TECHNICAL SPECIFICATION

ISO/TS 16952-1

First edition
2006-06-01

Technical product documentation — Reference designation system —

Part 1:
General application rules

Documentation technique de produits — Système de désignation de référence —

Partie 1: Règles générales d'application

© ISO 2006

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

It is intended, at the next revision of ISO/TS 16952-1 and of IEC 61346-1, to combine both documents into one ISO/IEC standard with a 80000 number.

ISO/TS 16952-1 was prepared by Technical Committee ISO/TC 10, *Technical product documentation*, Subcommittee SC 10, *Process plant documentation and tpd-symbols*.

ISO/TS 16952 consists of the following parts, under the general title *Technical product documentation — Reference designation system*:

— *Part 1: General application rules*

The following part is under preparation:

— *Part 10: Power plants*

Further parts on sector-specific rules are under consideration.

Introduction

IEC 61346 is the basic standard for structuring principles and reference designation. IEC 61346-1 provides a number of possibilities for the construction of reference designations. For most applications, however, only a subset of the possibilities given in IEC 61346-1 need to be used. IEC 61346-1 does not restrict the use of the reference designation system to a specific area. It is sometimes necessary to incorporate further basic requirements, and it is recommended that these be specified and explained in supporting documentation.

To enhance an efficient implementation of those basic rules and to ensure a consistent interpretation of those rules, an easily understandable system is necessary. Consequently, ISO/TS 16952:

— offers broadly based, general solutions with rules for a practice-oriented and consistent application;

— fulfils the requirements for ergonomics and occupational safety;

— takes into account memorability, labelling, and processing in common office- and CAx-tools;

— summarizes in a single document all technical designation tasks (reference designations according to function, product and location aspect as well as designation of connections, signals, documents);

— recommends decoupling of reference designation activities of plant designers and of equipment suppliers, by use and allocation of different aspects;

— introduces the "conjoint designation" for higher level objects without specific aspect;

— supports the handling of computer programs and parts of such programs as technical products;

— forms the basis for sector-specific solutions and specifications in further parts of ISO/TS 16952, in order to achieve a consistent designation across different technical fields.

Technical product documentation — Reference designation system —

Part 1:
General application rules

1 Scope

This part of ISO/TS 16952 establishes comprehensive and practice-oriented principles and rules for the designation of technical objects within a system, as well as for the designation of connections, signals and documents in accordance with the corresponding basic standards.

The principles of this part of ISO/TS 16952 apply to all technical fields for all industries and can be applied in all phases of the life cycle of a technical object.

This part of ISO/TS 16952 serves as the basis for sector-specific parts of ISO/TS 16952 and thus forms the connecting element between them and the basic IEC 61346 series.

The designation of types, individuals, cost-centres, projects, etc. is not covered by this part of ISO/TS 16952.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9355-1, *Ergonomic requirements for the design of displays and control actuators — Part 1: Human interactions with displays and control actuators*

ISO 9355-2, *Ergonomic requirements for the design of displays and control actuators — Part 2: Displays*

ISO 12100-1, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

ISO 12100-2, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles*

IEC 61175, *Industrial systems, installations and equipment and industrial products — Designation of signals*

IEC 61346-1:1996, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 1: Basic rules*

IEC 61346-2:2000, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 2: Classification of objects and codes for classes*

IEC 61355, *Classification and designation of documents for plants, systems and equipment*

IEC 61666, *Industrial systems, installations and equipment and industrial products — Identification of terminals within a system*

3   Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
aspect
specific way of selecting information on, or describing a system or an object of a system

[IEC 61346-1]

3.2
building
construction works that has the provision of shelter for its occupants or contents as one of its main purposes, and which is usually partially or totally enclosed and designed to stand permanently in one place

[ISO 6707-1]

3.3
designation
generation of task-specific reference designations for technical objects in accordance with fixed rules

3.4
document
information on a data medium

NOTE 1   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 2   Information can appear in static manner on paper and microform, or dynamically on (video) display devices.

[IEC 61082-1]

3.5
document kind
type of document defined with respect to its specified content of information and form of presentation

[IEC 61355]

3.6
document kind class
group of document kinds having similar characteristics concerning the content of information independent of the form of presentation

[IEC 61355]

3.7
documentation
collection of documents assigned to a specific object

NOTE   This can include technical, commercial and/or other documents.

[IEC 61082-1]

3.8
function
purpose related to an object

[IEC 61346-1]

3.9
infrastructure
system of facilities, equipment and services required for the operation of an organization

[ISO 9000]

3.10
multi-level reference designation
reference designation derived from a structural path through an overall system

[IEC 61346-1]

3.11
object
entity treated in the process of design, engineering, realization, operation, maintenance and demolition

NOTE 1   The entity can refer to a physical or non-physical "thing", or to a set of information associated with it.

NOTE 2   Depending on its purpose, an object can be viewed in different ways, called "aspects".

[IEC 61346-1]

3.12
plant
complete set of technical equipment and facilities for solving a defined technical task

NOTE   A plant includes apparatus, machines, instruments, devices, means of transportation, control equipment and other operating equipment.

[IEC 60050-351]

3.13
process
sequence of chemical, physical or biological operations for the conversion, transport or storage of material or energy

NOTE 1   Different processes or process steps can be carried out in the same process plant or plant section at different times.

[ISO 10628]

NOTE 2   A process can also be regarded as an entirety of interacting events in a system through which material, energy or information are transformed, transported or stored.

3.14
product
intended or accomplished result of labour, or of a natural or artificial process

NOTE 1   A product usually has a part number, order number, type designation, and/or a name.

NOTE 2   A technical system or plant can be considered as a product.

[IEC 61346-1]

3.15
reference designation
identifier of a specific object with respect to the system of which the object is a constituent, based on one or more aspects of that system

[IEC 61346-1]

3.16
signal
identification of information and transferring of the information from an object to another

[IEC 61175]

3.17
single-level reference designation
reference designation assigned with respect to the object of which the specific object is a direct constituent

[IEC 61346-1]

3.18
structure
relations among the elements of a system

[IEC 60050-351]

3.19
system
set of interrelated objects

[IEC 61346-1]

3.20
terminal
point of access to an object intended for connection to an external network

NOTE 1   The connection can refer to:

⎯ a physical interface between conductors and/or contacts, or piping and/or duct systems to provide a signal, energy or material flow path;

⎯ an association of functional nature established between logical elements, software modules, etc. for conveying information.

NOTE 2   The external networks can be of different nature and accordingly they can be classified. IEC 81714-3 provides such classifications.

[IEC 61666]

4   Designation systematics

4.1   General

4.1.1   Designation systematics is a well-ordered and methodical process of forming designations on the basis of simple rules, ensuring compliance with the following requirements:

a)   consistency in all phases (e.g. engineering, operation and decommissioning) and engineering disciplines (e.g. process, civil, mechanical and electrical engineering) of a project;

b) fulfilment of ergonomic principles in accordance with ISO 12100-1, ISO 12100-2, ISO 9355-1 and ISO 9355-2, with regard to occupational health and safety (hazard analysis, fault tracing, job orders, equipment release procedures, etc.), e. g.

— simple structure of designation,

— easy-to-remember representation,

— clear legibility and easy memorability,

— error-free interpretation;

c) improvement of information management and information quality control, e.g. by establishing:

— identifiers for data and document management systems,

— identifiers for configuration and quality management systems,

— clear cross-references between physical application and documentation.

The designation shall clearly and unambiguously identify all objects and associated information according to their function, implementation and location.

The designation shall describe the real structure of an object and its relations to other objects.

The designation of the parts of a system shall be generic to such an extent that the system can be incorporated in any other system, without the need for changing the reference designations in any of the systems involved.

4.1.2   IEC 61346-1 provides a number of possibilities for the construction of reference designation. For most applications, however, only a subset of the possibilities given in IEC 61346-1 need to be used. For a consistent application in practice, this part of ISO/TS 16952 establishes clear and easily understandable rules and guidelines as well as well-defined specifications for the following:

— tasks of designation (see Clause 5),

— general and sector neutral construction of designation (see Clause 6).

4.1.3   This part of ISO/TS 16952 stipulates only basic rules. Detailed and specific requirements are given in the sector-specific parts of ISO/TS 16952, in order to cover the specific needs of different application fields. These specific requirements comprise:

— a relevant subset of designation possibilities,

— letter codes for infrastructure objects,

— a reference designation that identifies the object unambiguously (main aspect),

— transitions between different aspects,

— a sector-specific designation structure,

— the allocation of structural levels to letter code tables,

— additional aspects.

4.1.4 Furthermore, the following specifications need to be established and documented for each project:

⸺ conjoint allocation,

⸺ notation, e.g. in documents, on labels, on displays.

4.1.5 The chosen structure, with corresponding reference designations, shall be documented not only in relevant object describing documents, but also in a separate document describing the structure.

For a specific project, the general rules shall be listed at the start of the designation process and documented complete with specific requirements in separate instructions.

4.1.6 An example of a designation process within a project is given in Annex A. Application examples are given in Annex B. Other terms and definitions that are used in the context of a "designation system" and will be helpful for the elaboration of sector-specific parts of ISO/TS 16952 are given in Annex C.

4.2   Designation process

The designation process comprises the following sub-processes.

Starting from process flow diagrams, overview diagrams, site plans, etc. used to describe the structure of the overall project in accordance with IEC 61346-1, the overall object shall be broken down according to different viewpoints. For instance, a location with industrial facilities can be divided into specific areas (e.g. manufacture, power plant). These objects shall be defined as top-level nodes of the overall structure and shall serve as starting point for subdivisions into lower-level aspect-oriented structures (see 5.3.1).

At an early stage in the planning, the task-oriented representations of the object of interest shall be translated into a hierarchical tree-like structure under a functional aspect. In subsequent phases, the products that fulfil the tasks of the partial objects viewed under functional aspects shall be defined and structured. To designate the location of the products, the overall object shall be structured under the location aspect. Structuring shall be performed in compliance with the principle of constituency, i.e. an object is a constituent of a single higher object, but can comprise several sub-objects (hierarchical structural model). The subdividing process is completed with the smallest object of interest for the defined purpose.

Partial objects shall be defined and classified during the structuring process. To classify partial objects, it is possible to use IEC 61346-2:2000, Table 1, for non aspect-specific purposes and/or sector- or project-specific letter code tables structured in accordance with IEC 61346-2:2000, Table 2. In cases where both methods are used, the allocations of the structural level to the corresponding letter code level shall be defined. The parts of an object shall be classified in accordance with their location in the structure (structural level), as specified by the agreed tables.

The prefix for the aspect, the letter code of the object class and an additional number form the single-level reference designation. The number is used to distinguish between objects belonging to the same class and to the same overall object. The multi-level reference designation is created by concatenating the single-level reference designations represented in the path beginning with the top-most one.

To establish a unique designation, it is necessary to create task-specific designation combinations (in relation to technical objects, signals, connections, documents), as described in Clause 6.

The designation shall be used for labelling technical objects in the plant, for designating documents and for identifying the representation of objects in documents.

Reference designations with different aspects can be used in databases to network object information in different records ("pragmatic relations"). This yields a large number of task-related evaluation options, e.g. information about the location of products performing a function and which are reported as defective.

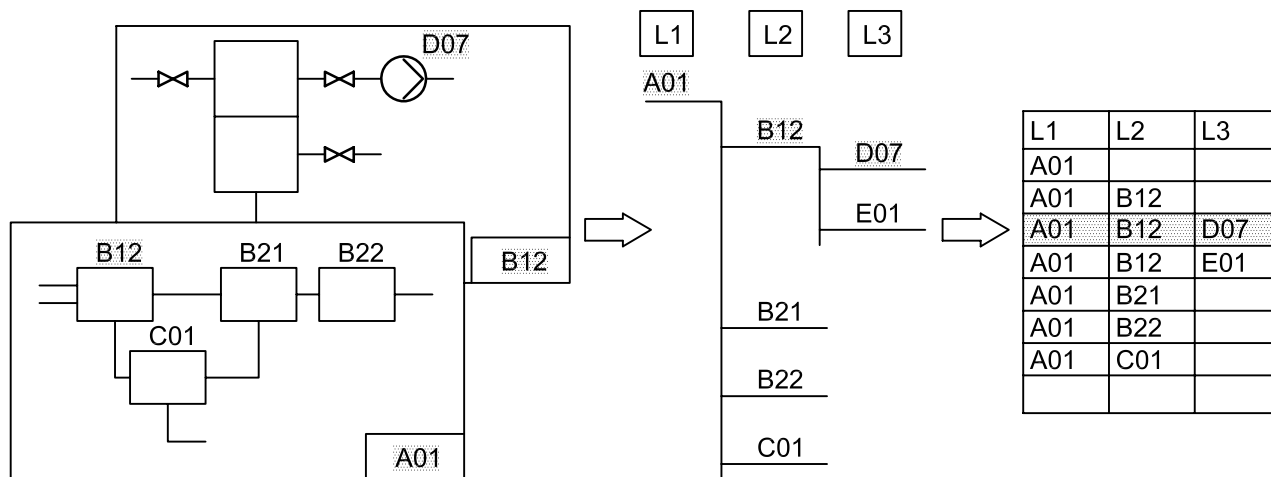Figure 1 shows the schematic representation of the designation process.

Figure 1 — Schematic representation of the designation process

5 Tasks of designation

5.1 General

A reference designation shall:

— identify an object,

— provide information regarding the class to which the object belongs, and

— provide information on where the object is located within a structure.

5.2   Conjoint designation

It is recognized that on a site different plants may exist. In order to address these plants with respect to the site, it may be necessary to apply a conjoint designation. A conjoint designation is a reference designation of a plant/system with respect to the site, which is not related to one of the defined aspects.

The use of the conjoint designation is optional. The application, structure and number of data characters shall be defined project-specifically.

