AS 3720—2008
IEC 60833, Ed. 1.0 (1987)

AS 3720—2008

Australian Standard®

Measurement of power-frequency electric fields

STANDARDS Australia

This Australian Standard® was prepared by Committee EL-007, Power Switchgear. It was approved on behalf of the Council of Standards Australia on 8 November 2007.
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The following are represented on Committee EL-007:

- Australian British Chamber of Commerce
- Australian Electrical and Electronic Manufacturers Association
- Australian Railway Association
- Energy Networks Association
- Engineers Australia
- Testing interests

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee.

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PREFACE

This Standard was reviewed by the Standards Australia Committee EL-007, Power Switchgear to supersede AS 3720—1989.

This Standard is republished from AS 3720—1989, without technical alterations.

This Standard is identical with, and has been reproduced from IEC 60833, Ed. 1.0 (1987), *Measurement of power-frequency electric fields*.

It is intended primarily to specify standard methods for use by power authorities in measuring electric field strengths near the ground plane in the vicinity of high voltage lines and conductors.

At locations closer to the high voltage conductors, where the field is non-uniform, power authorities have used the following methods, not covered by this Standard:

(a) The determination of maximum field strength using three-coordinate probes.

(b) The determination of average field strength using body current measurements.

As this Standard is reproduced from an International Standard, the following applies:

(i) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(ii) In the source text 'IEC 60833' should read 'AS 3720'.

(iii) A full point should be substituted for a comma when referring to a decimal marker.

(iv) Any French text on figures should be ignored.

The terms 'normative' and 'informative' are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

CONTENTS

NOTES

STANDARDS AUSTRALIA

Australian Standard

Measurement of power-frequency electric fields

1 Scope

This standard is applicable to the measurement of electric field strength at power frequencies in air for quasi-uniform electric fields with instrumentation in common use and/or commercially available. The standard is applicable to other instruments provided they are calibrated according to the procedures described in this standard.

2 Object

The objects of this standard are:

- to define the terms used;
- to describe the basic operating principles of measuring instruments;
- to specify methods for calibration and calibration checks;
- to specify electric field strength measurement procedures;
- to identify significant sources of measurement error and to give limits of permissible uncertainties.

3 Definitions

3.1
Electric field strength
When a conductor is electrically charged, the space in the vicinity of the conductor is affected so that a charged particle, when introduced into the affected space, experiences a force in a well-defined direction at any instant. An electric field is said to exist in the affected space, and the electric field strength at any point is a vector quantity equal to the force per unit positive charge located at that point. Two types of electric fields are considered in this document, single-phase a.c. fields and three-phase a.c. fields. The field strength magnitude is specified in units of volts per metre.

3.2
Single-phase a.c. fields
A single-phase source of alternating voltage, when connected to conducting boundary surfaces (for example, electrodes), produces at any point in the affected space an electric field vector which oscillates along a fixed axis.

3.3
Three-phase a.c. fields
A three-phase source of alternating voltage, when connected to conducting boundary surfaces (for example, electrodes) produces an electric field vector which, in general, rotates in space. The rotating vector describes an ellipse whose semi-major axis represents the magnitude and direction of the maximum value of the electric field, and whose semi-minor axis represents the magnitude and direction of the minimum value of the electric field, which occurs a quarter cycle later than the maximum. On conducting boundary surfaces, the rotating vector becomes an oscillating vector whose direction is perpendicular to the surface.

