

**Electrical measuring transducers for converting
a.c. electrical quantities to analogue or digital
signals**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60688:2002 sisaldab Euroopa standardi EN 60688:1992+A1:1999+A2:2001 ingliskeelset teksti.

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English version

Electrical measuring transducers for converting a.c. electrical quantities to analogue or digital signals

(IEC 688 : 1992)

Transducteurs électriques de mesure
convertissant les grandeurs électriques
alternatives en signaux analogiques ou
numériques
(CEI 688 : 1992)

Meßumformer für die Umwandlung von
Wechselstromgrößen in analoge oder digitale
Signale
(IEC 688 : 1992)

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CENELEC

European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document IEC 85(C.O.)17, as prepared by IEC/TC 85, was submitted to the IEC-CENELEC parallel vote in June 1991.

The reference document was approved by CENELEC as EN 60688 on 24 March 1992.

The following dates were fixed:

- latest date of publication (dop) 1993-01-15
of an identical national
standard
- latest date of withdrawal (dow) 1993-01-15
of conflicting national
standards

For products which have complied with the relevant national standard before 1993-01-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1998-01-15.

Annexes designated 'normative' are part of the body of the standard. In this standard, annex ZA is normative.

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INTRODUCTION

The **class Index** system of classification used in this standard is based upon IEC 51: Direct acting indicating analogue electrical measuring instruments and their accessories. Under this system, the permitted variations of the **output signal** due to varying **Influence quantities** - ambient temperature, voltage, frequency, etc., - are implicit in the classification.

For those unfamiliar with the **class Index** system, a word of warning is necessary. If, for example, a **transducer** is classified as Class 1, it does not follow that the **error** under practical conditions of use will be within 1 % of the actual value of the output or 1 % of the full output value. It means that the **error** should not exceed 1 % of the **fiducial value under closely specified conditions**. If the **Influence quantities** are varied between the limits specified by the **nominal ranges** of use, a variation of amount comparable with the value of the **class Index** may be incurred for each **Influence quantity**.

The permissible **error** of a **transducer** under working conditions is the sum of the permissible **Intrinsic error** and of the permissible variations due to each of the **Influence quantities**. However, the actual **error** is likely to be much smaller because not all of the **Influence quantities** are likely to be simultaneously at their most unfavourable values and some of the variations may cancel one another. It is important that these facts be taken into consideration when specifying **transducers** for a particular purpose.

Furthermore, some of the terms used in this standard are different from those used in IEC 51 due to the fundamental differences between indicating instruments and measuring **transducers**.

All statements of performance are related to the output which is governed by two basic terms:

- "the **nominal value**", which may have a positive or a negative sign or both,
- "the **span**", which is the range of values of the **output signal** from maximum positive to maximum negative, if appropriate.

ELECTRICAL MEASURING TRANSDUCERS FOR CONVERTING A.C. ELECTRICAL QUANTITIES TO ANALOGUE OR DIGITAL SIGNALS

1 Scope

This International Standard applies to **transducers** with electrical inputs and outputs for making measurements of a.c. electrical quantities. The **output signal** may be in the form of an analogue direct current or in digital form. In this instance, that part of the **transducer** utilized for communication purposes will need to be compatible with the external system.

This standard applies to measuring **transducers** used for converting alternating electrical quantities such as:

- current
- voltage
- active power
- reactive power
- power factor
- phase angle
- frequency

to an **output signal**.

Within the **measuring range**, the **output signal** is a function of the measurand. An **auxiliary supply** may be needed.

This standard applies:

- a) if the nominal frequency of the input(s) lies between 5 Hz and 1 500 Hz;
- b) if a measuring **transducer** is part of a system for the measurement of a non-electrical quantity, this standard may be applied to the **electrical measuring transducer**, if it otherwise falls within the scope of this standard;
- c) to **transducers** for use in a variety of applications such as telemetry and process control and in one of a number of defined environments.

This International Standard is intended:

- to specify the terminology and definitions relating to **transducers** whose main application is in electrical power engineering, especially for the purposes of process control and telemetry systems;
- to unify the test methods used in evaluating **transducer** performance;
- to specify **accuracy** limits and output values for **transducers**.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50 (301, 302, 303): 1989, *International Electrotechnical Vocabulary (IEV). Chapter 301: General terms on measurements in electricity. Chapter 302: Electrical measuring instruments. Chapter 303: Electronic measuring instruments.*

IEC 68-2-3: 1985, *Environmental testing – Part 2: Tests – Test Ca: Damp heat, steady state.*

IEC 255-4: 1976, *Electrical relays – Part 4: Single input energizing quantity measuring relays with dependent specified time.*

IEC 414: 1973, *Safety requirements for indicating and recording electrical measuring instruments and their accessories.*

IEC 521: 1988, *Class 0,5, 1 and 2 alternating-current watt-hour meters.*

NOTE - Refer to annex A for the list of informative references.