If this designation is used as part of the identifier (see 6.1), the systems, objects and products which fulfil the same task in different plants can have the same reference designation. Unambiguous designations are obtained by means of the different conjoint designations. There is a significant ergonomic advantage in adopting this approach. Even if the equipment is moved from plant to plant, the necessary changes of its designation are limited. The same principle applies to designations of locations.

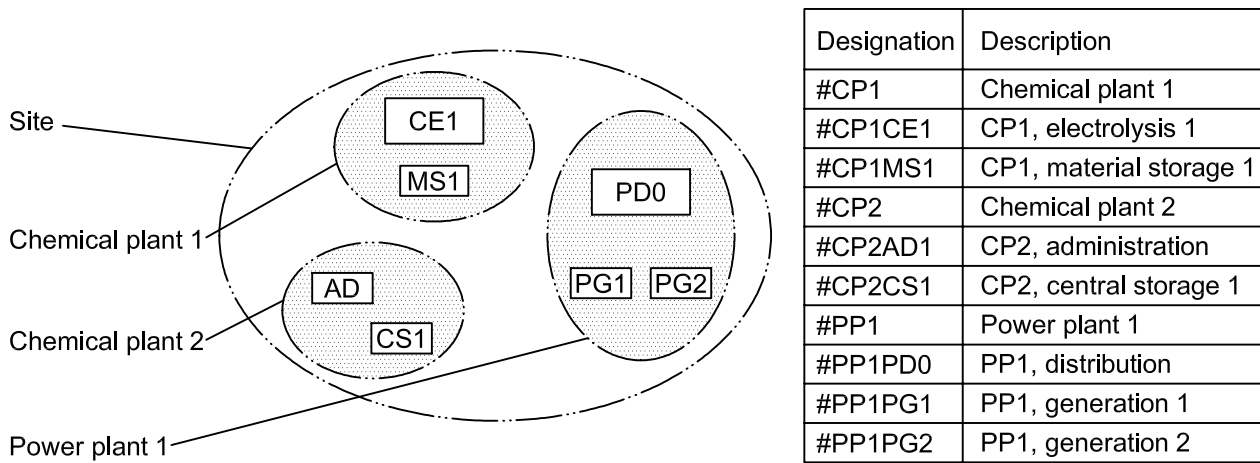| Designation	Description
#CP1	Chemical plant 1
#CP1CE1	CP1, electrolysis 1
#CP1MS1	CP1, material storage 1
#CP2	Chemical plant 2
#CP2AD1	CP2, administration
#CP2CS1	CP2, central storage 1
#PP1	Power plant 1
#PP1PD0	PP1, distribution
#PP1PG1	PP1, generation 1
#PP1PG2	PP1, generation 2

Figure 2 — Conjoint designation, designation principle

5.3   Designation of technical objects

5.3.1   Reference designation

5.3.1.1   Aspects

IEC 61346-1:1996 specifies that "the reference designation identifies objects for the purpose of correlating information about an object among different kinds of documents and the products implementing the system".

A system, and each constituent object, can be viewed in many ways, called "aspects" (see Figure 3).

Questions:

— What does the object do? (function aspect)

— How is the object constructed? (product aspect)

— Where is the object located? (location aspect)
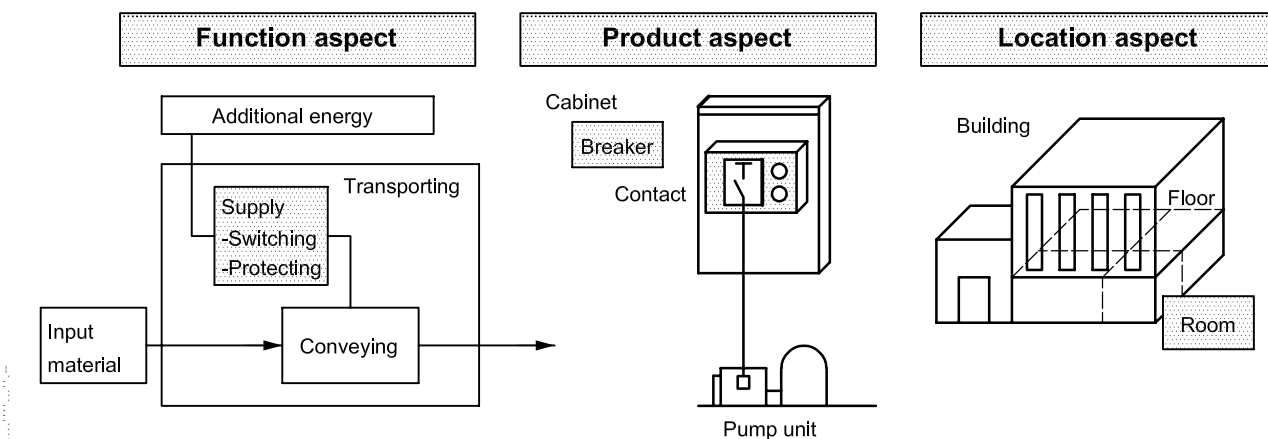
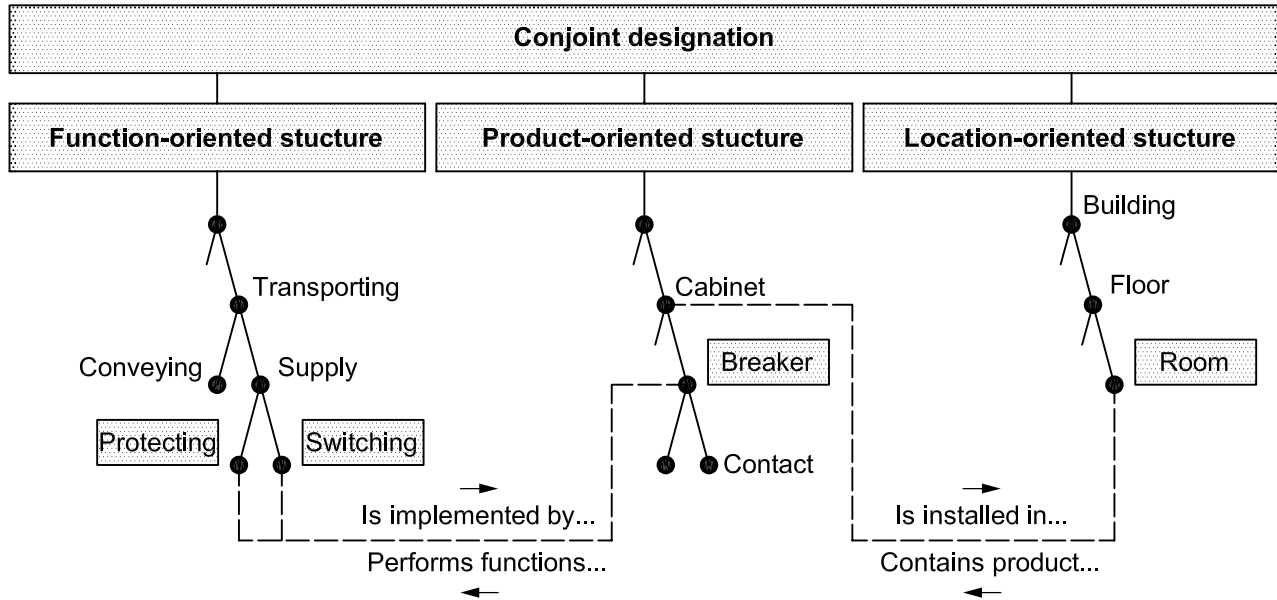Explanations:

— Materials are to be conveyed in a transport process. This task requires electrical energy, which shall be switched by a control. The equipment shall be protected from the effects of short circuit and overload (function aspect).

— A breaker with contacts is part of a cabinet (product aspect).

— A building with floors and a number of rooms (location aspect).

Figure 3 — Aspects

5.3.1.2 Structures

With respect to the three types of aspects considered in 5.3.1.1, and following the rule of constituent objects, three independent structures can be generated (see Figure 4).

Figure 4 — Structures and relations

Explanations:

The relations of objects (represented by nodes) within one structure tree are partitive relations, e.g.

— the cabinet consists of the breaker, etc.; the breaker consists of contacts, etc.;

— the contact is a constituent of the breaker, the breaker is a constituent of the cabinet.

The relations of objects (represented by nodes) between different structure trees are associative (pragmatic) relations (indicated by dotted lines), which opens numerous options for the extraction of comprehensive information regarding the plant, e.g.

— the basic tasks of switching and protecting are implemented with a breaker: this device is part of a cabinet, which is installed in a certain room on a floor of a building;

— a room contains cabinets with breakers, one of which performs the functions of switching and protecting within the transporting process.

5.3.2 Designation of function-oriented structure

The function aspect shall be based on the purpose of the system, without necessarily taking into account the products used to fulfil this purpose or their location.

An additional aspect of the function type enables distinction to be drawn between, e.g.:

— functional units with dynamic effects,

— the control function view,

— the energy supply function view.

A precise definition shall be documented in the sector-specific parts of ISO/TS 16952.

The designation based on the function aspect is preferably performed in the early planning phase of a project without taking implementation into account. Normally, this type of designation is first used by the planner of the overall process (top-down approach).

5.3.3 Designation of product-oriented structure

The product aspect shall be based on the way in which a system is implemented, constructed or delivered, without necessarily taking into account functions and/or locations.

The designation based on the product aspect is, for example, used for assemblies, indicating the way an assembly is built up from its parts without necessarily taking into account the functions and/or locations.

An additional aspect of the product type enables a distinction to be made for purposes to be defined in supporting documentation.

5.3.4 Designation of location-oriented structure

The location aspect shall be based on the topographical layout of a system, without necessarily taking into account products and/or functions.

An additional aspect of the location type enables a distinction to be drawn between:

— the designation of locations within design modules (installation aspect) as well as designation of locations on machinery components (mounting aspect), and

— the designation of the plant topology (erection aspect).

The designation based on the location aspect is preferably used for the designation of objects which fulfil the task of providing locations for other objects. The plant designer normally uses this type of designation for assigning the equipment parts to their locations (i.e. installation, mounting, set-up).

5.3.5 Designation of objects using different aspects

It is often expedient to use different aspects for the same object. Different aspects of successive objects may be used by making a transition from one aspect to another.

The most frequent application of this method is the transition from the function to the product aspect when a function is completely implemented by a product, and when there is no sub-product that by itself completely implements the function.

Figure 5 shows the transition from the function aspect to the product aspect, and presents the difference between transition and allocation.

© ISO 2006 – All rights reserved
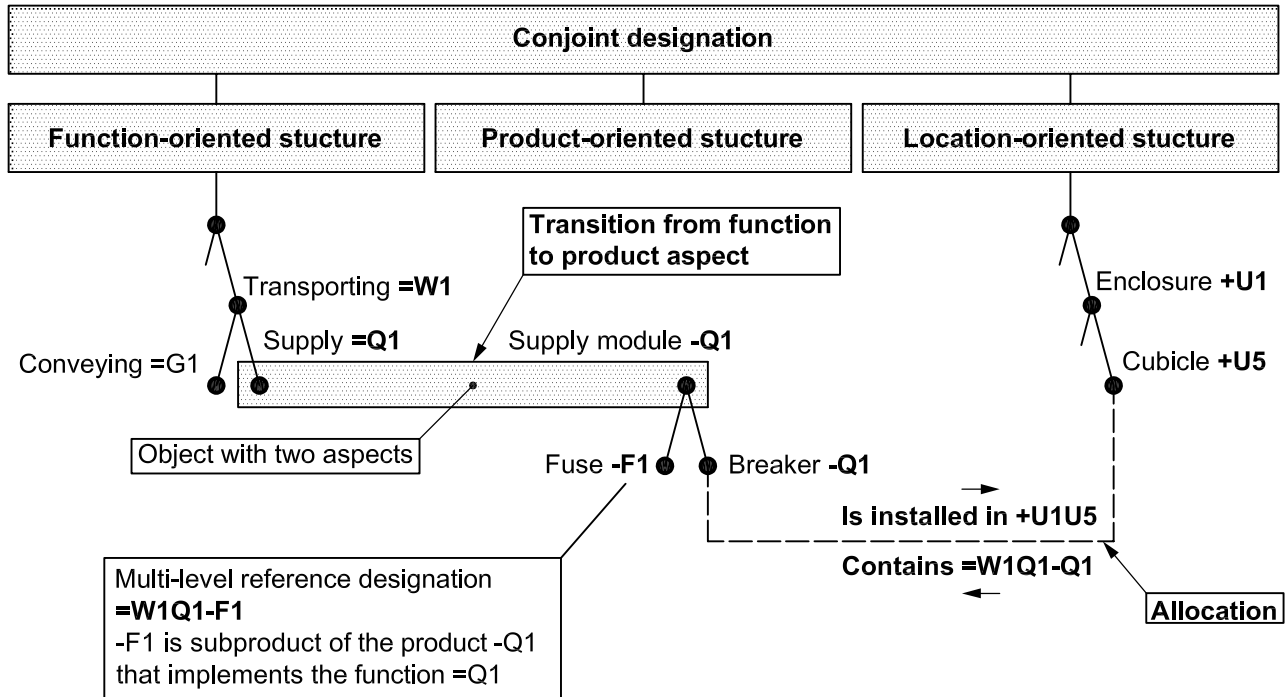
Explanation:

The product-oriented designation -F1 of the sub-product "fuse" is added to the function-oriented designation =Q1 of the function "supply" (in the sense of "is a constituent of") and, in this combination, forms a clear and unambiguous designation.

Figure 5 — Transition from function aspect to product aspect

Application of this method enables product-specific assignment of designations for independent products by the manufacturer, which can then be easily attached to existing function-oriented structures and designations.

Further guidelines on the application of transitions are given in the sector-specific parts of ISO/TS 16952.

5.4 Designation of other objects

5.4.1 Designation of signals

If a designation is required, signals shall be designated unambiguously (see 6.4.3).

