TECHNICAL SPECIFICATION

**ISO/TS 16952-10**

First edition
2008-11-15

# Technical product documentation — Reference designation system —

## Part 10: **Power plants**

*Documentation technique de produits — Système de désignation de référence —*

*Partie 10: Centrales électriques*

Reference number
ISO/TS 16952-10:2008(E)



ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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# Foreword

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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 document:

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— 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order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn.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again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.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.

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

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

— *Part 1: General application rules* [Technical Specification]

— *Part 10: Power plants* [Technical Specification]

Further parts on sector-specific rules are under consideration.

# Introduction

Based on ISO/TS 16952-1, this part of ISO 16952 serves to designate plants, sections of plants and items of equipment in any type of installation for industrial production of electrical and thermal energy according to task, type and location. This sector-specific Reference Designation System (RDS) is intended for application by all engineering disciplines for the entire life cycle of a plant, from planning, licensing, construction, operation and maintenance, re-powering, extension and recreation, to dismantling and demolition. Based on the structuring principles and reference designation rules of IEC 61346 and other documents, ISO 16952 breaks down these rules into interdisciplinary guidelines for practical application.

The relationships of input documents with this part of ISO 16952 are shown in Figure 1.

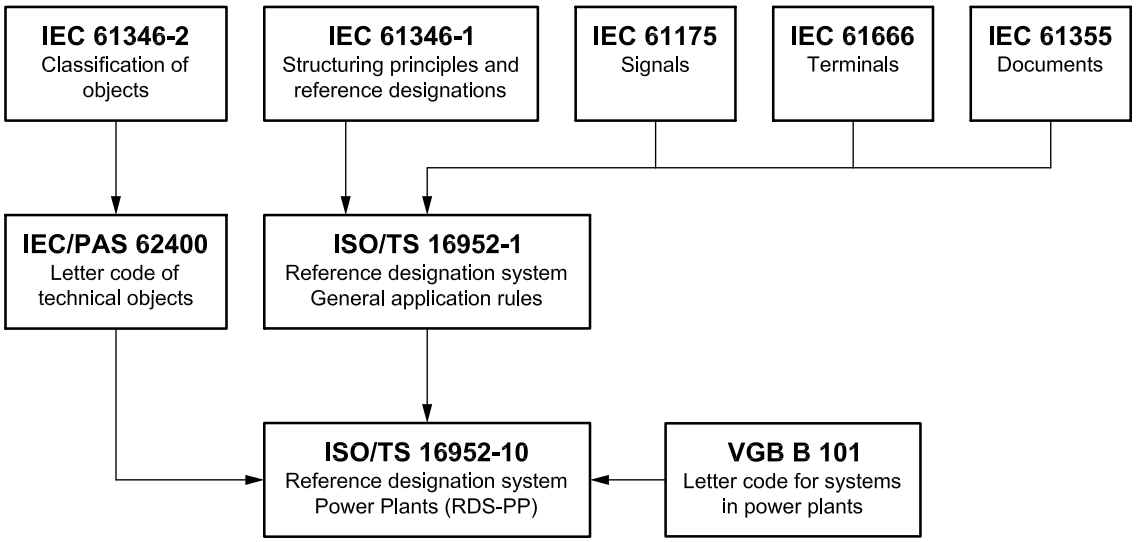



**Figure 1 — Structuring and designation standards**

This part of ISO 16952 establishes the prerequisites for

— uniform designation of all power plant processes (see Figure 2 for a summary of the energy conversion cycle),

— uniform designation of all power plant types,

— language-independent codes to ensure international applicability,

— adequate capacity and possible detail for designation of all systems, equipment and structures,

— adequate extension possibilities for new technologies,

— consistent designation for planning, licensing, construction, operation, maintenance and decommissioning,

— common applicability in mechanical, electrical, instrumentation and control (I&C) and civil engineering, with the simultaneous possibility to designate according to function, product and location aspects,

— fulfilment of quality management requirements,

— fulfilment of the technical documents management system requirements,

— fulfilment of the requirements for occupational safety and ergonomics.

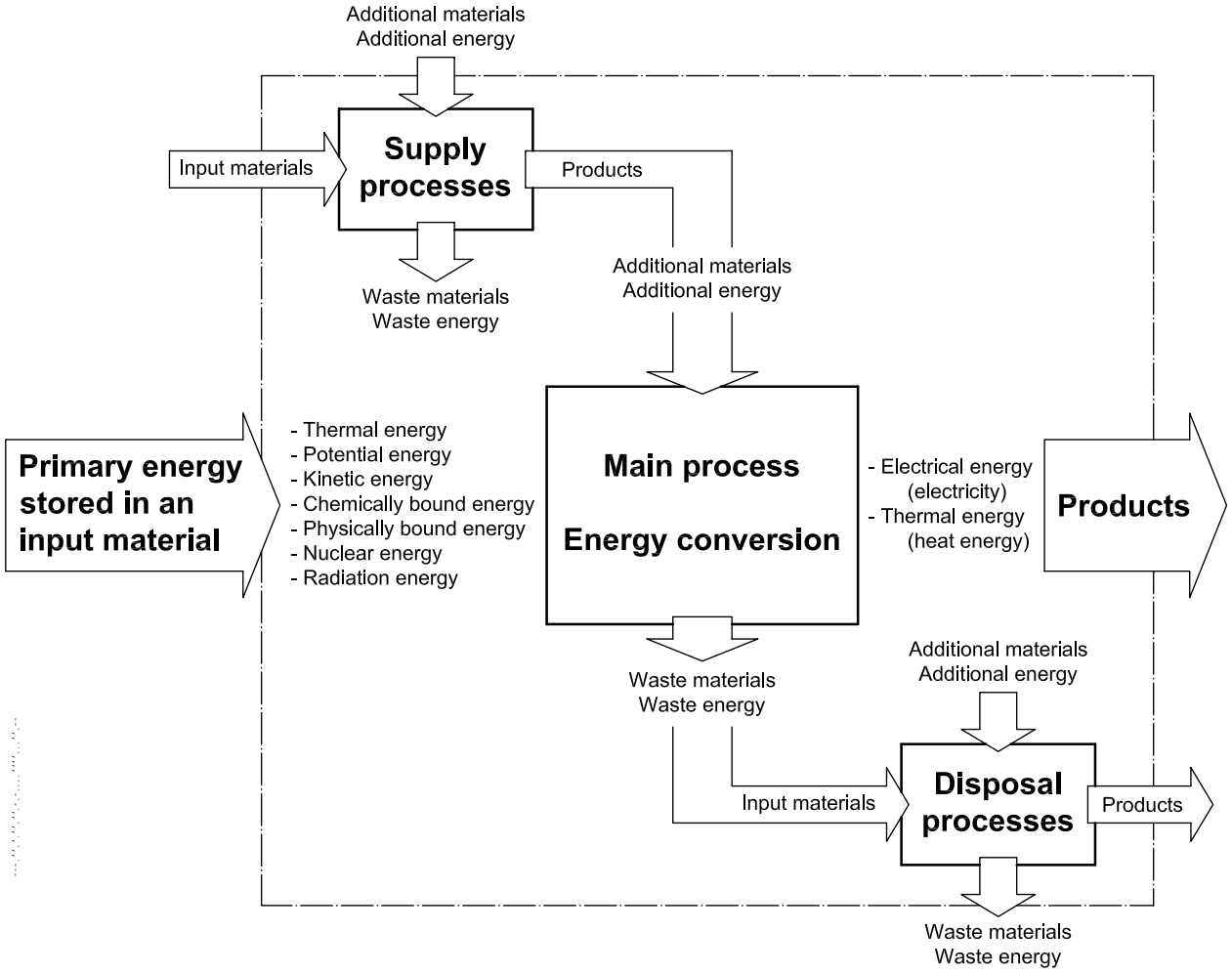



**Figure 2 — Principle of energy conversion including supply and disposal processes**

# Technical product documentation — Reference designation system —

# Part 10: Power plants

## 1 Scope

This part of ISO 16952 contains sector-specific stipulations for structuring principles and reference designation rules on technical products and technical product documentation of power plants.

It applies in combination with ISO/TS 16952-1, IEC/PAS 62400 and VGB B 101 for the classification of systems and objects, and for function-, product- and location-specific designation of technical products and their documentation for power plants.

It specifies the designation blocks for the clear identification and localization of the technical products, which are used for their labelling in the plant, for their designation in technical documents and for the designation of the technical documents as well.

This part of ISO 16952 encompasses the process of energy conversion. The specifications in this part of ISO 16952 apply for the power plant process, for the primary energy supply and final products distribution, as well as for auxiliary media and auxiliary energy supply, waste materials and waste energy disposal.

This part of ISO 16952 is not applicable to recovery of the primary energy and the media for supplying the process, nor to the processing of residues from process disposal (e.g. gypsum, slag products, waste water, etc.).

## 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/TS 16952-1:2006, *Technical product documentation — Reference designation system — Part 1: General application rules*

IEC 60445, *Basic and safety principles for man-machine interface, marking and identification — Identification of equipment terminals and of terminations of certain designated conductors, including general rules of an alphanumeric system*

IEC 61082-1, *Preparation of documents used in electrotechnology — Part 1: Rules*

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

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

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*

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

EN 50005, *Low Voltage Switchgear and Controlgear for Industrial Use — Terminal Marking and Distinctive Number — General Rules*

VBG B 101, *Letter code for systems in power plants* [1)]

## 3 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO/TS 16952-1 and the following apply.

**3.1**
**ancillary system**
system which is not directly required for the power plant process

NOTE This includes heating, ventilation, air-conditioning systems, space-heating systems, stationary compressed air supplies, fire protection systems, cranes, elevators, workshops, staff amenities, etc.

**3.2**
**aspect**
specific way of selecting information on or describing a system, or an object of a system

NOTE Such ways may be:

— what the system or object is doing (function viewpoint);

— how the system or object is constructed (product viewpoint);

— where the system or object is located (location viewpoint).

[IEC 61346-1]

**3.3**
**auxiliary system**
system which is required for the support of a power plant process

NOTE This includes auxiliary steam system, compressed air, carrier air, control air, central chemicals supply, sampling systems, etc.

**3.4**
**control**
purposeful action on or in a process to meet specified objectives

[IEC 60050-351]

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

**3.5**
**designation block**
structured compilation of related information units, consisting of a prefix, letters and numbers, and optionally a breakdown mark

1) Source: www.vgb.org

**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 related to a given subject

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

[IEC 61082-1]

**3.8**
**functional area**
combination of groups and/or elements in a unit that can be used independently

**3.9**
**functional group**
combination of elements in a unit that can be used independently

**3.10**
**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 may be implemented by one or several physical units or program modules.

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

— element;

— equipment;

— system.

For the subject under consideration, it is understood that “element” should designate the smallest functional unit in each case.

[IEC 60050-351]

**3.11**
**multi-level reference designation**
reference designation derived from a structural path through an overall system

[IEC 61346-1]

**3.12**
**object**
entity treated in the process of design, engineering, realization, operation, maintenance and demolition

NOTE 1 The entity may 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 may be viewed in different ways called “aspects”.

[IEC 61346-1]

**3.13**
**operating equipment**
all products, which serve to implement technical tasks as a whole or in individual parts

**3.14**
**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, the following should 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” should designate the smallest physical unit in each case.

NOTE 4 The designations of 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]

**3.15**
**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]

**3.16**
**plant section**
part of a process plant that can, at least occasionally, be operated independently

[ISO 10628]

**3.17**
**power plant process**
process for the generation of electrical energy and/or heat energy products, including the conversion, supply, and disposal processes

**3.18**
**power plant unit**
technical plant including all equipment needed for fulfilment of a power plant process

**3.19**
**system**
set of interrelated objects

NOTE 1 Examples of a system: a drive system, a water supply system, a stereo system, a computer.

NOTE 2 When a system is part of another system, it may be considered as an object.

[IEC 61346-1]

**3.20**
**technical equipment**
physical or functional unit used to fulfil a technical task

**3.21**
**terminal**
point of access to an object intended for connection to an external network

NOTE 1 The connection may refer to

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

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

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

[IEC 61666]

**3.22**
**works**
system of industrial complexes and the associated infrastructure in one location

[ISO 10628]

# 4 Designation systematic

## 4.1 General

The designation systematic has to be understood as a well-organized, methodical process of forming permanent designations with ergonomic notation according to simple, easily learned rules that are based on predefined standards.

## 4.2 Process of forming designations

Starting from site plans, process flow diagrams, overview diagrams, etc., the entire power plant shall be broken down into plant sections, units and, if necessary, sub-units.

These shall then be further broken down, based on functional aspects, into systems, subsystems and technical equipment. Consistent compliance with the rule of constituency (an object can contain more than one sub-objects but is a constituent of one higher object only) shall be ensured. The objects identified in this way shall be classified based on specified letter codes in accordance with VGB B 101 for systems and subsystems and IEC/PAS 62400 for technical objects, and then provided with reference designations. All information about the object is governed under this designation.

Structuring of location-specific systems (structures, sites, etc.) shall be performed in the same way.

In further processing, the products required for fulfilment of the tasks shall be specified and designated. The combination of the function and product aspects generates a unique designation.

The results shall be documented.

