

AS/NZS 4383.1:1996

IEC 1082-1:1991

IEC 1082-1:1991 Amendment 1:1995

(incorporates Corrigendum:1993)

Australian/New Zealand Standard[®]

**Preparation of documents used
in electrotechnology**

Part 1: General requirements

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AS/NZS 4383.1:1996

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee TE/13, Symbols Units and Quantities for Electrotechnology. It was approved on behalf of the Council of Standards Australia on 21 February 1996 and on behalf of the Council of Standards New Zealand on 28 February 1996. It was published on 5 May 1996.

The following interests are represented on Committee TE/13:

AUSTEL

Airservices Australia
 Australasian Railway Association
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 Department of Employment and Technical and Further Education, S.A.
 Department of Defence, Australia
 Institution of Engineers, Australia
 Institution of Radio and Electronics Engineers, Australia
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Part 1: General requirements

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE/13 on Symbols, Units and Quantities for Electrotechnology. It is issued as a Joint Standard to supersede various parts of AS 1103, *Diagrams, charts and tables for electrotechnology*.

The objective of this Standard is to provide those who use and develop electrotechnical diagrams with the rules for preparing diagrams for the purpose of uniform and efficient presentation of information.

This Standard is identical with and has been reproduced from IEC 1082-1, *Preparation of documents used in electrotechnology*, Part 1: *General requirements*.

IEC 1082-1:1991 Amendment 1:1995 (which incorporates Corrigendum:1993) is at the rear of this Standard. Text affected is marked by a marginal bar.

Due to restructuring and extensions of the material in this series of Joint Standards, there is no exact correspondence between the parts of AS/NZS 4383 and those of AS 1103. The following gives an approximate indication:

AS/NZS 4383	Corresponding Parts of AS 1103
Part 1	Parts 1 and 3, portions of Parts 7 and 8
Part 2	Part 4, portions of Parts 7 and 8
Part 3	Parts 5 and 6

The term 'informative' has been used in this Standard to define the application of the annex to which it applies. An 'informative' annex is only for information and guidance.

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- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text 'this International Standard' should read 'this Australian/New Zealand Standard'.
- (c) A full point substitutes for a comma when referring to a decimal marker.

References to international Standards should be replaced by equivalent Australian or Australian/New Zealand Standards as follows:

Reference to International Standard or other Publications Australian or Australian/New Zealand Standard

IEC		AS	
27-1	Letter symbols to be used in electrical technology Part 1: General	1046	Letter symbols to be used in electrotechnology Part 1: General
76-4	Power transformers Part 4: Tappings and connections	2374	Power transformers
		2374.4	Part 4: Tappings and connections
417	Graphical symbols for use on equipment— Index, survey and compilation of the single sheets	1104	Informative symbols for use on electrical and electronic equipment

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IEC		AS
445	Identification of equipment terminals and of terminations of certain designated conductors, including general rules of an alphanumeric system.	—
617-1	Graphical symbols for diagrams Part 1: General information, general index. Cross-reference tables	1102 Graphical symbols for electrotechnology 1102.101 Part 101: General information and general index
617-2	Graphical symbols for diagrams Part 2: Symbol elements, qualifying symbols and other symbols having general application	1102.102 Part 102: Symbol elements, qualifying symbols and other symbols having general application
617-3	Graphical symbols for diagrams Part 3: Conductors and connecting devices	1102.103 Part 103: Conductors and connecting devices
617-4	Graphical symbols for diagrams Part 4: Passive components	1102.104 Part 104: Passive components
617-5	Graphical symbols for diagrams Part 5: Semiconductors and electron tubes	1102.105 Part 105: Semiconductors and electron tubes
617-6	Graphical symbols for diagrams Part 6: Production and conversion of electrical energy	1102.106 Part 106: Production and conversion of electrical energy
617-7	Graphical symbols for diagrams Part 7: Switchgear, controlgear and protective devices	1102.107 Part 107: Switchgear, controlgear and protective devices
617-8	Graphical symbols for diagrams Part 8: Measuring instruments, lamps and signalling devices	1102.108 Part 108: Measuring instruments, lamps and signalling devices
617-9	Graphical symbols for diagrams Part 9: Telecommunications: Switching and peripheral equipment	1102.109 Part 109: Telecommunications—Switching and peripheral equipment
617-10	Graphical symbols for diagrams Part 10: Telecommunications: Transmission	1102.110 Part 110: Telecommunications—Transmission
617-11	Graphical symbols for diagrams Part 11: Architectural and topographical installation plans and diagrams	1102.8 Part 8: Symbols for location diagrams
617-12	Graphical symbols for diagrams Part 12: Binary logic elements	AS/NZS 1102.112 Part 112: Binary logic elements
617-13	Graphical symbols for diagrams Part 13: Analogue elements	1102.113 Part 113: Analogue elements
750	Item designation in electrotechnology	AS 3702 Item designation in electrotechnology

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IEC		AS/NZS	
848	Preparation of function charts for control systems	4382	Preparation of function charts for control systems
1082-2	Preparation of documents used in electrotechnology	4383	Preparation of documents used in electrotechnology
	Part 2: Function-oriented diagrams	4383.2	Part 2: Function-oriented diagrams
1175	Designations for signals and connections	—	
DIS 3B(CO)55*	Information technology—Coded graphic character set for use in the preparation of documents used in electrotechnology and for information interchange	—	
ISO		AS	
31-1	Quantities and units of space and time	2900	Quantities, units and symbols
		2900.1	Part 1: Quantities and units of space and time
31-2	Quantities and units of periodic and related phenomena	2900.2	Part 2: Quantities and units of periodic and related phenomena
31-3	Quantities and units of mechanics	2900.3	Part 3: Quantities and units of mechanics
31-4	Quantities and units of heat	2900.4	Part 4: Quantities and units of heat
31-5	Quantities and units of electricity and magnetism	2900.5	Part 5: Quantities and units of electricity and magnetism
31-6	Quantities and units of light and related electromagnetic radiations	2900.6	Part 6: Quantities and units of light and related electromagnetic radiations
31-7	Quantities and units of acoustics	2900.7	Part 7: Quantities and units of acoustics
31-8	Quantities and units of physical chemistry and molecular physics	2900.8	Part 8: Quantities and units of physical chemistry and molecular physics
31-9	Quantities and units of atomic and nuclear physics	2900.9	Part 9: Quantities and units of atomic and nuclear physics
31-10	Quantities and units of nuclear reactions and ionizing radiations	2900.10	Part 10: Quantities and units of nuclear reactions and ionizing radiations
31-11	Mathematical signs and symbols for use in the physical sciences and technology	2900.11	Part 11: Mathematical signs and symbols for use in the physical sciences and technology
31-12	Dimensionless parameters	2900.12	Part 12: Dimensionless parameters
31-13	Quantities and units of solid state physics	2900.13	Part 13: Quantities and units of solid state physics
128	General principles of presentation	1100	Technical drawing
		1100.101	Part 101: General principles
129	Technical drawings—Dimensioning—General principles, definitions, methods of execution and special indications	1100.101	Part 101: General principles

* Published as IEC 1286

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ISO		AS	
216	Writing paper and certain classes of printed matter. Trimmed sizes—A and B series	1100.101	Part 101: General principles
1219	Fluid power systems and components—Graphic symbols	1101	Graphic symbols for general engineering
		1101.1	Part 1: Hydraulic and pneumatic systems
2594	Building drawings—Projection methods	1100	Technical drawing
		1100.101	Part 101: General principles
3098-1	Technical drawings—Lettering—Part 1: Currently used characters	1100.101	Part 101: General principles
3098-2	Technical drawings—Lettering—Part 2: Greek characters	—	
3098-3	Technical drawings—Lettering—Part 3: Diacritical and particular marks for the Latin alphabet	—	
3098-4	Technical drawings—Lettering—Part 4: Cyrillic characters	—	
3461-2	Graphical symbols Part 2: General principles for creation of graphical symbols for use in technical product documentation	—	
5455	Technical drawings—Scales	1100.101	Part 101: General principles
5457	Technical drawings—Sizes and layout of drawing sheets	1100.101	Part 101: General principles
6428	Technical drawings—Requirements for microcopying	1100.101	Part 101: General principles
7200	Technical drawings—Title blocks	1100.101	Part 101: General principles

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Originated in part as AS 1103.1—1973.
 Previous editions AS 1103.1—1973, AS 1103.3—1989, part of
 AS 1103.7—1984, and part of AS 1103.8—1986.
 Revised, amalgamated and redesignated AS/NZS 4383.1:1996.



AUSTRALIAN/NEW ZEALAND STANDARD

Preparation of documents used in electrotechnology

Part 1:
General requirements

1.1 Scope

This International Standard provides general rules and guidelines for the preparation of documents used in electrotechnology, and specific rules and guidelines for certain kinds of documents.

Examples are intended to illustrate a given rule and are not necessarily representative of complete documents.

