

Australian Standard™

**Stand-alone power systems**

**Part 2: System design guidelines**

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 11 February 2002 and published on 29 March 2002.

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The following interests are represented on Committee EL-042:

Alternative Technology Association  
Australian Electrical and Electronic Manufacturers Association  
Electricity Supply Association of Australia  
Ministry of Economic Development, New Zealand  
National Electrical and Communications Association  
Regulatory Authorities (Electrical)  
Sustainable Energy Industry Association of Australia  
The University of New South Wales

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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](mailto:mail@standards.com.au), or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

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**Part 2: System design guidelines**

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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. 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 guidelines for the design of stand-alone power systems used for the supply of extra-low and low voltage electric power.

This Standard was originally prepared following requests from interests involved in the solar energy industry who perceived a need for safety, design, installation and maintenance procedures appropriate to the industry.

This Standard was developed with the assistance of the following organizations:

- (a) NSW Department of Energy.
- (b) Australian CRC for Renewable Energy.
- (c) Australian Greenhouse Office.
- (d) Queensland Government.

This Standard is Part 2 of a series which consists of the following:

AS

- 4509 Stand-alone power systems
- 4509.1 Part 1: Safety requirements
- 4509.2 Part 2: System design guidelines (this Standard)
- 4509.3 Part 3: Installation and maintenance

Any comments on the Standard that users wish to submit will be considered by Committee EL-042 when the Standard is next reviewed. Submissions should be forwarded to—

Projects Manager, EL-042  
Standards Australia  
GPO Box 5420  
SYDNEY NSW 2001

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is for information and guidance.

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STANDARDS AUSTRALIA

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**Australian Standard**  
**Stand-alone power systems**

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Part 2: System design guidelines

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SECTION 1 SCOPE AND GENERAL

**1.1 SCOPE**

This Standard sets out guidelines for the design of stand-alone power systems with energy storage at extra-low voltage used for the supply of extra-low and low voltage electric power in a domestic situation. Equipment up to the system output terminals is covered.

The principles in this Standard can be applied to other systems including commercial and industrial applications.

**1.2 REFERENCED DOCUMENTS**

The following documents are referred to in this Standard:

AS

- |          |                                                                                                     |
|----------|-----------------------------------------------------------------------------------------------------|
| 1170     | Minimum design loads on structures (known as the SAA Loading Code)                                  |
| 1170.2   | Wind loads                                                                                          |
| 1359     | Rotating electrical machines—General requirements                                                   |
| 1359.109 | Part 109: Noise limits                                                                              |
| 1768     | Lightning protection                                                                                |
| 2676     | Guide to the installation, maintenance, testing and replacement of secondary batteries in buildings |
| 2676.1   | Part 1: Vented cells                                                                                |
| 2676.2   | Part 2: Sealed cells                                                                                |
| 3010     | Electrical installations—Supply by generating set                                                   |
| 3010.1   | Part 1: Internal combustion engine driven sets                                                      |
| 3595     | Energy management programs—Guidelines for financial evaluation of a project                         |
| 4086     | Secondary batteries for use with stand-alone power systems                                          |
| 4086.2   | Part 2: Installation and maintenance                                                                |
| 4509     | Stand-alone power systems                                                                           |
| 4509.1   | Part 1: Safety requirements                                                                         |
| 4509.3   | Part 3: Installation and maintenance                                                                |

AS/NZS

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|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1044 | Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and similar electrical apparatus |
| 3000 | Electrical installations (known as the Australian/New Zealand Wiring Rules)                                                                                                                                    |
| 4536 | Life cycle costing—An application guide                                                                                                                                                                        |