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Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations —

Part 10: Power supply systems

Systèmes industriels, installations et appareils, et produits industriels — Principes de structuration et désignations de référence —

Partie 10: Centrales électriques

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 10, *Technical product documentation*, Subcommittee SC 10, *Process plant documentation*, in cooperation with the Technical Committee IEC/TC 3, *Information structures and elements, identification and marking principles, documentation and graphical symbols*.

This document cancels and replaces ISO/TS 81346-10:2015, which has been technically revised.

The main changes are as follows:

— converted to an International Standard;

— structure adapted to that of IEC 81346-1;

— only requirements constituting a modification or addition to those of IEC 81346-1 have been included;

— reference is made to ISO 81346-12, with which this document is intended to be used, if needed;

— the abbreviation RDS-PS is introduced for reference designation system for power supply systems, providing an identifier to reference designation systems according to this document.

Documents in the 80000 to 89999 range of reference numbers are developed by collaboration between ISO and IEC.

A list of all parts in the ISO 81346 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document considers and supports planning, erection, utilization and operation of power supply systems. The application of a reference designation system for power supply systems (RDS-PS) can lead to restructuring and reorientation of these activities and thereby offers chances and potential of increasing efficiency and economization.

This document has shifted from the focus of the previous technical specification (ISO/TS 81346-10:2015), where fixed syntax and focus on coding mechanism were dominant, towards full flexibility in dividing systems into system elements in a non-fixed manner (i.e. no fixed syntax), using one or more aspects at the same time to designate objects of interest. Locations can also be designated accordingly in order to reference the location of objects. Annex E provides a mapping of letter codes between ISO/TS 81346-10:2015 and this document.

Furthermore, this document is aligned with ISO 81346-12 for construction works (referred to as RDS-CW), in order to support harmonization of methods and principles for forming reference designations across the industry-specific applications of the ISO 81346 series.

The following advantages of designation systems in accordance with this document and the IEC/ISO 81346 series in general will become increasingly important in the future. The following should be noted:

— The reference designation system can be applied in several technical fields in the same way and is not designed for one field only. Therefore, process, mechanical, electrical and structural design, for example, can be treated in the same way, which is a basis for company-wide synergy effects.

— The reference designation system allows for integrating any kind of systems and components without changing the once-defined designations.

— The reference designation is not bound to a fixed structural pattern. Thus, the designation system is vertically and horizontally expansible, which can make the interpretability in some cases quite complex. Therefore, an exact documentation and description of the designation system is important when it is applied.

— The application of different aspects allows for the designation of system elements by function, realizing products or location independently of each other.

— The different aspects used for structuring and the possibility of creating relations between objects represented in these structures offer search and filter criteria and information correlations in a much greater variety than before.

The users of this document will be able to manage objects and related properties in a more efficient and consistent way. When implemented, information across various data processing systems can be handled in an unambiguous way. Other information structures besides those described in this document are:

— organization structures;

— utilization structures;

— cost structures;

— performance structures;

— real estate structures.

This document is applicable for all types of assets used for energy conversion and provision to transmission, distribution or local energy networks, for example:

— large central conventional or renewable power generation systems

  — thermal power plants;

  - hydropower plants;
  - nuclear power plants;
  - onshore and offshore wind farms;
  - photovoltaic and solar power plants;
  - geothermal plants;
- distributed and/or renewable energy resources
  - wind turbine generators;
  - diesel and gas generators;
  - photovoltaic, solar thermal and combined heat and power (CHP) units;
  - generation from combustible renewables;
- storage or a combination of storage technologies
  - thermal storage;
  - electrochemical storage;
  - electrical storage;
  - mechanical storage;
- power to X technologies
  - power to gas;
  - power to liquid;
  - power to heat;
- transmission and distribution systems, including technical equipment provided by such systems.

New technologies with the purpose of reducing CO_2 emissions, such as coal gasification, air separation and amine scrubbing, are also covered by this document. It applies, furthermore, to digital process control systems, operational management systems (e.g. asset management systems and virtual power plants used for demand response or aggregation) and the designation of related application software.

Due to the natural diversification of international energy infrastructures, this document will enable and support the establishment of regional or branch-specific application profiles in order to provide the required level of interoperability of designations among different stakeholder groups.

Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations —

Part 10:
Power supply systems

1 Scope

This document provides rules for structuring of systems in the domain of power supply systems, being supplementary to the general principles for the structuring of systems including structuring of information about systems specified in IEC 81346-1.

Based on these principles, rules and guidance are given for the formulation of unambiguous reference designations for objects in any system.

The reference designation identifies objects for the purpose of creation and retrieval of information about an object and, where realized, about its corresponding component.

A reference designation labelled at a component is the key to finding information about that object among different kinds of documents.

The principles are general and are applicable to all technical areas (e.g. mechanical engineering, electrical engineering, construction engineering, process engineering). They can be used for systems based on different technologies or for systems combining several technologies.

This document also defines classes for systems and spaces in the field of power supply systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 81346-1:2022, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 1: Basic rules*

IEC 81346-2:2019, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 2: Classification of objects and codes for classes*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 81346-1 and IEC 81346-2 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
building
construction entity (3.3) that has the provision of shelter for its occupants or contents as one of its main purposes, usually partially or totally enclosed and designed to stand permanently in one place

[SOURCE: ISO 6707-1:2020, 3.1.1.3, modified —*works* replaced by *entity* and Note 1 to entry deleted.]

3.2
construction complex
aggregate of one or more *construction entities* (3.3) intended to serve at least one function or user activity

[SOURCE: ISO 12006-2:2015, 3.4.1, modified — Note 1 to entry deleted]

3.3
construction entity
independent unit of the built environment with a characteristic form and spatial structure, intended to serve at least one function or user activity

[SOURCE: ISO 12006-2:2015, 3.4.2, modified — Note 1 to entry deleted]

3.4
component system
system of one or more components providing a fundamental self-contained function

3.5
control
purposeful action on or in a process to meet specified objectives

Note 1 to entry: Actions include measuring, counting, monitoring, indicating, alerting, recording, logging, manipulating, evaluating, optimizing, intervening and configuring.

[SOURCE: IEC 60050-351:2013, 351-42-19, modified — Note 1 to entry replaced, Note 2 to entry and Figure 29 deleted.]

3.6
equipment
aggregation of functional elements or assembly of components and modules that belong together in one physical unit of a *plant* (3.10) or in a functional unit of a system

[SOURCE: ISO 16484-2:2004, 3.73, modified — Notes 1 and 2 to entry deleted.]

3.7
host installation aspect
location aspect relating objects to locations inside or on a product or product assembly

Note 1 to entry: Product or product assembly is not to be confused with reference designations based on the product aspect.

3.8
inherent function
function of an object, independent of any application of the object

3.9
power supply system
system representing a process for conversion, transmission and/or distribution of energy

3.10
plant
assembly of different systems on a specific site

[SOURCE: IEC 61355-1:2008, 3.10]

3.11
site of installation aspect
location aspect relating objects to locations inside a *space* (3.12)

3.12
space
limited three-dimensional extent defined physically or notionally

[SOURCE: ISO 12006-2:2015, 3.1.8]

3.13
technical system
object with characteristics which predominantly represents a coherent technical solution with an *inherent function* (3.8)

[SOURCE: ISO 81346-12:2018, 3.21]

3.14
works
system of industrial complexes and the associated infrastructure in one location

4 Concepts

4.1 General

The requirements of IEC 81346-1:2022, Clause 4, apply.

4.2 Object

The requirements of IEC 81346-1:2022, 4.1, apply.

4.3 Aspect

The requirements of IEC 81346-1:2022, 4.2, apply.

4.4 Systems

4.4.1 General

The requirements of IEC 81346-1:2022, 4.3, apply with the following additions:

In the context of this document, all objects are seen as systems and/or system elements.

The system concept allows a designer to handle wholes (as distinct from parts). By identifying related systems, the relationships among these can be determined and monitored, for example to ensure that all systems operate correctly.

Systems and system elements bring together a set of objects for a task that none of the objects can accomplish on their own.

4.4.2 Power supply systems

Power supply systems are those systems used to convert, transmit, distribute or store energy and to manage such systems.

Power supply systems shall be classified in accordance with the scheme defined in Annex B, Table B.1.

A power supply system may incorporate another power supply system recursively as one of its elements.

4.4.3 Technical systems

Technical systems are those systems that are not by themselves considered to be power supply systems but represent technical solutions useful for the realization of a power supply system.

Technical systems shall be classified in accordance with the scheme defined in Annex B, Table B.2.

A technical system may incorporate another technical system recursively as one of its elements.

4.4.4 Component systems

Component systems are systems that are well defined with respect to both their inherent function and implementation. Component systems are used as part of technical systems and may also be referred to power supply systems.

Component systems shall be classified in accordance with IEC 81346-2:2019, Table 3.

A component system may incorporate another component system recursively as one of its elements.

4.5 Structuring

The requirements of IEC 81346-1:2022, 4.4, apply.

4.6 Function

The requirements of IEC 81346-1:2022, 4.5, apply.

4.7 Products and components

The requirements of IEC 81346-1:2022, 4.6, apply.

4.8 Location

4.8.1 General

The requirements of IEC 81346-1:2022, 4.7, apply.

Two different location aspects shall be applied:

— Host installation aspect: this location aspect shall be applied to relate the location of an object to locations inside or on a product or product assembly.

EXAMPLES Locations within or on a cubicle, a console or a panel.

— Site of installation aspect: this location aspect shall be applied to relate the location of an object to a location defined inside a larger location, irrespective of the existence of physical objects making up that larger location.

