



Product Service

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June 5, 2014

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## Prüfbericht / Test Report

**Nr. / No. 70464-37516-1 (Edition 1)**

Auftraggeber <i>Applicant</i>	<b>Weatherdock AG Germany</b>
Geräteart <i>Type of equipment</i>	<b>AIS Transmitter</b>
Typenbezeichnung <i>Type designation</i>	<b>easyONE (AIS-MOB)</b>
Auftragsnummer / <i>Order No.</i>	<b>1985</b>
Prüfgrundlage <i>Test standards</i>	<b>EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 + AC:2011</b>

TEST REPORT	
IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006 Information technology equipment – Safety – Part 1: General requirements	
Report Reference No.....:	70464-37516-1
Date of issue.....:	June 5, 2014
Total number of pages.....	27
Testing Laboratory.....:	TÜV SÜD Product Service GmbH
Address .....	Äußere Frühlingsstr. 45, D-94315 Straubing, Germany
Applicant's name .....	Weatherdock AG Germany
Address .....	Sigmundstraße 180, D-90431 Nürnberg, Germany
Test specification:	
Standard .....	<input type="checkbox"/> IEC 60950-1:2005 (2nd Edition) and/or <input checked="" type="checkbox"/> EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 + AC:2011
Test procedure .....	standard
Non-standard test method.....:	N/A
Test Report Form No.....:	IECEN60950_1C
Test Report Form(s) Originator .....	SGS Fimko Ltd
Master TRF.....:	Dated 2007-06
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This report is not valid as a CCA Test Report unless signed by an approved CCA Testing Laboratory and appended to a CCA Test Certificate issued by an NCB in accordance with CCA	
Test item description .....	AIS Transmitter
Trade Mark .....	
Manufacturer .....	Weatherdock AG Germany
Model/Type reference.....:	easyONE (AIS-MOB)
Ratings.....:	powered by internal battery (CR2) 2 x 3 V DC max. operating temperature of EUT: -20 °C to +55 °C

### Testing procedure and testing location:

☒ Testing Laboratory: TÜV SÜD Product Service GmbH  
Testing location/ address.....: Äußere Frühlingsstr. 45, D-94315 Straubing, Germany  
  
Tested by (name+ signature).....: Stefan Weiherer  
  
Approved by (name + signature) .: Johann Roidt



### Summary of testing:

The equipment under test in accordance with the conditions of acceptability complies with the requirements.

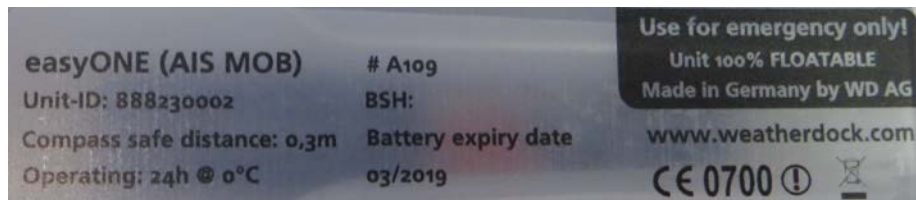
#### Conditions of Acceptability:

- In order to verify, if a component is already tested according to the applicable standard (IEC) following information-sources are accepted, in agreement with the customer: Copies of the type approval test certificate, markings on a component, brochures and prospectus from the manufacturer of the component, declarations of conformity from the manufacturer of the component, and information from the customer; all information the test-laboratory receives will not be verified.
- This test does not cover tests concerning an IP class according to IEC 60529.
- All safety instructions and equipment marking has to be in the language which is acceptable in the country in which the equipment is to be installed. Documentation, intended for service persons only, is permitted to be in English language only, except Germany where also this information has to be in the German language, too. The safety instructions are not evaluated in this report.
- A marking close to the battery or a statement in the servicing instructions with following or similar text:

CAUTION  
RISK OF EXPLOSION IF BATTERY IS REPLACED  
BY AN INCORRECT TYPE.  
DISPOSE OF USED BATTERIES ACCORDING  
TO THE INSTRUCTIONS

