



IEC 60358-1

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INTERNATIONAL STANDARD

**Coupling capacitors and capacitor dividers -
Part 1: General rules**



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CONTENTS

FOREWORD	5
INTRODUCTION	7
1 Scope	9
2 Normative references	9
3 Terms, definitions, symbols and abbreviated terms	10
3.1 General	10
3.2 Coupling capacitor and capacitor divider specifics	14
4 Normal and special environmental conditions	16
4.1 General	16
4.2 Normal service conditions	16
4.2.1 Ambient air temperature	16
4.2.2 Altitude	16
4.2.3 Vibrations or earthquakes	16
4.2.4 Other service conditions for indoor equipment	16
4.2.5 Other service conditions for outdoor equipment	17
4.3 Special service conditions	17
4.3.1 General	17
4.3.2 Altitude	17
4.3.3 Ambient temperature	18
4.3.4 Earthquakes	19
4.4 System earthing	19
5 Ratings	19
5.1 Standard values of rated frequency	19
5.2 Standard values of rated voltages	19
5.2.1 Rated voltage U_r for AC	19
5.2.2 Rated voltage U_r for DC	19
5.3 Standard values of rated voltage factor	20
5.3.1 Standard values of rated voltage factor for AC voltages	20
5.3.2 Standard values of rated voltage factor for DC voltages	21
6 Design requirements	21
6.1 Insulation requirements	21
6.2 Other insulation requirements	23
6.2.1 Low-voltage terminal not exposed to weather	23
6.2.2 Low-voltage terminal exposed to weather	23
6.2.3 Partial discharges	23
6.2.4 Chopped lightning impulse test	24
6.2.5 Capacitance at power frequency	25
6.2.6 Losses of the capacitor at power frequency	25
6.2.7 External insulation requirements	25
6.3 Electromagnetic emission requirements – Radio interference voltage (RIV)	26
6.4 Mechanical requirements	26
6.5 Tightness of equipment	27
6.5.1 General	27
6.5.2 Liquid tightness	27
6.5.3 Gas tightness	28

6.6	Voltage grading for DC capacitors.....	29
6.7	Requirements for temperature rise.....	30
6.8	Capacitor element ageing requirements	30
6.8.1	General	30
6.8.2	Capacitor element design criteria.....	30
6.9	Marking of the equipment.....	31
6.9.1	General	31
6.9.2	Markings of the rating plate	31
7	Tests	33
7.1	General.....	33
7.2	Classification of tests	33
7.2.1	General	33
7.2.2	Routine tests	34
7.2.3	Type tests.....	34
7.2.4	Special tests.....	35
7.2.5	Design tests	35
7.2.6	Routine test sequence	36
7.2.7	Type test sequence	37
7.3	Routine tests	38
7.3.1	General	38
7.3.2	Tightness of equipment	38
7.3.3	Capacitance and $\tan\delta$ measurement at power-frequency	38
7.3.4	Power-frequency or DC withstand test.....	39
7.3.5	Partial discharge measurement.....	41
7.3.6	Power-frequency voltage withstand test on low-voltage terminal if applicable.....	42
7.3.7	Resistance measurement for DC equipment	42
7.3.8	Verification of markings	42
7.3.9	Gas dew point measurement	42
7.4	Type tests	43
7.4.1	General	43
7.4.2	Impulse tests	43
7.4.3	Wet test for outdoor equipment.....	45
7.4.4	Radio interference voltage test.....	46
7.4.5	Polarity reversal test for DC equipment.....	47
7.4.6	Temperature rise test	48
7.4.7	Enclosure tightness test at ambient temperature.....	50
7.4.8	Mechanical tests.....	50
7.5	Special tests	51
7.5.1	Determination of the temperature coefficient of capacitance T_C	51
7.5.2	Enclosure tightness test at low and high temperatures.....	52
7.5.3	Internal arc test	53
7.5.4	Multiple chopped impulse test on primary terminals	53
7.5.5	Measurement of the impedance depending on frequency.....	53
7.5.6	Thermal stability test	54
7.5.7	Corrosion test.....	54
7.6	Design tests	55
7.6.1	Ageing test	55