A signal represents information that is transferred between objects independent of the medium used for the transfer.

The signal designation is an important means of co-ordinating the data flow and serves as a pathfinder in technical control documentation.

5.4.2 Designation of terminals

If a designation is required, terminals shall be designated unambiguously (see 6.4.4).

Terminals are points of access to an object for connection to different kinds of external networks. In addition to electrical networks, terminals of products may also provide facilities for a connection to piping systems, for the flow of material or energy, signals, etc.

Electrical, mechanical and functional terminals of different objects shall be clearly designated.

5.4.3 Designation of documents

If a designation is required, documents shall be designated unambiguously (e.g. by drawing number).

Documents provide information necessary for different activities and purposes during the life cycle of a plant, system or equipment.

The document designation helps to provide clear addresses on and in documents, and is also a unique address in document management systems.

If, in addition to an unambiguous designation, a designation with respect to the object represented in the document is required, the rules given in 6.4.5 shall apply.

6   Construction of designation

6.1   Syntax overview

The variety of industrial systems, installations, equipment and industrial products, as well as the different aspects they are viewed from, necessitates different designations that reflect this variety accordingly. The solution is an identifier that consists of three main parts (see Figure 6), which are constructed differently according to their purpose and task.

The three parts of the identifier are:

— conjoint designation (see 6.2);

— reference designation (see 6.3);

— specific designation (see 6.4).

Identifier		
Conjoint designation	Reference designation	Specific designation
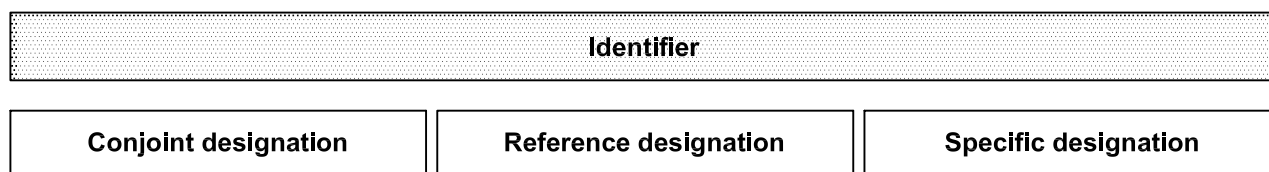
Figure 6 — Parts of the identifier

NOTE   For documents, "reference designation" is called "object designation" (see 6.4.5).

Because of the designation needs in different technical fields, the combinations of the identifier parts can be numerous. Table 1 shows some frequently-occurring examples. In most cases, the reference designation is an integral part of the identifier, while the conjoint designation is an optional element and the specific designation is used where appropriate.

Table 1 — Examples of combinations of the parts of the identifier
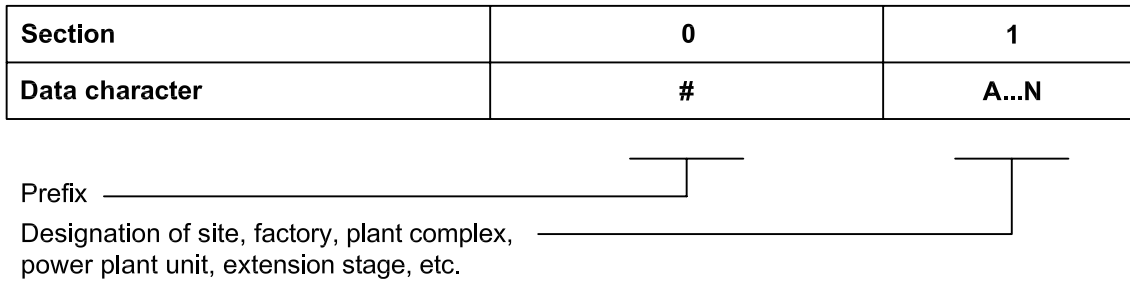
Conjoint designation		
Conjoint designation	Reference designation	
Conjoint designation	Reference designation	Specific designation
Conjoint designation		Specific designation
	Reference designation	
	Reference designation	Specific designation

© ISO 2006 — All rights reserved

6.2 Conjoint designation

The conjoint designation shall consist of the prefix "#" followed by a sequence of characters (letters and/or numbers) which should not exceed 12. In the case of letters, capital Latin letters shall be used. The letters "I" and "O" should not be used if there is the possibility of confusion with the digits "1" and "0". In the case of numbers, the Arabic digits "1" to "9" and "0" (zero) shall be used.

If the conjoint designation is used, it shall form the first part of the identifier.

The structure of the conjoint designation is given in Figure 7.

Section	0	1
Data character	#	A...N

Prefix ————————————————

Designation of site, factory, plant complex, power plant unit, extension stage, etc.

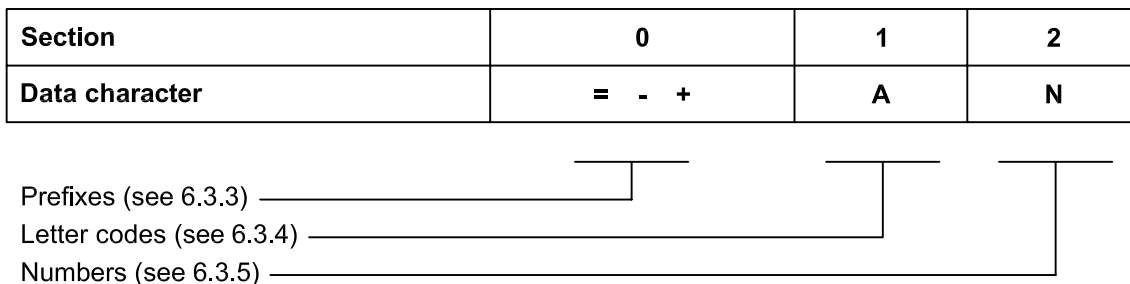**Figure 7 — Structure of the conjoint designation**

6.3 Reference designation

6.3.1 Single-level reference designation

IEC 61346-1 allows three variants for the construction of a single-level reference designation. A single-level reference designation assigned to an object shall consist of a prefix followed either by:

— a letter code;

— a letter code followed by a number;

— a number.

If requirements for ergonomics and occupational safety (e.g. legibility, memorability, error-free interpretation) are to be fulfilled, the single-level reference designation shall be constructed as shown in Figure 8.

Section	0	1	2
Data character	= - +	A	N

Prefixes (see 6.3.3) ————————————

Letter codes (see 6.3.4) ————————————

Numbers (see 6.3.5) ————————————

Figure 8 — Structure of a single-level reference designation

To satisfy the needs of legibility and memorability, there should not be more than three letters or numbers.

6.3.2 Multi-level reference designation

A multi-level reference designation is a coded representation of the path from the top of a structure down to the object of interest. It shall be constructed by concatenating the single-level reference designation for each object represented in the path, beginning with the top-most one.

If the prefix for a single-level reference designation is the same as for the preceding single-level reference designation, the prefix may be omitted within the multi-level reference designation for the presentation, provided that the preceding designation ends with a number and the following designation starts with a letter code.

6.3.3 Prefixes

Because of its function to indicate the aspect, the prefix is an essential part of the reference designation and shall always be shown. In accordance with IEC 61346-1, if additional views of an aspect are required, the designation shall be formed by doubling, tripling, etc. the prefix (see Table 2).

Table 2 — Prefixes for reference designation

Prefix	Aspect
=	Function
==	Function (another aspect)
–	Product
- -	Product (another aspect)
+	Location based on the location within the packaging system
++[a]	Location based on the topography of the plant

[a]   See example in IEC 61346-1:1996, Figure 23.

6.3.4 Letter codes

The letters of the reference designation indicate the object or the class of objects according to purpose or task.

IEC 61346–2 offers two tables with letter codes and rules for subclasses for coequal application.

⎯   Table 1 defines classes of objects and associated letter codes generally for all applications.

⎯   Table 2 provides a frame for setting up classification schemes and gives examples for classes of infrastructure objects.

The use of IEC 61346-2:2000, Table 1, is mandatory. If supplementary subclasses are necessary, they shall be specified in sector-specific or project-related documents.

If both tables are used, an indication shall be made of the table from which a certain reference level is implemented.

Letter codes shall be formed using capital Latin letters, excluding "I" and "O" because of possible confusion with the digits "1" (one) and "0" (zero). Mnemotechnical and local characters shall be omitted to enhance international usability.

6.3.5 Numbers

Numbers serve to differentiate between objects with the same preceding designation elements.

The Arabic digits "1" to "9" and "0" (zero) shall be used.

6.4   Specific designation

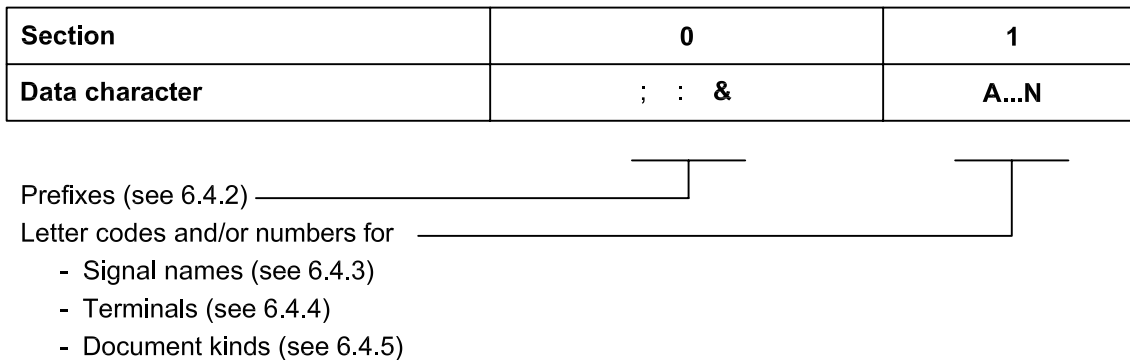### 6.4.1   General

The specific designation shall designate:

⎯ signal names, in accordance with IEC 61175;

⎯ electrical, mechanical and functional terminals, in accordance with IEC 61666;

⎯ document kinds, in accordance with IEC 61355.

NOTE   In ISO terminology, "document kinds" are referred to as "document types".

The specific designation may consist of:

⎯ the prefix (see 6.4.2 and Table 2, Footnote),

⎯ letter codes,

⎯ numbers,

and shall be constructed as shown in Figure 9.

Section	0	1
Data character	; : &	A...N

Prefixes (see 6.4.2)
Letter codes and/or numbers for
- Signal names (see 6.4.3)
- Terminals (see 6.4.4)
- Document kinds (see 6.4.5)

Figure 9 — Structure of the specific designation

Within a system/plant, this part of the identifier is only unambiguous in connection with the reference designation/object designation or/and conjoint designation.

6.4.2   Prefixes

For prefixes for specific designations, see Table 3.

Table 3 — Prefixes for specific designation

Prefix	Task
;	Signal designation
:a	Terminal designation
&	Document designation
a In IEC 61666, used as a separator between reference designation and terminal designation and not as part of the terminal designation.	

6.4.3   Signal designation

Signals shall be identified with respect to the object, by means of an unambiguous and valid signal name and a signal designation in accordance with IEC 61175 (see Figure 10).

Reference designation	; Signal name : Variant (optional)

Figure 10 — Signal designation

6.4.4   Terminal designation

Terminals shall be identified with respect to the object to which they belong and in accordance with IEC 61666 (see Figure 11).
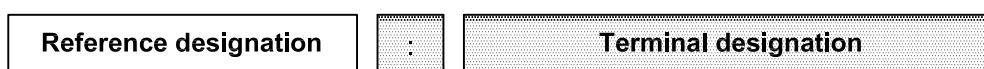
Reference designation	:	Terminal designation

Figure 11 — Terminal designation

6.4.5   Document designation

Documents may be identified with respect to the object to which the document is assigned and with a classification code independent of supplier-specific numbering systems in accordance with IEC 61355 (see Figure 12).
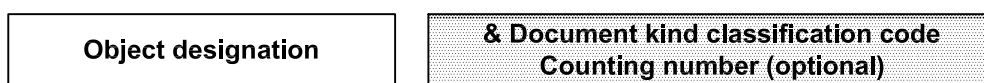
Object designation	& Document kind classification code Counting number (optional)

Figure 12 — Document designation

The reference designation is generally used as the object designation.

© ISO 2006 – All rights reserved

Annex A
(informative)

Designation process within a project

A.1 General

This Annex shows, by means of a sample project, the designation process within a project:

— implemented project-related stipulations (see A.2);

— application examples for different project disciplines, e.g. civil, process, electro- and control engineering (see A.3);

— an example of a database analysis and its representation (see A.3.6).

A.2 Project-related stipulations

At the beginning of a project, the designation-relevant stipulations indicated in Table A.1 should be respected.

Table A.1 — General stipulations

Subject	Stipulations (examples)
Designation range	Conjoint designation (#), function (=), product (-), point of installation (+), document (&)
Main aspect	Function (=)
Allowed transitions	From function aspect to product aspect
Additional aspects	Location (++)
Counting directions	From south to north, from west to east

If the conjoint designation is to be used in the project, the overall plant structure should be considered and the structure of the conjoint designation should be fixed accordingly. The structure of the conjoint designation (see examples in Table A.2) and the project-related application rules should be written down in a project-specific designation management document.

Table A.2 — Examples of conjoint designation

Conjoint designation	Description
#WORK1 AD1	Administration 1
#WORK1 CP1	Chemical plant 1
#WORK1 CP2	Chemical plant 2
#WORK1 CP3	Chemical plant 3
#WORK1 PP1	Power plant 1

The configuration of the reference designation structural levels should be decided in accordance with this structure. For each level, the classification should be allocated in accordance with IEC 61346-2:2000, Table 1 and Table 2 or the sector-specific classification tables. Table A.3 gives an example of such a structuring and classification allocation:

Table A.3 — Structural levels, allocation of classifications and alphanumerical structure

Level	L1	L2	L3	L4
Data type	AN	AANN	AANN	AANN
Corresponding table	Table A.4	Table A.5	Table A.5	Table A.5

The classes of infrastructure objects (level L1 in Table A.3) are based on the rules of IEC 61346-2:2000, Clause 6 and Table 2. If sub-classes are necessary, IEC 61346-2:2000, Clause 7, should be considered. Table A.4 gives examples of infrastructure objects of a chemical plant.