EXAMPLES A site, a construction complex, a construction entity (a building), a part of a building, a storey, a room, an outside area, a green area, a park area.

4.8.2 Construction complexes

Construction complexes are spaces which are an aggregation of construction entities in the context of this document. Construction complexes are used to represent spaces, i.e. locations, within the site installation aspect.

Classes of construction complexes are shown in Annex C, Table C.1.

A construction complex may recursively incorporate another construction complex as one of its elements.

4.8.3 Construction entities

A construction entity is an independent unit of a built environment forming a construction complex. In the context of this document, construction entities are used to represent spaces, i.e. locations, within the site installation aspect.

Classes of construction entities are shown in Annex C, Table C.2.

A construction entity may recursively incorporate another construction entity as one of its elements.

4.8.4 Construction spaces

Construction spaces are spaces, i.e. locations, within the site installation aspect that are well defined with respect to their intended use. Construction spaces are used as part of construction entities and may also be referred to as construction complexes.

Construction spaces shall be classified in accordance with IEC 81346-2:2019, Table 4.

A construction space may recursively incorporate another construction space as one of its elements.

4.9 Types

The requirements of IEC 81346-1:2022, 4.8, apply.

4.10 Object occurrences and product individuals

The requirements of IEC 81346-1:2022, 4.9, apply.

4.11 Relations between concepts

The requirements of IEC 81346-1:2022, 4.10, apply.

4.12 Management aspect

For the purpose of this document, the management aspect signifies an aspect of the considered system that is not covered by the other aspects defined. The management aspect is used to relate objects within the considered system to the system independent of any other aspects.

The application of the management aspect shall be explained in supporting documentation. See also IEC 81346-1:2022, 5.7.

NOTE This aspect was formerly known as the “conjoint aspect”.

5 Structuring principles

5.1 General

The requirements of IEC 81346-1:2022, 5.1, apply.

5.2 Forming structures

The requirements of IEC 81346-1:2022, 5.2, apply.

5.3 Function-oriented structure

The requirements of IEC 81346-1:2022, 5.3, apply.

A function-oriented structure is important for the full life cycle of a system, for example system design, design of process and control functions, commissioning and locating failures of functionality, service operations and optimization works during system operation.

A reference designation based on a function-oriented structure may be shown in any kind of document, for example an overview diagram, a process diagram, a function diagram or a circuit diagram.

5.4 Product-oriented structure

The requirements of IEC 81346-1:2022, 5.4, apply.

A product can realize one or more functions, for example a heat exchanger can heat or cool, an ornament can be used for covering and for providing a presentation of some artwork. Several control functions can be implemented in one control system unit.

A product can, alone or together with others, be located at one or more locations, for example a measuring system with location of measuring unit and displaying unit or a duct system extended to several different locations.

For the structuring and assessment of objects in planning and implementation as preparation of the operation phase, the product-oriented aspect is important, for example for assembling and maintenance.

A reference designation based on a product-oriented structure may be shown in any kind of document, for example product description, construction drawing, assembly drawing, exploded view drawing, network part drawing or maintenance instruction. Such a reference designation will only designate the product occurrence within a system and not the real-world product individual being used.

5.5 Location-oriented structure

The requirements of IEC 81346-1:2022, 5.5, apply.

A location-oriented structure is used for locating objects.

A reference designation based on a location-oriented structure may be shown in any kind of document, for example a site plan, a floor plan, a sectional drawing, an elevation drawing, a ground plan, an arrangement drawing or an installation drawing.

The following separate location-oriented structures shall be made, if applicable:

— host installation-oriented structure utilizing the host-installation aspect;

— site installation-oriented structure utilizing the site installation aspect.

A host installation-oriented structure may be based on a coordinate system, a defined grid zone, area or similar. It may also be based on a physical product, e.g. a cabinet.

5.6 Type-oriented structure

The requirements of IEC 81346-1:2022, 5.6, apply.

A type-oriented structure may be used to relate object occurrences to a company's object-type library or a company's product catalogue (the compilation of information about their products) or to a project-type library.

A reference designation based on a type-oriented structure may be shown in any kind of document and is especially applicable to object libraries and bills of quantities.

5.7 Structures based on "other aspects"

The requirements of IEC 81346-1:2022, 5.7, apply.

A management-oriented structure is based on the subdivision of the system into constituent objects with respect to the management aspect without taking into account other possible aspects of these objects.

On a power supply site, it is recognized that different systems, such as generators, switchgears or buildings, can exist. The management aspect is used to relate these units with respect to the site, without considering the other aspects defined. The management information aspect is often used as site reference in asset management systems, where all aspect-related designation structures are related to.

A reference designation based on a management-oriented structure may be shown in any kind of document.

5.8 Structures based on more than one aspect

The requirements of IEC 81346-1:2022, 5.8, apply.

6 Construction of reference designations

6.1 General

The requirements of IEC 81346-1:2022, 6.1, apply.

6.2 Format of reference designations

6.2.1 Single level

The requirements of IEC 81346-1:2022, 6.2.1, apply.

Except for designation of spaces, a single-level reference designation shall be formed by applying the method of a prefix followed by a letter code followed by a number.

IEC 81346-1:2022, 6.2.1, Rule 7 does not apply. Instead, the following applies:

The prefix signs used to indicate the type of aspect in a reference designation shall be:

a) "=" (EQUALS SIGN) when relating to the function aspect of the object;

b) "–" (MINUS SIGN) when relating to the product aspect of the object;

c) "+" (PLUS SIGN) when relating to the host installation aspect of the object;

d) "++" (PLUS SIGN, PLUS SIGN) when relating to the site installation aspect of the object;

e) "%" (PERCENT SIGN) when relating to the type aspect of the object;

f) "#" (NUMBER SIGN) when relating to the management aspect of the object.

6.2.2 Multi-level

The requirements of IEC 81346-1:2022, 6.2.2, apply.

6.2.3 Use of letter codes

The requirements of IEC 81346-1:2022, 6.2.3, apply.

Where a two-letter code for a technical system or construction entity is not applicable or possible to determine, it is recommended that the relevant one-letter code is applied followed by the character "?" (QUESTION MARK) to indicate a missing sub-class.

Where a three-letter code for a component system or construction space is not applicable or possible to determine, it is recommended that the relevant one-letter code or two-letter code is applied, followed by the characters "??" (two QUESTION MARKs) or "?" (QUESTION MARK), respectively, to indicate a missing sub-class(es).

Figure 1 illustrates the application of the ONE- TWO- and THREE-letter codes related to power supply systems (ONE), technical systems (TWO) and component systems (THREE). Figure 2 provides the same illustration related to construction complexes (ONE), construction entities (TWO) and construction spaces (THREE).

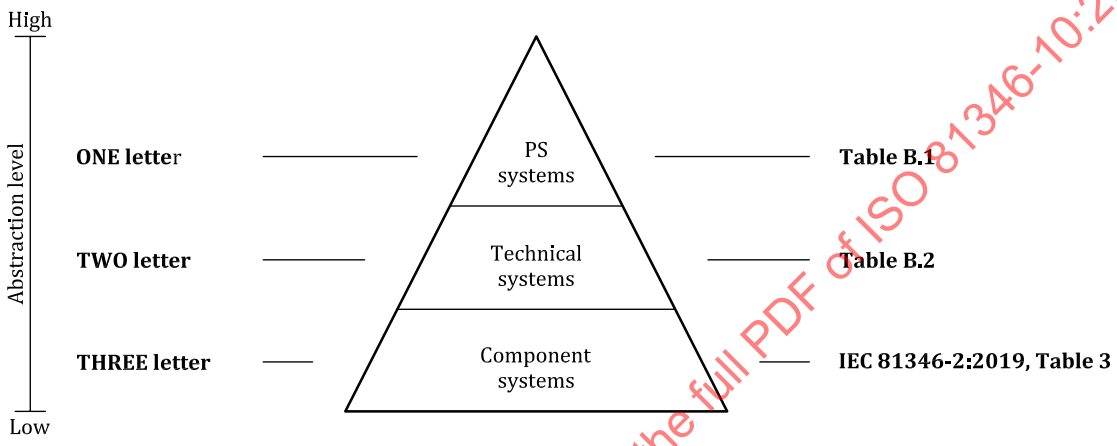


Figure 1 — Classes of power supply, technical and component systems

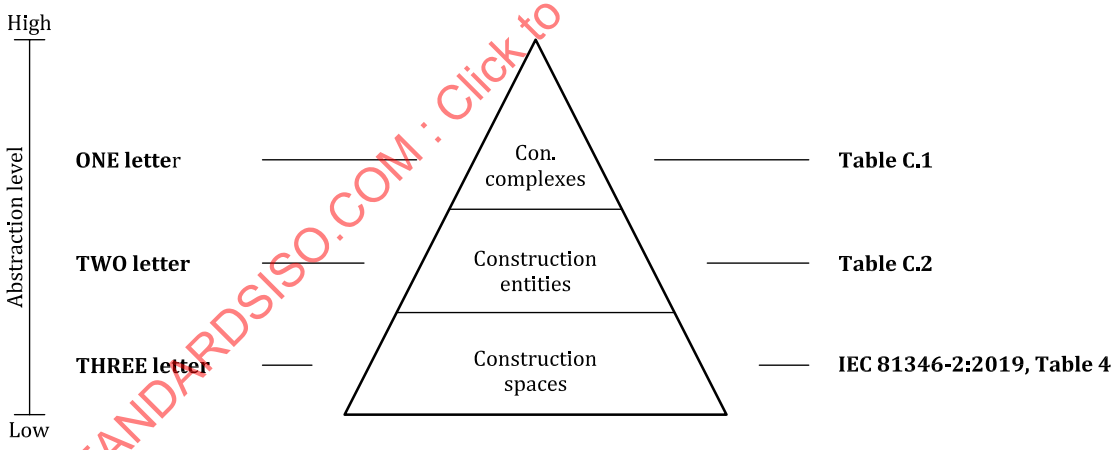


Figure 2 — Classes of construction complexes, entities and spaces

Annex B for letter codes for classes of power systems or technical systems shall be used for designation of objects within a function-orientated structure, or product-orientated structure or designation of types.

