
Niskonapetostne stikalne in krmilne naprave – 5-5. del: Krmilne naprave in stikalni elementi – Električna (varnostna) naprava za zaustavitev v sili z mehansko zaporo

Low-voltage switchgear and controlgear -- Part 5-5: Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function (IEC 60947-5-5:1997)

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English version

Low-voltage switchgear and controlgear
Part 5-5: Control circuit devices and switching elements
Electrical emergency stop device with mechanical latching function
(IEC 60947-5-5:1997)

Appareillage à basse tension
Partie 5-5: Appareils et éléments
de commutation pour circuits de
commande - Appareil d'arrêt d'urgence
électrique à accrochage mécanique
(CEI 60947-5-5:1997)

Niederspannungsschaltgeräte
Teil 5-5: Steuergeräte und
Schaltelemente
Elektrisches NOT-AUS-Gerät mit
mechanischer Verrastfunktion
(IEC 60947-5-5:1997)

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

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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.

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) 1998-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-08-01

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.

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

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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.

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

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).

2 Normative references

SIST EN 60947-5-5:1999

The following normative documents contain provisions, which through reference in this text, constitute provisions of this section of IEC 60947-5. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this section of IEC 60947-5 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

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

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

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)*

IEC 60073:1996, *Basic and safety principles for man-machine interface, marking and identification – Coding principles for indicating devices and actuators*

IEC 60204-1:1992, *Electrical equipment of industrial machines – Part 1: General requirements*

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*

IEC 60947-1:1996, *Low-voltage switchgear and controlgear – Part 1: General rules*

IEC 60947-5-1:1997, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

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.

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]

NOTES

- 1 Examples of an actuator may be a button, a wire, a rope, a bar, a foot pedal.
- 2 This applies to the French text only.

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): Function or means which engage the actuating system in the actuated position until reset by a separate manual action.

3.8 resetting (of a emergency stop device): Manual action letting the actuating system return the emergency stop device to its rest position after it has been moved to the actuated position.

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

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].

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.

NOTES

- 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).
- 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.