## 4.3 General rules for designation structure

The general designation structure corresponds to ISO/TS 16952-1:2006, 6.1. It shall consist of a maximum of three main parts, see Figure 3.

| **Identifier** | | |
|---|---|---|
| **Conjoint designation** | **Reference designation** | **Specific designation** |
| – Site | Technical objects based on | – Signals |
| – Factory complex | – Function aspect | – Terminals |
| – Power plant unit | – Product aspect | – Documents |
| – Subsystems based on project-specific requirements | – Location aspect | |

**Figure 3 — Parts of the identifier**

The permitted combinations and their sequence are given in Figure 4.

| | | |
|---|---|---|
| Conjoint designation | | |
| Conjoint designation | Reference designation | |
| Conjoint designation | Reference designation | Specific designation |
| Conjoint designation | | Specific designation |
| | Reference designation | |
| | Reference designation | Specific designation |

**Figure 4 — Permitted combinations of identifier parts**

Each of the three identifier parts consists of one or more designation blocks (see Figure 5 and Clause 6). Each designation block always contains

— a prefix in accordance with Table 1 and

— letters and numbers in accordance with Figure 6.

| | |
|---|---|
| Prefix | Letters and numbers |

**Figure 5 — Designation block**

The designation blocks are distinguished by prefixes and thus uniquely identified. The prefixes are always the first data characters in the designation blocks.

**Table 1 — Prefixes for designation tasks**

| Prefix | | Designation | Designation tasks/aspect | Prefix origin, basic principles specified in |
|---|---|---|---|---|
| 1 | 2 | | | |
| | # | Number | Conjoint designation | ISO/TS 16952-1 |
| | = | Equals | Function-oriented designation | IEC 61346-1 |
| = | = | Equals-Equals | Functional allocation | ISO/TS 16952-1 |
| | + | Plus | Point of installation | IEC 61346-1 |
| + | + | Plus-Plus | Location | ISO/TS 16952-1 |
| | – | Minus | Product-oriented designation | IEC 61346-1 |
| | : | Colon | Terminal designation | IEC 61666 |
| | ; | Semicolon | Signal designation | IEC 61175 |
| | & | Ampersand | Document designation | IEC 61355 |

The letter codes and numbers in the designation blocks are subdivided into breakdown levels, sections and data characters as the smallest information unit.

The letters classify an object and are specified as letter codes in the corresponding tables (see IEC/PAS 62400, VGB B 101).

The numbers are used to distinguish between objects with the same letter code, if they are constituents of the same object.

The basic structure is shown in Figure 6. Details of the individual designation blocks are specified in Clause 6.

| Breakdown level | 1 | | | | | 2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Section | 1 | | | 2 | | 3 | | 4 | | |
| Number/type of data position | A | A | A | N | N | A | A | N | N | N |

**Key**

A = Letter

N = Number

**Figure 6 — Basic structure of the designation part of a designation block**

## 4.4 Rules for forming designations

— **Rule 1:** Each object can be viewed in one or more ways called aspects (see 5.3.1). The considered aspect is indicated by a prefix (see Table 1). The prefix shall be written always when a misinterpretation of the aspect is possible.

— **Rule 2:** Sections at the beginning and/or at the end of a designation block may be omitted.

— **Rule 3:** Only the transition from the function aspect to the product aspect is allowed.

— **Rule 4:** Designation of operating equipment shall be achieved exclusively by the transition from the functional aspect to the product aspect. The location-oriented designation carries the allocation information only.

— **Rule 5:** When designation blocks are combined, the prefix of the block that is the furthest to the right (smallest object of consideration) shall determine the aspect of the entire designation.

— **Rule 6:** The structure within an aspect shall comply with the principle of constituency in accordance with IEC 61346-1. Each object has only one predecessor, but can have one or more successors.

— **Rule 7:** Information regarding the installation and location of an object as well as the interaction of the object in the power plant process shall be represented by attaching the designations "+ point of installation", "++ location" and "== functional allocation" respectively as a separate additional designation.

— **Rule 8:** The multi-level reference designations shall be presented in designation blocks with a fixed structure. The designation blocks shall be identified with regard to their aspect by prefixes, which have their own data character positions.

— **Rule 9:** Each designation section shall consist of a maximum of three data characters, but not all of these need to be written, depending on the application. The sections shall be structured with alternating alphabetic (A) and numeric (N) characters.

— **Rule 10:** The letter codes from IEC/PAS 62400 and VGB B 101 shall be used for the classification of objects. Only Roman capitals from A to Z, with the exception of "I" and "O", are permitted; country-specific letters and mnemonic assignments shall be avoided.

— **Rule 11:** Arabic numerals "1" to "9" and "0" (zero) shall be used for numerical data characters; numbers shall be written with leading zeros.

— **Rule 12:** For certain designation blocks between breakdown levels, the breakdown mark "**.**" (full stop) with its own data position shall be applied. In this case Rule 2 shall apply for each part of the designation block on the left and on the right side of the breakdown mark.

# 5 Designation tasks

## 5.1 General

The designation system for power plants shall fulfil the following main tasks:

a) unambiguous identification of the technical objects and documents;

b) classification of objects according to their purpose, task or composition;

c) coded representation of technical structures;

d) coded representation of networked relationships.

This enables the designation of the following:

— conjoint allocations (factories, plant complexes, power plant units, etc.);

— technical objects (systems, plants, technical equipment, components, etc.);

— electrical and mechanical connections;

— signals and potentials;

— documents.

The structure and contents of designation for these different tasks are specified in Clause 6.

## 5.2 Conjoint designation (optional)

It may be required to identify different sites. Moreover, different power plant units, non-unit-aligned or common plants and systems, different extension stages as well as power plant extrinsic works can exist or be planned on the same site (e.g. at cogeneration power plants). Conjoint designation facilitates a unified identification of such different plant complexes (for an example see Figure D.1).

Conjoint designation is a reference designation of a plant/system with respect to the site not being related to one of the defined aspects.

If it is used as part of the identifier, then systems, objects and products which fulfil the same task in different plants can have the same reference designation. The unambiguous nature of the equipment designation is achieved by using different conjoint designations. This provides significant ergonomic and economic advantages.

The use of the conjoint designation is optional.

## 5.3 Designation of technical objects — Reference designation

### 5.3.1 General

Reference designation identifies objects for the purpose of correlating information about an object among different kinds of documents with the products implementing the system. A reference designation shall unambiguously identify an object of interest within the considered system.

An object within a system can be viewed in different ways, called aspects:

— What does the object do? (function aspect)

— How is the object constructed? (product aspect)

— Where is the object located? (location aspect)

### 5.3.2 Function aspect

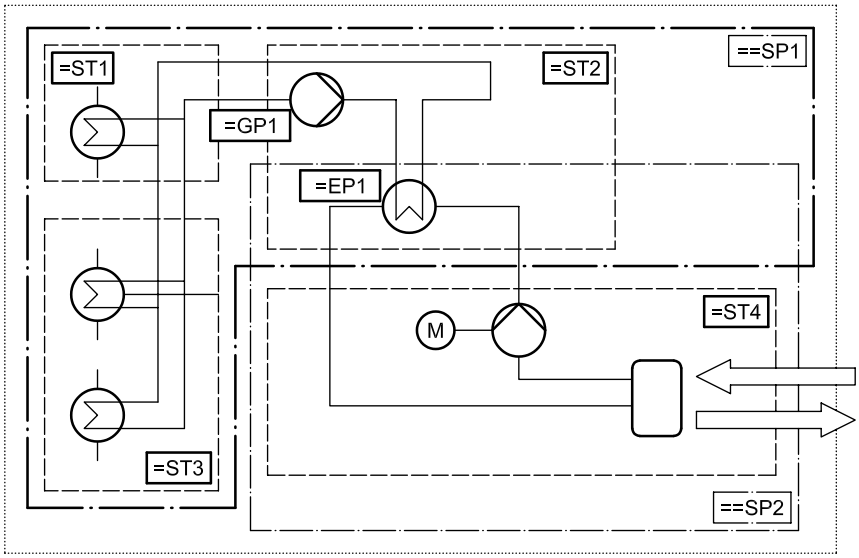
A function-oriented structure is based on the purpose of a system, without necessarily taking into account the products with which this purpose is fulfilled or their location.

Designation by function aspect is applied in an early planning phase of a project, and remains unchanged over the entire service life of an overall plant.

In power plant engineering, a distinction is made between functional units with static tasks (see 6.3.1) and those with dynamic effect (see 6.3.2).

Figure 7 shows a diagram of a system consisting of several functions.

NOTE The notations in this diagram are not based on standardized letter codes.




Subtask =ST2 consists of heat exchanger =EP1 and pump =GP1.

**Figure 7 — Diagram of functional units by task (subtasks ST) and effect (subprocesses SP)**

As a subfunction of subtask =ST2, heat exchanger =EP1 has effects both in subprocess ==SP1 as well as in ==SP2.

Figure 8 shows the relationships in two structure trees with the constituent relations in each of the tree-like structures (solid lines) and the allocation (associative relations) between these two structures (dashed lines).

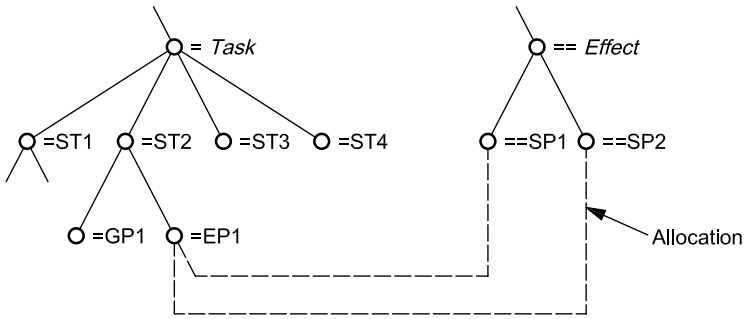



**Figure 8 — Function structures by task (subtasks ST) and effect (subprocesses SP)**

### 5.3.3 Product aspect

A product-oriented structure is based on the way in which a system is implemented, constructed or delivered, including the use of intermediate or end products, without necessarily taking into account their functions and/or locations.

Designation by product aspect is used in the manufacture of equipment parts without taking into account their application or places of use.

In power plant engineering, the designation according to product aspect is specifically restricted (see 6.4).

### 5.3.4 Transition from function aspect to product aspect

It is possible and often expedient to identify an object in a system using two aspects. Different aspects may be used for successive objects by making a transition from one aspect to another. Prerequisite for this is that the object is exclusively associated with the preceding functional unit.

Figure 9 shows the transition from the function aspect to the product aspect and allocation to the location structure for the example of the multi-level reference designation =LAB12 QM001 -QA01 (feed water piping system, train 12, isolation 1; power breaker 1).

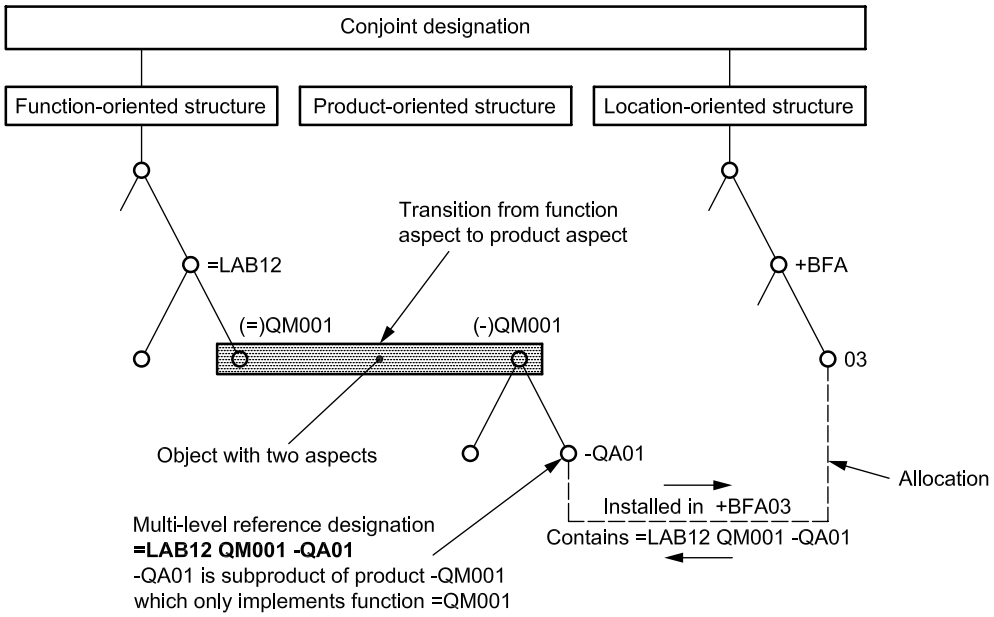



**Figure 9 — Transition from function aspect to product aspect and allocation (associative relation)**

### 5.3.5 Location aspect

A location-oriented structure is based on the topographical layout of a system and/or the surroundings in which the system is located, without necessarily taking into account products and/or functions.

This additional aspect enables distinction between the following:

— designation of points of installation within design units or modules of electrical and I&C systems, as well as designation of locations in mechanical engineering equipment (installation aspect);

— designation of object locations (erection aspect).

Designation by location aspect is applied in the designation of objects which perform the task of providing points of installation for other technical objects.

This type of designation is used for allocation of the equipment parts to their locations (point of installation, location).

## 5.4 Specific designations

### 5.4.1 Signal designation

Signals are the carriers of information and shall be designated unambiguously. The principles are specified in IEC 61175.

### 5.4.2 Terminal designation

Electrical and mechanical terminals shall be designated unambiguously. The principles are specified in IEC 61666.