See Annex C for letter codes for classes of construction complexes or construction entities to be used for designation of objects within a location-orientated structure.

Table 1 shows examples of the use of "?" in a letter code, and Table 2 shows examples of reference designation in accordance with this document.

Table 1 — Example of application of wildcard in selection of a motor

Class designation	Object	Examples
MA?	Electromagnetic rotational driving object (class MA) with no further division of type	Motor of any kind (unspecified)
MAA	Electromagnetic rotational driving object providing continuous rotation (class MAA)	Electric motor, AC motor, DC motor
MAB	Electromagnetic rotational driving object providing discrete rotational steps (class MAB)	Stepper motor, servo motor

Table 2 — Examples of objects or systems

Object or system	Reference designation
Condensate system (derived from Class C "Power supply system transporting energy or energy carrier")	= C2
Low pressure preheater system 1 Part of condensate system	= C2 = HD1 or = C2.HD1
Main pump Part of feed water pump system 2 Part of feed water pump system Part of feed water system	= C1 = KE2 = KE1 = GP?1 or = C1.KE2.KE1.GP?1
Voltage metering 11 Part of electrical backup supply system 3 Part of internal electrical supply system 1	-D1-HD3-BE?11 or -D1.HD3.BE?11
Cabinet 1 Part of 230 V supply system 4 Part of electrical auxiliary system 2	+D2+HD4+UCA1 or +D2.HD4.UCA1
Slot 02 Part of top hat rail AB Part of cabinet 5	+UCA5+AB+02 or +UCA5.AB.02
Machine room 1 Part of gate entity 2 Part of reservoir complex 1	++Q1++UH2++DBA1 or ++Q1.UH2.DBA1

Annex D provides application examples of reference designations for power supply systems.

Rule 15 c) of IEC 81346-1:2022, 6.2.3 does not apply. Instead, the following applies.

Letter codes indicating the class of power supply systems shall be selected from Table B.1.

Letter codes indicating the class of technical systems shall be selected from Table B.2, preferably applying the two-letter codes.

Letter codes indicating the class of components systems shall be selected from IEC 81346-2:2019, Table 3, preferably applying the three-letter codes.

Letter codes indicating the class of construction complexes shall be selected from Table C.1.

Letter codes indicating the class of construction entities shall be selected from Table C.2, preferably applying the two-letter codes.

Letter codes indicating the class of construction spaces shall be selected from IEC 81346-2:2019, Table 4, preferably applying the three-letter codes.

6.3 Different structures within the same aspect

The requirements of IEC 81346-1:2022, 6.3, apply.

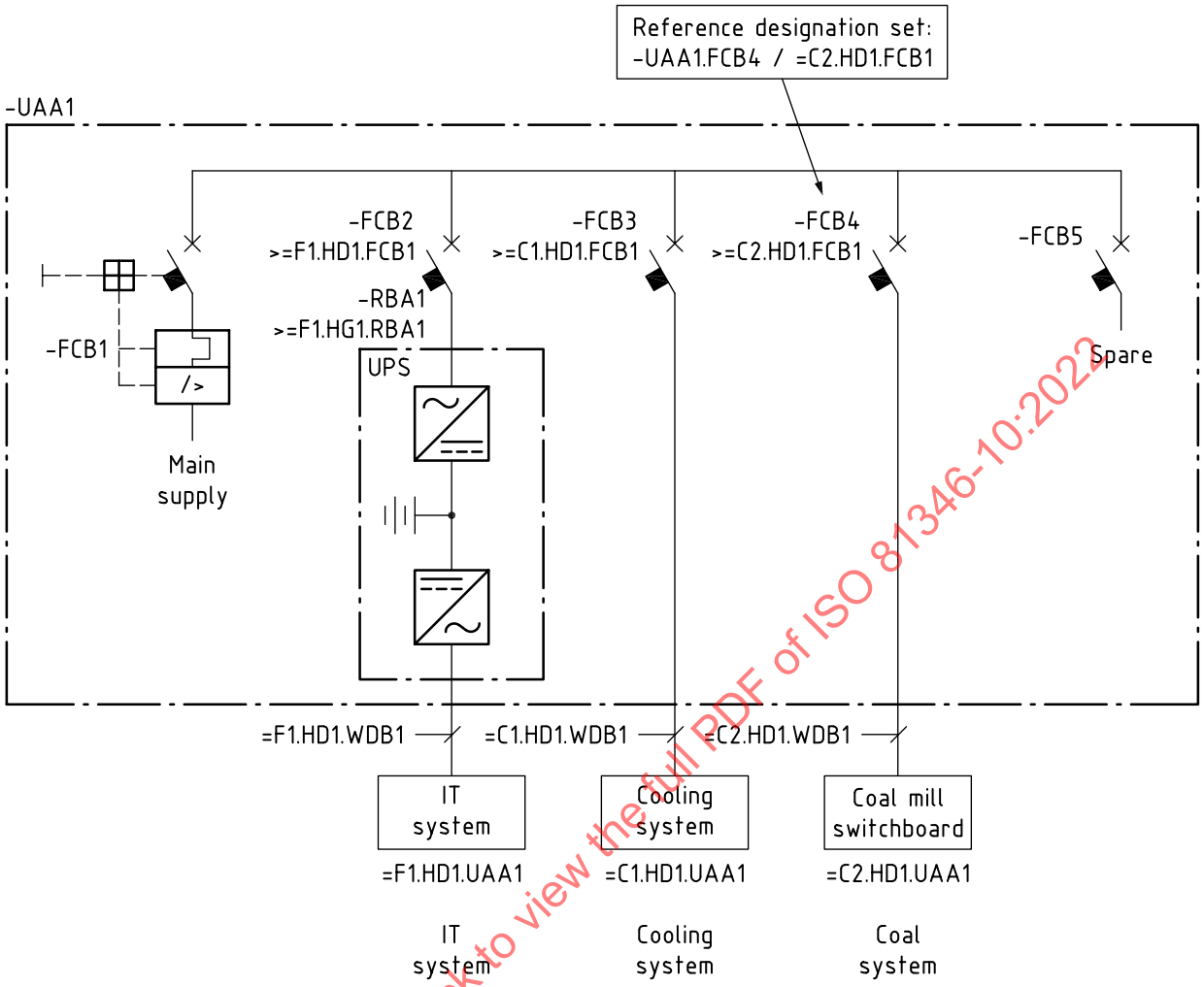
7 Reference designation set

The requirements of IEC 81346-1:2022, Clause 7, apply.

A reference designation set is useful where a supplier with no knowledge of the further functional use by the client can decide to designate the product(s) by making a product structure based on the product aspect only, and thereby disregard the functionality of the system delivered. The client's general engineering can designate the system by the functional aspect independently of the solution made.

Figure 3 shows an example of an electrical diagram where the manufacturer of the switchboard has designated the components by single level reference designations using the product aspect (e.g. -FCB4) irrespective of the functionality they form part of, whereas the functionality the components form part of is designated with multi-level reference designations (e.g. = C2.HD1.FCB1). Figure 3 shows that one object (e.g. a circuit breaker) has multiple reference designations, here: (=) and (-), put together as a reference designation set.

NOTE Further information can be found in IEC 61082-1:2014, 5.20.1 and Figure 17 and ISO 15519-1:2010, 7.2.4 and Figure 6.



NOTE The sign ">" (greater than) implies that the reference designation is complete and not to be concatenated to any other reference designations in the actual presentation, see IEC 81346-1.

Figure 3 — Reference using two aspects (=) and (-) for designation

8 Designation of locations

The requirements of IEC 81346-1:2022, Clause 8, apply.

9 Presentation of reference designations

The requirements of IEC 81346-1:2022, Clause 9, apply.

10 Labelling

The requirements of IEC 81346-1:2022, Clause 10, apply.

11 Designation of properties

The requirements of IEC 81346-1:2022, Clause 11, apply.

Table 3 illustrates how properties of objects relevant within the domain of power supply systems can be designated.

Table 3 — Examples of how to add properties

Object	Property	Property data and reference	Reference designation with property information
Turbine no. 1	Power rating	750 kW	%RB1 (750 kW)
Preheater no. 1	Heating capacity	73 MW	%HE1 (73 MW)
Pump no. 2	Capacity (pressure, volume flow)	400 bar, 1 m^3/s	= GPA02 (400 bar, 1 m^3/s)

12 Application of the reference designation system

The requirements of IEC 81346-1:2022, Clause 12, apply.

The reference designation system allows the same object to be designated based on viewing the objects using different or multiple aspects. It is even possible to apply different application parts of the IEC/ISO 81346 series for defining those reference designations or to apply different application parts for different parts of the system considered.

In the context of this document, the application of ISO 81346-12 (RDS-CW) should be used for all systems belonging to the construction works domain. This includes buildings, general housing, garages and workshops, roads and access tunnels. It also includes dam constructions, but not key systems for the power generation process within the dam (e.g. floodgates) as these shall be considered part of the supply or storage system, as they are a sub-function of the reservoir system.

Where reference designations according to RDS-CW are used, these should be formed by applying a top-node identifier in accordance with IEC 81346-1:2022, 6.3, see Figure 4.

