Superseded by 1980.

AS 1360.11—1977

Australian Standard
1360, Part 11–1977

ROTATING ELECTRICAL MACHINES
OF PARTICULAR TYPES OR FOR PARTICULAR APPLICATIONS

Part 11—Dimensions and Performance of Small Power Electrical Machines

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.
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This part of the standard, prepared by Committee EL/9, Rotating Electrical Machinery, was approved on behalf of the Council of the Standards Association of Australia on 31 May 1977, and was published on 1 September 1977.

In order to keep abreast with progress in the industries concerned, Australian standards are subject to periodical review. Suggestions for improvements, addressed to the head office of the Association, will be welcomed.

PREFACE

This part of the standard covers both dimensions and performance of small power rotating electrical machines (of outputs of the order of 2·5 W to 3 kW) of a lighter construction than the machines covered by AS 1360, Part 10, Dimensions and Outputs of Standard Single-speed Three-phase General Purpose Motors.

Frame dimensions are specified for frame numbers S56, S63, S70, S80 and S90; also fixing dimensions for four methods of mounting. For flange-mounted and face-flange-mounted machines, both frame numbers and flange numbers are designated. A shaft extension is specified for each frame size.

In the preparation of dimensional requirements the following documents were taken into account and acknowledgement is made thereto:

IEC 72 — 1971 Dimensions and Output Ratings for Rotating Electrical Machines — Frame Numbers 56 to 400 and Flange Numbers F55 to F1080.

IEC Doc. 2B(Secretariat)74 Draft Addendum to IEC Publication 72 — 1971 (November 1970).

It is recognized in practice that there is some overlap between this part and Part 10 which specifies dimensions of three-phase electric motors. Motors of certain ratings may be constructed to comply either with this part or Part 10; mechanical considerations may require a heavier form of construction, e.g. a larger shaft extension (see Note to Table 11.5.1), in which case reference should be made to Part 10.

The dimensional aspects of this part were circulated for public review in December 1972 (reference DR 72202); as a result of comments received and of further committee deliberations, the draft has been considerably amended. In particular, alternative shaft sizes are not provided for and flange numbers have been tied to frame numbers. This part is intended as a parallel standard to AS C350, Dimensions of Fractional Horsepower Motors, Part 1 — Dimensions of Motors for General Use, which will be withdrawn on 1 January 1979.

With regard to the performance of the machines, this part is a revision of and supersedes AS C74—1965, which was an endorsement of BS 170 : 1962 with editorial amendment.

Preferred output ratings are specified in the range of 2·5 W to 3 kW.

In the preparation of performance requirements, the following standards were taken into account:

AS 1359 General Requirements for Rotating Electrical Machines.

BS 5000 Rotating Electrical Machines of Particular Types or for Particular Applications

Part 11 — The Electrical Performance of Small-Power Electric Motors and Generators.

Acknowledgement is made of the assistance obtained from the latter standard.

The performance aspects of this part were circulated for public review in July 1974 (reference DR 74093); changes have been made as a result of comments received.

In the application of this part, reference may be necessary to the follwoing standards:

AS 1110 ISO Metric Hexagon Precision Bolts and Screws

AS 1275 Metric Screw Threads for Fasteners (based on ISO Recommendations)

AS 1359 General Requirements for Rotating Electrical Machines
Part 1 — Definitions
Part 20 — Classification of Types of Enclosure*
Part 21 — Classification of Methods of Cooling
Part 22 — Classification of Mounting Arrangements and Types of Construction

AS 1360 Rotating Electrical Machines of Particular Types or for Particular Applications
Part 10 — Dimensions and Outputs of Standard Single-speed Three-phase General Purpose Motors

AS 1654 Limits and Fits for Engineering

AS C98 Flameproof Enclosure of Electrical Equipment for Explosive Atmospheres

AS C320 Classification of Insulating Materials for Electrical Machinery and Apparatus on the Basis of Thermal Stability in Service

BS 2725 Memorandum on the Measurement of Cooling Medium Temperature when Testing Electrical Machines, Transformers and Other Electrical Apparatus

BS 4235 Metric Keys and Keyways
Part 1 — Parallel and Taper Keys.

