IEC 61557-10

Edition 2.0 2013-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures –
Part 10: Combined measuring equipment for testing, measuring or monitoring of protective measures

Sécurité électrique dans les réseaux de distribution basse tension de 1 000 V c.a. et 1 500 V c.c. – Dispositifs de contrôle, de mesure ou de surveillance de mesures de protection –
Partie 10: Appareils combinés de contrôle, de mesure ou de surveillance de mesures de protection

IEC 61557-10:2013

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ELECTRICAL SAFETY IN LOW VOLTAGE DISTRIBUTION SYSTEMS UP TO 1 000 V a.c. AND 1 500 V d.c. – EQUIPMENT FOR TESTING, MEASURING OR MONITORING OF PROTECTIVE MEASURES –

Part 10: Combined measuring equipment for testing, measuring or monitoring of protective measures

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International Standard IEC 61557-10 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities.

This second edition cancels and replaces the first edition published in 2000. This edition constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
85/442/FDIS	85/451/RVD

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

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

This part of IEC 61557 is to be used in conjunction with Part 1.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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ELECTRICAL SAFETY IN LOW VOLTAGE DISTRIBUTION SYSTEMS UP TO 1 000 V a.c. AND 1 500 V d.c. – EQUIPMENT FOR TESTING, MEASURING OR MONITORING OF PROTECTIVE MEASURES –

Part 10: Combined measuring equipment for testing, measuring or monitoring of protective measures

1 Scope

This part of IEC 61557 specifies the requirements for combined measuring equipment which combines into one piece of apparatus, several measuring functions or methods of testing, measuring or monitoring according to the respective parts of IEC 61557.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

IEC 61557-3, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 3: Loop impedance*

IEC 61557-4, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 4: Resistance of earth connection and equipotential bonding*

IEC 61557-5, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 5: Resistance to earth*

IEC 61557-6, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 6: Effectiveness of residual current devices (RCD) in TT, TN and IT systems*

IEC 61557-7, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 7: Phase sequence*

IEC 61010-2-030:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61557-1, IEC 61557-2, IEC 61557-3, IEC 61557-4, IEC 61557-5, IEC 61557-6 and IEC 61557-7 as well as the following terms and definitions apply.

3.1
combined measuring equipment
equipment that combines, into one piece of apparatus, several measuring functions or methods of testing, measuring or monitoring, some or all of which are in accordance with other parts of IEC 61557

3.2
extraneous overvoltage
voltage applied to the terminals of the combined measuring equipment to test the overvoltage withstand capability

4 Requirements

4.1 General

4.1.1 The following requirements in addition to those given in all relevant parts of IEC 61557 shall apply.

4.1.2 No hazard shall arise for the user when the highest extraneous overvoltage according to the respective parts of this document (see Table 1) is accidentally applied to each combination of tests and measurement terminals with every combination of function and range settings, even though some of these functions are not themselves covered by IEC 61557 Parts 2 to Parts 7.

4.1.3 Terminals that are clearly identifiable as not test or measurement terminals and that will not retain the terminals of specified probes or accessories need not be tested.

The duration time shall be the longest possible indicated in the respective parts of IEC 61557.

Table 1 – Extraneous overvoltage withstand capability

	Part of IEC 61557					
	2 Insulation	**3 Loop**	**4 Protective bonding**	**5 Earth resistance**	**6 RCD**	**7 Phase sequence**
Extraneous overvoltage and duration time	1,2 × U_N 10 s	1,2 × U_0 continuous and 1,1 × phase-to-phase voltage 1 min	1,2 × U_0 continuous	1,2 × U_0 continuous	1,2 × U_0 continuous and 1,1 × phase-to-phase voltage 1 min	1,2 × U_0 continuous
NOTE 1 U_0 is the voltage referenced to earth (see IEC 61557-1:2007[1], 3.3a). NOTE 2 U_N is the nominal output voltage (see IEC 61557-1:2007, 3.1 and IEC 61557-2:2007[2], 3.1).						

1 IEC 61557-1:2007, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements*

2 IEC 61557-2:2007, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 2: Insulation resistance*

4.1.4 If parts of the combined measuring equipment are defective after the extraneous overvoltage is applied, the defect shall be clearly indicated. Indications and displayed values shall not lead to erroneous interpretations of safe or unsafe situations or conditions. The indication shall be visible for the user when the instrument is in normal position.

4.1.5 When the extraneous overvoltage is applied, protective components or protective circuits within the measurement equipment may be activated. The activation of protective components or circuits in equipment for measuring or testing insulation resistance according to IEC 61557-2 shall be indicated, if the operation of the equipment is impaired. Protective components or circuits shall have sufficient voltage- and current-breakability for the expected overload current.

4.2 Marking and pictogram

When the combined measuring equipment bears one of the following marking or pictogram, the applied extraneous overvoltage can be reduced to a voltage of 1,1 times phase-to-phase voltage:

a) Marking

DO NOT USE IN DISTRIBUTION SYSTEMS WITH VOLTAGES HIGHER THAN ... V.

This marking shall be written in the corresponding country language.

The value of the voltage shown on the marking shall be 1,1 times the maximum expected phase-to-phase voltage.

b) Example of pictogram for a 500 V a.c. system

The value of the voltage shown on the marking shall be 1,1 times the maximum expected phase-to-phase voltage

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Combined measuring equipment bearing one of the markings of a) or pictograms of b) shall withstand the above specified overvoltage for 1 min without any defect. The test configuration shall be according to 4.1.2, protective devices may be activated according to 4.1.5.

If the combined measuring equipment includes an insulation resistance measuring or testing function, this function shall also fulfill the overvoltage requirements according to IEC 61557-2.

5 Marking and operating instructions

The requirements specified in the respective parts of IEC 61557 shall apply. If the requirements of 4.2 are applicable, the marking shall be clearly readable in the position of normal use.

If a pictogram according to 4.2 is used, the meaning of the relevant pictogram shall be clearly explained in the user manual.

6 Tests

In addition to the tests specified in the respective parts of IEC 61557, the following tests in Clause 6 shall be performed:

– the voltage withstand capability for the combined measuring equipment shall be type tested by using an extraneous overvoltage either in accordance with 4.1 or in accordance with 4.2;

– the technical specifications of protective devices shall be checked;

– the voltage source for the overload test shall be capable of driving the highest expected overload current. If certified protective devices are used, the test can be limited according to IEC 61010-2-030, 101.3.1;

– compliance with the requirements of Clause 5 shall be verified as a routine test;

– compliance with the tests in Clause 6 shall be documented.

Bibliography

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

IEC 61557-8, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 8: Insulation monitoring devices for IT systems*

IEC 61557-9, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 9: Equipment for insulation fault location in IT systems*

IEC 61557-11, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 11: Effectiveness of residual current monitors (RCMs) type A and type B in TT, TN and IT systems*

IEC 61557-12, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 12: Performance measuring and monitoring devices (PMD)*

IEC 61557-13, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 13: Hand-held and hand-manipulated current clamps and sensors for measurement of leakage currents in electrical distribution systems*