Tests performed (name of test and test clause):  EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 + AC:2011:  all	Testing location:  TÜV SÜD Product Service GmbH, Äussere Frühlingstraße 45, 94315 Straubing, Germany		
Summary of compliance with National Differences:			
<input checked="" type="checkbox"/> CENELEC common modifications	<input checked="" type="checkbox"/> United Kingdom	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Finland	<input checked="" type="checkbox"/> Denmark	<input checked="" type="checkbox"/> Ireland	<input type="checkbox"/>
<input checked="" type="checkbox"/> Sweden	<input checked="" type="checkbox"/> Germany	<input checked="" type="checkbox"/> Spain	<input type="checkbox"/>
<input checked="" type="checkbox"/> Norway	<input checked="" type="checkbox"/> Switzerland	<input type="checkbox"/>	<input type="checkbox"/>

Copy of marking plate



Test item particulars .....	
Equipment mobility .....	<input checked="" type="checkbox"/> movable <input checked="" type="checkbox"/> hand-held <input checked="" type="checkbox"/> transportable <input type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains .....	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input checked="" type="checkbox"/> not directly connected to the mains
Operating condition .....	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location .....	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC) .....	<input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values .....	---
Tested for IT power systems .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IT testing, phase-phase voltage (V) .....	---
Class of equipment .....	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input checked="" type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating (A) .....	---
Pollution degree (PD) .....	<input type="checkbox"/> PD 1 <input type="checkbox"/> PD 2 <input checked="" type="checkbox"/> PD 3
IP protection class .....	ordinary
Altitude during operation (m) .....	≤ 2000
Altitude of test laboratory (m) .....	322
Mass of equipment (kg) .....	<1
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 .....	March 03, 2014
Date(s) of performance of tests .....	March 12 – June 03, 2014

#### 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.

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

Throughout this report a comma (point) is used as the decimal separator.

#### General product information:

Automatic Identification System (AIS) Transmitter integrated in life jackets.

Once activated they transmit the current GPS position of the victim in distress directly to all AIS receivers within range.



1	GENERAL	
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1.5	Components		P
1.5.1	General		P
	Comply with IEC 60950-1 or relevant component standard	Components, which were found to affect safety aspects, comply with the requirements of this standard or within the safety aspects of the relevant IEC component standards.(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components	Components, which are certified to IEC and/or national standards, are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal controls	no thermal controls	N/A
1.5.4	Transformers		N/A
1.5.5	Interconnecting cables		N/A
1.5.6	Capacitors bridging insulation		N/A
1.5.7	Resistors bridging insulation		N/A
1.5.8	Components in equipment for IT power systems		N/A
1.5.9	Surge suppressors		N/A

1.6	Power interface		N/A
1.6.1	AC power distribution systems		N/A
1.6.2	Input current	(see appended table 1.6.2)	N/A
1.6.3	Voltage limit of hand-held equipment	6 V DC, (2 x 3 V battery)	N/A
1.6.4	Neutral conductor		N/A

1.7	Marking and instructions		P
1.7.1	Power rating	Powered by internal battery. No connection to a.c. or d.c. mains supply.	P
	Rated voltage(s) or voltage range(s) (V) .....		N/A
	Symbol for nature of supply, for d.c. only .....		N/A
	Rated frequency or rated frequency range (Hz) ....		N/A



	Rated current (mA or A) .....		N/A
	Manufacturer's name or trade-mark or identification mark .....	WD AG	P
	Model identification or type reference .....	easyONE (AIS MOB)	P
	Symbol for Class II equipment only .....	Class III equipment	N/A
	Other markings and symbols .....	Additional symbols or markings do not give rise to misunderstanding.	P
1.7.2	Safety instructions and marking	Please refer to conditions of acceptability	P
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N/A
1.7.4	Supply voltage adjustment .....	No voltage/frequency setting.	N/A
1.7.5	Power outlets on the equipment .....	No power outlets existing.	N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) .....		N/A
1.7.7	Wiring terminals		N/A
1.7.8	Controls and indicators		P
1.7.9	Isolation of multiple power sources .....		N/A
1.7.10	Thermostats and other regulating devices .....	No thermostats or other regulating devices existing	N/A
1.7.11	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 s and then again for 15 s with the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling or lifting of the label edge.	P
1.7.12	Removable parts	No required markings placed on removable parts.	N/A
1.7.13	Replaceable batteries .....	Service area – please refer to conditions of acceptability	N/A
	Language(s) .....		—
1.7.14	Equipment for restricted access locations .....	The unit is not intended to be used in restricted locations	N/A

