BS EN 81346-2:2009

BSI Standards Publication

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

Part 2: Classification of objects and codes for classes

National foreword

This British Standard is the UK implementation of EN 81346-2:2009. It is identical to IEC 81346-2:2009. It supersedes BS EN 61346-2:2001 and DD IEC/PAS 62400:2005, which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/3, Documentation and graphical symbols.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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English version

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

(IEC 81346-2:2009)

Systèmes industriels, installations et appareils, et produits industriels - Principes de structuration et désignations de référence - Partie 2: Classification des objets et codes pour les classes (CEI 81346-2:2009)

Industrielle Systeme, Anlagen und Ausrüstungen und Industrieprodukte - Strukturierungsprinzipien und Referenzkennzeichnung - Teil 2: Klassifizierung von Objekten und Kennbuchstaben für Klassen (IEC 81346-2:2009)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

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Foreword

The text of document 3/945/FDIS, future edition 1 of IEC 81346-2, prepared by IEC TC 3, Information structures, documentation and graphical symbols, and ISO TC 10, Technical product documentation, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 81346-2 on 2009-08-01.

This European Standard supersedes EN 61346-2:2000.

EN 81346-2:2009 includes the following technical changes with respect to EN 61346-2:2000:

– all rules concerning the application of letter codes have been removed as these should be included in another publication dealing with the application of letter codes within reference designations.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2010-05-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2012-08-01

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 81346-2:2009 was approved by CENELEC as a European Standard without any modification.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 81346-1	-[1)]	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 1: Basic rules	EN 81346-1	2009[2)]
ISO 14617-6	2002	Graphical symbols for diagrams - Part 6: Measurement and control functions	-	-

[1)] Undated reference.

[2)] Valid edition at date of issue.

CONTENTS

INTRODUCTION

0.1 General

The aim of this part of IEC 81346 is to establish classification schemes for objects with associated letter codes which can be applied throughout all technical areas, e.g. electrical, mechanical and civil engineering as well as all branches of industry, e.g. energy, chemical industry, building technology, shipbuilding and marine technology. The letter codes are intended for use with the rules for the construction of reference designations in accordance with IEC 81346-1.

Annex A illustrates how objects may be classified according to their intended purpose or task related to a generic process.

Annex B illustrates how objects may be classified according to their position in an infrastructure.

0.2 Basic requirements for this standard

The basic requirements were developed during the preparation of IEC 61346-2 Ed. 1, and accepted by vote by the national committees.

NOTE These basic requirements concern the development of the letter code classification system in this standard and not its application. They are therefore not normative vis-à-vis the application of this standard.

(1) Letter codes shall be based on a classification scheme.

(2) A classification scheme is the set of definitions for the types of objects (for example, a classification scheme for function types containing the definition of the different function types of objects).

(3) A classification scheme shall allow for hierarchical classification of types of objects, i.e. subclasses and superclasses.

(4) A letter code for a type of object shall be independent of the actual position of the instances of that type of object in a system.

(5) Distinct classes shall be defined on each level of the classification scheme.

(6) The definitions of the classes of a particular level within a classification scheme shall have a common basis (for example, a classification scheme that, on one level, classifies objects according to colour shall not contain classes that classify objects by shape). The basis, however, may vary from one level to another.

(7) A letter code should indicate the type of object and not an aspect of this object.

(8) A classification scheme shall allow for expansion in order to take into account future development and needs.

(9) A classification scheme shall be usable within all technical areas without favouring a specific area.

(10) It shall be possible to use the letter codes consistently throughout all technical areas. The same type of object should preferably have only one letter code independent of the technical area where it is being used.

(11) It should be possible to indicate in a letter code from which technical area the object originates, if this is wanted.

(12) A classification scheme should reflect the practical application of letter codes.

