

# Australian Standard 1359, Part 60—1981

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## GENERAL REQUIREMENTS FOR ROTATING ELECTRICAL MACHINES

### Part 60—TESTS

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## PREFACE

This part of the standard on rotating electrical machinery is based on IEC Publication 34—1 and the appropriate part of BS 4999, and acknowledgement is made of the assistance received therefrom.

This part specifies the conditions under which the tests for overspeed, commutation, sudden three-phase short circuit, temperature rise and high-voltage withstand are to be carried out. The value of the applied high voltage is specified for the various parts of machines having rated voltages up to and including 17 000 V.

This edition recognizes the publication of Part 51, Noise Level Limits. It also specifies the method of measuring losses with reference to the forthcoming Part 33, Methods of Determining Losses and Efficiency (in course of publication).

Details of the tests for vibration are under consideration.

This part of the standard may require reference to the following standards:

AS C329	Method for the Measurement of Voltage with Sphere-gaps (One Sphere Earthed)
IEC 34	Rotating Electrical Machines Part 4—Methods for Determining Synchronous Machine Quantities from Tests

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BEFORE 1974 SEE THE DRAFT  
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# STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

for

## GENERAL REQUIREMENTS FOR ROTATING ELECTRICAL MACHINES

### PART 60—TESTS

**60.1 SCOPE.** This Part of this standard sets out the test requirements applicable to rotating electrical machines.

**60.2 TEST ARRANGEMENTS.** The tests described in this Part shall normally be made at the manufacturer's works.

When test certificates are required, this shall be specified with the enquiry.

If normal test arrangements are inapplicable, e.g. in the case of certain large or special machines, the tests to be made and the manner of their application is a matter for agreement between the purchaser and the manufacturer before the order is placed.

NOTE: The presence of the purchaser or his representative during tests carried out to demonstrate compliance with the terms of the order is a matter for special arrangement before the order is placed.

**60.3 CLASSIFICATION OF TESTS.** Tests shall be classified as set out in Clauses 60.3.1 to 60.3.4.

**60.3.1 Performance Tests.** Performance tests shall include those tests required to show that a machine complies with the performance requirements specified in this standard. In addition tests shall be made to determine the compliance of the machine with any guaranteed specific performance.

**60.3.2 Type Tests.** Type tests are all the performance tests taken on the first machine of each type of design to determine its characteristics and to show that it complies with its specified performance. These tests provide a standard of reference for any subsequent duplicate machine.

**60.3.3 Duplicate Tests.** Duplicate tests are those tests applied to a machine which is of the same design and construction as a machine previously made and tested under performance and type tests, and are sufficient to demonstrate that the machine is in accordance with the original design.

**60.3.4 Routine Check Tests.** Routine check tests are those tests applied to a machine to show that the machine has been assembled correctly, is able to withstand the appropriate high voltage tests, and is in sound working order both electrically and mechanically.

**60.4 TEST RESULTS.** The results of performance, type and duplicate tests shall be held available by the manufacturer.

Unless otherwise specified and agreed before the order is placed, the manufacturer may submit certificates of type tests which have been made on a machine identical in all essential details with those purchased, in conjunction with duplicate or routine

check tests, as *prima facie* evidence of compliance of the machine with this standard. The records of routine check tests need not be made available.

When the results of such type tests are not available and when specified and agreed before the order is placed, performance tests shall be taken on the first machine of each design, and either duplicate or routine check tests shall be taken on all subsequent machines of the same design in the order.

When the results of type tests at the precise ratings are not available for a duplicate machine and when performance tests were not specified and agreed before the order was placed, performance tests taken on a machine of similar design and rating which, together with the tests taken on the actual machine, satisfy the manufacturer and the purchaser that the machine complies with the specification, shall be accepted as type tests for the machines.

**60.5 OVERSPEED TESTS.** Overspeed tests shall be carried out when the purchaser requests them at the time of the enquiry. In this case the tests shall be carried out in accordance with the requirements specified in AS 1359.41, Table 41.5, at any convenient temperature. The duration of the tests shall be 2 min.

A machine shall be deemed to satisfy the requirements of the overspeed test if no permanent abnormal deformation is apparent after the test, if no damage is sustained which would prevent the machine from operating normally, and if the windings withstand the specified high voltage test after the overspeed test.

**60.6 COMMUTATION TESTS.** Commutation tests shall be made to ensure compliance with the requirements of AS 1359.41, Clause 41.6, over the speed range for which the machine is designed. Where a temperature-rise test is being carried out these tests shall be made at the conclusion of the temperature-rise test.

In the case of series excited machines for which running on no-load is not practicable, the lowest test load shall be by agreement.

**60.7 SUDDEN THREE-PHASE SHORT CIRCUIT TESTS FOR A.C. GENERATORS.** Sudden three-phase short circuit tests for a.c. generators shall only be carried out when the purchaser requests them at the time of the enquiry. In this case the test shall be carried out on a machine running on open circuit at normal speed with excitation constant at a value which will produce a generator terminal voltage not greater than the rated voltage. The voltage at which the test shall be carried out shall be the subject of agreement between the purchaser and the manufacturer at the time of the enquiry.