Australian Standard®

STABILIZED POWER SUPPLIES—A.C. OUTPUT

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PREFACE

This standard was prepared by the Association's Committee on Power Electronics. Although editorially modified in terminology, format and general treatment of the subject, it is similar to IEC 686, Stabilized Power Supplies, A.C. Output. Cross-references to other Australian standards have been inserted and may have introduced some slight technical changes but, in general, the standard can be regarded as technically similar to IEC 686.

The purpose of the standard is to define and prescribe parameters and establish procedures applicable to stabilized power supplies designed to supply a.c. power from an a.c. or d.c. source for application in the computer and telecommunication industries and in industrial equipment.

The term 'regulated power supply' is in common use and considered synonymous with the term 'stabilized power supply'. However, in order to harmonize with IEC 686, only the term 'stabilized power supply' is used.

This standard is complementary to AS 2598, Stabilized Power Supplies—D.C. Output.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
STABILIZED POWER SUPPLIES—A.C. OUTPUT

1 SCOPE. This standard specifies requirements for stabilized power supplies designed to supply a.c. power from an a.c. or d.c. source. Power supplies for electrical measurement are excluded.

2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1259 Sound Level Meters

AS 1939 Classification of Degrees of Protection Provided by Enclosures for Electrical Equipment

AS 1955 Semiconductor Convertors

AS 2598 Stabilized Power Supplies D.C. Output

IEC 348 Safety Requirements for Electronic Measuring Apparatus.

3 DEFINITIONS.

3.1 General. For the purpose of this standard, the definitions given in AS 2598 and the following apply:

3.2 Modes of stabilization.

3.2.1 *A. C. voltage (current) stabilization*—a stabilization mode by which the a.c. output voltage (current) is the stabilized output quantity.

NOTE: The a.c. output voltage (current) can be stabilized with respect to the r.m.s. value, peak value or mean rectified value.

3.2.2 *Waveform stabilization*—a stabilization mode by which the instantaneous value of a.c. voltage (current) is controlled such that a desired waveform of the voltage (current) is obtained.

3.2.3 *Frequency stabilization*—a stabilization mode by which the output frequency is the stabilized output quantity.

3.2.4 *Phase angle stabilization*—a stabilization mode by which the a.c. output voltage is held within a specified range of values or phase shift with respect to the phase of a reference voltage.

3.3 Imbalance of load impedance—for the polyphase output of a stabilized power supply, a condition in which the value of the load impedance of at least one phase is significantly different from the value of the other phases.

For a sine-wave, the imbalance can be expressed using symmetrical components.

3.4 A.C. voltage (current) distortion—the deviation of the voltage (current) waveform from the desired waveform.

NOTE: Voltage (current) distortion can be expressed using quantities such as the following:
(a) D.C. voltage (current) content.
(b) Harmonic content.
(c) Harmonic components.
(d) Modulation.
(e) Random deviation.
(f) Voltage (current) imbalance.

3.4.1 *Harmonic content*—the function obtained by subtracting the fundamental component from a non-sinusoidal periodic function.

3.4.2 *Relative harmonic content*—the ratio of the r.m.s. value of the harmonic content to the r.m.s. value of the non-sinusoidal periodic function.

3.4.3 *Harmonic components*—the components of the harmonic content as expressed in terms of the order and r.m.s. values of the Fourier series terms describing the periodic function.

3.4.4 *Periodic output voltage modulation*—the periodic variation of output voltage amplitude at frequencies less than the fundamental output frequency.

3.4.5 *Periodic frequency modulation*—the periodic variation of the output frequency from its rated value.

3.4.6 *Random deviation*—a random deviation of the output quantity from its desired value with all influencing and control quantities maintained constant.

4 MARKING AND PERFORMANCE RATINGS.

4.1 Marking. The following information shall be permanently affixed to the power supply:

(a) Name of manufacturer or supplier.
(b) Model number.
(c) Serial number (optional).
(d) Output ratings: rated values or rated ranges of values for output voltage, current, frequency, number of phases.
(e) Input ratings: nominal values for source voltage, source current and frequency, number of phases.
(f) Enclosure protection class in accordance with AS 1939.

4.2 Performance ratings.

4.2.1 *Specification of performance.* The performance of a stabilized power supply shall comply with the specified values of the quantities listed in the manufacturer's data sheet or other documents mutually agreed on by user and manufacturer. If not otherwise specified, the values of voltage and current shall be expressed as r.m.s. quantities.

4.2.2 *Operating conditions.* Different performance ratings are valid under different operating conditions. These conditions are defined by different sets of values or ranges of values of the influencing quantities and the stabilized output quantity. The stated values give no indication as to the permissible duration of their application. Clauses 4.2.3, 4.2.4 and 4.2.5 define three conditions.

4.2.3 *Reference conditions.* Reference conditions are prescribed by values or ranges of values for the influencing quantities and the stabilized output quantity which reflect typical operating conditions. Tables 1 and 2 list the quantities which serve as reference conditions.