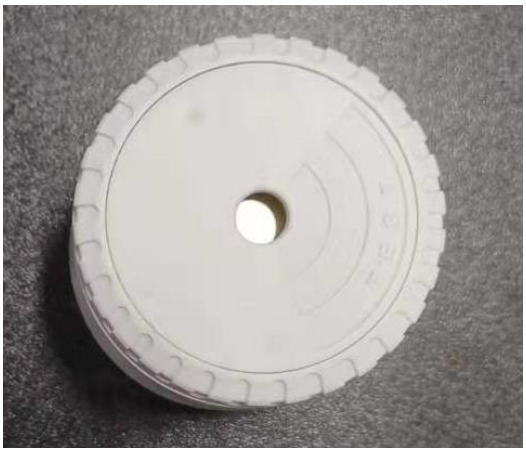
Prüfbericht-Nr.: *Test report no.*:	CN21RBZE 001	**Auftrags-Nr.:** *Order no.*:	168279795	Seite 1 von 64 *Page 1 of* 64
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2020.06.10	
Auftraggeber: *Client:*	Ningbo Deling Electron Technology Company Limited No.8, Sanjiang Road, Wuxiang Industry Area, Yinzhou District, Ningbo, Zhejiang, China			
Prüfgegenstand: *Test item:*	Photoelectric Smoke Alarm			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	SD-435, SD-436			
Auftrags-Inhalt: *Order content*:	TÜV Rheinland CE_CPR			
Prüfgrundlage: *Test specification:*	EN 14604:2005/AC:2008 Smoke alarm devices			

Wareneingangsdatum: *Date of sample receipt:*	2020.08.17
Prüfmuster-Nr.: *Test sample no:*	A002888882-001~030
Prüfzeitraum: *Testing period:*	2020.08.17 - 2020.12.26
Ort der Prüfung: *Place of testing:*	See page 3
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass



erstellt von: *created by:*		**genehmigt von:** authorized by:	
Datum: 2021.01.18 *Date:*	Elin Dong	**Datum:** 2021.01.18 *Date:*	William Xian
Stellung / *Position:*	Project Engineer	**Stellung** / *Position:*	Technical Certifier

Sonstiges / *Other:* Attachement
1: Equipment list. 2: Photo Documentation.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* *Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.
This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.

TUV Rheinland (Shenzhen) Co., Ltd. 1601 R&D Room, 1602-1604, 17-18F, Building 7 Site C, Vanke Cloud City Phase I, Xingke First Street, Xili Street, Xili Community, Nanshan District, Shenzhen 518052, P.R. China
Mail: info@bi.chn.tuv.com Web: http://www.chn.tuv.com

TEST REPORT
EN 14604
Smoke alarm devices

Report Number. ..... :	CN21RBZE 001
Date of issue ..... :	See cover page
Total number of pages ..... :	See cover page
Applicant's name ..... :	Ningbo Deling Electron Technology Company Limited
Address ..... :	No.8, Sanjiang Road, Wuxiang Industry Area, Yinzhou District, Ningbo, Zhejiang, China
Manufactory's name ..... :	Same as applicant
Address ..... :	Same as applicant
Factory's name ..... :	Same as applicant
Address ..... :	Same as applicant
Test specification:	
Standard ..... :	EN 14604:2005/AC:2008
Test procedure ..... :	TÜV Rheinland CE_CPR
Non-standard test method..... :	N/A
Test Report Form No. ..... :	EN14604_A
Test Report Form(s) Originator .... :	TÜV Rheinland
Master TRF ..... :	Dated 2016-03
Test item description ..... :	Photoelectric Smoke Detector
Trade Mark ..... :	Ningbo Deling Electron Technology Company Limited
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	SD-436, SD-435
Ratings ..... :	DC 3.0V

List of Attachments (including a total number of pages in each attachment):

1. Equipment list (1 page)
2. Photo documentation (4 pages)

Summary of testing:

Tests performed (name of test and test clause):

Clause(s)	Test(s)
5.2	Repeatability
5.3	Directional dependence
5.4	Initial sensitivity
5.5	Air movement
5.6	Dazzling
5.7	Dry heat
5.8	Cold (operational)
5.9	Damp heat (operational)
5.10	Sulphur dioxide (SO_2) corrosion
5.11	Impact
5.12	Vibration (operational)
5.13	Vibration (endurance)
5.14	Electrostatic discharge
	Radiated electromagnetic fields
5.15	Fire sensitivity
5.16	Battery fault warning
5.17	Sound output
5.18	Sounder durability
5.20	Alarm silence facility (optional)
5.21	Variation in supply voltage
5.24	Electrical safety

Testing location:

Anhui Product Quality Supervision&Inspection Research Institute

No. 13 Yan'an Road, Baohe Industrial Park, Hefei City, Anhui province, P.R. China

Copy of marking plate

Photoelectric Smoke Alarm
Model: SD-435
Power: 3.0V Battery
Alarm Sound: ≥85dB/3m
Test the alarm for correct operation using the test facility before using.

CE 21
1008
1008-CPR-MC XXXXXXXX 001

MFG: Ningbo Deling Electro Technology Company Limited
ADD: No.8, Sanjiang Road, Wuxiang Industry Area, Yinzhou District, Ningbo, Zhejiang, China
EN 14604:2005:AC2008
DOP NO:001-CPR-2014-07-03
MFG./REP.Date.202005/20300
SN: DL43620052400001
"WARNING — Battery not replaceable — See instruction manual" which shall be visible during normal use.

Photoelectric Smoke Alarm
Model: SD-436
Power: 3.0V Battery
Alarm Sound: ≥85dB/3m
Test the alarm for correct operation using the test facility before using.

CE 21
1008
1008-CPR-MC XXXXXXXX 001

MFG: Ningbo Deling Electro Technology Company Limited
ADD: No.8, Sanjiang Road, Wuxiang Industry Area, Yinzhou District, Ningbo, Zhejiang, China
EN 14604:2005:AC2008
DOP NO:001-CPR-2014-07-03
MFG./REP.Date.202005/20300
SN: DL43620052400001
"WARNING — Battery not replaceable — See instruction manual" which shall be visible during normal use.

Test item particulars ..... :	Photoelectric Smoke Alarm
Classification of installation and use ..... :	Class III
Supply Connection ..... :	Battery compartment
..... :	
Possible test case verdicts:	
- test case does not apply to the test object .....:	N/A
- test object does meet the requirement .....:	P (Pass)
- test object does not meet the requirement .....:	F (Fail)
Testing .....:	
Date of receipt of test item.....:	See cover page
Date (s) of performance of tests .....:	See cover page

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:

☐ **Yes**

☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) .....:	Ningbo Deling Electron Technology Company Limited No.8, Sanjiang Road, Wuxiang Industry Area, Yinzhou District, Ningbo, Zhejiang, China

General product information:

1. These products are photoelectric type smoke alarm devices.
2. Only enclosure appearance are different between SD-435, SD-436C the construction, critical components, smoke chamber, designed circuit, PCB layout, mounting base, critical components, and service life are all the same, see details in photo documentation as attachment.
3. Products are powered by replaceable battery, DC 3.0V providing with at least 10 years operating life.
4. Products are designed without silent function and interconnection function.
5. Products are intended to be installed in accordance with user manual to insure the appropriate performance.

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict

4	**General requirements**		**P**
4.1	**Compliance**		**P**
	The smoke alarm shall be verified by visual inspection or engineering assessment, shall be tested as described in Clause 5.		P
	For smoke alarms which a manufacturer claims are suitable for leisure accommodation vehicles, the tests in Annex L shall be applied.	Not suitable for leisure accommodation vehicles.	N/A
4.2	**Individual alarm indicator (optional)**		P
	Alarm indicators, if fitted, shall be red and shall be separate from the mains-on indicator.		P
4.3	**Mains-on indicator**	3.0Vdc Battery supplied.	N/A
	A smoke alarm intended to be connected to the AC mains shall be provided with a continuous mains on indicator to indicate energization of the unit. This indicator shall be colored green and shall be separate from any other indicators.		N/A
	If more than one light-emitting indicator is provided on the smoke alarm, the mains-on indicator shall be green, an alarm indicator shall be red, and a fault indicator shall be amber or yellow.		N/A
4.4	**Connection of external ancillary devices**		N/A
	The smoke alarm may provide for connections to external ancillary devices shall not prevent the correct operation of the smoke alarm when open- or short-circuit of these connections occur.		N/A
4.5	**Means of calibration**		**P**
	The manufacturer's means of calibration shall not be readily adjustable, on site, after manufacture.		P
4.6	**User replaceable components**		**P**
	Except for batteries or fuses, a smoke alarm shall have no user replaceable or serviceable components.	No Such component	P
4.7	**Normal power source**		**P**
	Internal or external to the smoke alarm housing.	Internal, 3.0Vdc Battery supplied.	P
	Where the power source is internal to the smoke alarm, the source shall meet the following requirements.		P
	Operating the smoke alarm for at least one year's life		P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	A distinctive audible fault signal shall be given before a battery is incapable of operating for alarm purposes.		P
	The smoke alarm shall be capable of producing an alarm signal for at least 4 min at the battery voltage at which a fault signal is normally obtained or 30 days of fault signal operation.		P
	The internal power source shall be replaceable by the user unless its operating life in the smoke alarm is 10 years or greater.	Replaceable battery	P
4.8	**Standby power source**	No standby power source used.	N/A
4.8.1	**General**		N/A
	For smoke alarms intended for connection to an external power supply, for which an integral backup/ standby power facility is provided, the following requirements shall apply:		N/A
	a) primary cell battery back-up power supply shall be capable of meeting the requirements of 4.15;		N/A
	b) rechargeable back-up power sources shall be capable of supplying the quiescent load of the smoke alarm for a minimum period of 72 h followed by an alarm signal as specified in 5.17 for at least 4 min in the event of fire, or in the absence of a fire, a fault warning for at least 24 h.		N/A
4.8.2	**Monitoring of back-up power source**		N/A
	The back-up power source shall be monitored by the smoke alarm for faults (low back-up, open circuit and short circuit).		N/A
4.9	**Electrical safety requirements**		P
	The apparatus shall be designed and constructed so as to present no danger, either in normal use or under fault conditions, as determined by the tests and requirements in 5.24.		P
4.10	**Routine test facility**		P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	A routine test facility shall be provided on all smoke alarms to simulate either mechanically or electrically the presence of smoke in the sensing assembly.		P
4.11	**Terminals for external conductors**	No such terminal used.	N/A
	If intended to have external connections, shall provide for the connection of conductors by means of screws, nuts or equally effective devices.		N/A
	For mains-powered smoke alarms which utilize a "flying lead"–type connector, the connector shall be regarded as a conductor. If terminals are provided, they shall allow the connection of conductors having nominal cross-sectional areas of 0.4 mm^2 – 1.5 mm^2.		N/A
	Flying lead type connectors shall be subjected to a pull test, such that when the connector is subjected to a pull of 20 N without jerks for 1 min in any direction allowed by the design, the connector does not become detached.		N/A
4.12	**Smoke alarm signals**		P
	In a smoke alarm which employs one or more non-fire alarm features the following operation shall be obtained:		P
	a) the smoke alarm fire alarm signal shall take precedence over any other signal even when such other signal is initiated first.		P
	b) distinctive signals shall be obtained between a smoke alarm's fire alarm and other non-fire alarm functions. Use of a common sounder is permitted if distinctive signals are obtained. If an audible fault signal is provided it shall be distinctive from all alarm signals but may be common to all functions employed.		P
4.13	**Battery removal indication**	Replaceable	P
	The removal of any user-replaceable battery used to power, or provide back-up power, for the smoke detection circuit/sounder, from a battery or mains powered d.c. backed smoke alarm, shall result in a visual, mechanical or audible warning that the battery has been removed. The visual warning shall not depend upon a power source.	A mechanical trigger will keep the battery compartment open once battery is removed.	P
4.14	**Battery connections**		P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	Lead or terminal connections to batteries shall be identified with the proper polarity (plus or minus). The polarity may be indicated on the unit adjacent to the battery terminals or leads.		P
	Any leads connecting the terminal connectors of batteries in smoke alarms to the smoke alarm circuit board shall be provided with strain relieving devices adjacent to both battery terminal connectors and the smoke alarm circuit board so that when the leads are subjected to a pull of 20 N without jerks for 1 min in any direction allowed by the design, the pull is not transmitted to the joints between the leads and the battery terminal connectors or between the leads and the smoke alarm circuit board.		P
4.15	**Battery capacity**		P
	The batteries supplied with or specified for use in smoke alarms shall be capable of supplying the quiescent load of the smoke alarm together with the additional load resulting from a routine weekly 10 s test, for at least 1 year before the battery fault warning is given. At the point when the battery fault warning commences, the batteries shall have sufficient capacity to give an alarm signal as specified in 5.17 for at least 4 min in the event of fire, or in the absence of fire a battery fault warning for at least 30 days.		P
	In the absence of suitable test procedures to verify battery capacity, data concerning the smoke alarm loads and the battery characteristics shall be used to indicate that the above requirement can be met.		P
4.16	**Protection against the ingress of foreign bodies**		P
	The smoke alarm shall be so designed that a sphere of diameter (1.3 ± 0.05) mm cannot pass into the sensor chamber(s).	The test finger does not pass into the sense chamber.	P
4.17	**Additional requirements for software controlled smoke alarms**		P
4.17.1	**General**		P
	For smoke alarms, which rely on software control in order to fulfil the requirements of this document, the requirements of 4.17.2, 4.17.3 and 4.17.4 shall be met.		P
4.17.2	**Software documentation**		P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
4.17.2.1	The documentation shall be in sufficient detail for the design to be inspected for compliance with this document and shall include at least the following:		P
	a) a functional description of the main program flow (e.g. as a flow diagram or structogram) including: 1) a brief description of the modules and the functions that they perform; 2) the way in which the modules interact; 3) the overall hierarchy of the program; 4) the way in which the software interacts with the hardware of the smoke alarms; 5) the way in which the modules are called, including any interrupt processing.		P
	b) a description of which areas of memory are used for the various purposes (e.g. the program, site specific data and running data);		P
	c) a designation, by which the software and its version can be uniquely identified.		P
4.17.2.2	The manufacturer shall have available detailed design documentation, which only needs to be provided if required by the testing authority. It shall comprise at least the following:		P
	a) an overview of the whole system configuration, including all software and hardware components;		P
	b) a description of each module of the program, containing at least: 1) the name of the module; 2) a description of the tasks performed; 3) a description of the interfaces, including the type of data transfer, the valid data range and the checking for valid data.		P
	c) full source code listings, as hard copy or in machine-readable form (e.g. ASCII-code), including all global and local variables, constants and labels used, and sufficient comment for the program flow to be recognized;		P
	d) details of any software tools used in the design and implementation phase (e.g. CASE-tools, compilers).		P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
4.17.3	**Software design**		P
	In order to ensure the reliability of the smoke alarm, the following requirements for software design shall apply:		P
	a) the software shall have a modular structure;		P
	b) the design of the interfaces for manually and automatically generated data shall not permit invalid data to cause errors in the program operation;		P
	c) the software shall be designed to avoid the occurrence of deadlock of the program flow.		P
4.17.4	**The storage of programs and data**		P
	The program necessary to comply with this document and any preset data, such as manufacturer's settings, shall be held in non-volatile memory.		P
	Site-specific data shall be held in memory which will retain data for at least two weeks without power from the mains or any replaceable battery, unless provision is made for the automatic renewal of such data, following loss of power, within 1 h of power being restored.		P
4.18	**Inter-connectable smoke alarms**	No such function	N/A
	If a means of connecting a number of smoke alarms to give a general alarm signal is provided the following shall apply (see 5.19).		N/A
	a) The audible alarm signal shall be emitted by all of the interconnecting smoke alarms when the smoke is detected by any one or more of them. If the smoke alarms are provided with an alarm silence facility, initiation of the alarm silence period of one of the smoke alarms shall not prevent the audible alarm signal being emitted by that smoke alarm when the smoke is detected by any of the other alarms.		N/A
	b) The interconnection of the maximum number of smoke alarms allowed by the manufacturer shall not have a significant effect on the sensitivity of the smoke alarms nor their ability to meet the battery capacity or sound output requirements (see 4.15 and 5.17).		N/A