Figure 4 shows an example where a dam is used to make the reservoir used in the process of producing electrical energy by hydro power. At the same time, from another point of view, the dam is a wall with design parameters allocated to it. However, the sluice which controls the flow of water is both a part of the production process and built into the dam physically.

Based on the classification scheme of RDS, a dam is classified as a wall in RDS-CW and a reservoir is classified as an open tank in RDS-PS. RDS thus offers the product aspect to structure the construction works of the dam itself (as a product), including walls, decks, gangways and lighting, but also the sluice gates built into the dam and the function aspect to create the functional structure of the hydro power process plant, including the sluices in the reservoir.

In projects using different RDS structures, it is recommended that a project-specific designation specification is introduced at an early stage in order to unambiguously specify the application of the different RDS structures for specific parts of the project, such as buildings, structures, systems and lots. This designation specification should be maintained during the project and be made available for all stakeholders involved in reference designation activities.

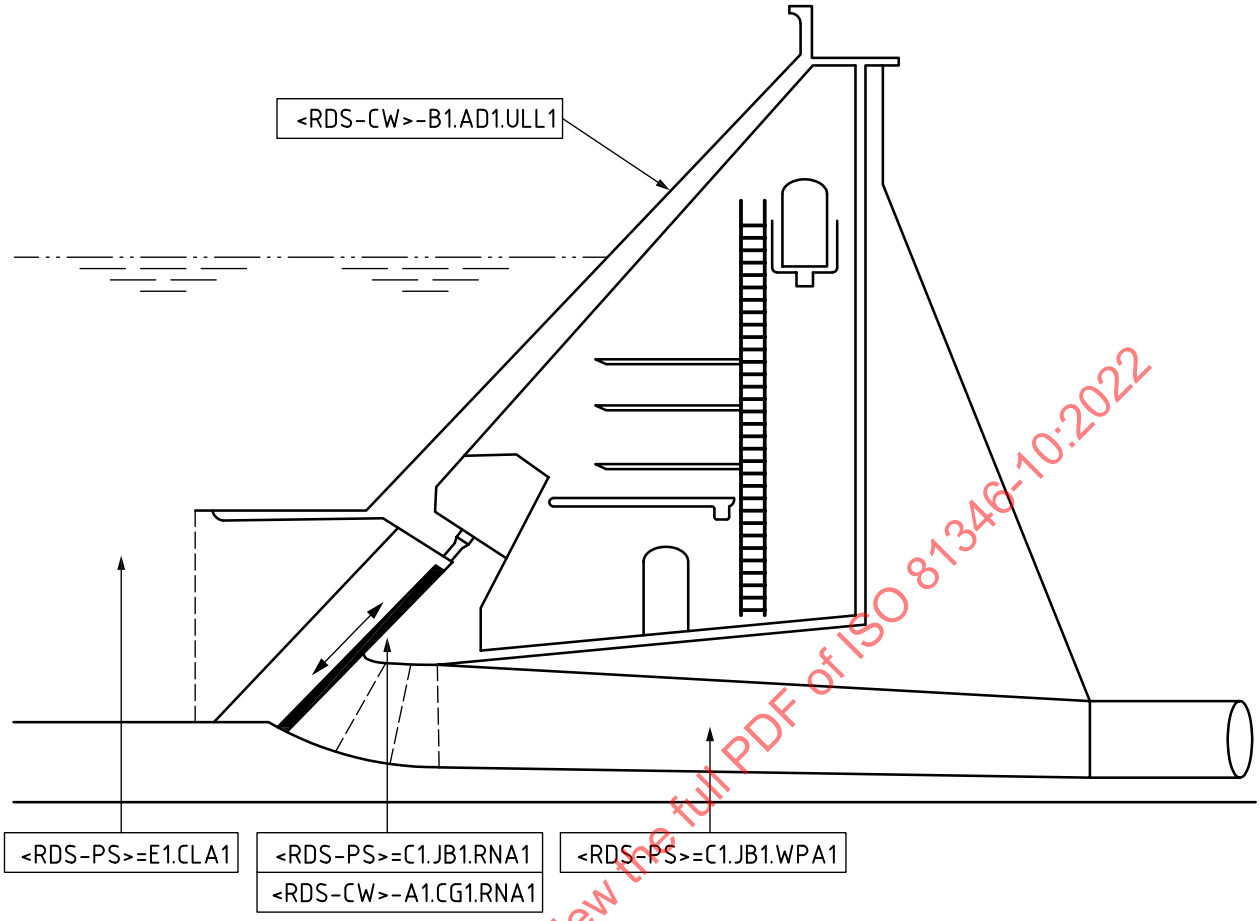
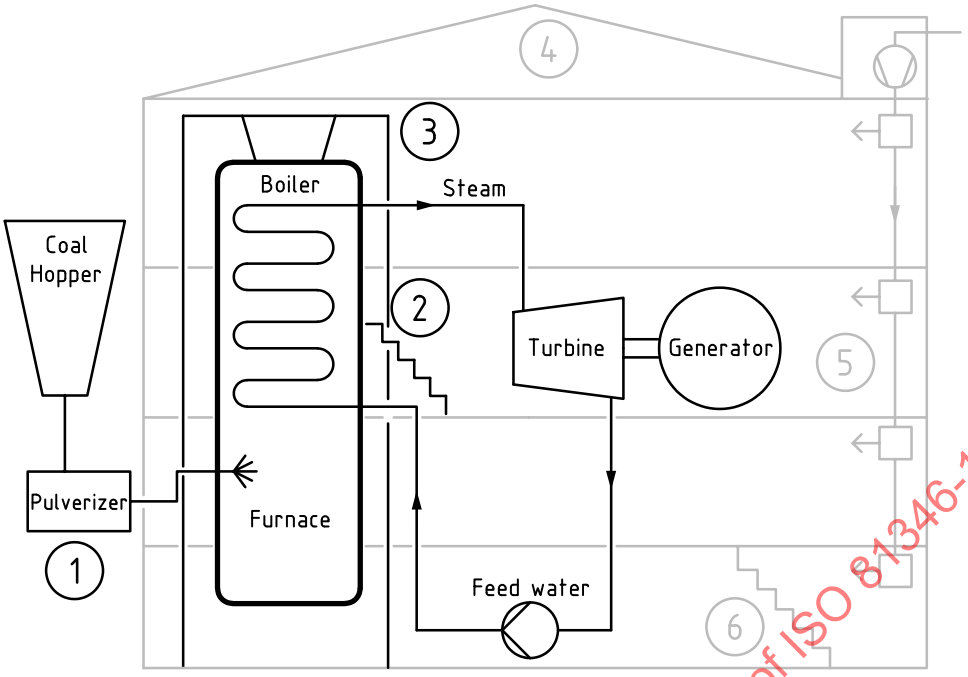


Figure 4 — Sluice gate in a dam with different reference designations using RDS-PS and RDS-CW

NOTE For rules for the presentation of top nodes and recommendations on relevant metadata associated with structures, see IEC 81346-1.

Figure 5 shows an example of the application of systems and their class codes in accordance with this document and ISO 81346-12 within a power supply system.



Key

1 solid matter transforming system; see Table B.2, class KH
2 staircase systems which provides access to boiler; see Table B.2, class AD
3 structural systems which supports the boiler; see Table B.2, class AA
4 roof structure, part of building; see ISO 81346-12:2018, Table A.2, class BE
5 ventilation system providing airflow in building; see ISO 81346-12:2018, Table A.2, class HF
6 staircase system which provides access in building; see ISO 81346-12:2018, Table A.2, class AF

NOTE 1 Grey lines indicate systems considered to be part of the building and are designated according to ISO 81346-12.

NOTE 2 Black lines indicate systems directly involved in the power generation process and are designated according to this document.

Figure 5 — Example of a plant utilizing systems of both this document and ISO 81346-12

13 Application of annexes in IEC 81346-1

The normative annexes of IEC 81346-1, as listed in Annex A, Table A.1, shall be followed.

The informative annexes of IEC 81346-1, which are also applicable to this document, are listed in Annex A, Table A.2.

Annex A
(informative)

Application of annexes in IEC 81346-1

Table A.1 lists the normative annexes in IEC 81346-1.

Table A.1 — List of normative annexes in IEC 81346-1

Annex	Title
Annex E (normative)	Object represented with several top nodes in an aspect
Annex G (normative)	Incorporating sub-objects in object structures
Annex I (normative)	Designation of relations between objects
Annex J (normative)	Requirements for developing sector specific parts of the IEC/ISO 81346 series

Table A.2 lists the informative annexes in IEC 81346-1.

Table A.2 — List of informative annexes in IEC 81346-1

Annex	Title
Annex A (informative)	Information model on the reference designation system
Annex B (informative)	Establishment and life cycle of objects
Annex C (informative)	Manipulation of objects
Annex D (informative)	Interpretation of reference designations using different aspects
Annex F (informative)	Examples of multiple structures based on the same aspect
Annex H (informative)	Example of reference designations within a system
Annex K (informative)	Metadata resource for structure management
Annex L (informative)	Recommendations for documentation of the application of the reference designation system
Annex M (informative)	Relationship to other standards

Annex B
(normative)

Classification letter codes for systems

B.1 General

This annex provides classification schemes for power supply systems and technical systems within the domain of power supply systems. The classification schemes are mainly intended to be applied for designating object occurrences within a function-oriented structure and a product-oriented structure. They may also be applied for designation of types.

The classification schemes are developed in accordance with the rules and guidelines given in ISO 704 and ISO 22274.

B.2 Classes of power supply systems

Table B.1 lists the classes of power supply systems. The entry classes are based on the inherent function of the systems.

