European Fire and Security Group
EFSG Secretariat
Route de la Chapelle Réanville
F-27950 Saint-Marcel

MUTUAL RECOGNITION AGREEMENT ELECTRICAL COMPONENTS OF FIRE DETECTION AND FIRE ALARM SYSTEMS, FIRE EXTINGUISHING SYSTEMS & SMOKE AND HEAT CONTROL SYSTEMS

Participants:

Certification Body	**Signatory**
AFNOR Certification	afnor CERTIFICATION 11 rue Francis de Pressensé F-93571 La Plaine Saint Denis Cedex
BRE Global Ltd	bre BRE Global Ltd Bucknalls Lane Watford, Herts, WD25 9XX
DBI Certification A/S	DBI DBI Certification A/S Jernholmen 12 DK-2650 Hvidovre Denmark
VdS Schadenverhütung GmbH	VdS VdS Schadenverhütung GmbH Amsterdamer Str. 174 D-50735 Köln
Associated Testing Laboratories	**Signatory**
BRE Global Ltd	bre BRE Global Ltd Bucknalls Lane Watford, Herts, WD25 9XX
CNPP Entreprise	CNPP CNPP Entreprise Route de la Chapelle Réanville F-27950 Saint-Marcel
VdS Schadenverhütung GmbH	VdS VdS Schadenverhütung GmbH Amsterdamer Str. 174 D-50735 Köln

The certification bodies (CB), which are members in the European Fire and Security Group (EFSG) and associated testing laboratories (ATL) signing this mutual recognition agreement (MRA), agree to accept the following terms and conditions. Each party undertakes to communicate the conditions of this MRA to the market (i.e. the customer base).

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1 GENERAL

This agreement specifies the conditions for the mutual recognition of test results used for certification for components of fire detection and fire alarm systems, fire extinguishing systems and smoke and heat control systems according to the standards and tables listed in the technical part (ANNEX 1) of this agreement, for the purposes of granting permission to use the certification marks of the certification body signatories.

The agreement has been made on the understanding that the participating certification bodies are accredited in accordance with EN ISO/IEC 17065 by a member of EA (European co-operation for Accreditation) with a scope covering the relevant equipment.

Attention is drawn to the EN ISO/IEC 17065 requirements related to conflicts of interest. Each member certification body and each ATL must require its personnel involved in the execution of this mutual recognition agreement to disclose any situation of which they are aware that may confront them with a conflict of interest. In the event of such a disclosure the other signatories to this agreement must be informed at the earliest convenience.

This MRA agreement is based on the Terms of Reference of EFSG revision 24.

2 OBJECT

It is the object of this agreement on the mutual recognition of **test results** to make it easier for manufacturers to obtain authorisation to use the mark of each Certification Body (CB). To achieve this, test results as specified below, will be considered to be acceptable for all CBs within this MRA.

3 SCOPE

This MRA applies to components of fire detection and fire alarm systems, fire extinguishing systems and smoke and heat control systems in accordance with the standards listed in the technical part of this agreement.

This MRA covers initial type testing of the product.

As a first step, individual additional requirements such as application procedures, surveillance of manufacturing and additional quality requirements are not covered by this agreement. (Note: As a second step this agreement could be extended to surveillance activity).

Each ATL will have been successfully audited and will have met the requirements of the applicable inter-laboratory comparison testing programme(s) for the assigned standards before signing the MRA.

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4 APPLICATION PROCEDURE

If a manufacturer wants to be licensed for the certification mark of another party of this MRA, the manufacturer shall apply to that certification body and shall agree to abide by its rules.

For comparison of test results, it is necessary, that the manufacturer gives permission to the CB and its ATL, to exchange information (e.g. test results) between the signatories of this agreement.

The **test results** from any one of the ATL providing tests according to the technical part of this MRA (see ANNEX 1 defining the relevant tests), shall be mutually accepted by the CB who have, by endorsement of this MRA confirmed such agreement, within the bounds of the respective regulations.

5 ASSOCIATED TESTING LABORATORY (ATL)

The ATL shall operate in conformity with standards and tables listed in the technical part (ANNEX 1) of this EFSG agreement.

It shall be accredited in accordance with EN ISO/IEC 17025 by a member of the EA for the relevant testing.

The ATL shall be capable of conducting at least the entire product specific Key Performance Tests (KPT *), identified in the tables in the technical ANNEX 1 in its own premises.
However, other tests may be subcontracted to another EFSG ATL.

If a test is subcontracted to another ATL, it shall be performed completely in the other ATL, e.g. climatic testing including initial assessment, monitoring during conditioning and measurement after conditioning.

The results of the tests shall be given in a test report issued at least in English. Translations may be provided for better understanding by the manufacturer or CB but the original report shall be used in case of dispute.

The ATL shall participate in the inter-laboratory comparison programmes set up by EFSG and agree to exchange experiences.

* Key performance tests are those tests that demonstrate the primary function(s) and operational parameters of the device under test.

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6 COMMON COMMITTEES

At least, once a year or at the request of one signatory of the agreement, the CBs and ATLs will meet for a review regarding the implementation of the EFSG agreement.

The review will consider but need not be limited to, the suitability of the MRA to meet the needs of the market, changes to standards and/or testing practices.

Unless otherwise agreed, one representative respectively for each signatory of this MRA will participate at the review. This representative can participate with consultative participants. The resolutions of the meetings shall be recorded.

The place and date of the review shall be discussed and agreed by the signatories of this MRA.

7 DISPUTES

In case of a breach of the EFSG agreement, the signatories are obliged to attempt to resolve the problem in a fair discussion before terminating this MRA.

8 TERMINATION OF OR WITHDRAWAL FROM THE MRA

Termination of this MRA will occur when a simple majority of the signatories give 12 months notice, to all the signatories, of their request to terminate this MRA.

Withdrawal from the MRA by one signatory will occur when that organisation gives 12 months notice to all the signatories of its intention to withdraw from this MRA. Upon receipt of the notification by one ATL signatory to withdraw from the MRA the PDG must conduct a review of the impact upon existing product certifications. If/when requested, the ATL shall provide any additional information necessary in order that the product certifications can continue.