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	c) For battery-operated smoke alarms, open or short-circuits of the interconnecting leads either shall not prevent the smoke alarms from functioning individually or shall result in an alarm condition or fault warning.		N/A
4.19	**Marking and data**		P
4.19.1	**Smoke alarm marking**	See labels on page 4.	P
	Each alarm shall be indelibly marked with the following:		P
	a) the number and date of this document, i.e. EN 14604:2005;		P
	b) the name or trade mark and address of the manufacturer or supplier;		P
	c) the date of manufacture, or the batch number;		P
	d) the manufacturer's recommended date for replacement, subject to normal, regular maintenance;		P
	e) smoke alarms incorporating user replaceable batteries: the type or numbers of batteries recommended by the manufacturer and an instruction to the user "Test the alarm for correct operation using the test facility, whenever the battery is replaced"; which shall be visible during the operation of changing the batteries;	See label and user manual.	P
	f) smoke alarms incorporating non-replaceable batteries: the warning "WARNING — Battery not replaceable — See instruction manual" which shall be visible during normal use.		P
	The marking cannot be removed when rubbed lightly with a piece of cloth soaked with petroleum spirit and then water.		N/A
4.19.2	**Packaging marking**		N/A
	The point-of-sale carton, in which a smoke alarm employing a radionuclide is packaged, shall be permanently marked on the exterior with the trefoil symbol, name of radionuclide, and activity.		N/A
4.19.3	**Data**	See user manual.	P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	Information supplied on or with smoke alarms shall include instructions on siting, installation and maintenance.		P
	The information provided with smoke alarms incorporating user-replaceable batteries shall include specific guidance on changing the batteries.		P
	For smoke alarms incorporating non-replaceable batteries, information shall be given on the action to be taken if a battery fault warning is emitted.		N/A
	Information for inter-connectable smoke alarms shall state the maximum number that may be interconnected. Details of suitable cables shall also be given.		N/A
	Information for smoke alarms intended for connection to mains supplies shall include a warning that draws attention to the hazards associated with mains voltages and recommends that the smoke alarm, together with any associated supply and interconnect wiring, be installed in accordance with appropriate national electrical installation regulations.		N/A
	If it is claimed that the smoke alarm is also suitable for use in leisure accommodation vehicles (LAVs) this shall be clearly stated in the information supplied on or with the smoke alarm.		N/A
5	**Tests**		P
5.1	**General**		P
5.1.1	**Atmospheric conditions for tests**		P
	The testing shall be carried out after the test specimen has been allowed to stabilize in the standard atmospheric conditions for testing as follows: a) temperature 15 °C to 35 °C; b) relative humidity 25 % to 75 %; c) air pressure 86 kPa to 106 kPa.		P
5.1.2	**Operating conditions for tests**		P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	If a test method requires a specimen to be operational, then the specimen shall be connected to, or provided with, a suitable power source with characteristics as required by the manufacturer's data. Unless otherwise specified in the test method, the power source parameters applied to the specimen shall be set within the manufacturer's specified range(s) and shall remain substantially constant throughout the tests. The value chosen for each parameter shall normally be the nominal value, or the mean of the specified range.		P
5.1.3	**Mounting arrangements**		P
	The specimen shall be mounted by its normal means of attachment in accordance with the manufacturer's instructions. If these instructions describe more than one method of mounting then the method considered to be most unfavourable shall be chosen for each test.		P
5.1.4	**Tolerances**		P
	If a specific tolerance or limit is not specified in a requirement or test procedure, a tolerance of ± 5 % shall be applied.		P
5.1.5	**Measurement of response threshold value**		P
	The specimen shall be installed in the smoke tunnel, described in Annex A, in its normal operating position, by its normal means of attachment.		P
	The air velocity in the proximity of the specimen shall be (0.2 ± 0.04) ms-1 during the measurement.		P
	The air temperature in the tunnel shall be (23 ± 5) °C and shall not vary by more than 5 °C for all the measurements on a particular smoke alarm type.		P
	The specimen shall be connected to its power source as described in 5.1.2, and shall be allowed to stabilize for at least 15 min, unless otherwise specified by the manufacturer.		P
5.1.6	**Provision for tests**		P
	The following shall be provided for testing compliance:		P
	a) 20 specimens;		P
	b) data required in 4.19.		P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.7	**Test schedule**		P
	The smoke alarms shall be numbered as specified in 5.4.2. The tests on each smoke alarm indicated in Table 1 shall be carried out in the order in which they are listed.		P
5.2	**Repeatability**		P
5.2.1	**Object**		P
	To show that the smoke alarm has stable behavior with respect to its sensitivity even after a number of alarm conditions.		P
5.2.2	**Test procedure**		P
	The response threshold value of the specimen to be tested shall be measured as described in 5.1.5 six times with same direction of air flow.	See appended table	P
	The maximum response threshold value shall be designated y_{max} or m_{max}, the minimum value shall be designated y_{min} or m_{min}.		P
5.2.3	**Requirements**		P
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall be not greater than 1.6.		P
	The lower response threshold value y_{min} shall be not less than 0.2 or m_{min} shall be not less than 0.05 dB m^{-1}.		P
5.3	**Directional dependence**		P
5.3.1	**Object**		P
	To show that the sensitivity of the smoke alarm is not unduly dependent on the direction of airflow around the smoke alarm.		P
5.3.2	**Test procedure**		P
	The response threshold value of the specimen to be tested shall be measured eight times as described in 5.1.5 with the specimen being rotated 45° about its vertical axis between each measurement, so that the measurements are taken for eight different orientations relative to the direction of air flow.	See appended table	P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	The maximum response threshold value shall be designated y_{max} or m_{max}, the minimum value shall be designated y_{min} or m_{min}.		P
5.3.3	**Requirements**		P
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6.		P
	The lower response threshold value y_{min} shall not be less than 0.2 or m_{min} shall not be less than 0.05 dB m^{-1}.		P
5.4	**Initial sensitivity**		P
5.4.1	**Object**		P
	To establish the sensitivity of each smoke alarm prior to testing. This will be used as a baseline for the following tests.		P
5.4.2	**Test procedure**		P
	Measure the response threshold value of the specimens as described in 5.1.5. Number the smoke alarms in order of sensitivity, number 1 having the lowest response threshold and number 20 the highest response threshold.	See appended table	P
	The maximum response threshold value shall be designated y_{max} or m_{max} and the minimum value shall be designated y_{min} or m_{min}. The mean of these response threshold values shall be calculated and shall be designated as y or m.		P
5.4.3	**Requirements**		P
	The following relationships shall hold y_{max}:y or m_{max}:m_{av} ≤ 1.33 and y:y_{min} or m:m_{min} ≤ 1.5.		P
5.5	**Air movement**		P
5.5.1	**Object**		P
	To show that the sensitivity of the smoke alarm is not unduly affected by the rate of the air flow, and that it is not unduly prone to false alarms in draughts or in short gusts.		P
5.5.2	**Test procedure**		P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	The response threshold value of the specimen to be tested is measured as described in 5.1.5 in the most and least sensitive orientations, and shall be appropriately designated $y_{(0.2)max}$ and $y_{(0.2)min}$ or $m_{(0.2)max}$ and $m_{(0.2)min}$.	See appended table	P
	These measurements shall then be repeated but with an air velocity in the proximity of the smoke alarm of (1 ± 0.2) ms^{-1}. The response threshold values in these tests shall be designated $y_{(1.0)max}$ and $y_{(1.0)min}$ or $m_{(1.0)max}$ and $m_{(1.0)min}$.		P
	For ionization chamber alarms only, the specimen to be tested shall then be subjected, in its most sensitive orientation, to an aerosol-free air flow at a velocity of (5 ± 0.5) ms^{-1} for a period of 5 min.		N/A
5.5.3	**Requirements**		P
	One of the following relationship shall hold: a) $0{,}625 \leqslant \frac{y_{(0,2)max.} + y_{(0,2)min.}}{y_{(1,0)max.} + y_{(1,0)min.}} \leqslant 1{,}6$ or b) $0{,}625 \leqslant \frac{m_{(0,2)max.} + m_{(0,2)min.}}{m_{(1,0)max.} + m_{(1,0)min.}} \leqslant 1{,}6$		P
	The alarm shall emit neither a fault signal nor an alarm signal during the test with aerosol free air.		P
5.6	**Dazzling**		P
5.6.1	**Object**		P
	To show that the sensitivity of the smoke alarm is not unduly influenced by the close proximity of artificial light sources. This test is only applied to smoke alarms using scattered light or transmitted light as ionization chamber smoke alarms are considered unlikely to be influenced.		P
5.6.2	**Test procedure**		P
	The response threshold value is measured as described in 5.1.5.	See appended table	P
	The four lamps are switched simultaneously ON for 10 s and then OFF for 10 s, ten times.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Then switched ON again and after at least 1 min the response threshold value is measured as described in 5.1.5, with the lamps ON		P
5.6.3	**Requirements**		P
	During the periods when the switching sequences are being conducted and when the lamps are all on for at least 1 min, the specimen shall emit neither an alarm nor fault signal.		P
	For each orientation, the ratio of the response threshold m_{max}:m_{min} shall not be greater than 1.6.		P
5.7	**Dry heat**		P
5.7.1	**Object**		P
	To demonstrate the ability of the smoke alarm to function correctly at high ambient temperatures, which may occur for short periods in the service environment.		P
5.7.2	**Test procedure**		P
	Installed in the smoke tunnel described in Annex A, air temperature 23 ± 5 °C, connected to its power source as described in 5.1.2.	See appended table	P
	The air temperature in the tunnel shall then be increased to (55 ± 2) °C, at a rate not exceeding 1 °C min^{-1}, and maintained at this temperature for 2 h.	55 °C, 2 h.	P
	The response threshold value shall then be measured as described in 5.1.5 but with the temperature at (55 ± 2) °C.	55 °C	P
5.7.3	**Requirements**		P
	No alarm or fault signals during test		P
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6.		P
5.8	**Cold (operational)**		P
5.8.1	**Object**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	To demonstrate the ability of the smoke alarm to function correctly at low ambient temperatures, which may occur for short periods in the service environment.		P
5.8.2	**Test procedure**		P
	Installed in the smoke tunnel described in Annex A, air temperature 23 ± 5 °C, connected to its power source as described in 5.1.2.	See appended table	P
	The air temperature in the tunnel shall then be decreased to (0 ± 2) °C, at a rate not exceeding 1 °Cmin^{-1}, and maintained at this temperature for 2 h.	0 °C, 2 h.	P
	The response threshold value shall then be measured as described in 5.1.5 but with the temperature at (0 ± 2) °C.	0 °C	P
5.8.3	**Requirements**		P
	No alarm or fault signals during test		P
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6.		P
5.9	**Damp heat (operational)**		P
5.9.1	**Object**		P
	To demonstrate the ability of the smoke alarm to function correctly after exposure to high relative humidity (without condensation) and temperature, which may occur for short periods in the service environment.		P
5.9.2	**Test procedure**		P
	The specimen to be tested shall be exposed to an initial air temperature of (40 ± 2) °C, and a relative humidity of less than 45 %.	See appended table	P
	After 2 h, the relative humidity is to be increased to (93 ± 3) % over a period of 1 h. This temperature and humidity shall be maintained for a period of 4 days.	93 % R.H., 4 days	P
5.9.3	**Requirements**		P
	No alarm or fault signals during test		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6.		P
5.10	**Sulphur dioxide (SO_2) corrosion**		P
5.10.1	**Object**		P
	To demonstrate the ability of the smoke alarm to withstand the corrosive effects of sulphur dioxide as an atmospheric pollutant.		P
5.10.2	**Test procedure**		P
5.10.2.1	**Reference**		P
	The test apparatus and procedure shall be as described in EN 60068-2-42:2003, except that the conditioning shall be as described below.		P
5.10.2.2	**State of the specimen during conditioning**		P
	The specimen shall be mounted as described in 5.1.3. It shall not be supplied with power during the conditioning, but it shall have untinned copper wires, of the appropriate diameter, connected to sufficient terminals to allow the final measurement to be made, without making further connections to the specimen.		P