Table B.1 — Classes of power supply systems

Class code	Class definition	Preferred term	Examples
A	Power supply system transforming energy or energy carrier	Energy transforming system	Boiler, fuel cell system, generator, parabolic concentrator system, photovoltaic system solar heating, power-to-X system, production unit, turbine
B	Power supply system transporting electric power	Electrical transporting system	Cabling, distribution line, electric vehicle supply system, substation, transmission, transmission line
C	Power supply system transporting energy or energy carrier, excluding electric energy	Transporting system	Coal transport system, condensate system, cooling water system, feed water system, gas transport system, inlet, penstocks, steam system, tunnels, waterway
D	Power supply system supporting the energy production process	Supporting system	Cleaning system, crane and lifting arrangement, emergency start-up system, internal electrical supply system, lubrication system
E	Power supply system for collecting and storing energy for subsequent retrieval	Storing system	Bunker system, catchment area, coal mine, creek intake, electrochemical storage system, gas storing system, geothermal reservoir, heat storage system, mechanical energy storage system, reservoir, waste bunker
F	Power supply system managing energy supply and generation	Managing system	Communication system, control system, SCADA system, supervising system
G	Not to be applied	N/A	N/A
NOTE	Letters not used in this table are reserved for future standardization.		

Table B.1 *(continued)*

Class code	Class definition	Preferred term	Examples
H	Power supply system disposing of residues or waste	Disposing system	Ash disposal, denitrification system, desulphurization, drainage, energy dissipation, fuel-gas cleaning, minimum flow bypass, outlet, overflow
NOTE Letters not used in this table are reserved for future standardization.			

B.3 Classes of technical systems

Table B.2 lists the classes of technical systems. The entry classes are based on the inherent function of the technical systems.

Table B.2 — Classes of technical systems

Class code	Sub-class code	Class definition	Preferred term	Examples
A		**Technical system which forms structural support**	**Structural system**	
	AA	Structural system forming a load supporting frame	Support frame system	Frame system, integrated structure, nacelle structure, structure system, supporting frame structure, rotor hub, WTG tower section system
	AB	Structural system providing foundation	Foundation system	Concrete foundation, floating foundation, jacket, monopile, spar, template suction foundation, tension leg platform
	AC	Structural system holding a supply or distribution system	Routing structure system	Cable routing, pipe bridge, pipe support
	AD	Structural system providing base for access	Access support system	Access platform, escape way, helipad
	AE	Structural system providing protection against undesirable environmental impacts	Casing system	Airlock system, casing, containment system, housing, shielding,
H		**Technical system supplying**	**Supply system**	
	HA	Supply system for gaseous matter	Gas supply system	Air supply, burning gas supply, emergency air generation system, inerting system, mixer, ventilation unit
	HB	Supply system for liquid matter	Liquid matter supply system	Chalk milk supply, creek intake, fuel supply, hydraulic oil, water supply
	HC	Supply system for solid matter	Solid matter supply system	Coal supply
	HD	Supply system for electrical energy	Electrical power supply system	Backup supply system, electrical power generation, electrical supply system, emergency supply system,
NOTE Letters not used in this table are reserved for future standardization.				

Table B.2 *(continued)*

Class code	Sub-class code	Class definition	Preferred term	Examples
	HE	Supply system for heating and/or cooling	Heating and cooling supply system	Air conditioning system, air supplemental cooling system, anti-icing system, boiler, condenser, cooler, heat pump plant, heater
	HF	Supply system for artificial lighting	Lighting system	Artificial light, emergency lighting, safety lighting
J		**Technical system which brings something from one place to another**	**Transport or distribution system**	
	JA	Transport or distribution system for gaseous matter	Gaseous matter transportation system	Air system, air ventilation, fresh air system, inert gas management system, inerting system, pneumatic energy distribution
	JB	Transport or distribution system for liquid matter	Liquid matter transportation system	Drainage water system, hydraulic distribution system, oil distribution, penstock, wastewater system, water distribution
	JC	Transport or distribution system for solid matter	Solid matter transportation system	Coal belt, elevator, hoist
	JD	Transport or distribution system for multiphase matter	Multiphase matter transportation system	Wet steam
	JE	Transport or distribution system for electrical energy	Electrical power transportation system	Electrical distribution, electrical power distribution, electrical system, power supply system
	JF	Transport or distribution system for mechanical energy	Mechanical energy transportation system	Gear system, turbine shaft system
	JG	Transport or distribution system for heating and/or cooling	Heating transportation system	Cooling distribution, heating distribution,
	JH	Transport or distribution system for data	Data transportation system	Data distribution system, intercommunication data system, IT-network, signal system,
K		**Technical system which provides treatment**	**Treatment system**	
	KA	Treatment system controlling a flow of matter	Matter flow controlling system	Actuator system, brake system, gate system, gates, opening or closing system, turbine governing system, valve system, valves
	KB	Treatment system controlling a threshold	Threshold control system	Overflow system, pressure relief system, weir system
	KC	Treatment system for separating substances	Separator system	Demineralizing, desulphurization, drum, filter unit, filtration, osmosis, separation unit
NOTE Letters not used in this table are reserved for future standardization.				

Table B.2 *(continued)*

Class code	Sub-class code	Class definition	Preferred term	Examples
	KD	Treatment system for adding substances	Mixing system	Chemicals system, water treatment equipment, water treatment system
	KE	Treatment system for changing pressure in a fluid	Pump system	Fuel pump system, pumping equipment, vacuum system, water pump, wet well
	KF	Treatment system for transforming electrical energy	Transformer system	Converter system, electrical power transformation, inverter system, transformer
	KG	Treatment system for converting between wireless and wired signals	Signal converting system	Antenna, audio communication system, radio communication system, satellite communication system
	KH	Treatment system for changing the form or shape of solid matter	Solid matter transforming system	Biomass treatment, coal milling system
	KJ	Treatment system limiting friction	Friction reduction system	Bearing system, guide bearing, thrust bearing
	KK	Treatment system controlling a position	Positioning system	Gate manipulation system, guide vane angle manipulation system, piston system, pitch system, positioning system, yaw system
	KL	Treatment system controlling a flow of electrical energy	Electrical energy flow controlling system	Circuit breaker bay, circuit breaker system
L		**Technical system which monitors and/or controls events and processes**	**Monitor and/or control system**	
	LA	Monitor and/or control system in a central unit for process operation	Automation system	Backup system, control system, process control system, SCADA
	LB	Monitor and/or control system which raises an alarm in the presence of dangerous or undesirable conditions	Alarm system	Emergency stop system, temperature alarm system, warning system
	LC	Monitor and/or control system which provides remote visual monitoring	Video surveillance system	CCTV system, external video assistance system, internal video system, safety video system, surveillance systems
	LD	Monitor and/or control system which provides regulation of voltage, load and/or frequency	Regulating system	Turbine governor, voltage regulator
	LE	Monitor and/or control system which provides data acquisition	Monitoring system	Central maintenance system, condition monitoring equipment, generator health monitoring system, metering system, surveillance system, weather measuring system
NOTE Letters not used in this table are reserved for future standardization.				

Table B.2 *(continued)*

Class code	Sub-class code	Class definition	Preferred term	Examples
P		**Technical system which protects against danger or unwanted conditions**	**Protection system**	
	PA	Protection system against fire	Fire protection system	Fire extinguishing system, fire protection system, oxygen reduction system
	PB	Protection system against secondary effects of fire	Smoke and heat venting system	Pressure aeration system, smoke exhaust system
	PC	Protection system against dangerous electrical currents by earthing of electrical systems	Earthing system	Bonding system, earthing system, static discharge
	PD	Protection system against lightning	Lightning protection system	Copper foil, lightning protection system
	PE	Protection system for metal constructions against corrosion by corrosion protection	Cathodic protection system	Cathodic protection
	PF	Protection system against mechanical and hydraulic fault	Mechanical and hydraulic protection system	Air cushion, emergency bypass, pressure release, surge chamber, surge shaft
	PG	Protection system against electrical fault	Electrical protection system	Over-frequency protection, overload protection, overvoltage protection, relay protection, under-frequency protection, undervoltage protection
	PH	Protection system against human injury	Human protection system	Personal protection equipment, personal protective equipment, trip or fall safety arrangement
Q		**Technical system which stores information, energy or substances**	**Storage system**	
	QA	Storage system for air and other gaseous matter	Gas and air storage system	Gas storage
	QB	Storage system for liquid matter	Liquid storage system	Fuel tank, fuel system, waste disposal tank, wastewater, wastewater tank, water tank
	QC	Storage system for solid matter	Solid matter storage system	Coal bunker, pellets storage
	QD	Storage system for electrical energy	Electrical energy storage system	Battery bank, electrical power storage
	QE	Storage system for kinetic energy	Kinetic energy storage system	Flywheel
	QF	Storage system for thermal energy	Thermal energy storage system	Cold water storage, hot water storage, soil storage system
	QG	Storage system for data	Data storage system	Database system, meter storage system, server system
R		**Technical system which converts one form of energy to another**	**Energy conversion system**	

NOTE Letters not used in this table are reserved for future standardization.