A termination of, or withdrawal from, this MRA does not invalidate certifications, based on mutually accepted results, that have been granted before the date of termination or withdrawal.

9 IMPLEMENTATION

This MRA is valid for a period of **3 years** commencing from the date of publication. It supersedes the MRA on Electrical Components of Fire Detection and Fire Alarm Systems, Fire Extinguishing Systems and Smoke and Heat Control Systems – Version 9, December 2020.

Tests results issued after the date of publication are fully valid for implementation: those issued before the date of publication shall be scrutinised individually for acceptance by the members.

After this period, this MRA will be renewed automatically for a further 3 years unless the signatories decide otherwise.

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ANNEX 1 to the Mutual Recognition Agreement on Electrical Components of Fire Detection and Fire Alarm Systems, Fire Extinguishing Systems and Smoke and Heat Control Systems

EFSG Members (certification bodies) involved in the certification of electrical components of fire detection and fire alarm systems, fire extinguishing systems and smoke and heat control systems accept test results as indicated in the following tables from any associated testing laboratory providing the tests in the framework of this agreement.

A certification body may request additional testing for the certification of a product, e.g. different options with requirements from EN54-2 or a higher severity for a certain test.

Where a standard has options with requirements, a manufacturer shall be aware that these options may be forbidden or mandatory for obtaining the specific quality mark of the specific requirements of each certification body and shall ask for the possible extension of the test schedule to cover all relevant requirements before the start of testing.

A manufacturer shall be aware of the specific requirements of each certification body such that it can be incorporated in the test schedule to cover the relevant requirements within the scope of the standard (e.g. for NF mark – Sounders with NF S32-001 Tone).

The following product standards are under consideration:

Fire detection and fire alarm systems	
EN 54-2: 1997	Fire detection and fire alarm systems - Part 2 : Control and indicating equipment
EN 54-2/A1: 2006	
EN54-3: 2001	Fire detection and fire alarm systems – Part 3: Fire alarm devices – Sounders
EN 54-3/A1: 2002	
EN 54-3/A2: 2006	
EN54-3: 2014	
EN 54-3/A1: 2019	
EN 54-4: 1997	Fire detection and fire alarm systems - Part 4 : power supply equipment
EN 54-4/A1: 2002	
EN 54-4/A2: 2006	
EN 54-5: 2017	Fire detection and fire alarm systems - Part 5 : Heat Detectors
EN 54-5/A1: 2018	
EN 54-7: 2018	Fire detection and fire alarm systems - Part 7 : Point smoke detectors – Detectors using scattered light, transmitted light or ionization
EN 54-10: 2002	Fire detection and fire alarm systems - Part 10 : Flame detectors- Point Detectors
EN 54-10/A1: 2005	
EN 54-11: 2001	Fire detection and fire alarm systems - Part 11: Manual call points
EN 54-11/A1: 2005	

EN 54-12: 2015	Fire detection and fire alarm systems - Part 12: Smoke detectors – Line detectors using an optical beam
EN 54-17: 2005	Fire detection and fire alarm systems - Part 17: Short circuit isolators
EN 54-17/AC: 2007	
EN 54-18: 2005	Fire detection and fire alarm systems - Part 18: Input / output devices
EN 54-18/AC: 2007	
EN 54-23: 2010	Fire detection and fire alarm systems – Part 23: Fire alarm devices – Visual alarm devices
EN 54-29: 2015	Fire detection and fire alarm systems - Part 29 : Multi-Sensor fire detectors – Point detectors using a combination of smoke and heat sensors
EN 14604: 2005	Smoke alarm devices
EN 14604/AC: 2008	

Fire Extinguishing Systems	
EN 12094-3: 2003	Fixed firefighting systems – Components for gas extinguishing systems Part 3: Requirements and test methods for manual triggering and stop devices

Smoke and Heat Control Systems	
EN 12101-10: 2005	Smoke and heat control systems - Part 10: Power supplies
EN 12101-10/AC: 2007	

Mutual recognition is based on the fact, that the products to be certified are identical to those tested and the test reports issued by any of the associated test laboratories contain the same level of detailed information.

As stated in the EFSG Terms of Reference, the associated testing laboratories shall have taken part in the inter-laboratory testing programme and/or expert exchange that have satisfactorily confirmed the test methods and test results.

1 CERTIFICATION BODIES AND THEIR ASSOCIATED TESTING LABORATORIES

The table below identifies the certification bodies and their nominated associated laboratories and their testing capabilities.

Certification bodies and their associated testing laboratories			Certification bodies				
			AFNOR Certification	BRE Global Ltd	DBI Certification	VdS Schaden-verhütung	
Testing laboratories	**Standards**	**Remarks / Limitations to tests**					
BRE Global Ltd	EN 54-2	-- None --	■	●	■	■	
	EN 54-3	Frequency : not less than 365Hz IP for outdoor use (1)	■	●	■	■	
	EN 54-4	-- None --	■	●	■	■	
	EN 54-5	-- None --	■	●	■	■	
	EN 54-7	-- only for closed detectors --	■	●	■	■	
	EN 54-10	-- None --	■	●	■	■	
	EN 54-11	IP for outdoor use (1)	■	●	■	■	
	EN 54-12	-- None --	■	●	■	■	
	EN 54-17	-- None --	■	●	■	■	
	EN 54-18	-- None --	■	●	■	■	
	EN 54-23	IP for outdoor use (1)	■	●	■	■	
	EN 54-29	-- None --	■	●	■	■	
	EN 14604	Electrical safety (1)	■	●	■	■	
	EN 12094-3	Only electrical devices with EN 54-11 design	■	●	■	■	
	EN 12101-10	Only electrical PSE with batteries	■	●	■	■	
CNPP	EN 54-2	-- None --	●	■	●	■	
	EN 54-3	Frequency : not less than 400Hz	●	■	●	■	
	EN 54-4	-- None --	●	■	●	■	
	EN 54-5	classes A1 to C only	●	■	●	■	
	EN 54-7	-- only for closed detectors --	●	■	●	■	
	EN 54-10	-- None --	●	■	●	■	
	EN 54-11	-- None --	●	■	●	■	
	EN 54-12	-- None --	●	■	●	■	
	EN 54-17	-- None --	●	■	●	■	
	EN 54-18	-- None --	●	■	●	■	
	EN 54-23	-- None --	●	■	●	■	
	EN 54-29	-- None --	●	■	●	■	
	EN 14604	-- None --	●	■	●	■	
	EN 12094-3	Only electrical devices with EN 54-11 design	●	■	●	■	
	EN 12101-10	Only electrical PSE with batteries	●	■	●	■	