5.10.2.3	**Conditioning**		P
	The following conditioning shall be applied: Temperature (25 ± 2) °C; Relative humidity (93 ± 3) %; SO_2 concentration (25 ± 5) ppm (by volume) Duration 4 days.	25 °C; 93 %; 25 ppm; 4 days.	P
5.10.2.4	**Final measurements**		P
	Immediately after the conditioning, the specimen shall be subjected to a drying period of 16 h at 40 °C, ≤ 50 % RH, followed by a recovery period of 1 h to 2 h at the standard laboratory conditions. After this recovery period, the response threshold value shall be measured as described in 5.1.5.	40 °C; 40 %; 16 h.	P
5.10.3	**Requirements**		P
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6.		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.11	**Impact**		P
5.11.1	**Object**		P
	To demonstrate the immunity of the smoke alarm to mechanical impacts upon its surface, which it may sustain in the normal shipping, installation and service environment, and which it can reasonably be expected to withstand.		P
5.11.2	**Test procedure**		P
5.11.2.1	**Apparatus**		P
	The test apparatus shall consist of a swinging hammer incorporating a rectangular-section aluminium alloy head (aluminium alloy AlCu4SiMg complying with EN 573-4, solution treated and precipitation treated condition) with the plane impact face chamfered to an angle of 60° to the horizontal, when in the striking position (i.e. when the hammer shaft is vertical). The hammer head shall be (50 ± 2.5) mm high, (76 ± 3.8) mm wide and (80 ± 4) mm long at mid height as shown in Figure E.1. A suitable apparatus is described in Annex E.	See appended table	P
5.11.2.2	**State of the specimen during conditioning**		P
	The specimen shall be rigidly mounted to the apparatus by its normal mounting means and shall be positioned so that it is struck by the upper half of the impact face when the hammer is in the vertical position.		P
	The specimen shall be connected to its power source as described in 5.1.2.		P
5.11.2.3	**Conditioning**		P
	The following conditioning shall be applied: Impact energy (1.9 ± 0.1) J; Hammer velocity (1.5 ± 0.13) ms^{-1}; Number of impacts 1.	1.9 J; 1.5 $ms^{-1;}$	P
5.11.2.4	**Measurements during conditioning**		P
	The specimen shall be monitored during the conditioning and for a further 2 min after the impact to detect any alarm or fault signals.		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.11.2.5	**Final measurements**		P
	After the conditioning the response threshold value shall be measured as described in 5.1.5.		P
5.11.3	**Requirements**		P
	No alarm or fault signals shall be given during the conditioning or the additional 2 min.		P
	The impact shall not detach the alarm from its base, or the base from the mounting. The cover of the smoke alarm shall not unscrew or open.		P
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6.		P
5.12	**Vibration (operational)**		P
5.12.1	**Object**		P
	To demonstrate the immunity of the smoke alarm to vibration at levels considered appropriate to the normal service environment.		P
5.12.2	**Test procedure**		P
5.12.2.1	**Reference**		P
	The test apparatus and procedure shall be as described in EN 60068-2-6:1995 and as described below.		P
5.12.2.2	**State of the specimen during conditioning**		P
	The specimen shall be mounted on a rigid fixture as described in 5.1.3 and shall be connected to its power source as described in 5.1.2.		P
	The vibration shall be applied in each of three mutually perpendicular axes, in turn. The specimen shall be mounted so that one of the three axes is perpendicular to its normal mounting plane.		P
5.12.2.3	**Conditioning**		P
	The following conditioning shall be applied: Frequency range (10 to 150) Hz; Acceleration amplitude 5 m s^{-2} (≈ 0.5 g_n); Number of axes 3; Sweep rate 1 octave min^{-1}; Number of sweep cycles 1 per axis.	See appended table	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.12.2.4	**Measurements during conditioning**		P
	The specimen shall be monitored during the conditioning period to detect any alarm or fault signals.		P
5.12.2.5	**Final measurements**		P
	After the conditioning the specimen is to be inspected visually for mechanical damage both internally and externally. The response threshold value shall be measured as described in 5.1.5.		P
5.12.3	**Requirements**		P
	No alarm or fault signals shall be given during the conditioning. No mechanical damage, either internally or externally, shall result. The lid of the smoke alarm shall not unscrew or open.		P
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6.		P
5.13	**Vibration (endurance)**		P
5.13.1	**Object**		P
	To demonstrate the ability of the smoke alarm to withstand the long term effects of vibration at levels appropriate to the shipping, installation and service environment.		P
5.13.2	**Reference**		P
	The test apparatus and procedure shall be as described in EN 60068-2-6:1995 and as described below.		P
5.13.2.1	**State of the specimen during conditioning**		P
	The specimen shall be mounted on a rigid fixture as described in 5.1.3, but shall not be supplied with power during conditioning.	See appended table	P
	The vibration shall be applied in each of three mutually perpendicular axes, in turn. The specimen shall be mounted so that one of the three axes is perpendicular to its normal mounting axis.		P
5.13.2.2	**Conditioning**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The following conditioning shall be applied: Frequency range (10 to 150) Hz; Acceleration amplitude 10 m s^{-2} (1,0 g_n); Number of axes 3; Sweep rate 1 octave min^{-1}; Number of sweep cycles 20 per axis.		P
5.13.2.3	**Final measurements**		P
	The response threshold value shall be measured as described in 5.1.5		P
5.13.3	**Requirements**		P
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6.		P
5.14	**Electromagnetic Compatibility (EMC), immunity tests (operational)**		P
	The following EMC immunity tests shall be carried out, as described in EN 50130-4:1995:	See appended table	P
	a) mains supply voltage dips and short interruptions;		N/A
	b) electrostatic discharge;		P
	c) radiated electromagnetic fields;		P
	d) conducted disturbances induced by electromagnetic fields;		N/A
	e) fast transient bursts;		N/A
	f) slow high-energy voltage surges.		N/A
	The required operating condition shall be as described in 5.1.2.		P
	For these tests the criteria for compliance specified in EN 50130-4:1995 and the following shall apply.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	1) The functional test, called for in the initial and final measurements, shall be as follows: - the response threshold value shall be measured as described in 5.1.5. - the greater of the response threshold value measured in this test and that measured for the same specimen in the initial sensitivity test shall be designated y_{max} or m_{max}, and the lesser shall be designated y_{min} or m_{min}.		P
	2) The acceptance criteria for the functional test after the conditioning shall be as follows: -the ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6.	See appended table	P
5.15	**Fire sensitivity**		P
5.15.1	**Object**		P
	To demonstrate the ability of the smoke alarm to respond to a broad spectrum of smoke types as required for general application in fire detection systems for residences.	See appended table	P
5.15.2	**Test procedure**		P
5.15.2.1	**General**		P
	The fire sensitivity tests shall be conducted in a room as shown in Annex F.		P
	The specimens shall be subjected to the four test fires TF2 to TF5. The type, quantity and arrangement of the fuel and the method of combustion are described in Annexes G to J, for each test fire, along with the end of test condition and the required profile curve limits.		P
	In order to be a valid test fire, the development of the fire shall be such that the profile curves of m against y, and m against time, fall within the specified limits, up to the time when all of the specimens have generated an alarm signal, or the end of test condition is reached, whichever is the earlier.		P
	If these conditions are not met then the test is invalid and shall be repeated. It is permissible, and may be necessary, to adjust the quantity and arrangement of the fuel to obtain valid test fires.		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.15.2.2	**Mounting of the specimens**	ceiling mounting	P
	For smoke alarms intended for wall mounting only, the four specimens shall be mounted within 0.5 m of the middle of the long walls as shown in Annex F with specimens 18 and 19 at the least distance below the ceiling, and specimens 17 and 20 at the greatest distance below the ceiling, consistent with the manufacturer's instructions.		P
	For smoke alarms intended for either ceiling or wall mounting, specimens 17 and 18 shall be mounted on the ceiling within the designated area and specimens 19 and 20 shall be mounted on the walls as described above.		N/A
	Each specimen shall be connected to its power source as described in 5.1.2, and shall be allowed to stabilize in its quiescent condition before the start of each test fire.		P
5.15.2.3	**Initial conditions**		P
	Before each test fire the room shall be ventilated with clean air until it is free from smoke, and so that the conditions listed below can be obtained.		P
	The ventilation system shall then be switched off and all doors, windows and other openings shall be closed. The air in the room shall then be allowed to stabilize, and the following conditions shall be obtained before the test is started: Temperature T = (23 ± 5) °C ; Air movement: negligible y = 0.05; m = 0.02 dB m^{-1}.		P
5.15.2.4	**Recording of the fire parameters and response values**		P
	During each test fire the fire parameters shown in Table 2 shall be recorded against the time from the start of the test. Each parameter shall be recorded continuously or at least once per second.		P
	The alarm signal given by the specimen shall be taken as the indication that an alarm has responded to the test fire.		P
5.15.3	**Requirements**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	All four specimens shall generate an alarm signal, in each test fire, before the specified end of test condition is reached.		P
5.16	**Battery fault warning**		P
5.16.1	**Object**		P
	To demonstrate that a smoke alarm will give an audible fault warning before an increase in the internal resistance or decrease in the terminal voltage of the battery prevents correct operation.		P
5.16.2	**Test procedure**		P
5.16.2.1	Connect the alarm as shown in Figure 1 and apply the tests described in 5.16.2.2 to 5.16.2.5.	See appended table	P
5.16.2.2	With the series resistor R set to zero and the supply voltage V set to the rated battery voltage V_R, measure the response threshold of the alarm in accordance with 5.1.5.		P
5.16.2.3	With the series resistor R set to zero, decrease the supply voltage V in stages of 0.1 volts at intervals of at least 1 min, until the fault warning is given. Record the supply voltage at which the fault warning is given as V_E and measure the response threshold of the alarm in accordance with 5.1.5.		P
5.16.2.4	With the supply voltage V set at V_R, increase the resistance of the series resistor R from zero in increments of 1 Ω at intervals of at least 1 min until the fault warning is given. Record the resistance of the series resistor at which the fault warning is given as R_A and measure the response threshold of the alarm in accordance with 5.1.5.		P
5.16.2.5	Repeat the procedure described in 5.16.2.4 with the supply voltage V set at 0.75 (V_R –V_E) + V_E, 0.5 (V_R – V_E) + V_E, and 0.25 (V_R – V_E) + V_E in turn, and record the resistances of the series resistor at which the fault warning is given as R_B, R_C and R_D, respectively.		P
5.16.3	**Requirements**		P
	The ratio of the response thresholds measured in 5.16.2.3, 5.16.2.4 or 5.16.2.5 to the response threshold measured in 5.16.2.2 shall be not less than 0.625 and not greater than 1.6.	See appended table	P
5.17	**Sound output**		P
5.17.1	**Object**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	To demonstrate that the smoke alarm is capable of providing an adequate sound output.		P
5.17.2	**Method of test**		P
	At least two samples shall be tested.		P
	Units intended additionally for multiple-station interconnection shall be tested in that configuration with the maximum line resistance and maximum number of networked alarms, and the sound output measured on the smoke alarm subject to an abnormal smoke condition.		P
	Battery powered (or equivalent) smoke alarms shall be tested with the battery depleted to a point just above or at the battery fault warning level.		P
	The smoke alarm shall be mounted on a mounting board as described in EN 54-3. The sound level shall be measured 3 m from the smoke alarm either directly in front of the smoke alarm or at an angle specified by the manufacturer within 45° of this.		P
	A sound level meter conforming to EN 61672-1:2003, class 2 or better shall be used.		P
	The measurement shall be made in a free field condition to minimize the effects of reflected sound energy. The ambient noise level shall be at least 10 dB (A) below the measured level produced by the alarm.		P
5.17.3	**Requirements**	See appended table	P
	For battery operated alarms, the sound output shall be at least 85 dB(A) at 3 m after 1 min of alarm operation and at least 82 dB(A) after 4 min of alarm operation.		P
	For mains powered alarms, the sound output shall be at least 85 dB(A) at 3 m after 4 min of alarm operation.		P