Table B.2 *(continued)*

Class code	Sub-class code	Class definition	Preferred term	Examples
	RA	Energy conversion system between mechanical energy and electrical energy	Mechanical-electrical conversion system	Generator-motor system, generator system, motor system
	RB	Energy conversion system between mechanical energy and pressure and/or kinetic energy	Mechanical-pressure-kinetic conversion system	Hydro turbine, wind turbine
	RC	Energy conversion system between mechanical energy and enthalpy	Mechanical-enthalpy conversion system	Pressure decreasing system, steam train, steam turbine, Stirling engine
	RD	Energy conversion system between chemical energy and enthalpy	Chemical-enthalpy conversion system	Coal combustion system, gas combustion system, oil combustion system
	RE	Energy conversion system between chemical energy and electrical energy	Chemical-electrical conversion system	Battery, electrolysis, fuel cell, hydrogen, lithium, power to gas
	RF	Energy conversion system from solar energy to enthalpy	Solar energy-enthalpy conversion system	Solar heating system
	RG	Energy conversion system from solar energy to electrical energy	Solar-electrical energy conversion system	Photovoltaic system
	RH	Energy conversion system from nuclear energy to enthalpy	Nuclear energy-enthalpy conversion system	Reactor system
	RJ	Energy conversion system between mechanical energy and electromagnetic field in motion	Mechanical energy-moving electromagnetic field conversion system	Generator rotor system
	RK	Energy conversion system between electromagnetic field in motion and electric energy	Moving electromagnetic field-electric energy conversion system	Generator stator system

NOTE Letters not used in this table are reserved for future standardization.

Annex C
(normative)

Classification letter codes for constructions

C.1 General

This annex provides classification schemes for construction complexes and constriction entities. The classification schemes are mainly intended to be applied for designating object occurrences within a location-oriented structure, i.e. based on the host-installation aspect. They may also be applied for designation of types.

The classification schemes are developed in accordance with the rules and guidelines given in ISO 704 and ISO 22274.

As these classification schemes are applicable to domains other than power supply systems, they are intended to be part of the general standard for classification of objects, i.e. IEC 81346-2. Until they are included in IEC 81346-2, the schemes are retained in this annex.

C.2 Classes for construction complexes

Table C.1 — Classes of construction complexes

Class code	Class definition	Class name	Examples
A	Construction complex for dwelling	Residential complex	Apartment building area, apartment building area with common facilities, camp site, caravan park, hostel complex, hotel complex, housing estate, military camp, mixed housing area, monastery, refugee camp, religious retreat, single family housing area
B	Construction complex for promotion of wellness and/or treatment of illness	Health and care complex	Clinical complex, fitness and detox complex, group housing complex, hospice, hospital complex, kennel complex, nursing home, quarantine station, spa complex, veterinary hospital, welfare complex
NOTE	Letters not used in this table are reserved for future standardization.		

Table C.1 *(continued)*

Class code	Class definition	Class name	Examples
C	Construction complex for immaterial production	Administration, trading or service complex	Administrative complex, auction complex, business park, cleaning and maintenance complex, commercial complex, embassy complex, exhibition complex, governmental complex, legislative complex, local government complex, marine and water maintenance complex, market complex, mixed use complex, motor vehicle fuelling and charging stations, motor vehicle maintenance and fuelling complex, motor vehicle servicing complex, national government complex, office complex, parade of shops, postal communications complex, postal complex, regional government complex, retail parks, secular representative complex, shopping complex, shopping mall, square, vehicle cleaning complex, vehicle sales complex, warehousing and distribution complex, workshop and service depot
D	Construction complex for knowledge production and/or transfer	Education or science complex	Astronomical observatory complex, botanical garden, campus, course facility, education and nurturing facility, educational complex, exhibition complex, folk high school, further education colleges, gardens and arboretums, kindergarten, laboratory complex, memorial complex, monument complex, multi-purpose exhibition complex, preschool, primary school, professional high school, research and laboratory complex, research complex, school complex, scientific complex, secondary school, tertiary colleges, university, zoo
E	Construction complex for protection and defence	Protection or defence complex	Air and sea rescue complex, air force complex, army complex, artillery firing range complex, coastguard stations, court complex, detention complex, fire brigade complex, immigrant detention complex, incident support complex, judicial complex, law enforcement agency complex, law enforcement complex, lifeboat stations, mountain rescue complex, navy complex, prison complex, probation complex, small arms firing range complex, weapons training complex
F	Construction complex for cultural activities	Culture complex	Cinema complex, concert hall complex, conference complex, document archives, film and television studio complex, historic site, information centre, information complex, library complex, museum complex, open air museum, open air sculpture park, theatre complex, worship complex
NOTE	Letters not used in this table are reserved for future standardization.		

Table C.1 *(continued)*

Class code	Class definition	Class name	Examples
G	Construction complex for social and physical activities and/or mental stimulation	Recreational and sports complex	Allotment area, amusement park, athletics stadium, battle site, camping ground, car racing complex, community centre, fairground complex, golf course, horse racing complex, indoor athletics stadium, indoor sports complex, indoor swimming pool complex, national park, outdoor life complex, outdoor sports complex, outdoor swimming pool complex, park, playgrounds, pleasure piers, public park, race horse track, recreation grounds, sports facility, stable complex, theme park, water park, winter sports complex
L	Construction complex for conversion of energy	Energy supply complex	Biomass power generation complex, coal power generation complex, combined heat and power generation complex, district cooling complex, district heating and cooling complex, district heating complex, electrical power generation complex, gas power generation complex, geothermal power generation complex, hydroelectric power generation complex, nuclear power generation complex, offshore wind power generation complex, oil-fired power generation complex, onshore wind power generation complex, photovoltaic power generation complex, power plant, solar reflector power generation complex, tidal power generation complex, wave power generation complex
M	Construction complex for continuous transport of matter, electricity or signals	Distribution complex	District cooling distribution network, district heating distribution network, drainage collection and distribution networks, dry waste collection and distribution complex, dry waste collection and distribution complex, electrical power distribution network, electrical power treatment complex, gas distribution complex, gas distribution network, liquid fuel distribution complex, liquid fuel distribution networks, signal distribution network, wastewater collection and distribution network, water distribution network
N	Construction complex for raw materials extraction or manufacturing	Production complex	Deep mine complex, drift mine complex, gas extraction complex, gas supply complex, heavy manufacturing complex, industrial complex, industrial park, kinetic power generation complex, light manufacturing complex, liquid fuel supply complex, manufacturing complex, marine and water maintenance complex, mechanical power generation complex, methane hydrates extraction complex, mineral extraction complex, oil extraction complex, open-cast mine, quarry, shale gas extraction complex, shale oil extraction complex, ship and boat building yards, warehousing and distribution complex, water extraction complex, water supply complex
NOTE	Letters not used in this table are reserved for future standardization.		

Table C.1 *(continued)*

Class code	Class definition	Class name	Examples
P	Construction complex for treating matter or electricity	Processing complex	Abattoir complex, animal and plant products processing complex, animal product processing complex, arable crop processing complex, bakery complex, brewery complex, cannery complex, cleaning and maintenance complex, day water treatment complex, distillery complex, dry waste disposal complex, dry waste treatment complex, electrical energy treatment complex, fish processing complex, gas processing complex, gas treatment complex, horticultural crop processing complex, laundry complex, livestock processing complex, mills complex, mineral processing complex, nuclear and chemical management complex, nuclear waste treatment complex, oil processing complex, oil refinery, oil treatment complex, ore processing complex, slaughterhouse complex, surface radioactive waste management complex, timber processing complex, underground radioactive waste management complex, vehicle cleaning complex, wastewater treatment complex, water treatment complex, winery complex
Q	Construction complex for accumulations of matter or electricity	Storage complex	Ambient food storage complex, arms storage complex, cemetery complex, circulation and storage complex, cold storage complex, dry waste storage complex, gas storage complex, liquid fuel storage complex, military arsenals complex, mineral storage complex, refrigerated food storage complex, secure storage complex, self-storage complex, solid fuel storage complex, storage complex, warehouse complex, wastewater storage complex, water storage complex
R	Construction complex for discrete transport of people and/or matter	Traffic complex	Aerial tramway complex, aerospace complex, airport complex, cable railway complex, cable transport complex, canal complex, chairlift way complex, container harbour, dry bulk harbour, ferry terminal complex, fishing harbour, funicular railway complex, gondola lift way complex, harbour complex, heavy rail complex, heliport complex, high-speed rail complex, light rail transit complex, liquid bulk harbour, magnetic levitation ways, marine and waterways transport complex, monorail complex, narrow-gauge rail complex, rack rail complex, railway complex, rapid transit complex, river ferry complex, road complex, road network, road-based light rail complex, roll-on roll-off harbour, sea cruise harbour, sea ferry harbour, spacecraft complex, subway network, surface lift way complex, tram network, transport complex, transport interchange complex, transport terminal, zip line way complex
T	Construction complex for land-based production or management	Land use complex	Agricultural farm, horticultural nursery, livestock farm, managed forest, national park, nature reserve, orchard, vineyard
NOTE	Letters not used in this table are reserved for future standardization.		

Table C.1 *(continued)*

Class code	Class definition	Class name	Examples
U	Construction complex for water-based production or management	Water use complex	Fish farm, fish hatchery, reservoir, tidal barrier, water control and retaining complex, water control complex, water level and flow monitoring complex, water pumping complex
X	Construction complex being remains	Ruins complex	Archaeological site
NOTE	Letters not used in this table are reserved for future standardization.		