2	PROTECTION FROM HAZARDS	P
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2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas		P
2.1.2	Protection in service access areas	No maintenance work in operation mode necessary.	P
2.1.3	Protection in restricted access locations	The unit is not intended to be used in restricted locations	N/A

2.2	SELV circuits		P
2.2.1	General requirements		P
2.2.2	Voltages under normal conditions (V) .....	6 V DC (2 x 3 V)	P
2.2.3	Voltages under fault conditions (V) .....		P
2.2.4	Connection of SELV circuits to other circuits .....	No connection to other circuits. Only SELV circuits inside the EUT.	P

2.3	TNV circuits	no TNV-circuits existing	N/A
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2.4	Limited current circuits		N/A
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2.5	Limited power sources		P
	a) Inherently limited output	2 x CR2 battery	P
	b) Impedance limited output		N/A
	c) Regulating network limited output under normal operating and single fault condition		N/A
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA) .....	2 V, 8A, for 5 seconds After 40 seconds: 0.2 V, max. 5 A, 1 VA	—
	Current rating of overcurrent protective device (A) ..		—

2.6	Provisions for earthing and bonding		N/A
2.6.1	Protective earthing	No protective or functional earthing existing.	N/A
2.6.2	Functional earthing		N/A
2.6.3	Protective earthing and protective bonding conductors		N/A
2.6.4	Terminals		N/A
2.6.5	Integrity of protective earthing		N/A

2.7	Overcurrent and earth fault protection in primary circuits	N/A
2.8	Safety interlocks	N/A

2.9	Electrical insulation	P
2.9.1	Properties of insulating materials	N/A
2.9.2	Humidity conditioning	N/A
	Relative humidity (%), temperature (°C) ..... :	—
2.9.3	Grade of insulation	functional
2.9.4	Separation from hazardous voltages	P
	Method(s) used ..... :	—

2.10	Clearances, creepage distances and distances through insulation	P
2.10.1	General	P
2.10.1.1	Frequency ..... :	P
2.10.1.2	Pollution degrees ..... :	pollution degree 2
2.10.1.3	Reduced values for functional insulation	functional insulation, clause 5.3.4 c)
2.10.1.4	Intervening unconnected conductive parts	P
2.10.1.5	Insulation with varying dimensions	N/A
2.10.1.6	Special separation requirements	N/A
2.10.1.7	Insulation in circuits generating starting pulses	N/A
2.10.2	Determination of working voltage	N/A
2.10.3	Clearances	P
2.10.3.1	General	P
2.10.3.2	Mains transient voltages	N/A
2.10.3.3	Clearances in primary circuits	(see appended table 2.10.3 and 2.10.4)
2.10.3.4	Clearances in secondary circuits	(see appended table 2.10.3 and 2.10.4)
2.10.3.5	Clearances in circuits having starting pulses	(see appended table 2.10.3 and 2.10.4)
2.10.3.6	Transients from a.c. mains supply ..... :	Battery supply
2.10.3.7	Transients from d.c. mains supply ..... :	N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems ..... :	no telecommunication networks or cable distribution systems existing.
2.10.3.9	Measurement of transient voltage levels	N/A

2.10.4	Creepage distances		P
2.10.4.1	General		P
2.10.4.2	Material group and comparative tracking index		P
	CTI tests.....:	Material group IIIb is assumed to be used	—
2.10.4.3	Minimum creepage distances	(see appended table 2.10.3 and 2.10.4)	P
2.10.5	Solid insulation		N/A
2.10.6	Construction of printed boards		P
2.10.7	Component external terminations	(see appended table 2.10.3 and 2.10.4)	N/A
2.10.8	Tests on coated printed boards and coated components		N/A
2.10.9	Thermal cycling		N/A
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N/A
2.10.11	Tests for semiconductor devices and cemented joints		N/A
2.10.12	Enclosed and sealed parts		N/A