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* In course of preparation. Meanwhile, reference may be made to AS 1939, Classification of Degrees of Protection Provided by Enclosures for Electrical Equipment.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
ROTATING ELECTRICAL MACHINES OF PARTICULAR TYPES AND FOR PARTICULAR APPLICATIONS

PART 11. DIMENSIONS AND PERFORMANCE OF SMALL POWER ELECTRIC MACHINES

11.1 SCOPE. This Part of this standard specifies the dimensions and performance of a.c., d.c., and universal type electrical machines intended for applications for which a lighter construction than that specified in AS 1360, Part 10* is adequate and having the following characteristics:

(a) Foot, flange, face-flange or resilient mounting.

(b) Sleeve or rolling bearings.

(c) Any type of enclosure.

(d) A rated voltage up to and including 240 V d.c., 480 V single-phase a.c., or 650 V three-phase a.c.

(e) A continuous rated output (or equivalent continuous rated output for short-time rated machines) up to and including 0·75 kW (or kV.A) for each 1000 r/min of the rated speed (or synchronous speed for a.c. machines).

NOTE: It is recognized that in practice there is some overlap between the ratings covered by this Part and those covered by Part 10; e.g. motors of certain ratings may be constructed to comply either with this Part or with Part 10 but not necessarily with both.

11.2 DEFINITIONS.† For the purpose of this Part, the following definitions apply:

11.2.1 General Definitions.

11.2.1.1 *Rotating electrical machine* — an electrical apparatus depending upon electromagnetic induction for its operation and having components capable of relative rotary movement and intended for converting energy.

11.2.1.2 *General purpose machine* — any machine designed, listed and offered in standard ratings with operating characteristics and mechanical construction suitable for use under usual service conditions without restrictions to a particular application or type of application.

11.2.1.3 *Universal motor* — a motor which can be operated by either direct current or single-phase alternating current of normal frequencies.

11.2.1.4 *Adjustable-speed motor* — a motor the speed of which can be adjusted to any value in a specified range.

11.2.1.5 *Multi-speed motor* — a motor which can be operated at any one of two or more speeds which are substantially constant over its normal range of loads.

11.2.2 Cooling.

11.2.2.1 *Cooling* — a procedure by means of which heat resulting from losses occurring in a machine is given up first to a primary coolant by increasing its temperature. The heated primary coolant may be replaced by new coolant at a lower temperature or may be cooled by a secondary coolant in some form of heat exchanger.

11.2.2.2 *Open circuit cooling* — a method of cooling in which the coolant is drawn from the medium surrounding the machine, passes through the machine and then returns to the surrounding medium.

11.2.2.3 *Closed circuit cooling* — a method of cooling in which a primary coolant is circulated in a closed circuit through the machine and, if necessary, through a heat exchanger. Heat is transferred from the primary coolant to the secondary coolant through the structural parts or in the heat exchanger.

11.2.2.4 *Air-over-machine (AOM) cooling* — a method of cooling where the machine is located in an air stream, the source of air movement not being an integral part of the machine.

11.2.3 Duty and Duty Cycles.

11.2.3.1 *Duty* — a statement of the loads, including no-load and rest and de-energized periods, to which a machine is subjected, including their duration and sequence in time.

11.2.3.2 *Duty cycle* — a variation of load with time in which the cycle time is too short for thermal equilibrium to be attained.

11.2.3.3 *Cyclic duration factor* — the ratio between the period of loading including starting and electric braking and the duration of the duty cycle, expressed per unit.

11.2.4 Loads.

11.2.4.1 *Load* — all the numerical values of the electrical and mechanical quantities that signify the demand to be made at a given instant on a rotating machine by an electric circuit or a mechanism.

11.2.4.2 *No-load* — the state of a machine rotating at normal speed under rated conditions but when no output is required of it.

* AS 1360, Part 10—Dimensions and Outputs of Standard Single-speed Three-phase General Purpose Motors.

† Definitions from Part 1 of AS 1359 are included here for convenience.