Certification bodies and their associated testing laboratories			Certification bodies				
			AFNOR Certification	BRE Global Ltd	DBI Certification	VdS Schaden-verhütung	
Testing laboratories	**Standards**	**Remarks / Limitations to tests**					
VdS Schaden-verhütung	EN 54-2	-- None --	■	■	■	●	
	EN 54-3	Frequency : not less than 400Hz	■	■	■	●	
	EN 54-4	-- None --	■	■	■	●	
	EN 54-5	-- None --	■	■	■	●	
	EN 54-7	-- only for closed detectors --	■	■	■	●	
	EN 54-10	-- None --	■	■	■	●	
	EN 54-11	-- None --	■	■	■	●	
	EN 54-12	-- None --	■	■	■	●	
	EN 54-17	-- None --	■	■	■	●	
	EN 54-18	-- None --	■	■	■	●	
	EN 54-23	-- None --	■	■	■	●	
	EN 54-29	-- None --	■	■	■	●	
	EN 14604	-- None --	■	■	■	●	
	EN 12094-3	Only electrical devices with EN 54-11 design	■	■	■	●	
	EN 12101-10	Only electrical PSE with batteries	■	■	■	●	

(1) The tests are subcontracted to another associated testing laboratory listed in this agreement
● Associated testing laboratory, nominated by the CB
■ Test laboratories from which test results can – at least partly – be accepted

Each certification body (CB) participating in this agreement remains responsible for its decisions and autonomous in its decisions. The CBs issue the certificate on their own mark.

In case of uncertainties, a certification body may ask for further information. This may lead to further testing.

2 MUTUAL RECOGNITION OF TEST RESULTS

The performance of testing and certification is managed by a single Certification Body. Customers shall have a contractual arrangement with the Certification Body which owns the relevant mark.
In order to guarantee a smooth process the customer is to indicate directly at a new application his intention of a recognition procedure under EFSG.
With the application customer shall also give their agreement that all information regarding product, customer etc. will be exchanged between the certification bodies and laboratories which are contractually involved in the procedure.

3 PROCEDURE FOR TESTING AND CERTIFICATION

An applicant shall apply for certification at those CBs from which he wishes a certificate indicating his wish where the product shall be tested.

When the applicant has not informed all the relevant CBs prior to the test, additional tests may be performed at any associated testing laboratory of this agreement. The reasons for these additional tests shall be justified in writing to the applicant and the other involved CB will be informed by the CB who asks for additional tests.

No “X” in the columns “ATLs” means, that the certification body is free to accept or not to accept results from the laboratory in question.
A “X” in the columns “ATLs” means, that the certification body will basically accept the result.

Control and Indicating Equipment								
Tests according to EN54-2: 1997 + A1: 2006	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
GENERAL REQUIREMENTS	4		✓					
GENERAL REQUIREMENTS FOR INDICATIONS	5		✓					
QUIESCENT CONDITION	6		✓					
FIRE ALARM CONDITION	7		✓					
FAULT WARNING CONDITION	8		✓					
DISABLED CONDITION	9		✓					
TEST CONDITION	10		✓					
STANDARDIZED I/O INTERFACE	11		✓					
DESIGN REQUIREMENTS	12		✓					
ADDITIONAL DESIGN REQUIREMENTS	13		✓					
MARKING	14							
COLD (operational)	15.4				X	X	X	X
DAMP HEAT,STEADY STATE (operational)	15.5				X	X	X	X
IMPACT (operational)	15.6				X	X	X	X
VIBRATION, SINUSOIDAL (operational)	15.7				X	X	X	X
MAINS SUPPLY VOLTAGE VARIATION (operational)	15.8				X	X	X	X
ELECTROSTATIC DISCHARGE (operational)	15.8				X	X	X	X
RADIATED ELECTROMAGNETIC FIELDS (operational)	15.8				X	X	X	X
CONDUCTED DISTURBANCES INDUCED BY ELECTROMAGNETIC FIELDS (operational)	15.8				X	X	X	X
FAST TRANSIENT BURSTS (operational)	15.8				X	X	X	X
SLOW HIGH ENERGY VOLTAGE SURGES (operational)	15.8				X	X	X	X
SUPPLY VOLTAGE VARIATION (operational)	15.13				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	15.14				X	X	X	X
VIBRATION, SINUSOIDAL (endurance)	15.15				X	X	X	X

General remark:
A certification body may require different options with requirements (see annex B of EN 54-2).
Mutual recognition requires that these options are included in the CIE submitted for environmental testing.

