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GUIDE FOR PREPARATION OF DIAGRAMS, CHARTS AND TABLES FOR ELECTROTECHNOLOGY

PART I DEFINITIONS AND CLASSIFICATION

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Indian Standard

GUIDE FOR PREPARATION OF DIAGRAMS, CHARTS AND TABLES FOR ELECTROTECHNOLOGY

PART I DEFINITIONS AND CLASSIFICATION

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 26 November 1976, after the draft finalized by the Electrotechnical Standards Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 A number of standards have been published on graphical symbols for use on diagrams in the field of electrotechnology (*see* various parts of IS : 2032*). After having covered most of the needs for graphical symbols, with the exception of those for new fields of electrotechnology still under consideration, it has been found advisable to supplement the standards on symbols with standards for the preparation of diagrams.

0.3 This standard will include definitions and classification of diagrams, charts and tables; guiding principles for : (a) use and combination of graphical symbols; (b) for preparation of diagrams; (c) for supplementing or replacing diagrams by charts and tables; item designation; etc.

0.4 This standard is being brought out in five parts as follows:

Guide for preparation of diagrams, charts and tables for electrotechnology:

Part I Definitions and classification

Part II Item designation

Part III General requirements for diagrams

Part IV Circuit diagrams

Part V Interconnection diagrams and tables.

0.5 This standard (Part I) supersedes IS : 2032 (Part I)-1962†.

0.6 In the preparation of this standard assistance has been derived from IEC Pub 113-1(1971) ' Diagrams, charts, tables: Part 1 Definitions and classification ' issued by the International Electrotechnical Commission.

*Graphical symbols used in electrotechnology.

†Graphical symbols used in electrotechnology: Part I Classification and definitions of diagrams and charts.

1. SCOPE

1.1 This standard (Part I) covers the definitions and classification of diagrams, charts and tables used in electrotechnology in order to explain functions or show connections and to give information for manufacture, installation and maintenance.

1.2 Two kinds of classification have been adopted:

a) classification according to purpose, and

b) classification according to method of representation.

NOTE — In practice, the type of diagram is determined by its purpose, the method(s) of representation being chosen for convenience.

2. DEFINITIONS

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Diagram — A diagram may show the manner in which the various parts of a network, installation, group of apparatus or items of an apparatus are interrelated and/or interconnected.

2.2 Chart — A chart may show the interrelation between:

a) different operations,

b) operations and time,

c) operations and physical quantities, and

d) the states of several items.

2.3 Table — A table replaces or supplements a diagram or a chart.

3. CLASSIFICATION ACCORDING TO PURPOSE

3.1 The main classifications are:

a) explanatory diagrams (*see* **3.1.1**),

b) explanatory charts or tables (*see* **3.1.2**),

c) wiring diagrams or wiring tables (*see* **3.1.3**), and

d) location diagrams or tables (*see* **3.1.4**).

3.1.1 *Explanatory Diagrams* — Explanatory diagrams are intended to facilitate the study and understanding of the functioning of an installation or equipment. Three types are defined in **3.1.1.1** to **3.1.1.3**.

3.1.1.1 *Block diagram* — Relatively simple diagram to facilitate the understanding of the principle of operation. It is a diagram in which an installation or equipment together with its functional interrelationships are represented by symbols, block symbols or pictures without necessarily showing all the connections.

3.1.1.2 *Circuit diagram* — Explanatory diagram intended to facilitate the understanding of the functioning in detail. It shows by symbols an

installation or part of an installation and the electrical connections and other links concerned with its operation.

3.1.1.3 *Equivalent circuit diagram* — Special type of circuit diagram for the analysis and calculation of circuit characteristics.

3.1.2 *Explanatory Charts or Tables* — Explanatory charts or tables are intended to facilitate the study of diagrams and to give additional information. Two examples are given below:

a) *Sequence chart or table* — Gives the successive operations in a specified order, and

b) *Time sequence chart or table* — Is one which in addition takes account of the time intervals between successive operations.

3.1.3 *Wiring Diagrams or Wiring Tables* — Wiring diagrams are intended to guide the making and checking of the connections of an installation or equipment. For an equipment, they show the internal or external connections or both. The diagrams may sometimes show the layout of the different parts and accessories, such as terminal blocks and the wiring between them.

3.1.3.1 *Unit wiring diagram* — Diagram representing all connections within a unit of an installation.

3.1.3.2 *Interconnection diagram* — Diagram representing the connections between the different units of an installation.

3.1.3.3 *Terminal diagram* — Diagram showing the terminals and the internal and/or external conductors connected to them.

NOTE — Any of the wiring diagrams may be replaced or supplemented by a table.

3.1.4 *Location Diagrams or Tables* — A location diagram or table contains detailed information about the location of parts of the equipment, for example, terminal blocks, plug-in units, sub-assemblies, modules, etc. It shows the item designations used in related diagrams and tables.

NOTE 1 — A location diagram need not necessarily be to scale.

NOTE 2 — (Applicable to **3.1.1** to **3.1.4**) — Several types of diagrams may be combined into a single diagram, forming a mixed diagram. The same drawing may form both an explanatory and wiring diagram.

4. CLASSIFICATION ACCORDING TO METHOD OF REPRESENTATION

4.1 The method of representation is distinguished by:

a) the number of conductors, devices or elements represented by a single symbol (*see* **4.1.1**);

b) the arrangement of the symbols representing the elements or parts of an item of apparatus (for example, detached or assembled) (*see* **4.1.2**); and

c) the placing of the symbols to correspond with the topographical layout of the devices (*see* **4.1.3**).

4.1.1 *Number of Conductors* — According to the number of conductors, devices or elements represented by a single symbol, the two methods of representation as given in **4.1.1.1** and **4.1.1.2** may be distinguished.

4.1.1.1 *Single-line representation* — Two or more conductors are represented by a single line. In particular, a single line may represent:

a) circuits of a multiphase system,
b) circuits which have a similar electrical function,
c) circuits or conductors which belong to the same signal path,
d) circuits which follow the same physical route, and
e) conductor symbols which would follow the same route on the diagram.

Several similar items of apparatus may accordingly be represented by a single symbol.

4.1.1.2 *Multi-line representation* — Each conductor is represented by an individual line.

4.1.2 *Arrangement of Symbols* — According to the arrangement of the symbols representing the elements or parts of an item of apparatus on the diagram, the methods of representation are given in **4.1.2.1** to **4.1.2.3**.

4.1.2.1 *Assembled representation* — The symbols for the different parts of an item of apparatus or of an installation or equipment are drawn in close proximity on the diagram.

4.1.2.2 *Semi-assembled representation* — The symbols for the different parts of an item of apparatus or of an installation are separated and arranged in such a way that the symbols for mechanical linkages between the parts which work together may be drawn easily.

4.1.2.3 *Detached representation* — The symbols for the different parts of an item of apparatus or of an installation are separated and arranged in such a way that the circuits may easily be followed.

4.1.3 *Topographical Representation* — The positions of the symbols on the diagram correspond wholly or partly to the topographical (physical) location of items represented.

The following are examples where topographical representation may be used :

a) Wiring diagrams,
b) Architectural diagrams, and
c) Network diagrams.

NOTE — (Applicable to **4.1.1** to **4.1.3**) — Several of these methods of representation may be used on the same diagram.