
Power capacitors - Low-voltage power factor correction banks

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EUROPEAN STANDARD

EN 61921

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2003

ICS 31.060.70

English version

**Power capacitors –
Low-voltage power factor correction banks
(IEC 61921:2003)**

Condensateurs de puissance -
Batteries de compensation
du facteur de puissance basse tension
(CEI 61921:2003)

Kondensatorbatterien zur Korrektur
des Niederspannungsleistungsfaktors
(IEC 61921:2003)

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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

Foreword

The text of document 33/387/FDIS, future edition 1 of IEC 61921, prepared by IEC TC 33, Power capacitors, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61921 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- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-06-01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.

Annexes designated "informative" are given for information only.

In this standard, annexes A, B and ZA are normative and annexes C and D are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61921:2003 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60060-1	NOTE	Harmonized as HD 588.1 S1:1991 (not modified).
IEC 60831-2	NOTE	Harmonized as EN 60831-2:1996 (not modified).
IEC 60931-2	NOTE	Harmonized as EN 60931-2:1996 (not modified).
IEC 60931-3	NOTE	Harmonized as EN 60931-3:1996 (not modified).
IEC 61000-2-2	NOTE	Harmonized as EN 61000-2-2:2002 (not modified).
IEC 61000-4-1	NOTE	Harmonized as EN 61000-4-1:2000 (not modified).

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60439-1	1999	Low-voltage switchgear and controlgear assemblies Part 1: Type-tested and partially type-tested assemblies	EN 60439-1	1999
IEC 60439-3 (mod)	1990	Part 3: Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards	EN 60439-3 + Corr. April	1991 1994
IEC 60831-1	1996	Shunt power capacitors of the self-healing type for a.c. systems having a rated voltage up to and including 1 kV Part 1: General - Performance, testing and rating - Safety requirements - Guide for installation and operation	EN 60831-1	1996
IEC 60931-1	1996	Shunt power capacitors of the non-self-healing type for a.c. systems having a rated voltage up to and including 1 kV Part 1: General - Performance, testing and rating - Safety requirements - Guide for installation and operation	EN 60931-1	1996

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CEI
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Batteries de compensation du facteur
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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**POWER CAPACITORS –
LOW-VOLTAGE POWER FACTOR CORRECTION BANKS**

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.
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International Standard IEC 61921 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
33/387/FDIS	33/390/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.

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.

POWER CAPACITORS – LOW-VOLTAGE POWER FACTOR CORRECTION BANKS

1 Scope

This International Standard is applicable to low-voltage a.c. capacitor banks intended to be used for power factor correction purposes, equipped with a built-in switchgear and controlgear apparatus capable of connecting to or disconnecting from the mains part(s) of the bank with the aim to correct its power factor.

Low-voltage power factor correction banks if not otherwise indicated hereinafter and where applicable shall comply with the requirements of IEC 60439-1 and those of IEC 60439-3.

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 60439-1:1999, *Low-voltage switchgear and controlgear assemblies – Part 1: Type-tested and partially type-tested assemblies*

IEC 60439-3:1990, *Low-voltage switchgear and controlgear assemblies – Part 3: Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use – Distribution boards*

IEC 60831-1:1996, *Shunt power capacitors of the self-healing type for a.c. systems having a rated voltage up to and including 1 000 V – Part 1: General – Performance, testing and rating – Safety requirements – Guide for installation and operation*

IEC 60931-1:1996, *Shunt power capacitors of the non-self-healing type for a.c. systems having a rated voltage up to and including 1 000 V – Part 1: General – Performance, testing and rating – Safety requirements – Guide for installation and operation*

3 Terms and definitions

For the purpose of this document, the following definitions, together with the definitions found in IEC 60439-1, IEC 60831-1 and IEC 60931-1 apply.

3.1

low-voltage a.c. capacitor bank

combination of one or more low-voltage capacitor units together with associated switching devices and control, measuring, signalling, protective, regulating equipment, etc., completely assembled under the responsibility of the manufacturer with all the internal electrical and mechanical interconnections and structural parts

NOTE 1 Throughout this standard, the abbreviations "automatic bank" and "assembly" are used for a low-voltage a.c capacitors automatic or non-automatic bank.

NOTE 2 The components of switchgear and controlgear of the automatic bank may be electromechanical or electronic.

3.2

step of capacitor bank

step

combination of one or more capacitor units switched together

3.3

automatic reactive power regulator

controller

circuit designed to calculate the reactive power absorbed by the load connected to the power line and to control the switching on and off of the steps of the automatic bank, in order to compensate for the reactive power

NOTE 1 The reactive power is normally calculated at the fundamental frequency.

NOTE 2 The controller may be "built-in" or "free-standing" and has usually to be adjusted for each bank before operation.

3.4

transient inrush current I_t

transient overcurrent of high amplitude and frequency that may occur when a capacitor is switched on, the amplitude and frequency being determined by factors such as the short-circuit impedance of the supply, the amount of energized capacitance switched in parallel and the instant of the switching

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3.5

rated reactive power Q_N (of an assembly)

total reactive power of an assembly at the rated frequency and voltage, calculated by the total impedance of the bank including reactors, if any

4 Marking of a capacitor bank

The following minimum information shall be given by the manufacturer in an instruction sheet or alternatively, on request of the purchaser, on a rating plate to be fixed on the assembly.

- 1) Manufacturer's name or trademark.
- 2) Identification number or type designation.
- 3) Date of manufacture, in clear or code form.
- 4) Rated reactive power, Q_N in kilovars (kvar).
- 5) Rated voltage, U_N in volts (V).
- 6) Rated frequency, f_N in hertz (Hz).
- 7) Minimum and maximum ambient temperatures in degrees Celsius (°C).
- 8) Degree of protection.
- 9) Short-circuit withstand strength, in amperes (A).