	For both battery operated and main powered alarms, the maximum sound output shall be 110 dB(A) at 3 m after 1 min of alarm operation.		P
	The maximum nominal frequency shall not exceed 3.5 kHz.		P
5.18	**Sounder durability**		P
5.18.1	**Object**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	To demonstrate the ability of the smoke alarm's sounder to operate as intended after prolonged operation.		P
5.18.2	**Test procedure**		P
	Connect the specimen to its power source as described in 5.1.2. Battery operated smoke alarms shall use a stabilized supply adjusted to the specified voltage.	See appended table	P
	Operate the specimen for 8 h of alternate 5-minute periods of energization and de-energization in the standby and alarm conditions.		P
	After the conditioning, the sound output of the smoke alarm shall be measured as specified in 5.17.		P
5.18.3	**Requirements**		P
	The specimen shall meet the sound output requirements as specified in 5.17.	See appended table	P
5.19	**Inter-connectable smoke alarms**		N/A
5.19.1	**Object**		N/A
	To demonstrate correct functioning of inter-connectable smoke alarms.		N/A
5.19.2	**Test procedure**		N/A
5.19.2.1	Connect the alarm under test with the maximum number of smoke alarms allowed in the manufacturer's instructions (see 4.19).		N/A
5.19.2.2	With the smoke alarms interconnected in accordance with 5.19.2.1, measure the response threshold of the alarm under test in accordance with 5.1.5.		N/A
5.19.2.3	For battery-operated smoke alarms repeat the test in 5.19.2.2 with the interconnecting leads short circuited.		N/A
5.19.2.4	With smoke alarms interconnected in accordance with 5.19.2.1, repeat the sound output test in 5.17 on one of the smoke alarms. During this test ensure that the other interconnected smoke alarms are sufficiently screened or distanced so that their audible alarm signals do not influence the measurement.		N/A
5.19.2.5	For battery-operated smoke alarms repeat the test in 5.19.2.4 with interconnecting leads short-circuited.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.19.2.6	Reassess the battery capacity requirements taking into account the load introduced by interconnecting the maximum permitted number of smoke alarms.		N/A
5.19.3	**Requirements**		N/A
5.19.3.1	All the interconnected smoke alarms shall give an audible alarm signal within 1 min when tested in accordance with 5.19.2.1.		N/A
5.19.3.2	The ratio(s) of the response thresholds measured in accordance with 5.19.2.2 and, for battery operated smoke alarms the response thresholds measured in accordance with 5.19.2.3, to the response threshold measured for the same specimen in accordance with 5.4 shall be between 0.625 and 1.6.		N/A
5.19.3.3	The sound output shall be at least 85 dB(A) when measured in accordance with 5.19.2.4 and, for battery-operated smoke alarms, when measured in accordance with 5.19.2.5.		N/A
5.19.3.4	The assessment in 5.19.2.6 shall indicate that the battery capacity requirements specified in 4.15 can still be met.		N/A
5.20	**Alarm silence facility (optional)**	No such function	N/A
5.20.1	**Object**		N/A
	If means of temporarily disabling or desensitising a smoke alarm are provided the following shall apply.		N/A
	a) The initiation of the alarm silence period shall require the operation of a manual control on the smoke alarm.		N/A
	b) Operation of the alarm silence control shall desensitize the smoke alarm for at least 5 min. The sensitivity of the smoke alarm shall be restored within 15 min of operation of the alarm silence control. If the alarm silence period is adjustable it shall not be possible to set it to less than 5 min or to more than 15 min.		N/A
	c) Continuous operation of the alarm silence control shall not lead to the smoke alarm being desensitised for more than 15 min without an audible warning being given.		N/A
5.20.2	**Test requirement**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.20.2.1	Generate smoke in accordance with 5.1.5, in the smoke tunnel specified in Annex A, with an air velocity of (0.2 ± 0,04) m s^{-1} and an air temperature of (22 ± 5) °C, but increase the smoke density to three times the response threshold recorded for alarm number 16 (m_{16} or y_{16}), when tested in accordance with 5.3.2. Using alarm number 16, with a supply voltage corresponding to that of a new battery, operate the alarm silence control, immediately insert the alarm into the smoke-filled smoke tunnel and maintain the smoke density between three and four times m_{16} or y_{16} for at least 15 min.		
5.20.2.2	Repeat the test in 5.20.2.1 but with a supply voltage of V_E, as determined in 5.16.2.3.		N/A
5.20.2.3	With the supply voltage corresponding to that of a new battery, put alarm number 16 into the alarm silence condition by the operation of the alarm silence control. Measure the response threshold as described in 5.1.5 but with the smoke generation commencing (15 ±0.25) min after the operation of the alarm silence control.		N/A
5.20.2.4	Repeat the test described in 5.20.2.3 but with a supply voltage of V_E, as determined in 5.16.2.3.		N/A
5.20.2.5	Repeat the test in 5.20.2.3 but, after operating the alarm silence control, hold the control on continuously for the remainder of the test.		N/A
5.20.3	**Requirements**		N/A
5.20.3.1	When tested in accordance with 5.20.2.1 and 5.20.2.2, the alarm shall not emit an alarm signal during the first 5 min after the alarm silence control is operated.		N/A
5.20.3.2	The ratio of the response thresholds measured in accordance with 5.20.2.3 and 5.20.2.4 to the response threshold recorded for alarm number 16 when tested in accordance with 5.4 shall be not less than 0.625 and not greater than 1.6.		N/A
5.20.3.3	When tested in accordance with 5.20.2.5 either:		N/A
	a) within 15 min of the initial operation of the alarm silence control the alarm shall emit an audible signal (alarm or battery fault warning) for as long as the control is held on; or	Not emit an audible signal	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) the ratio of the response threshold measured during the test to the response threshold recorded for the same alarm when tested in accordance with 5.4 shall be not less than 0.625 and not greater than 1.6.		N/A
5.21	**Variation in supply voltage**		P
5.21.1	**Object**		P
	To show that, within the specified range(s) of the supply voltage, the sensitivity of the smoke alarm is not unduly dependent on these parameters.		P
5.21.2	**Test procedure**		P
	The response threshold value of the specimen to be tested shall be measured as described in 5.1.5, under the extremes of the specified supply conditions (e.g. maximum and minimum voltage).	See appended table	P
	For self-contained smoke alarms intended for operation from mains supplies, the alarm shall be tested with supply voltages of 0.85 times the lower limit and 1.1 times the upper limit of the nominal supply voltage range specified in the manufacturer's requirements.		N/A
	If the smoke alarm is provided with a rechargeable battery, sufficient time shall be allowed for the battery voltage to stabilize before the response threshold is measured.	Non rechargeable battery.	N/A
	For self-contained battery operated smoke alarms, the tests shall be carried out with a supply voltage corresponding to that of a new battery, and also at the fault voltage (VE) as determined in 5.16.2.3. A smoke alarm with a standby battery (or equivalent) is also to be tested but with the primary supply disconnected.	V_E = 2.7V	P
	For smoke alarms intended to operate from any external supply other than mains, the manufacturer shall specify a maximum and minimum voltage. Tests shall be conducted at the maximum and minimum voltage.	No external supply.	N/A
5.21.3	**Requirements**		P
	The ratio of the response threshold values y_{max}: y_{min} or m_{max}:m_{min} shall not be greater than 1.6.		P
	The lower response threshold value y_{min} shall not be less than 0.2 or m_{min} shall not be less than 0.05 dB m^{-1}.		P
5.22	**Battery reversal**		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.22.1	**Object**		P
	To demonstrate the ability of the smoke alarm to function properly after being misconnected with respect to polarity.		P
5.22.2	**Test procedure**		P
	Any user-replaceable batteries shall be fitted with reversed polarity for 10 s to 15 s, if it is possible to establish the reversed connection with the intended battery type, without causing mechanical damage to the smoke alarm.		P
	Following the reverse polarity conditioning, the specimen shall be connected to its power source as described in 5.1.2 and its response threshold value measured as in 5.1.5.		P
	Apply a voltage to the alarm of V_E as determined in 5.16.2 minus 5 %.		P
	Of the two response threshold values for the specimen in this test and the initial sensitivity test, the greater shall be designated y_{max} or m_{max} and the lesser y_{min} or m_{min}.		P
5.22.3	**Requirements**		P
	The ratio of the response threshold values y_{max}:y_{min} or m_{max}:m_{min} shall not be greater than 1.6. When voltage V_E minus 5 % is applied, the battery fault warning shall be given.	See appended table	P
5.23	**Back-up power source**	None back-up power source	N/A
5.23.1	**Object**		N/A
	To demonstrate that the back-up power source is correctly monitored.		N/A
5.23.2	**Test procedure**		N/A
5.23.2.1	**Low back-up**		N/A
	The test procedure set out in 5.16 shall be used to simulate the depletion of the back-up power source to the point where a low back-up warning is given.		N/A
5.23.2.2	**Open circuit**		N/A
	The back-up power supply shall be disconnected or removed as appropriate and mains power applied to the unit.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.23.2.3	**Short-circuit**		N/A
	The back-up power supply shall be disconnected and replaced with a short-circuit between the backup terminals and the mains power applied to the unit.		N/A
5.23.3	**Requirements**		N/A
	When tested as described in 5.23.2.1, a low back-up signal shall be obtained both with mains power to the unit and without mains power to the unit.		N/A
	When tested as described in 5.23.2.2, the smoke alarm shall give an audible warning.		N/A
	When tested as described in 5.23.2.3, the smoke alarm shall give an audible warning.		N/A
5.24	**Electrical safety**		P
5.24.1	**Marking**	See Annex EN 60065	P
	The apparatus shall be marked in accordance with EN 60065:2002, Clause 5.		P
	For class I apparatus, the following information shall be given close to the mains input terminals: **"WARNING — THIS APPARATUS MUST BE EARTHED"**	Class III apparatus.	N/A
	If live parts are made accessible when a cover is removed or opened, a warning shall be displayed which is visible before the cover is removed or opened.		N/A
5.24.2	**Heating under normal operating conditions**	See Annex	P
	The apparatus shall conform to the requirements of EN 60065:2002, Clause 7.		P
5.24.3	**Shock hazard under normal operating conditions**	See Annex	N/A
	The apparatus shall conform to the requirements of EN 60065:2002, Clauses 8 and 9 when mounted in any orientation on a vertical surface and when mounted on the underside of a horizontal surface.	No hazard live parts inside EUT.	N/A
5.24.4	**Insulation requirements**	See Annex	N/A
	Supply > 34 V (peak or d.c.), shall conform to the requirements of EN 60065:2002, except clause 10.1	No hazard live parts inside EUT.	N/A
5.24.5	**Fault conditions**	See Annex	P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	The apparatus shall conform to the requirements of EN 60065:2002, Clause 11.	No hazard live parts inside EUT.	P
5.24.6	**Mechanical strength**	See Annex	N/A
	The apparatus shall conform to the requirements of EN 60065:2002, Clause 12 disregarding 12.1.1 of that standard.		N/A
5.24.7	**Clearances and creepage distances**	See Annex	N/A
	The apparatus shall conform to the requirements of EN 60065:2002, Clause 13.	No hazard live parts inside EUT.	N/A
5.24.8	**Components**	See Annex	P
	Resistors, capacitors, inductors and transformers, the short-circuiting or disconnecting of which would cause an infringement of the requirements for operation under fault conditions, in respect of overheating, fire or shock hazard, shall conform to the relevant requirements of EN 60065:2002, Clause 14.		P
	Protective devices, switches, safety interlocks, voltage setting devices and the housing arrangements for batteries shall conform to the relevant requirements of EN 60065:2002, Clause 14.		P
	The power, voltage and current ratings, as appropriate, of all components shall be suitable for the application in which they are used.		P
	Conformity shall be checked by circuit measurement, analysis of the circuit design, measurements on the components in question and by inspection, as appropriate.		P
5.24.9	**Protection against the start and spread of fire**	See Annex	P
	The apparatus shall conform to the requirements of EN 60065:2002, Clause 20.		P
5.24.10	**Parts connected to the supply mains**	No connected to mains.	N/A
	The apparatus shall comply with the requirements of Clause 13 of EN 60065:2002.		N/A
5.24.11	**Wiring connections**		N/A
	The apparatus shall comply with the requirements of 3.1, 3.2, 3.3 and 3.4 of EN 60950-1:2001.		N/A
	In these sub-clauses, reference to 2.9 and 5.1 shall be read as references to 9.3.5 and Clause 7 respectively of EN 60065:2002.		N/A
5.24.12	**Resistance to the effects of heat and fire**	See Annex	P