Table A.4 — Infrastructure objects

Letter code	Description
D1	Crushing plant
E1	Dissolution plant
E2	Reaction plant
E3	Concentration plant
G1	Recovery plant
F1	Distillation
H1	Waste scrubbing plant
S1	Electrical power system

For levels L2, L3 and L4 in Table A.3, the object classes according to IEC 61346-2:2000, Table 1, should be used. The sub-classes (second letter) are chosen from IEC/PAS 62400. Table A.5 gives examples of letter codes for the classification of aspect-oriented structures.

Table A.5 — Classes of aspect-oriented object structures

Letter code	Function aspect (function unit)	Product aspect (design unit)
BT	Temperature measurement	Temperature sensor
CM	Storage of materials	Tank, silo
EP	Generation of heat energy by energy transfer	Condenser, heat exchanger
FL	Protection from hazardous pressure conditions	Safety valve
GP	Conveyance of liquid substances	Pump
HP	Separation by thermal processes	Distillation column
HQ	Separation by filtering	Fluid filter
KF	Processing of electrical and electronic signals	Controller
MA	Driving by electric motor	Electric motor
PF	Presentation of information (permanent)	Recorder, printer
QA	Switching of electrical energy circuits	Circuit breaker
QC	Grounding of electrical energy circuits	Grounder
QM	Limiting of flow in closed enclosures	Shutoff valve
QN	Setting and control of flow in closed enclosures	Control valve
SF	Conversion of a manual operation to electrical signals	Switch, set point adjuster
TA	Conversion of electrical energy	Transformer
TF	Conversion of signals	Amplifier
UC	Enclosure of electrical energy equipment	Switch panel, cubicle

For classes of location aspect oriented objects (++, see Table A.1), the codes given in Table A.6 are used in the application examples in Clause A.3.

Table A.6 — Location aspect oriented infrastructure objects

Location aspect-oriented structure	Description
++E1	Building for reaction and concentration
++F1	Distillation building
++S1	Switch gear building

A.3 Application examples

A.3.1 Conjoint designation

At this highest designation level, the complexes of objects are identified. Figure A.1 shows the overall layout of the plant WORK1. The designations are in accordance with Table A.2.
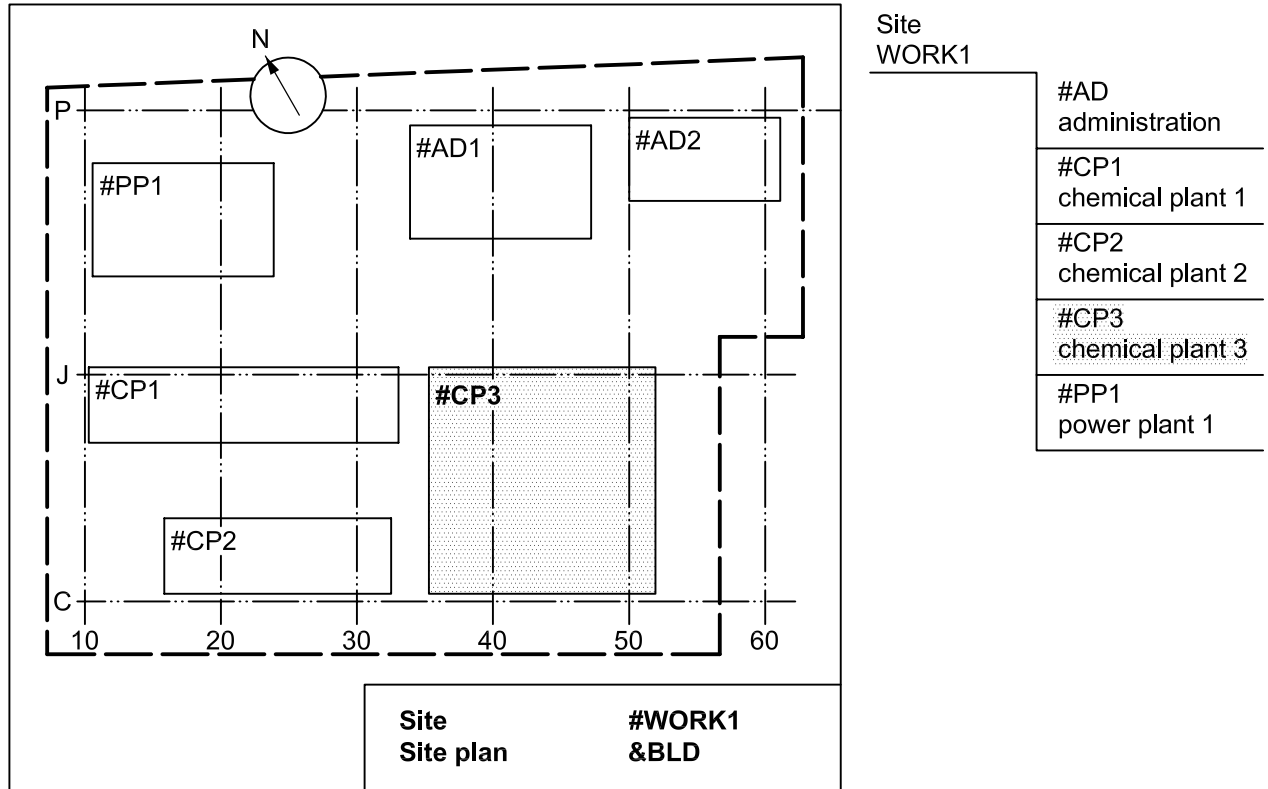

Figure A.1 — Site plan WORK1

A.3.2 Civil engineering

At structural level L1 (see Table A.3) of the reference designation, all buildings are designated according to the location aspect. The designations are in accordance with Table A.6. Figure A.2 shows the site layout of chemical plant 3.
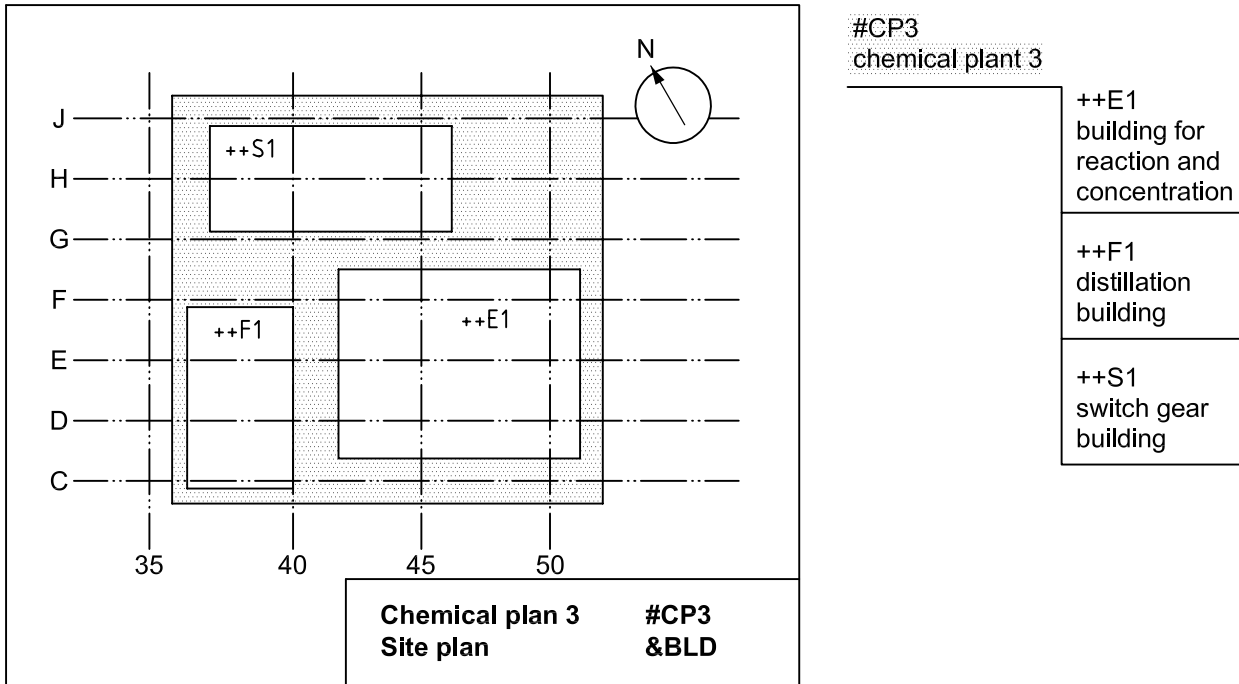
Figure A.2 — Site layout plan of chemical plant 3 (#CP3)

A.3.3 Process engineering

The function aspect is the dominant aspect in the structuring of process engineering. The structuring and designation process are in accordance with ISO 10628. Figure A.3 shows the whole production process flow of chemical plant 3.
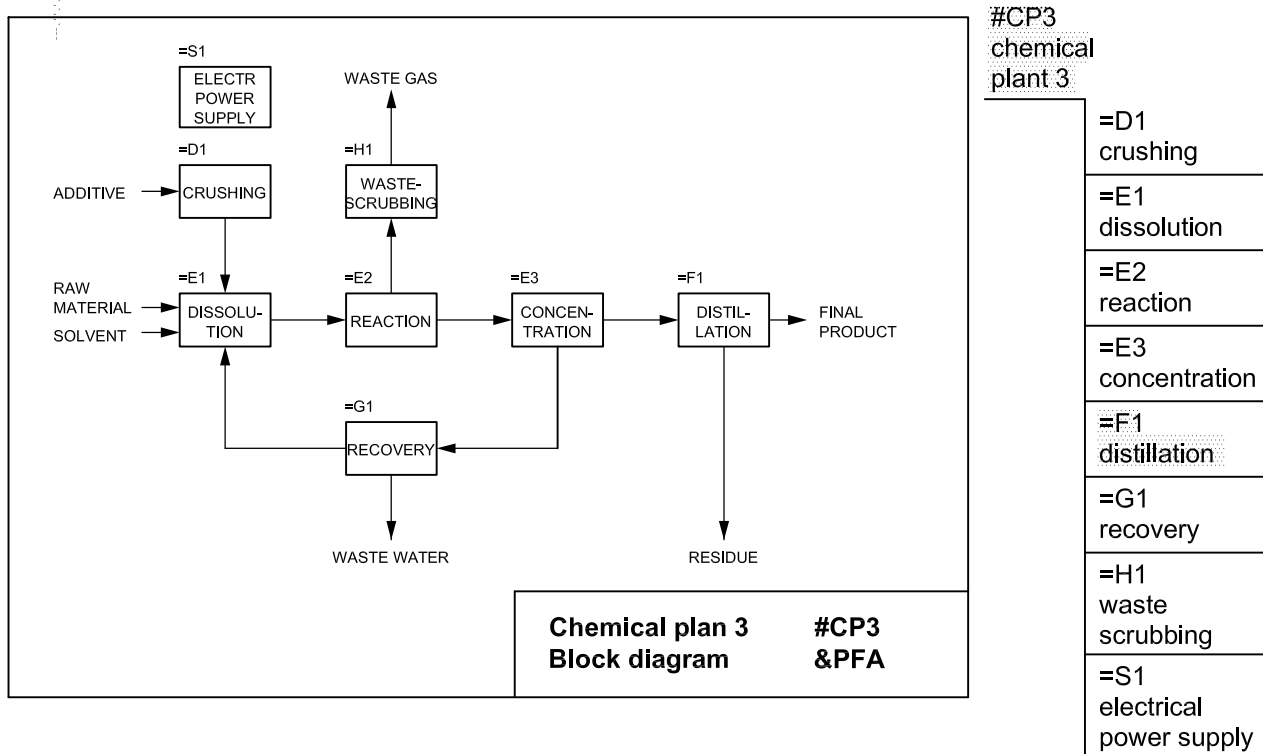

Figure A.3 — Block diagram of chemical plant 3 (#CP3)