1.2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 27-1:1971	Letter symbols to be used in electrical technology - Part 1: General
IEC 76-4:1976	Power transformers - Part 4: Tappings and connections
IEC 417:1973	Graphical symbols for use on equipment - Index, survey and compilation of the single sheets
IEC 617-1:1985	Graphical symbols for diagrams - Part 1: General information, general index. Cross-reference tables
IEC 617-2:1983	Graphical symbols for diagrams - Part 2: Symbol elements, qualifying symbols and other symbols having general application
IEC 617-3:1983	Graphical symbols for diagrams - Part 3: Conductors and connecting devices
IEC 617-4:1983	Graphical symbols for diagrams - Part 4: Passive components
IEC 617-5:1983	Graphical symbols for diagrams - Part 5: Semiconductors and electron tubes
IEC 617-6:1983	Graphical symbols for diagrams - Part 6: Production and conversion of electrical energy
IEC 617-7:1983	Graphical symbols for diagrams - Part 7: Switchgear, controlgear and protective devices
IEC 617-8:1983	Graphical symbols for diagrams - Part 8: Measuring instruments, lamps and signalling devices
IEC 617-9:1983	Graphical symbols for diagrams - Part 9: Telecommunications: Switching and peripheral equipment
IEC 617-10:1983	Graphical symbols for diagrams - Part 10: Telecommunications: Transmission
IEC 617-11:1983	Graphical symbols for diagrams - Part 11: Architectural and topographical installation plans and diagrams
IEC 617-12:1991	Graphical symbols for diagrams - Part 12: Binary logic elements
IEC 617-13:1978	Graphical symbols for diagrams - Part 13: Analogue elements
IEC 750:1983	Item designation in electrotechnology
IEC 848:1988	Preparation of function charts for control systems
IEC 1082-2	Preparation of documents used in electrotechnology - Part 2: Function-oriented diagrams (<i>in preparation</i>)
ISO 31-1:1978	Quantities and units of space and time
ISO 31-2:1978	Quantities and units of periodic and related phenomena
ISO 31-3:1978	Quantities and units of mechanics
ISO 31-4:1978	Quantities and units of heat
ISO 31-5:1979	Quantities and units of electricity and magnetism
ISO 31-6:1980	Quantities and units of light and related electromagnetic radiations
ISO 31-7:1978	Quantities and units of acoustics
ISO 31-8:1980	Quantities and units of physical chemistry and molecular physics
ISO 31-9:1980	Quantities and units of atomic and nuclear physics
ISO 31-10:1980	Quantities and units of nuclear reactions and ionizing radiations
ISO 31-11:1978	Mathematical signs and symbols for use in the physical sciences and technology
ISO 31-12:1981	Dimensionless parameters
ISO 31-13:1981	Quantities and units of solid state physics
ISO 128:1982	General principles of presentation
ISO 129:1985	Technical drawings - Dimensioning - General principles, definitions, methods of execution and special indications
ISO 216:1975	Writing paper and certain classes of printed matter. Trimmed sizes - A and B series
ISO 1219:1976	Fluid power systems and components - Graphic symbols
ISO 2594:1972	Building drawings - Projection methods
ISO 3098-1:1974	Technical drawings - Lettering - Part 1: Currently used characters
ISO 3098-2:1984	Technical drawings - Lettering - Part 2: Greek characters
ISO 3098-3:1987	Technical drawings - Lettering - Part 3: Diacritical and particular marks for the Latin alphabet

ISO 3098-4:1984	Technical drawings - Lettering - Part 4: Cyrillic characters
ISO 3461-2:1987	Graphical symbols - Part 2: General principles for creation of graphical symbols for use in technical product documentation
ISO 5455:1979	Technical drawings - Scales
ISO 5457:1980	Technical drawings - Sizes and layout of drawing sheets
ISO 6428:1982	Technical drawings - Requirements for microcopying
ISO 7200:1984	Technical drawings - Title blocks

Section 2 - Definitions, classification

2.1 Definitions

For the purpose of this International Standard, the following definitions apply.

In the definitions, terms that are defined elsewhere within this clause are shown in *italics*.

2.1.1 Basic terms

The interrelations among some of the terms are illustrated in figure 1.

2.1.1.1 medium : Material on which information is recorded, for example paper, microform, magnetic or optical disk.

2.1.1.2 document : Information on a data *medium*. Normally, a document is designated in accordance with the type of information and the form of presentation, for example *overview diagram*, *connection table*, *function chart*.

Note : - Information may appear in a static manner on paper and microform or dynamically on (video) display devices.

2.1.1.3 drawing (technical) : *Document* presenting information in a graphical manner, which may include text.

1) collection of *documents* related to a given subject;

2) processing of *documents*.

2.1.2 Forms of the presentation of information

2.1.2.1 pictorial form : Graphical presentation depicting the shape, size, etc. of a physical part or assembly, often to scale.

2.1.2.2 plan¹⁾ : *Drawing* showing a horizontal view, section or cut.

2.1.2.3 diagram¹⁾ : Graphical presentation depicting, by the use of graphical symbols and outlines with inscriptions, the relations among the components and the parts of a system or of an equipment including the interconnections.

2.1.2.4 map¹⁾ : Graphical presentation of an installation with respect to its surrounding topography.

2.1.2.5 chart, graph¹⁾ : Graphical presentation describing the behaviour of a system, for example the relations between two or more variable quantities, operations or states.

2.1.2.6 table, list¹⁾ : Presentation form using columns and rows.

2.1.2.7 textual form : Presentation form using text, for example in written instructions and descriptions.

1) The term is used with two different meanings: for the form of presentation (as defined) and for the document.

2.1.3 Methods of the representation of components and connections in diagrams

Functionally dependent parts of a component

2.1.3.1 attached representation¹⁾ : Representation wherein the parts of a composite symbol are placed together. See figures 2 and 4.

2.1.3.2 semi-attached representation²⁾ : (*Usually for components having a mechanical functional linkage.*) Representation wherein the symbol is extended with each part placed in the *diagram* to achieve a clear layout of the circuits, the parts being connected by the symbol 02-12-01 of IEC 617 for a functional linkage. See figures 3 and 5.

2.1.3.3 detached representation : (*For components having a functional linkage.*) Representation wherein the symbol is separated into its parts with each part placed in the *diagram* to achieve a clear layout of the circuits, the parts being related by their item designations. See figures 6 and 7.

2.1.3.4 repeated representation : (*Usually for components having an electrical functional linkage, for example binary logic elements represented by a symbol including a common control block or a common output block.*) Representation wherein a complete symbol is shown in two or more places in the *diagram*, the identical item designation for each appearance indicating that the symbols represent only one component. See figure 8.

Functionally independent³⁾ parts of a component

2.1.3.5 grouped representation : Representation wherein:

- 1) the symbols for the parts are surrounded by an outline. See figure 9;
- 2) the symbols for the parts (usually binary logic and analogue elements) are abutted. See figure 10.

2.1.3.6 dispersed representation : Representation wherein the symbols for the parts are separated and placed in the *diagram* to achieve a clear layout of the circuits, the parts being related by their item designations. See figure 11.

Circuits

2.1.3.7 multi-line representation : Representation wherein each connection is represented by a line. See figure 12.

2.1.3.8 single-line representation : Representation wherein two or more connections are represented by a single line. See figure 13.

1) Formerly designated "assembled representation", which is now deprecated.

2) Formerly designated "semi-assembled representation", which is now deprecated.

3) The individual parts of the component may have a common voltage supply connection.

2.1.4 Diagram layout methods

2.1.4.1 functional layout : Layout method wherein the symbols for the components or their parts are placed in the *diagram* so that the functional relations can be easily recognized.
See figures 3, 5, 7, 14, 15 and 16.

2.1.4.2 topographical layout : Layout method wherein the symbols for the components are placed so that their relative positions in the *diagram* correspond to the relative physical locations of the components. See figures 17 and 18.

2.2 Classification of documents

2.2.1 Function-oriented documents

2.2.1.1 overview diagram¹⁾ : Relatively simple *diagram*, often using *single-line representation*, showing the main interrelations or connections among the items within a system, sub-system, installation, part, equipment, software, etc. See figures 14 and 15.

2.2.1.2 block diagram : *Overview diagram* using block symbols predominantly.

2.2.1.3 network map : *Overview diagram* showing a network on a *map*, for example generating and transforming stations and power lines, telecommunication equipment and transmission lines. See figure 18.

2.2.1.4 function diagram : *Diagram* showing details of the theoretical or ideal operation of a system, sub-system, installation, part, equipment, software, etc. by means of theoretical or ideal circuits without necessarily taking into account the means used for implementation.
See figure 16.

2.2.1.5 logic-function diagram²⁾ : *Function diagram* that predominantly uses symbols for binary logic elements.

2.2.1.6 equivalent-circuit diagram : *Function diagram* showing equivalent circuits, used as an aid for the analysis and calculation of characteristics or behaviour.

2.2.1.7 function chart : *Chart* describing the functions and behaviour of a control system, using steps and transitions.³⁾

2.2.1.8 sequence chart [table] : *Chart [table]* showing the succession of operations or status of the units of a system, the operations or status of the individual units being listed in one direction and the process steps or time being plotted at a right angle to that.
See figure 21.

2.2.1.9 time sequence chart : *Sequence chart* with the time axis plotted to scale.

1) An overview diagram showing a system containing primarily non-electrical devices in the process flow paths is normally designated *(process) flow diagram*.

2) Formerly designated "pure logic diagram", which is now deprecated.

3) The corresponding publication is IEC 848.