### 5.4.3 Document designation

Documents shall be designated unambiguously. A non-manufacturer-specific, uniform and object-related designation in accordance with IEC 61355 is required for power plant technology.

# 6 Structure and contents of designation blocks

## 6.1 General

The designations are structured in the form of designation blocks, which are subdivided into sections (alphabetical and numerical). The number and type of data characters for the individual designation tasks are specified and described in the following subclauses.

The alphabetical sections classify systems, plants and technical equipment, components, points of installation and locations as well as signals, connections and documents according to their purpose or task. The numerical sections serve for distinction and numbering.

The rules specified in 4.4 apply.

## 6.2 Designation block “Conjoint designation”

Each of the two identification levels has a maximum of 12 data characters. The structure of the designation block, the contents, the meaning as well as the type and number of data characters shall be defined separately for every project.

Figure 10 shows the structure and contents of the designation block “Conjoint designation”.

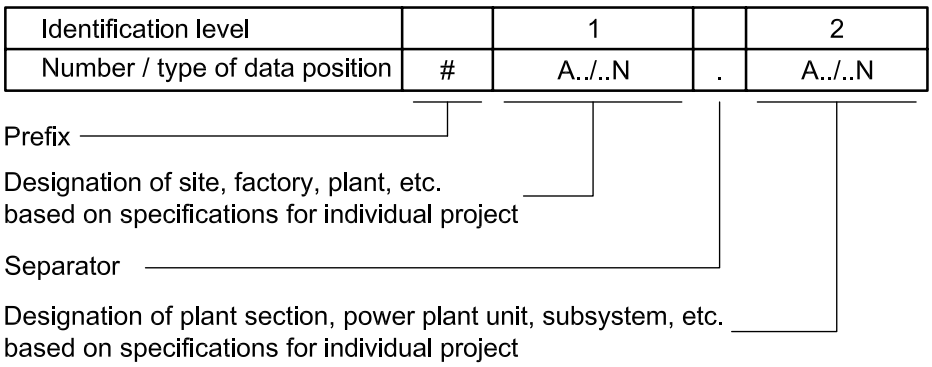



**Figure 10 — Structure and contents of designation block “Conjoint designation”**

## 6.3 Function aspect

### 6.3.1 Designation block “Function”

This designation block is used for function-oriented structuring with regard to the task and purpose (static tasks) of the technical objects. It is used to designate systems, plants, subsystems and technical equipment, see Figure 11.

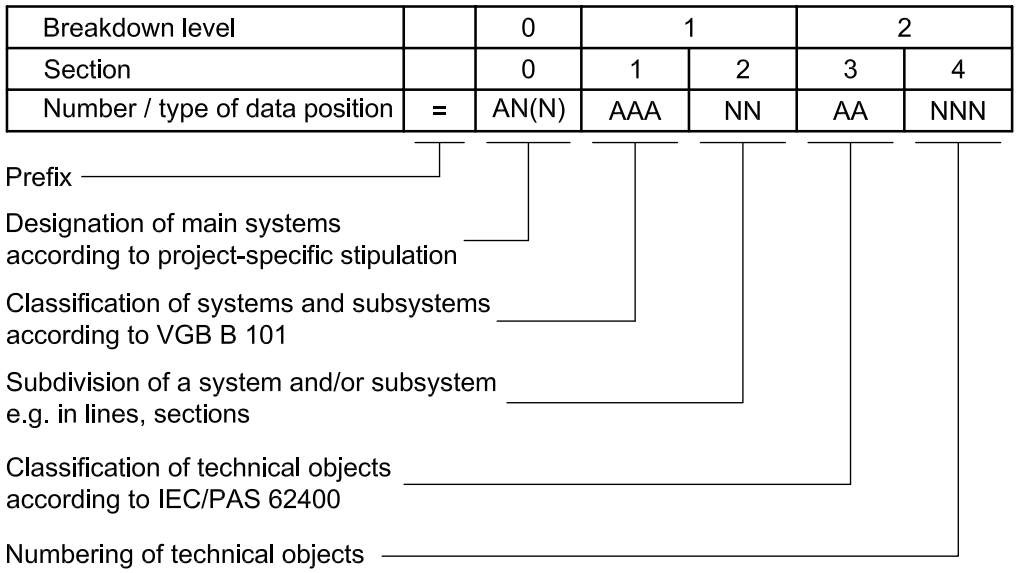



**Figure 11 — Structure and contents of designation block “Function”**

Figure D.2 shows an example of breakdown level 0. Figure D.3 shows an example of a civil engineering object.

### 6.3.2 Designation block “Function allocation”

#### 6.3.2.1 General

This designation block is used for function-oriented structuring with regard to interaction (dynamic effect) of technical objects. It is used to designate relationships between functions, technical equipment and components.

#### 6.3.2.2 Designation of functional areas and groups as “Function allocation (group level)”

This designation block is used to designate functional areas and/or functional groups of technical objects, which are represented under a functional aspect different to that in the designation block “Function”, see Figure 12.

Universally valid contents cannot be specified (for examples see Figures D.4 and D.5).

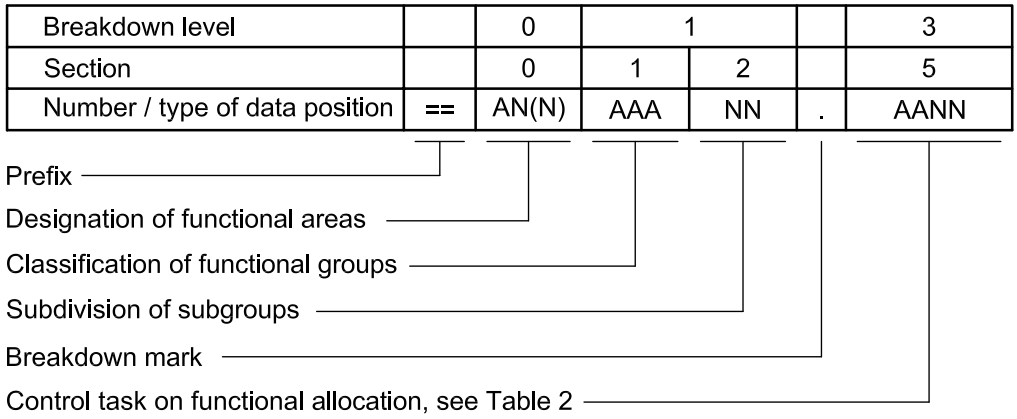



**Figure 12 — Structure and contents of designation block "Function allocation" for functional areas**

### 6.3.2.3 Designation of technical equipment as "Function allocation (individual level)"

This designation block is used to designate technical equipment which is viewed in the sense of the function allocation.

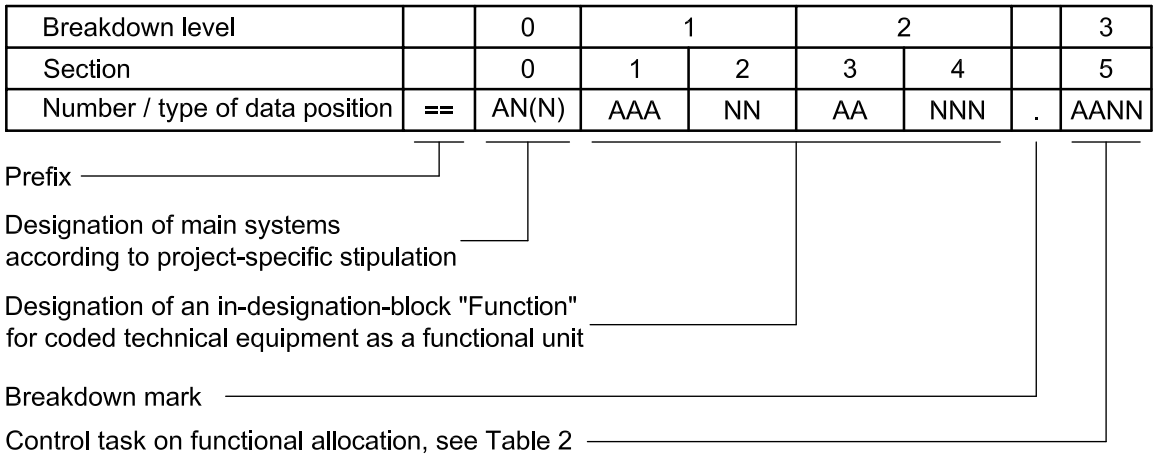



**Figure 13 — Structure and contents of designation block "Function allocation for technical equipment"**

**Table 2 — Control tasks for "Function allocation", section 5, data characters 1 and 2**

| Code | Denomination |
|---|---|
| AA | Alarms, monitoring |
| CA | Closed-loop feedback control |
| CB | Reference loop control |
| HA | Operation and monitoring |
| MA | Direct measurement |
| MB | Measurand calculation |
| SA | Individual control |
| SB | Group control |
| ZA | Equipment protection |
| ZB | Plant protection |

Further stipulations, if necessary, should be project-specific.

## 6.4 Product aspect — Designation block "Product"

This designation block is used for product-oriented designation of electrical and mechanical objects, see Figure 14.

If an object is to be further broken down into its parts, the "nested product-oriented designation" shall be applied, where several blocks are concatenated in the sense of the multi-level reference designation. The prefix shall be placed in front of the first designation block only (example see Figure D.6).

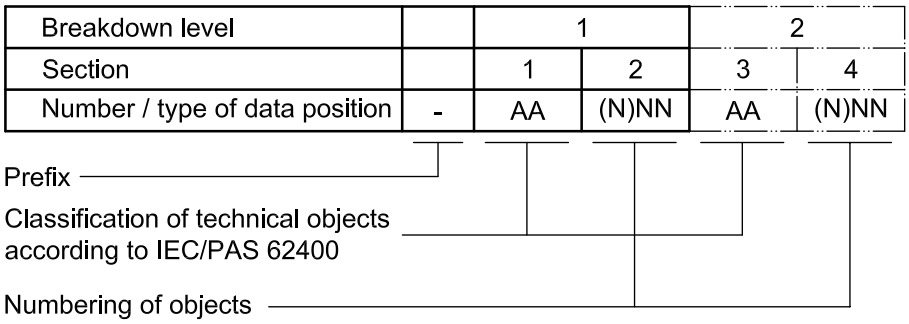



**Figure 14 — Structure and contents of designation block "Product"**

## 6.5 Transition from function aspect to product aspect

For unambiguous identification of technical objects in power plant engineering, the possibility is used to simultaneously follow objects according to both function and product aspects. The structure of such a designation block is shown in Figure 15, with Examples 1 and 2.

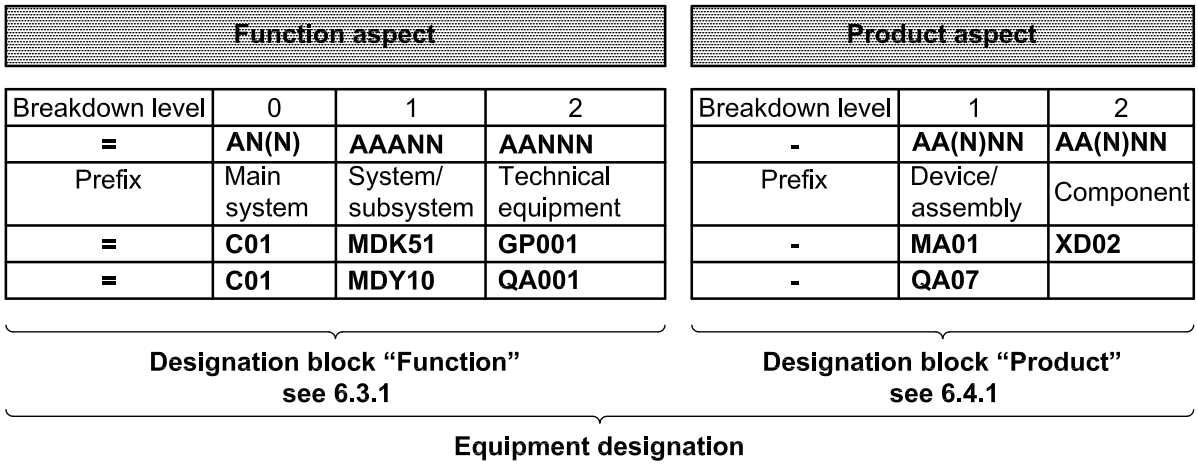



**Figure 15 — Structure of the designation block "Equipment"**

EXAMPLE 1 **=C01 MDK51 GP001 –MA01XD02**
wind turbine generator system C01, wind turbine system MD, power transmission (drive train) K, transmission lubricant subsystem 51, conveying GP001; electric motor MA01, junction box XD02

EXAMPLE 2 **=C01 MDY10 QA001 –QA07**
wind turbine generator system C01, wind turbine system MD, control system Y10, power unit QA001; circuit breaker QA07

The first letter codes in breakdown level 1 of the function aspect are given in Table 3. Selected first letter codes are illustrated in Figure 16.

The first letter codes in breakdown level 2 of the function aspect and of breakdown levels 1 and 2 of the product aspect are given in Table 4.

