Australian Standard™

Grid connection of energy systems via inverters

Part 3: Grid protection requirements

Standards Australia

This Australian Standard was prepared by Committee EL-042, Renewable Energy Power Supply Systems and Equipment. It was approved on behalf of the Council of Standards Australia on 18 June 2002 and published on 10 July 2002.

The following are represented on Committee EL-042:

Alternative Technology Association

Australian Electrical and Electronic Manufacturers Association

Consumers Federation of Australia

Electricity Supply Association of Australia

Ministry of Economic Development, New Zealand

National Electrical and Communications Association

Regulatory Authorities (Electrical)

Solar Energy Industries Australia

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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee EL-042, Renewable Energy Power Supply Systems and Equipment and is based on requirements developed by a group of utility, photovoltaic and inverter industry experts coming together under the auspices of the Electricity Supply Association of Australia (ESAA) with the assistance of the Australian Cooperative Research Centre for Renewable Energy (ACRE).

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian, rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide regulators, electricity distributors and manufacturers with the requirements and tests for grid protection devices to be used in inverter energy systems intended for the injection of electric power through an electrical installation to the electricity distribution network.

It is Part Three of a three part series as follows:

AS 4777, Grid connection of energy systems via inverters

AS 4777.1 Part 1: Installation requirements

AS 4777.2 Part 2: Inverter requirements

AS 4777.3 Part 3: Grid protection requirements (this Part)

This Standard should be read in conjunction with the regulations, service and installation rules of the electricity distributor approving the connection.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the Appendix to which they apply. A ‘normative’ Appendix is an integral part of a Standard whereas an ‘informative’ Appendix is only for information and guidance.

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1 SCOPE

This Standard specifies the requirements for grid protection devices intended to be used in inverter energy systems, with ratings up to 10 kVA for single-phase units, or up to 30 kVA for three-phase units, and for the injection of electric power through an electrical installation to the electricity distribution network.

NOTES:

1 Although this Standard does not apply to larger systems, similar principles can be used for the grid protection of such systems.

2 These devices do not replace devices used for protection and/or isolation as required in AS/NZS 3000.

2 APPLICATION

Grid protection of the inverter energy system shall be provided by a grid protection device. This does not preclude the grid protection device being integral to the inverter, nor a single grid protection device being used to protect an inverter energy system comprising multiple inverters. Compliance with this Standard shall be determined by type testing the inverter and, if necessary, grid protection device in combination. Compliance of this combination shall be conditional on their being used together in the same manner in which they have been type tested. Compliance of one combination of inverter and grid protection device does not preclude compliance of either device as part of a different combination.

3 NORMATIVE REFERENCES

The following normative documents contain provisions which, through reference in this text, constitute provisions of this Standard.

AS

60038 Standard voltages

AS/NZS

3000 Wiring Rules

3100 Approval and test specification—General requirements for electrical equipment

60950 Safety of information technology equipment

61000 Electromagnetic compatibility (EMC)

61000.3.3 Part 3.3: Limits—Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current less than or equal to 16 A

61000.3.5 Part 3.5: Limits—Limitation of voltage fluctuations and flicker in low-voltage power supply systems for equipment with rated current greater than 16 A

IEC

60255 Electrical relays