- 2.2.1.10 circuit diagram** : *Diagram* showing the implementation of the circuits of a system, sub-system, installation, part, equipment, software, etc., depicting parts and connections by means of graphical symbols arranged to show the functions but without necessarily taking into account the physical sizes, shapes, or locations of the items. See figures 4, 5, and 7.
- 2.2.1.11 terminal-function diagram** : *Diagram* for a functional unit showing the terminals for the interface connections and a description of the internal functions. These may be described by means of a *circuit diagram*, simplified if applicable, a *function diagram*, a *function or sequence chart*, or text. See figures 19 and 20.
- 2.2.1.12 program diagram [table] [list]** : *Diagram [table] [list]* showing in detail program elements, modules and their interconnections, so arranged that the interrelations are clearly recognizable. See figure 22.
- 2.2.2 Location documents**
- 2.2.2.1 site plan** : *Plan* showing the location, in relation to "setting-out points", of construction works, service networks, and roadworks, and information on landscape, means of access and general layout of site. See figure 24.
- 2.2.2.2 installation drawing [plan]** : *Drawing [plan]* showing the location of the components of an installation. See figures 17, 23, 25, and 26.
- 2.2.2.3 installation diagram** : *Installation drawing* showing the connections between items. See figure 17.
- 2.2.2.4 assembly drawing** : *Drawing* representing the spatial position and shape of a group of assembled parts, normally to scale.
- 2.2.2.5 arrangement drawing** : *Assembly drawing* simplified or supplemented to give information needed for some particular purpose. See figures 27 and 30.
- 2.2.3 Connection documents**
- 2.2.3.1 connection diagram [table]** : *Diagram [table]* showing or listing the connections of an installation or equipment.
- 2.2.3.2 unit connection diagram [table]** : *Connection diagram [table]* showing or listing the connections within a constructional unit. See figure 28.
- 2.2.3.3 interconnection diagram [table]** : *Connection diagram [table]* showing the connections among different constructional units. See figure 29.
- 2.2.3.4 terminal connection diagram [table]** : *Connection diagram [table]* showing the terminals of a constructional unit and the internal and/or external connections to the terminals. See figure 31.
- 2.2.3.5 cable diagram [table] [list]** : *Diagram [table] [list]* providing information on cables, such as the identification of the conductors, the location of the ends and, if needed, the characteristics, routes and function. See figure 32.

2.2.4 Item lists

2.2.4.1 parts list : *List specifying the items (parts, components, software, equipment, etc.) that constitute an assembly (or sub-assembly) and , if necessary, the reference documents. See figure 33.*

2.2.4.2 spare parts list : *List specifying the items (parts, components, software, bulk material, etc.) for preventive and corrective maintenance.*

2.2.5 Installation-specific documents

Documents giving instructions or information regarding the installation conditions and the supply, delivery, off-loading, erection and testing of a system, installation, equipment or component.

2.2.6 Commissioning-specific documents

Documents giving instructions or information regarding the commissioning and stating prior adjustments, simulation modes, recommended setting values and actions to be taken in order to achieve the development and proper functioning of a system, installation, equipment or component.

2.2.7 Operation-specific documents

Documents giving instructions or information regarding the operation of a system, installation, equipment or component.

2.2.8 Maintenance-specific documents

Documents giving instructions or information regarding maintenance procedures, for example in maintenance or service manuals, for a system, installation, equipment or component.

2.2.9 Reliability- and maintainability-specific documents

Documents giving information on the reliability and maintainability of a system, installation, equipment or component.

2.2.10 Other documents

Other documents may be necessary, such as handbooks, guides, catalogues, and drawing and document lists.

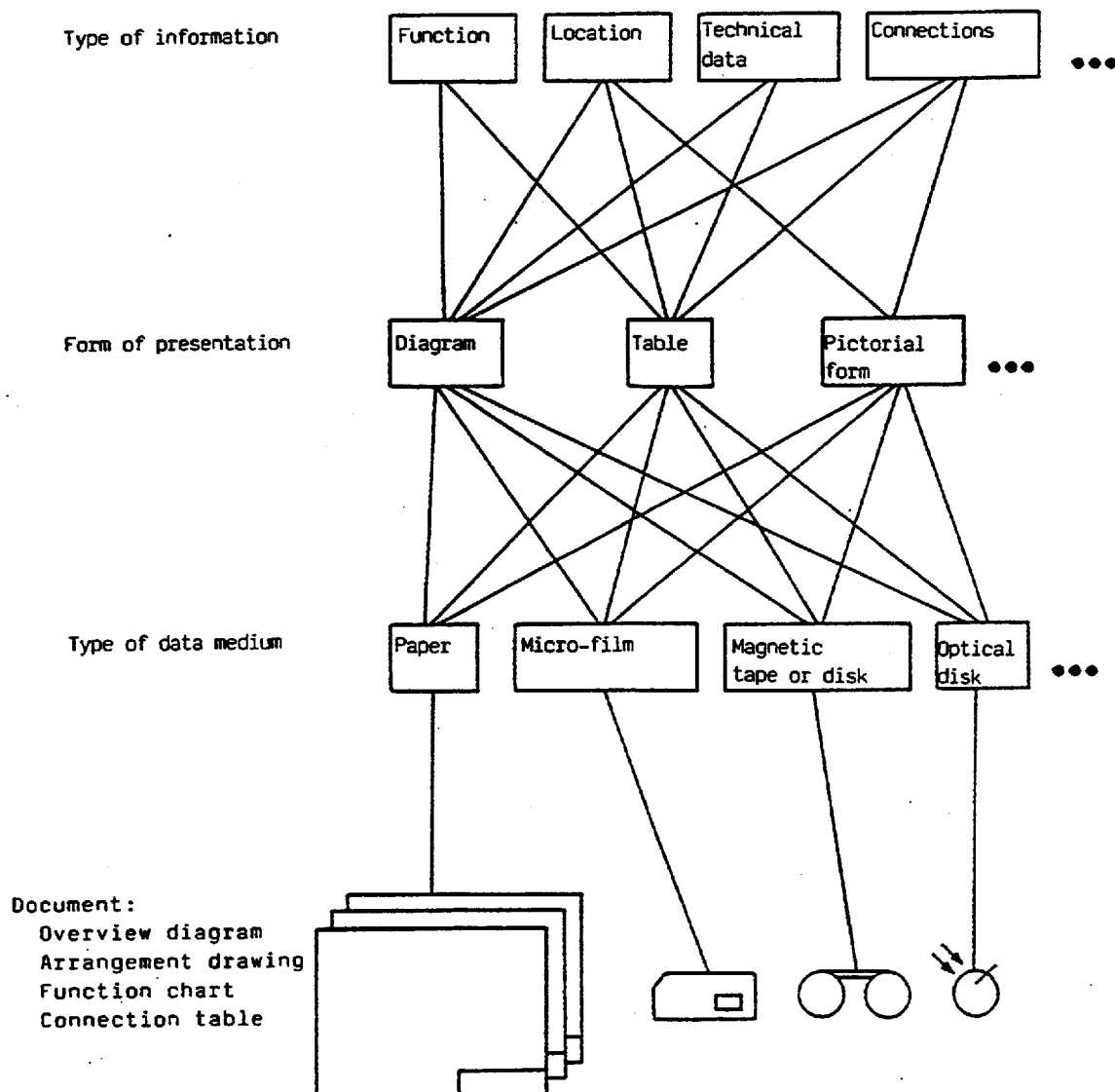


Figure 1 - Some interrelations among various types of information, forms of presentation, types of data medium and the classification of documents.

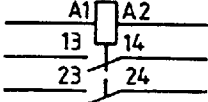
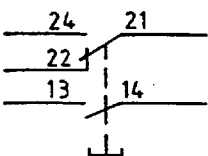
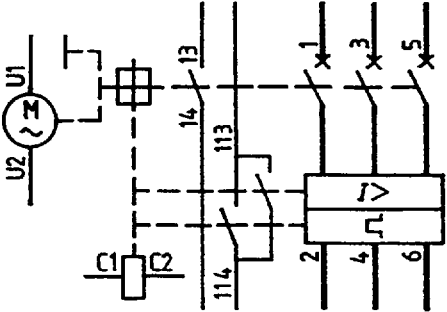
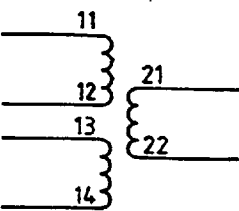
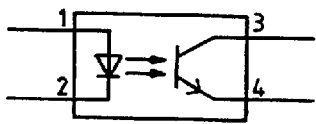
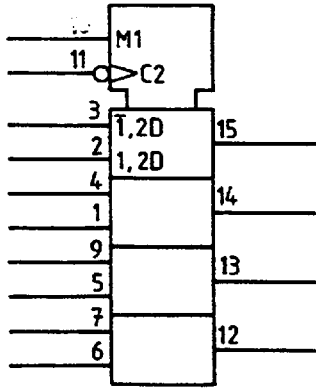
No	Attached representation	Description	Comments
1		Relay	May be shown in semi-attached representation (fig.3) or in detached representation (fig. 6).
2		Pushbutton	
3		Circuit-breaker, operated by hand or motor, with trip-free mechanism, trip coil, over-current and over-load releases.	
4		Transformer with three windings	May be shown in detached representation (fig. 6).
5		Optical coupling device	
6		Multiplexer with storage, quad 2-input	May be shown in repeated representation (fig. 8, 84 and 85).