Figure A.4 shows a part-process distillation (=F1 in Figure A.3) as a process flow diagram. It shows the structural levels L1 and L2 as specified in Table A.3.
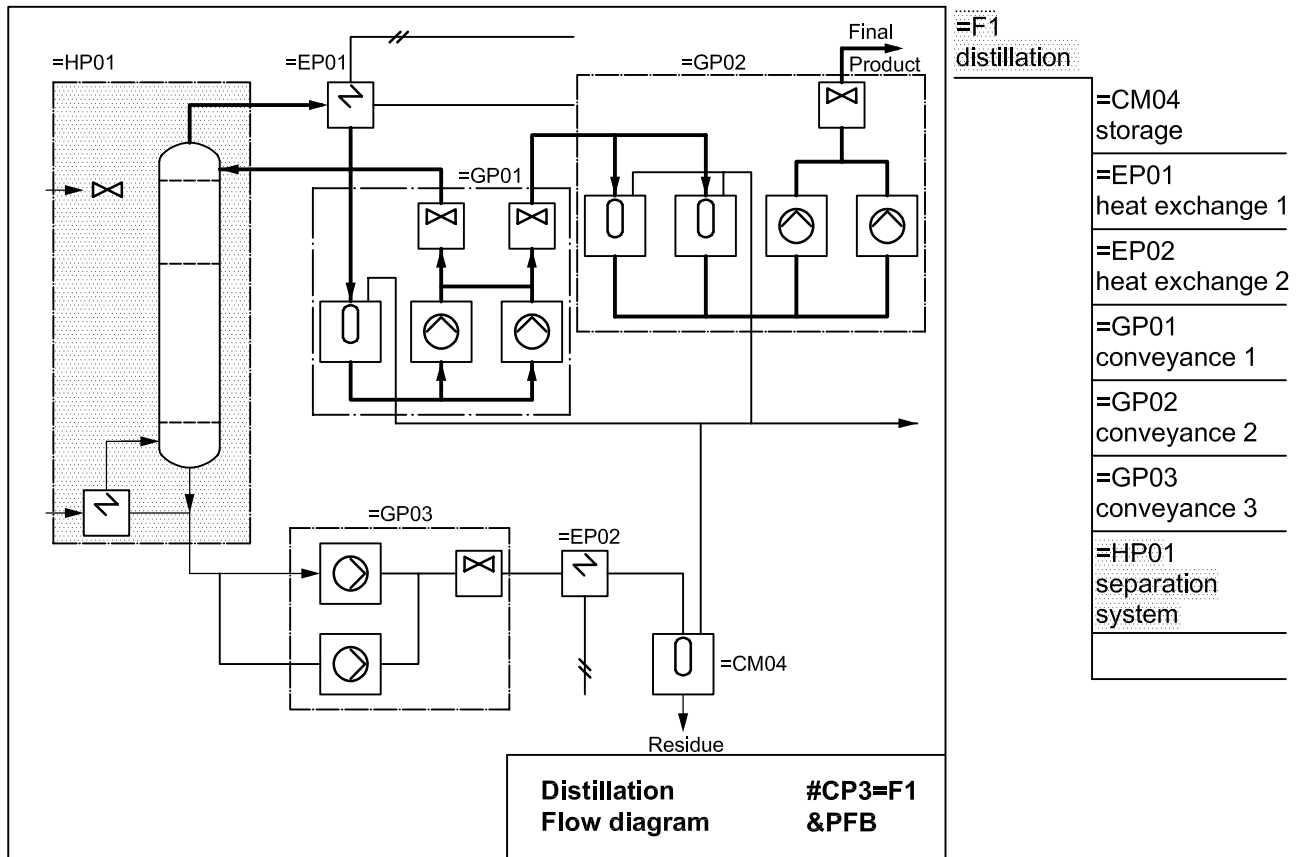

Figure A.4 — Process flow diagram distillation =F1 of chemical plant 3 (#CP3)

Figure A.5 shows the "separation system" on the structural level L3 as a constituent system of the part-process distillation =F1 of chemical plant 3 (#CP3), in the form of a piping and instrument diagram (P & ID).

=HP01 separation system	

=BF01, flow 1	
=BF02, flow 2	
=BL01, level 1	
=BT01, temp 1	
=BT02, temp 2	
=BT03, temp 3	
=BT04, temp 4	
=EP02 heat exchange	
=FL01 safety valve	
=HP10 column system	
=HQ01 filter system	
=QM01 shutoff valve 1	
=QM02	
=QM03	
=QM04	
=QM05	
=QM06	
=QM07	
=QN01 control valve 1	
=QN02	
=QN03	
=QN04	

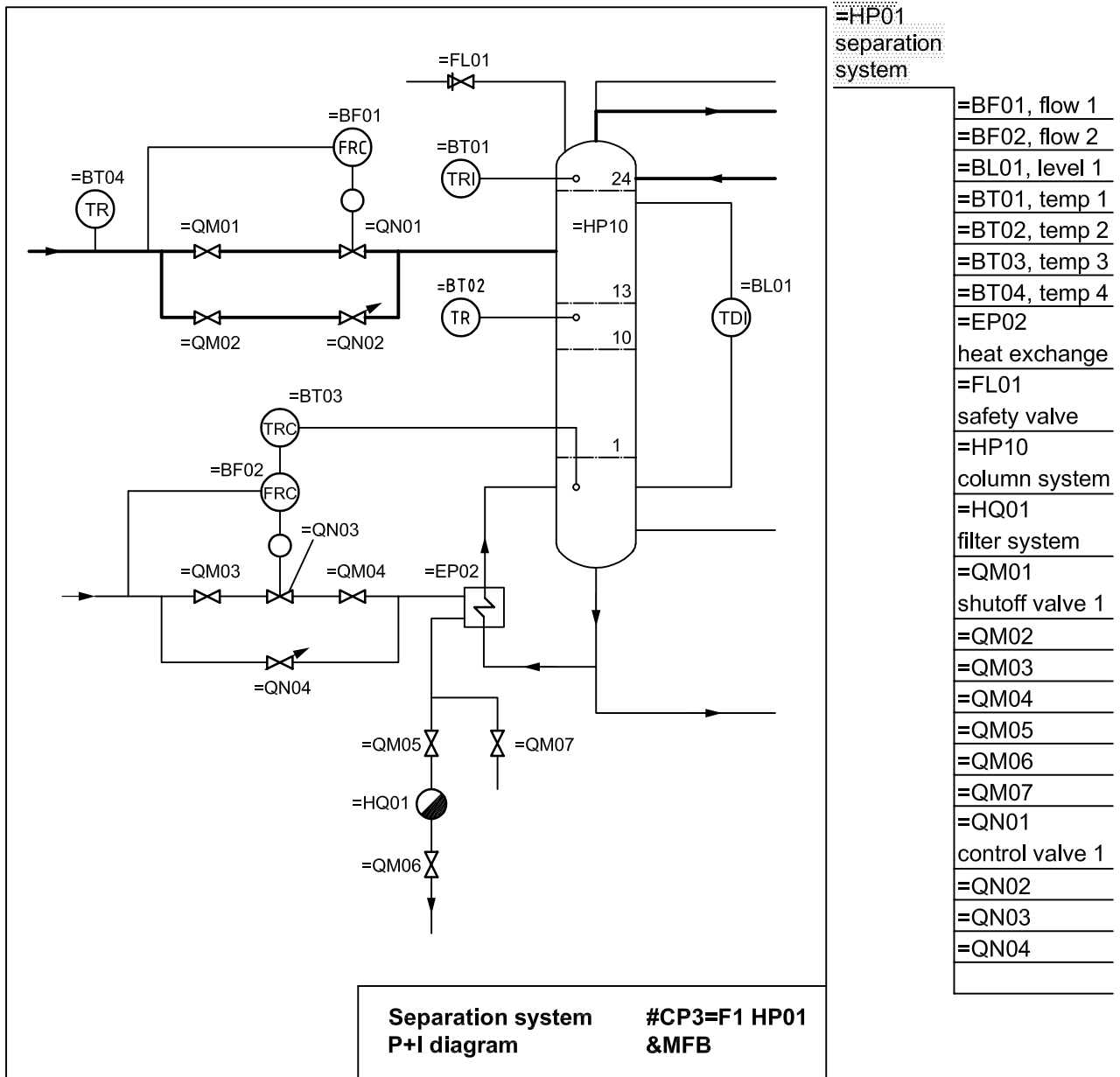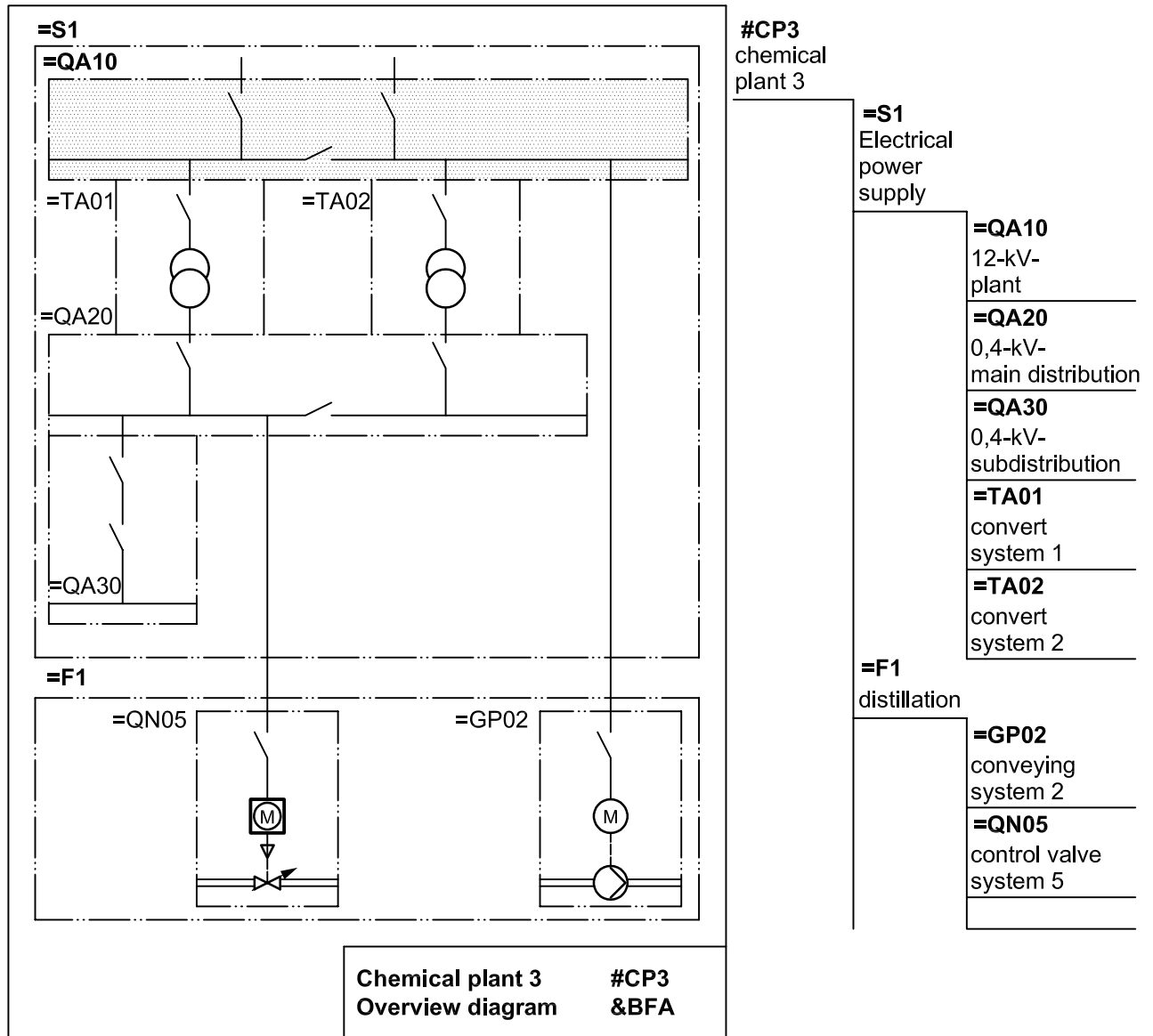| Separation system P+I diagram	#CP3=F1 HP01 &MFB

Figure A.5 — P & ID of separation system =HP01

A.3.4 Electrotechnology

Figure A.6 shows a part of a power supply system (distribution, transformation). The structuring levels L1 and L2 including the conjoint designation (#CP3) are represented, as well as distribution in the part-process distillation (=F1).

Figure A.6 — Electrical power supply overview diagram for chemical plant 3 (#CP3)

Figure A.7 shows the overview diagram of a "12-kV-system" as a function-oriented system. The structural levels L2 and L3 are represented.
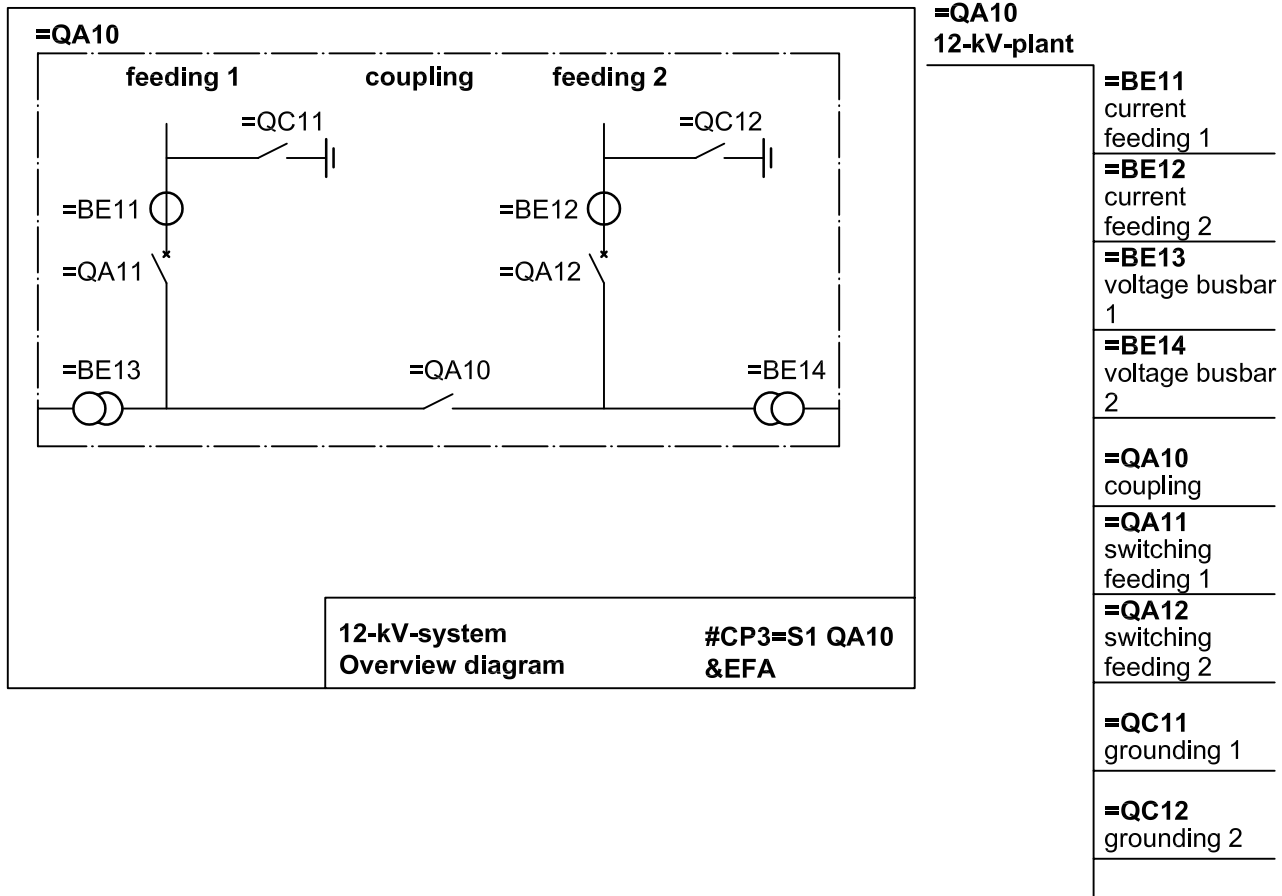

Figure A.7 — Electrical overview diagram, 12-kV-system, =QA10

Figure A.8 shows the power supply system under the aspect "point of installation" (+).