**Table 3 — Letter code for designation block "Function", breakdown level 1, section 1, data character 1 (according to VGB B 101)**

| | Class code | Denomination |
|---|---|---|
| Objects for conjoint tasks | A | Systems for common tasks |
| Objects for the power plant process | B | Electrical auxiliary power supply systems |
| | C | Control and management systems |
| | D | Function allocation (group level) |
| | E | Fuel supply and residue disposal (excluding nuclear) |
| | F | Handling of nuclear equipment |
| | G | Water supply, disposal and treatment |
| | H | Heat generation including flue gas exhaust and treatment (excluding nuclear) |
| | J | Nuclear heat generation |
| | K | Nuclear auxiliary systems |
| | L | Water, steam, gas systems |
| | M | Systems for generation and transmission of electrical energy |
| | N | Process energy supply for external consumers |
| | P | Cooling water systems |
| | Q | Auxiliary systems |
| | R | Utilization of heat from regenerative energy sources (excluding combustion processes) |
| | S | - reserved for later standardization - |
| | T | - reserved for later standardization - |
| | U | Structures and areas for systems inside of the power plant process |
| Objects which are not allocated to the power plant process | V | Systems for storage of material or goods |
| | W | Systems for administrative or social purposes or tasks |
| | X | Ancillary systems |
| | Y | Communication and information systems |
| | Z | Structures and areas for systems outside of the power plant process |

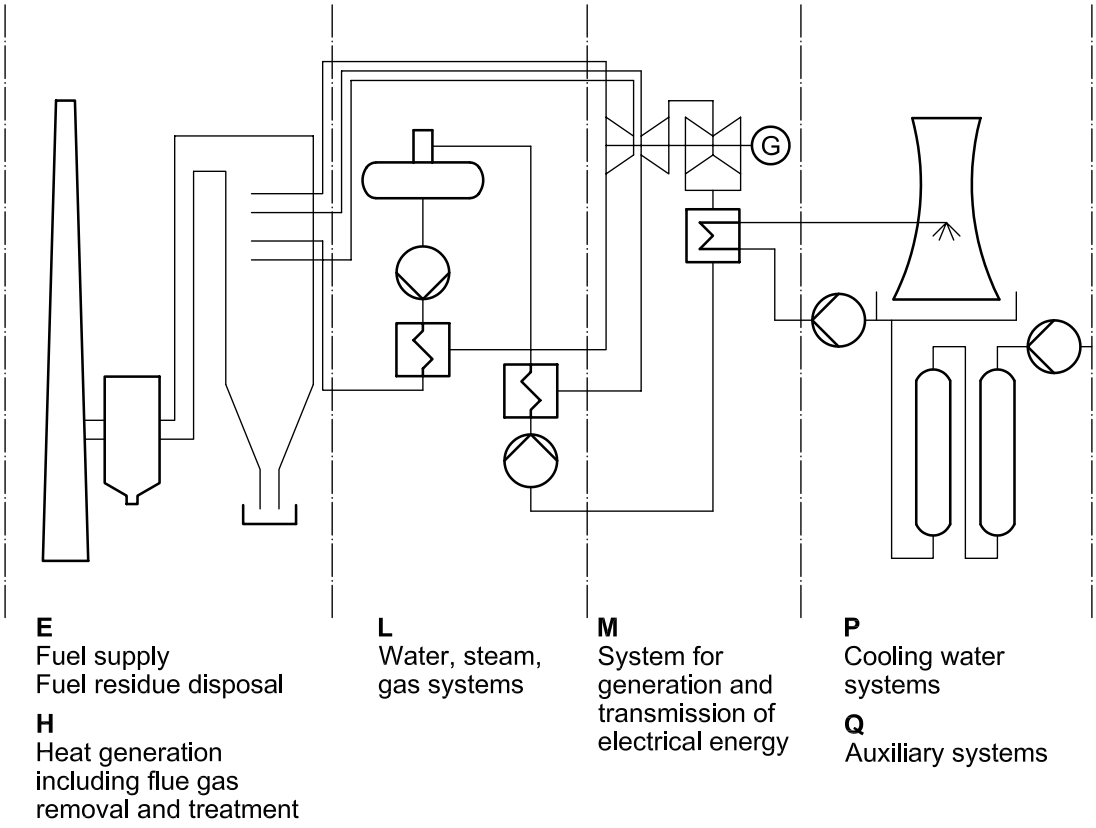



**Figure 16 — Overview with letter codes and denominations, e.g. steam power plant**

**Table 4 — Letter code for designation block "Function", breakdown level 2, section 3, data character 1 and for designation block "Product", breakdown level 1, section 1, data character 1 and breakdown level 2, section 3, data character 1 (according to IEC/PAS 62400)**

| Code | Denomination |
|---|---|
| A | Two or more purposes or tasks |
| B | Conversion of an input variable (physical property, condition or event) to a specific signal for further processing |
| C | Storage of energy, information or material |
| D | - reserved for future standardization - |
| E | Providing radiant or thermal energy |
| F | Direct (self-acting) protection of an energy or signal flow, of personnel or facilities from dangerous or unwanted conditions including systems and equipment for protective purposes |
| G | Initiation of an energy or material flow; generation of signals which are used as an information carrier or reference source |
| H | Production of a new type of material or product |
| J | - reserved for future standardization - |
| K | Processing (receipt, processing and providing) of signals or information (with the exception of objects for protection purposes, see class F) |
| L | Reserved for future standardization |
| M | Providing mechanical energy (rotational or linear mechanical notion) for driving purposes |

**Table 4** (*continued*)

| Code | Denomination |
|---|---|
| N | - reserved for future standardization - |
| P | Presentation of information |
| Q | Controlled switching or variation of a flow of energy, signal or material (see classes K and S for signals in closed/open feedback control loops) |
| R | Restriction or stabilization of movement or flow of energy, information or material |
| S | Conversion of a manual operation to a specific signal for further processing |
| T | Conversion of energy while maintaining the kind of energy, conversion of an established signal while maintaining the content of information, conversion of the form or shape of a material |
| U | Keeping objects in a defined position |
| V | Processing (handling) of material or products (including pre-treatment and post-treatment) |
| W | Conducting or routing energy, signals, materials or products from one location to another |
| X | Connecting objects |
| Y | - reserved for future standardization - |
| Z | - reserved for future standardization - |

## 6.6 Location aspect

### 6.6.1 Designation block “Point of installation”

#### 6.6.1.1 General

This designation block is used for designating the points of installation of technical products. Different designation blocks are specified according to the tasks in the various disciplines:

— points of installation in electrical/I&C[2)] installation units (consoles, panels, cabinets);

— points of installation in electrical/I&C installation units oriented to mechanical systems;

— points of installation in electrical/I&C installation units oriented to locations;

— points of installation in technical equipment for mechanical and civil engineering.

NOTE For the designation of points of installation, the contents of the designation block “= Function” (or parts of it) can be used as the “+ point of installation”. The aspect of the designation is determined solely by the prefix (+).

#### 6.6.1.2 Points of installation in electrical/I&C installation units

The structure and contents of the designation block “point of installation” for electrical and I&C installation units are shown in Figure 17.

2) I&C = Instrumentation and Control.

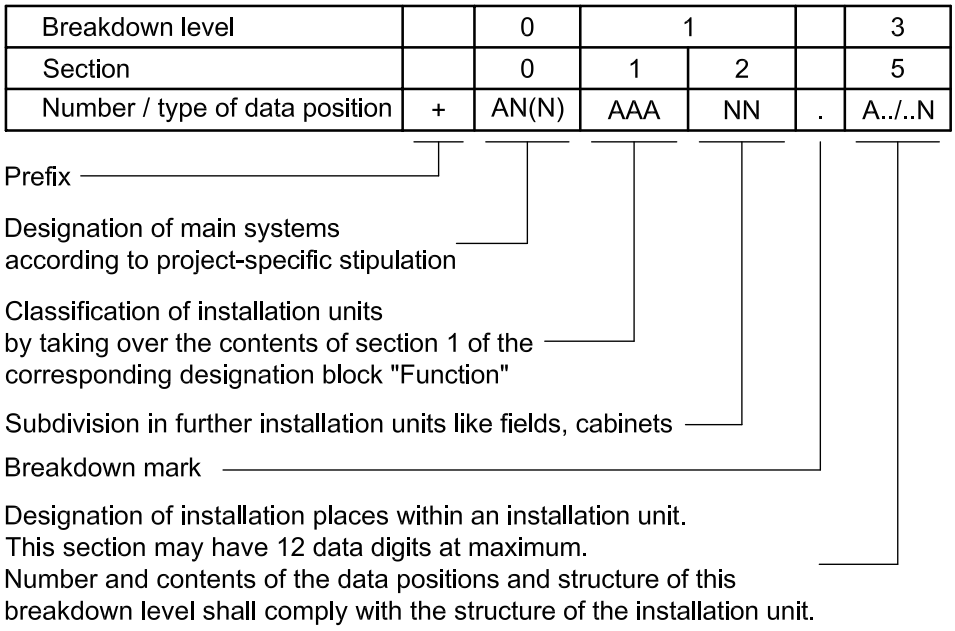



**Figure 17 — Structure and contents of designation block “Point of installation” in electrical/I&C installation units**

### 6.6.1.3 Points of installation in electrical/I&C installation units oriented to mechanical systems

The structure and contents of the designation block “point of installation” for system-oriented electrical and I&C installation units are shown in Figure 18.

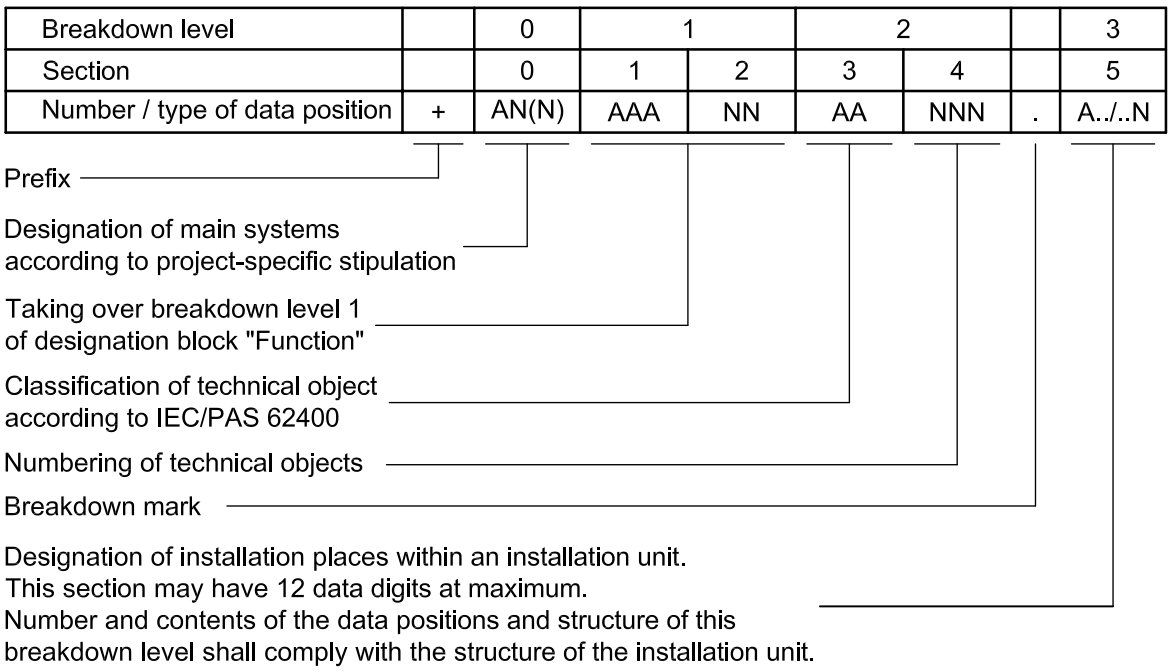



**Figure 18 — Structure and contents of the designation block “Point of installation” in electrical/I&C installation units oriented to mechanical systems**

#### 6.6.1.4 Points of installation in electrical/I&C installation units oriented to locations

The structure and contents of the designation block “Point of installation” for location-oriented electrical and I&C installation units are shown in Figure 19.

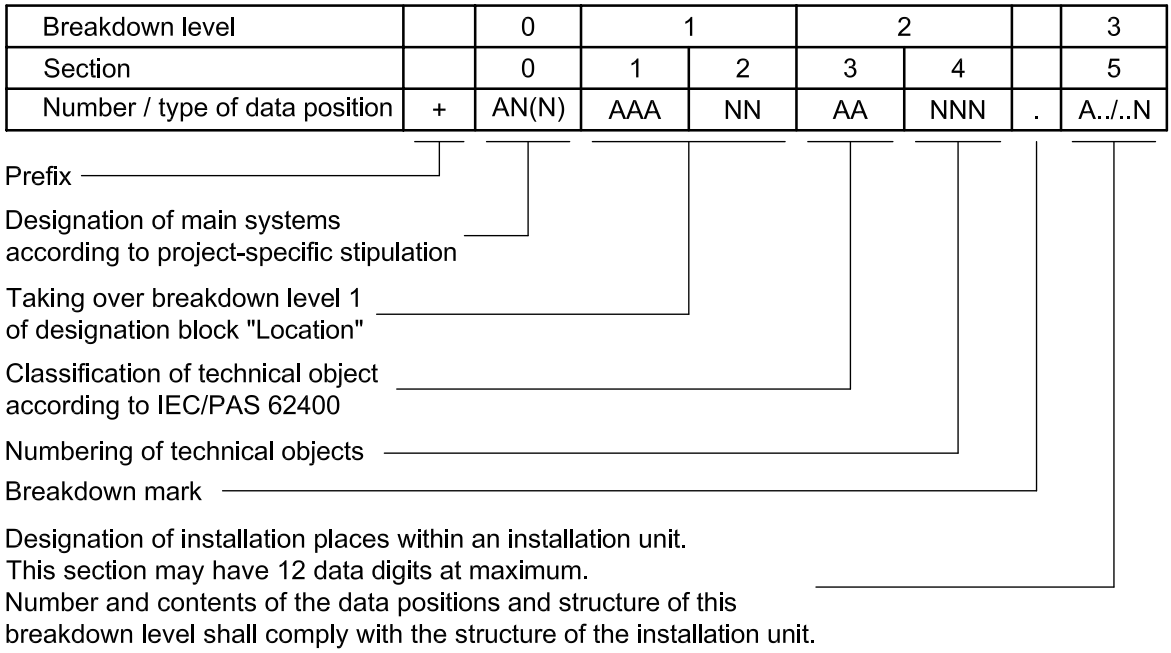



**Figure 19 — Structure and contents of designation block “point of installation” in electrical/I&C installation units oriented to locations**

#### 6.6.1.5 Points of installation in technical equipment for mechanical and civil engineering

The structure and contents of the designation block “Point of installation” in technical equipment for mechanical and civil engineering is shown in Figure 20.