Figure 2 - Examples of symbols in attached representation.

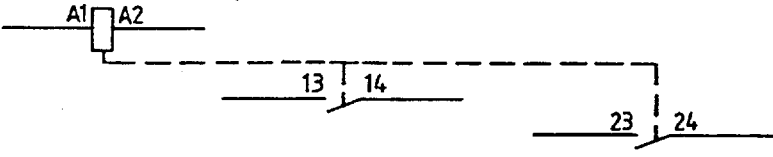
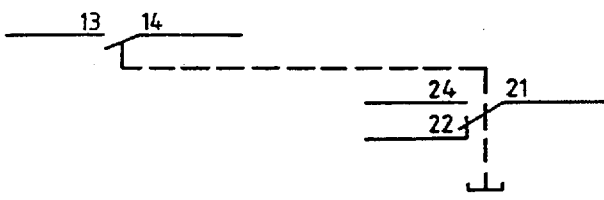
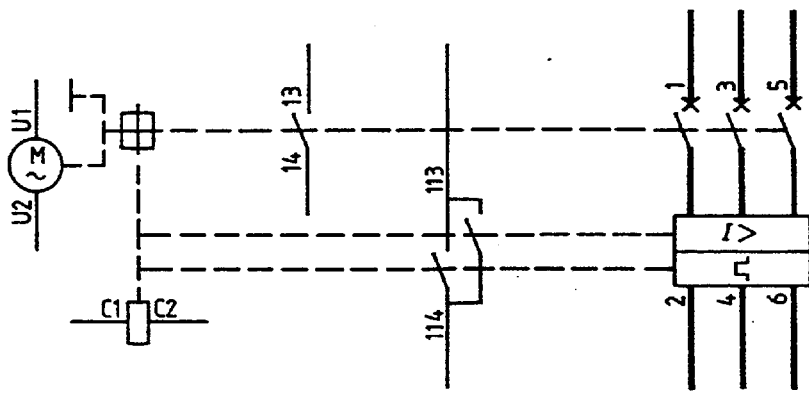
No	Semi-attached representation	Description
1		Relay
2		Pushbutton
3		Circuit-breaker, operated by hand or motor, with trip-free mechanism, trip coil, over-current and thermal over-load releases.

Figure 3 - Examples of symbols in semi-attached representation; the components represented are the same as in examples 1-3 of figure 2.

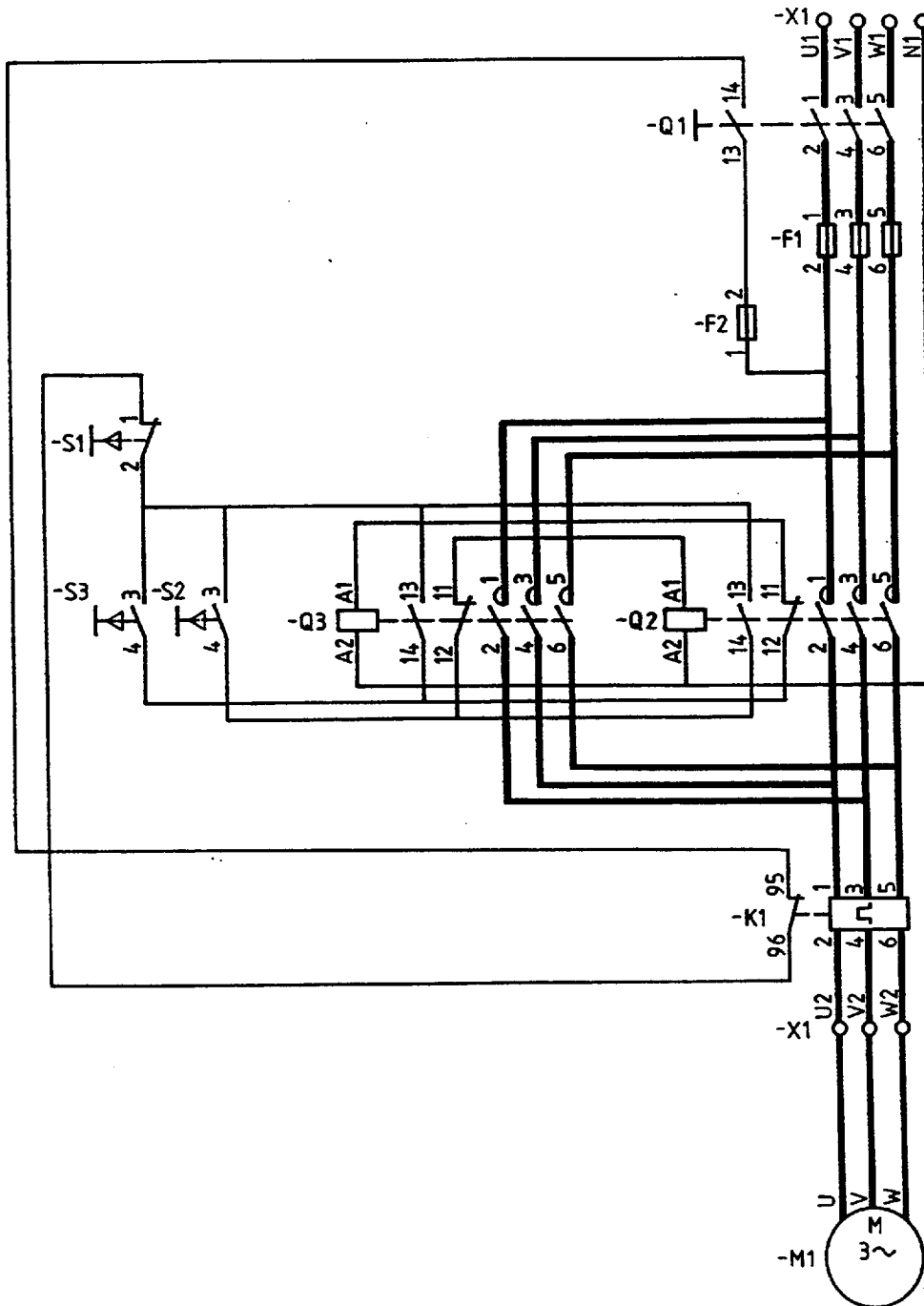


Figure 4 - Example of a circuit diagram using attached representation; a drive system for two directions of rotation.

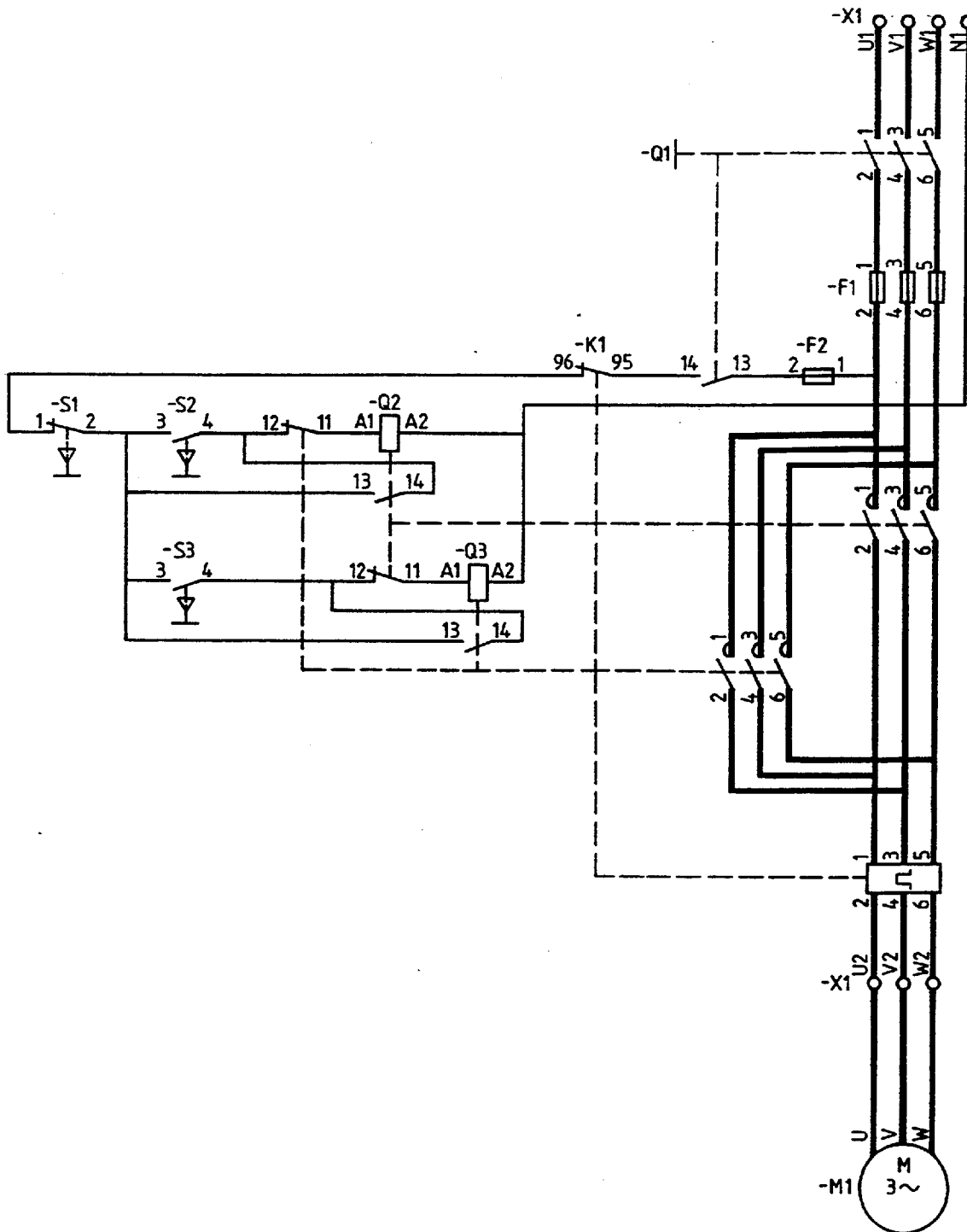


Figure 5 - Example of a circuit diagram using semi-attached representation; the same drive system as in figure 4.