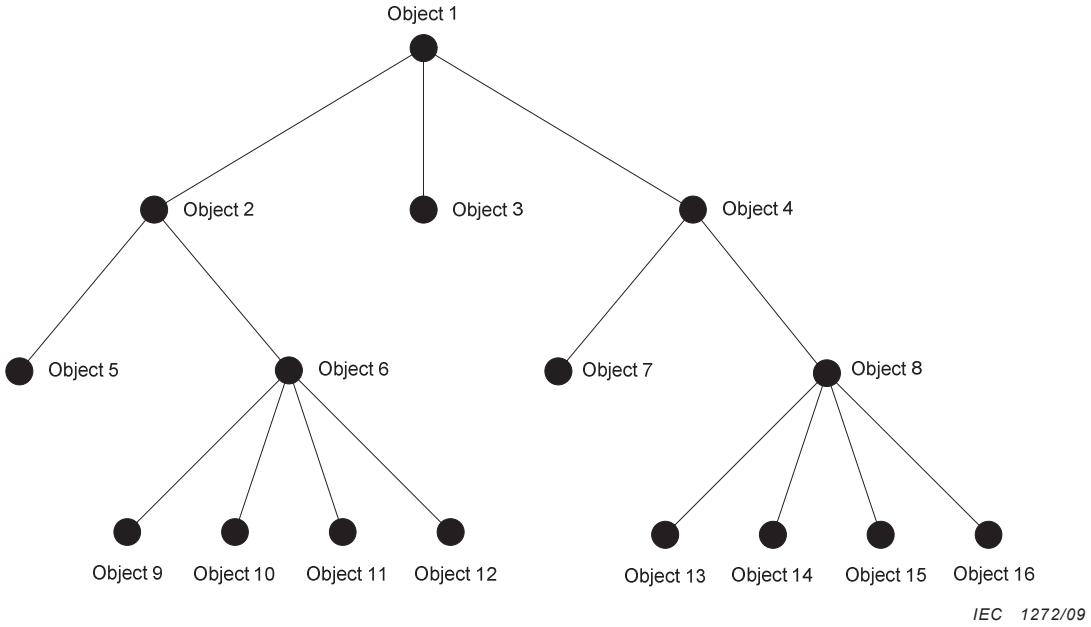
(13) Letter codes should not be mnemonic, as this cannot be implemented consistently throughout a classification scheme and for different languages.

(14) Letter codes shall be formed using capital letters from the Latin alphabet, excluding I and O due to possible confusion with the digits 1 (one) and 0 (zero).

(15) Different classification schemes shall be allowed and be applicable for the same type of object.

(16) Objects may be classified for example according to function types, shapes, colours, or material. This means that the same type of object may be assigned different letter codes according to the different classification schemes.

(17) Objects that are directly constituents of another object using the same aspect shall be assigned letter codes according to the same classification scheme as shown in Figure 1. See also Figure A.1.



Objects 2, 3, and 4, which are direct constituents of object 1, shall be assigned letter codes from the same classification scheme.

Objects 5 and 6, which are direct constituents of object 2, shall be assigned letter codes from the same classification scheme.

Objects 7 and 8, which are direct constituents of object 4, shall be assigned letter codes from the same classification scheme.

Objects 9, 10, 11, and 12, which are direct constituents of object 6, shall be assigned letter codes from the same classification scheme.

Objecst 13, 14, 15, and 16, which are direct constituents of object 8, shall be assigned letter codes from the same classification scheme.

Figure 1 – Constituent objects

(18) If products from different manufacturers are combined into a new product, the constituents of this product may be assigned codes according to different classification schemes.

INDUSTRIAL SYSTEMS, INSTALLATIONS AND EQUIPMENT AND INDUSTRIAL PRODUCTS – STRUCTURING PRINCIPLES AND REFERENCE DESIGNATIONS –

Part 2: Classification of objects and codes for classes

1 Scope

This part of International Standard 81346, published jointly by IEC and ISO defines classes and subclasses of objects based on a purpose- or task-related view of the objects, together with their associated letter codes to be used in reference designations.

The classification is applicable for objects in all technical areas, e.g. electrical, mechanical and civil engineering as well as all branches of industry, e.g. energy, chemical industry, building technology, shipbuilding and marine technology, and can be used by all technical disciplines in any design process.

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.

