enclosure only, or from the outside of the enclosure by use of a tool intended for that purpose.

A1 This shall be verified by inspection. **A1**

6.4 Additional requirements for trip wire switches

6.4.1 The construction of the emergency stop device shall be such that:

- the setting of the wire or rope, and subsequent adjustment, can be carried out without causing malfunction; and
- the installation of the emergency stop device can fulfil the requirements of 4.5.1 and 4.5.2 of ISO/IEC 13850.

The tests shall be conducted according to 7.2 and 7.3.

* Corresponds to 4.1.11 of EN 418.

6.4.2 When the actuator is installed according to the instructions:

- the perpendicular pulling force applied to the wire or rope necessary for generating the emergency stop signal (opening of the contacts) shall be less than 200 N;
- the wire or rope shall resist a tension force 10 times higher than the perpendicular pulling force necessary for generating the emergency stop signal;
- the perpendicular deflection of the wire or rope necessary for generating the emergency stop signal shall be less than 400 mm;
- the breaking or disengagement of the wire or rope shall generate the emergency stop signal;

A1) *Text deleted*

The pulling force shall be applied at the mid-point of the length of the wire or rope.

The tests shall be conducted according to 7.8.1. **A1)**

6.4.3 Changes in the length of the rope (for example temperature, age etc.) shall be taken into account.

The tests shall be conducted according to 7.2.1.

6.5 Additional requirement for footswitches

A pedal (footswitch) type emergency stop device shall have no cover.

The test shall be conducted according to 7.2.1.

7 Testing of the mechanical design

7.1 General

In accordance with 8.1.1 and 8.1.2 of IEC 60947-1, type tests shall be made to prove compliance with the requirements of clauses 4, 5 and 6.

An emergency stop device may have combinations of both main and auxiliary contacts. The tests given in 7.5 and 7.6 are to verify that all these contacts are not adversely affected by mechanical shocks.

Some tests, for example based on visual inspection, or by checking the literature provided with the emergency stop device, require only one sample.

A1) For the tests described in 7.3.3, 7.4, 7.5, 7.6 and 7.7, three identical samples of emergency stop device shall be selected, and each sample shall be subjected successfully to the sequence of tests, in the order given in this clause.

When more than one type of emergency stop device is manufactured to the same basic design, less than three identical samples may be tested, providing that more than three products of the same family are tested. Such an acceptance shall be fully documented. **A1)**

7.2 General design inspection

7.2.1 The requirements of 4.1, 6.1.1, 6.4.1 and, where applicable, of 6.3, 6.4.3 and 6.5 are verified by inspection of the mechanical structure of the emergency stop device.

7.2.2 Button type emergency stop device.

7.2.2.1 The requirement of 6.3.1 is checked by latching and resetting the actuator manually.

7.2.2.2 The requirement of 6.3.2 is verified by inspection of the fastening parts, and by pulling and turning the button and other parts of the device by hand.

7.3 Operating tests

7.3.1 General

The purpose of the operating tests is to verify the durability of the latching parts (springs, balls, pins etc.) in normal use.

The test verifies the requirements of 6.1.2, 6.2.2 and 6.3.

The operating tests described in this subclause may be carried out in conjunction with the electrical tests (see clause 5).

A1 7.3.2 Robustness of a button actuator

A button actuator shall withstand:

- a force as specified in Table 1, applied in the three mutually perpendicular axes; and
- a torque as specified in Table 1, in both directions of rotation, in each of the latched and unlatched positions, where the resetting action requires rotation of the push-button.

Table 1 – Robustness of a button type actuator

Mounting hole diameter mm	Force N	Torque N·m
16	80	1,6
22	110	2,2
30	150	3,0

7.3.3 Durability test **A1**

The three samples (see 7.1) shall be subjected to the following test:

The actuator of an emergency stop device shall be moved through its full travel, then it shall be reset in a manner to imitate human operation as closely as possible.

The test shall consist of 6 050 cycles in which latching and resetting of the actuator occurs during each cycle. The movement and actuating forces shall be consistent throughout the test. Monitoring of these parameters shall be carried out to ensure consistency.

The durability test is passed if each emergency stop device completes the 6 050 cycles without failure.

A1 Text deleted **A1**

7.4 Conditioning procedures

The purpose of the following procedures is to expose the emergency stop devices to various environmental conditions in order to verify their functioning after such exposure.