Sounders								
Tests according to EN54-3: 2001 + A1: 2002 + A2: 2006	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
REQUIREMENTS	4		✓		X	X	X	X
REPRODUCIBILITY	5.2		✓		X	X	X	X
OPERATION PERFORMANCE	5.3		✓		X	X	X	X
DURABILITY	5.4				X	X	X	X
DRY HEAT (operational)	5.5		✓		X	X	X	X
DRY HEAT (endurance)	5.6				X	X	X	X
COLD (operational)	5.7		✓		X	X	X	X
DAMP HEAT, CYCLIC (operational)	5.8				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	5.9				X	X	X	X
DAMP HEAT, CYCLIC (endurance)	5.10				X	X	X	X
SO_2 CORROSION (endurance)	5.11				X	X	X	X
SHOCK (operational)	5.12				X	X	X	X
IMPACT (operational)	5.13				X	X	X	X
VIBRATION ,SINUSOIDAL (operational)	5.14				X	X	X	X
VIBRATION ,SINUSOIDAL (endurance)	5.15				X	X	X	X
ELECTROSTATIC DISCHARGE (operational)	5.16				X	X	X	X
RADIATED ELECTROMAGNETIC FIELDS (operational)	5.16				X	X	X	X
CONDUCTED DISTURBANCES INDUCED BY ELECTROMAGNETIC FIELDS (operational)	5.16				X	X	X	X
FAST TRANSIENT BURSTS (operational)	5.16				X	X	X	X
SLOW HIGH ENERGY VOLTAGE SURGES (operational)	5.16				X	X	X	X
ENCLOSURE PROTECTION	5.17				X	X	X	X
ATTENTION DRAWING SIGNAL AND MESSAGE BROADCAST SEQUENCES	C.3.1		✓		X	X	X	X
SYNCHRONISATION (option with requirements)	C.3.2				X	X	X	X
GENERAL TESTING	C.4				X	X	X	X
BROADCAST MESSAGE PERFORMANCE	C.5.1		✓		X	X	X	X
ATTENTION DRAWING SIGNAL/SILENCE/MESSAGE SEQUENCE TIMING	C.5.2				X	X	X	X
MESSAGE SYNCHRONISATION TESTING (option with requirements)	C.5.3				X	X	X	X
General remark: A certification body may require additional functions. Mutual recognition requires that these functions are included in the sounder submitted to environmental testing.								

Sounders								
Tests according to EN54-3: 2014 + A1: 2019	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
DURATION OF OPERATION	4.2.1 (5.2.1)		✓		X	X	X	X
PROVISION OF EXTERNAL CONDUCTORS	4.2.2 (5.2.2)				X	X	X	X
FLAMMABILITY OF MATERIALS	4.2.3 (5.2.3)				X	X	X	X
ENCLOSURE PROTECTION	4.2.4 (5.2.4)				X	X	X	X
ACCESS	4.2.5 (5.2.5)				X	X	X	X
MANUFACTURERS ADJUSTMENT	4.2.6 (5.2.6)				X	X	X	X
ONSITE ADJUSTMENT OF THE OPERATION MODE	4.2.7 (5.2.7)				X	X	X	X
SOFTWARE CONTROLLED SOUNDERS	4.2.8 (5.2.8)				X	X	X	X
SOUND PRESSURE LEVEL	4.3.1 (5.3.1)		✓		X	X	X	X
FREQUENCIES AND SOUND PATTERN	4.3.2 (5.3.2)		✓		X	X	X	X
SYNCHRONISATION	4.3.3 (5.3.3)		✓		X	X	X	X
PERFORMANCE OF VOICE SOUNDERS	4.3.4 (5.3.4)		✓		X	X	X	X
VOICE SOUNDERS SEQUENCE TIMING	4.3.5 (5.3.5)		✓		X	X	X	X
DRY HEAT (operational)	4.4.1.1 (5.4.1.1)		✓		X	X	X	X
DRY HEAT (endurance)	4.4.1.2 (5.4.1.2)				X	X	X	X
COLD (operational)	4.4.1.3 (5.4.1.3)		✓		X	X	X	X
DAMP HEAT, CYCLIC (operational)	4.4.2.1 (5.4.2.1)				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	4.4.2.2 (5.4.2.2)				X	X	X	X
DAMP HEAT, CYCLIC (endurance)	4.4.2.3 (5.4.2.3)				X	X	X	X
SHOCK (operational)	4.4.3.1 (5.4.3.1)				X	X	X	X
IMPACT (operational)	4.4.3.2 (5.4.3.2)				X	X	X	X
VIBRATION ,SINUSOIDAL (operational)	4.4.3.3 (5.4.3.3)				X	X	X	X
VIBRATION ,SINUSOIDAL (endurance)	4.4.3.4 (5.4.3.4)				X	X	X	X
SO_2 CORROSION (endurance)	4.4.4.1 (5.4.4.1)				X	X	X	X
EMC IMMUNITY (operational)	4.4.5.1 (5.4.5.1)				X	X	X	X
General remark: A certification body may require additional functions. Mutual recognition requires that these functions are included in the sounder submitted to environmental testing.								

Power Supply Equipment								
Tests according to EN54-4: 1997 + A1: 2002 + A2: 2006	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
GENERAL REQUIREMENTS	4		✓		X	X	X	X
FUNCTIONS	5		✓		X	X	X	X
MATERIALS; DESIGN AND MANUFACTURE	6		✓		X	X	X	X
DOCUMENTATION	7							
MARKING	8							
FUNCTIONAL TESTS	9.2		✓		X	X	X	X
TEST OF THE CHARGER AND THE STANDBY POWER SOURCE	9.3		✓		X	X	X	X
COLD (operational)	9.5		✓		X	X	X	X
DAMP HEAT ,STEADY STATE (operational)	9.6		✓		X	X	X	X
IMPACT (operational)	9.7				X	X	X	X
VIBRATION, SINUSOIDAL (operational)	9.8				X	X	X	X
ELECTROSTATIC DISCHARGE (operational)	9.9				X	X	X	X
RADIATED ELECTROMAGNETIC FIELDS (operational)	9.9				X	X	X	X
CONDUCTED DISTURBANCES INDUCED BY ELECTROMAGNETIC FIELDS (operational)	9.9				X	X	X	X
FAST TRANSIENT BURSTS (operational)	9.9				X	X	X	X
SLOW HIGH ENERGY VOLTAGE SURGES (operational)	9.9				X	X	X	X
DAMP HEAT STEADY STATE (endurance)	9.14				X	X	X	X
VIBRATION, SINUSOIDAL (endurance)	9.15				X	X	X	X

General remark:
A certification body may require additional functions (e.g. deep discharge protection for the batteries). Mutual recognition requires that these functions are included in the p.s.e. submitted to environmental testing.

