SLOVENSKI STANDARD
oSIST prEN 14604:2016

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Javljalniki dima

Smoke alarm devices

Rauchwarnmelder

Dispositif d'alarme de fumée

Ta slovenski standard je istoveten z: **prEN 14604**

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13.220.20	Požarna zaščita	Fire protection
13.320	Alarmni in opozorilni sistemi	Alarm and warning systems

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English Version

Smoke alarm devices

Dispositif d'alarme de fumée

Rauchwarnmelder

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 14604:2016) has been prepared by Technical Committee CEN/TC 72 “Fire detection and fire alarms systems”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14604:2005.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential the basic requirements of Regulation (EU) 305/2011.

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

EN 14604:2005 has been revised so as to align with the second answer of CEN/TC 72 to Mandate M/109.

EN 14604:2016 includes new clauses and annexes as follows:

a) Electrical safety requirements for mains powered smoke alarms and extra low voltage smoke alarms, have been revised and clarified by adding a table (EN 14604:2005, 4.12.1 and 5.12.1);

b) as required by the mandate, Clause 4 has been revised to state all the requirements. Clause 5 has been revised to state all the corresponding tests;

c) additional requirements for 21 day humidity (endurance);

d) additional requirements for ingress for foreign bodies;

e) the sound output test method was modified;

f) requirements for smoke alarms using radio links have been added;

g) requirements for visual alarm indication have been added;

h) alarms with built-in batteries are to be automatically connected to their power source on installation (8.3 in the revised standard);

i) battery capacity requirements in 4.2.2.3, 5.2.3.2 and Annex M revised and now require primary battery powered smoke alarms to have a minimum of 3 years battery service life. Details of the assessment of battery service life are included;

j) mains powered smoke alarms are required to have an integral backup power supply;

k) alarm silence facility test function was revised and replaced by temporary disablement and alarm muting;

l) Clause 6, “Assessment and verification of constancy of performance (AVCP)”;

m) Clause 7, “Classification and designation”;

n) Clause 8, “Marking, labelling and packaging”;

o) content of the technical manual added in Clause 8;

p) Annex L, M, N and R were added.

1 Scope

This document specifies requirements, test methods, performance criteria, and manufacturer's instructions for smoke alarms that operate using scattered light or transmitted light (Type A- optical) or ionization (Type B-ionization), intended for household or similar residential applications.

This document includes additional requirements for smoke alarms which are also suitable for use in leisure accommodation vehicles.

For the testing of other types of smoke alarms, or smoke alarms working on different principles, this document should only be used for guidance. The tests covered by this document are not intended to verify special features of smoke alarms or special characteristics that have been developed for specific risks.

Where interconnection, temporary disablement and alarm muting are included in the smoke alarm, this document specifies applicable requirements.

This document does not cover the requirements for devices intended for incorporation in systems using separate fire control and indicating equipment. Certain types of smoke alarms contain radioactive materials. The national requirements for radiation protection differ from country to country and they are not specified in this document. Such smoke alarms should, however, comply with the applicable national requirements.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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, *Fire detection and fire alarm systems — Part 1: Introduction*

EN 573-3, *Aluminium and aluminium alloys — Chemical composition and form of wrought products - Part 3: Chemical composition and form of products*

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

EN 60068-1, *Environmental testing — Part 1: General and guidance (IEC 60068-1)*

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

EN 60068-2-27, *Environmental testing — Part 2-27: Tests - Test Ea and guidance: Shock (IEC 60068-2-27)*

EN 60068-2-42, *Environmental testing — Part 2-42: Tests - Test Kc: Sulphur dioxide test for contacts and connections (IEC 60068-2-42)*

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

EN 61672-1, *Electroaccoustics — Sound level meters — Part 1: Specifications (IEC 61672-1)*

3 Terms definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 54-1 and the following apply.

3.1.1
alarm condition
condition in which the alarm is giving an audible signal specified by the manufacturer as indicating the existence of a fire

3.1.2
alarm muting facility
means of temporarily silencing a smoke alarm after smoke has been detected

3.1.3
ancillary devices
piece of equipment for supplementary purposes designed to be used with a smoke alarm and which will not prevent the basic function of a smoke alarm

3.1.4
audible alarm signal
sound signal intended to indicate an alarm condition

3.1.5
battery service life
duration of normal operation of the smoke alarm with the battery fitted, prior to the battery fault warning

3.1.6
detachable
removable for maintenance without damaging either component

3.1.7
fault condition
condition in which the operation of the individual smoke alarm is affected by an adverse condition

3.1.8
fault warning
signal intended to indicate an actual or incipient fault of the individual smoke alarm that might prevent it from alarming

3.1.9
interconnectable smoke alarm
smoke alarm which may be interconnected with other smoke alarms to provide a common alarm

3.1.10
leisure accommodation vehicle (LAV)
unit of living accommodation for temporary or seasonal occupation that may meet requirements for construction and use of road vehicles

EXAMPLE 1 Mobile home, caravan, motorhome.