A1 The three emergency stop devices successfully tested in 7.3.3 shall be subjected to the following exposures: **A1**

- 96 h at +70 °C in dry atmosphere (see test Ba of IEC 60068-2-2 and IEC 60721-3-3 class 3K7)
- 96 h at changing moist and warm atmosphere (see IEC 60068-2-30 and IEC 60721-3-3 class 3K7):
+25 °C/+55 °C 97 % / 93 % RH
- 96 h at -40 °C (see IEC 60068-2-1: test Aa and IEC 60721-3-3 class 3K7)
- 96 h at +35 °C in a solution of 5 % NaCl (see IEC 60068-2-11 and IEC 60721-3-3 class 3C3).

Following the environmental exposures and after the devices have been restored to room temperature, the sequence of tests in 7.5, 7.6 and 7.7 shall be conducted.

7.5 Shock test

7.5.1 The three emergency stop devices which have been conditioned in accordance with 7.4 shall be tested each on one of the three mutually perpendicular axes.

7.5.2 Each emergency stop device is tested in the rest position and shall withstand 15 g shock in both directions of the corresponding axis (see IEC 60068-2-27:11 ms: 15 g).

During the test, the closed contacts shall not open, the open contacts, if applicable, shall not close and the latching mechanism shall not latch.

The checking means shall be able to detect any opening or closing of contacts longer than 0,2 ms.

7.5.3 The procedure is repeated in the actuated position (actuator latched).

During the test, the open contacts shall not close; the closed contacts, if applicable, shall not open; and the latching mechanism shall not unlatch.

7.6 Vibration tests

7.6.1 The three samples used for 7.5 shall be tested, one for each of the three mutually perpendicular axes.

7.6.2 Each emergency stop device is tested in the rest position as per the following specifications (see IEC 60068-2-6):

- frequency range: 10 Hz to 500 Hz, logarithmic ramp and return;
- duration 2 h: 10 sweep cycles, 1 oct/min;
- maximum peak amplitude: 0,35 mm (0,7 mm from peak to peak);
- maximum acceleration: 50 m/s²;
- crossover frequency between 58 Hz and 62 Hz.

During the test, the closed contacts shall not open, the open contacts, if applicable, shall not close, and the latching mechanism shall not unlatch.

The checking means shall be able to detect any opening or closing of contacts longer than 0,2 ms.

7.6.3 The procedure is repeated in the actuated position (actuator latched).

During the test, the open contacts shall not close, the closed contacts, if applicable, shall not open, and the latching mechanism shall not unlatch.

A1 7.7 Latching, resetting and impact tests **A1**

7.7.1 General

The three sample emergency stop devices which have successfully completed the tests of 7.6 shall be used for the following tests.

A1 The requirements of 6.2.1 are verified by testing each sample in accordance with 7.7.2, 7.7.3 and 7.7.4. The sample shall also be tested in accordance with 7.7.5 where applicable. **A1**

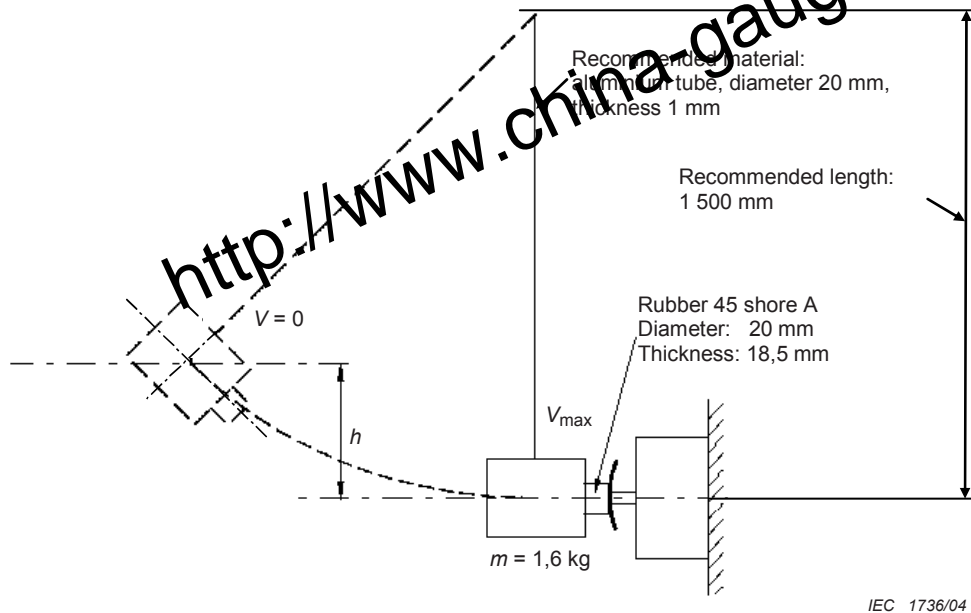
7.7.2 Opening test

The actuator of the emergency stop device shall be moved slowly just to the point where latching occurs.