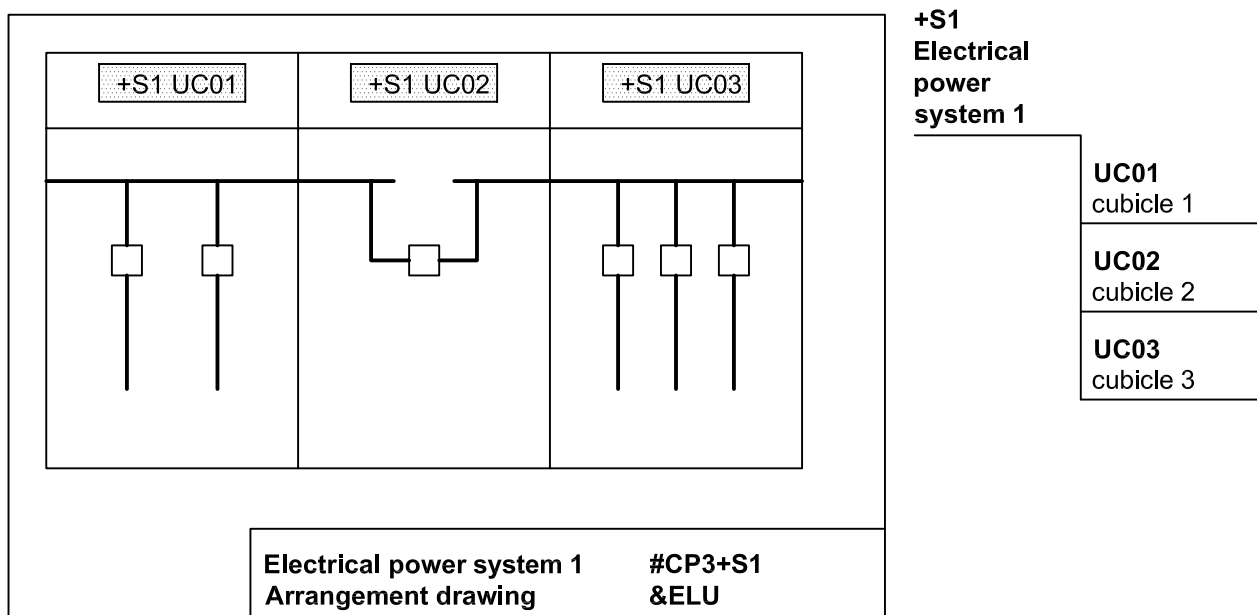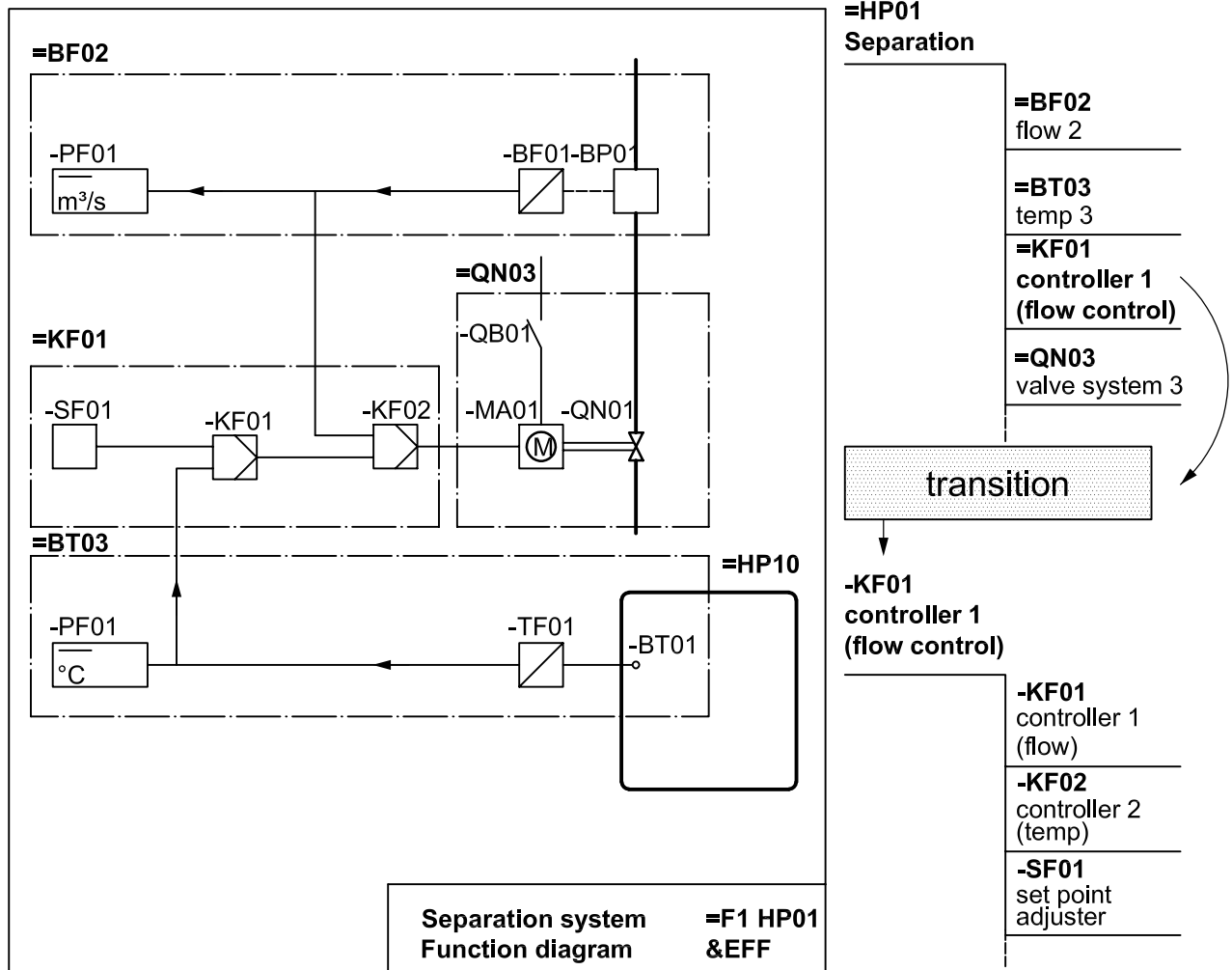**Figure A.8 — Arrangement drawing of a power supply system +S1**

A.3.5 Control technology

Figure A.9 shows the measured data acquisition in the process, the signal processing and process control as a function diagram. The structural levels L3 and L4 are represented, as well as a transition from function to product aspect.

Figure A.9 — Function diagram of separation system =F1 HP01

A.3.6 Database analysis

Figure A.10 presents the data allocated to objects of the part-process distillation (=F1) and its electrical power supply (=S1) in form of a table. Not only attributes, but also relations and allocations, can be attached to the object identified. Many different data analyses can be conducted using the reference designation as a navigation tool.

Identifier	Attributes		Allocations/Relations			
	Description	Data	Type	Loc. 1	Loc. 2	Source
=F1	Distillation					
=F1 GP02	Conveyance 2					
=F1 GP02GP01	Pump system					
=F1 GP02GP01-QA01	Circuit breaker	36 A		+S1 UC03	++S1 UZ08	=S1 QA10QA12
=F1 HP01	Separation system					
=F1 HP01BF02	Flow measuring	0...5 m^2/s				
=F1 HP01BT03	Temp measuring	0...120 °C				
=F1 HP01BT03-BT01	Temp sensor	0...600 °C	PT100		++F1 UZ01	=F1 HP01HP10
=F1 HP01BT03-TF01	Amplifier	4...20 mA	7ABC12		++F1 UZ02	
=F1 HP01HP10	Distillation column				++F1 UZ01	
=F1 HP01KF01	Control					
=F1 HP01KF01-KF01	Controller					=F1 HP01BT03
=F1 HP01KF01-KF02	Controller					=F1 HP01BF02
=F1 HP01KF01-SF01	Set point adjuster	0...10 %				
=F1 HP01QN03	Control valve system					=F1 HP01KF01
=F1 HP01 QN03-MA01	Actuator	40 W	RA4712			
=F1 HP01QN03-QB01	Load switch	25 A				=S1 QA21
=S1	Electr. power supply					
=S1 QA10	12-kV-system					
=S1 QA10QA11	Feeding 1	540 A				
=S1 QA10QA11-QA01	Circuit breaker	630 A		+S1 UC01	++S1 UZ08	
=S1 QA10QC11-QC01	Grounding switch					

Figure A.10 — Database analysis in form of a table

Annex B
(informative)

Application examples

B.1 Conjoint designation
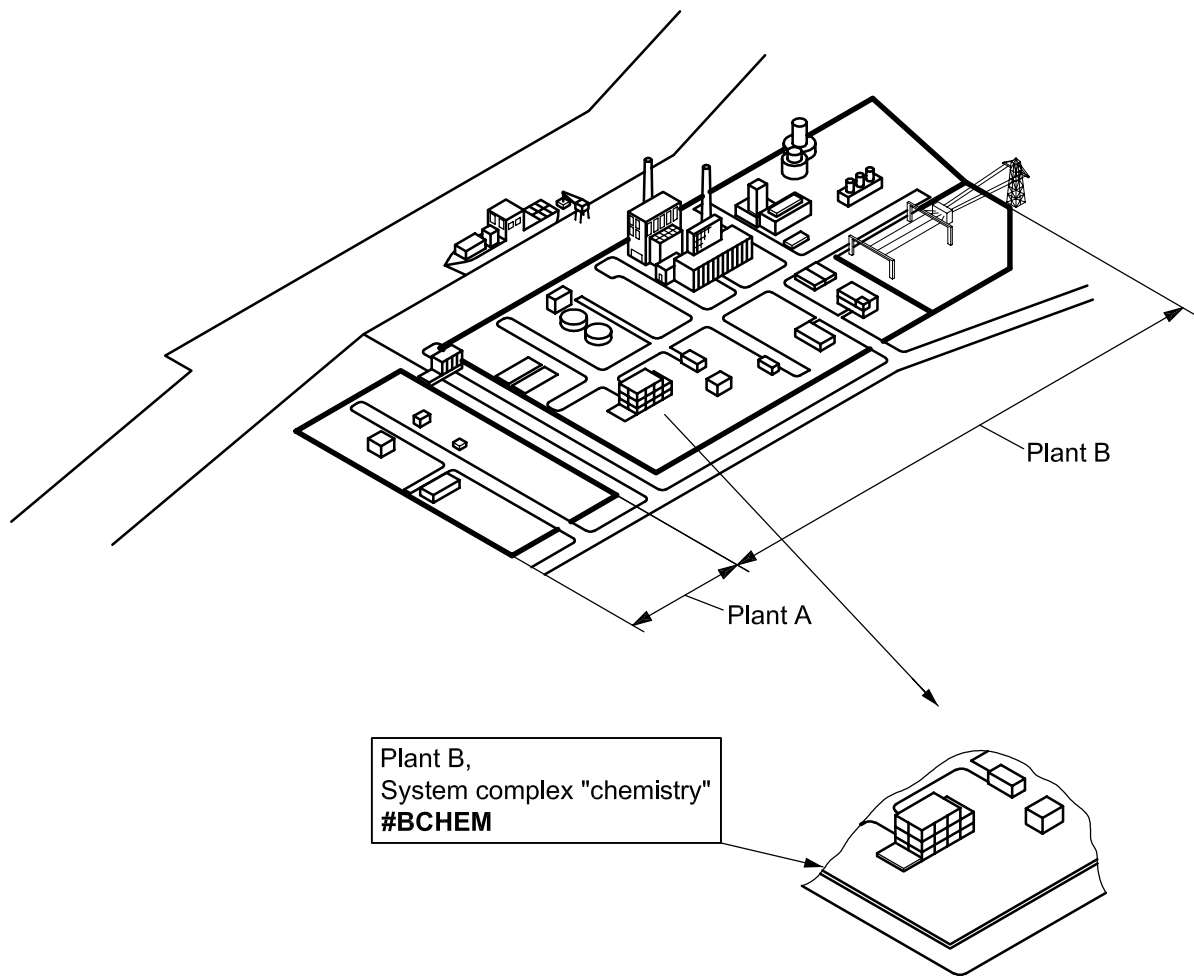
Figure B.1 — Industrial site; plant B, complex "chemistry"

© ISO 2006 — All rights reserved

B.2 Function-oriented reference designation with transition to the product aspect

General	System	Task	Part
Specific	Spray deluge system	Pressure measurement	Gauge
Designation	**=F10**	**=BP011**	**-P1**

Label:

