Australian Standard™

Grid connection of energy systems via inverters

Part 2: Inverter 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

University of New South Wales

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Australian Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

This Standard was issued in draft form for comment as DR 01213.

Australian Standard™

Grid connection of energy systems via inverters

Part 2: Inverter requirements

First published as AS 4777.2—2002.

COPYRIGHT

© Standards Australia International

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia International Ltd
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 4672 1

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 inverters intended for the injection of electric power through an electrical installation to the electricity distribution network.

It is Part Two 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 (this Part)

AS 4777.3 Part 3: Grid protection requirements

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

CONTENTS

Page

1 SCOPE 4
2 NORMATIVE REFERENCES 4
3 DEFINITIONS 4
4 INVERTER REQUIREMENTS 5

APPENDICES
A POWER FACTOR TEST 9
B HARMONIC CURRENT LIMIT TEST 10
C TRANSIENT VOLTAGE LIMIT TEST 12

STANDARDS AUSTRALIA

Australian Standard
Grid connection of energy systems via inverters

Part 2: Inverter requirements

1 SCOPE

This Standard specifies the requirements for inverters, with ratings up to 10 kVA for single-phase units or up to 30 kVA for three-phase units, for the injection of electric power through an electrical installation to the electricity distribution network.

NOTE: Although this Standard does not apply to larger systems, similar principles can be used for the design of such systems.

2 NORMATIVE REFERENCES

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

AS	
4777	Grid connection of energy systems via inverters
4777.3	Part 3: Grid protection requirements
60038	Standard voltages
AS/NZS	
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
60255-5	Part 5: Insulation coordination for measuring relays and protection equipment—Requirements and tests
ACA	Electromagnetic Compatibility—Information for suppliers of electrical and electronic products in Australia and New Zealand

3 DEFINITIONS

For the purpose of this Standard, the following definitions apply.

3.1 Electricity distribution network

The portion of an electrical system that is operated by an electrical distributor.

3.2 Grid

An alternative term for an electricity distribution network.