EN 14604			
Clause	Requirement + Test	Result - Remark	Verdict
	The apparatus shall comply with the requirements of EN 60950-1:2001, 4.7, 4.7.1, 4.7.2, and 4.7.3		P

TABLE 5.2	Repeatability						P
	Mes. ☒m(dB/m) ☐ y	a	b	c	d	e	f
	Sample No. 5#	0.106	0.113	0.105	0.121	0.117	0.116
		☐max. ☒min.	☐max. ☐min.	☐max. ☐min.	☒max. ☐min.	☐max. ☐min.	☐max. ☐min.
	Result	☒ m_{min} = (0.105)dB/m; m_{max} = (0.121)dB/m; m_{max} / m_{min} = (1.15) ☐ y_{min} = ( ); y_{max} / y_{min} = ( )					
	Observation	☒ Pass (m_{min} > 0.05 dB/m or y_{min} > 0.02 and m_{max} / m_{min} < 1.6 or y_{max} / y_{min} < 1.6) ☐ Fail					

TABLE 5.3	Directional dependence								P
	Orient. (°)	0	45	90	135	180	225	270	315
	Sample No. 7#	0.117	0.108	0.106	0.113	0.131	0.113	0.109	0.123
		☒max. ☐min.	☐max. ☐min.	☐max. ☐min.	☐max. ☐min.	☐max. ☐min.	☐max. ☐min.	☐max. ☒min.	☐max. ☐min.
	Result	☒ m_{min} = (0.106)dB/m; m_{max} = (0.131)dB/m; m_{max} / m_{min} = (1.24) ☐ y_{min} = ( ); y_{max} / y_{min} = ( )							
	Observation	☒ Pass (m_{min} > 0.05 dB/m or y_{min} > 0.02 and m_{max} / m_{min} < 1.6 or y_{max} / y_{min} < 1.6) ☐ Fail							

TABLE 5.4	Initial sensitivity									P
	Sample No.	1 lowest	2	3	4	5	6	7	8	9	10
	☒m(dB/m) ☐ y	0.095	0.098	0.105	0.106	0.109	0.110	0.111	0.112	0.113	0.113
	Sample No.	11	12	13	14	15	16	17	18	19	20 highest

	☒m(dB/m) ☐ y	0.115	0.116	0.117	0.118	0.121	0.122	0.123	0.128	0.131	0.136
	Result	☒$m_{av.}$ = (0.115); m_{max} / $m_{av.}$= (1.18) ; m_{av} / m_{min}= (1.21) ☐y_{av} = ( ); y_{max} / $m_{av.}$= ( ) ; m_{av} / y_{min}= ( )									
	Observation	☒ Pass (m_{min} > 0.05 dB/m or y_{min} > 0.02 and m_{max} / m_{av} ≤ 1.33 or m_{av} / m_{min} ≤ 1.5) ☐ Fail									

TABLE 5.5	**Air movement**				**P**
Sample No. 10	**Most sensitive orientations:** (135)°		**Least sensitive orientations:** (180)°		—
	$m_{min\ (0.2)}$ or $y_{min\ (0.2)}$	$m_{min\ (0.2)}$ = 0.105	$m_{max\ (0.2)}$ or $y_{max\ (0.2)}$	$m_{max\ (0.2)}$ = 0.112	—
	$m_{min\ (1.0)}$ or $y_{min\ (1.0)}$	$m_{min\ (1.0)}$ = 0.095	$m_{max\ (1.0)}$ or $y_{max\ (1.0)}$	$m_{max\ (1.0)}$ = 0.118	—
	Observation	0.625 ≤ {($m_{max\ (0.2)}$+ $m_{min\ (0.2)}$)}: {($m_{max\ (1)}$+ $m_{min\ (1)}$)}= 1.02 ≤ 1.6			

TABLE 5.6	**Dazzling**				**P**
Sample No.2	m (225 ° lamps OFF):	0.106	m (225 ° lamps ON):	0.113	
	m (315 ° lamps OFF):	0.111	m (315 ° lamps ON):	0105	
	Result	1 m_{max} / m_{min} = (1.05) ; 2 m_{max} / m_{min} = (1.08)			
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 or no false alarm nor fault signal) ☐ Fail			

TABLE 5.7	**Dry Heat**		**P**
Sample No. 3	55 +/- 2°C, 2h	Initial sensitivity	
	☒m(dB/m) = 0.109 ☐ y	☒m(dB/m) = 0.105 ☐ y	
	Result	m_{max} / m_{min} = (1.04)	

	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 or false alarm nor fault signal) ☐ Fail

TABLE 5.8	**Cold (operational):**		**P**
Sample No. 4	0 ± 2°C, 2h	Initial sensitivity	
	☒m(dB/m) = 0.115 ☐ y	☒m(dB/m) = 0.106 ☐ y	
	Result	m_{max} / m_{min} = (1.08)	
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 or false alarm nor fault signal) ☐ Fail	

TABLE 5.9	**Damp Heat (operational):**		**P**
Sample No. 5	40 ± 2°C, (93± 3)%, 96h	Initial sensitivity	
	☒m(dB/m) = 0.118 ☐ y	☒m(dB/m) = 0.109 ☐ y	
	Result	m_{max} / m_{min} = (1.08)	
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 or false alarm nor fault signal) ☐ Fail	

TABLE 5.10	**Sulphur dioxide (SO2) corrosion**		**P**
Sample No. 6	After	Before	
	☒m(dB/m) = 0.136 ☐ y	☒m(dB/m) = 0.110 ☐ y	
	Result	m_{max} / m_{min} = (1.23)	
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 or false alarm nor fault signal) ☐ Fail	
Sample No. 7	After	Before	
	☒m(dB/m) = 0.109 ☐ y	☒m(dB/m) = 0.111 ☐ y	
	Result	m_{max} / m_{min} = (1.02)	

	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 or false alarm nor fault signal) ☐ Fail

TABLE 5.11	**Impact**		**P**
Sample No. 8	After test: Impact energy (1.9 ± 0.1) J; 1 time	Before test:	
	☒m(dB/m) = 0.162 ☐ y	☒m(dB/m) = 0.112 ☐ y	
	Result	m_{max} / m_{min} = (1.45)	
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 or false alarm nor fault signal) ☐ Fail	

TABLE 5.12	**Vibration (operational)**		**P**
Sample No. 9	After test: (10 to 150) Hz; 5 m s^{-2}; 3 axes	Before test:	
	☒m(dB/m) = 0.107 ☐ y	☒m(dB/m) = 0.113 ☐ y	
	Result	m_{max} / m_{min} = (1.06)	
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 or false alarm nor fault signal) ☐ Fail	

TABLE 5.13	**Vibration (endurance)**		**P**
Sample No. 9	After test: (10 to 150) Hz; 10 m s^{-2}; 3 axes	Before test:	
	☒m(dB/m) = 0.108 ☐ y	☒m(dB/m) = 0.113 ☐ y	
	Result	m_{max} / m_{min} = (1.06)	
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 or false alarm nor fault signal) ☐ Fail	

TABLE 5.14	**Electromagnetic Compatibility (EMC), immunity tests (operational)**	**P**
Sample No. 2	Mains supply voltage dips and short interruptions	N/A

	After test:		Before test:	
	☐m: (dB/m) ☐ y		☐m: (dB/m) ☐ y	
	☐max. ☐min.		☐max. ☐min.	
	Result	m_{max} / m_{min} = ( )		
	Observation	☐ Pass (m_{max} / m_{min} ≤ 1.6) ☐ Fail		
Sample No. 10	Electrostatic discharge			P
	After test:		Before test:	
	☒m: 0.120 (dB/m) ☐ y		☒m: 0.113 (dB/m) ☐ y	
	☒max. ☐min.		☐max. ☒min.	
	Result	m_{max} / m_{min} = (1.06)		
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6) ☐ Fail		
Sample No. 11	Radiated electromagnetic fields			P
	After test:		Before test:	
	☒m: 0.121 (dB/m) ☐ y		☒m: 0.109 (dB/m) ☐ y	
	☐max. ☒min.		☒max. ☐min.	
	Result	m_{max} / m_{min} = (1.11)		
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6) ☐ Fail		
Sample No. 2	Conducted disturbances induced by electromagnetic fields			N/A
	After test:		Before test:	
	☐m: (dB/m) ☐ y		☐m: (dB/m) ☐ y	
	☐max. ☐min.		☐max. ☐min.	
	Result	m_{max} / m_{min} = ( )		
	Observation	☐ Pass (m_{max} / m_{min} ≤ 1.6) ☐ Fail		
Sample No. 12	Fast transient bursts			N/A
	After test:		Before test:	
	☐m: (dB/m) ☐ y		☐m: (dB/m) ☐ y	
	☐max. ☐min.		☐max. ☐min.	
	Result	m_{max} / m_{min} = ( )		
	Observation	☐ Pass (m_{max} / m_{min} ≤ 1.6) ☐ Fail		
Sample No. 13	Slow high-energy voltage surges			N/A
	After test:		Before test:	

	☐m: (dB/m) ☐ y	☐m: (dB/m) ☐ y
	☐max. ☐min.	☐max. ☐min.
	Result	m_{max} / m_{min} = ( )
	Observation	☐ Pass (m_{max} / m_{min} ≤ 1.6) ☐ Fail

TABLE 5.15	**Fire Sensitivity**					**P**
Type of flame						—
TF2	Sample No.	Response time (s)	ΔT(°C)	m (dB m^{-1})	y	**P**
	19	543	0.18	1.632	1.07	
	18	543	0.18	1.632	1.07	
	20	544	0.00	1.503	1.07	
	17	545	0.18	1.503	1.07	
Remarks: When the alarm responding, m less than 2 dB m^{-1}						
TF3	Sample No.	Response time (s)	ΔT(°C)	m (dB m^{-1})	y	**P**
	20	144	0.00	0.507	1.32	
	17	144	0.18	0.507	1.32	
	18	147	0.18	0.842	1.47	
	19	151	0.18	0.758	1.62	
Remarks: When the alarm responding, m less than 2 dB m^{-1}						
TF4	Sample No.	Response time (s)	ΔT(°C)	m (dB m^{-1})	y	**P**
	20	60	3.37	0.325	1.52	
	18	62	3.37	0.362	1.64	
	19	62	3.37	0.362	1.64	
	17	63	3.56	0.348	1.70	
Remarks: When the alarm responding, y less than 6.						