=F10 BP011 -P1
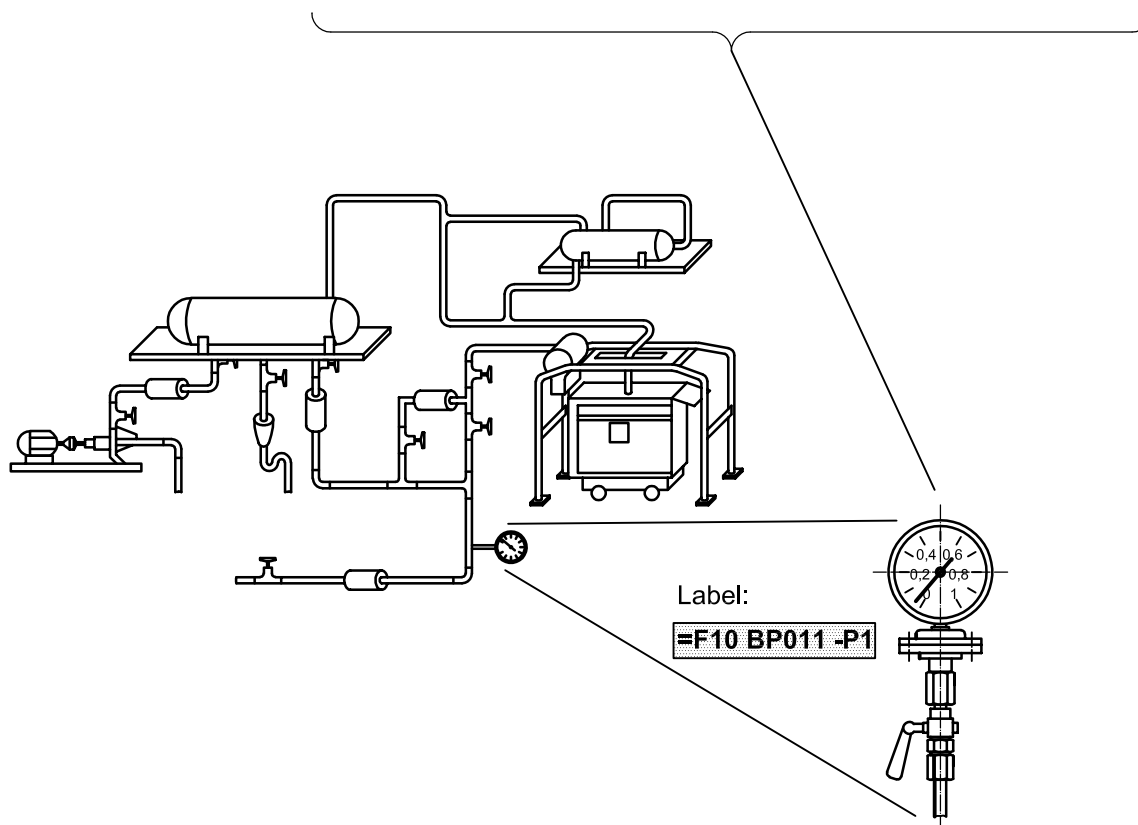
Figure B.2 — Spray deluge system with pressure measurement as a subtask

B.3 Functional allocation
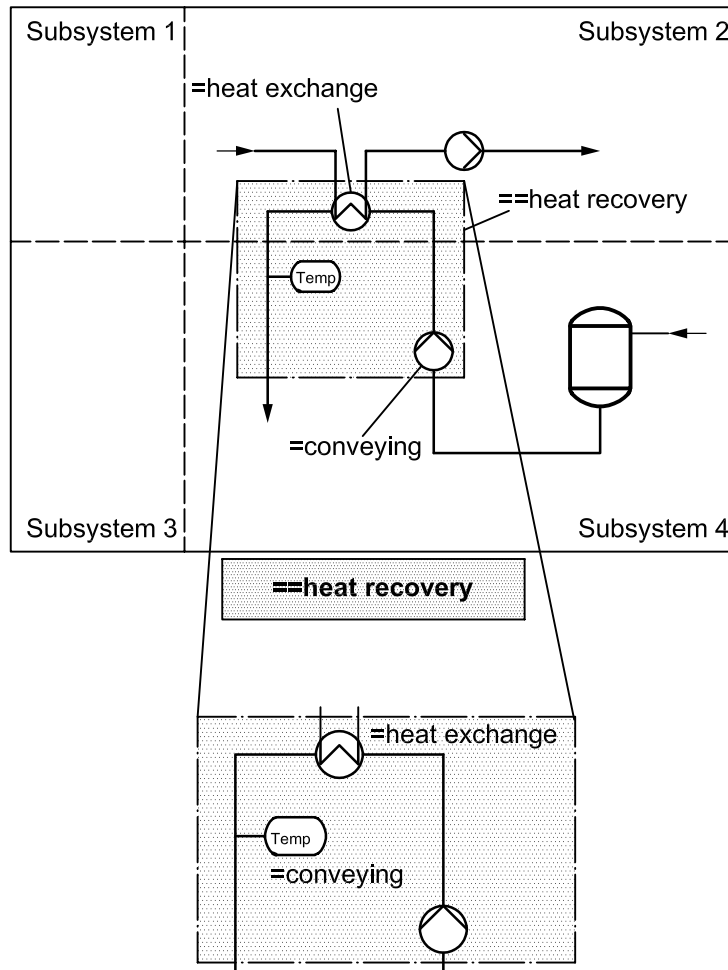
Figure B.3 — Functional unit "heat recovery" consisting of the subtasks "heat exchange" and "conveying" (objects of subsystem 2 and subsystem 4)

© ISO 2006 — All rights reserved

B.4 Terminal designation

Figure B.4 — Subsystem with terminals on tank, pump, valves and piping

Annex C
(informative)

Other helpful terms and definitions for a "designation system"

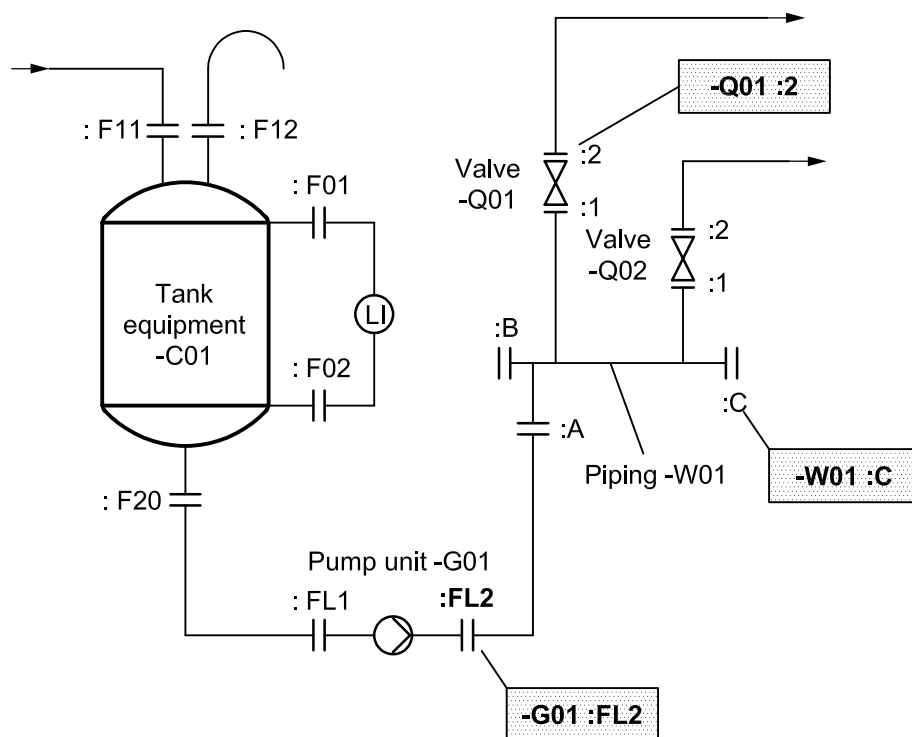The following terms and definitions are used in the context of a "designation system" and will be helpful for the elaboration of the sector-specific parts of ISO/TS 16952.

C.1
actuating drive
physical unit used for driving mechanically actuated final controlling elements

NOTE   No actuating drive is required for a final controlling element if the manipulated variable at the controller output is capable of directly influencing the mass flow of energy flow, i.e. without any mechanical intermediate variable (quantity).

EXAMPLES   Electric, hydraulic or pneumatic actuating drive; diaphragm system; piston actuator.

[IEC 60050-351]

C.2
actuator
functional unit that generates from the controller output variable the manipulated variable required to drive the final controlling element

NOTE   If the final controlling element is mechanically actuated, it is controlled via an actuating drive. The actuator drives the actuating drive in this case.

EXAMPLE   A practical example of an actuator acting directly on the final controlling element is a DC drive. The control unit takes the function of an actuator. The final controlling element is formed by the thyristor assembly that delivers an variable DC voltage as an output variable. The control unit and the thyristor assembly together form the final controlling equipment.

[IEC 60050-351]

C.3
apparatus
finished product with an intrinsic function intended for the final user, and intended to be placed on the market or put into service as a single commercial unit

[EN 50178]

C.4
assembly
product that is decomposable into a set of components or other assemblies from the perspective of a specific application

[ISO 10303-1]

C.5
associative relation
pragmatic relation
relation between two concepts having a non-hierarchical thematic connection by virtue of experience

NOTE   An associative relation exists between the concepts "education" and "teaching", "baking" and "oven".

[ISO 1087-1]

C.6
attribute
any one of the properties to describe any entity, possibly involving one or more entities

[IEC 61360-1]

C.7
automation
conversion of processes or equipment to automatic operation or the result of the conversion

[ISO/IEC 2382-1]

C.8
character
member of a set of elements that is used for the representation, organization or control of data

[ISO/IEC 2382-4]

C.9
characteristic
abstraction of a property of an object or of a set of objects

NOTE   Characteristics are used for describing concepts.

[ISO 1087-1]

C.10
civil engineering works
civil engineering project US
construction works comprising a structure, such as a dam, bridge, road, railway, runway, utilities, pipeline or sewerage system, or the result of operations, such as dredging, earthwork, geotechnical processes, but excluding a building and its associated site works

NOTE   Associated site works are included in US civil engineering projects.

[ISO 6707-1]

C.11
class
set of elements having at least one characteristic in common

[ISO 5127]

C.12
classification
arrangement of symbols indicating concepts into classes and their sub-divisions to express generic relations or other types of relations between them

[ISO 5127]

C.13
classification system
indexing language with assigned notations

[ISO 5127]

C.14
closed–loop control
feedback control
process whereby one variable (quantity), namely the controlled variable, is continuously measured, compared with an other variable (quantity), namely the reference variable, and influenced in such a manner as to adjust to the reference variable

NOTE   Characteristic for closed-loop control is the closed action in which the controlled variable continuously influences itself in the action path of the closed loop.

[IEC 60050-351]

C.15
code
coding scheme
collection of rules that maps the elements of a first set onto the elements of a second set

NOTE 1   The elements of either set may be characters or character strings.

NOTE 2   The first set is called coded set and the second set is called code set.

NOTE 3   Each element of the code set can be related to more than one element of the coded set but the reverse is not true.

[ISO/IEC 2382-4]

C.16
component
industrial product which serves a specific function or functions, which is not decomposable or physically divisible and which is intended for use in a higher order assembled product

[IEC 61360-1]

C.17
component
⟨computer resource⟩ each part of a computer system which is required for performance of the desired operation

EXAMPLES   Memory; input/output unit; one or more processing units; data; file; program.

[ISO/IEC 2382-1]

C.18
configuration
interrelated functional and physical characteristics of a product defined in product configuration information

[ISO 10007]

C.19
connection
physical interface between conductors and/or contacts to provide an electrical path

[IEC 60050-581]

C.20
connections
threaded ports, flanges or similar means for connecting to the pipelines

[ISO 5598]

C.21
construction works
construction US
everything that is constructed or results from construction operations

[ISO 6707-1]

C.22
control
purposeful action on or in a process to meet specified objectives

NOTE   This includes measure, count, monitor, indicate, alert, record, log, manipulate, evaluate, optimize, intervene, manipulate by hand, safeguard, structure, configure, parameter, automate.

[IEC 60050-351]

C.23
control chain
set of elements or systems which act upon one another in a series structure

[IEC 60050-351]

C.24
control equipment
entirety of devices and programs and, in a broader sense, all instructions and programs used for the task of controlling

NOTE 1   Control equipment also comprises the process control station, and instructions include operating manuals.

NOTE 2   The action of providing a process with control equipment is denoted as process automation.

[IEC 60050-351]

C.25
control level
entirety of all control equipment of the same rank within a control hierarchy

[IEC 60050-351]

C.26
control system
system constituted by a controlled system, its controlling system, the measuring elements and the associated transducing elements

[IEC 60050-351]

C.27
controlled system
functional unit which is to be influenced according to the control task

[IEC 60050-351]

C.28
controlling system
totality of the functional units appointed to influence the controlled system according to the control task

[IEC 60050-351]

C.29
designation
designator
representation of a concept by a sign which denotes it

[ISO 1087-1]

C.30
designation system
entirety of the stipulated regulation for generating designations for a bounded area

C.31
device
material element or assembly of such elements intended to perform a required function

NOTE   A device may form part of a larger device.

[IEC 60050-151]

C.32
document designation
identifier of a specific document in relation to an object to which the document is assigned

[IEC 61355]

C.33
electric equipment
item used for such purposes as generation, conversion, transmission, distribution or utilization of electric energy, such as electric machines, transformers, switchgear and controlgear, measuring instruments, protective devices, wiring systems, current-using equipment

[IEC 60050-826]

C.34
electric network
electric circuit or set of electric circuits, interconnected or having intentional capacitive or inductive coupling between them [702-09-05 MOD]

NOTE 1   An electric network can form part of a larger electric network.

NOTE 2   In IEC 60050-131, the term "electric network" has another meaning relative to circuit theory.

