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Sistemi za odkrivanje in javljanje požara ter alarmiranje - 21. del: Oprema za usmerjanje alarma in opozoril o napakah

Fire detection and fire alarm systems - Part 21: Alarm transmission and fault warning routing equipment

Brandmeldeanlagen - Teil 21: Übertragungseinrichtungen für Brand- und Störungsmeldungen

Systemes de détection et d'alarme incendie - Partie 21 : Dispositif de transmission de l'alarme feu et du signal de dérangement

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Fire detection and fire alarm systems - Part 21: Alarm transmission and fault warning routing equipment

Systèmes de détection et d'alarme incendie - Partie 21 : Dispositif de transmission de l'alarme feu et du signal de dérangement

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This European Standard was approved by CEN on 27 April 2006.

CEN 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 CEN 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 CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 54-21:2006) has been prepared by Technical Committee CEN/TC 72 “Fire detection and fire alarm systems”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2006, and conflicting national standards shall be withdrawn at the latest by May 2009.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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

EN 54 “Fire detection and fire alarm systems” consists of the following Parts:

- Part 1: Introduction,
- Part 2: Control and indicating equipment,
- Part 3: Fire alarm devices – Sounders,
- Part 4: Power supply equipment,
- Part 5: Heat detectors – Point detectors,
- Part 7: Smoke detectors – Point detectors using scattered light, transmitted light or ionisation,
- Part 10: Flame detectors – Point detectors,
- Part 11: Manual call points,
- Part 12: Smoke detectors – Line detectors using an optical light beam,
- Part 13: Compatibility assessment of system components,
- Part 14: Guidelines for planning, design, installation, commissioning, use and maintenance,
- Part 15: Point detectors using a combination of detected fire phenomena,
- Part 16: Voice alarm control and indicating equipment,
- Part 17: Short-circuit isolators,
- Part 18: Input/output devices,
- Part 20: Aspirating smoke detectors,
- Part 21: Alarm transmission and fault warning routing equipment,
- Part 22: Line-type heat detectors,
- Part 23: Fire alarm devices – Visual alarms,
- Part 24: Components of voice alarm systems – Loudspeakers,

— Part 25: Components using radio links and system requirements.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This European Standard specifies requirements, test methods and performance criteria against which the effectiveness and reliability of routing equipment capable of transmitting fire alarm and/or fault warning signals for use with fire detection and fire alarm systems installed in buildings can be assessed (see EN 54-1). The routing equipment is designed to allow the system to function in accordance with the requirements of this European Standard. It also provides for the evaluation of conformity of the equipment to the requirements of this standard.

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.

EN 54-1:1996, *Fire detection and fire alarm systems — Part 1: Introduction*

EN 54-2:1997, *Fire detection and fire alarm systems — Part 2: Control and indicating equipment*

EN 54-4:1997, *Fire detection and fire alarm systems — Part 4: Power supply equipment*

EN 50130-4, *Alarm systems — Part 4: Electromagnetic compatibility — Product family standard: Immunity requirements for components of fire, intruder and social alarm systems*

EN 50136-1-1:1998, *Alarm systems — Alarm transmission systems and equipment — Part 1-1: General requirements for alarm transmission systems*

EN 50136-2-1:1998, *Alarm systems — Alarm transmission systems and equipment — Part 2-1: General requirements for alarm transmission equipment*

EN 60068-1, *Environmental testing - Part 1: General and guidance (IEC 60068-1:1988 + Corrigendum 1988 + A1:1992)*

EN 60068-2-1, *Environmental testing; part 2: tests; tests A: cold (IEC 60068-2-1:1990)*

EN 60068-2-6, *Environmental testing - Part 2: Tests - Tests Fc: Vibration (sinusoidal) (IEC 60068-2-6:1995 + Corrigendum 1995)*

EN 60068-2-47, *Environmental testing - Part 2-47: Test Mounting of specimens for vibration, impact and similar dynamic tests (IEC 60068-2-47:2005)*