C.3 Classes for construction entities

Table C.2 — Classes of construction entities

Class	Sub-class	Definition	Class name	Examples
A		**Construction entity for human living**	**Residential building**	
	AA	Residential building for one household	Single-dwelling house	Row house, summer house
	AB	Residential building for two households	Dual-dwelling building	Duplex
	AC	Residential building for three or more households	Multi-dwelling building	Community dwelling building
	AD	Residential building for temporary living	Lodging building	Barracks, dormitory, hostel building, hotel building, military barracks, motel building, prison, prison barracks, residential hotel, shelter, vacation bungalow
B		**Construction entity for human or animal wellbeing**	**Physical needs building**	
	BA	Physical needs building for treatment of persons	Care building	Health centre, hospital building, polyclinic, sanatorium
	BB	Physical needs building for long-term care	Care home building	Child and adolescent care home, home for the elderly
	BD	Physical needs building for treatment of animals	Animal hospital	
	BE	Physical needs building for persons to relieve themselves	Toilet building	
	BF	Physical needs building for persons to wash themselves	Baths building	Bath building, sauna, spa
C		**Construction entity for immaterial production**	**Administration, trading or service building**	
	CA	Administration building for production or interpretation of information	Office building	City hall, courthouse, governmental building, law court building, town hall
	CB	Service building for providing non-acute assistance or advice	Service building	Bank, car wash, gas station, post office
	CC	Service building for providing acute assistance or advice	Emergency service building	Coastal guard station, fire station, forest ranger station, police station, rescue station
NOTE	Letters not used in this table are reserved for future standardization.			

Table C.2 *(continued)*

Class	Sub-class	Definition	Class name	Examples
	CD	Service building for sale of goods	Shop building	Boutique, department store, mall, shopping centre
	CE	Trading building for display of goods and for assemblies	Exhibition hall	Conference centre, congress building, convention centre, visitor centre
	CF	Service building for serving food and/or beverages	Restaurant building	
	CG	Service building for monitoring and controlling of processes	Operations building	Dispatch building, central control and monitoring building
D		**Construction entity for knowledge production and transfer**	**Education or research building**	
	DA	Education building for small children	Pre-school building	Kindergarten
	DB	Education building for basic education	School building	
	DC	Education building for series of lectures or lessons in a particular subject	Course centre building	
	DD	Education building for further education	University building	Agricultural school, art school, business school, college
	DE	Research building for experiments	Laboratory building	Chemical laboratory, research facility, test laboratory
F		**Construction entity for artistic activities**	**Cultural building**	
	FA	Cultural building for oral performances	Theatre building	
	FB	Cultural building for musical performances	Concert building	Concert hall, opera
	FC	Cultural building for display of art	Exhibition building	Gallery building, museum building
	FD	Cultural building for displaying the night sky	Planetarium	
	FE	Cultural building for displaying films	Cinema building	
	FF	Cultural building providing books and other media	Library building	
	FG	Cultural building for multiple use	Cultural centre	
	FH	Cultural building for gambling	Casino	
	FJ	Cultural building for production of art and entertainment	Studio	
G		**Construction entity for social activities and/or mental stimulation**	**Recreational facility**	
	GA	Recreational facility for gardening tools	Allotment building	
	GB	Recreational facility for garden retreat	Gazebo	

NOTE Letters not used in this table are reserved for future standardization.

Table C.2 *(continued)*

Class	Sub-class	Definition	Class name	Examples
	GC	Recreational facility for protection from sun and precipitation	Cantilever roof	
	GD	Recreational facility for child play	Playhouse	
	GE	Recreational facility for protection from wind	Wind shelter	
	GF	Recreational facility for raised viewing position	Observation tower	Bird tower
	GG	Recreational facility for raised shooting position	Hunting tower	
	GH	Recreational facility for physical exaltation	Amusement facility	Merry-go-round, roller coaster
	GJ	Recreational facility for private outdoor activities	Garden	Green space, open space
	GK	Recreational facility for public outdoor activities	Park	
	GL	Recreational facility for children's activities for enjoyment and recreation	Playground	
	GM	Recreational facility for tents and recreational vehicles	Campsite	
	GN	Recreational facility for outdoor water activities	Bathing site	
	GP	Recreational facility for persons to change clothing	Changing building	
H		**Construction entity for physical activities**	**Sports facility**	
	HA	Sports facility for multiple activities	Multi-purpose sports building	Fitness and training facility, gymnastics facility
	HB	Sports facility for indoor water activities	Swimming hall	Indoor swimming pool, indoor water park
	HC	Sports facility for equestrian activities	Riding school	Paddock
	HD	Sports facility for diving	Diving tower	
	HE	Sports facility for bowling	Bowling hall	
	HF	Sports facility for ice skating	Skating rink	
	HG	Sports facility for ball sports	Ball sport building	Badminton hall, soccer hall, tennis hall
	HH	Sports facility with spectator facilities	Stadium	Arena
	HJ	Sports facility for ball games	Playing field	Baseball field, football field, padel court, soccer field, tennis court
	HK	Sports facility for racing competitions	Racetrack	Automobile racetrack, horse racetrack
	HL	Sports facility for track and field	Track and field area	

NOTE Letters not used in this table are reserved for future standardization.

Table C.2 *(continued)*

Class	Sub-class	Definition	Class name	Examples
	HM	Sports facility for multiple or specific outdoor activities	Activity park	Parcour facility, skateboard park
	HN	Sports facility for downhill skiing	Downhill skiing slope	
	HP	Sports facility for running	Exercise track	Jogging track
	HQ	Sports facility for walking	Foot path	
	HR	Sports facility for golf	Golf course	Driving range, miniature golf course
J		**Construction entity for groups of people**	**Assembly facility**	
	JA	Assembly facility for common activities	Activity centre	
	JB	Assembly facility for an association	Community hall	Clubhouse, local hall
	JC	Assembly facility for a religious community	Ceremonial building	Cathedral. church, mosque, synagogue, temple
	JD	Assembly facility for an audience	Stand	Spectator stand
	JE	Assembly facility for staff	Personnel building	Mess building
	JF	Assembly facility for outdoors urban activities	Square	Market
	JG	Assembly facility for practicing competencies	Training site	
	JH	Assembly facility for school persons	School yard	
K		**Construction entity for allowing or preventing persons to approach or enter a place**	**Access or barrier facility**	
	KA	Access facility for horizontal movement between two or more buildings	Passageway	
	KB	Access facility for non-automated vertical movement between two or more storeys	Staircase tower	
	KC	Access facility for automated vertical movement between two or more levels	Lift tower	
	KD	Access facility to an open area	Gatehouse	
	KE	Access facility to a road	Tollgate	
	KF	Barrier facility	Barrier	Fence, wall
L		**Construction entity for conversion of energy**	**Energy supply facility**	
	LA	Energy supply facility for electrical power	Power station	Hydropower station, nuclear power station, solar cell array, wind turbine
	LB	Energy supply facility for hot liquid	Heating plant	

NOTE Letters not used in this table are reserved for future standardization.

Table C.2 *(continued)*

Class	Sub-class	Definition	Class name	Examples
	LC	Energy supply facility for hot liquid and electrical power	Combined heat and power station	
	LD	Energy supply facility for cold liquid	Cooling plant	
M		**Construction entity for distribution and communication between persons or systems**	**Distribution facility**	
	MA	Distribution facility for control, regulation, and monitoring	Control tower	
	MB	Distribution facility for electromagnetic waves	Aerial mast	Radio or TV mast, signal mast, transmission mast
	MC	Distribution facility for optical signals	Lighthouse	
	MD	Distribution facility for audio signals	Bell tower	
	ME	Distribution facility for electrical power above ground	Overhead power line	
	MF	Distribution facility for electrical power in ground	Power cabling	Distribution line, power cable, power transmission
	MG	Distribution facility for signals above ground	Overhead signal line	
	MH	Distribution facility for signals in ground	Signal cabling	
	MJ	Distribution facility for fluids in a closed environment	Piping	Day water piping, distribution network tunnel, fuel piping, wastewater piping, water supply piping, water tunnel
	MK	Distribution facility for fluids in an open environment	Canal	Canal, channel, ditch, drainage channel, irrigation channel
	ML	Distribution facility for heating fluid	Heating piping	
	MM	Distribution facility for cooling fluid	Cooling piping	
	MN	Distribution facility for connecting parts of the network	Distribution node facility	
	MP	Distribution facility for moving matter over larger distances	Conveyor	Belt conveyor
	MQ	Distribution facility for moving people over larger distances	Cable car	Aerial lift, aerial tramway, gondola, ropeway, ski lift
	MR	Distribution facility for solid waste	Garbage suction facility	
N		**Construction entity for raw materials extraction or for manufacturing**	**Production facility**	
	NA	Production facility for solid matter used for further refinement	Mine	Open-pit mine, quarry, raw materials facility
NOTE	Letters not used in this table are reserved for future standardization.			

Table C.2 *(continued)*

Class	Sub-class	Definition	Class name	Examples
	NB	Production facility for fluid matter used for further refinement	Gas or liquid extraction facility	Gas extraction site, oil extraction site
	NC	Production facility for matter refinement	Refinement facility	Demineralization plant, gas decarbonisation plant, refinery, slaughterhouse, waste reclamation facility
	ND	Production facility for fabrication or repair of products	Workshop	Craft production facility, fabrication building, factory, manufacturing facility, shipyard
	NE	Production facility for indoor plant production	Greenhouse	
P		**Construction entity for treating matter or electricity**	**Processing facility**	
	PA	Processing facility to increase pressure	Pumping station	
	PB	Processing facility for treating matter	Treatment facility	Sewage cleaning facility, water treatment facility
	PC	Processing facility for destruction by burning	Incinerator facility	
	PD	Processing facility for cleaning objects	Washing facility	
	PE	Processing facility for printing	Print shop	
	PF	Processing facility for post sorting	Postal sorting terminal	
	PG	Processing facility for surveillance and/or data capture	Measuring station	Testing station, weather station
	PH	Processing facility for treating electrical power	Electrical power treatment facility	Electrical substation, electrical transformer, switching station
Q		**Construction entity for accumulations of matter or energy**	**Storage facility**	
	QA	Storage facility for matter used for further refinement	Raw materials depot	Storage yard
	QB	Storage facility for products	Products storage	Cold storage facility, freezer storage facility, recycling centre, self-storage facility, storehouse, warehouse
	QC	Storage facility for moveable technical equipment	Equipment building	
	QD	Storage facility for four-wheeled or larger road vehicles	Garage	Car park, carport
	QE	Storage facility for two-wheeled road vehicles	Bicycle parking	
	QF	Storage facility for railway vehicles	Train garage	Siding
	QG	Storage facility for aircraft	Hangar	Apron
	QH	Storage facility for watercraft	Boathouse	Dolphin, marina, quay
	QJ	Storage facility for containers	Container space	

NOTE Letters not used in this table are reserved for future standardization.