[IEC 60050-151]

C.35
electrical installation
assembly of associated electric equipment having coordinated characteristics to fulfil specific purposes

[IEC 60050-826]

C.36
electronic equipment
EE
electrical equipment, the main function of which is performed by the use of components using electron or ion conduction in semiconductors, in vacuum or in gases

NOTE 1   Electronic equipment contains data processing equipment and/or power electronics equipment according to its main function. It can contain non-electronic components or equipment.

NOTE 2   This includes sub-assemblies and equipment, such as assembled printed circuit boards, plug-in units and cubibles.

[EN 50178]

C.37
element
part of a component

[ISO 14617-1]

C.38
equipment
single apparatus or set of devices or apparatuses, or the set of main devices of an installation, or all devices necessary to perform a specific task

EXAMPLES   Power transformer; equipment of a substation; measuring equipment.

[IEC 60050-151]

C.39
final controlling equipment
functional unit that consists of an actuator and a final controlling element

[IEC 60050-351]

C.40
floor
horizontal plane construction that provides the lowest surface in any space in a building

[ISO 6707-1]

C.41
functional allocation
compilation of several interacting objects, systems or subsystems in order to perform an additional task, fulfil a complementary function or form an interrelated process

C.42
functional unit
item under consideration defined according to function or effect

NOTE 1   A functional unit produces the interactive effect between input variables and output variables.

NOTE 2   A functional unit can be implemented by one or several physical units or program modules.

NOTE 3   If compound terms are used to designate functional units, it is recommended that the following be used as the last word (in ascending order of rank):

— element

— equipment

— system.

For the subject under consideration, it is understood that "element" designates the smallest functional unit in each case.

[IEC 60050-351]

C.43
generic relation
genus-species relation
relation between two concepts where the intention of one of the concepts includes that of the other concept and at least one additional delimiting characteristic

NOTE   A generic relation exists between the concepts "word" and "pronoun", "vehicle" and "car", "person" and "child".

[ISO 1087-1]

C.44
hardware
all or part of the physical components of an information processing system

[ISO/IEC 2382-1]

C.45
identification
clear and unambiguous recognition of an object based on identification characteristics with the precision stipulated for the corresponding purpose

C.46
identifier
one or more characters used to identify a name or a data category

NOTE   An identifier can also indicate certain properties of that data category.

[ISO 1087-2]

C.47
industrial complex
number of discrete or interconnected process plants, together with the associated buildings

[ISO 10628]

C.48
installation
⟨electrotechnical engineering⟩ one apparatus or a set of devices and/or apparatuses associated in a given location to fulfil specified purposes, including all means of their satisfactory operation

[IEC 60050-151]

C.49
installation
⟨civil engineering⟩ assembly of material(s) and component(s) placed in position to provide a service

[ISO 6707-1]

C.50
joint
connection US
construction formed by the adjacent parts of two or more products, components or assemblies, when these are put together, fixed or united

[ISO 6707-1]

C.51
jointing component
jointing product formed as a distinct unit and having specified sizes in three dimensions

[ISO 6707-1]

C.52
key
⟨organization of data⟩ identifier that is part of a set of data elements

[ISO/IEC 2382-4]

© ISO 2006 – All rights reserved

C.53
location
place (e.g. a civil structure, floor, room or outdoor ground) at which design units, technical facilities or components are installed or erected

NOTE   This includes the site of a component within a packaging system or technical equipment.

C.54
measure, verb
perform actions for quantitative comparison of a measured value with a unit [VIM 2.1 MOD]

[IEC 60050-351]

C.55
measurement
set of operations having the object of determining the value of quantity

[ISO/DGuide 99999]

C.56
measuring chain
series of elements of a measuring instrument or system that constitutes the path of the measurement signal from the input to the output [VIM 4.4]

EXAMPLE   Set of transducers and connecting elements between one or more measuring instruments, placed between the sensor, which is the first element of the chain, and the last element of the chain (e.g. the indicating, recording or storage device).

[IEC 60050-300]

C.57
measuring equipment
assembly of measuring instruments intended for specified measurement purposes

[IEC 60050-300]

C.58
measuring instrument
device intended to be used to make measurements, alone or in conjunction with supplementary devices [VIM 4.1]

[IEC 60050-300]

C.59
measuring system
complete set of measuring instruments and other equipment assembled to carry out specified measurements [VIM 4.5]

[IEC 60050-300]

C.60
network
⟨network topology⟩ set of ideal circuit elements and their interconnections, considered as a whole

[IEC 60050-131]

C.61
notation
notation system
system of ordinal symbols used to express the relations between the classes and maintain the pre-established order of a classification system

[ISO 5127]

C.62
open-loop control
process in a system whereby one or more variables (variable quantities), as input variables, influence other variables (variable quantities), as output variables, in accordance with the proper laws of the system

NOTE   A characteristic for open-loop control is the open action path, or in case of a closed action path, the fact that the output variables influenced by the input variables do not continuously influence themselves, and are not influenced by the same input variables.

[IEC 60050-351]

C.63
operating material
material required in the manufacturing of an object, but which is not contained in the object

EXAMPLES   Machining fluids; cleaning agents; soldering paste.

C.64
packaging system
physical unit for containing technical equipment and components

C.65
partitive relation
part-whole relation
relation between two concepts where one of the concepts constitutes the whole and the other concept a part of that whole

NOTE   A partitive relation exists between the concepts "week" and "day", "molecule" and "atom".

[ISO 1087-1]

C.66
physical unit
item under consideration, defined according to construction or configuration

NOTE 1   One or several functional units may be implemented in a single physical unit. The corresponding functional unit(s) is/are in some cases not explicitly designated.

NOTE 2   The various parts of a physical unit need not be functionally interrelated. For example, a physical unit may be in the form of an integrated circuit with four independent AND modules.

NOTE 3   If compound terms are used to designate physical units, it is recommended that the following be used as the last word (in ascending order of rank):

— component

— assembly

— device

— plant.

For the subject under consideration, it is understood that "component" designates the smallest physical unit in each case.

NOTE 4   The designations are conceptually corresponding functional units and physical units are stated together in the following if they are commonly used but different from each other.

[IEC 60050-351]

C.67
plant section
part of a process plant that can, at least occasionally, be operated independently

[ISO 10628]

C.68
positioner
physical unit combining an actuating drive and the final controlling element mechanically actuated by the actuating drive

NOTE   Positioners are used only in conjunction with mechanically actuated final controlling elements.

[IEC 60050-351]

C.69
prefabricated structural component
component of a prefabricated structure delivered to the construction site as a purpose-made part

[ISO 4172]

C.70
prefabricated structure
structure erected out of prefabricated structural elements

[ISO 4172]

C.71
procedure
specific way to carry out an activity or a process

NOTE 1   Procedures can be documented or not.

NOTE 2   When a procedure is documented, the term "written procedure" or "documented procedure" is frequently used. The document that contains a procedure can be called a "procedure document".

[ISO 9000]

C.72
process
⟨control technology⟩ complete set of interacting operations in a system by which matter, energy or information is transformed, transported or stored

NOTE   Operations or sets of operations can be separated and organized to form subprocesses or complete processes. Process variables may be deterministic or stochastic.

EXAMPLES   Generation of electrical energy in a power station; energy distribution; petroleum refinement to win hydrocarbons; pig iron production in a blast furnace; production of gears; shipment of general cargo in a container system; planning and carrying-out of a flight; data processing in a computer system; performance of administrative acts by public authorities.

[IEC 60050-351]

C.73
process
⟨data processing⟩ predetermined course of events that occur during the execution of all or part of a program

[ISO/IEC 2382-1]

C.74
process control function
function to work on process variables, which is composed of basic functions of process control, specific to units of the plant

[IEC 60050-351]

C.75
process plant
facilities and structures necessary for performing a process

NOTE   Different processes or process steps can be carried out in the same process plant or plant section at different times.

[ISO 10628]

C.76
process step
part of a process which is predominantly self-sufficient and consists of one or several unit operations

[ISO 10628]

C.77
program
syntactic unit which follows the rules of a specific programming language and comprises definitions and instructions or commands required to fulfil a specific function, or to perform a special task, or to solve a special problem

NOTE   Under certain circumstances, a system of program modules can be regarded as a program module. One or more functional units can form the program module.

[ISO/IEC 2382–1]

C.78
project
unique process, consisting of a set of co-ordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources.

NOTE 1   An individual project can form part of a larger project structure.

NOTE 2   In some projects, the objective(s) is (are) refined and the product characteristics defined progressively as the project proceeds.

[ISO 10006]

C.79
relation
intellectual connection between two or more elements

[ISO 5127]

C.80
room
enclosed space within a storey, other than a circulation space

[ISO 6707-1]

C.81
sensor
measuring element
functional unit that senses the effect of a measured variable (quantity) at its input and places a corresponding measurement signal at its output

NOTE   The corresponding physical unit is named sensor or detecting device.

EXAMPLES   Thermocouple; foil strain gauge; pH electrode.

[IEC 60050-351]

C.82
set
assembly of objects or concepts considered as a whole

[ISO 5127]

C.83
signal designation
unambiguous identifier of a signal within a system

[IEC 61175]

C.84
site
area of land or water where construction work or other development is undertaken

[ISO 6707-1]

C.85
software
all or part of the programs, procedures, rules and associated documentation of an information processing system

NOTE   Software is an intellectual creation that is independent of the medium on which it is recorded.

[ISO/IEC 2382–1]

C.86
space
area or volume bounded actually or theoretically

[ISO 6707-1]

C.87
storey
story US
space between two consecutive floors or between a floor and a roof

NOTE   In the US, this term does not apply to attics or spaces partly or wholly below ground level.

[ISO 6707-1]

C.88
structural element
each object used in the assembly of a component or device and which has no independent function for the end user

[EN 50178]

C.89
structural member
part of a structure intended to resist force(s)

[ISO 6707-1]

C.90
systematics
uniform, ordered and planned presentation and design

C.91
technical document
document of the type and completeness required for technical purposes

C.92
technical equipment
physical and/or functional combination of components to fulfil a technical task

C.93
terminal
⟨electric⟩ conductive part of a device, electric circuit or electric network, provided for connecting that device, electric circuit or electric network to one or more external conductors

[IEC 60050-151]

C.94
terminal designation
identifier of a terminal with respect to the object to which it belongs, related to one aspect of the object

[IEC 61666]

C.95
unit operation
simplest operation in a process according to the theory of process technology

[ISO 10628]

Bibliography

[1]   ISO 1087-1, *Terminology work — Vocabulary — Part 1: Theory and application*

[2]   ISO 1087-2, *Terminology work — Vocabulary — Part 2: Computer applications*

[3]   ISO/IEC 2382-1, *Information technology — Vocabulary — Part 1: Fundamental terms*

[4]   ISO/IEC 2382-4, *Information technology — Vocabulary — Part 4: Organization of data*

[5]   ISO 3511-1, *Process measurement control functions and instrumentation — Symbolic representation — Part 1: Basic requirements*

[6]   ISO 4172, *Technical drawings — Construction drawings — Drawings for the assembly of prefabricated structures*

[7]   ISO 5127, *Information and documentation — Vocabulary*

[8]   ISO 5598, *Fluid power systems and components — Vocabulary*

[9]   ISO 6707-1, *Building and civil engineering — Vocabulary — Part 1: General terms*

[10]   ISO 9000, *Quality management systems — Fundamentals and vocabulary*

[11]   ISO 10006, *Quality management systems — Guidelines for quality management in projects*

[12]   ISO 10007, *Quality management systems — Guidelines for configuration management*

[13]   ISO 10303-1, *Industrial automation systems and integration — Product data representation and exchange – Part 1: Overview and fundamental principles*

[14]   ISO 10628, *Flow diagrams for process plants — General rules*

[15]   ISO 12006-2, *Building construction — Organization of information about construction works — Part 2: Framework for classification of information*

[16]   ISO 14617-1, *Graphical symbols for diagrams — Part 1: General information and indexes*

[17]   IEC 60050-131, *International Electrotechnical Vocabulary — Part 131: Circuit theory*

[18]   IEC 60050-151, *International Electrotechnical Vocabulary — Part 151: Electrical and magnetic devices*

[19]   IEC 60050-300, *International Electrotechnical Vocabulary — Electrical and electronic measurements and measuring instruments — Part 311: General terms relating to measurements — Part 312: General terms relating to electrical measurements — Part 313: Types of electrical measuring instruments; Part 314: Specific terms according to the type of instrument*

[20]   IEC 60050-351, *International Electrotechnical Vocabulary — Part 351: Automatic control*

[21]   IEC 60050-441, *International Electrotechnical Vocabulary — Switchgear, controlgear and fuses*

[22]   IEC 60050-581, *International Electrotechnical Vocabulary — Electromechanical components for electronic equipment*

[23]   IEC 60050-826, *International Electrotechnical Vocabulary — Part 826: Electrical installations*

[24]   IEC 61082-1, *Preparation of documents used in electrotechnology — Part 1: General requirements*

[25]   IEC 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals*

[26]   IEC 61310-2, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking*

[27]   IEC/TR 61346-3, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 3: Application guidelines*

[28]   IEC/TR 61346-4, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 4: Discussion of concepts*

[29]   IEC 61360-1, *Standard data element types with associated classification scheme for electric components — Part 1: Definitions - Principles and methods*

[30]   IEC 61506, *Industrial-process measurement and control — Documentation of application software*

[31]   IEC/PAS 62337, *Milestones and activities during commissioning of electrical instrumentation and control systems in the process industry*

[32]   IEC/PAS 62400, *Structuring principles for technical products and technical product documentation — Letter codes — Main classes and subclasses of objects according to their purpose and task*

[33]   IEC 81714-3, *Design of graphical symbols for use in the technical documentation of products — Part 3: Classification of connect nodes, networks and their encoding*

[34]   EN 50178, *Electronic equipment for use in power installations*

[35]   ISO/DGuide 99999, *International vocabulary of basic and general terms in metrology (VIM)*

ICS 01.110

Price based on 47 pages