8	Rules for transport, storage, erection, operation and maintenance.....	56
8.1	General.....	56
8.2	Conditions during transport, storage and installation.....	56
8.3	Installation	57
8.3.1	General	57
8.3.2	Unpacking and lifting	57
8.3.3	Assembly	57
8.3.4	Mounting	57
8.3.5	Connections	57
8.3.6	Final installation inspection and tests	57
8.4	Maintenance	58
8.4.1	General	58
8.4.2	Responsibilities for the manufacturer.....	58
9	Safety.....	58
10	Influence of products on the natural environment.....	59
Annex A (informative)	Typical diagram of an equipment.....	60
Annex B (informative)	Partial discharge test circuit and instrumentation.....	61
Annex C (normative)	Radio interference voltage – Measurement circuit.....	63
Annex D (informative)	Superimposed impulse voltage test	65
D.1	Overview	65
D.2	Test description	65
D.3	Criteria to pass the test.....	66
Annex E (informative)	Test circuit for superimposed impulse voltage tests	67
E.1	General.....	67
E.2	Test circuit using blocking capacitor.....	67
E.3	Test circuit using sphere gap	67
Annex F (informative)	High-frequency characteristic measurements	69
Annex G (informative)	Composite AC/DC voltages.....	70
G.1	Composite AC/DC voltage descriptions.....	70
G.2	Example 1 – without 3PWM	71
G.3	Example 2 – with 3PWM	72
G.4	Conclusion.....	74
Annex H (informative)	Voltage definitions	75
Bibliography.....		76
Figure 1 – Factor m for the switching impulse withstand test	18	
Figure 2 – Reduced scale model capacitor element geometry	31	
Figure 3 – Flow charts test sequence to be applied when performing the routine test.....	36	
Figure 4 – Flow charts test sequence to be applied when performing the type test.....	37	
Figure 5 – Test sequence for polarity reversal tests	48	
Figure 6 – Flow chart for temperature rise test.....	48	
Figure A.1 – Example of a diagram for a coupling capacitor (with and without low-voltage terminal)	60	
Figure A.2 – Example of a diagram for a capacitor divider (with and without low-voltage terminal)	60	
Figure B.1 – Test circuit.....	61	

Figure B.2 – Alternative circuit	61
Figure B.3 – Example of balanced test circuit	62
Figure B.4 – Example of calibration circuit	62
Figure C.1 – Measuring circuit	64
Figure D.1 – Schematic representation of superimposed impulse voltage tests	65
Figure E.1 – Test circuit for superimposed impulse tests using blocking capacitor	67
Figure E.2 – Test circuit for superimposed impulse tests using sphere gap	68
Figure F.1 – Wiring diagram of the measuring circuit for the high-frequency capacitance and equivalent series resistance of a coupling capacitor	69
Figure G.1 – Example of an unsymmetrically VSC converter	71
Figure G.2 – Maximum peak voltage without 3PWM	72
Figure G.3 – Both individual AC voltage curves with 3PWM	73
Figure G.4 – Superimposed voltage curve with 3PWM, based on Figure G.3	73
Figure H.1 – Voltage overview and definitions	75
 Table 1 – Rated ambient temperature categories	16
Table 2 – Standard values of rated voltage factors	20
Table 3 – Standard insulation levels for AC voltages	21
Table 4 – Partial discharge test voltages and permissible levels	24
Table 5 – Creepage distance for AC	26
Table 6 – Static withstand test loads for insulators	27
Table 7 – Permissible temporary leakage rates for gas systems	29
Table 8 – Marking of the rating plate	32
Table 9 – List of Routine tests	34
Table 10 – List of Type tests	34
Table 11 – List of Special tests	35
Table 12 – List of Design tests	35
Table 13 – Test voltages for units, stacks and complete equipment	40
Table 14 – Modalities of application of the test loads to the line primary terminals	51
Table H.1 – Voltage definitions for DC application	75

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Coupling capacitors and capacitor dividers -
Part 1: General rules****FOREWORD**

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IEC 60358-1 has been prepared by IEC Technical Committee 33: Power capacitors and their applications. It is an International Standard.

This second edition cancels and replaces the first edition published in 2012. This edition constitutes a technical revision.