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

ISO 14617-6:2002 *Graphical symbols for diagrams – Part 6: Measurement and control functions*

3 Terms and definitions

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

4 Classification principles

4.1 General

The principle of classification of objects is based on viewing each object as a means for performing an activity often with input and output (see Figure 2). In this respect, the internal structure of an object is not important.

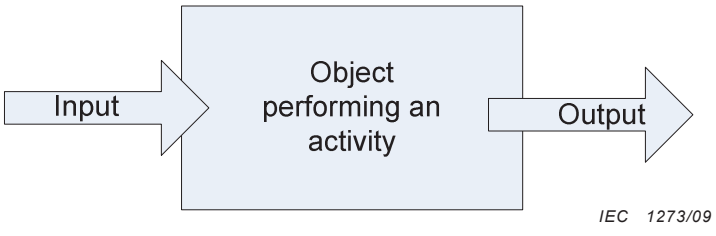


Figure 2 – The basic concept

Annex A shows the generic process model used for the establishment of the classification scheme based on intended purpose or task as shown in Table 1.

An alternative classification according to purpose or task in the special case of an object regarded as part of an infrastructure is presented in Table 3.

Each class defined in Table 1 is in this standard associated with a set of predefined subclasses allowing a more detailed characterization of a component, if required.. The definitions of subclasses of objects are presented in Table 2 together with their associated letter codes of class and subclass.

NOTE 1 Subclasses do not define a new level in a structure, i.e. they do not describe a subdivision of the object. Class and subclass refer to the same object.

NOTE 2 The use of subclasses for the coding of technical attributes should be avoided, as this is a separate kind of information presented in the documentation, for example in a technical specification or in a parts list.

4.2 Assigning objects to classes

For the assignment of objects (i.e. components belonging to the system under consideration) to classes, the following rules apply:

Rule 1 For the classification of objects according to their intended purpose or task, main classes and letter codes in accordance with Table 1 or Table 3 shall be applied.

Rule 2 For assigning an object to a class according to Table 1 or Table 3, the object shall be viewed with respect to its intended purpose or task, as a component in the system under consideration, without considering the means for implementation (e.g. the kind of product).

EXAMPLE The desired purpose of an object is “heating”. A possible component required to fulfil this is a “heater”. According to Table 1, this object is clearly related to class E. It is not of importance, or simply not known at an early stage of a design process, how the required purpose is realized. This needed component may be satisfied by using a gas or oil burner or an electric heater (which all may be products delivered by others). In the case of an electric heater, the heat may be produced by a product called electric resistor. This product may, in other cases, be classified by its purpose “restricting a flow” according to class R if that describes it use as a component in those contexts.

