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AS/NZS IEC 60947.4.3:2015

Australian/New Zealand Standard™

Low-voltage switchgear and controlgear

Part 4.3: Contactors and motor-starters—AC semiconductor controllers and contactors for non-motor loads

STANDARDS Australia

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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/NZS 3947.4.3:2000.

The objective of this Standard is to state—

(a) the characteristics of semiconductor controllers and contactors and associated equipment;

(b) the conditions with which semiconductor controllers and contactors should comply with reference to—

  (i) their operation and behaviour;

  (ii) their dielectric properties;

  (iii) the degrees of protection provided by their enclosures, where applicable;

  (iv) their construction;

(c) the tests intended for confirming that these conditions have been met, and the methods to be adopted for these tests; and

(d) the information to be given with the equipment or in the manufacturer's literature.

This Standard is identical with, and has been reproduced from, IEC 60947-4-3, Ed. 2.0 (2014), *Low-voltage switchgear and controlgear*, Part 4.3: *Contactors and motor-starters—AC semiconductor controllers and contactors for non-motor loads*. This edition cancels and replaces the first edition published in 1999, Amendment 1:2006 and Amendment 2:2011.

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

(a) In the source text 'this part of IEC 60947 should read 'this Australian/New Zealand Standard'.

(b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
IEC		AS/NZS	
61000	Electromagnetic compatibility (EMC)	61000	Electromagnetic compatibility (EMC)
61000-4-5	Part 4-5: Testing and measurement techniques—Surge immunity test	61000-4-5	Part 4.5: Testing and measurement techniques—Surge immunity test
CISPR		AS/NZS CISPR	
11	Industrial, scientific and medical equipment—Radio-frequency disturbance characteristics—Limits and methods of measurement Amendment 1 (2010)	11	Industrial, scientific and medical equipment—Radio-frequency disturbance characteristics—Limits and methods of measurement

Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annexes 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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INTRODUCTION

This part of IEC 60947 covers low-voltage a.c. semiconductor controllers and contactors (solid-state contactors) intended for the use with non-motor loads. As controllers, they have many capabilities beyond the simple switching on and off of non-motor loads. As contactors, they perform the same functions as mechanical contactors, but utilize one or more semiconductor switching devices in their main poles.

The devices may be single-pole or multi-pole (see 2.3.1 of IEC 60947-1:2007,). This standard refers to complete devices rated as a unit incorporating all necessary heat-sinking material and terminals. It includes devices with all necessary terminals, which are supplied with or without heat-sink in knocked-down form for combination by the users, when the manufacturer gives with the device detailed information about choosing the heat-sink and mounting the device on the heat-sink.

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 "contactor" is used in this standard wherever the features of simple switching on and off is the most significant point of interest. Specific designations (for example, form 4, form H*x*B, etc.) are used wherever the unique features of various configurations comprise significant points of interest.

NOTES

AUSTRALIAN/NEW ZEALAND STANDARD

Low-voltage switchgear and controlgear

Part 4.3: Contactors and motor-starters—AC semiconductor controllers and contactors for non-motor loads

1 Scope

This part of IEC 60947 applies to a.c. semiconductor non-motor load controllers and contactors intended for performing electrical operations by changing the state of a.c. electric circuits between the ON-state and the OFF-state. Typical applications are classified by utilization categories given in Table 2.

As controllers, they may be used to reduce the amplitude of the r.m.s. a.c. voltage on the load terminals from that of the applied voltage – either continuously or for a specified period of time. The half-wave period of the a.c. wave form remains unchanged from that of the applied voltage.

They may include a series mechanical switching device and are intended to be connected to circuits, the rated voltage of which does not exceed 1 000 V a.c.

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

The semiconductor controllers and contactors dealt with in this standard are not normally intended 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 itself.

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

This standard does not apply to:

- operation of a.c. and d.c. motors;
- low-voltage a.c. semiconductor motor controllers and starters covered by IEC 60947-4-2;
- electronic a.c. power controllers covered by the IEC 60146 series;
- all-or-nothing solid-state relays.

Contactors and control-circuit devices used in semiconductor controllers and contactors 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

a) the characteristics of semiconductor controllers and contactors and associated equipment;
b) the conditions with which semiconductor controllers and contactors should comply with reference to:
   - their operation and behaviour;
   - their dielectric properties;
   - the degrees of protection provided by their enclosures, where applicable;