Resettable Heat Detector								
Tests according to EN54-5: 2017 + A1: 2018	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
POSITION OF HEAT SENSITIVE ELEMENT	4.2.1 (5.2.1)		✓		X	X	X	X
INDIVIDUAL ALARM INDICATION	4.2.2 (5.2.2)		✓		X	X	X	X
CONNECTION OF ANCILLARY DEVICES	4.2.3 (5.2.3)		✓		X	X	X	X
MONITORING OF ATTACHABLE DETECTOR	4.2.4 (5.2.4)		✓		X	X	X	X
MANUFACTURER´S ADJUSTMENTS	4.2.5 (5.2.5)		✓		X	X	X	X
ON-SITE- ADJUSTMENT OF RESPONSE BEHAVIOUR	4.2.6 (5.2.6)		✓		X	X	X	X
SOFTWARE CONTROLLED DETECTOR	4.2.7 (5.2.7)		✓		X	X	X	X
DIRECTIONAL DEPENDENCE	4.3.1 (5.3.1)		✓		X	X	X	X
STATIC RESPONSE TEMPERATURE	4.3.2 (5.3.2)		✓		X	X	X	X
RESPONSE TIMES FROM TYP. APPLICATION TEMPERATURE	4.3.3 (5.3.3)		✓		X	X	X	X
RESPONSE TIMES FROM 25°C	4.3.4 (5.3.4)		✓		X	X	X	X
RESPONSE TIMES FOR HIGH AMBIENT TEMPERATURE	4.3.5 (5.3.5)		✓		X	X	X	X
REPRODUCIBILITY	4.3.6 (5.3.6)		✓		X	X	X	X
ADD. TEST FOR SUFFIX S DETECTORS	4.4.1 (5.4.1)		✓		X	X	X	X
ADD. TEST FOR SUFFIX R DETECTORS	4.4.2 (5.4.2)		✓		X	X	X	X
VARIATION IN SUPPLY PARAMETERS	4.5.1 (5.5.1)		✓		X	X	X	X
COLD (operational)	4.6.1.1 (5.6.1.1)				X	X	X	X
DRY HEAT (endurance)	4.6.1.2 (5.6.1.2)				X	X	X	X
DAMP HEAT, Cyclic (operational)	4.6.2.1 (5.6.2.1)				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	4.6.2.2 (5.6.2.2)				X	X	X	X
SO_2 CORROSION (endurance)	4.6.3 (5.6.3)				X	X	X	X
SHOCK (operational)	4.6.4.1 (5.6.4.1)				X	X	X	X
IMPACT (operational)	4.6.4.2 (5.6.4.2)				X	X	X	X
VIBRATION ,SINUSOIDAL (operational)	4.6.4.3 (5.6.4.3)				X	X	X	X
VIBRATION ,SINUSOIDAL (endurance)	4.6.4.4 (5.6.4.4)				X	X	X	X
ELECTROMAGNETIC COMPATIBILITY (EMC) IMMUNITY (operational)	4.6.5 (5.6.5)				X	X	X	X

Optical & Ionization Smoke Detectors								
Tests according to EN54-7: 2018	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
INDIVIDUAL ALARM INDICATION	4.2.1 (5.2.1)		✓		X	X	X	X
CONNECTION OF ANCILLARY DEVICES	4.2.2 (5.2.2)		✓		X	X	X	X
MONITORING OF ATTACHABLE DETECTORS	4.2.3 (5.2.3)		✓		X	X	X	X
MANUFACTURER´S ADJUSTMENTS	4.2.4 (5.2.4)		✓		X	X	X	X
ON-SITE- ADJUSTMENT OF RESPONSE BEHAVIOUR	4.2.5 (5.2.5)		✓		X	X	X	X
PROTECTION AGAINST THE INGRESS OF FOREIGN BODIES	4.2.6 (5.2.6)	(2)	✓		X	X	X	X
RESPONSE TO SLOWLY DEVELOPING FIRES	4.2.7 (5.2.7)		✓		X	X	X	X
SOFTWARE CONTROLLED DETECTORS	4.2.8 (5.2.8)		✓		X	X	X	X
REPEATABILITY	4.3.1 (5.3.1)		✓		X	X	X	X
DIRECTIONAL DEPENDENCE	4.3.2 (5.3.2)	(2)	✓		X	X	X	X
REPRODUCIBILITY	4.3.3 (5.3.3)		✓		X	X	X	X
AIR MOVEMENT	4.4.1 (5.4.1)		✓		X	X	X	X
DAZZLING	4.4.2 (5.4.2)	(1) (2)	✓		X	X	X	X
VARIATIONS IN SUPPLY PARAMETERS	4.5 (5.5)		✓		X	X	X	X
FIRE SENSITIVITY	4.6 (5.6)		✓		X	X	X	X
COLD (operational)	4.7.1.1 (5.7.1.1)				X	X	X	X
DRY HEAT (operational)	4.7.1.2 (5.7.1.2)		✓		X	X	X	X
DAMP HEAT, STEADY STATE (operational)	4.7.2.1 (5.7.2.1)				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	4.7.2.2 (5.7.2.2)				X	X	X	X
SO_2 CORROSION (endurance)	4.7.3 (5.7.3)				X	X	X	X
SHOCK (operational)	4.7.4.1 (5.7.4.1)				X	X	X	X
IMPACT (operational)	4.7.4.2 (5.7.4.2)				X	X	X	X
VIBRATION ,SINUSOIDAL (operational)	4.7.4.3 (5.7.4.3)				X	X	X	X
VIBRATION ,SINUSOIDAL (endurance)	4.7.4.4 (5.7.4.4)				X	X	X	X
ELECTROMAGNETIC COMPATIBILITY (EMC) IMMUNITY (operational)	4.7.5 (5.7.5)				X	X	X	X

