



BSI Standards Publication

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

National foreword

This British Standard is the UK implementation of EN 60358-2:2013. It is identical to IEC 60358-2:2013. Together with BS EN 60358-1:2012, BS EN 60358-3 and BS EN 60358-4 it supersedes BS 7578:1992 (dual numbered as IEC 60358:1990), which will be withdrawn on publication of all parts of the BS EN 60358 series.

The UK participation in its preparation was entrusted to Technical Committee PEL/33, Power capacitors.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2014.
Published by BSI Standards Limited 2014

ISBN 978 0 580 71591 4
ICS 29.120.99; 29.240.99; 31.060.70

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2014.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

English version

**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 60358-2:2013)**

Condensateurs de couplage et diviseurs
 capacitifs -
 Partie 2: Condensateur de couplage
 monophasé à courant alternatif ou à courant
 continu connecté entre la ligne et la terre
 pour application aux liaisons à courant
 porteur sur lignes d'énergie (CPL)
 (CEI 60358-2:2013)

Kopplungskondensatoren und kapazitive
 Teiler -
 Teil 2: Einphasen-Kopplungskondensatoren
 für Wechsel- oder Gleichstrom, die für
 Trägerfrequenzübertragungen auf
 Hochspannungsleitungen (TFH-
 Übertragung) zwischen Außenleiter und
 Erde geschaltet sind
 (IEC 60358-2:2013)

This European Standard was approved by CENELEC on 2013-09-16. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 33/531/FDIS, future edition 1 of IEC 60358-2, prepared by IEC/TC 33, "Power capacitors and their applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60358-2:2013.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-06-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-09-16

This document supersedes HD 597 S1:1992 (partially).

This European Standard is to be used in conjunction with the latest edition of EN 60358-1 and its amendments. It was established on the basis of the first edition (2012) of that standard.

This Part 2 supplements or modifies the corresponding clauses in EN 60358-1.

When a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies as far as is reasonable. Where this Part 2 states "addition" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

For additional clauses, subclauses, figures, tables or annexes, the following numbering system is used:

- subclauses, tables and figures which are additional to those in Part 1 are numbered starting from 200;
- additional annexes are lettered AA, BB etc.
- as the notes are integrated into the clauses, their numbering starts from 1 as usual.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60358-2:2013 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 60085	NOTE	Harmonized as EN 60085.
IEC 60721 Series	NOTE	Harmonized in EN 60721 series.
IEC 61462	NOTE	Harmonized as EN 61462.
CISPR 16-1-1	NOTE	Harmonized as EN 55016-1-1.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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

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 60060-1		High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	
IEC 60060-2		High-voltage test techniques - Part 2: Measuring systems	EN 60060-2	
IEC 60358-1 + corr. July	2012 2013	Coupling capacitors and capacitor dividers - Part 1: General rules	EN 60358-1 + AC:2013	2012 2013
IEC 60481		Coupling devices for power line carrier systems	-	-
IEC 61869-5		Instrument transformers - Part 5: Additional requirements for capacitor voltage transformers		

CONTENTS

INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	7
3.200 Carrier-frequency accessories definitions	8
4 Service conditions	8
5 Ratings.....	8
6 Design requirements	8
6.200 Design requirements for coupling capacitor and carrier-frequency accessories	8
6.200.1 Design requirements for coupling capacitor	8
6.200.2 Design requirements for carrier-frequency accessories	9
7 Test conditions	10
8 Classification of tests	10
8.1 General	10
8.2 Routine tests	10
8.2.200 General	10
8.2.201 Routine tests for carrier frequency accessories.....	10
8.3 Type tests	10
8.3.200 Type test for coupling capacitor and carrier-frequency accessories	10
8.4 Special tests.....	11
9 Routine tests	11
9.1 Tightness of the liquid-filled equipment.....	11
9.2 Electrical routine tests	11
9.2.200 Electrical tests for coupling capacitor and carrier frequency accessories	11
10 Type tests	12
10.200 Test on capacitor	12
10.200.1 High frequency capacitance and equivalent series resistance	12
10.200.2 Measurement of the stray capacitance and stray conductance of the low voltage terminal	12
10.201 Type test on carrier frequency accessories	13
10.201.1 General	13
10.201.2 Type tests for drain coil	13
10.201.3 Type test for voltage limitation device together with drain coil: Impulse voltage test.....	14
11 Special tests.....	14
12 Marking	15
12.1 General	15
12.2 Marking of capacitor	15
12.200 Marking of the carrier-frequency accessories	15
Annexes	15
Annex A (informative) Typical diagram of an equipment.....	16

Annex AA (informative) High-frequency characteristics of coupling capacitors for power line carrier circuits 17

Bibliography..... 19

Figure A.200.1 – Example of a diagram for a coupling capacitor with carrier-frequency accessories (see IEC 60481) 16

Figure AA.1 – Wiring diagram of the measuring circuit for the high-frequency capacitance and equivalent series resistance of a coupling capacitor 18

Figure AA.2 – Relation between length and capacitance where capacitive deviation – 20 % to +50 % can be fulfilled up to 500 kHz 18

Table 200 – Limits of temperature rise of windings..... 14

INTRODUCTION

This series consists of the following parts:

- 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 60358-3¹, *Coupling capacitors and capacitor dividers – Part 3: AC or DC single-phase coupling capacitor connected between line and ground for harmonic-filters applications*
- IEC 60358-4², *Coupling capacitors and capacitor dividers – Part 4: AC or DC single-phase capacitor-divider and RC-divider connected between line and ground (except for CVT's which belong to IEC 61869 series)*

¹ Under consideration.

² Under consideration.

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

1 Scope

Clause 1 of IEC 60358-1:2012 is applicable with the following additions:

This part of the IEC 60358 series applies to AC or DC single-phase coupling capacitors, with rated voltage > 1 000 V, connected between line and ground with a low voltage terminal either permanently earthed or connected to a device for power line carrier-frequency (PLC) applications at frequencies from 30 kHz to 500 kHz or similar applications (DC or AC) at power frequencies from 15 Hz to 60 Hz.

The transmission requirements for coupling devices for power line carrier (PLC) systems are defined in IEC 60481.

NOTE Diagrams of coupling capacitors to which this standard applies are given in Figure A.1.

2 Normative references

Clause 2 of IEC 60358-1:2012 is replaced by the following:

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

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

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

IEC 60358-1:2012, *Coupling capacitors and capacitor dividers. – Part 1: General rules*

IEC 60481, *Coupling devices for power line carrier systems*

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

3 Terms and definitions

Clause 3 of IEC 60358-1:2012 is applicable with the following additions:

For the purposes of this document, the terms and definitions given in Clause 3 of IEC 60358-1:2012, as well as the following apply.