AS/NZS 3947.4.2:2000
IEC 60947-4-2:1999

Australian/New Zealand Standard™

Low-voltage switchgear and controlgear

Part 4.2: Contactors and motor-starters—A.C. semiconductor motor controllers and starters

Standards Australia
STANDARDS NEW ZEALAND

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-006, Industrial Switchgear and Controlgear. It was approved on behalf of the Council of Standards Australia on 5 November 2000 and on behalf of the Council of Standards New Zealand on 27 October 2000. It was published on 11 December 2000.

The following interests are represented on Committee EL-006:

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Australian Chamber of Commerce and Industry
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Australian/New Zealand Standard™

Low-voltage switchgear and controlgear

Part 4.2: Contactors and motor-starters—A.C. semiconductor motor controllers and starters

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-006, Industrial Switchgear and Controlgear to supersede AS 3947.4.2—1997.

The objective of this Standard is to provide characteristics, constructional and performance requirements and tests to verify performance for a.c. semiconductor motor controllers and starters for rated voltage up to 1000 V a.c.

This Standard is Part 4.2 of a series which, when complete, will consist of the following:

AS(/NZS) 3947	Low-voltage switchgear and controlgear	
AS/NZS 3947.1	Part 1:	General rules
AS 3947.2	Part 2:	Circuit-breakers
AS/NZS 3947.3	Part 3:	Switches, disconnectors, switch-disconnectors and fuse-combination units
AS/NZS 3947.3 Supp1	Part 3:	Switches, disconnectors, switch-disconnectors and fuse-combination units, Supplement 1: Fuse-switch-disconnectors and switch-disconnectors for use with low voltage aerial bundled cables
AS 3947.4.1	Part 4.1:	Contactors and motor-starters—Electromechanical contactors and motor-starters
AS/NZS 3947.4.2	Part 4.2:	Contactors and motor-starters—A.C. semiconductor motor controllers and starters (this Standard)
AS/NZS 3947.4.3	Part 4.3:	Contactors and motor-starters—A.C. semiconductor controllers and contactors for non-motor loads
AS/NZS 3947.5.1	Part 5.1:	Control circuit devices and switching elements—Electro-mechanical control circuit devices
AS/NZS 3947.5.2	Part 5.2:	Control circuit devices and switching elements—Proximity switches
AS/NZS 3947.5.3	Part 5.3:	Control circuit devices and switching elements—Requirements for proximity devices with defined behaviour under fault conditions
AS/NZS 3947.5.4	Part 5.4:	Control circuit devices and switching elements—Methods of assessing the performance of low-energy contacts–Special tests
AS/NZS 3947.5.5	Part 5.5:	Control circuit devices and switching elements—Electrical emergency stop devices with mechanical latching function
AS/NZS 3947.5.6	Part 5.6:	Control circuit devices and switching elements—D.C. interface for proximity sensors and switching amplifiers (NAMUR)
AS/NZS 3947.6.1	Part 6.1:	Multiple function equipment—Automatic transfer switching equipment
AS/NZS 3947.6.2	Part 6.2:	Multiple function equipment—Control and protective switching devices (or equipment) (CPS)
AS/NZS 3947.7.1	Part 7.1:	Ancillary equipment—Terminal blocks for copper conductors
AS 3947.7.2	Part 7.2:	Ancillary equipment—Protective conductor terminal blocks for copper conductors
AS/NZS 3947.7.3	Part 7.3:	Ancillary equipment—Safety requirements for terminal blocks for the reception of cartridge fuse-links

This Standard is identical with and has been reproduced from IEC 60947-4-2:1999, *Low-voltage swtichgear and controlgear*, Part 4-2: *Contactors and motor-starters—AC semiconductor motor controllers and starters*.

This Standard covers low-voltage a.c. semiconductor motor controllers and starters, that have many capabilities and features beyond the simple starting and stopping of an induction motor, such as controlled starting and stopping, manoeuvring and controlled running.

The generic term, controller, is used in this Standard wherever the unique features of the power semiconductor switching elements are the most significant points of interest. The generic term, starter, is used wherever the consequences of operating the power semi-conductor switching elements, together with suitable overload protective means are the most significant points of interest. Specific designations (for example form 1, form HxB) are used wherever the unique features of various configurations comprise significant points of interest.

The provisions of AS/NZS 3947.1, *General rules*, are applicable to this Standard, where specifically called for. Clauses and subclauses thus applicable, as well as tables, figures, and annexes are identified by reference to IEC 60947-1, for example subclause 1.2.3 of IEC 60947-1, table 4 of IEC 60947-1 or annex A of IEC 60947-1.

This Standard differs from AS 3947.4.2—1997 in the following:

(a) Requirements and tests for dielectric properties have been revised and clarified.

(b) Requirements for coordination with short-circuit protective devices, a test to verify performance under short-circuit conditions and information relating to discrimination between overload protective devices and short-circuit protective devices have been added.

(c) The conducted radio frequency emission test and its associated terminal disturbance voltage limits have been revised.

A reference to an International Standard identified in the Normative References Clause and the Bibliography by strikethrough (~~example~~) is replaced by a reference to the Australian or Australian/New Zealand Standard(s) listed immediately thereafter and identified by shading (example). Where the struck-through referenced document and the referenced Australian or Australian/New Zealand Standard are identical, this is indicated in parenthesis after the title of the latter.

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

(i) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(ii) In the source text ‘this standard’ should read ‘this Australian/New Zealand Standard’.

(iii) A full point should be substituted for a comma when referring to a decimal marker.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex to which they apply. A ‘normative’ annex is an integral part of a Standard, whereas an ‘informative’ annex is only for information and guidance.

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Any IEC table, figure or passage of text that is struck-through is not part of this Standard. Any Australian/New Zealand table, figure or passage of text that is added (and identified by shading) is part of this Standard.

1 Scope and object

This standard applies to controllers and starters, which may include a series mechanical switching device, intended to be connected to circuits, the rated voltage of which does not exceed 1 000 V a.c.

This standard characterizes controllers and starters for use with and without bypass switching devices.

Controllers and starters dealt with in this standard are not normally designed to interrupt short-circuit currents. Therefore, suitable short-circuit protection (see 8.2.5) should form part of the installation, but not necessarily of the controller or starter.

In this context, this standard gives requirements for controllers and starters associated with separate short-circuit protective devices.

This standard does not apply to:

– continuous operation of a.c. motors at motor speeds other than the normal speed;

– semiconductor equipment, including semiconductor contactors (see 2.2.13 of IEC 60947-1) controlling non-motor loads;

– electronic a.c. power controllers covered by IEC 60146.

Contactors and control circuit devices used in controllers and starters should comply with the requirements of their relevant product standard. Where mechanical switching devices are used, they should meet the requirements of their own IEC product standard, and the additional requirements of this standard.

The object of this standard is to state as follows:

– the characteristics of controllers and starters and associated equipment;

– the conditions with which controllers and starters shall comply with reference to:

  a) their operation and behaviour;

  b) their dielectric properties;

  c) the degrees of protection provided by their enclosures where applicable;

  d) their construction;