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Interested committees:

Title: BS EN IEC 61557-18 Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC - equipment for testing, measuring or monitoring of protective measures

Part 18: DC EV supply equipment monitoring device

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- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



85/917/CD

COMMITTEE DRAFT (CD)

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CLOSING DATE FOR COMMENTS:
2024-06-21

SUPERSEDES DOCUMENTS:
85/787/NP, 85/799A/RVN

IEC TC 85 : MEASURING EQUIPMENT FOR ELECTRICAL AND ELECTROMAGNETIC QUANTITIES	
SECRETARIAT: China	SECRETARY: Ms Guiju HAN
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 69	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☒ ENVIRONMENT ☒ QUALITY ASSURANCE ☒ SAFETY	

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TITLE:

Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC – equipment for testing, measuring or monitoring of protective measures – part 18: DC EV supply equipment monitoring device

NOTE FROM TC/SC OFFICERS:

CONTENTS

1	FOREWORD.....	4
2	INTRODUCTION.....	6
3	1 Scope.....	7
4	2 Normative references	7
5	3 Terms, definitions and abbreviations	8
6	4 Requirements	12
7	4.1 General.....	12
8	4.2 Mandatory functions.....	12
9	4.2.1 Response signal.....	12
10	4.2.2 Service functions provided by the DC-EVSE-IMD – Functional check.....	12
11	4.3 Performance requirements.....	13
12	4.3.1 Specified response value R_{resp}	13
13	4.3.2 System leakage capacitance C_e	13
14	4.3.3 Reference conditions	13
15	4.3.4 Relative percentage uncertainty A of the specified response value R_{resp}	13
16	4.3.5 Response time t_{resp}	15
17	4.3.6 Measuring voltage U_m and measuring current I_m	15
18	4.3.7 Internal DC resistance R_{ei}	16
19	4.3.8 Permanently admissible nominal voltage U_{pa}	16
20	4.3.9 Supply voltage U_s	16
21	4.4 Electromagnetic compatibility.....	16
22	4.5 Safety	16
23	4.5.1 General	16
24	4.5.2 Clearances and creepage distances	16
25	4.5.3 Protection class and earth connection of a DC-EVSE-IMD	17
26	4.6 Climatic environmental conditions.....	17
27	4.7 Mechanical requirements	17
28	4.7.1 Product mechanical robustness	17
29	4.7.2 IP protection class requirements.....	18
30	5 Marking and operating instructions	19
31	5.1 Marking.....	19
32	5.2 Operating instructions.....	19
33	6 Tests	20
34	6.1 General.....	20
35	6.2 Type tests.....	20
36	6.2.1 Test of insulation resistance response value R_a	20
37	6.2.2 Test of response time t_{resp}	24
38	6.2.3 Test of the measuring voltage U_m	25
39	6.2.4 Test of the measuring current I_m	26
40	6.2.5 Test of internal DC resistance R_{ei}	27
41	6.2.6 Test for indication of the insulation resistance resistances R_{F+} and R_{F-}	29

44	6.2.7	Test of effectiveness of the functional check.....	29
45	6.2.8	Test of permanently admissible nominal voltage U_n	31
46	6.2.9	Test of supply voltage U_s	31
47	6.2.10	Voltage tests	31
48	6.2.11	Test of electromagnetic compatibility (EMC)	31
49	6.2.12	Inspection of the marking and operating instructions.....	31
50	6.2.13	Mechanical tests.....	31
51	6.3	Routine tests	31
52	6.3.1	Voltage tests	31
53	6.3.2	Records	31
54		Bibliography.....	32
55			
56		Figure 1 – Test circuit for testing insulation response value R_a and response time t_{resp}	22
57		Figure 2 – Test circuit for measurement of measuring voltage U_m	26
58		Figure 3 – Test circuit for measurement of measuring current I_m	27
59		Figure 4 – Test circuit for symmetrical connection.....	28
60		Figure 5 – Test setup for verification of DC-EVSE-IMD functional check	31
61			
62		Table 1 - Reference conditions for A	14
63		Table 2 – Calculation of operating uncertainty	15
64		Table 3 – Product mechanical requirements.....	18
65		Table 4 – Minimum IP requirements for DC-EVSE-IMD	18
66		Table 5 – Reference conditions for tests in operation.....	20
67		Table 6 – Reference conditions for storage tests (product not powered)	20
68		Table 7 – Test cases for insulation resistance response values	21
69		Table 8 –Test cases for disturbance test.....	23
70		Table 8 - Test cases for verification of DC-EVSE-IMD functional check.....	29
71			
72			
73			
74			
75			

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICAL SAFETY IN LOW VOLTAGE DISTRIBUTION SYSTEMS
UP TO 1 000 V AC AND 1 500 V DC –
EQUIPMENT FOR TESTING, MEASURING OR MONITORING
OF PROTECTIVE MEASURES –****Part 18: DC EV Supply Equipment Monitoring Device****FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61557-18 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities. This standard may also be of interest to TC69, TC64, TC95, SC23E and SC121A.

The text of this International Standard is based on the following documents:

FDIS	Report on voting

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

126 This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

127 A list of all parts of the IEC 61557 series, published under the general title *Electrical safety in*
128 *low voltage distribution systems up to 1 000 V AC and 1 500 V DC – Equipment for testing,*
129 *measuring or monitoring of protective measures*, can be found on the IEC website

130 The committee has decided that the contents of this document will remain unchanged until the
131 stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to
132 the specific document. At this date, the document will be

- 133 • reconfirmed,
- 134 • withdrawn,
- 135 • replaced by a revised edition, or
- 136 • amended.

