Australian Standard®

Disturbances in mains supply networks

Part 4: Limitation of voltage fluctuations caused by industrial equipment

This Australian Standard was prepared by Committee EL/34, Electric Waveform Distortion. It was approved on behalf of the Council of Standards Australia on 15 March 1991 and published on 13 May 1991.

The following interests are represented on Committee EL/34:

Australian Electrical and Electronic Manufacturers Association

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of Defence

Electricity Supply Association of Australia

Institution of Engineers, Australia

Institution of Radio and Electronics Engineers, Australia

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PREFACE

This Standard was prepared by the Standards Australia Committee on Electric Waveform Distortion. It is one part of a Standard on disturbances in mains supply networks, the four parts being as follows:

Part 1—*Limitation of harmonics caused by household and similar electrical appliances*

Part 2—*Limitation of harmonics caused by industrial equipment*

Part 3—*Limitation of voltage fluctuations caused by household and similar electrical appliances*

Part 4—*Limitation of voltage fluctuations caused by industrial equipment*

This Standard should be read in conjunction with the Regulations, Service Rules and Installation Rules of the supply authority approving the connection.

Part 4 of this Standard provides guidance on the acceptable limits of voltage fluctuations caused by industrial equipment. In particular, this guidance is intended for application to equipment which is intended exclusively for industrial, professional or commercial purposes with ratings greater than 4.8 kV.A and which produces voltage changes in the range of one change per hour to 1800 changes per minute.

Part 4 also concerns specific equipment subject to individual consideration by the supply authority before it may be connected to the system.

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Disturbances in mains supply networks

Part 4—Limitation of voltage fluctuations caused by industrial equipment

1 SCOPE Part 4 of this Standard provides guidance on the acceptable limits of voltage fluctuations at the point of common coupling caused by industrial equipment supplied from high or low voltage electricity supply systems.

The switching of equipment or variations in its loading may cause changes in voltage which could result in the unsatisfactory operation of other equipment and undesirable effects such as flicker in incandescent lamps.

Part 4 of this Standard is applicable to all electrical equipment other than that covered by AS 2279.3. In particular, this Part is intended for application to equipment which—

(a) is intended exclusively for industrial, professional or commercial purposes and with a rating greater than 4.8 kV.A; and

(b) produces voltage changes in the range of one change per day to 1800 changes per minute.

In addition, it concerns specific equipment subject to individual consideration by the supply authority before it may be connected to the system.

Equipment which would produce voltage fluctuations and would fall within the Scope of Part 4 of this Standard includes pump and compressor motors, welding plant, furnaces, elevators, equipment for manufacturing processes, mining, lighting and air conditioning.

This Standard does not apply to voltage unbalance in supply systems or intermittent transient disturbances e.g. spikes and dips.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS
2279 Disturbances in mains supply networks

2279.3 Part 3: Limitation of voltage fluctuations caused by household and similar electrical appliances

IEC
868 Flickermeter. Functional and design specifications

3 GENERAL By necessity, the limits contained in this Standard have been based on certain simplifying assumptions. They are to be taken as a guide to good engineering practice with regard to voltage fluctuations.

Adherence to the recommended values should minimize the likelihood of interference with or visual annoyance to other consumers.

4 SUPPLY AUTHORITY RIGHT OF APPROVAL This Standard does not override the Regulations, Service Rules or Installation Rules of the supply authority that will approve the connection of the equipment.

5 DEFINITIONS For the purpose of this Standard, the following definitions apply:

5.1 Point of common coupling (PCC)—the point in the public supply network, electrically nearest to the consumer for whom the new connection is proposed, at which other consumers' loads are, or may be, connected.

NOTE: It is possible to obtain a greater voltage fluctuation on the supply side of the PCC with certain types of installation, such as when reactive power compensation is used in conjunction with a large fluctuating load. These will require Stage 3 assessment (see Clause 6.1.1(c)) which should provide for this possibility. Stage 3 considerations should also be applied for supply systems having low fault levels and which are sensitive to fluctuating loads.

5.2 Transmission system—a system conveying electrical energy in bulk at high voltages, generally over long distances.

NOTE: Standard voltage levels in Australia are 66, 110, 132, 220, 275, 330 and 500 kV.

5.3 Subtransmission system—a system conveying electrical energy, obtained from a transmission system or power station to a primary distribution system.

NOTE: Customary voltage levels in Australia are 22, 33, 66, 110 and 132 kV.