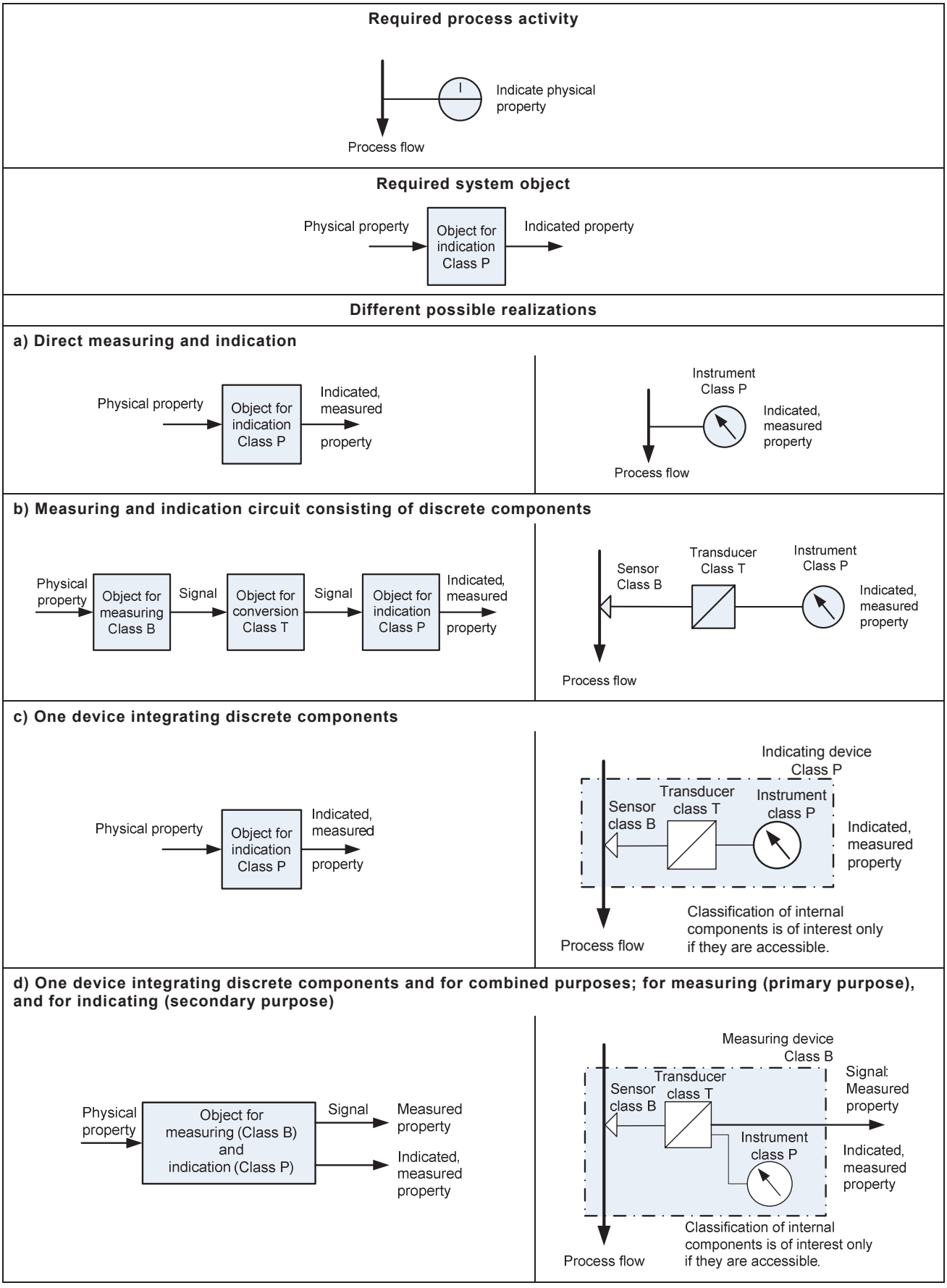
It is the component that is classified – not the product used for implementation!

Rule 3 For objects with more than one intended purpose or task, the object shall be classified according to the intended purpose or task considered to be the main one.

Rule 4 The class with letter code A according to Table 1 shall only be applied for objects with no explicit main purpose or task.

EXAMPLE A flow rate recorder stores measured values for later use but, at the same time, delivers an output in visible form. If storing is regarded as the main purpose, the object is related to class C of Table 1. If the indication of measured values is regarded as the main purpose, the object is related to class P. If the two purposes are considered equally valid, the object is related to class A.

Figure 3 illustrates the principle of assigning classes to objects in the case of a measuring circuit. The left-hand side illustrates how the requirements are turned into objects with input and output. On the right-hand side, the used components are shown.



NOTE The classes are taken from Table 1.

IEC 1274/09

Figure 3 – Classification of objects in a measuring circuit

5 Classes of objects

5.1 Classes of objects according to intended purpose or task

Table 1 constitutes the main classification method applicable for any object from any field of technology.

The most important element in the table is the description of the intended purpose or task of an object to which it is to be referred when searching for an appropriate class for an object.