The normally closed contacts shall then be open. This shall be verified by an impulse voltage test at 2 500 V (see details in K.8.3.4.4.1 of IEC 60947-5-1).

7.7.3 Latching test

A1 To simulate the typical human actuation of a button-type switch, the emergency stop device and its actuator shall be mounted and tested by a pendulum-type hammer as shown in Figure 1.



NOTE The 1,6 kg mass does not include the mass of the aluminium tube.

Figure 1 – Hammer for tests

The relationship between the emergency stop mounting hole and the hammer height (h) is given in Table 2.

Table 2 – Relationship between the emergency stop mounting hole and the hammer height

Mounting hole diameter mm	Hammer height (h) mm
16	60 if the actuator diameter is < 30 mm 75 if the actuator diameter is \geq 30 mm
22	75
30	75

The actuator shall be unlatched prior to each strike.

The hammer shall be released whilst stationary.

To ensure that the hammer is released whilst stationary, it is recommended that a magnetic or other holding mechanism is used.

This test shall be performed three times.

After each strike, the actuating system shall be latched.

Other types are under consideration. **A1**

7.7.4 Resetting test

- a) if the resetting is by pulling, the pulling force shall be less than 50 N;
- b) if the actuator is reset by turning, the torque shall be less than 1 N·m;
- c) for other types: under consideration.

A1 7.7.5 Impact test for button type actuators

In order to verify 6.1.2 and 6.1.3 where applicable, the three sample emergency stop devices are tested by striking the actuator three times with the hammer shown in Figure 1, where $h = 310 \text{ mm} \pm 2 \text{ mm}$.

The actuator shall be unlatched prior to each strike.

After each strike, the emergency stop device shall be latched and break contacts shall be open.

After three strikes, the actuator shall not be damaged.

After the third strike, the opening contact element shall meet the requirements of K.8.3.6 of IEC 60947-5-1. **A1**

7.8 Miscellaneous tests

A1 *Text deleted*

7.8.1 Disengagement of wire or rope **A1**

In order to verify 6.4.2 where applicable, one emergency stop device is installed with the wire or rope according to the manufacturer's instructions.

The rope is disengaged.

The main contact(s) shall open and the actuating system shall latch in the active position.

A1 7.8.2 Effect of foreign matter **A1**

Special tests are under consideration.

Annex A

(Deleted)

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-441	1984	International Electrotechnical Vocabulary (IEV) Chapter 441: Switchgear, controlgear and fuses	-	-
A1	2000		-	-
IEC 60068-2-1	1990	Environmental testing Part 2: Tests - Tests A: Cold	EN 60068-2-1	1993
A1	1993		A1	1993
A2	1994		A2	1994
IEC 60068-2-2	1974	Part 2: Tests - Tests B: Dry heat	EN 60068-2-2	1993
A1	1993		A1	1993
A2	1994		A2	1994
IEC 60068-2-6 + corr. March	1995 1995	Part 2: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	1995
IEC 60068-2-11	1981	Part 2: Tests - Test Ka: Salt mist	EN 60068-2-11	1999
IEC 60068-2-27	1987	Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993
IEC 60068-2-30 + A1	1980 1985	Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)	EN 60068-2-30	1999
IEC 60073	2002	Basic and safety principles for man-machine interface, marking and identification - Coding principles for indicators and actuators	EN 60073	2002
IEC 60204-1	1997	Safety of machinery - Electrical equipment of machines Part 1: General requirements	EN 60204-1 + corr. September	1997 1998
A1	1999		-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60721-3-3	1994	Classification of environmental conditions Part 3: Classification of groups of environmental parameters and their severities -- Section 3: Stationary use at weatherprotected locations	EN 60721-3-3	1995
A1	1995			-
A2	1996		A2	1997
IEC 60947-1	2004	Low-voltage switchgear and controlgear Part 1: General rules	EN 60947-1 + corr. November	2004 2004
IEC 60947-5-1	2003	Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1 + corr. November	2004 2004
IEC 61310-1	1995	Safety of machinery - Indication, marking and actuation Part 1: Requirements for visual, auditory and tactile signals	EN 61310-1	1995
ISO 3864	1984	Safety colours and safety signs	-	-
ISO 13850	1996	Safety of machinery - Emergency stop - Principles for design	-	-

Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers all relevant essential requirements as given in Annex I, 1.2.1, 1.2.2, 4th paragraph of the EU Directive 2006/42/EC.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive(s) concerned.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

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