SLOVENSKI STANDARD

SIST EN 60252-2:2003

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AC motor capacitors - Part 2: Motor start capacitors

ICS 31.060.70

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EUROPEAN STANDARD **EN 60252-2**

NORME EUROPÉENNE

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English version

AC motor capacitors
Part 2: Motor start capacitors
(IEC 60252-2:2003)

Condensateurs des moteurs
à courant alternatif
Partie 2: Condensateurs de démarrage
de moteurs
(CEI 60252-2:2003)

Wechselspannungsmotorkondensatoren
Teil 2: Motoranlaufkondensatoren
(IEC 60252-2:2003)

This European Standard was approved by CENELEC on 2003-06-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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 European Standard 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, 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

Ref. No. EN 60252-2:2003 E

Foreword

The text of document 33/389/FDIS, future edition 1 of IEC 60252-2, prepared by IEC TC 33, Power capacitors, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60252-2 on 2003-06-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-03-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-06-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annexes A and ZA are normative.
Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60252-2:2003 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60068-2-6 + corr. March	1995 1995	Environmental testing Part 2: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	1995
IEC 60068-2-14	1984	Part 2: Tests - Test N: Change of temperature	EN 60068-2-14 [1)]	1999
IEC 60068-2-20	1979	Part 2: Tests - Test T: Soldering	HD 323.2.20 S3 [2)]	1988
IEC 60068-2-21	1999	Part 2-21: Tests - Test U: Robustness of terminations and integral mounting devices	EN 60068-2-21	1999
IEC 60068-2-78	2001	Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	2001
IEC 60112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2 [3)]	1980
IEC 60309-1	1999	Plugs, socket-outlets and couplers for industrial purposes Part 1: General requirements	EN 60309-1	1999
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 60695-2-10	2000	Fire hazard testing Part 2-10: Glowing/hot-wire based test methods - Glow-wire apparatus and common test procedure	EN 60695-2-10	2001

1) EN 60068-2-14 includes A1:1986 to IEC 60068-2-14.

2) HD 323.2.20 S3 includes A2:1987 to IEC 60068-2-20.

3) HD 214.S2 is superseded by EN 60112:2003, which is based on IEC 60112:2003.

Publication	Year	Title	EN/HD	Year
IEC 60695-2-11	2000	Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products	EN 60695-2-11	2001
ISO 4046	- [4)]	Paper, board, pulp and related terms - Vocabulary	-	-

4) Undated reference.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

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Condensateurs des moteurs à courant alternatif –

Partie 2: Condensateurs de démarrage de moteurs

AC motor capacitors –

Part 2: Motor start capacitors

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

AC MOTOR CAPACITORS –

Part 2: Motor start capacitors

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60252-2 has been prepared by IEC technical committee 33: Power capacitors.

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

FDIS	Report on voting
33/389/FDIS	33/391/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 60252 consists of the following parts, under the general title *AC motor capacitors*:

Part 1: General – Performance, testing and rating – Safety requirements – Guide for installation and operation

Part 2: Motor start capacitors

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

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

AC MOTOR CAPACITORS –

Part 2: Motor start capacitors

1 General

1.1 Scope and object

This International Standard applies to motor start capacitors intended for connection to windings of asynchronous motors supplied from a single-phase system having the frequency of the mains.

This standard covers impregnated or unimpregnated metallized motor start capacitors having a dielectric of paper or plastic film, or a combination of both and electrolytic motor start capacitors with non-solid electrolyte, with rated voltages up to and including 660 V.

1.2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-6:1995, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-14:1984, *Environmental testing – Part 2: Tests – Test N: Change of temperature*

IEC 60068-2-20:1979, *Environmental testing – Part 2: Tests – Test T: Soldering*

IEC 60068-2-21:1999, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60068-2-78:2001, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60112:1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

IEC 60309-1:1999, *Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

IEC 60695-2-10:2000, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

IEC 60695-2-11:2000, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products*

ISO 4046: *Paper, board, pulps and related terms – Vocabulary*

1.3 Definitions

For the purposes of this document, the following definitions apply.

1.3.1
motor running capacitor
power capacitor which, when used in conjunction with an auxiliary winding of a motor, assists the motor to start and improves the torque under running conditions

NOTE The running capacitor is usually connected permanently to the motor winding and remains in circuit throughout the running period of the motor. During the starting period, if it is in parallel with the starting capacitor, it helps to start the motor.

1.3.2
motor starting capacitor
power capacitor which provides a leading current to an auxiliary winding of a motor and which is switched out of circuit once the motor is running

1.3.3
metal foil capacitor
capacitor, the electrodes of which consist of metal foils or strips separated by a dielectric

1.3.4
metallized capacitor
capacitor, in which the electrodes consist of a metallic deposit on the dielectric

1.3.5
self-healing capacitor
capacitor, the electrical properties of which, after local breakdown of the dielectric, are rapidly and essentially self-restored

1.3.6
discharge device of a capacitor
device which may be incorporated in a capacitor, capable of reducing the voltage between the terminals effectively to zero, within a given time, after the capacitor has been disconnected from a network

1.3.7
continuous operation

operation with no time limit within the normal life of the capacitor

1.3.8
intermittent operation
operation in which periods with the capacitor energized are followed by intervals during which the capacitor is unenergized

1.3.9
starting operation
special type of intermittent operation in which the capacitor is energized for only a very short period while the motor is accelerating to rated speed

1.3.10
rated duty cycle
rated value indicating the rate of intermittent or starting duty for which a capacitor is suitable. It is specified by the duty cycle duration, in minutes, and the percentage of the time during which the capacitor is energized

1.3.11
duty cycle duration
total time of one energized and one unenergized interval during the intermittent operation

1.3.12
relative operation time
percentage of the cycle duration in which the capacitor is energized

1.3.13
capacitor for continuous and starting operation
capacitor designed to operate at one voltage when in continuous operation and at a different (usually higher) voltage when in starting operation

1.3.14
minimum permissible capacitor operating temperature
minimum permissible temperature on the outside of the case at the moment of switching on the capacitor

1.3.15
maximum permissible capacitor operating temperature (t_C)
maximum permissible temperature of the hottest area of the outside of the capacitor case during operation

1.3.16
rated voltage of a capacitor (U_N)
r.m.s. value of the alternating voltage for which the capacitor has been designed

1.3.17
maximum voltage
maximum r.m.s. voltage permissible at the starting capacitor terminals between the point of starting and the instant at which the capacitor is disconnected

1.3.18
rated frequency of a capacitor (f_N)
highest frequency for which the capacitor has been designed

1.3.19
rated capacitance of a capacitor (C_N)
capacitance value for which the capacitor has been designed

1.3.20
rated current of a capacitor (I_N)
r.m.s. value of the alternating current at the rated voltage and frequency

1.3.21
rated output of a capacitor (Q_N)
reactive power derived from the rated values of capacitance, frequency and voltage (or current)

1.3.22
capacitor losses
active power dissipated by a capacitor

NOTE Unless otherwise stated, the capacitor losses will be understood to include losses in fuses and discharge resistors forming an integral part of the capacitor.