TF5	Sample No.	Response time (s)	ΔT(°C)	m (dB m^{-1})	y	**P**
	18	51	7.13	0.487	2.19	
	17	53	7.21	0.467	2.38	
	19	55	7.31	0.472	2.35	
	20	58	8.12	0.421	2.27	
Remarks: When the alarm responding, y less than 6.						

TABLE 5.16	Battery fault warning			**P**
Specimen No.	Nominal Battery voltage (VR)	Resist setting (Ω)	m (VR) or y (VR)	
1	3.0V	0	A=0.102 dB/m	
15	3.0V	0	B=0.120 dB/m	
Specimen No.	Low battery voltage (VE)	Resist setting (Ω)	m (VR) or y (VR)	Result (W)
1	2.7V	0	0.099 dB/m	m/A=1.03
15	2.7V	0	0.123 dB/m	m/B=1.03
Specimen No.	Nominal Battery voltage (VR)	Impedance: RA (Ω)	m (VR) or y (VR)	
1	3V	9	0.092 dB/m	m/A=1.11
15	3V	7	0.127 dB/m	m/B=1.06
Specimen No.	0.75x(VR-VE)+VE	Impedance: RB (Ω)	m (VR) or y (VR)	
1	2.925V	6	0.079 dB/m	m/A=0.96
15	2.925V	6	0.093 dB/m	m/B=0.85
Specimen No.	0,5x(VR-VE)+VE	Impedance: RC (Ω)	m (VR) or y (VR)	
1	2.85V	4	0.077 dB/m	m/A=0.94
15	2.85V	4	0.087 dB/m	m/B=0.81
Specimen No.	0,25x(VR-VE)+VE	Impedance: RD (Ω)	m (VR) or y (VR)	
1	2.775V	3	0.069 dB/m	m/A=0.84
15	2.775V	2	0.088 dB/m	m/B=0.81
	Observation	☒ Pass (0.625 ≤ W ≤ 1.6)	☐ Fail	

TABLE 5.17	Sound output					P
Sample No.	Low Battery voltage (V_E)	Sound level after 1 min.		Sound level after 4 min.		
1#	8.3 V	85.2	☒ Pass(≥ 85dB(A)) ☐ Fail	83.5	☒ Pass(≥ 82dB(A)) ☐ Fail	
15#	8.1 V	85.2	☒ Pass(≥ 85dB(A)) ☐ Fail	83.8	☒ Pass(≥ 82dB(A)) ☐ Fail	
Note: Sound output frequency <3.5kHz						

TABLE 5.18	Sound durability					P
Sample No.	Sound level before test	Sound level after 1 min.		Sound level after 4 min.		
15	85.2	88.0	☒ Pass(≥ 85dB(A)) ☐ Fail	87.3	☒ Pass(≥ 82dB(A)) ☐ Fail	
	Note: ☒The maximum nominal frequency shall not exceed 3.5 kHz. Measured: (3350 Hz)					

TABLE 5.20	Alarm silence facility					P
Specimen No. 16	Supply voltage	Silence time	After silence	Initial sensitivity	Ratio	
	3.0V	7min10sec	0.135 dB/m	0.138 dB/m	1.02	
	2.7V	7min02sec	0.141 dB/m	0.138 dB/m	1.02	

TABLE 5.21	Variation in supply voltage			P
Specimen No. 2	Supply voltage (V) 3.0Vdc	After test: m (dB/m) or y	Before test: m (dB/m) or y	
	V: 3.00V	☒m: 0.179 (dB/m) ☐ y	☒m: 0.145 (dB/m) ☐ y	

		☒max. ☐min.	☐max. ☒min.
	Result: y_{max} / y_{min} or m_{max} / m_{min}= 1.23		
	V_E: 2.70V	☐m: 0.182 (dB/m) ☐ y	☒m: 0.145 (dB/m) ☐ y
		☒max. ☐min.	☐max. ☒min.
	Result: y_{max} / y_{min} or m_{max} / m_{min}= 1.26		
	Observation	☒ Pass (y_{max} / y_{min} or m_{max} / m_{min} ≤ 1,6 and y_{min} ≥ 0,2 or m_{min} ≤ 0,5 dB/m) ☐ Fail	

TABLE 5.22	**Battery reversal**		**N/A**
Sample No. 16	After test:	Before test:	
	☒m: (dB/m) ☐ y	☒m: (dB/m) ☐ y	
	☐max. ☐min.	☐max. ☒min.	
	Result	m_{max} / m_{min} = ( )	
	Observation	☒ Pass (m_{max} / m_{min} ≤ 1.6 and when voltage V_E minus 5 % is applied, the battery fault warning shall be given.) ☐ Fail	

List of Critical Components:					
Object / Part No.	Manufacturer / Trademark	Type / model	Technical data	Standard	Mark(s) of conformity
Enclosure (Bottom. Top Cover, Base)	KOREA KUMHO PETROCHEMICAL CO LTD	ABS-750SW, ABS-750SH	85°C, V-0	ANSI/UL 746	UL E65424
Smoke chamber	KOREA KUMHO PETROCHEMICAL CO LTD	ABS-750SW, ABS-750SH	85°C, V-0	ANSI/UL 746	UL E65424
PCB	GUANGDE LONGTAI ELECTRONIC SCI-TECH CO LTD	LT150	90°C, V-0	ANSI/UL 746 ANSI/UL 796	UL E357246
Smoke detector	Shanghai Jiyao Electronics CO., LTD	L50032NV-3.4	48mW, λp: 940nm	---	Test with appliance
Smoke receiver unit	Shanghai Jiyao Electronics CO., LTD	L61222PDT-3.65	150mW, λp: 940nm	---	Test with appliance
Battery	Huizhou Huiderui Lithium Battery Technology Co., Ltd	CR123A	3.0V, Max Abnormal Charging Current: 200mA, Capacity: 1400mAH;	---	Test with appliance
	Pairdeer	CR123A	3.0V, Max Abnormal Charging Current: 200mA, Capacity: 1500mAh;	---	Test with appliance
LED indicator	F5	---	10-11mW	---	Test with appliance
Sounder	Audiowell Electric (Guangdong) CO., Ltd.	AW4E31G-32S1L2Z	Buzzer, diameter 34.5mm, wire length: 45mm each	---	Test with appliance
IC	HOLTED SEMICONDUCTOR INC. IC	BA45F5220	fSYS=8MHz: 2.2V~5.5V, SOP-10	---	Test with appliance