(1) only for optical detectors
(2) mutual agreement only for closed detectors

Flame Detectors								
Tests according to EN54-10: 2002 + A1: 2005	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
GENERAL REQUIREMENTS	4		✓					
REPRODUCIBILITY	5.2		✓					
REPEATABILITY	5.3		✓					
DIRECTIONAL DEPENDENCE	5.4		✓					
FIRE SENSITIVITY	5.5		✓					
DAZZLING (operational)	5.6		✓		X	X	X	X
DRY HEAT (operational)	5.7				X	X	X	X
COLD (operational)	5.8				X	X	X	X
DAMP HEAT CYCLIC (operational)	5.9				X	X	X	X
DAMP HEAT STEADY STATE (endurance)	5.10				X	X	X	X
SO_2 CORROSION (endurance)	5.11				X	X	X	X
SHOCK (operational)	5.12				X	X	X	X
IMPACT (operational)	5.13				X	X	X	X
VIBRATION (operational)	5.14				X	X	X	X
VIBRATION (endurance)	5.15				X	X	X	X
VARIATION IN SUPPLY PARAMETERS	5.16		✓					
ELECTROSTATIC DISCHARGE (operational)	5.17				X	X	X	X
RADIATED ELECTROMAGNETIC FIELDS (operational)	5.17				X	X	X	X
CONDUCTED DISTURBANCES INDUCED BY ELECTROMAGNETIC FIELDS (operational)	5.17				X	X	X	X
FAST TRANSIENT BURSTS (operational)	5.17				X	X	X	X
SLOW HIGH ENERGY VOLTAGE SURGES (operational)	5.17				X	X	X	X
MARKING	6							

Manual Call Points								
Tests according to EN54-11: 2001 + A1: 2005	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
GENERAL REQUIREMENTS	4		✓		X	X	X	X
OPERATIONAL PERFORMANCE TEST	5.2		✓		X	X	X	X
FUNCTION TEST	5.3		✓		X	X	X	X
TEST FACILITY TEST (operational)	5.4		✓		X	X	X	X
RELIABILITY TEST (endurance)	5.5		✓		X	X	X	X
VARIATION IN SUPPLY PARAMETERS	5.6		✓		X	X	X	X
DRY HEAT (operational)	5.7				X	X	X	X
DRY HEAT (endurance)	5.8				X	X	X	X
COLD (operational)	5.9				X	X	X	X
DAMP HEAT, CYCLIC (operational)	5.10				X	X	X	X
DAMP HEAT, CYCLIC (endurance)	5.11				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	5.12				X	X	X	X
SO_2 CORROSION (endurance)	5.13				X	X	X	X
SHOCK (operational)	5.14				X	X	X	X
IMPACT (operational)	5.15				X	X	X	X
VIBRATION ,SINUSOIDAL (operational)	5.16				X	X	X	X
VIBRATION ,SINUSOIDAL (endurance)	5.17				X	X	X	X
ELECTROSTATIC DISCHARGE (operational)	5.18				X	X	X	X
RADIATED ELECTROMAGNETIC FIELDS (operational)	5.18				X	X	X	X
CONDUCTED DISTURBANCES INDUCED BY ELECTROMAGNETIC FIELDS (operational)	5.18				X	X	X	X
FAST TRANSIENT BURSTS (operational)	5.18				X	X	X	X
SLOW HIGH ENERGY VOLTAGE SURGES (operational)	5.18				X	X	X	X
ENCLOSURE PROTECTION	5.19				X	X	X	X

Smoke Detectors – Line Detectors using optical light beam								
Tests according to EN54-12: 2015	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
OPERATIONAL RELIABILITY	4.2 / 5.2		✓		X	X	X	X
REPRODUCIBILITY	4.3.1 (5.3.1)		✓					
REPEATABILITY	4.3.2 (5.3.2)		✓					
TOLERANCE TO BEAM MISALIGNMENT	4.3.3 (5.3.3)		✓		X	X	X	X
RAPID CHANGES IN ATTENUATION	4.3.4 (5.3.4)		✓		X	X	X	X
RESPONSE TO SLOWLY DEVELOPING FIRES	4.3.5 (5.3.5)		✓		X	X	X	X
OPTICAL PATH LENGTH DEPENDENCE	4.3.6 (5.3.6)		✓		X	X	X	X
STRAY LIGHT	4.3.7 (5.3.7)		✓					
VARIATION OF SUPPLY PARAMETERS	4.4 (5.4)		✓					
FIRE SENSITIVITY	4.5.1 (5.5.1)		✓		X	X	X	X
DRY HEAT (operational)	4.6.1.1 (5.6.1.1)				X	X	X	X
COLD (operational)	4.6.1.2 (5.6.1.2)				X	X	X	X
DAMP HEAT; STEADY STATE (operational)	4.6.2.1 (5.6.2.1)				X	X	X	X
DAMP HEAT (endurance)	4.6.2.2 (5.6.2.2)				X	X	X	X
VIBRATION (endurance)	4.6.3.1 (5.6.3.1)				X	X	X	X
IMPACT (operational)	4.6.3.2 (5.6.3.2)				X	X	X	X
ELECTROMAGNETIC COMPATIBILITY (EMC), IMMUNITY TESTS (operational)	4.6.4 (5.6.4)				X	X	X	X
SO_2 CORROSION (endurance)	4.6.5 (5.6.5)				X	X	X	X

Short Circuit Isolators								
Tests according to EN54-17: 2005 + AC: 2007	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
REQUIREMENTS	4		✓		X	X	X	X
FUNCTIONAL TEST	5.1.5		✓		X	X	X	X
REPRODUCIBILITY	5.2		✓		X	X	X	X
VARIATION IN SUPPLY VOLTAGE	5.3		✓		X	X	X	X
DRY HEAT (operational)	5.4				X	X	X	X
COLD (operational)	5.5				X	X	X	X
DAMP HEAT, CYCLIC (operational)	5.6				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	5.7				X	X	X	X
SO_2 CORROSION (endurance)	5.8				X	X	X	X
SHOCK (operational)	5.9				X	X	X	X
IMPACT (operational)	5.10				X	X	X	X
VIBRATION ,SINUSOIDAL (operational)	5.11				X	X	X	X
VIBRATION ,SINUSOIDAL (endurance)	5.12				X	X	X	X
ELECTROSTATIC DISCHARGE (operational)	5.13				X	X	X	X
RADIATED ELECTROMAGNETIC FIELDS (operational)	5.13				X	X	X	X
CONDUCTED DISTURBANCES INDUCED BY ELECTROMAGNETIC FIELDS (operational)	5.13				X	X	X	X
FAST TRANSIENT BURSTS (operational)	5.13				X	X	X	X
SLOW HIGH ENERGY VOLTAGE SURGES (operational)	5.13				X	X	X	X
Considering that the complexity and functioning of short-circuit isolators can vary significantly, certification bodies (CB) and associated testing laboratories (ATL) need to consult all other CB and ATL prior to undertaking the tests work. Otherwise, testing may be repeated with other CBs.								

