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AS 1360.11—1980

Australian Standard®

ROTATING ELECTRICAL MACHINES OF PARTICULAR TYPES OR FOR PARTICULAR APPLICATIONS

Part 11—Dimensions and Performance of Small Power Electrical Machines

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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 8 November 1979, and was published on 1 February 1980.

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PREFACE

This revised edition of AS 1360, Part 11—1977 was prepared by the Association's Committee on Rotating Machines.

The revision was undertaken in response to requests from the industry to permit shaft extensions of smaller diameter for low-load applications. The opportunity was also taken to make other necessary changes.

The revision differs from the original as follows:

(a) Shaft extensions of smaller diameter are specified for frame numbers S80 and S90 for limited torque applications where mechanical adequacy is assured (see Table 11.5.1, frame numbers S80-14 and S90-16).

(b) Descriptions of dimensional symbols have been clarified; redefined symbols ED and ES replace previously specified EB and EC (see Fig. 11.5.1).

(c) The application of limits of shaft extension runout has been extended to all machines (see Clause 11.5.1).

(d) The tolerance on H for resilient-mounted frames has been considerably increased (see Table 11.6.1).

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 rating may be constructed to comply with either 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.

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

AS 1044	Limits of Electromagnetic Interference for Electrical Appliances and Equipment
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 Part 51—Noise Level Limits
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

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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

* 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 transfered 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.

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

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