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict

5	**Marking and instructions**		P
	Comprehensible and easily discernible	The rating label is easily discernible	P
	Permanent durability against water and petroleum spirit	Compliance was checked by rubbing the marking by hand for 15 s with cloth soaked with water and cloth soaked with petroleum spirit, it was not possible to remove marking plate and no curling observed after the test	P
5.1	a) Identification, maker ..... :	Manufacturer name used.	P
	b) Model number or type reference ..... :	SD-435, SD-436	P
	c) Class II symbol if applicable ..... :	Not class II	N/A
	d) Nature of supply ..... :	(See marking plate on page 4)	P
	e) Rated supply voltage ..... :	(See marking plate on page 4)	P
	f) Mains frequency if safety dependant ..... :		N/A
	g) Rated current or power consumption for apparatus supplied by supply apparatus for general use ..... :		N/A
	Measured current or power consumption ..... :	(see appended table 7.1)	P
	Deviation % (max 10%) ..... :		N/A
	h) Rated current or power consumption for apparat-us intended for connection to an a.c. mains supply..... :		N/A
	Measured current or power consumption ..... :		N/A
	Measured current or power consumption for Television set ..... :		N/A
	Deviation % (max 10%) ..... :		N/A
5.2	a) Earth terminal	Not class I equipment.	N/A
	b) Hazardous live terminals	No hazardous terminals.	N/A
	c) Markings on supply output terminals	No such output terminals	N/A
5.3	a) Use of triangle with exclamation mark		N/A
	b) marking on loudspeaker grille, IEC 60417-5036	No such grille	N/A
5.4	Instructions for use	Provided in user manual	P
5.4.1	a) Mains powered equipment not exposed to dripping or splashing. Warning concerning objects filled with liquid, etc.	Not connected to the mains.	N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
	b) Hazardous live terminals, instructions for wiring	No such terminals.	N/A
	c) Instructions for replacing lithium battery	See user manual.	P
	d) Class I earth connection warning	Not class I	N/A
	e) Instructions for multimedia system connection	Not multimedia system.	N/A
	f) Special stability warning for attachment of the apparatus to the floor/wall		N/A
	g) Warning: battery exposure to heat	Provided in user manual	P
	h) Warning: protective film on CRT face	No CRT used.	N/A
5.4.2	a-b) Disconnect device: plug/coupler or all-pole mains switch location, accessibility and markings	Not connected to the mains.	N/A
	c) Instructions for permanently connected equipment	No such equipment	N/A
	Marking, signal lamps or similar for completely disconnection from the mains		N/A
7	**Heating under normal operating conditions**		P
7.1	Temperature rises not exceeding specified values; fuse links and other protective devices defeated	(see appended table)	P
7.1.1	Temperature rise of accessible parts	(see appended table)	P
7.1.2	Temperature rise of parts providing electrical insulation	(see appended table)	P
7.1.3	Temperature rise of parts acting as a support or as a mechanical barrier		N/A
7.1.4	Temperature rise of windings		N/A
7.1.5	Parts not subject to a limit under 7.1.1 to 7.1.4		N/A
7.2	Softening temperature of insulating material supporting parts conductively connected to the mains carrying a current > 0,2 A at least 150 °C		N/A
8	**Constructional requirements with regard to the protection against electric shock**		N/A
8.1	Conductive parts covered by lacquer, paper, untreated textile oxide films and beads etc. considered to be bare	No hazard live parts inside EUT.	N/A
8.2	No shock hazard when changing voltage setting device, fuse-links or handling drawers etc.	Not necessary to change setting of voltage, fuse-link or handing drawers.	N/A
8.3	Insulation of hazardous live parts not provided by hygroscopic material		N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
8.4	No risk of electric shock from accessible parts or from parts rendered accessible following the removal of a cover which can be removed by hand	Battery 9.0V supply.	N/A
8.5	Class I equipment	Class III equipment	N/A
	Basic insulation between hazardous live parts and earthed accessible parts		N/A
	Resistors bridging basic insulation complying with 14.1 a)		N/A
	Capacitors bridging basic insulation complying with 14.2.1 a)		N/A
	Protective earthing terminal		N/A
8.6	Class II equipment and Class II constructions within Class I equipment	Class III equipment	N/A
	Double or reinforced insulation between hazardous live parts and accessible parts		N/A
	Components bridging double or reinforced insulation complying with 14.1 a) or 14.3		N/A
	Basic insulation bridged by components complying with 14.3.4.3.		N/A
	Basic and supplementary insulation each being bridged by a capacitor complying with 14.1 a)		N/A
	Double or reinforced insulation being bridged with 2 capacitors in series complying with 14.2.1 a)		N/A
	Double or reinforced insulation being bridged with a single capacitor complying with 14.2.1 b)		N/A
8.7	This clause is void		—
8.8	Basic or supplementary insulation > 0,4 mm (mm) :		N/A
	Reinforced insulation > 0,4 mm (mm) ..... :		N/A
	Thin sheet insulation (excluding non-separable thin sheet insulation. See 8.22)		N/A
	Basic or supplementary insulation, at least two layers, each meeting 10.3		N/A
	Basic or supplementary insulation, three layers any two of which meet 10.3		N/A
	Reinforced insulation, two layers each of which meet 10.3		N/A
	Reinforced insulation, three layers any two which meet 10.3		N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
8.9	Adequate insulation between internal hazardous live conductors and accessible parts		N/A
	Adequate insulation between internal hazardous live parts and conductors connected to accessible parts		N/A
8.10	Double insulation between conductors connected to the mains and accessible parts.	Class III equipment	N/A
	Double insulation between internal hazardous live parts and conductors connected to accessible parts.		N/A
8.11	Detaching of wires	No detaching wires used.	N/A
	No undue reduction of creepages or clearance distances if wires become detached		N/A
	Vibration test carried out ..... :	Yes / No	N/A
8.12	This clause is void		—
8.13	Adequate fastening of windows, lenses, lamp covers etc. (pull test 20 N for 10 s)		N/A
8.14	Adequate fastening of covers (push/pull test 50 N for 10 s)		N/A
8.15	No risk of damage to the insulation of internal wiring due to hot parts or sharp edges		N/A
8.16	Only special supply equipment can be used	No such equipment.	N/A
8.17	Insulated winding wire without additional interleaved insulation	No such equipment.	N/A
8.18	Endurance test as required by 8.17	No such equipment.	N/A
8.19	Disconnection from the mains	Not connected to mains.	N/A
8.19.1	Disconnect device	Not connected to mains.	N/A
	All-pole switch or circuit breaker with >3mm contact separation		N/A
8.19.2	Mains switch ON indication		N/A
8.20	Switch not fitted in the mains cord	Not connected to mains.	N/A
8.21	Bridging components comply with clause 14	Not connected to mains.	N/A
8.22	Non-separable thin sheet material	No such equipment.	N/A
9	**Electric shock hazard under normal operating conditions**	No hazard live parts inside EUT.	N/A
9.1	Testing on the outside		N/A
9.1.1	For voltages >1000 V ac or >1500 V dc complies with clause 13.3.1 for basic insulation	9.0V dc, no output terminals.	N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
9.1.1.1	a) Open circuit voltages	3.0V dc, no output terminals.	N/A
	b) Touch current measured from terminal devices using the network in annex D ..... :	Voltage U1 Voltage U2 Alternatively – Measured Current	N/A
	c) Discharge not exceeding 45 µC		N/A
	d) Energy of discharge not exceeding 350 mJ		N/A
9.1.1.2	Test with test finger and test probe		N/A
9.1.2	No hazardous live shafts of knobs, handles or levers	No hazardous live parts.	N/A
9.1.3	Ventilation holes and other holes tested by means of 4 mm x 100 mm test pin		N/A
9.1.4	Terminal devices tested with 1 mm x 20 mm test pin (10 N); test probe D of IEC 61032	Not such terminals.	N/A
	Terminal devices tested with 1 mm x 100 mm straight wire (1 N); test probe D of IEC 61032	Not such terminals.	N/A
9.1.5	Pre-set controls tested with 2.5 mm x 100 mm test pin (10 N); test probe C of IEC 61032	No such equipment.	N/A
9.1.6	No shock hazard due to stored charge on withdrawal of the mains plug; voltage (V) after 2 s ..... :	Not connected to mains.	N/A
	If C is not greater than 0,1 µF no test needed		N/A
9.1.7	Resistance to external forces		N/A
	a) Test probe 11 of IEC 61032 for 10 s (50 N)		N/A
	b) Test hook of fig. 4 for 10 s (20 N)		N/A
	c) 30 mm diameter test tool for 5 s (100 or 250 N)		N/A
9.2	No hazard after removing a cover by hand		N/A
10	**Insulation requirements**	No hazard live parts inside EUT, no insulation requirements.	N/A
10.1	Insulation resistance (MΩ) at least 2 MΩ min. after surge test for basic and 4 MΩ min. for reinforced insulation ..... :	Class III equipment.	N/A
10.2	Humidity treatment 48 h or 120 h ..... :		N/A
10.3	Insulation resistance and dielectric strength between mains terminals		N/A
	Insulation Resistance and dielectric strength across BASIC or SUPPLEMENTARY insulation (Class I)		N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulation resistance and dielectric strength across REINFORCED insulation (Class II)		N/A
11	**Fault conditions**		**P**
11.1	No shock hazard under fault condition		P
11.2	Heating under fault condition		P
	Flames extinguish within 10 seconds	No flames.	P
	No hazard from softening solder	No hazard.	P
	Soldered terminations not used as protective mechanism		P
11.2.1	Measurement of temperature rises	(see appended table)	P
11.2.2	Temperature rise of accessible parts	(see appended table)	P
11.2.3	Temperature rise of parts, other than windings and printed boards, providing electrical insulation	(see appended table)	P
11.2.4	Temperature rise of parts acting as a support or mechanical barrier		P
11.2.5	Temperature rise of windings	No windings.	N/A
11.2.6	Temperature rise of printed boards shall not exceed the limits of table 3 by max. 100 K for max. 5 min	(see appended table)	P
	Printed circuit boards (PCB) classified as V-0 according to 60695-11-10 or Clause G.1 may exceed the limit in table 3 in case a) and b):	UL V-0 approval, and conduct the requirement with IEC 60695-11-10, clause G.1	P
	a) Temperature rise of printed circuit boards exceeding the limits of table 3 by not more than 100 K for an area not greater than 2 cm² ..... :		P
	b) Temperature rise of printed circuit boards exceeding the limits of table 3 up to 300 K for an area not greater than 2 cm² for a maximum of 5 min		N/A
	Meets all the special conditions if conductors on printed circuit boards are interrupted		P
	Class I protective earthing maintained	Class III equipment.	N/A
11.2.7	Temperature rise of parts not subject to the limits of 11.2.1 to 11.2.6 shall not exceed the limits in table 3, item e), "Fault conditions".	(see appended table)	P
12	**Mechanical strength**	No hazard live part in side EUT, no mechanical strength required/.	N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
12.1.1	Bump test where mass >7 kg	0.2 kg	N/A
12.1.2	Vibration test		N/A
12.1.3	Impact hammer test		N/A
	Steel ball test		N/A
12.1.4	Drop test for portable apparatus where mass ≤ 7 kg	Not portable apparatus.	N/A
12.1.5	Thermoplastic enclosures stress relief test		N/A
12.2	Fixing of knobs, push buttons, keys and levers	No such components.	N/A
12.3	Remote controls with hazardous live parts	No such components.	N/A
12.4	Drawers (pull test 50 N, 10 s)	No such components.	N/A
12.5	Antenna coaxial sockets providing isolation	No such components.	N/A
12.6	Telescoping or rod antennas construction	No such components.	N/A
12.6.1	Telescoping or rod antennas securement	No such components.	N/A
13	**Clearances and creepage distances**		N/A
13.1	Clearances in accordance with 13.3	No hazardous live parts inside EUT, no separation required.	N/A
	Creepage distances in accordance with 13.4		N/A
13.2	Determination of working voltage	3.0Vdc	N/A
13.3	Clearances	See appendix table.	N/A
13.3.1	General	See appendix table.	N/A
13.3.2	Circuits conductively connected to the mains comply with table 8 and, where applicable, table 9 ..... :	Not connected to mains.	N/A
13.3.3	Circuits not conductively connected to the mains comply with table 10		N/A
13.3.4	Measurement of transient voltages	Not connected to mains.	N/A
13.4	Creepage distances		N/A
	Creepage distances greater than table 11 minimum values		N/A
13.5	Printed boards	Not connected to mains.	N/A
13.5.1	Clearances and creepage distances between conductors on printed circuit boards, one of which may be conductively connected to the mains, as in fig. 10		N/A
13.5.2	Type B coated printed circuit boards complying with IEC 60664-3 (basic insulation only)		N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
13.6	Conductive parts along uncemented joints clearances and creepage distances comply with 13.3 and 13.4	No such components.	N/A
	Conductive parts along reliably cemented joints comply with 8.8		N/A
	Temperature cycle test and dielectric strength test		N/A
	500V test for transformers, magnetic coupler and similar devices, if insulation is relied upon for safety		N/A
13.7	Enclosed, enveloped or hermetically sealed parts not conductively connected to the mains, clearances and creepage distances as in table 12		N/A
13.8	Parts filled with insulating compound, meeting the requirements of 8.8		N/A