3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection		P
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges and heatsinks, which could damage the insulation and cause hazard.	P
3.1.3	Securing of internal wiring		P
3.1.4	Insulation of conductors	The insulation of the individual conductors is suitable for the application and the working voltage.	P
3.1.5	Beads and ceramic insulators		N/A
3.1.6	Screws for electrical contact pressure		N/A
3.1.7	Insulating materials in electrical connections		N/A
3.1.8	Self-tapping and spaced thread screws		N/A
3.1.9	Termination of conductors		N/A
	10 N pull test		N/A
3.1.10	Sleeving on wiring		N/A

3.2	Connection to a mains supply	N/A
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3.3	Wiring terminals for connection of external conductors	N/A
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3.4	Disconnection from the mains supply	N/A
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3.5	Interconnection of equipment		N/A
3.5.1	General requirements	No connection to other circuits. Internal battery.	N/A
3.5.2	Types of interconnection circuits ..... :		N/A
3.5.3	ELV circuits as interconnection circuits		N/A
3.5.4	Data ports for additional equipment	No data ports.	N/A

4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N/A
	Angle of 10°	Transportable, handheld equipment	N/A
	Test force (N) ..... :		N/A

4.2	Mechanical strength		P
4.2.1	General		P
4.2.2	Steady force test, 10 N	10N applied to components other than parts serving as an enclosure.	P
4.2.3	Steady force test, 30 N		N/A
4.2.4	Steady force test, 250 N	250N applied to outer enclosure. No energy or other hazards.	P
4.2.5	Impact test	Transportable, handheld equipment.	N/A
	Fall test		N/A
	Swing test		N/A
4.2.6	Drop test; height (mm) ..... :	1 000	P
4.2.7	Stress relief test		N/A
4.2.8	Cathode ray tubes	no CRT	N/A
	Picture tube separately certified ..... :	(see separate test report or attached certificate)	N/A
4.2.9	High pressure lamps	No high pressure lamp.	N/A

4.2.10	Wall or ceiling mounted equipment; force (N) .....:		N/A
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4.3	Design and construction		P
4.3.1	Edges and corners	Edges and corners are well rounded.	P
4.3.2	Handles and manual controls; force (N) .....:		N/A
4.3.3	Adjustable controls	None that would cause hazards.	N/A
4.3.4	Securing of parts		N/A
4.3.5	Connection by plugs and sockets		N/A
4.3.6	Direct plug-in equipment		N/A
4.3.7	Heating elements in earthed equipment	No heating elements.	N/A
4.3.8	Batteries		P
	- Overcharging of a rechargeable battery		N/A
	- Unintentional charging of a non-rechargeable battery	No connection to other circuits.	N/A
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		P
4.3.9	Oil and grease	not existing	N/A
4.3.10	Dust, powders, liquids and gases		N/A
4.3.11	Containers for liquids or gases		N/A
4.3.12	Flammable liquids .....:	no liquids	N/A
4.3.13	Radiation		N/A

4.4	Protection against hazardous moving parts		N/A
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4.5	Thermal requirements		P
4.5.1	General	Maximum operating temperature of EUT: -20 °C to +55 °C	P
4.5.2	Temperature tests		P
	Normal load condition per Annex L .....:		—
4.5.3	Temperature limits for materials	(see appended table 4.5)	P
4.5.4	Touch temperature limits	(see appended table 4.5)	P
4.5.5	Resistance to abnormal heat .....:	(see appended table 4.5.5)	N/A

4.6	Openings in enclosures		P
4.6.1	Top and side openings	No openings	N/A

4.6.2	Bottoms of fire enclosures	No fire enclosure necessary.	N/A
4.6.3	Doors or covers in fire enclosures		N/A
4.6.4	Openings in transportable equipment	No openings.	N/A
4.6.5	Adhesives for constructional purposes		N/A

4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame		P
	Method 1, selection and application of components wiring and materials	(see appended table 4.7)	P
	Method 2, application of all of simulated fault condition tests	Method 1 used.	N/A
4.7.2	Conditions for a fire enclosure	No fire enclosure necessary.	P
4.7.2.1	Parts requiring a fire enclosure		N/A
4.7.2.2	Parts not requiring a fire enclosure	PCB = V-0, powered by LPS	P
4.7.3	Materials		P
4.7.3.1	General		P
4.7.3.2	Materials for fire enclosures	No fire enclosure necessary.	N/A
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		N/A
4.7.3.5	Materials for air filter assemblies		N/A
4.7.3.6	Materials used in high-voltage components		N/A