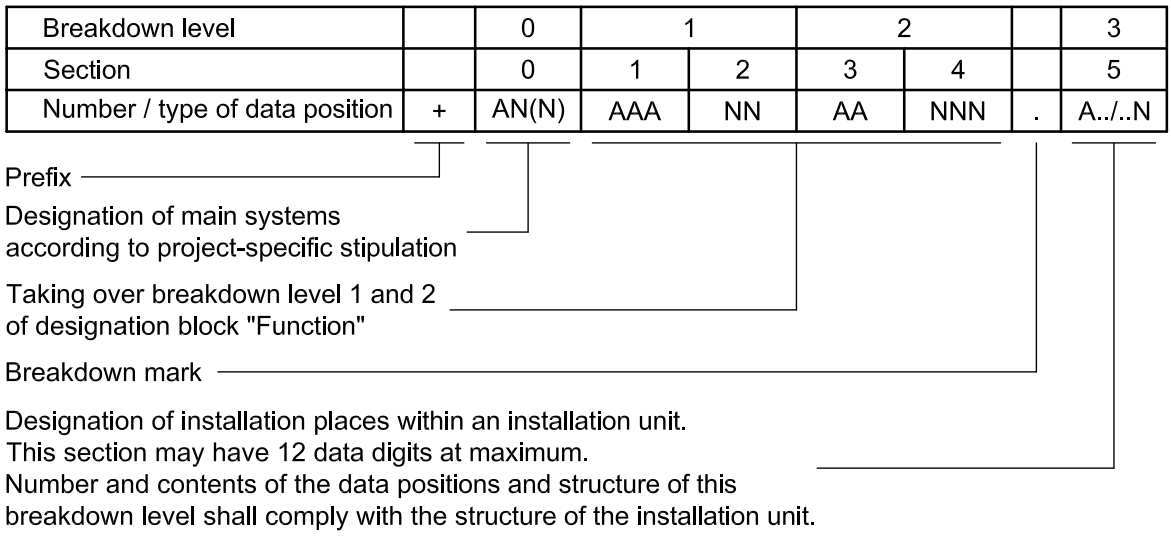



**Figure 20 — Structure and contents of designation block “Point of installation” in technical equipment for mechanical and civil engineering**

### 6.6.2 Designation block “Location”

This designation block is used for designation of locations; see Figure 21. The contents of breakdown level 1 can be used in the designation block “function” if technical equipment is to be designated on a building-specific basis.

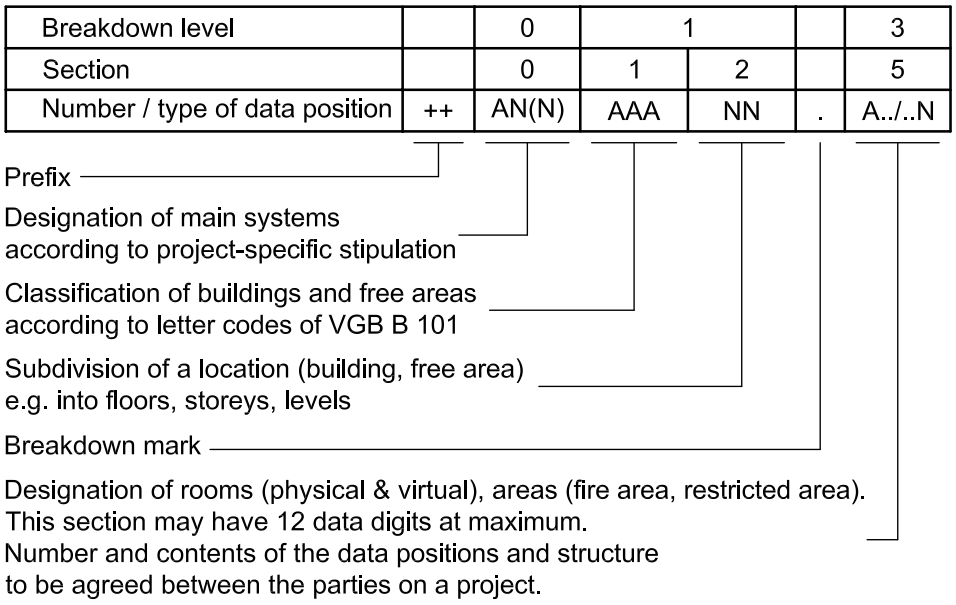



**Figure 21 — Structure and contents of designation block “Location”**

## 6.7 Specific designations

### 6.7.1 Signal designation

#### 6.7.1.1 General

The unambiguous designation of signals is achieved by combining the reference designations and the signal name based on IEC 61175, see Figure 22.


**Figure 22 — Signal designation**

Signal designation distinguishes between:

— signal origin (information source), and

— signal application (information sink).

A signal may serve several applications; an application may be served by several signals.

The signal origin is assigned the reference designation of the function in which the signal is generated (output); the signal application is assigned the reference designation of the function in which the signal is processed (input).

#### 6.7.1.2 Designation block “Signal”

This designation block is used for the designation of signals, see Figure 23.

| Breakdown level | | 1 | | | 3 |
|---|---|---|---|---|---|
| Section | | 1 | 2 | | 5 |
| Number / type of data position | ; | AA | (N)NN | . | A../..N |

Prefix

Classification of signal types according to Tables 5 and 6

Sequential number according to Table 7

Breakdown mark

Other designation possibilities according to IEC 61175

**Figure 23 — Structure and contents of the designation block “Signal”**

**Table 5 — Letter code for main classes of signal name, section 1, data character 1**

| Code in accordance with IEC 61175 | Main classes of signal name |
|---|---|
| X | Signal origin |
| Y | Signal application |

**Table 6 — Letter code for subclasses of signal name, section 1, data character 2**

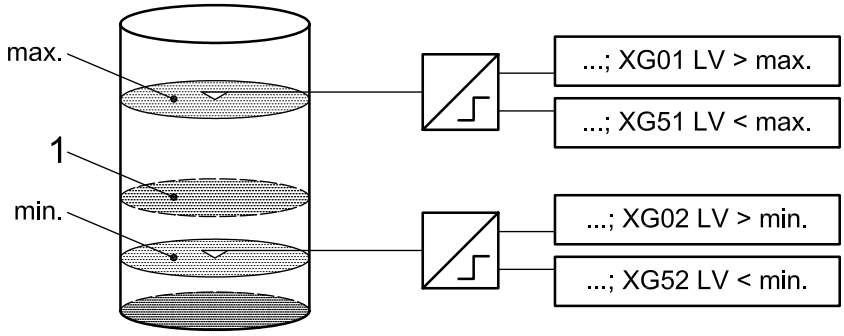
| Code | Subclasses of signal name |
|---|---|
| A | Group control (open-loop) |
| B | Individual control (open-loop) |
| C | Individual control (closed-loop) |
| G | Binary process signals |
| H | Limit signals, generated from analogue process signals |
| J | Unspecified areas |
| K | Component protection |
| L | Control rooms and control stations |
| M | Individual alarms |
| P | Process computer |
| Q | Analogue process signals |
| R | Pilot controls |
| S | Step control |
| U | Group fault alarms |
| V | Signal interlock |
| W | Alarm system |
| NOTE Unused letters may be defined for project-specific applications. | |

**Table 7 — Specification of sequential numbers for the signal classes B, G and H**

| Sequential number | Signal class | | |
|---|---|---|---|
| | B | G | H |
| 01 | Check back on/open | LV > max. 1, check back on/open | LV > max. 1 |
| 02 | Check back off/closed | LV > min. 1, check back off/closed | LV > min. 1 |
| 03 | | LV > max. 2 | LV > max. 2 |
| 04 | | LV > min. 2 | LV > min. 2 |
| 05 | | LV > max. 3 | LV > max. 3 |
| 06 | | LV > min. 3 | LV > min. 3 |
| 07 | | | |
| 08 | | | |
| 09 | | | |
| 10 | | | |
| 11 | Push button command on/open | | |
| 12 | Push button command off/closed | | |
| 13 | Control command | | |
| 14 | | | |
| …… | | | |
| 21 | Automatic command on/open | | |
| 22 | Automatic command off/closed | | |
| 23 | Control command | | |
| 24 | | | |
| ….. | | | |
| 31 | Protection command on/open | | |
| 32 | Protection command off/closed | | |
| 33 | Control command | | |
| 34 | | | |
| ….. | | | |
| ….. | | | |
| 51 | Check back not on/not open | LV < max. 1, check back not on/not open | LV < max. 1 |
| 52 | Check back not off/not closed | LV < min. 1, check back not off/not closed | LV < min. 1 |
| 53 | | LV < max. 2 | LV < max. 2 |
| 54 | | LV < min. 2 | LV < min. 2 |
| 55 | | LV < max. 3 | LV < max. 3 |
| 56 | | LV < min. 3 | LV < min. 3 |

NOTE LV = limit value.

Specifications for operation level are represented in Figure 24.




**Key**

1 operation level

**Figure 24 — Specifications for operation level**

### 6.7.2 Terminal designation

#### 6.7.2.1 General

The unambiguous designation of terminals is achieved by combining the reference designation and the terminal designation based on IEC 61666, see Figure 25.


**Figure 25 — Terminal designation**

#### 6.7.2.2 Designation block “Terminal”

This designation block is used for the designation of the terminals to technical products, see Figure 26.

The component's existing terminal designations are used here. If no terminal designations exist, they shall be generated in accordance with existing standards, such as EN 50005 and IEC 60445 for electrical engineering.

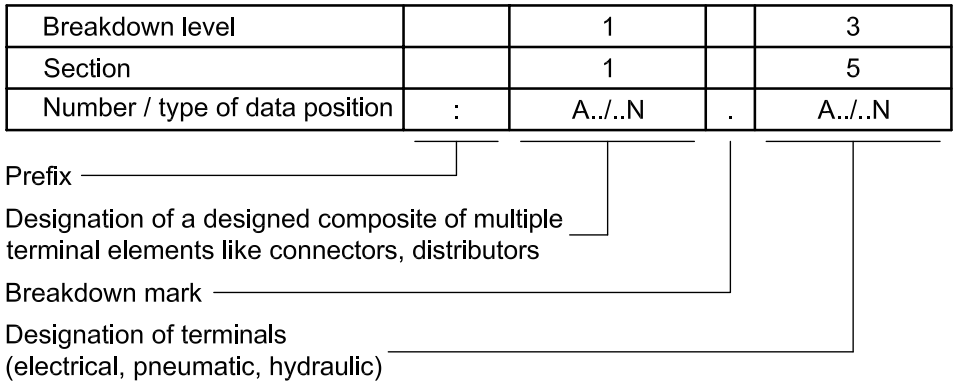



**Figure 26 — Structure and contents of designation block “Terminal”**

The breakdown mark "**.**" shall only be used if identical data characters occur successively in breakdown levels 1 and 3. If breakdown level 3 is used alone, the breakdown mark "**.**" shall be omitted.

The sections of the designation block shall not contain more than 12 data characters. Deviating from Rule 10 in 4.4, lowercase letters and special characters are permitted.

### 6.7.3 Document designation

#### 6.7.3.1 General

The non-manufacturer-specific, appropriate designation of documents is achieved by combining the object designation and the document kind classification code according to IEC 61355 together with a counting number (optional), see Figure 27.

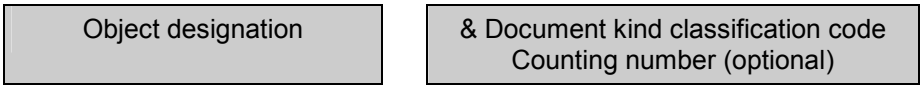



**Figure 27 — Document designation**

#### 6.7.3.2 Designation block "Document kind class"

This designation block is used for document designation distinguishing between information contents, independent of the information carriers of the documents, see Figure 28.

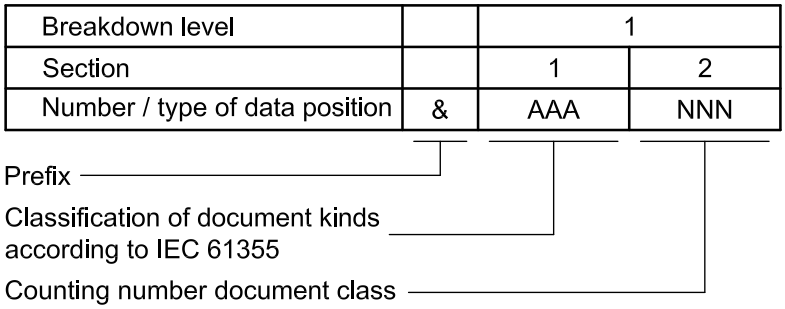



**Figure 28 — Structure and contents of designation block "Document kind class"**

In power plant engineering, the use of all three letters (in section 1) is mandatory, the use of the counting number (in section 2) is optional.