Table 1 – Classes of objects according to their intended purpose or task
(Codes A to D)

Code	Intended purpose or task of object	Examples of terms describing the intended purpose or task of objects	Examples of typical mechanical/fluid components	Examples of typical electrical components
A	Two or more purposes or tasks NOTE This class is only for objects for which no main intended purpose or task can be identified.			
B	Converting an input variable (physical property, condition or event) into a signal for further processing	Detecting Measuring (picking-up of values) Monitoring Sensing Weighing (picking-up of values)	Orifice plate (for measuring) Sensor	Buchholz relay Current transformer Flame detector Measuring relay Measuring shunt (resistance) Microphone Movement detector Overload relay Photocell Position switch Proximity sensor Proximity switch Smoke sensor Tachometer Temperature sensor Video camera Voltage transformer
C	Storing of energy, information or material	Recording Storing	Barrel Buffer Cistern Container Hot water accumulator Paper reel stand Tank	Buffer battery Capacitor Event recorder (mainly for storing purposes) Hard disk Magnetic tape recorder (mainly for storing purposes) Memory RAM Storage battery Video recorder (mainly for storing purposes) Voltage recorder (mainly for storing purposes)
D	*Reserved for future standardization*			

Table 1 ***(continued, codes E to J)***

Code	Intended purpose or task of object	Examples of terms describing the intended purpose or task of objects	Examples of typical mechanical/fluid components	Examples of typical electrical components
E	*Providing radiant or thermal energy*	Cooling Heating Lighting Radiating	Boiler Freezer Furnace Gas lamp Heater Heat exchanger Nuclear reactor Paraffin lamp Radiator Refrigerator	Boiler Electrical heater Electrical radiator Fluorescent lamp Lamp Lamp bulb Laser Luminaire Maser
F	Direct protection (self-acting) of a flow of energy, signals, personnel or equipment from dangerous or unwanted conditions Including systems and equipment for protective purposes	Absorbing Guarding Preventing Protecting Securing Shielding	Airbag Guard Rupture disc Safety belt Safety valve	Cathodic protection anode Faraday cage Fuse Miniature circuit-breaker Surge arrester Thermal overload release
G	Initiating a flow of energy or material Generating signals used as information carriers or reference source	Generating	Blower Conveyor, (driven) Fan Pump Vacuum pump Ventilator	Dry cell battery Dynamo Fuel cell Generator Rotating generator Signal generator Solar cell Wave generator
H	Producing a new kind of material or product	Assembling Crushing Disassembling Fractionating Material removing Milling Mixing Producing Pulverizing	Component insertion machine Crusher Mixer	Absorption washer Centrifuge Crusher Distillation column Emulsifier Fermenter Magnetic separator Mill Pellet maker Rake Reactor Separator Sintering facility
I	*Not to be applied*	---	---	---
J	*Reserved for future standardization*			

Table 1 *(continued, codes K to P)*

Code	Intended purpose or task of object	Examples of terms describing the intended purpose or task of objects	Examples of typical mechanical/fluid components	Examples of typical electrical components
K	Processing (receiving, treating and providing) signals or information (excluding objects for protective purposes, see Class F)	Closing (of control circuits) Continuous controlling Delaying Opening (of control circuits) Postponing Switching (of control circuits) Synchronizing	Fluid feedback controller Pilot valve	All-or-nothing relay Analogue integrated circuit Binary integrated circuit Contactor relay CPU Delay line Electronic valve Electronic tube Feedback controller Filter, a.c. or d.c. Induction stirrer Microprocessor Programmable controller Synchronizing device Time relay Transistor
L	*Reserved for future standardization*			
M	Providing mechanical energy (rotational or linear mechanical motion) for driving purposes	Actuating Driving	Combustion engine Fluid cylinder Heat engine Hydraulic turbine Mechanical actuator Spring-loaded actuator Steam turbine Wind turbine	Actuating coil Actuator Electric motor Linear motor
N	*Reserved for future standardization*			
O	*Not to be applied*	---	---	---
P	Presenting information	Alarming Communicating Displaying Indicating Informing Measuring (presentation of variables) Presenting Printing Warning	Balance (for weighing) Bell Clock Flow meter Manometer Printer Text display Thermometer	Ammeter Bell Clock Continuous line recorder Event counter Geiger counter LED Loudspeaker Printer Recording voltmeter (mainly for presentation purposes) Signal lamp Signal vibrator Synchroscope Text display Voltmeter Wattmeter Watt-hour meter

