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Australian Standard®

Diagrams, charts and tables for electrotechnology

Part 4: Guiding principles for the preparation of circuit diagrams

STANDARDS AUSTRALIA

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PREFACE

This Standard was prepared by the Standards Australia Committee on Symbols, Units and Quantities for Electrotechnology to supersede AS 1103.4—1978. It is one part of the AS1103 series of Standards on *Diagrams, charts and tables for electrotechnology*.

This Standard is a comprehensive revision of the 1978 edition. The diagrams are revised to reflect the latest technology, including symbols which are aligned with AS 1102 series (*Graphical symbols for electrotechnology*).

The purpose of this Part is to give guidance on principles to be used in the preparation of circuit diagrams for the electrical, electronics and similar electrotechnology fields. In this regard it is an extension of AS 1103, Part 3: *General rules for the preparation of diagrams and associated documents*. Part 4 demonstrates that a circuit diagram should show, by means of graphical symbols, the electrical connections and functions of a specific piece of equipment without regard to the physical size, shape or location of the parts. Numerous examples are given to demonstrate the variety of methods which may be used to illustrate the basic principles set out in Part 3 and, without going into unnecessary detail, to demonstrate the simplifications which are considered permissible in achieving the main aim.

In its terminology, format and general treatment of the subject, this Part is consistent with the recommendation of IEC 113-4 (1975), *Diagrams, charts, tables*, Part 4: *Recommendations for the preparation of circuit diagrams*. In the main, it is technically identical with IEC 113-4 but some diagrams have been replaced by others having more meaning in the Australian context.

Attention is drawn to the clause references, enclosed in parentheses, below the diagrams. These are references to the relevant text to provide a fuller understanding of the example and for ease of use of the Standard.

The AS 1103 series of Standards is complementary to the AS 1100 series (*Technical Drawing*) and to the AS 1102 series (*Graphical symbols for electrotechnology*). For information on matters specific to drawing practice which are not covered in the AS 1103 series, reference should be made to the AS 1100 series. In addition, reference may also be required to AS 1046, *Letter symbols for use in electrotechnology*, Part 1: *General*, and Part 2: *Telecommunications and electronics*.

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Part 4: Guiding principles for the preparation of circuit diagrams

1 SCOPE This Part of the Standard specifies guiding principles to assist in the preparation of circuit diagrams for electrical and electronic fields of use.

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

AS
1102 Graphical symbols for electrotechnology
1102.102 Part 102: Symbol elements, qualifying symbols and other symbols having general application
1102.103 Part 103: Conductors and connecting devices

1103 Diagrams, charts and tables for electrotechnology
1103.1 Part 1: Definitions and classifications
1103.3 Part 3: General rules for the preparation of diagrams and associated documents

1359 Rotating electrical machines—General requirements
1359.3 Part 3: Direction of rotation and marking of terminals

3702 Item designation in electrotechnology

BS
822 Terminal markings for electrical machinery and apparatus
822.6 Part 6: Terminal markings for rotating electrical machinery

2 PURPOSE AND CONTENT OF A CIRCUIT DIAGRAM

2.1 Purpose A circuit diagram should—

(a) explain the functioning of the equipment or part of it, if necessary, with the aid of a description or supplementary information, e.g. charts and tables;

(b) provide data for the preparation of wiring diagrams or tables (in conjunction with constructional design information when necessary); and

(c) facilitate testing and fault location.

Additional written instructions, wiring and location diagrams and tables may be required for a full understanding of the equipment.

2.2 Content A circuit diagram should show, by means of graphical symbols, the electrical connections and functions of a specific circuit arrangement without regard to the physical size, shape, or location of the parts. The diagram facilitates the tracing of the circuit and its functions.

Simplifications are permissible in the following cases:

(a) Single-line representation of the whole circuit or part of it may be used, if it is sufficient for the defined purpose.

(b) Part of the circuit diagram may be replaced by block symbols or rectangles to save space or to improve clarity. In such cases, reference should be made to the complete diagram.

(c) When a particular circuit arrangement is repeated, it may be sufficient to show this circuit arrangement once only in detail with appropriate references to the detailed diagram replacing the other circuits.

(d) If external or common circuits are necessary to understand the circuits concerned, they may be shown in simplified form with a reference to the relevant complete diagram.

3 GENERAL GUIDING PRINCIPLES

3.1 Layout The most important consideration in the preparation of a circuit diagram is the adoption of a clear layout which will best aid understanding and fulfil the purposes outlined in Clause 2.

3.2 Lines Lines representing conductors on a diagram should be straight with a minimum of cross-overs and changes of direction. However, these considerations should not dominate. Individual circuits should preferably be arranged vertically as shown in Figure 1 or horizontally as shown in Figure 2.