

# Power transformer and reactor fittings —

## Part 1: General

The European Standard EN 50216-1:2002 has the status of a  
British Standard

ICS 29.180

## National foreword

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The UK participation in its preparation was entrusted to Technical Committee PEL/14, Power transformers, which has the responsibility to:

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### Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 7 and a back cover.

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### Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD

**EN 50216-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2002

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ICS 29.180

English version

**Power transformer and reactor fittings  
Part 1: General**

Accessoires pour transformateurs  
de puissance et bobines d'inductance  
Partie 1: Généralités

Zubehör für Transformatoren  
und Drosselspulen  
Teil 1: Allgemeines

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**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**

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## Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 14, Power transformers.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50216-1 on 2001-07-01.

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) 2002-08-01
  - latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2004-08-01
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## Introduction

EN 50216 is divided into several parts, the first covering general features while the remaining parts cover different accessories.

This EN will consist of the following parts, under the general title “Power transformer and reactor fittings”:

Part 1: General

Part 2: Gas and oil actuated relay for liquid immersed transformers and reactors with conservator

Part 3: Protective relay for hermetically sealed liquid-immersed transformers and reactors without gaseous cushion

Part 4: Basic accessories (earthing terminal, drain and filling devices, thermometer pocket, wheel assembly)

Part 5: Liquid level, pressure devices and flow indicators

Part 6: Cooling equipment – Removable radiators for oil-immersed transformers

Part 7: Electric pumps for transformer oil

## 1 Scope

This European Standard covers the general conditions concerning accessories for oil immersed and dry-type transformers and reactors.

Part 1 describes in particular

- general conditions of service,
- electrical characteristics of contacts,
- dynamic characteristics,
- mechanical construction.

They are used for stationary, non-weather protected locations.

## 2 Normative references

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).

EN 60068-3-3	1993	Environmental testing - Part 3: Guidance - Seismic test methods for equipments (IEC 60068-3-3:1991)
EN 60076-1	1997	Power transformers - Part 1: General (IEC 60076-1:1993, mod.)
EN 60255-5	2001	Electrical relays - Part 5: Insulation coordination for measuring relays and protection equipment - Requirements and tests (IEC 60255-5:2000)

EN 60529 + corr. May	1991 1993	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 60721-3-4	1995	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 4: Stationary use at non-weather protected locations (IEC 60721-3-4:1995)
IEC 60296	1982	Specification for unused mineral insulating oils for transformers and switchgear

### 3 Service conditions

#### 3.1 Environmental conditions

The severities of the environmental conditions are as classified in EN 60721-3-4.

The classes which are appropriate for the accessories are as defined in Table 1.

By agreement between manufacturer and purchaser, other classes may be given in the relevant accessory specification.

**Table 1 - Environmental classes**

K	Climatic conditions	4 K 2 <sup>a</sup>
Z	Special climatic conditions	4 Z 2 + 4 Z 4 + 4 Z 7
B	Biological conditions	4 B 1
C	Chemically active substances	4 C 2
S	Mechanically active substances	4 S 3
M	Mechanical conditions <sup>b</sup>	4 M 4
<sup>a</sup> Except the minimum ambient temperature which is -25 °C. <sup>b</sup> Accessories may be fitted with elastic suspension to meet this requirement.		

#### 3.2 Degree of protection

The degree of protection of the connecting box for outdoor installation shall be at least IP 44 (or IP 54 if requested) according to EN 60529.

#### 3.3 Corrosion

The materials used for the construction of the transformer accessories or the surface treatment shall be oil resistant and suitable to withstand the environmental conditions given in 3.1.

### 3.4 Insulating liquid characteristics

This subclause concerns only the accessories which are in contact with the insulating liquid.

If the insulating liquid and its maximum temperature are not specified, mineral oil according to IEC 60296 class I or class II shall be considered as the insulating liquid, with a maximum temperature of 115 °C.

The accessories shall operate with the kinematic viscosity of the insulating liquid equal to or below 1 100 mm<sup>2</sup>/s.

### 4 Dielectric strength of contacts (according to EN 60255-5)

The minimum dielectric withstand strength is given in Table 2.

**Table 2 - Dielectric strength of contacts**

	<b>Short duration power frequency withstand voltage 1 min kV (r.m.s.)</b>	<b>Lightning impulse withstand voltage kV (peak)</b>
Between circuits and earth	2	4
Between contacts in open position	1	3

By agreement between manufacturer and purchaser, other values may be given in the relevant accessory specification.

### 5 Seismic withstand

When the accessory is specified with a seismic withstand without specified acceleration values, the performance level shall be chosen in accordance with EN 60068-3-3 as follows:

- classification 0 (4.3);
- level II (7.1).

### 6 Tests

The definitions concerning testing are given in EN 60076-1. The liquid used for the tests shall be compatible with that used in the transformer (see 3.4).

#### 6.1 Routine test

The rated short duration power frequency withstand test shall be carried out according to Table 2.



## 6.2 Type test

Where type tests are required, the manufacturer and the purchaser shall specify which of the following tests shall be performed:

- checking of the switching capacity of contacts. Values shall be given in the relevant accessory specification;
- impulse withstand test of electrical circuits according to Table 2 (wave shape 1,2/50  $\mu$ s);
- verification of no malfunctioning of contacts (opening or closing) under
  - mechanical shock waves,
  - seismic conditions.

The tests shall be carried out for longitudinal and vertical directions separately.

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