

Australian/New Zealand Standard™

**Rotating electrical machines—General
requirements**

**Part 5: Three-phase cage induction
motors—High efficiency and minimum
energy performance standards
requirements**

AS/NZS 1359.5:2000

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-046, Rotating Electrical Machinery—Efficiency. It was approved on behalf of the Council of Standards Australia on 15 August 2000 and on behalf of the Council of Standards New Zealand on 2 August 2000. It was published on 13 November 2000.

The following are represented on Committee EL-046:

Australian Chamber of Commerce and Industry
Australian Electrical and Electronic Manufacturers Association
Australian Greenhouse Office
Bureau of Steel Manufacturers of Australia
Electricity Supply Association of Australia
Energy Efficiency and Conservation Authority of New Zealand
National Appliance and Equipment Energy Efficiency Committee (Australia)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee Rotating Electrical Machinery—Efficiency. This document is a Part of the AS/NZS 1359 series, *Rotating electrical machines—General requirements*.

This Standard incorporates Amendment No. 1 (December 2002). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

This Standard is published with the approval of the combined state regulatory authorities and it is structured to be suitable for reference in minimum energy performance legislation. As such, it is anticipated that regulatory authorities will give mandatory effect to this document and impose minimum energy performance standards (MEPS). The intention of the MEPS is to increase energy efficiency by eliminating low efficiency motors from the market and to encourage the use of high efficiency motors.

The objective of this Standard is to provide industry in general, and manufacturers and suppliers of electric motors specifically, with minimum energy performance standards (MEPS) and high-efficiency performance levels for three-phase cage induction electric motors with output ratings commonly used in industry. Government officials have informed stake holders that MEPS will not take effect earlier than 1 July 2001 though the final implementation date is (at the date of publishing this Standard) still to be resolved in each State and Territory by the relevant regulatory agency. Please contact the equipment energy efficiency regulator in your jurisdiction to ascertain the status of MEPS. Contact details for these regulatory bodies are available from the Standards Australia Research and Information Centre and/or visit SAI website www.standards.com.au.

One of the test methods (Method A) specified in this Standard is based on the current draft of IEC 61972. On publication of the final version of the IEC Standard, this Standard will be reviewed for consideration to align with the IEC Standard.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

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FOREWORD

Two test methods are offered as acceptable options in this document:

- Method A is technically identical to the current draft of IEC 61972. This method is further based on and technically equivalent to the IEEE 112-B (USA) method.
- Method B is drawn from AS 1359.102.1, which is technically equivalent to and reproduced from IEC 60034-2. This method includes a stray loss allowance of 0.5%.

Previous surveys of the efficiency of machines on the Australian market used figures based on Method B.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard applies to three-phase cage induction motors with ratings from 0.73 kW and up to but not including 185 kW. The scope covers motors of rated voltages up to 1100 V a.c.

NOTE: This range includes motors with ratings of 1 hp and 1 CV/PS (French/German or metric horsepower).

This Standard specifies the minimum efficiency values that a motor shall meet, and also the minimum efficiency values that a motor shall meet in order to be designated 'high efficiency'. Two methods of measurement are prescribed (Method A and Method B) for each category; see Sections 2 and 3.

Only one method need be applied.

1.2 EXCLUSIONS

The minimum energy performance standards (MEPS) requirements of this Standard do not apply to the following:

- (a) Submersible (sealed) motors specifically designed to operate wholly immersed in a liquid.

NOTE: This exclusion does not apply to motors that normally operate with a surrounding medium of air but that may withstand inundation.

- (b) Motors that are integral with, and not separable from, a driven unit.

NOTE: An example is a motor constructed on the same shaft as a compressor for an air-conditioning unit.

- (c) Multi-speed motors.

- (d) Motors that have been granted exemption by the relevant Australia/New Zealand regulatory authority due to their application placing restraints on the motor dimensions or other key design aspects.

- (e) Motors for use only for short-time duty cycle applications (e.g. those used for hoists, roller doors and cranes) which have a duty type rating of S2 under the IEC 60034-12.

NOTE: Exclusion from MEPS for these types of motors is based on their low projected usage and hence low total energy consumption.

This Standard does not apply to a rewind motor except where a supplier claims the rewind motor is 'high efficiency'.