EN 60068-2-75, *Environmental testing - Part 2: Tests - Test Eh: Hammer tests (IEC 60068-2-75:1997)*

EN 60068-2-78, *Environmental testing - Part 2-78: Tests; Test Cab: Damp heat, steady state (IEC 60068-2-78:2001)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 60721-3-3:1995, *Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 3: Stationary use at weatherprotected locations (IEC 60721-3-3:1994)*

EN ISO 9001:2000, *Quality management systems — Requirements (ISO 9001:2000).*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 54-1:1996, EN 54-2:1997, EN 54-4:1997 and EN 50136-1-1:1998, 4.7 apply.

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply:

CIE: Control and indicating equipment,

PSE: Power supply equipment.

4 General requirements

4.1 General

If functions other than those specified in this European Standard are provided, they shall not jeopardize the compliance with any requirements of this European Standard.

4.2 Compliance

In order to comply with this standard the routing equipment shall meet the requirements of this clause, which shall be verified by visual inspection or engineering assessment, shall be tested as described in Clause 5 and shall meet the requirements of the tests.

5 Functional requirements

5.1 Alarm transmission routing equipment

The alarm transmission routing equipment shall be capable of processing the following signals:

a) receiving fire alarm signal from the CIE,

b) transmitting fault warning signals to the CIE,

c) receiving fault warning signals from the transmission network,

d) transmitting fire alarm signal to the fire alarm receiving centre,

e) receiving acknowledgement signal from the alarm receiving centre,

f) transmitting acknowledgement to the CIE.

5.2 Fault warning routing equipment

The fault warning routing equipment shall be capable of processing the following signals:

a) receiving fault warning signal from the CIE,

b) transmitting fault warning signals to the CIE,

c) receiving fault warning signals from the transmission network,

d) transmitting fault warning signals to the fault warning receiving centre.

5.3 Indication of signals

The following signals shall be indicated at the routing equipment by separate light-emitting indicators for a) and b). Alternatively, the signals can be indicated at the CIE, in which case it is not necessary to indicate the signals at the routing equipment.

a) The received acknowledgement signal from fire alarm receiving centre as defined in EN 50136-2-1:1998, 5.5.

b) At least one common fault warning shall be used to indicate the following:

1) if the acknowledgement signal is not received at the routing equipment within 100 s for type 1 and 240 s for type 2 (see Annex A, Table A.1) of the initiation of the transmitted fire alarm signal, a fault warning shall be given;

2) a fault warning indicating a failure within the routing equipment (e.g. power supply failure), required to be indicated in accordance with this standard;

3) a fault warning indicating a failure within the alarm transmission network;

4) where the routing equipment is located in a separate enclosure from the CIE, an open circuit or short circuit of the interconnection between the routing equipment and the CIE shall be indicated at the CIE and a fault warning signal sent to the alarm receiving centre.

6 Alarm transmission and fault warning systems requirements

The performance requirements of transmission systems shall be as specified in Annex A.

The verification of this performance is detailed in Annex B.

7 Design requirements

7.1 General requirements and manufacturer's declarations

The routing equipment shall comply with the design requirements of 7.3 relevant to the technology used. Some requirements can be verified by testing. Others (e.g. long-term reliability of the routing equipment) can only be verified by inspection of the design and its accompanying documentation (product or system specification, reports etc.).

In order to assist the process of design inspection, the manufacturer shall declare the following in writing:

a) that the design has been carried out in accordance with a factory production control system, which incorporates a set of rules for the design of all elements of the routing equipment;

b) that all the components of the routing equipment have been selected for the intended purpose and are expected to operate within their specification when the environmental conditions outside the enclosure of the routing equipment comply with class 3K5 of EN 60721-3-3:1995.