This edition of IEC 60358-1 includes the following significant technical changes with respect to the previous edition:

- a) new terms and definitions are presented in Clause 3;
- b) new definitions in Clause 4 and Clause 5;
- c) gas-insulated coupling capacitors and capacitor dividers are integrated in Clause 6;
- d) new tests in routine, type, special and design test sections are introduced, see Clause 7;
- e) new Clause 8, Clause 9 and Clause 10;

f) new Annex D, Annex E, Annex F, Annex G and Annex H.

The text of this International Standard is based on the following documents:

Draft	Report on voting
33/732/FDIS	33/737/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60358 series, published under the general title *Coupling capacitors and capacitor dividers*, can be found on the IEC website.

IEC 60358-1, *Coupling capacitors and capacitor dividers - Part 1: General rules*

IEC 60358-2, *Coupling capacitors and capacitor dividers - Part 2: AC or DC single-phase coupling capacitor connected between line and ground for power line carrier-frequency (PLC) application*

IEC 60358-3, *Coupling capacitors and capacitor dividers - Part 3: AC or DC single-phase coupling capacitor for harmonic-filters applications*

IEC 60358-4, *Coupling capacitors and capacitor dividers - Part 4: DC or AC single-phase capacitor dividers*

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

This document is the first revision of IEC 60358-1, defining general rules for coupling capacitors and capacitor dividers.

The main modifications of this revision are listed below:

- terms and definitions:
 - new terms and definitions are presented in Clause 3;
- normal and special environmental conditions:
 - new definitions in Clause 4 are introduced;
- ratings:
 - addition of HV insulation levels above 800 kV;
 - new definition on rated voltage U_r for AC and DC applications;
 - Clause 5, new definitions for DC application are integrated;
 - new standard values of rated voltages are defined;
- design and construction:
 - clarification of the altitude correction for external insulation and dielectric tests;
 - external insulation requirements for DC application;
 - gas-insulated coupling capacitors and capacitor dividers are integrated in Clause 6;
 - new test with its requirements on capacitor element ageing is defined;
- type tests:
 - temperature rise test: more accurate definition of the test duration;
 - lightning impulse test: new test procedure (15 impulses) for $U_m \geq 300$ kV;
 - mechanical test: moved from special test to type test;
 - new enclosure tightness test for gas-insulated coupling capacitors and dividers;
- routine tests:
 - tightness tests for gas-insulated equipment;
 - gas dew point measurements;
 - new flowchart of routine tests presented in Figure 3;
- special tests:
 - determination of temperature coefficient of the capacitor element;
 - new enclosure tightness test on low and hot temperature;
 - information about internal arc tests;
 - information about multiple chopped impulse tests;
 - new test on impedance measurements depending on frequency;
 - new test on thermal stability;
 - new test on corrosion;
 - new flowchart of type tests presented in Figure 4;
- design tests (new clause):
 - ageing tests of capacitor elements;

- commissioning tests (new clause):
 - new installation inspection;
 - gas dew point test moved from special test to commissioning tests;
- rules for transport, storage, erection, operation and maintenance:
 - new mandatory rules for user and manufacturer;
 - new conditions for transportation and storage;
- new annexes:
 - Annex D (informative): provide information about superimposed impulse voltages;
 - Annex E (informative): provide information on test setups for superimposed impulse voltage tests;
 - Annex F (informative): is introduced on high-frequency characteristic measurements;
 - Annex G (informative): provide information about composite AC/DC voltages;
 - Annex H (informative): present a summary of all voltages used in DC application.

1 Scope

This part of IEC 60358 applies to:

- Coupling capacitors and capacitor dividers, with rated voltage $> 1\ 000\text{ V}$, connected line to ground with the low-voltage terminal either permanently earthed or connected to devices, for applications listed hereunder and other similar uses.

This document serves as a basic standard for the coupling capacitors and capacitor dividers. The different parts of this standard series will present the supplementary specifications and tests, for example IEC 60358-2, IEC 60358-3 or IEC 60358-4.