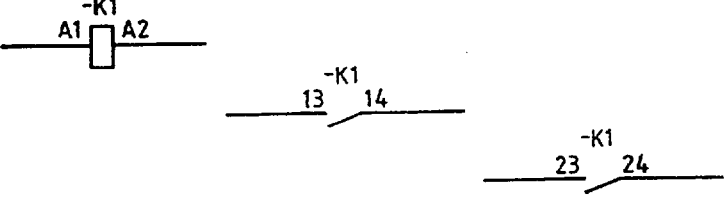
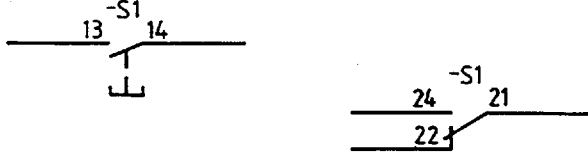
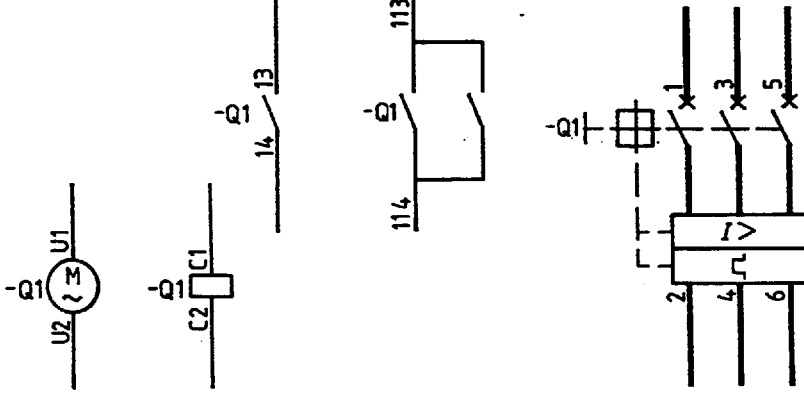
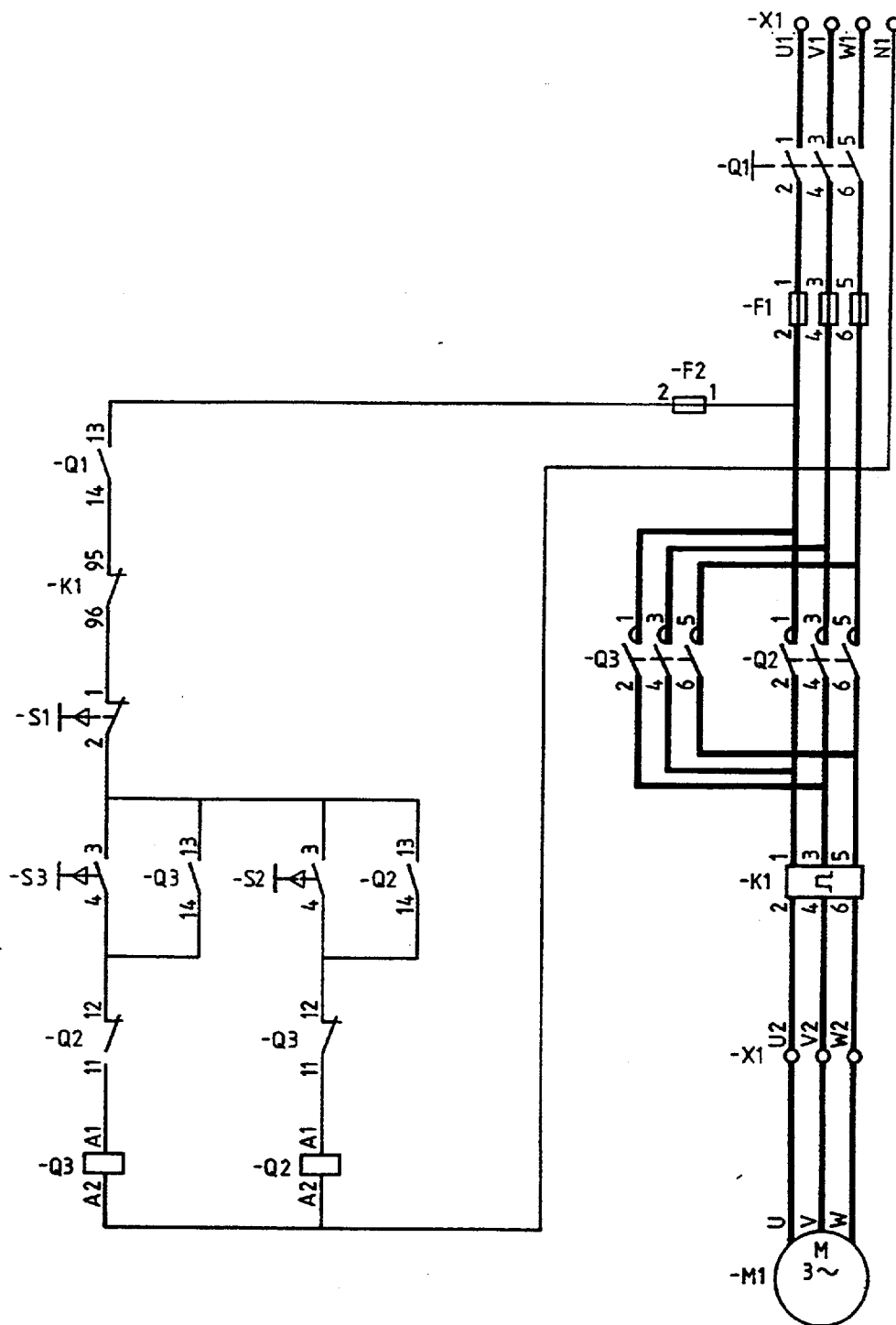
No	Detached representation	Description
1		Relay
2		Pushbutton
3		Circuit-breaker, operated by hand or motor, with trip-free mechanism, trip coil, over-current and thermal overload releases
4		Transformer with three windings
5		Optical coupling device

Figure 6 - Examples of symbols in detached representation; the components represented are the same as in examples 1 - 5 in figure 2.



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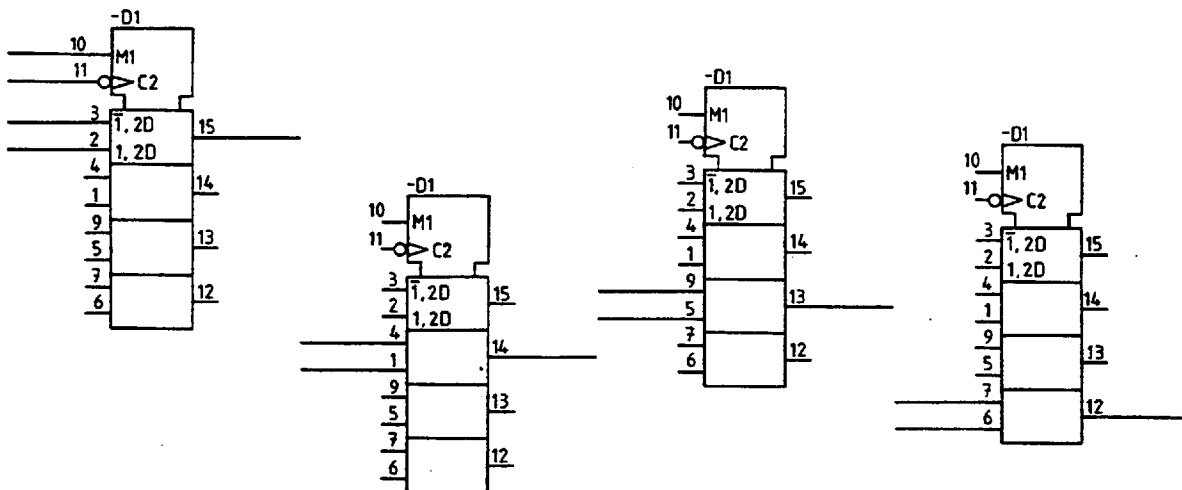


Figure 8 - Exemple de représentation répétée; multiplexeur représenté dans l'exemple 6 de la figure 2.

Figure 8 - Example of repeated representation; multiplexer represented in example 6 of figure 2.