## 7 Application of designation

### 7.1 Combination of designation blocks

Depending on the task and designation complexity, designation blocks may be used alone or in combination for identification and localization of the technical objects.

When combining designation blocks, a distinction shall be made between the following:

a) **Linking** of two or more designation blocks in a new unambiguous designation (identifier), see Figure 29.

EXAMPLE Factory 1, power plant 2; turbine building, floor 3

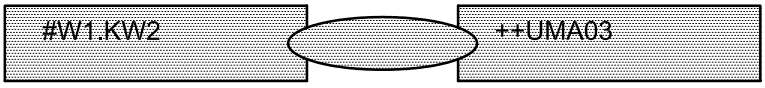



**Figure 29 — Linking two designation blocks**

The permitted links between various designation blocks are specified in Table 8.

**Table 8 — Permitted designation block link-ups**

| Designation blocks | | | | | |
|---|---|---|---|---|---|
| = | Function | – | Product | | |
| = | Function | – | Product | : | Connection |
| = | Function | – | Product | & | Document kind class |
| = | Function | ; | Signal name | | |
| = | Function | & | Document kind class | | |
| == | Functional allocation | ; | Signal name | | |
| == | Functional allocation | & | Document kind class | | |
| + | Point of installation | & | Document kind class | | |
| ++ | Location | & | Document kind class | | |

The designation block conjoint designation (#) may be linked with function, function allocation, point of installation, location and document kind class.

and

b) **Allocation** of a designation block or of a linked designation to one or more designation blocks or linked designations (associative relation), see Figure 30.

EXAMPLE Feed water piping system, train 12, isolation 1; power breaker 1

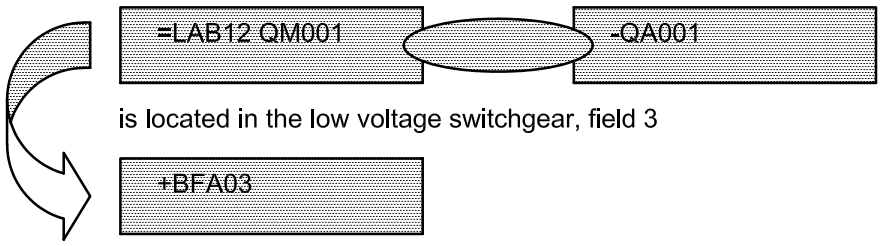



**Figure 30 — Allocation between a linked designation and a designation block**

## 7.2 Designation notation

### 7.2.1 General

Depending on the requirements, the designation blocks may be written individually, in combination, together or separately, but always with their prefixes.

Basically, objects shall be identified by their full identifier. However, where a first part of the designation is common to all objects of an assembly or to all objects represented in a document, then this common part may be shown only once. This is called a divided notation.

Divided notation is permitted only if the allocation of the reference designation remains clear.

The breakdown mark "**.**" (full stop) between individual breakdown levels shall be written if specified for an application in accordance with Clause 6.

### 7.2.2 Notation in technical documents

Designations may be written:

— in the title block;

— at the top left edge of the document page and/or at the boundary frames;

— at the separating lines and break points;

— in tables;

— at (next to) graphical symbols.

In divided notation, the complete designation comprises

a) the common designation part for the larger object of consideration, which is written at the top left edge of the document page and

b) the designation parts for smaller objects of consideration (sub-objects) placed at other locations in the document, e.g. at the boundary frame, adjacent to graphical symbols, to the signal break point, or in the text.

It shall be possible to compile complete designations easily. If there is any risk of misinterpretation, the full, undivided designation shall be used.

Rules for the notation at break points, for reference generation and for abbreviations or divided notation are specified in IEC 61082-1.

### 7.2.3 Notation in the plant

Rooms, technical equipment, components and installation locations shall be designated in such a way that simple identification and unambiguous reference to the documentation for reliable operation is ensured at all times. Divided notation is also permitted in the plant, provided this condition is fulfilled.

Subclause 7.2.2 applies analogously.

# Annex A
(normative)

# Representation of designations

The designation may be represented with or without spacing (blanks), but it shall be written in such a way that it cannot be misinterpreted. Spaced notation promotes the comprehensibility and mnemonic quality of designations. Designations may be spaced by the insertion of blanks at specified points in a single-line notation, or by multiple-line notation.

The permitted spaced notations are defined. Their application for each intended use shall be agreed between the parties to the project.

There are two methods, see Figure A.1:

a) “Small spacing”:

   Blanks between the breakdown levels for designations, which do not have to be recognized within a limited period of time.

b) “Large spacing”:

   Blanks between the alphabetical and numerical parts within the breakdown levels where the breakdown levels are more than four data characters long. This kind of spacing shall be used for example on designations in the control room, which have to be recognized in a short period of time.

| Line type | Small spacing | Large spacing |
|---|---|---|
| **Single line** | ANN AAANN AANNN AANNN | A NN AAA NN AA NNN AA NNN |
| **Multiple line** | ANN | A NN |
| | AAANN | AAA NN |
| | AANNN | AA NNN |
| | AANNN | AA NNN |

**Figure A.1 — Basic representation of designations with small and large spacing**

The proper position of prefixes in spaced writing is shown in Table A.1.

**Table A.1 — Examples of spaced notations**

| | |
|---|---|
| **#S5.B3 =LNA10 BL001 –BP002 :U+** | Site 5, works 3;<br>Upper-water, level 1, pressure-measuring transducer 2;<br>Terminal U+ |
| **#S5.B3 +BFA17.G4** | Site 5, works 3;<br>Installation place BFA, section 17;<br>Mounting point tier G, row 4 |
| **#S5.V1 ++UAA01.CH2** | Site 5, distribution 1;<br>Building UAA, storey 1;<br>Section CH2 |
| **=M 1 MBV 10 GP 001 -MA 001** | Machine group 1:<br>Gas turbine system, lubricant supply system;<br>Conveyance 1, electrical motor 1 |

NOTE Designation with spacing (blanks) may not be accepted by CAD/CAE systems.

# Annex B
(normative)

# Special stipulations

## B.1 Rules for letter codes

The letter codes to be used in power plant engineering and their designations are defined in IEC/PAS 62400 and in VGB B 101. These documents provide information on their application (description of system boundaries, etc.).

## B.2 System designations for driving systems

The designation of certain “components”, such as steam turbines used as drives for feed-water pumps, can be extremely complex so that, as “driving systems”, they need separate system designations in order to permit designation of all associated mechanical equipment as well as electrical and I&C equipment. The subgroups of the respective main group shall be used as system designations for these driving systems (see also the example in Figure D.7).

## B.3 Allocation of technical equipment to system designations

Mechanical installations, equipment and apparatus shall be designated based on the system within whose limits they are installed.

## B.4 Hangers and supports, racks, junction boxes

These auxiliary equipment items may be designated using function- or location-oriented designations.

Function-oriented designation shall be used when the auxiliary equipment can be clearly allocated to a particular system.

The location-oriented designation shall be used when different systems share the same auxiliary equipment.

## B.5 Special rules for mechanical engineering

### B.5.1 Valves

Valves are classified as FL (safety valves), QM (shut-off valves), QN (control valves) or RM (check/non-return valves) in the designation for technical equipment, independent of design, type or method of actuation.

Exceptions are pilot valves where the method of actuation is part of the code — KH (fluid-operated pilot valves) and KL (electric pilot valves).

Safety equipment (FL) comprising safety valves and associated piping shall be allocated to the system to which it is connected.

Emptyings, drains and vents, up to the last shut-off (including double) valve or up to the free outlet, shall be allocated to the system to be emptied, drained or vented (originator principle).

At supply systems and closed cooling-water systems, all the piping, including valves and other in-line equipment up to the inlet into, and outlet from, the consumer (system), shall be allocated to the supply system.

System shut-off valves for instrumentation loops shall be designated with the classification QM in the breakdown level 2 of the designation block “Function”.

Downstream shut-off and equalizing valves in the instrumentation loop are components of the instrumentation loop with classification QM.

### B.5.2 Supply systems

Supply systems which supply several main groups of breakdown level 1 in “= function” shall be designated as separate main groups with the following letter codes:

G Water supply, disposal and treatment;

K Nuclear auxiliary systems;

Q Auxiliary systems;

X Ancillary systems.

If several mechanical consumers are connected to a mechanical supply system, the following letter codes shall be used for the supply systems at the second or third data character in breakdown level 1 in “= function”:

V Lubricant supply;

W Sealing fluid supply;

X Fluid supply system for control and protection equipment.

This designation application is illustrated with an example for sealing fluid supply, W, in Table B.1.

**Table B.1 — Designation application for sealing fluid supply, W**

| Consumers | | Supply system | |
|---|---|---|---|
| **Class code** | **Denomination** | **Class code** | **Denomination** |
| LAB<br>LAC<br>LAD | Feed-water piping system<br>Feed-water pump system<br>HP feed-water heating system | LAW | Feed-water sealing-water system (common for LAB, LAC, LAD and other LA. systems) |
| LA.<br>LB.<br>LC. | Feed-water system<br>Steam system<br>Condensate system | LW. | Sealing-fluid supply system for water, steam, gas cycles (common for LA., LB., LC. and other L systems) |
| L..<br>M.. | Water, steam, gas cycles<br>Generation and transmission of electrical energy | Q.. | Auxiliary systems (common for L.. and M..) |

### B.5.3 Auxiliary equipment with supply tasks

Technical equipment with supply tasks without a separate classifying designation in breakdown level 1 of the function designation are designated in breakdown level 2 on the same level as the other technical objects within the affected subsystem.

## B.6 Special rules for civil engineering

If a building structure contains several process-engineering systems, the designation of this structure shall be specified based on the most important, dominant system.

The designation of duct and bridge structures shall be discussed among the parties to the project, considering priority aspects and depending on the structures to be connected.

## B.7 Special rules for electrical and I&C systems

### B.7.1 Cable penetrations through the reactor containment

Cable penetrations through the reactor containment shall be designated with JML = “cable penetration” in breakdown level 1 of “= function” and with X = “connection of objects” in the first data character of designation section 3.

### B.7.2 Cable penetrations on and in building structures

Where cable penetrations on and in building structures are to be designated, they shall be given the designation for the respective structure and floor in breakdown level 1.

### B.7.3 Identification of cable connections

#### B.7.3.1 Cable numbering

For an unambiguous identification of cable connections between electric equipment in different systems, a cable numbering should preferably be applied. The numbering scheme is given in Figure B.1. This is a well established and practice-proven procedure in power plant engineering.

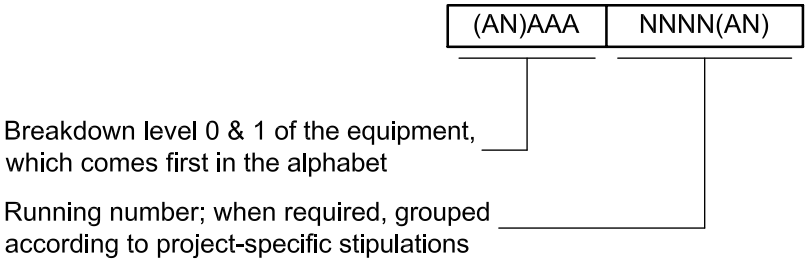



**Figure B.1 — Structure of the cable number**

In this method, cable connections between electric equipment in different systems are not considered as equipment with a reference designation. The cables are delivered as bulk material to the site, where the specific cable connections are made based on connection-describing documents. See Figure D.8 and Table D.1 for an example.

#### B.7.3.2 Cable designation

Electric connections with prefabricated cables (cable with plug connectors) within systems or physical units shall be considered as equipment (with order number, constituent of a part list) and therefore designated according to 6.5. See Figure D.9 and Table D.2 for an example.

This designation method may also be used in other cases provided the unambiguous nature of the cable designations is ensured.

### B.7.4 Measurements

Direct measurements are not designated by the measurement principle, but by the physical unit to be measured.

### B.7.5 Closed-loop control

Closed loop controls are identified according to the controlled variable (not by the final control element on which the control acts).

# Annex C
(informative)

# Stipulations between parties to the project

This part of ISO 16952 does not contain all the rules necessary for designating a project. There are areas for which clear definitions need to be stipulated between the purchaser (operator) and the vendor (supplier) in the form of project-specific requirements prior to the start of designation.

In this part of ISO 16952, such aspects are indicated by the remark “Details of application to be agreed between the parties to the project”.

A checklist is provided below as a basis (contents) for these agreements.

## C.1 General stipulations

General stipulations can include the following:

a) changes to denominations for functions, systems, plants (VGB B 101), technical equipment and components (IEC/PAS 62400), which are only possible as long as contents remain the same;

b) rules on numbering systems and direction of numbering for all designation sections entailing numbering;

c) rules on “conjoint designation” regarding content, scope, type and number of data positions;

d) rules on breakdown level 0 regarding content, scope, type and number of data positions;

e) rules on spacing for designation notation;

f) allocation of “free for use” available classifying code elements.

