AS/NZS 4777.2:2015

Australian/New Zealand Standard™

Grid connection of energy systems via inverters

Part 2: Inverter requirements

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-042, Renewable Energy Power Supply Systems and Equipment. It was approved on behalf of the Council of Standards Australia on 17 September 2015 and on behalf of the Council of Standards New Zealand on 21 August 2015. This Standard was published on 9 October 2015.

The following are represented on Committee EL-042:

ACT Government—Environment and Planning Directorate
Australian Energy Market Operator
Australasian Fire and Emergency Service Authorities Council
Australian Industry Group
Australian PV Association
Australian Solar Council
Clean Energy Council
Clean Energy Regulator
Consumer Electronics Suppliers Association
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Australian/New Zealand Standard™

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-042, Renewable Energy Power Supply Systems and Equipment, to supersede AS 4777.2—2005, *Grid connection of energy systems via inverters*, Part 2: *Inverter requirements*, and AS 4777.3—2005, *Grid connection of energy systems via inverters*, Part 3: *Grid protection requirements*, twelve months after its publication. During this twelve month period, this edition or AS 4777.2—2005 and AS 4777.3—2005 may be utilized.

The objective of this Standard is to specify minimum performance and safety requirements for the design, construction and operation of inverters intended for use in inverter energy systems for the injection of electric power through an electrical installation into the grid.

This Standard is part of a series on the grid connection of energy systems via inverters. The series is as follows:

AS/NZS	
4777	Grid connection of energy systems via inverters
4777.1	Part 1: Installation requirements
4777.2	Part 2: Inverter requirements (this Standard)

There are many differences between this and the previous edition. They include but are not limited to the following:

(a) Inclusion of a balance requirement for multiple phase systems.

(b) Revised set-points and limits to match electricity distributor requirements.

(c) Inclusion of provisions for demand response and power quality response modes.

NOTE: The demand response provisions in this Standard follow the framework in the AS/NZS 4755 series demand response capabilities and supporting technologies for electrical products. At present there is no overlap in the scope of AS/NZS 4777.2 and AS/NZS 4755. However, if in future a new part of the AS/NZS 4755 series is to be published that covers some of the products or functions within the scope of this Standard, it is intended that the coverage of the demand response aspects of those products or functions will then reference the relevant parts of AS/NZS 4755. This would be achieved by a future amendment to AS/NZS 4777.2.

(d) Inclusion of requirements for electrical safety in accordance with IEC 62109-1 and IEC 62109-2.

(e) Inclusion of requirements for multiple mode inverter operation and requirements for systems with energy storage to meet electrical safety requirements in accordance with AS 62040.1.1.

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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FOREWORD

This Standard necessarily deals with existing types of inverter energy systems, but is not intended to discourage innovation or to exclude materials, equipment and methods that may be developed in the future. Revisions will be made from time to time in view of such developments, and amendments to this edition will be made when necessary.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Grid connection of energy systems via inverters

Part 2: Inverter requirements

1 SCOPE

This Standard specifies requirements and tests for low voltage inverters for the injection of electric power through an electrical installation into the grid at low voltage. This Standard applies to inverters that have power flow in either direction between the energy source and the grid. General requirements relating to the test methods set out in Appendices B to J are specified in Appendix A.

NOTE: This Standard does not include the regulatory requirements mandated in Australia by the Australian Communications Media Authority (ACMA) and in New Zealand by Radio Spectrum Management. Refer to ACMA *Electromagnetic Compatibility—Information for suppliers of electrical and electronic products in Australia and New Zealand* for guidance.

2 APPLICATION

This Standard needs to be read in conjunction with the regulations, service and installation rules of the electricity distributor approving the connection. This Standard should also be read in conjunction with AS/NZS 3000.

3 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

NOTES:

1 Documents referenced for informative purposes are listed in the Bibliography.

2 Documents referred to in the preparation of this Standard are listed in Appendix K.

AS

60038 Standard voltages

62040 Uninterruptible power systems (UPS)

62040.1.1 Part 1.1: General and safety requirements for UPS used in operator access areas

AS/NZS

3000 Electrical installations (known as the Australian/New Zealand Wiring Rules)

3112 Approval and test specification—Plugs and socket-outlets

4777 Grid connection of energy systems via inverters

4777.1 Part 1: Installation requirements

5033 Installation and safety requirements for photovoltaic (PV) arrays

60320 Appliance couplers for household and similar general purposes

60320.1 Part 1: General requirements