14	**Components**		**P**
14.1	Resistors	No such components.	N/A
	a) Resistors between hazardous live parts and accessible metal parts	No such components.	N/A
	b) Resistors, other than between hazardous live parts and accessible parts	No such components.	N/A
	Resistors separately approved ..... :	Yes / No	N/A
14.2	Capacitors and RC units	No such components.	N/A
	Capacitors separately approved :	Yes / No	N/A
14.2.1	Y capacitors tested to IEC 60384-14:2005 ..... :	Y1 Y2	N/A
14.2.2	X capacitors tested to IEC 60384-14:2005 ..... :	X1 X2	N/A
14.2.3	Capacitors operating at mains frequency but not connected to the mains: tests for X2 ..... :	No such components.	N/A
14.2.5	Capacitors with volume exceeding 1750 mm³, where short-circuit current exceeds 0,2 A: compliance with IEC 60384-1, 4.38 category B or better ..... :	No such components.	N/A
	Capacitors with volume exceeding 1750 mm³, mounted closer to a potential ignition source than table 5 permits: compliance with IEC 60384-1, 4.38 category B or better ..... :	No such components.	N/A
	Shielded by a barrier acc. to 20.1.4/ table 21 or metal :	Yes / No	N/A
14.3	Inductors and windings	No such components.	N/A
	Comply with IEC 61558-1, IEC 61558-2 (as relevant) and clause 20.1.4	No such components.	N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
14.3.1	Transformers and inductors marked with manufacturer's name and type ..... :	No such components.	N/A
	Transformers and inductors separately approved :	Yes / No	N/A
14.3.2	General	No such components.	N/A
	Insulation material complies with clause 20.1.4	No such components.	N/A
14.3.3	Constructional requirements	No such components.	N/A
14.3.3.1	Clearances and creepage distances comply with clause 13	No such components.	N/A
14.3.3.2	Transformers meet the constructional requirements	No such components.	N/A
14.3.4	Separation between windings	No such components.	N/A
14.3.4.1	Class II transformers have adequate separation between hazardous live parts and accessible parts (double or reinforced insulation) ..... :	No such components.	N/A
	Coil formers and partition walls > 0,4 mm	No such components.	N/A
14.3.4.2	Class I transformers, with basic insulation and protective screening only if all 7 conditions of 14.3.4.2 are met	No such components.	N/A
14.3.4.3	Separating transformers with at least basic insulation	No such components.	N/A
14.3.5	Insulation between HAZARDOUS LIVE parts and ACCESSIBLE parts	No such components.	N/A
14.3.5.1	Class II transformers have adequate insulation between hazardous live parts and accessible parts (double or reinforced insulation)	No such components.	N/A
	Coil formers and partition walls > 0,4 mm	No such components.	N/A
14.3.5.2	Class I transformers have adequate insulation between hazardous live parts and accessible conductive parts or those conductive parts or protective screens connected to a protective earth terminal	No such components.	N/A
	Winding wires connected to protective earth have adequate current-carrying capacity	No such components.	N/A
14.4	High voltage components	No such components.	N/A
	High-voltage components and assemblies: U > 4 kV (peak) separately approved	No such components.	N/A
	Component meets category V-1 of IEC 60695-11-10	No such components.	N/A
14.4.1	High voltage transformers and multipliers tested as part of the submission	No such components.	N/A
14.4.2	High voltage assemblies and other parts tested as part of the submission	No such components.	N/A
14.5	Protective devices	No such components.	N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
	Protective devices used within their ratings	No such components.	N/A
	External clearances and creepage distances meet requirement of clause 13 for the voltage across the device when opened	No such components.	N/A
14.5.1.1	a) Thermal cut-outs separately approved	No such components.	N/A
	b) Thermal cut-outs tested as part of the submission	No such components.	N/A
14.5.1.2	a) Thermal links separately approved	No such components.	N/A
	b) Thermal links tested as part of the submission	No such components.	N/A
14.5.1.3	Thermal devices re-settable by soldering	No such components.	N/A
14.5.2.1	Fuse-links in the mains circuit according to IEC 60127	No such components.	N/A
14.5.2.2	Correct marking of fuse-links adjacent to holder ... :	No such components.	N/A
14.5.2.3	Not possible to connect fuses in parallel ..... :	No such components.	N/A
14.5.2.4	Not possible to touch hazardous live parts when replacing fuse-links without the use of a tool ..... :	No such components.	N/A
14.5.3	PTC thermistors comply with IEC 60730-1:2007	No such components.	N/A
	PTC devices (15 W) category V-1 or better	No such components.	N/A
14.5.4	Circuit protectors have adequate breaking capacity and their position is correctly marked	No such components.	N/A
14.6	Switches	No such components.	N/A
14.6.1 a)	Separate testing to IEC 61058-1 including: - 10 000 operations - Normal pollution suitability **- Make and break speed independent of speed of actuation** V-0 compliance with annex G, G.1.1	No such components.	N/A
14.6.1 b)	Tested in the apparatus:	No such components.	N/A
	Switch controlling > 0.2A with open contact voltage > 35 V (peak)/24 V dc complying with 14.6.3, 14.6.4 and V-0 in annex G, G.1.1	No such components.	N/A
	Switch controlling > 0.2A with open contact voltage < 35 V (peak)/24 V dc complying with 14.6.3 and V-0 in annex G, G.1.1	No such components.	N/A
	Switch controlling < 0.2A with open contact voltage > 35 V (peak)/24 V dc complying with 14.6.4 and V-0 in annex G, G.1.1	No such components.	N/A
14.6.2	Switch tested to 14.6.1 b) constructed to IEC 61058-1 subclause 13.1 and has making/breaking action independent of speed of actuation	No such components.	N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
14.6.3	Switch tested to 14.6.1 b) compliant with IEC 61058-1 subclause 16.2.2 d) and m) not attaining excessive temperatures in use	No such components.	N/A
14.6.4	Switch tested to 14.6.1 b) has adequate dielectric strength	No such components.	N/A
14.6.5	Mains switch controlling mains socket outlets additional tests to IEC 61058-1	No such components.	N/A
	Socket outlet current marking correct	No such components.	N/A
14.7	Safety interlocks	No such components.	N/A
	Safety interlocks to 2.8 of IEC 60950-1	No such components.	N/A
14.8	Voltage setting devices and the like	No such components.	N/A
	Voltage setting device not likely to be changed accidentally	No such components.	N/A
14.9	Motors	No such components.	N/A
14.9.1	Endurance test on motors	No such components.	N/A
	Motor start test	No such components.	N/A
	Dielectric strength test	No such components.	N/A
14.9.2	Not adversely affected by oil or grease etc.	No such components.	N/A
14.9.3	Protection against moving parts	No such components.	N/A
14.9.4	Motors with phase-shifting capacitors, three-phase motors and series motors meet clause. B.8, B.9 and B.10 of IEC 60950-1, Annex B	No such components.	N/A
14.10	Batteries		P
14.10.1	Batteries mounted with no risk of accumulation of flammable gases	No risk of flammable gases.	P
14.10.2	No possibility of recharging non-rechargeable batteries	Special battery compartment only fits for model LR03 non-rechargeable battery	P
14.10.3	Recharging currents and times within manufacturers limits		N/A
	Lithium batteries discharge and reverse currents within the manufacturers limits		P
14.10.4	Battery mould stress relief	Test with appliance.	P
14.10.5	Battery drop test		P
14.11	Optocouplers	No such components.	N/A
	a) Comply with 13.6 (jointed insulation) and N.2.1	No such components.	N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
	b) Comply with IEC 60747-5-5:2007	No such components.	N/A
	Alternative to a) and b) optocoupler comply with 13.8	No such components.	N/A
	a) Comply with 13.6 (jointed insulation) and N.2.1	No such components.	N/A
14.12	Surge suppression varistors	No such components.	N/A
	Comply with IEC 61051-2	No such components.	N/A
	Not connected between mains and accessible parts except for earthed parts of permanently connected apparatus	No such components.	N/A
	Complies with the current pulse, fire hazard and thermal stress requirements of 14.12	No such components.	N/A

20	**Resistance to fire**		**P**
20.1	Electrical components and mechanical parts		P
	a) Exemption for components contained in an enclosure of material V-0 to IEC 60695-11-10 with openings not exceeding 1 mm in width	UL approval V-0 plastic material.	P
	b) Exemption for small components as defined in 20.1		N/A
20.1.1	Electrical components meet the requirements of Clause 14 or 20.1.4		P
20.1.2	Insulation of internal wiring working at voltages > 4 kV or leaving an internal fire enclosure, or located within the areas mentioned in Table 21, not contributing to the spread of fire	3.0Vd.c. <15 W	N/A
20.1.3	Material of printed circuit boards on which the available power exceeds 15 W at a voltage between 50 V and 400 V (peak) a.c. or d.c. meets V-1 or better to IEC 60695-11-10, unless used in a fire enclosure	3.0Vd.c. <15 W	N/A
	Material of printed circuit boards on which the available power exceeds 15 W at a voltage >400 V (peak) a.c. or d.c. meets V-0 to IEC 60695-11-10.	3.0Vd.c. <15 W	N/A
20.1.4	Components and parts not covered by 20.1.1, 20.1.2 and 20.1.3 (other than fire enclosures) mounted nearer to a potential ignition source than the distances in Table 21 comply with the relevant flammability category in Table 21	See List of Critical Components on page 48	P
	Components and parts as above but shielded from a potential ignition source, with the barrier area in accordance with Table 21 and fig. 13		N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict
	Apparatus with voltages >4kV under normal operating conditions and distances to the enclosure exceed those specified Table 21, flammability classification HB40 or better is required for the enclosure	3.0Vd.c.	N/A
20.2	Fire enclosure	3.0Vd.c.	N/A
20.2.1	Potential ignition sources with open circuit voltage > 4 kV (peak) a.c. or d.c. contained in a fire enclosure to V-1	3.0Vd.c.	N/A
20.2.2	Internal fire enclosures with openings not exceeding 1 mm in width and with openings for wires completely filled	No internal fire enclosure.	N/A
20.2.3	Requirements of 20.2.1 and 20.2.2 met by an internal fire enclosure	No internal fire enclosure.	N/A

Annex EN 60065			
Clause	Requirement + Test	Result - Remark	Verdict

7.1	TABLE: temperature rise measurements					P
	Power consumption in the OFF/Stand-by				--	--
	Position of the functional switch (W) .....:				--	--
I rated (A)	Un (V)	Hz	I (mA)	P (W)	Operating Condition / Status	
1	3.0Vdc	--	2	0.006	Detecting smoke.	
Note: the measured current is less than the rated current x 1.1 obviously.						
	Loudspeaker impedance (Ω) .....:				--	—
	Several loudspeaker systems .....:				--	
	Marking of loudspeaker terminals .....:				--	

Temperature Rise dT of Part	dT (K)	Limit max dT (K)
Test Condition No.	**3.0Vd.c.**	**--**
Plastic Enclosure, External	2.1	60
PCB near U4	5.5	85
PCB near U3	4.3	85
Battery	2.7	40
Ambient	50.1 °C	—
Winding temperature rise measurements		
Ambient temperature t1 (°C) ..... :	--	—
Ambient temperature t2 (°C) ..... :	--	—
Remark: Max. declared operation ambient temperature: 50 °C. * PCB temperature limit used.		

11.2	**TABLE: Fault Conditions**			**P**
No.	**Component**	**Fault**	**dT (K) / Component**	**Test conditions, test duration, test result**
1.	Battery	s-c	40.6K	EUT shut down. No damage, no hazards. Test voltage: 3.0Vd.c. Input current: 0.002A → 1.1A (last 5mins)→0 (exhausted) Test time: 10mins
Supplementary information: s-c=short circuit				

Annex EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
3	**WIRING, CONNECTIONS AND SUPPLY**		P
3.1	**General**		P
3.1.1	Current rating and overcurrent protection	Internal wires are UL recognized wiring which is PVC insulated, rated VW-1or FT-1, and having gauge suitable for current intended to be carried.	P
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges which could damage the insulation and cause hazard.	P
3.1.3	Securing of internal wiring	Internal wires are routed and secured so that adequate insulations are maintained. The wires are secured by hooking-in, solder pins, crimp terminal, glue, so that a loosening of the terminal connection is unlikely.	P
3.1.4	Insulation of conductors	The insulation of the individual conductors suitable for the application and the working voltage. For the insulation material see 3.1.1.	P
3.1.5	Beads and ceramic insulators	Not used.	N/A
3.1.6	Screws for electrical contact pressure	No such screws provided.	N/A
3.1.7	Insulating materials in electrical connections	All current carrying connections are metal to metal.	N/A
3.1.8	Self-tapping and spaced thread screws	Not used.	N/A
3.1.9	Termination of conductors	All conductors are reliably secured.	P
	10 N pull test		P
3.1.10	Sleeving on wiring	No sleeve used.	N/A
3.2	**Connection to a mains supply**		N/A
3.2.1	Means of connection	Not connected to mains.	N/A
3.2.1.1	Connection to an a.c. mains supply		N/A
3.2.1.2	Connection to a d.c. mains supply		N/A
3.2.2	Multiple supply connections		N/A

Annex EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.3	Permanently connected equipment		N/A
	Number of conductors, diameter of cable and conduits (mm) ..... :		—
3.2.4	Appliance inlets		N/A
3.2.5	Power supply cords		N/A
3.2.5.1	AC power supply cords		N/A
	Type ..... :		—
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
3.2.5.2	DC power supply cords	No cords.	N/A
3.2.6	Cord anchorages and strain relief		N/A
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
3.2.7	Protection against mechanical damage		N/A
3.2.8	Cord guards		N/A
	Diameter or minor dimension D (mm); test mass (g) :		—
	Radius of curvature of cord (mm)..... :		—
3.2.9	Supply wiring space		N/A
3.3	**Wiring terminals for connection of external conductors**		N/A
3.3.1	Wiring terminals	No external conductors.	N/A
3.3.2	Connection of non-detachable power supply cords	No cords	N/A
3.3.3	Screw terminals	No terminals.	N/A
3.3.4	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, cross-sectional area (mm^2)..... :		—
3.3.5	Wiring terminal sizes		N/A
	Rated current (A), type, nominal thread diameter (mm) ..... :		—
3.3.6	Wiring terminal design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A
3.4	**Disconnection from the mains supply**		N/A
3.4.1	General requirement	Not connect to mains.	N/A

Annex EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
3.4.2	Disconnect devices		N/A
3.4.3	Permanently connected equipment		N/A
3.4.4	Parts which remain energized		N/A
3.4.5	Switches in flexible cords		N/A
3.4.6	Number of poles - single-phase and d.c. equipment		N/A
3.4.7	Number of poles - three-phase equipment		N/A
3.4.8	Switches as disconnect devices		N/A
3.4.9	Plugs as disconnect devices		N/A
3.4.10	Interconnected equipment		N/A
3.4.11	Multiple power sources		N/A
4.7	**Resistance to fire**		P
4.7.1	Reducing the risk of ignition and spread of flame	No excessive temperatures. No easily burning materials employed. Fire enclosure provided.	P
	Method 1, selection and application of components wiring and materials		P
	Method 2, application of all of simulated fault condition tests		N/A
4.7.2	Conditions for a fire enclosure	Fire enclosure provided.	P
4.7.2.1	Parts requiring a fire enclosure	Insulated wiring.	P
4.7.2.2	Parts not requiring a fire enclosure	No such parts.	N/A
4.7.3	Materials		P
4.7.3.1	General	See below	P
4.7.3.2	Materials for fire enclosures	V-0 fire enclosure used.	P
4.7.3.3	Materials for components and other parts outside fire enclosures		N/A
4.7.3.4	Materials for components and other parts inside fire enclosures	PCB rated V-0 or better, Internal components except small parts are V-2 or better.	P
4.7.3.5	Materials for air filter assemblies	No air filters provided.	N/A
4.7.3.6	Materials used in high-voltage components	No high voltage components provided.	N/A