Diagrams of coupling capacitor and capacitor divider to which this standard series applies are given in Figure A.1 and Figure A.2 (see Annex A).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60038, *IEC standard voltages*

IEC 60060-1, *High-voltage test techniques - Part 1: General definitions and test requirements*

IEC 60068-2-11:2021, *Environmental testing - Part 2-11: Tests - Test Ka: Salt mist*

IEC 60068-2-17, *Environmental testing - Part 2-17: Tests - Test Q: Sealing*

IEC 60071-1, *Insulation co-ordination - Part 1: Definitions, principles and rules*

IEC 60071-2, *Insulation co-ordination - Part 2: Application guidelines*

IEC 60071-11, *Insulation co-ordination - Part 11 : Definitions, principles and rules for HVDC system*

IEC 60270, *High-voltage test techniques - Charge-based measurement of partial discharges*

IEC 60296, *Fluids for electrotechnical applications - Mineral insulating oils for electrical equipment*

IEC 60376, *Specification of technical grade sulphur hexafluoride (SF_6) and complementary gases to be used in its mixtures for use in electrical equipment*

IEC 60480, *Specifications for the re-use of sulphur hexafluoride (SF_6) and its mixtures in electrical equipment*

IEC 60721 (all parts), *Classification of environmental conditions*

IEC TS 60815-1:2008, *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 1: Definitions, information and general principles*

IEC TS 60815-2:2008, *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 2: Ceramic and glass insulators for a.c. systems*

IEC TS 60815-3:2008, *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 3: Polymer insulators for a.c. systems*

IEC 60867, *Insulating liquids - Specifications for unused liquids based on synthetic aromatic hydrocarbons*

IEC 61099, *Insulating liquids - Specifications for unused synthetic organic esters for electrical purposes*

IEC 62271-4:2022, *High-voltage switchgear and controlgear - Part 4: Handling procedures for gases for insulation and/or switching*

IEC 62770, *Fluids for electrotechnical applications - Unused natural esters for transformers and similar electrical equipment*

IEC 63012, *Insulating liquids - Unused modified or blended esters for electrotechnical applications*

ISO 4628-3, *Paints and varnishes - Evaluation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: Assessment of degree of rusting*

ISO 22479, *Corrosion of metals and alloys - Sulfur dioxide test in a humid atmosphere (fixed gas method)*

CISPR/TR 18-2, *Radio interference characteristics of overhead power lines and high-voltage equipment - Part 2: Methods of measurement and procedure for determining limits*

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IEC 60050-321:1986, *International Electrotechnical Vocabulary (IEV) - Part 321: Instrument transformers*

IEC 60050-436:1990, *International Electrotechnical Vocabulary (IEV) - Part 436: Power capacitors*

IEC 60050-601:1985, *International Electrotechnical Vocabulary (IEV) - Part 601: Generation, transmission and distribution of electricity - General*

IEC 60050-604:1987, *International Electrotechnical Vocabulary - Chapter 604: Generation, transmission and distribution of electricity - Operation*

IEC 60060-2, *High-voltage test techniques - Part 2: Measuring systems*

IEC 60085, *Electrical insulation - Thermal evaluation and designation*

IEC 60358-2, *Coupling capacitors and capacitor dividers - Part 2: AC or DC single-phase coupling capacitor connected between line and ground for power line carrier-frequency (PLC) application*

IEC 60358-3, *Coupling capacitors and capacitor dividers - Part 3: AC or DC coupling capacitor for harmonic-filters applications*

IEC 60358-4, *Coupling capacitors and capacitor dividers - Part 4: DC and AC single-phase capacitor dividers*

IEC 60422, *Mineral insulating oils in electrical equipment - Supervision and maintenance guidance*

IEC TS 60815-4:2016, *Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 4: Insulators for d.c. systems*

IEC 61462, *Composite hollow insulators - Pressurized and unpressurized insulators for use in electrical equipment with AC rated voltage greater than 1 000 V AC and D.C. voltage greater than 1500V - Definitions, test methods, acceptance criteria and design recommendations*

IEC 61869-5, *Instrument transformers - Part 5: Additional requirements for capacitor voltage transformers*

IEC 62155, *Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1 000 V*

IEC 62217:2012, *Polymeric HV insulators for indoor and outdoor use - General definitions, test methods and acceptance criteria*

IEC 62271-203, *High-voltage switchgear and controlgear - Part 203: AC gas-insulated metal-enclosed switchgear for rated voltages above 52 kV*

IEC TR 62271-300, *High-voltage switchgear and controlgear - Part 300: Seismic qualification of alternating current circuit-breakers*

IEC Guide 109:2003, *Environmental aspects - Inclusion in electrotechnical product standards*

CISPR 16-1, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus - Measuring apparatus*