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		N/A
5.1.1	General	Powered by internal battery.	N/A
5.1.2	Configuration of equipment under test (EUT)		N/A
5.1.3	Test circuit		N/A
5.1.4	Application of measuring instrument		N/A
5.1.5	Test procedure		N/A
5.1.6	Test measurements		N/A
	Supply voltage (V) .....		—
	Measured touch current (mA) .....		—
	Max. allowed touch current (mA) .....		—
	Measured protective conductor current (mA) .....		—
	Max. allowed protective conductor current (mA)....		—

5.1.7	Equipment with touch current exceeding 3,5 mA		N/A
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks		N/A

5.2	Electric strength		N/A
5.2.1	General	(see appended table 5.2)	N/A
5.2.2	Test procedure		N/A

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	N/A
5.3.2	Motors	(see appended Annex B)	N/A
5.3.3	Transformers	(see appended Annex C)	N/A
5.3.4	Functional insulation..... : c)		P
5.3.5	Electromechanical components		N/A
5.3.6	Audio amplifiers in ITE ..... : See separate test report IEC/EN 60065		N/A
5.3.7	Simulation of faults		P
5.3.8	Unattended equipment		N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions		P

6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
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7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N/A
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A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE	N/A
B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)	N/A
C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)	N/A
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)	N/A
E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)	N/A
F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)	N/A
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES	N/A
H	ANNEX H, IONIZING RADIATION (see 4.3.13)	N/A
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)	N/A
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)	N/A
L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)	N/A
M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)	N/A
N	ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)	N/A
P	ANNEX P, NORMATIVE REFERENCES	—
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)	N/A

R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES	N/A
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)	N/A
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)	N/A
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)	N/A
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)	N/A
W	ANNEX W, SUMMATION OF TOUCH CURRENTS	N/A
X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)	N/A
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)	N/A
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)	N/A
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)	N/A
BB	ANNEX BB, CHANGES IN THE SECOND EDITION	—
EN 60950-1:2006/A11:2009/A1:2010/A12:2011 – CENELEC COMMON MODIFICATIONS		
IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)		
ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS	—
ZB	SPECIAL NATIONAL CONDITIONS (EN)	P

1.5.1	TABLE: List of critical components					P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity <sup>1)</sup>	
PCB	East Circuits Technology Co., Ltd., various	various	DS, max. operating temperature: +130 °C, V-0	UL94	UL E344390	
Battery	Duracell Inc.	2 x Ultra CR2	2 x 3 V DC, CR17355, Lithium manganese dioxide battery, Max. operating temperature: -20 °C to +75 °C		UL MH12538	
Enclosure	Various	Various	HB or better	UL94	UL	
<sup>1)</sup> An asterisk indicates a mark which assures the agreed level of surveillance						
Supplementary information:						

1.6.2	TABLE: Electrical data (in normal conditions)					N/A
U (V)	I (A)	I <sub>rated</sub> (A)	P (W)	Fuse #	I <sub>fuse</sub> (A)	Condition/status
Supplementary information:						

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements						P
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)	
Functional:							
clause 5.3.4 c)							
Basic/supplementary:							
Reinforced:							
Supplementary information:							

2.10.5	TABLE: Distance through insulation measurements					N/A
Distance through insulation (DTI) at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)	
Supplementary information:						

4.3.8	TABLE: Batteries								P
The tests of 4.3.8 are applicable only when appropriate battery data is not available									
Is it possible to install the battery in a reverse polarity position?									
	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition									
Max. current during fault condition									
Test results:									Verdict
- Chemical leaks									
- Explosion of the battery									
- Emission of flame or expulsion of molten metal									
- Electric strength tests of equipment after completion of tests									
Supplementary information:									

4.5	TABLE: Thermal requirements						P
	Supply voltage (V) .....	6					—
	Ambient T <sub>min</sub> (°C) .....						—
	Ambient T <sub>max</sub> (°C) .....	55					—
Maximum measured temperature T of part/at::		T (°C)					Allowed T <sub>max</sub> (°C)
Ambient inside EUT		55					
enclosure		55					
Supplementary information:							
Temperature T of winding:	t <sub>1</sub> (°C)	R <sub>1</sub> (Ω)	t <sub>2</sub> (°C)	R <sub>2</sub> (Ω)	T (°C)	Allowed T <sub>max</sub> (°C)	Insulation class