## C.2 Stipulations on function-oriented designation

These stipulations can include the following:

a) rules on numerical designation sections;

b) rules on designation for system-interfacing signal processing;

c) rules on designation for “signals and signal application” as well as allocation of subgroups in the main groups.

## C.3 Stipulations on location designation

These stipulations can include the following:

a) rules on numbering in designation of structures;

b) rules on room designation;

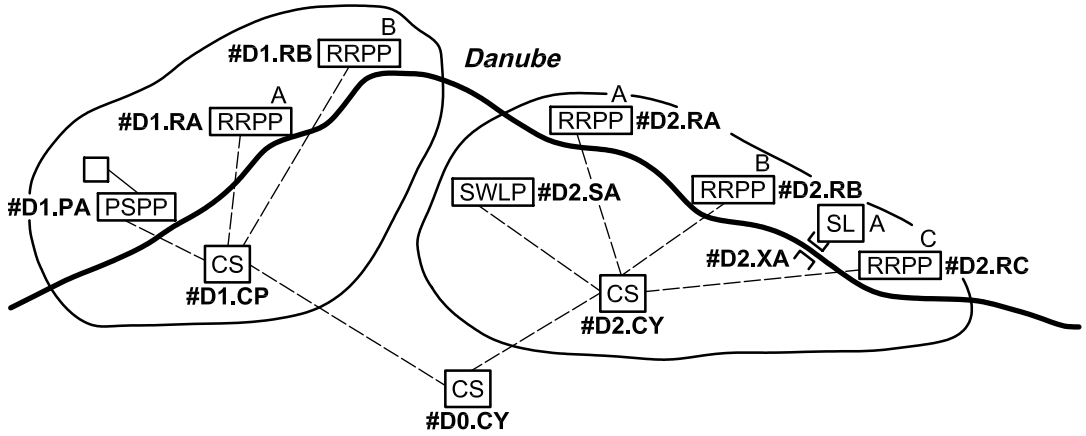
c) rules on structure designation for structures which contain several different systems;

d) rules on structure designation for duct and bridge structures as connecting structures.

# Annex D
(informative)

# Application examples

## D.1 Conjoint designation

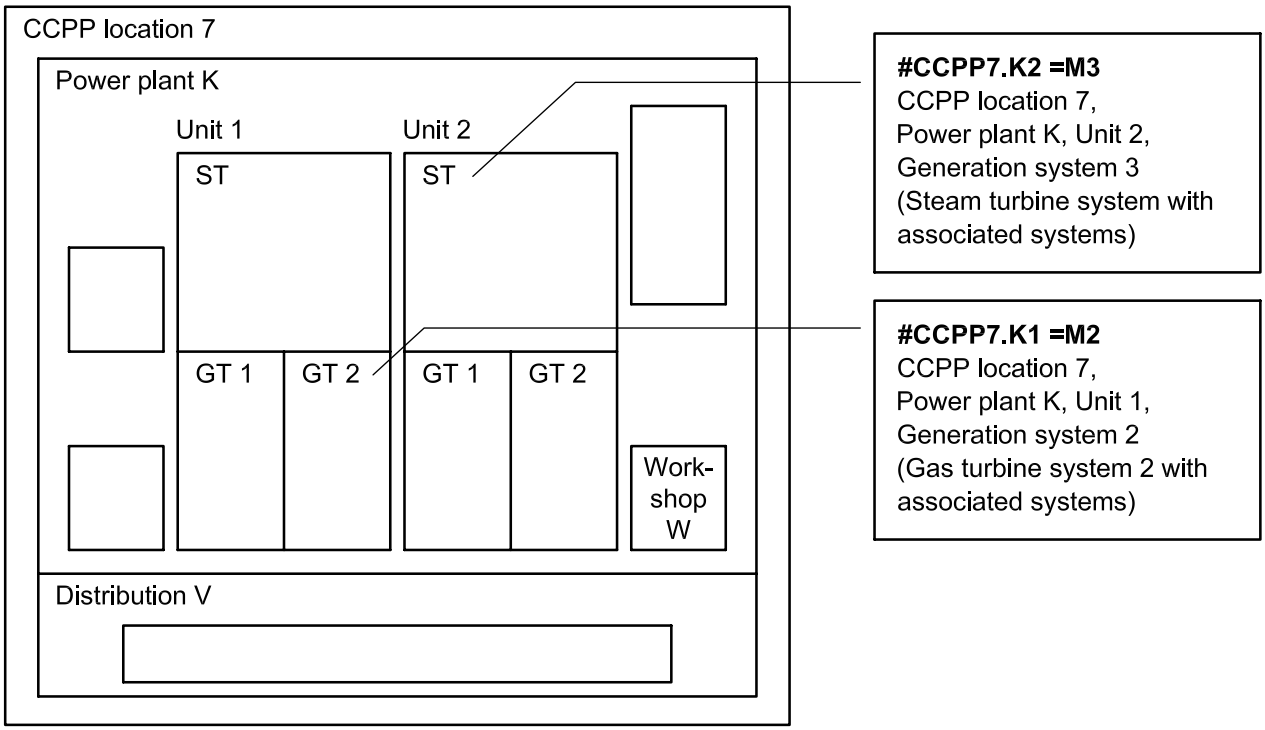



**Key**

| | |
|---|---|
| RRPP | Run-of-river power plant |
| PSPP | Pumped storage power plant |
| CS | Control station |
| SL | Sluice |
| SWPL | Outdoor switch plant 110 kV |

**Figure D.1 — Sites and hydro-power plants on the upper Danube**

## D.2 Functional designation, breakdown level 0



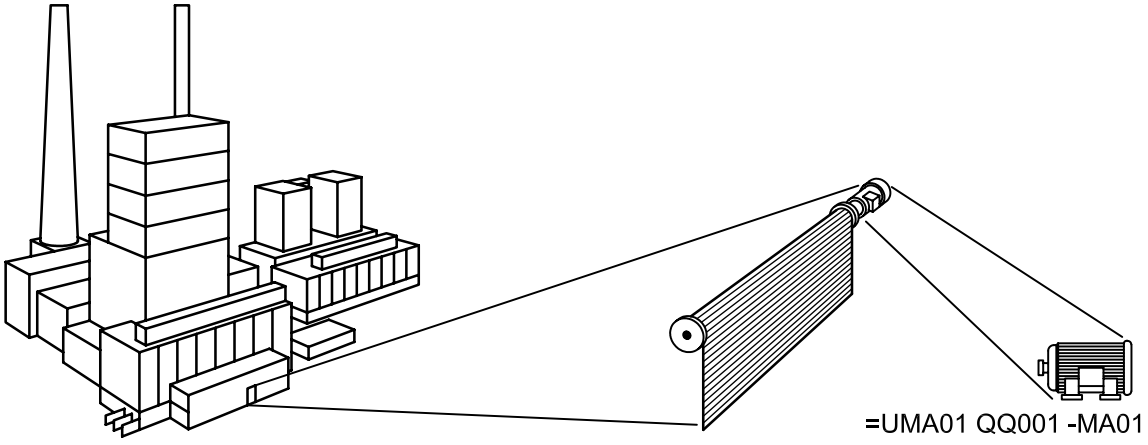

**Key**

ST Steam turbine

GT Gas turbine

**Figure D.2 — Main systems of a Combined Cycle Power Plant (CCPP)**

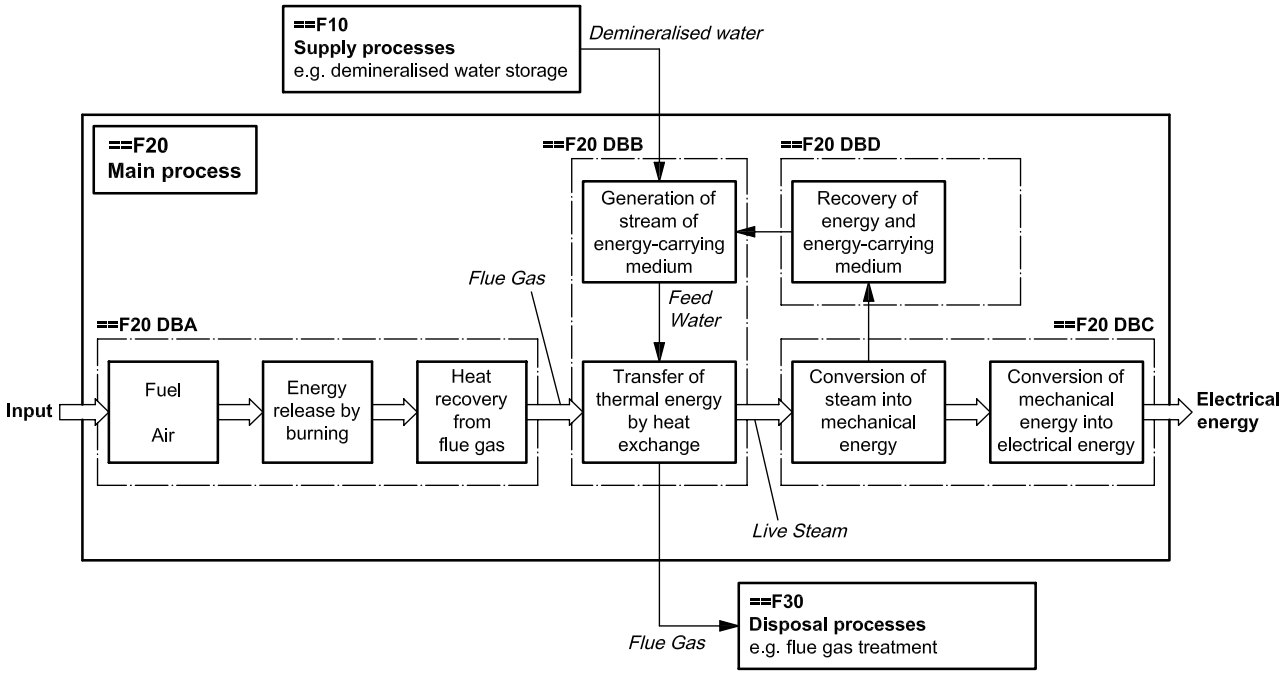
## D.3 Function designation in civil engineering




| Funcion | | Product |
|---|---|---|
| Engine house | opening/closing | Motor |
| =UMA01 | QQ001 | -MA01 |

**Figure D.3 — Rolling gate**

## D.4 Function allocation

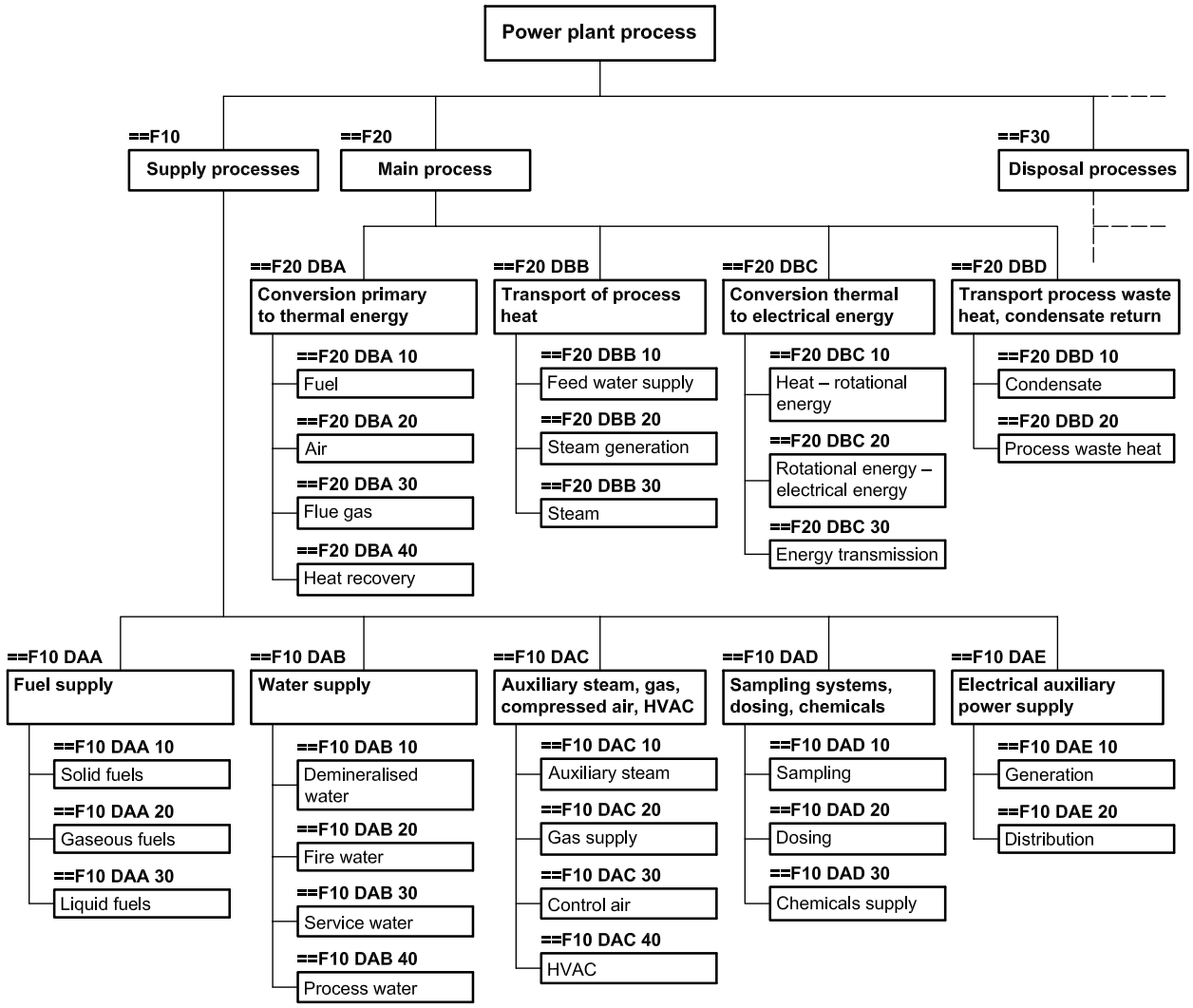



**Key**

Function areas: ==F10, ==F20, ==F30

Function groups: ==F20 DBA, ==F20 DBB, ==F20 DBC, ==F20 DBD

**Figure D.4 — Basic flow diagram of thermal power plant process with designation of function groups in the main process**