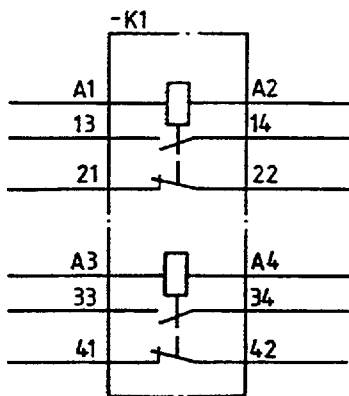


Figure 9 - Example of grouped representation; package of two electromechanical relays.

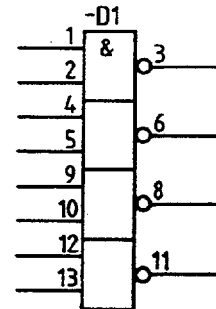
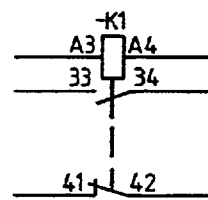
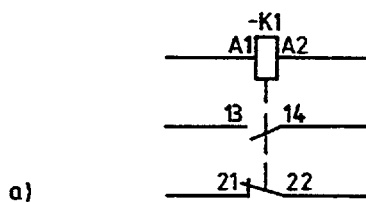


Figure 10 - Example of grouped representation; package of four AND-elements with negated output.



b)

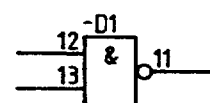
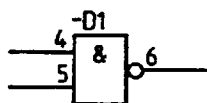
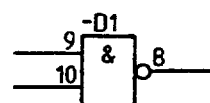
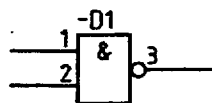


Figure 11 - Example of dispersed representation; the components represented in a) are the same as in figure 9, those represented in b) are the same as in figure 10.

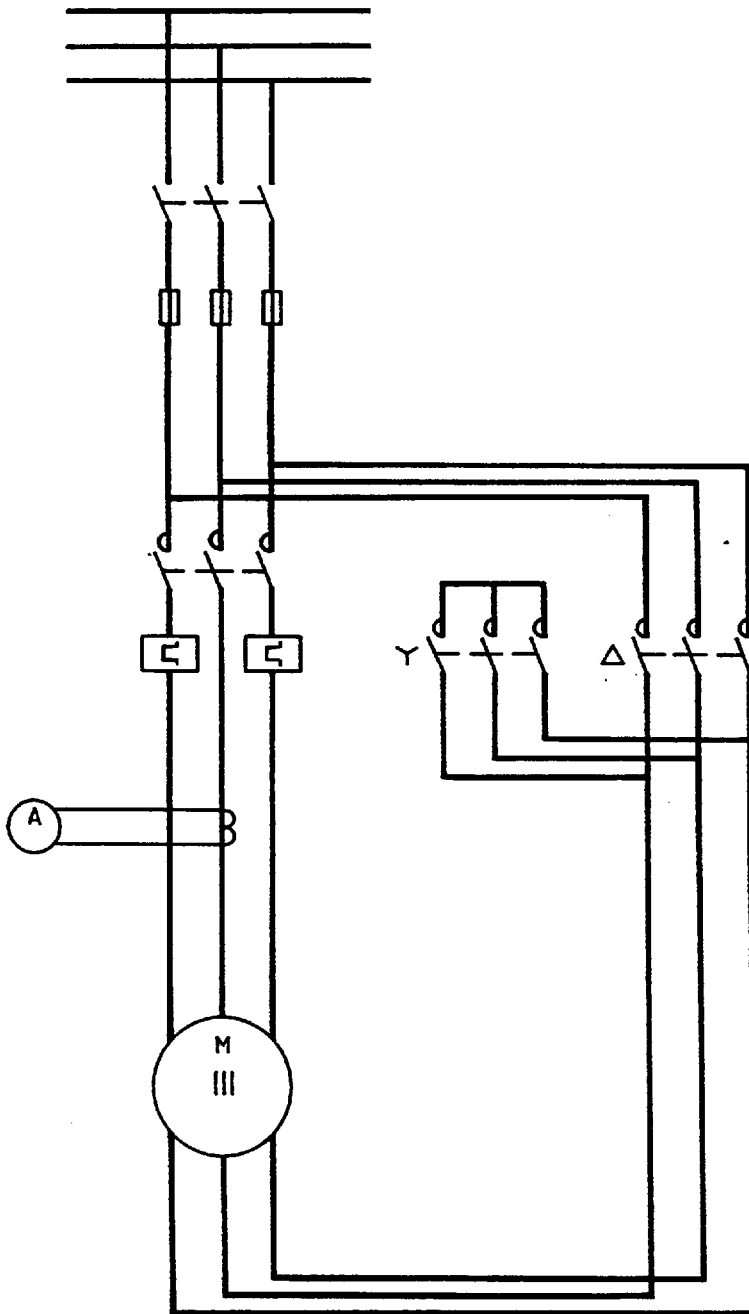


Figure 12 - Example of connections in multi-line representation; star-delta starter.

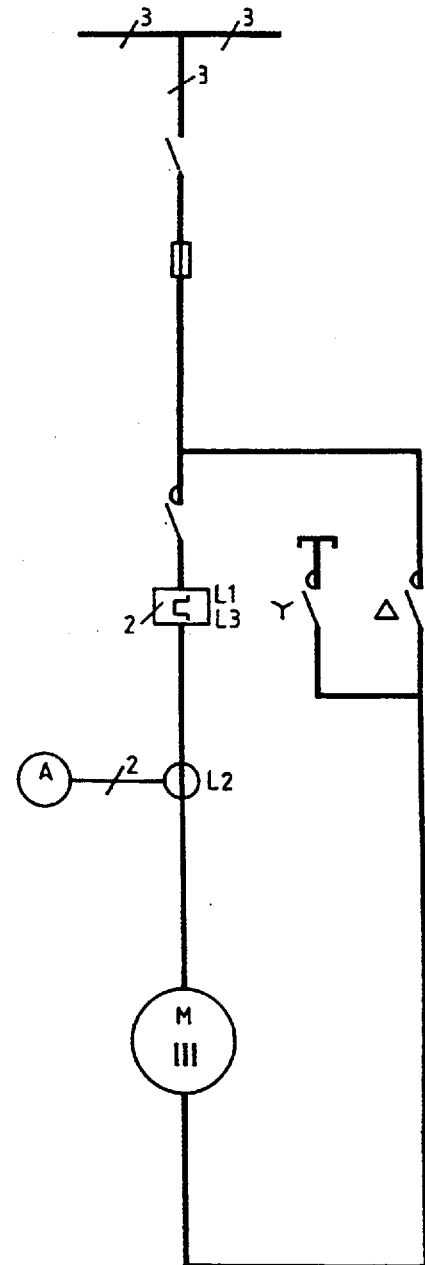


Figure 13 - Example of connections in single-line representation; same star-delta starter as in figure 12.