Table C.2 *(continued)*

Class	Sub-class	Definition	Class name	Examples
	QK	Storage facility for liquid, gas or other masses in sealed units	Tank	Cistern, gas tank, oil tank, petrol tank, pool, silo
	QL	Storage facility for loosened earth material	Landfill site	
	QM	Storage facility for hazardous material underground	Geological repository	
	QN	Storage facility for animals	Animal house	Animal stall, cow barn, poultry farm, stables
	QP	Storage facility for data	Data storage	Server building
	QQ	Storage facility for energy	Energy storage	Battery energy storage, compressed air energy storage, flow batteries energy storage, mechanical gravity energy storage
	QZ	Storage facility for the deceased	Burial site	Cemetery, churchyard, graveyard, mausoleum, mortuary
R		**Construction entity for discrete transport of people and/or matter**	**Traffic facility**	
	RA	Traffic facility on land for non-track bound vehicles	Road	Alley, avenue, beltway, highway, motorway, ring road, street
	RB	Traffic facility for long-distance transport with railbound vehicles, with level crossings with other traffic	Railroad	Light railway, heavy railway
	RC	Traffic facility for urban transport with railbound vehicles, with level crossings with other traffic	Light rail transit (LRT)	Streetcar, tramway, trolley
	RD	Traffic facility for urban transport with railbound vehicles, without level crossings with other traffic	Rapid transit	Elevated railway, elevated train, mass rapid transit (MRT), metro, medium-capacity rail system (MCS), monorail, subway, suspension railway, tube, underground
	RE	Traffic facility for hillside railway traffic	Funicular	
	RF	Traffic facility for pedestrian traffic	Footpath	Pavement, sidewalk
	RG	Traffic facility for bicycle and pedestrian traffic	Foot and bicycle path	
	RH	Traffic facility for bicycle traffic	Bicycle path	
	RJ	Traffic facility for air traffic starting, landing and ground movements	Airport way	Helidrome, heliport, rotor station
	RK	Traffic facility to cross over an obstacle	Bridge	Viaduct
	RL	Traffic facility to cross under or through an obstacle	Transport tunnel	

NOTE Letters not used in this table are reserved for future standardization.

Table C.2 *(continued)*

Class	Sub-class	Definition	Class name	Examples
	RM	Traffic facility for water-borne traffic in ground	Transport canal	
	RN	Traffic facility for water-borne traffic above ground	Aqueduct	
	RP	Traffic facility for equestrian traffic	Bridleway	
	RQ	Traffic facility for wildlife by-passing man-made entities	Wildlife crossing	Amphibian tunnel, animal bypass, ecoduct, fish ladder, green bridge, small mammals tunnel, wildlife bridge, wildlife viaduct
S		**Construction entity for connecting traffic facilities**	**Traffic transfer facility**	
	SA	Traffic transfer facility between rail transport and other traffic	Train station	
	SB	Traffic transfer facility for embarking a rail bound vehicle	Railway platform	
	SC	Traffic transfer facility between railroads and roads or paths	Level crossing	Railway crossing
	SD	Traffic transfer facility between multiple means of transport	Travel centre	
	SE	Traffic transfer facility between air transport and other traffic	Airport terminal	
	SF	Traffic transfer facility between bus transport and other traffic	Bus station	
	SG	Traffic transfer facility between truck transport and other traffic	Truck terminal	
	SH	Traffic transfer facility between taxi transport and other traffic	Taxi stand	
	SJ	Traffic transfer facility between water-borne and other traffic	Sea terminal	Ferry terminal, harbour, quay, wharf
T		**Construction entity for land-based production**	**Land use facility**	
	TA	Land use facility for annual yield	Field	Cropland, grazing land, pasture
	TB	Land use facility for long-term yield	Forest	Energy forest
U		**Construction entity for water management**	**Water control facility**	
	UA	Water control facility to retain a water level	Dam	
	UB	Water control facility to retain a water level with an overflow	Barrage	

NOTE Letters not used in this table are reserved for future standardization.

Table C.2 *(continued)*

Class	Sub-class	Definition	Class name	Examples
	UC	Water control facility to adjust water level	Sluice	
	UD	Water control facility to dampen wave movements	Mole	Breakwater, causeway, pier
	UF	Water control facility to lower the water level to zero	Dry dock	
	UG	Water control facility to prevent overflow	Dike	Dike, levee
	UH	Water control facility to control a water flow	Gate	
X		**Construction entity permanently lacking original use**	**Ruins**	
	XA	Ruins lacking cultural and historic value	Contemporary building ruins	
	XB	Ruins of cultural and historic value of a building	Cultural heritage building ruins	
	XC	Ruins of cultural and historic value of a site	Cultural heritage site ruins	
	XD	Ruins of cultural and historic value of a grave or grave site	Cultural heritage grave ruins	
Y		**Construction entity with symbolic or artistic meaning**	**Ornamental entity**	
	YA	Ornamental entity for remembrance of person or event	Monument	
	YB	Ornamental entity with water	Fountain	
	YC	Ornamental entity in free-standing sculptural form	Statue	
Z		**Construction entity with unknown use**	**Unknown construction entity**	
	ZZ	Unknown construction entity	Unknown construction entity	
NOTE	Letters not used in this table are reserved for future standardization.			

Annex D
(informative)

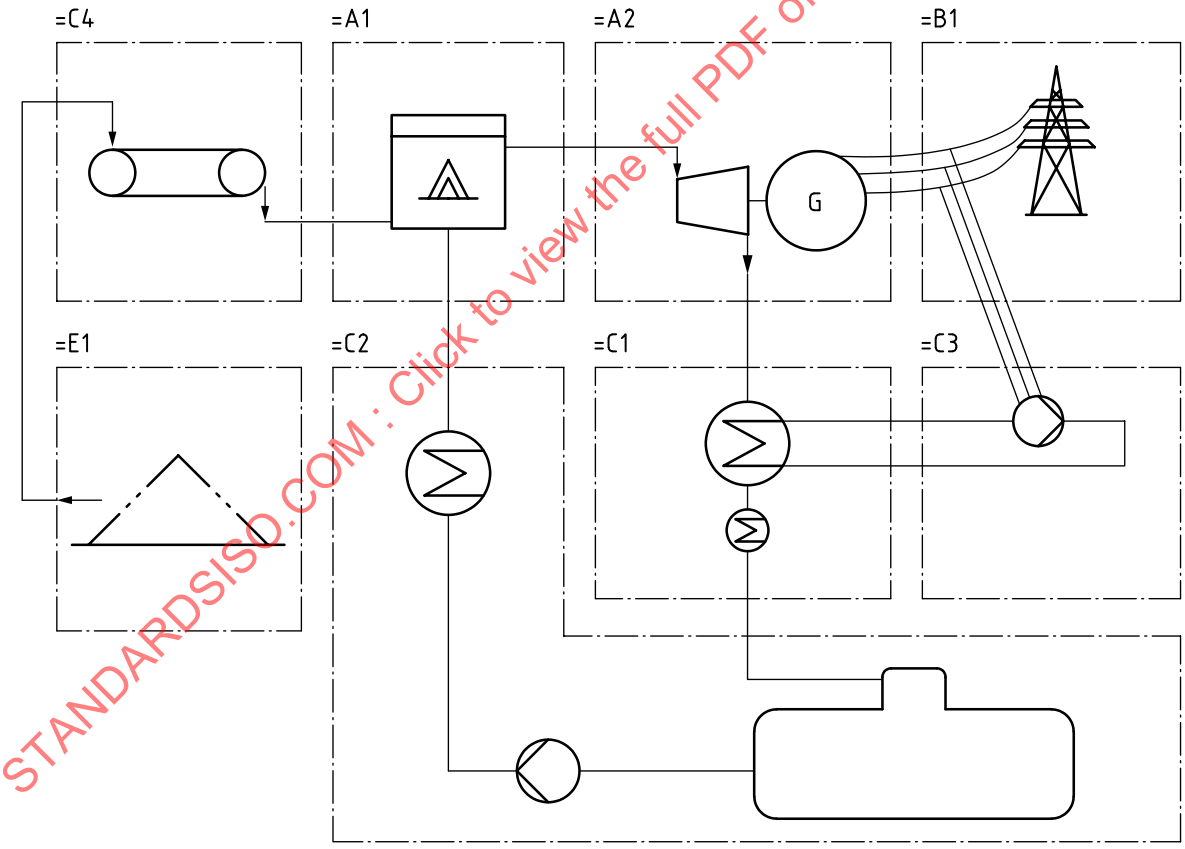
Examples of application

D.1 General

The examples provided in this annex serve to illustrate the principles of systems and their constituents in the context of this document. The examples do not represent a standardized or preferred system design, nor do they intend to regularise the design of any system.

D.2 Example of a coal power plant

Figure D.1 shows the main systems of the process of a coal power plant with their corresponding classes of power supply systems.



Key

A boiler, turbine, generator
B electrical supply, auxiliary supply
C coal supply, feed water system, condensate system, cooling water system
E coal storing system

Figure D.1 — Systems of coal power plant