

SLOVENSKI STANDARD

SIST EN 60947-4- 2:2000/A1:2002

prva izdaja
september 2002

**Niskonapetostne stikalne in krmilne naprave – 4-2. del: Kontaktorji in
motorski zaganjalniki – Polprevodniški krmilniki in zaganjalniki motorjev na
izmenični tok – Dopolnilo A1**

Low-voltage switchgear and controlgear - Part 4-2: Contactors and motor-starters –
AC semiconductor motor controllers and starters (IEC 60947-4-2:1999/A1:2001)

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ICS 29.130.20

Referenčna številka
SIST EN 60947-4-2:2000/A1:2002(en)

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EUROPEAN STANDARD

EN 60947-4-2/A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2002

ICS 29.130.20

English version

**Low-voltage switchgear and controlgear
Part 4-2: Contactors and motor-starters –
AC semiconductor motor controllers and starters
(IEC 60947-4-2:1999/A1:2001)**

Appareillage à basse tension
Partie 4-2: Contacteurs et démarreurs
de moteurs –
Gradateurs et démarreurs à
semiconducteurs de moteurs
à courant alternatif
(CEI 60947-4-2:1999/A1:2001)

Niederspannungsschaltgeräte
Teil 4-2: Schütze und Motorstarter -
Halbleiter-Motor-Steuergeräte und
-Starter für Wechselspannungen
(IEC 60947-4-2:1999/A1:2001)

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This amendment A1 modifies the European Standard EN 60947-4-2:2000; it was approved by CENELEC on 2002-03-05. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 17B/1143/FDIS, future amendment 1 to IEC 60947-4-2:1999, prepared by SC 17B, Low-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60947-4-2:2000 on 2002-03-05.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-12-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2005-03-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes I and ZA are normative and annex J is informative.
Annex ZA has been added by CENELEC.

iTeh STANDARD PREVIEW Endorsement notice (standards.iteh.ai)

The text of amendment 1:2001 to the International Standard IEC 60947-4-2:1999 was approved by CENELEC as an amendment to the European Standard without any modification.

[SIST EN 60947-4-2:2000/A1:2002](https://standards.iteh.ai/catalog/standards/sist/b496714c-a7c3-42e2-adff-4d44f7172a0b/sist-en-60947-4-2-2000-a1-2002)

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Annex ZA
(normative)

**Normative references to international publications
with their corresponding European publications**

Insert in the existing list the following standard:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60085	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990

Add after IEC 60947-1:1999:

A1	2000		A1	2000
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NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC

60947-4-2

1999

AMENDEMENT 1
AMENDMENT 1
2001-10

Amendement 1

Appareillage à basse tension –

Partie 4-2:

**Contacteurs et démarreurs de moteurs –
Gradateurs et démarreurs à semiconducteurs de
moteurs à courant alternatif**

SIST EN 60947-4-2:2000/A1:2002
<https://standards.iteh.ai/catalog/standards/sist/b496714c-a7c3-42e2-adff-4d44f7172a0b/sist-en-60947-4-2-2000-a1-2002>

Amendment 1

Low-voltage switchgear and controlgear –

Part 4-2:

**Contactors and motor-starters –
AC semiconductor motor controllers and starters**

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

S

*Pour prix, voir catalogue en vigueur
For price, see current catalogue*

FOREWORD

This amendment has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

The text of this amendment is based on the following documents:

FDIS	Report on voting
17B/1143/FDIS	17B/1168/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until 2003. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

The contents of the corrigendum of March 2002 have been included in this copy.

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Page 3

[SIST EN 60947-4-2:2000/A1:2002](https://standards.iteh.ai/catalog/standards/sist/b496714c-a7c3-42e2-adff-4d44f7172a0b/sist-en-60947-4-2-2000-a1-2002)

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CONTENTS

Add, on page 5, the titles of the following new annexes and tables:

Annex I (normative) Modified test circuit for short-circuit testing of semiconductor motor controllers and starters

Annex J (informative) Flowchart for constructing bypassed semiconductor controllers tests

Table 17 – Temperature rise limits for insulated coils in air and in oil

Table 18 – Intermittent duty test cycle data

Page 7

FOREWORD

Replace, on page 9, the first two paragraphs by the following:

Annexes A, B, C, D and I form an integral part of this standard.

Annexes E, F, G, H and J are for information only.

Page 13

1 Scope and object

Replace the existing second paragraph by the following:

This standard characterizes controllers and starters with and without bypass means.

Page 15

2 Normative references

Insert, in the existing list, the title of the following standard:

IEC 60085:1984, *Thermal evaluation and classification of electrical insulation*

Add, after "IEC 60947-1:1999, Low-voltage switchgear and controlgear – Part 1: General rules" the following:

Amendment 1 (2000)

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3 Definitions

[SIST EN 60947-4-2:2000/A1:2002](https://standards.iteh.ai/catalog/standards/sist/b496714c-a7c3-42e2-adff-4d4417172a0b/sist-en-60947-4-2-2000-a1-2002)

Replace, on page 21, the title of the existing figure 1 by the following new title:

Figure 1 – Semiconductor motor control devices

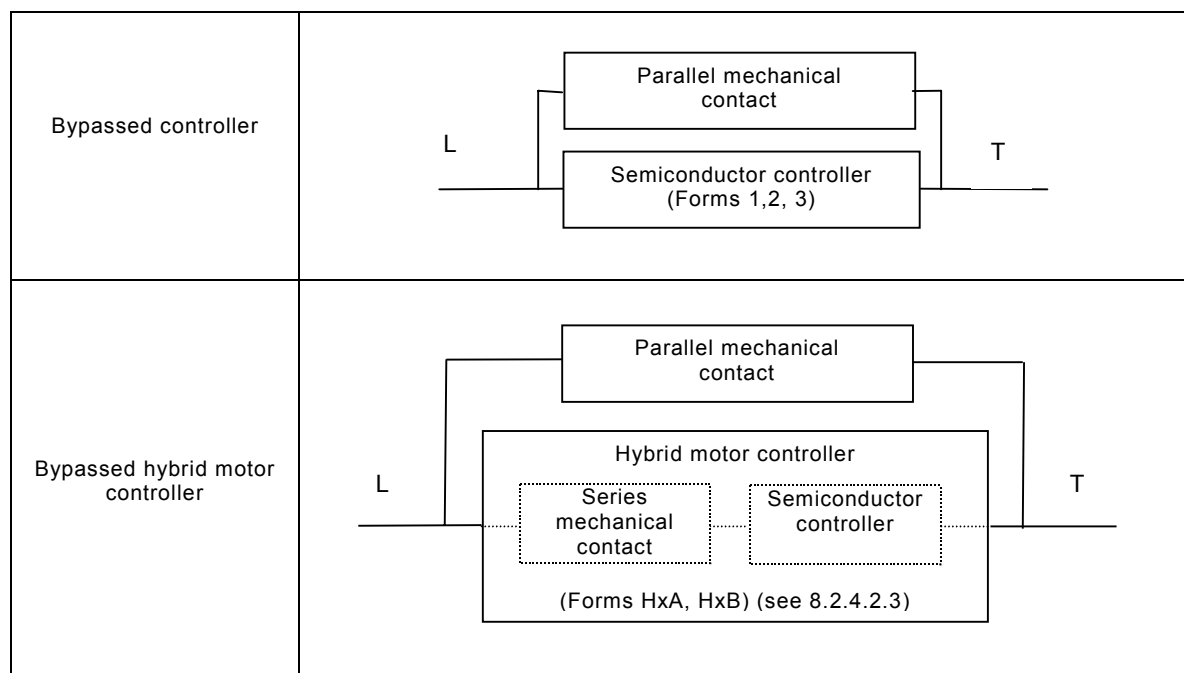
Within figure 1

In the first column, replace:

"Semiconductor motor controller (all forms)" by "Semiconductor motor controller (forms 1, 2, 3)"

"Semiconductor motor starter (all forms)" by "Semiconductor motor starter (forms 1, 2, 3)"

Add, after the row "Hybrid motor controller HxB**", the following new rows:



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Page 29

Add, after definition 3.1.23, the following new definition:

[SIST EN 60947-4-2:2000/A1:2002](https://standards.iteh.ai/catalog/standards/sist/b496714c-a7c3-42e2-adff-4d44f7172a0b/sist-en-60947-4-2-2000-a1-2002)
<https://standards.iteh.ai/catalog/standards/sist/b496714c-a7c3-42e2-adff-4d44f7172a0b/sist-en-60947-4-2-2000-a1-2002>

3.1.24

bypassed controller

equipment wherein the main circuit contacts of a mechanical switching device are connected in parallel with the main circuit terminals of a semiconductor switching device, and wherein the operating means of the two switching devices are co-ordinated

Page 43

5.3.5.3.1 Starting characteristics of squirrel cage and hermetic refrigeration motors

Replace the existing item b) by the following:

- b) One direction of rotation with the inclusion of phase-control capability to provide controlled acceleration to normal speed. Controllers and starters are rated for intermittent duty only (AC-53b, AC-58b); for example after starting, the motor may be connected into a circuit that bypasses the power semiconductors.

Page 47

Table 2 – Utilization categories

Replace the existing table by the following new table:

Utilization category	Typical application
AC-52a	Control of slip ring motor stators: 8 h duty with on-load currents for start, acceleration, run
AC-52b	Control of slip ring motor stators: intermittent duty
AC-53a	Control of squirrel cage motors: 8 h duty with on-load currents for start, acceleration, run
AC-53b	Control of squirrel cage motors: intermittent duty
AC-58a	Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: 8 h duty with on-load currents for start, acceleration, run
AC-58b	Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: intermittent duty

NOTE 1 The means of bypassing the semiconductor controller may be integral with the controller/starter or installed separately.

NOTE 2 A hermetic refrigerant compressor motor is a combination consisting of a compressor and motor, both of which are enclosed in the same housing, with no external shaft or shaft seals, the motor operating in the refrigerant.

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Page 55

8.1.3 Clearances and creepage distances

Replace the existing text by the following new text:

Subclause 7.1.3 of IEC 60947-1 applies with the following additional requirement. Specified minimum creepage distances only apply to those dimensions that are external to the semiconductor.

Page 59

Add, after 8.2.1.5.2, the following new subclauses 8.2.1.6 to 8.2.1.9:

8.2.1.6 Type tested components in bypassed controllers

8.2.1.6.1 Switching devices which meet the requirements of their own relevant product standard shall be considered as partially type tested devices subject to the following additional requirements:

- a) the temperature rises of mechanical switching devices shall comply with 8.2.2;
- b) the making and breaking capacity of mechanical switching devices shall comply with 8.2.4.2;
- c) semiconductor switching devices shall comply with 8.2.4.1 for utilization category AC-53b.