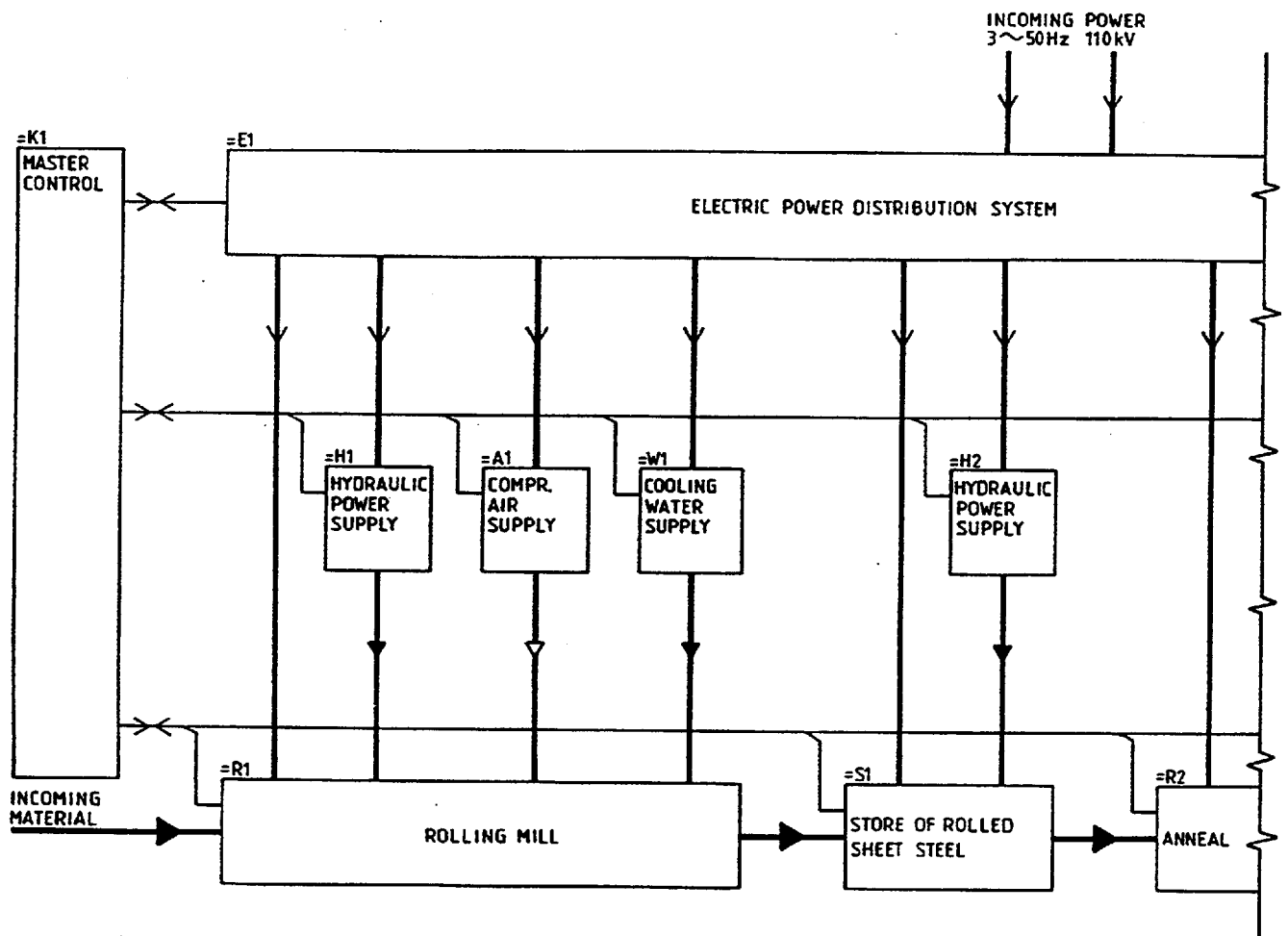


Figure 14 - Example of an overview diagram with functional layout; a steelworks.

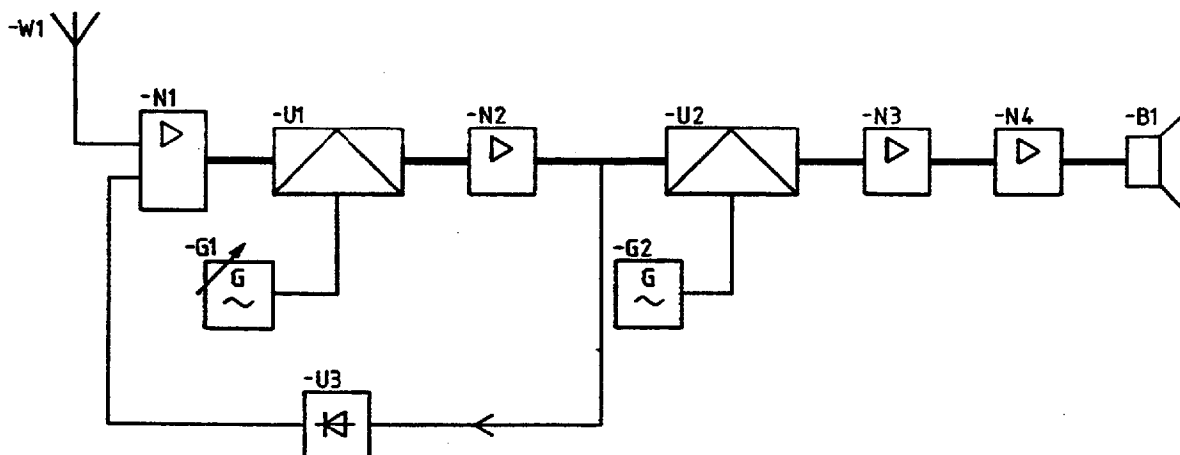


Figure 15 - Example of an overview diagram with functional layout; a radio receiver.

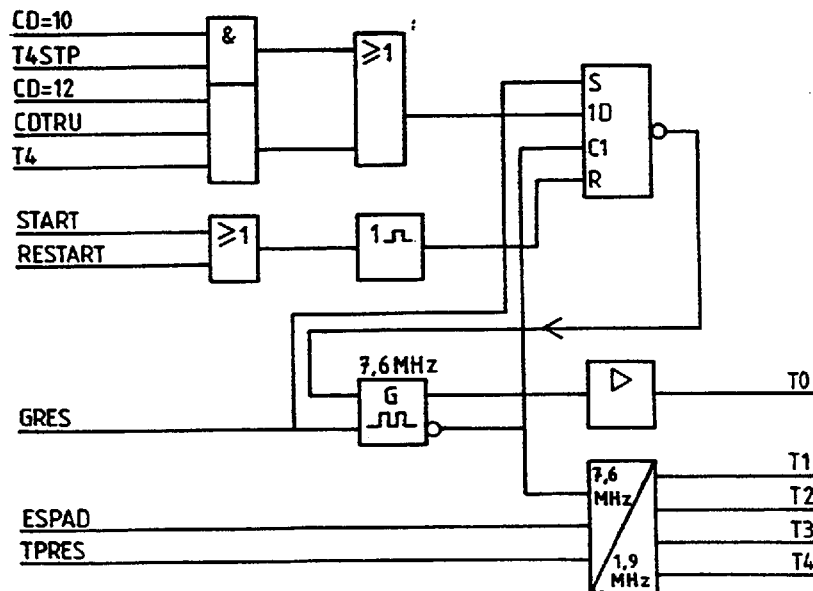


Figure 16 - Example of a logic-function diagram; timing-pulse generator equipment.

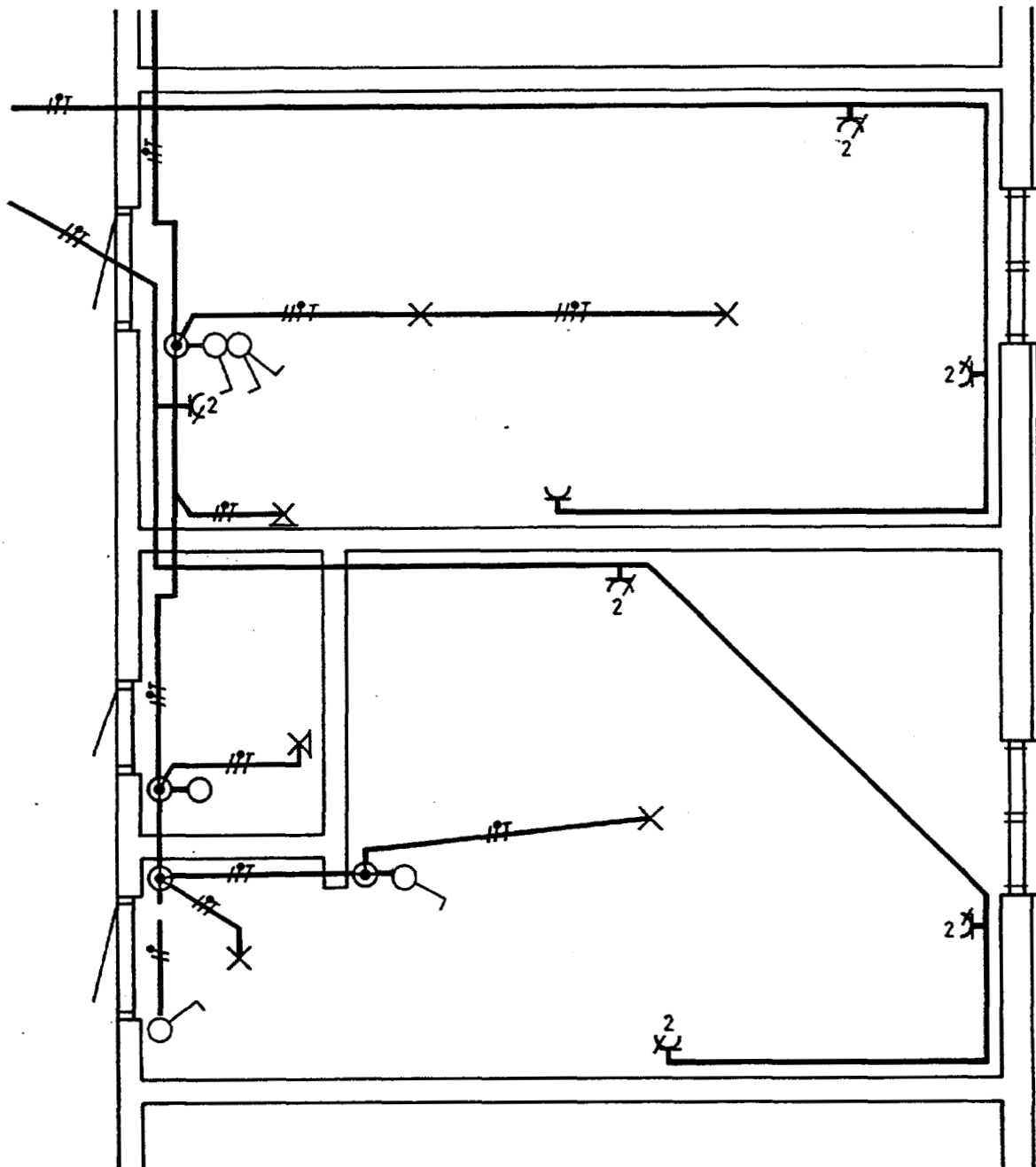


Figure 17 - Example of an installation diagram (drawing) with topographical layout; lighting installation in a building.

