

Australian Standard[®]

Rotating electrical machines

Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP Code)— Classification



This Australian Standard® was prepared by Committee EL-009, Rotating Electrical Machinery. It was approved on behalf of the Council of Standards Australia on 11 June 2009. This Standard was published on 15 July 2009.

The following are represented on Committee EL-009:

- Airconditioning and Refrigeration Equipment Manufacturers Association of Australia
 - Australian Chamber of Commerce and Industry
 - Australian Electrical and Electronic Manufacturers Association
 - Australian Greenhouse Office, Department of the Environment and Water Resources
 - Australian Industry Group
 - Bureau of Steel Manufacturers of Australia
 - Department of Defence (Australia)
 - Electrical Apparatus Service Association
 - Energy Efficiency and Conservation Authority of New Zealand
 - Engineers Australia
 - Ministry of Economic Development (New Zealand)
 - Registered Master Builders
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This Standard was issued in draft form for comment as DR 08207.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP Code)— Classification

Originated as part of AS C319-1956.
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-009, Rotating Electrical Machinery to supersede AS 1359.20—1980, *Rotating electrical machines Part 20: Classification of types of enclosure* on publication.

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee EL-009. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to define the requirements for protective enclosures that are in all other respects suitable for their intended use and which, from the point of view of materials and workmanship, ensure that the properties dealt with in this Standard are maintained under normal conditions of use.

This Standard is identical with, and has been reproduced from IEC 60034-5, Ed. 4.1 (2006), *Rotating electrical machines—Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code)—Classification* which includes Amendment 1:2006.

This Standard is Part 5 of a Series dealing with rotating electrical machinery. Additional parts will be added from time to time. This Series when complete will consist of the following parts:

AS

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|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1359.102.2 | Rotating electrical machines—Methods for determining losses and efficiency of rotating electrical machinery from tests—Measurement of losses by the calorimetric method |
| 60034 | Rotating electrical machines |
| 60034.1 | Part 1: Rating and performance |
| 60034.2.1 | Part 2.1: Methods for determining losses and efficiency from tests (excluding machines for traction vehicles) |
| 60034.3 | Part 3: Specific requirements for synchronous generators driven by steam turbines or combustion gas turbines |
| 60034.4 | Part 4: Methods for determining synchronous machine quantities from tests |
| 60034.5 | Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code)—Classification (this Standard) |
| 60034.6 | Part 6: Method of cooling (IC code) |
| 60034.7 | Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM code) |
| 60034.8 | Part 8: Terminal markings and direction of rotation |
| 60034.9 | Part 9: Noise limits |
| 60034.11 | Part 11: Thermal protection |
| 60034.12 | Part 12: Starting performance of single-speed three-phase cage induction motors |
| 60034.14 | Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher—Measurement, evaluation and limits of vibration severity |
| 60034.15 | Part 15: Impulse voltage withstand levels of rotating a.c. machines with form-wound stator coils |
| 60034.16 | Part 16: Excitation systems for synchronous machines (all parts) |
| 60034.17 | Part 17: Cage induction motors when fed from converters—Application guide |
| 60034.18 | Part 18: Functional evaluation of insulation systems (all parts) |
| 60034.19 | Part 19: Specific test methods for d.c. machines on conventional and rectifier-fed supplies |
| 60034.20.1 | Part 20.1: Control motors—Stepping motors |
| 60034.22 | Part 22: AC generators for reciprocating internal combustion (RIC) engine driven generating sets |

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60034.23	Part 23: Specification for the refurbishing of rotating electrical machines
60034.25	Part 25: Guidance for the design and performance of a.c. motors specifically designed for converter supply
60034.26	Part 26: Effects of unbalanced voltages on the performance of three-phase cage induction motors
60034.27	Part 27: Off-line partial discharge measurements on the stator winding insulation of rotating electrical machines
60034.28	Part 28: Test methods for determining quantities of equivalent circuit diagrams for the three-phase low voltage cage induction motors
60034.29	Part 29: Equivalent loading and superposition techniques—Indirect testing to determine temperature rise.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text 'IEC 60034-5' should read 'AS 60034.5'.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

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STANDARDS AUSTRALIA

Australian Standard**Rotating electrical machines****Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP Code)—Classification**

1 Scope and object

This International Standard applies to the classification of degrees of protection provided by enclosures for rotating electrical machines. It defines the requirements for protective enclosures that are in all other respects suitable for their intended use and which, from the point of view of materials and workmanship, ensure that the properties dealt with in this standard are maintained under normal conditions of use.

This standard does not specify:

- degrees of protection against mechanical damage of the machine, or conditions such as moisture (produced for example by condensation), corrosive dust and vapour, fungus or vermin;
- types of protection of machines for use in a potentially explosive (dust, vapour) environment.

In certain applications (such as agricultural or domestic appliances), more extensive precautions against accidental or deliberate contact may be specified.

This standard gives definitions for standard degrees of protection provided by enclosures applicable to rotating electrical machines as regards the:

- a) protection of persons against contacts with or approach to live parts and against contact with moving parts (other than smooth rotating shafts and the like) inside the enclosure and protection of the machine against ingress of solid foreign objects;
- b) protection of machines against the harmful effects due to ingress of water.

It gives designations for these protective degrees and tests to be performed to check that the machines meet the requirements of this standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

References to international standards that are struck through in this clause are replaced by references to Australian Standards that are listed immediately thereafter and identified by shading. Any Australian Standard that is identical to the International Standard it replaces is identified as such.

~~IEC 60034-1, Rotating electrical machines – Part 1: Rating and performance~~

AS 60034.1, Rotating electrical machines, Part 1: Rating and performance

IEC 60034-6, Rotating electrical machines – Part 6: Methods of cooling (IC code)