Input / Output Devices								
Tests according to EN54-18: 2005 + AC: 2007	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
REQUIREMENTS	4		✓		X	X	X	X
FUNCTIONAL TEST	5.1.4		✓		X	X	X	X
PERFORMANCE AND VARIATION OF SUPPLY PARAMETERS	5.2		✓		X	X	X	X
DRY HEAT (operational)	5.3				X	X	X	X
COLD (operational)	5.4				X	X	X	X
DAMP HEAT, CYCLIC (operational)	5.5				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	5.6				X	X	X	X
SO_2 CORROSION (endurance)	5.7				X	X	X	X
SHOCK (operational)	5.8				X	X	X	X
IMPACT (operational)	5.9				X	X	X	X
VIBRATION ,SINUSOIDAL (operational)	5.10				X	X	X	X
VIBRATION ,SINUSOIDAL (endurance)	5.11				X	X	X	X
ELECTROSTATIC DISCHARGE (operational)	5.12				X	X	X	X
RADIATED ELECTROMAGNETIC FIELDS (operational)	5.12				X	X	X	X
CONDUCTED DISTURBANCES INDUCED BY ELECTROMAGNETIC FIELDS (operational)	5.12				X	X	X	X
FAST TRANSIENT BURSTS (operational)	5.12				X	X	X	X
SLOW HIGH ENERGY VOLTAGE SURGES (operational)	5.12				X	X	X	X
Considering that the complexity and functioning of input/output devices can vary significantly, certification bodies (CB) and associated testing laboratories (ATL) need to consult all other CB and ATL prior to undertaking the tests work. Otherwise, testing may be repeated with other CBs.								

Visual Alarm Devices								
Tests according to EN54-23: 2010	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
REQUIREMENTS	4		✓		X	X	X	X
REPRODUCIBILITY	5.1.7		✓		X	X	X	X
DURATION OF OPERATION	5.2.1		✓		X	X	X	X
ENCLOSURE PROTECTION	5.2.4				X	X	X	X
COVERAGE VOLUME	5.3.1		✓		X*	X*	X*	X*
VARIATION OF LIGHT OUTPUT	5.3.2		✓		X	X	X	X
SYNCHRONISATION (option with requirements)	5.3.7				X	X	X	X
DRY HEAT (operational)	5.4.1.1		✓		X	X	X	X
DRY HEAT (endurance)	5.4.1.2				X	X	X	X
COLD (operational)	5.4.1.3		✓		X	X	X	X
DAMP HEAT, CYCLIC (operational)	5.4.2.1				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	5.4.2.2				X	X	X	X
DAMP HEAT, CYCLIC (endurance)	5.4.2.3				X	X	X	X
SHOCK (operational)	5.4.3.1				X	X	X	X
IMPACT (operational)	5.4.3.2				X	X	X	X
VIBRATION ,SINUSOIDAL (operational)	5.4.3.3				X	X	X	X
VIBRATION ,SINUSOIDAL (endurance)	5.4.3.4				X	X	X	X
SO_2 CORROSION (endurance)	5.4.4				X	X	X	X
ELECTROSTATIC DISCHARGE (operational)	5.4.5				X	X	X	X
RADIATED ELECTROMAGNETIC FIELDS (operational)	5.4.5				X	X	X	X
CONDUCTED DISTURBANCES INDUCED BY ELECTROMAGNETIC FIELDS (operational)	5.4.5				X	X	X	X
FAST TRANSIENT BURSTS (operational)	5.4.5				X	X	X	X
SLOW HIGH ENERGY VOLTAGE SURGES (operational)	5.4.5				X	X	X	X

*Only for VAD based on LED technology.

General remark:
A certification body may require additional functions. Mutual recognition requires that these functions are included in the VAD submitted to environmental testing.

Multi-Sensor Fire Detectors								
Tests according to EN54-29: 2015	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
INDIVIDUAL ALARM INDICATION	4.2.1				X	X	X	X
RESPONSE TO SLOWLY DEVELOPING FIRES	4.2.2		✓		X	X	X	X
REPEATABILITY OF SMOKE RESPONSE	4.2.3		✓		X	X	X	X
DIRECTIONAL DEPENDENCE OF SMOKE RESPONSE	4.2.4		✓		X	X	X	X
DIRECTIONAL DEPENDENCE OF HEAT RESPONSE	4.2.5		✓		X	X	X	X
LOWER LIMIT OF HEAT RESPONSE	4.2.6		✓		X	X	X	X
REPRODUCIBILITY OF SMOKE RESPONSE	4.2.7		✓		X	X	X	X
REPRODUCIBILITY OF HEAT RESPONSE	4.2.8		✓		X	X	X	X
AIR MOVEMENT	4.2.9		✓		X	X	X	X
DAZZLING	4.2.10	(1)	✓		X	X	X	X
CONNECTION OF ANCILLARY DEVICES	4.3.1				X	X	X	X
MONITORING OF DETACHABLE DETECTORS	4.3.2				X	X	X	X
MANUFACTURER´S ADJUSTMENTS	4.3.3				X	X	X	X
ON-SITE ADJUSTMENT OF RESPONSE BEHAVIOUR	4.3.4				X	X	X	X
PROTECTION AGAINST THE INGRESS OF FOREIGN BODIES	4.3.5				X	X	X	X
SOFTWARE CONTROLLED DETECTORS	4.3.6		✓		X	X	X	X
VARIATION IN SUPPLY PARAMETERS	4.4.1		✓		X	X	X	X
FIRE SENSITIVITY	4.5.1		✓		X	X	X	X
DRY HEAT (operational)	4.6.1.1		✓		X	X	X	X
COLD (operational)	4.6.1.2				X	X	X	X
DAMP HEAT, CYCLIC (operational)	4.6.2.1				X	X	X	X
DAMP HEAT, STEADY STATE (endurance)	4.6.2.2				X	X	X	X
SHOCK (operational)	4.6.3.1				X	X	X	X
IMPACT (operational)	4.6.3.2				X	X	X	X
VIBRATION, SINUSOIDAL (operational)	4.6.3.3				X	X	X	X
VIBRATION, SINUSOIDAL (endurance)	4.6.3.4				X	X	X	X
EMC, IMMUNITY (operational)	4.6.4.1				X	X	X	X
SO_2 CORROSION (endurance)	4.6.5.1				X	X	X	X
(1) only for optical detectors								