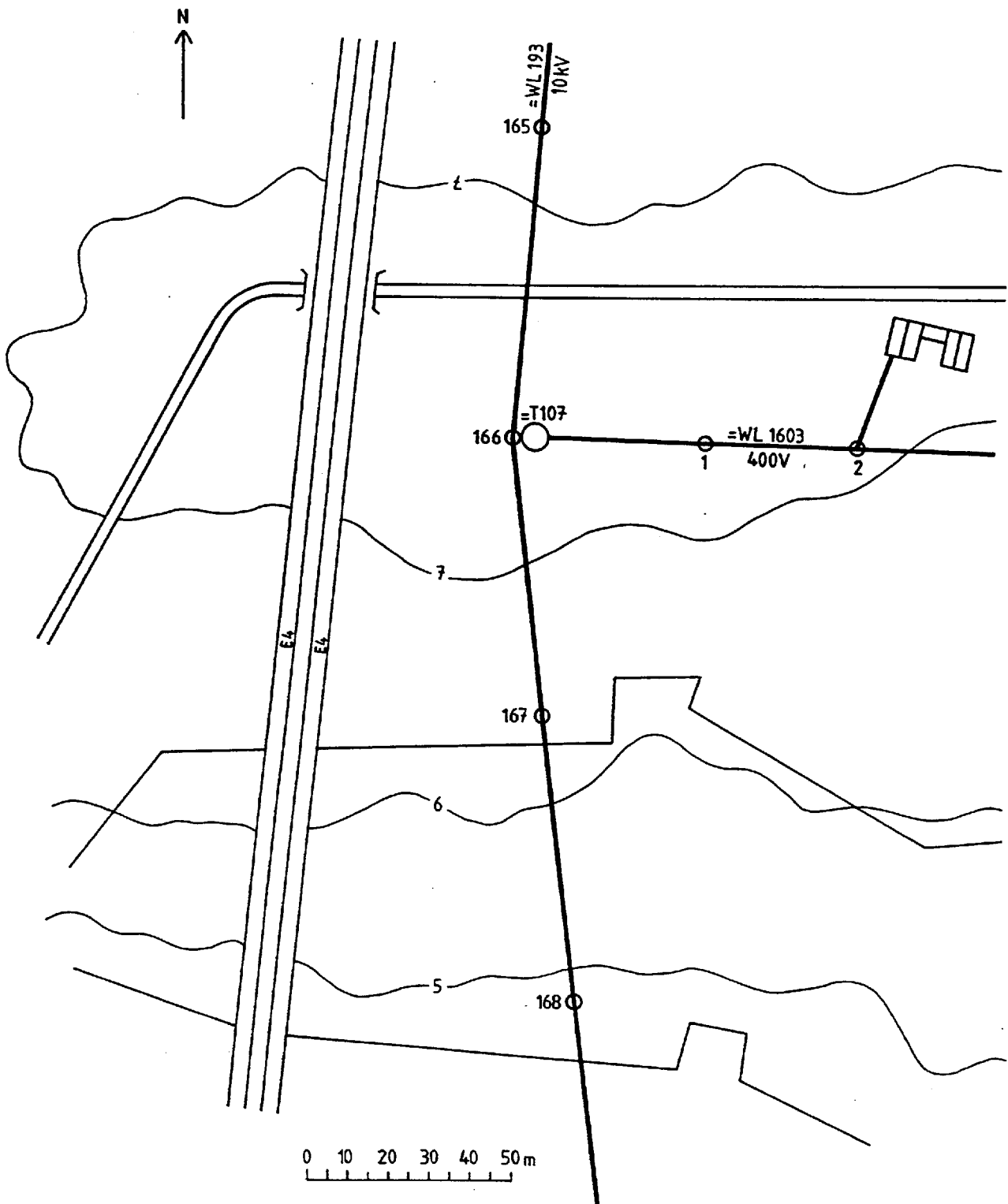


Figure 18 - Example of a network map; high voltage overhead line with a transformer station and 400 V branch.

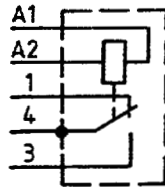


Figure 19 - Example of a terminal function diagram; screened electromechanical relay.

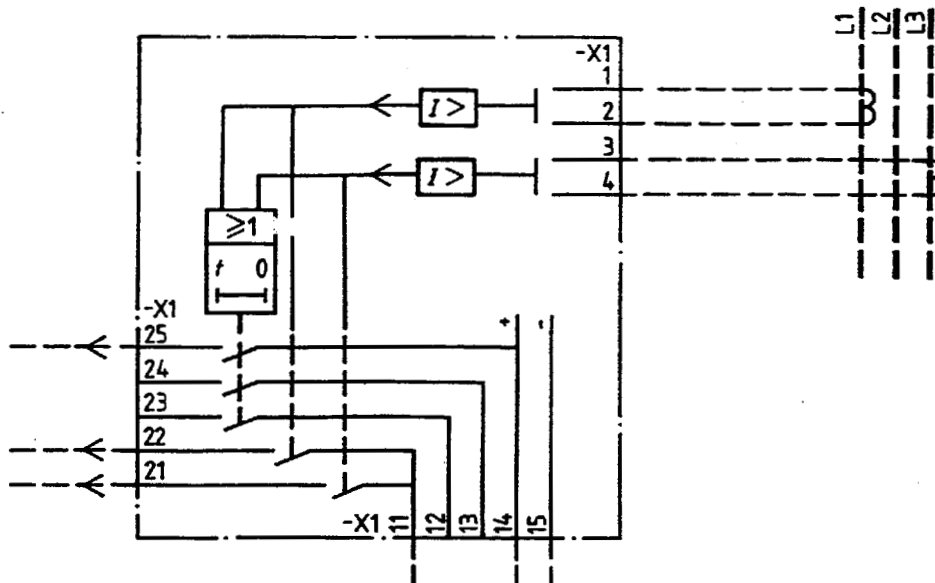


Figure 20 - Example of a terminal function diagram; functional unit for detecting overcurrent.

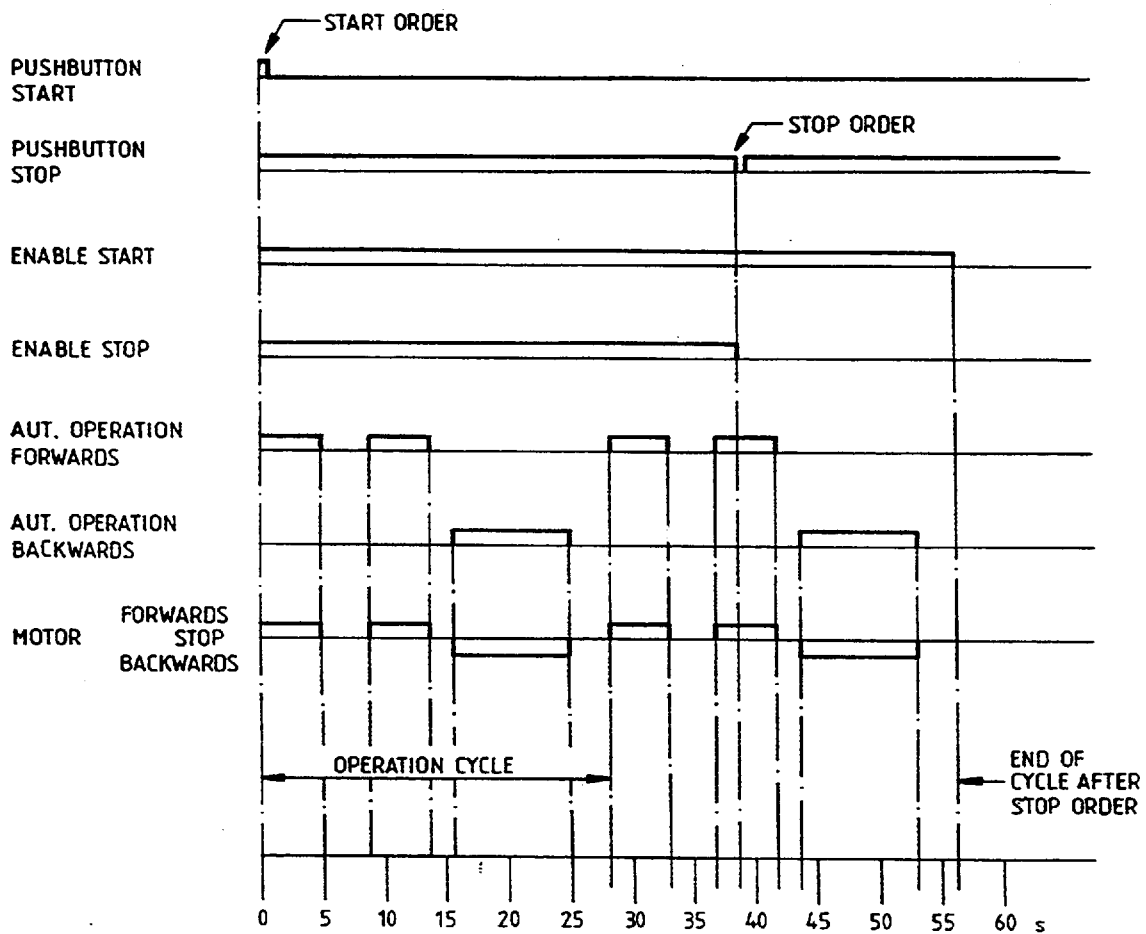


Figure 21 - Example of a time sequence chart; the control of a drive system.