7.2 Documentation

7.2.1 The manufacturer shall prepare installation and user documentation, which shall be submitted to the testing authority together with the routing equipment. This shall comprise at least the following:

a) a general description of the equipment, including:

- functions relating to other Parts of EN 54,
- ancillary functions not required by this European Standard,

b) technical specifications of the inputs and the outputs of the routing equipment, sufficient to permit an assessment of the mechanical, electrical and software compatibility with other components of the system (as described in EN 54-1), including where relevant:

- the power requirements for recommended operation,
- the maximum and minimum electrical ratings for each input and output,
- information on the communication parameters employed on each transmission path,
- recommended cable parameters for each transmission path,
- fuse ratings;

c) installation information, including:

- the suitability for use in the various environments specified in accordance with Annex A (e.g. the supplier specifies the performance parameters of the routing equipment in a data sheet, and it is these parameters together with the different parameters of the alarm transmission system which have to fulfil the requirements of Annex A),

- mounting instructions,
- instructions for connecting the inputs and outputs;

d) configuring and commissioning instructions;

e) operating instructions;

f) maintenance information.

7.2.2 The manufacturer shall also prepare design documentation, which shall be submitted to the testing authority together with the routing equipment. This documentation shall include drawings, parts lists, block diagrams, circuit diagrams and a functional description to such an extent that compliance with this standard may be checked and that a general assessment of the mechanical and electrical design is made possible.

7.3 Mechanical design requirements

7.3.1 The enclosure of the routing equipment shall be of robust construction, consistent with the method of installation recommended in the documentation. It shall meet at least classification IP30 of EN 60529:1991 at access level 2.

7.3.2 All light emitting indicators shall be clearly labelled to indicate their purpose. The information shall be legible at 0,8 m distance in an ambient light intensity from 100 lux to 500 lux.

7.3.3 The terminals for transmission paths and the fuses shall be clearly labelled.

7.4 Electrical and other design requirements

7.4.1 The processing of signals shall give the highest priority to the transmission of fire alarms (item E of Figure 1 of EN 54-1:1996) or fault warning (item J of Figure 1 of EN 54-1:1996). If both E and J are operated in the same routing equipment, then the highest priority should be given to fire alarms.

7.4.2 The availability of the power supply for the routing equipment shall be as a minimum on the same level as the availability of the power supply for the CIE required by EN 54-4.

7.4.3 Transitions between the main and the stand-by power sources shall not change any indications and/or the state of any outputs, except those relating to the power supplies.

7.4.4 If the routing equipment has provision for disconnecting or adjusting the main or the stand-by power source, this shall only be possible at access level 3 or 4.

7.5 Integrity of transmission paths

7.5.1 A fault in any transmission path between the routing equipment and the transmission network (as defined in EN 50136-1-1) shall not affect the correct functioning of the routing equipment or any other transmission path.

7.5.2 If the routing equipment is designed to be used with a power supply (item L of Figure 1 of EN 54-1:1996) contained in a separate enclosure, then an interface shall be provided for at least two transmission paths to the power supply, so that a short circuit or an interruption in one does not prevent the supply of power to the routing equipment.

7.6 Accessibility of indications and controls

NOTE See EN 54-2:1997, Annex A.

Access levels shall be provided on the routing equipment, from access level 1 (most accessible) to access level 4 (least accessible). Manual controls and other functions shall be grouped on the appropriate access level, as specified in EN 54-2:1997, 12.6.

7.7 Indications by means of light-emitting indicators

7.7.1 Mandatory indications from light-emitting indicators shall be visible in an ambient light intensity up to 500 lx, at any angle up to 22,5° from a line through the indicator perpendicular to its mounting surface:

— at 3 m distance: the indication of the supply of power,

— at 0,8 m distance: other indications.

7.7.2 If flashing indications are used, the on- and/or the off-periods shall be not less than 0,25 s and the frequencies of flash shall be not less than 0,2 Hz for fault indications.

7.8 Colours of indications

The colours of the general and specific indications from light-emitting indicators shall be yellow for indications of fault warnings and red for the indication of the acknowledgement.

7.9 Testing of indicators

All mandatory visible indicators at the routing equipment shall be testable by manual operation at access level 1 or 2.