Smoke alarm devices								
Tests according to EN 14604:2005 + AC:2008	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
GENERAL REQUIREMENTS	4		✓		X	X	X	X
REPEATABILITY	5.2		✓		X	X	X	X
DIRECTIONAL DEPENDENCE	5.3		✓		X	X	X	X
INITIAL SENSITIVITY	5.4		✓		X	X	X	X
AIR MOVEMENT	5.5		✓		X	X	X	X
DAZZLING	5.6	(1)	✓		X	X	X	X
DRY HEAT	5.7		✓		X	X	X	X
COLD (operational)	5.8				X	X	X	X
DAMP HEAT (operational)	5.9				X	X	X	X
SO_2 CORROSION (endurance)	5.10				X	X	X	X
IMPACT (operational)	5.11				X	X	X	X
VIBRATION ,SINUSOIDAL (operational)	5.12				X	X	X	X
VIBRATION ,SINUSOIDAL (endurance)	5.13				X	X	X	X
MAINS SUPPLY VOLTAGE DIPS AND SHORT INTERRUPTIONS	5.14				X	X	X	X
ELECTROSTATIC DISCHARGE (operational)	5.14				X	X	X	X
RADIATED ELECTROMAGN. FIELDS (operational)	5.14				X	X	X	X
CONDUCTED DISTURBANCES INDUCED BY ELECTROMAGNETIC FIELDS (operational)	5.14				X	X	X	X
FAST TRANSIENT BURSTS (operational)	5.14				X	X	X	X
SLOW HIGH ENERGY VOLT. SURGES (operational)	5.14				X	X	X	X
FIRE SENSITIVITY	5.15		✓		X	X	X	X
BATTERY FAULT WARNING	5.16				X	X	X	X
SOUND OUTPUT	5.17		✓		X	X	X	X
SOUNDER DURABILITY	5.18				X	X	X	X
INTER-CONNECTABLE SMOKE ALARMS	5.19				X	X	X	X
ALARM SILENCE FACILITY	5.20				X	X	X	X
VARIATION IN SUPPLY VOLTAGE	5.21				X	X	X	X
POLARITY REVERSAL	5.22				X	X	X	X
BACK-UP POWER SOURCE	5.23				X	X	X	X
ELECTRICAL SAFETY	5.24				X	X	X	X

(1) only for optical detectors

General remark:

A certification body may require additional functions. Mutual recognition requires that these functions are included in the detector submitted to environmental testing.

Manual triggering and stop devices for Gas extinguishing systems (limited to electrical devices with EN 54-11 design)								
Tests according to EN 12094-3: 2003	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
ELECTRICAL TRIGGERING DEVICES	4.1.1		✓		X	X	X	X
ELECTRICAL STOP DEVICES	4.1.2		✓		X	X	X	X
DOCUMENTATION	4.3							
TESTS	5.1		✓		X	X	X	X
RESISTANCE TO OVERLOAD FOR STOP DEVICES	5.3		✓		X	X	X	X
MARKING	6							

Power Supplies for Smoke and heat control systems (limited to electrical power supplies with batteries)								
Tests according to EN 12101-10: 2005 + AC: 2007	**Clause**	**Notes**	**Key Performance Tests**	**Certification Bodies**				
					AFNOR Certification	**BRE**	**DBI Certification**	**VdS**
GENERAL REQUIREMENTS (electrical), General	4.1		✓		X	X	X	X
GENERAL REQUIREMENTS (electrical), Batteries	4.2		✓		X	X	X	X
POWER SUPPLY FROM THE PRIMARY POWER SOURCE (electrical)	6.1		✓		X	X	X	X
POWER SUPPLY FROM SECONDARY POWER SOURCE (battery)	6.2		✓		X	X	X	X
RECOGNITION AND INDICATION OF FAULTS (electrical)	6.4				X	X	X	X
MATERIALS, DESIGN & MANUFACTURE – Mechanical Design	7.1				X	X	X	X
MATERIALS, DESIGN & MANUFACTURE – Electrical Design	7.2				X	X	X	X
CLASSIFICATION	8				X	X	X	X
DOCUMENTATION	9							
MARKING	10							
COLD (operational)	12.4		✓		X	X	X	X
DAMP HEAT ,STEADY STATE (operational)	12.5		✓		X	X	X	X
IMPACT (operational)	12.6				X	X	X	X
VIBRATION, SINUSOIDAL (operational)	12.7				X	X	X	X
DAMP HEAT STEADY STATE (endurance)	12.8				X	X	X	X
VIBRATION, SINUSOIDAL (endurance)	12.9				X	X	X	X
DRY HEAT (operational)	12.10		✓		X	X	X	X
SO_2 CORROSION	12.11				X	X	X	X
SALT SPRAY TESTING	12.12				X	X	X	X
PROTECTION AGAINST WATER	12.13				X	X	X	X
PROTECTION AGAINST SOLID FOREIGN OBJECTS	12.14				X	X	X	X
EMC IMMUNITY TESTS (operational)	12.15				X	X	X	X
General remark: A certification body may require additional functions (e.g. deep discharge protection for the batteries). Mutual recognition requires that these functions are included in the p.s.e. submitted to environmental testing.								