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Utility-interconnected photovoltaic inverters — Test procedure for low voltage ride-through measurements

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The UK participation in its preparation was entrusted to Technical Committee GEL/82, Photovoltaic Energy Systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2015

ISBN 978 0 580 85990 8
ICS 27.160

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 November 2015.

Amendments/corrigenda issued since publication

Date	Text affected

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IEC TS 62910

Edition 1.0 2015-10

TECHNICAL SPECIFICATION

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Utility-interconnected photovoltaic inverters – Test procedure for low voltage ride-through measurements

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 27.160

ISBN 978-2-8322-2957-6

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UTILITY-INTERCONNECTED PHOTOVOLTAIC INVERTERS – TEST PROCEDURE FOR LOW VOLTAGE RIDE-THROUGH MEASUREMENTS

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62910, which is a technical specification, has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

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The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
82/884/DTS	82/1005/RVC

Full information on the voting for the approval of this technical specification 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.

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

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UTILITY-INTERCONNECTED PHOTOVOLTAIC INVERTERS – TEST PROCEDURE FOR LOW VOLTAGE RIDE-THROUGH MEASUREMENTS

1 Scope

This Technical Specification provides a test procedure for evaluating the performance of Low Voltage Ride-Through (LVRT) functions in inverters used in utility-interconnected PV systems.

The technical specification is most applicable to large systems where PV inverters are connected to utility HV distribution systems. However, the applicable procedures may also be used for LV installations in locations where evolving LVRT requirements include such installations, e.g. single-phase or 3-phase systems.

The assessed LVRT performance is valid only for the specific configuration and operational mode of the inverter under test. Separate assessment is required for the inverter in other factory or user-settable configurations, as these may cause the inverter LVRT response to behave differently.

The measurement procedures are designed to be as non-site-specific as possible, so that LVRT characteristics measured at one test site, for example, can also be considered valid at other sites.

This technical specification is for testing of PV inverters, though it contains information that may also be useful for testing of a complete PV power plant consisting of multiple inverters connected at a single point to the utility grid. It further provides a basis for utility-interconnected PV inverter numerical simulation and model validation.

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 61400-21:2008, *Wind turbines – Part 21: Measurement and assessment of power quality characteristics of grid connected wind turbines*

3 Terms, definitions, symbols and abbreviations

3.1 Terms, definitions and symbols

For the purposes of this document, the following terms, definitions and symbols apply.

3.1.1
drop depth
magnitude of voltage drop during a fault or simulated fault, as a percentage of the nominal supply voltage

3.1.2
double drop
sudden decline of the nominal voltage to a value below 90 % of the voltage of PCC, followed after a short time by a voltage recovery, which happened twice. Voltage changes which do not

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reduce the voltage to below 90 % of the voltage of PCC are not considered to be voltage drops

3.1.3
equipment under test
EUT
EUT indicates the equipment on which these tests are performed and refers to the utility-interconnected PV inverter. During test period, EUT is connected with PV simulator instead of real PV modules on the DC side, while AC side is connected with grid

3.1.4
IT system
IT power system has all live parts isolated from earth or one point connected to earth through an impedance. The exposed-conductive-parts of the electrical installation are earthed independently or collectively or to the earthing of the system

[SOURCE: IEC 60364-1:2005, 312.2.3]

3.1.5
I_q
output reactive current of EUT

3.1.6
low voltage ride through
LVRT
capability of an inverter to continue generating power to connected loads during a limited duration loss or drop of grid voltage

3.1.7
maximum MPP voltage
maximum voltage at which the EUT can convert its rated power under MPPT conditions

[SOURCE: EN 50530:2010]

3.1.8
maximum power point tracking
MPPT
control strategy of operation at maximum power point or nearby

3.1.9
minimum MPP voltage
minimum voltage at which the EUT can convert its rated power under MPPT conditions

[SOURCE: EN 50530:2010]

3.1.10
N_{EUT}
access point of the EUT during the test

3.1.11
P_N
rated power of EUT

3.1.12
point of common coupling
PCC
point of a power supply network, electrically nearest to a particular load, at which other loads are, or may be, connected

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