[Source: EN 13878:2003]

3.1.11
normal condition
condition in which the smoke alarm is energized but is not giving either a fire alarm signal or a fault warning, although able to give such signals if the occasion arises

3.1.12
normal power source
primary source of power intended to supply the smoke alarm, e.g. a battery or mains

3.1.13
radio frequency link
means of communication between at least two points, using radio frequency wave propagation

3.1.14
response value
smoke concentration at which the smoke alarm changes to its alarm condition

3.1.15
standby power source
source of power intended to supply the smoke alarm in the event of a failure of the normal power source

3.1.16
smoke alarm device
unit containing all the components, except possibly the energy source, necessary for detecting smoke and for giving an audible alarm and this may comprise one or more parts such as a base (socket) and a head (body)

3.1.17
temporary disablement facility
means of temporarily disabling or desensitising a smoke alarm when it is in the normal condition

3.1.18
type A – optical
smoke alarm sensitive to combustion products capable of affecting the absorption or scattering of radiation in the infra-red, visible and/or ultraviolet regions of the electromagnetic spectrum

3.1.19
type B – ionisation
smoke alarm sensitive to combustion products capable of affecting ionisation currents within the detector

3.2 Symbols and abbreviations

ATP	average transmission power
ARS	average receiving sensitivity
AVCP	assessment and verification of constancy of performance
DUT	device under test
EMC	electromagnetic compatibility
EUT	equipment under test

FPC	factory production control
LAV	leisure accommodation vehicle
MIC	measuring ionization chamber
L_{AV}	calculated average of the sound output
L_{HIi}	measurement result of the sound output
L_i	measurements of the sound output
ΔL_i	difference between the measurements and the measurement results of the sound output
R	resistor
RL	reference level
R_A	resistance in series between the voltage source V_R and the smoke alarm which causes battery fault warning
R_B	resistance in series between the voltage source $0{,}5 \cdot (V_R - V_E) + V_E$ and the smoke alarm which causes battery fault warning
UFA	uniform field area
V_E	voltage at which the unit gives a battery fault warning with zero resistance between the voltage source and the smoke alarm
V_R	nominal battery voltage

4 Product characteristics

4.1 General

4.1.1 Compliance

In order to comply with this European Standard, the smoke alarm shall meet the requirements of this clause, and shall be verified by visual inspection or engineering assessment, or shall be tested as described in Clause 5 and shall meet the requirements of the tests. For smoke alarms which a manufacturer claims are suitable for leisure accommodation vehicles, the tests in Annex K shall be applied and the requirements shall be met.

4.2 Operational reliability

4.2.1 Indicators

4.2.1.1 General

All mandatory indicators shall be visible from a distance of at least 1 m from a line perpendicular to the mounting surface of the smoke alarm device, in an ambient light intensity up to 500 lx.

NOTE This requirement does not apply to any activation of visual indicators during the installation and commissioning phase of the smoke alarm.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.1.1*.

4.2.1.2 Alarm indicators

If a smoke alarm device has a light emitting alarm indicator it shall be red. A smoke alarm device which is capable of being interconnected shall be provided with a light emitting alarm indicator to indicate an

alarm. In case of interconnected smoke alarms, only the fire detecting smoke alarm device shall indicate the alarm by the red indicator. The alarm indication shall consist of a continuous or rapidly flashing light at least once per second. If this light emitting alarm indicator is used for any other purpose it shall flash not more than once in five seconds, to make it clearly distinguishable from the alarm condition.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.1.2.*

4.2.1.3 Mains-on-indicators

A smoke alarm device, stand alone or inter-connectable, intended to be connected to the mains or mains derived supply shall be provided with a continuous light emitting mains-on indicator to exclusively indicate energization by mains. This indicator shall be coloured green and shall be separate from any other indicators.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.1.3.*

4.2.1.4 Additional indicators

A smoke alarm device may be provided with additional indicators. Additional indicators shall not be coloured red or green.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.1.4.*

4.2.1.5 Connection of external ancillary devices

The smoke alarm may provide for connections to external ancillary devices (e.g. test facility, alarm muting facility, remote indicators, control relays, transmitters) by hard wiring, radio frequency or by another means, but open- or short-circuit failure of these connections or disruption of the communication path shall not prevent the correct operation of the smoke alarm.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.1.5.*

4.2.1.6 Manufacturer's adjustments

The manufacturer's adjustments shall not be readily accessible.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.1.6.*

4.2.2 Power supply

4.2.2.1 General

The smoke alarm device shall be powered either by mains or mains derived supply, with an internal back-up power source or an internal primary battery only.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.2.1.*