**Key**

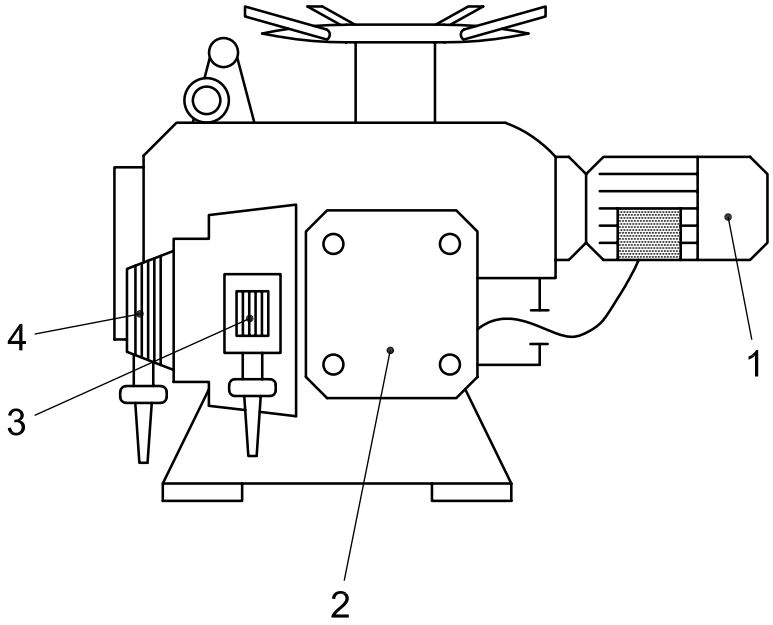
Function areas: ==F10, ==F20, ==F30

Function groups: e.g. ==F10 DAA, ==F20 DBA, ==F20 DBB

Function subgroups: e.g. ==F10 DAA 10, ==F20 DBB 20

**Figure D.5 — Structural diagram of a thermal power plant process**

## D.5 Nested product designation




**Key**

1 Driving motor **-MA01**

2 Terminal box -XG02

3 Control plug connector -XG01

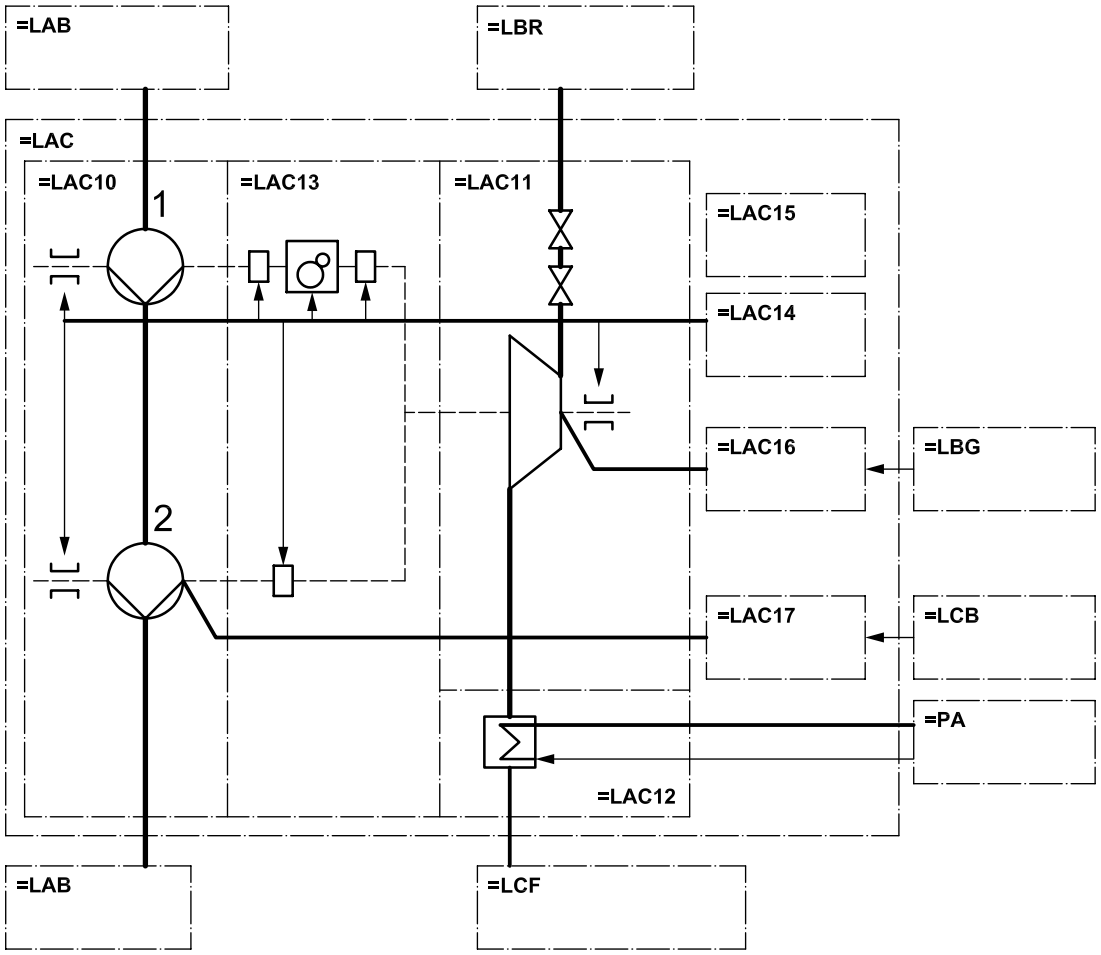
4 Power plug connector -XD01

Electric actuator =LAB15 QM021 **-QM01**

Electric actuator, driving motor =LAB15 QM021 **-QM01 MA01**

**Figure D.6 — Electric actuator**

## D.6 Drive system




**Key**

| | |
|---|---|
| 1 | booster pump |
| 2 | main pump |
| LAB | Feed water piping system |
| LAC | Feed water conveyance system |
| LAC10 | Pump subsystem (booster pump and main pump) |
| LAC11 | Drive subsystem |
| LAC12 | Condensation steam turbine drive |
| LAC13 | Power transmission |
| LAC14 | Bearing oil subsystem |
| LAC15 | Control fluid subsystem |
| LAC16 | Sealing steam subsystem |
| LAC17 | Sealing water subsystem |
| LBG | Auxiliary steam piping system |
| LBR | Steam piping system, steam turbine drive |
| LCB | Main condensate piping system |
| LCF | Condensate piping system, steam turbine drive |
| PA | Main cooling-water system |

**Figure D.7 — Feed water conveyance with steam turbine drive**

## D.7 Cable identification

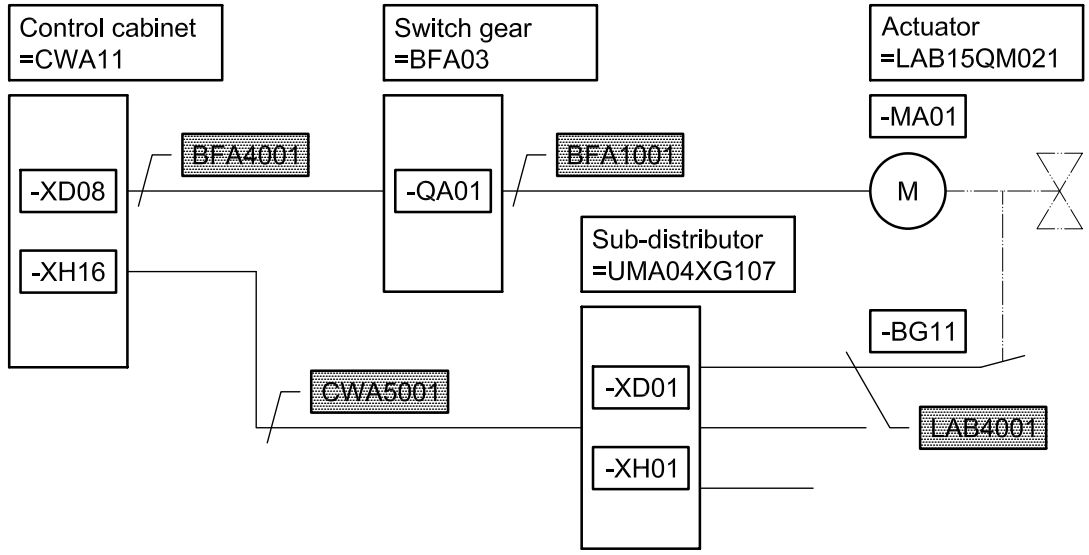



**Figure D.8 — Example of an interconnection diagram**

**Table D.1 — Example of a cable list**

| Cable number | from | | to | | Cable type [a] | Function allocation |
|---|---|---|---|---|---|---|
| | Equipment | Location | Equipment | Location | | |
| BFA1001 | =BFA03QA007 -QA01-XD01 | +BFA03.D2 | =LAB15QM021 -MA01 | ++UMA04 | LEK17 | ==LAB15QM021 |
| BFA4001 | =BFA03QA007 -QA01-XD19 | +BFA03.D2 | =CWA11XD001 -XD08 | +CWA11 | SAK02 | ==LAB15QM021 |
| CWA5001 | =CWA11XD001 -XH16 | +CWA11 | =UMA04XG107 -XH01 | ++UMA04 | LWL3 | ==LAB15QM021 |
| LAB4001 | =LAB15QM021 -BG11 | ++UMA04 | =UMA04XG107 -XD01 | ++UMA04 | STK01 | ==LAB15QM021 |

[a] For cable type, see cable type catalogues.

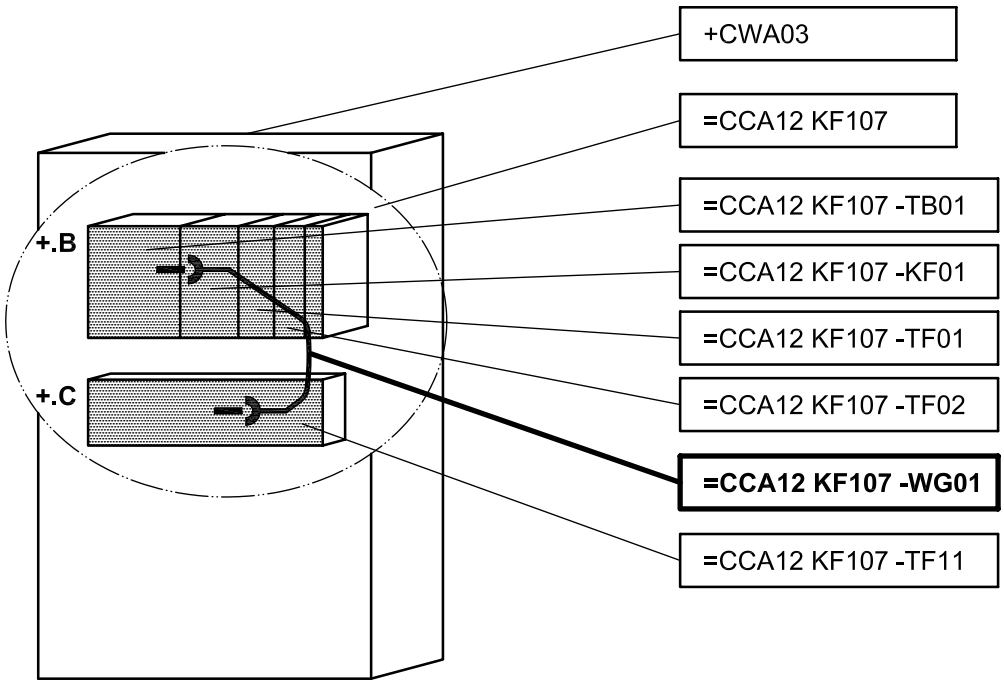



**Figure D.9 — Example of a layout plan of an automation installation**

**Table D.2 — Example of a parts list of an automation installation (incl. a prefabricated cable)**

| Equipment designation<br>=CCA12 KF107 | Point of installation designation<br>+CWA03 | Denomination | Product number | Manufacturer |
|---|---|---|---|---|
| -KF01 | +.B02 | CPU | PM1122 | **ABC** |
| -TB01 | +.B01 | PS-Module | PS3112 | **ABC** |
| -TF01 | +.B03 | I/O-Module | SM4301 | **ABC** |
| -TF02 | +.B04 | I/O-Module | SM4301 | **ABC** |
| -TF11 | +.C | I/O-Module | FM0816 | **ABC** |
| **-WG01** | | **Control cable** | **SK-05-2ST** | **B&B** |

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

[4] 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*

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