Supplementary information:							

4.5.5	TABLE: Ball pressure test of thermoplastic parts			N/A
	Allowed impression diameter (mm) .....	≤ 2 mm		—
Part		Test temperature (°C)	Impression diameter (mm)	
Supplementary information:				

4.7	TABLE: Resistance to fire					P
Part		Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
please refer to table 1.5.1 – List of critical components						
Supplementary information:						

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests			N/A
Test voltage applied between:		Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
Functional:				
Basic/supplementary:				
Reinforced:				
Supplementary information:				

5.3	TABLE: Fault condition tests			P
	Ambient temperature (°C) .....: 22			—

	Power source for EUT: Manufacturer, model/type, output rating .....					2 x CR17345 battery	—
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation	
	SC	6	120 s			Pass, no hazard.	
	DC	6	120 s			Pass, no hazard.	
Supplementary information:							

**List of test equipment used:**

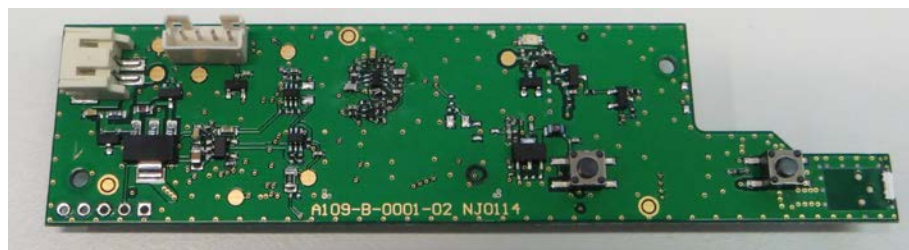
Measuring instrument	Inv. no.	Date
Mitutoyo, CD-15CP	1673	01/2013
Mitutoyo, 293-801	1674	01/2013
Weiss Umwelttechnik GmbH, WK11-340/70	1702	10/2012
Chroma ATE Inc., 6408-2	1706	
PTL Dr. Grabenhorst, P 10.48	1717	11/2012
PTL Dr. Grabenhorst, P 10.14	1718	11/2012
PTL Dr. Grabenhorst, P 10.37	1719	11/2012
Kroeplin Längenmesstechnik GmbH, OD1020	1720	05/2011
Chauvin Arnoux, Current Probe 10-100 A / 1V	2084	05/2011
Keithley, 2000	1731	02/2013
Spring scale, 1 kg	1732	03/2014
Spring scale, 10 kg	1733	03/2014
Spring scale, 20 kg	1734	03/2014
Measuring magnifier glas 7x	1755	
steel ball, 500 g	1757	
Yokogawa Measurement Technologies GmbH, WT2010	1762	11/2012
Rohde & Schwarz, NGB 32/10	1132	
LeCroy, Wave Surver 452	1796	07/2010
Frizlen, 15 $\Omega$ , 5 A	1882	
Frizlen, 15 $\Omega$ , 5 A	1883	
Frizlen, 700 $\Omega$ , 1 A	1884	
Frizlen, 700 $\Omega$ , 1 A	1885	
Frizlen, 6 $\Omega$ , 15 A	1886	
Frizlen, 6 $\Omega$ , 15 A	1887	
Frizlen, 6 $\Omega$ , 15 A	1888	
Pico Technologies U.K., TC-08 USB	1920	01/2014
Pico Technologies U.K., Software PicoLog	1961	
SPS electronic GmbH, KT 3881H	1940	01/2014
SPS electronic GmbH, Software 3332Dat	1960	
Fluke Multimeter	1653	11/2010
Flir, Infra-Cam	2001	
digital balance, digi2000		
Fischer Elektronik GmbH, ball pressure equipment	1959	



Foto of EUT:



Foto of EUT:



## Revision History

<i>Edition</i>	<i>Date</i>	<i>Issued by</i>	<i>Modifications</i>
001	2014-06-03	Stefan Weiherer	First Edition
Current Edition:		001	