137

138

139 The National Committees are requested to note that for this document the stability date
140 is 20XX.

141 THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED
142 AT THE PUBLICATION STAGE.

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INTRODUCTION

148 Electrical safety measures within DC Electric Vehicle Supply Equipment (DC EVSE) include
149 insulation monitoring devices (IMD) to monitor the protective measures for basic protection
150 (insulation of live parts).

151 During the preparation of the 2nd edition of IEC 61851-23 Electric vehicle conductive charging
152 system - Part 23: DC electric vehicle charging station, the requirement for monitoring of the
153 insulation level within each of the external DC conductors was raised by TC69 MT5, in relation
154 to a potential hazardous situation resulting from an insulation fault of the external DC conductor
155 whilst the DC EVSE is active.

156 Within TC85 WG8, it was discussed whether the particular requirement for insulation resistance
157 monitoring of individual conductors in DC EVSE applications should be included as an annex
158 to IEC 61557-8. TC85 WG8 came to the decision that the particular requirements for DC EVSE
159 applications require a new product standard for a DC EVSE Insulation Monitoring Device (DC
160 EVSE IMD) in which different monitoring tasks may be combined.

161 An IMD in accordance with IEC 61557-8 is used for monitoring for the first fault condition in an
162 IT system but does not incorporate the additional features that enables the monitoring of
163 insulation resistance, as required for DC EVSE applications, for example the possibility to
164 separately monitor the positive and negative external DC conductors.

165 Therefore, in the case of EVSE applications, DC-EVSE-IMD according to this standard replace
166 the use of general purpose IMD in accordance with IEC 61557-8.

167

**ELECTRICAL SAFETY IN LOW VOLTAGE DISTRIBUTION SYSTEMS
UP TO 1 000 V AC AND 1 500 V DC –
EQUIPMENT FOR TESTING, MEASURING OR MONITORING
OF PROTECTIVE MEASURES –**

Part 18: DC EV Supply Equipment Insulation Monitoring Device

1 Scope

This part of the IEC 61557 series specifies the requirements for DC electric vehicle supply equipment insulation monitoring devices that provide insulation monitoring in DC EVSE in accordance with the requirements of IEC 61851-23, IEC 61851-23-1 and IEC 61851-23-3 for EV supply equipment with a rated maximum voltage at side B up to 1500V DC.

DC-EVSE-IMD in accordance with this document fulfil the requirements for system C insulation monitoring devices in accordance with IEC 61851-23:2023. The requirements for IEC 61851-23-1 and IEC 61851-23-3 are under consideration.

This standard does not cover general purpose insulation monitoring devices (IMD) in accordance with IEC 61557-8.

This standard does not cover protective devices, nor protective functions used to provide automatic disconnection of the supply.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

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

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60664:2020, *Insulation coordination for equipment within low-voltage systems - ALL PARTS*

IEC 60691, *Thermal-links – Requirements and application guide*

IEC 60721-3-1, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 1: Storage*

IEC 60721-3-2, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 2: Transportation*

IEC 60721-3-3, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 3: Stationary use at weatherprotected locations*

IEC 60947-5-1, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

IEC 60947-5-4, *Low-voltage switchgear and controlgear – Part 5-4: Control circuit devices and switching elements – Method of assessing the performance of low-energy contacts – Special tests*

IEC 61010-1:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

IEC 61010-2-030, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits*

IEC 61326-2-4, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-4: Particular requirements – Test configurations, operational conditions and performance criteria for insulation monitoring devices according to IEC 61557-8 and for equipment for insulation fault location according to IEC 61557-9*

IEC 61557-1, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements*

IEC 61557-2, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 2: Insulation resistance*

IEC 61810-2, *Electromechanical elementary relays – Part 2: Reliability*

IEC 62109-2:2011, *Safety of power converters for use in photovoltaic power systems – Part 2: Particular requirements for inverters*

CISPR 11, *Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement*

3 Terms, definitions and abbreviations

For the purposes of this document, the terms and definitions given in IEC 61557-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 insulation resistance positive conductor

R_{F+}

monitored resistance of the positive conductor to earth

3.2 insulation resistance negative conductor

 R_{F-}

monitored resistance of the negative conductor to earth

3.3 response value

 R_a

the smaller of the two insulation resistances values, R_{F+} and R_{F-} , at which the device responds under specified conditions

[SOURCE: IEC 61557-8, 3.1.3, modified: “value of the insulation resistance” has been changed to “the smaller of the two insulation resistances values, R_{F+} and R_{F-} ”]

3.4 specified response value

 R_{resp}

value of the insulation resistance permanently set on the device and monitored if the smaller of the two insulation resistances, R_{F+} and R_{F-} , falls below this limit

Note 1 to entry: R_{resp} is the value declared by the manufacturer.

[SOURCE: IEC 61557-8:2014, 3.1.4, modified: ‘insulation resistance’ has been changed to ‘smaller of the two insulation resistances, R_{F+} and R_{F-} ,’]

3.5 relative deviation

relative percentage deviation

 A

Response value R_a minus the specified response value R_{resp} , divided by the specified response value R_{resp} , multiplied by 100 and stated as a percentage

$$A = \frac{R_a - R_{resp}}{R_{resp}} \cdot 100[\%]$$

[SOURCE: IEC 61557-8:2014, 3.1.5 modified to change “uncertainty” to “deviation”]

3.6 system leakage capacitance

 C_e

maximum permissible value of the total capacitance to earth of the DC EV supply equipment to be monitored, up to which the insulation monitoring function of an DC-EVSE-IMD can operate as specified and within the specified response time t_{resp}

[SOURCE: IEC 61557-8:2014, 3.1.6]

3.7 response time

 t_{resp}

time required by the insulation monitoring function of a DC-EVSE-IMD to respond under specified conditions

[SOURCE: IEC 61557-8:2014, 3.1.8]