4.2.2.2 Mains powered smoke alarm devices

4.2.2.2.1 General

For smoke alarms intended for connection to a mains or mains derived power supply an internal backup power supply shall be provided, which may be either a primary cell battery or a rechargeable power source. Data concerning the smoke alarm loads and the back-up facility characteristics shall be provided to indicate that the following requirements can be met.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.2.3.*

4.2.2.2.2 Primary cell battery back-up

For primary cell battery back-up the following shall apply:

a) The primary cell back-up power supply shall be replaceable by the user unless its life expectancy in the smoke alarm is 10 years or greater. The life expectancy of the battery is the period of time that it can remain unused but still operate with a 1 year battery service life.

b) The primary battery/batteries supplied with or specified for use in smoke alarms shall be capable have a battery service life of at least 1 years or a longer duration specified by the manufacturer, before the battery fault warning is given, considering the following loads:

— the quiescent load of the smoke alarm;

— the additional load resulting from a monthly test in accordance to the manufacturers specification;

— loads due to the radio circuitry and radio frequency messages (if applicable);

— the additional load of the interconnection-test at least every 6 months or more often, if specified by the manufacturer (if applicable).

If a separate battery is used for the radio frequency link, the tests and calculations shall be repeated for each battery. In this case the maximum battery service life shall be based on the results on that battery which give the shortest calculated duration.

c) For smoke alarms with additional features not described in this standard using battery power during mains failure, the above requirements shall also be met.

The manufacturer shall document in the user manual its underlying assumptions about the average frequency of usage of these functions and proof by calculation that battery service life of 1 year or longer can be achieved.

If it cannot be proven that the 1 year battery service life can be achieved, a separate power supply shall be used for additional features and the calculation shall be done for the battery dedicated to smoke alarm function.

If the power for the additional features is provided by a separate battery, then there shall be no audible indication of low battery warning for this battery on the smoke alarm.

d) At the point when the battery fault warning commences, the batteries shall have sufficient capacity to give an alarm signal as specified in 4.2.1 and 4.2.6 for at least 4 min in the event of fire, and in the absence of fire, a battery fault warning for at least 30 days, and for smoke alarms with radio frequency interlink, one radio frequency alarm signal in the event of fire.

e) To verify battery service life, data concerning the smoke alarm loads and the battery characteristics shall be provided to indicate that the above requirements can be met at normal ambient conditions.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.2.2.2*.

4.2.2.2.3 Rechargeable back-up power source

The rechargeable back-up power source shall be capable of supplying the smoke alarm with a quiescent load for a minimum period of 72 h followed by an alarm signal as specified in 4.2.1 or at least 4 min and a fault warning for at least 24 h.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.2.2.3*.

4.2.2.2.4 Monitoring of back-up power source

Each back-up power source shall be monitored by the smoke alarm for low back-up faults. Replaceable back-up power sources shall be monitored by the smoke alarm for open circuit and short circuit failure of the back-up.

In each case the audible low battery warning signal shall be given at least once every minute.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.2.2.4*.

4.2.2.3 Battery powered smoke alarm devices

For battery powered smoke alarm devices the following shall apply:

a) The battery power supply shall be replaceable by the user unless the battery service life is 10 years or greater.

b) The primary battery/batteries supplied with or specified for use in smoke alarms shall have a battery service life of at least 3 years or a longer duration specified by the manufacturer, before the battery fault warning is given, considering the following loads:

   — the quiescent load of the smoke alarm;

   — the additional load resulting from a monthly test in accordance to the manufacturers specification;

   — loads due to the radio circuitry and radio frequency messages (if applicable);

   — the additional load of the interconnection test at least every 6 months or more often, if specified by the manufacturer (if applicable).

If the battery used for the radio frequency part is different from the other(s), the tests and calculations shall be repeated for each battery. In this case the maximum operating time shall be based on the results on that battery which give the shortest calculated duration

c) For smoke alarms with additional features using battery power, the above requirements shall also be met.

The manufacturer shall document in the user manual their underlying assumptions about the average frequency of usage of these additional features and proof by calculation that battery service life of 3 years or longer can be achieved.

If it can't be proven that the 3 years battery service life can be achieved, a separate power supply shall be used for additional features and the calculation shall be done for the battery dedicated to smoke alarm function.

If the power for the additional features is provided by a separate battery, then there shall be no audible indication of low battery warning for this battery on the smoke alarm.

d) At the point when the battery fault warning commences, the batteries shall have sufficient capacity to give an alarm signal as specified in 4.2.1 for at least 4 min in the event of fire, and in the absence of fire, a battery fault warning for at least 30 days, and also for smoke alarm with radio frequency part, one radio frequency alarm signal in the event of fire.

e) To verify battery service life, data concerning the smoke alarm loads and the battery characteristics shall be provided to indicate that the above requirements can be met at normal ambient conditions.

To confirm this, the smoke alarm shall be tested in accordance with *5.2.2.3.*