Table 1 *(continued, codes Q to U)*

Code	Intended purpose or task of object	Examples of terms describing the intended purpose or task of objects	Examples of typical mechanical/fluid components	Examples of typical electrical components
Q	Controlled switching or varying a flow of energy, of signals (for signals in control circuits, see Classes K and S) or of material	Opening (of energy, signals and material flow) Closing (of energy, signals and material flow) Switching (of energy, signals and material flow Clutching	Brake Control valve Door Gate Shut-off valve Lock	Circuit-breaker Contactor (for power) Disconnector Fuse switch (if main purpose is protection, see Class F) Fuse-switch-disconnector (if main purpose is protection, see Class F) Motor starter Power transistor Thyristor
R	Restricting or stabilizing motion or a flow of energy, information or material	Blocking Damping Restricting Limiting Stabilizing	Blocking device Check valve Fence Latch Lock Orifice plate Shock absorber Shutter	Diode Inductor Limiter Resistor
S	Converting a manual operation into a signal for further processing	Influencing Manually controlling Selecting	Push-button valve Selector switch	Control switch Cordless mouse Discrepancy switch Keyboard Light pen Push-button switch Selector switch Set-point adjuster
T	Conversion of energy maintaining the kind of energy Conversion of an established signal maintaining the content of information Conversion of the form or shape of a material	Amplifying Modulating Transforming Casting Compressing Converting Cutting Material deforming Expanding Forging Grinding Rolling Size enlargement Size reduction Turning	Fluid amplifier Automatic gear Pressure amplifier Torque converter Casting machine Extruder Saw	AC/DC converter Aerial Amplifier Electrical transducer Frequency convertor Power transformer Rectifier Signal converter
U	Keeping objects in a defined position	Bearing Carrying Holding Supporting	Bracket Cabinet Cable duct Cable tray Centring device Corridor Duct Fixture Building foundation Insulator Pipe bridge Roller bearing Room	Insulator

Table 1 ***(continued, codes V to Z)***

Code	Intended purpose or task of object	Examples of terms describing the intended purpose or task of objects	Examples of typical mechanical/fluid components	Examples of typical electrical components
V	Processing (treating) of material or products (including preparatory and post-treatment)	Coating Cleaning Dehydrating Derusting Drying Filtering Heat treatment Packing Preconditioning Recovering Re-finishing Sealing Separating Sorting Stirring Surface treatment Wrapping	Balancing machine Drum Grinder Packaging machine Palletizer Sack Vacuum cleaner Washing machine Wrapping machine Wetting	
W	Guiding or transporting energy, signals, material or products from one place to another	Conducting Distributing Guiding Leading Positioning Transporting	Channel Duct Hose Linkage Mirror Roller table Pipe Shaft Turntable	Busbar Bushing Cable Conductor Data bus Optical fibre
X	Connecting objects	Connecting Coupling Joining	Flange Hook Hose coupling Piping fitting Piping flange Rigid coupling	Connector Hub Plug connector Terminal Terminal block Terminal strip
Y	Reserved for future standardization			
Z	Reserved for future standardization			

5.2 Subclasses of objects according to intended purpose or task

It is sometimes necessary or helpful to provide a more detailed classification of an object than the classification provided by the classes in Table 1.

Rule 5 Objects classified according to Table 1 shall be sub-classified according to Table 2 hereinafter, if such sub-classification is required.

Rule 6 Additional subclasses to those defined in Table 2, may be applied if:
- no subclass of Table 2 is applicable;
- the subclasses are defined in accordance with the basic grouping of subclasses in Table 2;
- the application of the subclasses is explained in the document where it is used or in supporting documentation.

Each subclass provided in Table 2 characterizes the object, and the different subclasses are arranged according to a relationship to a technical sector. The grouping is as follows:

- Subclass A – E for objects related to electrical energy;
- Subclass F – K, excluding I, for objects related to information and signals;
- Subclass L – Y, excluding O, for objects related to process, mechanical and civil engineering;
- Subclass Z for objects related to combined tasks.

This basic grouping is fixed for all classes of Table 1 except for the Class B where the letter codes specified for the subclasses are based on those in ISO 14617-6.

NOTE 1 It should be noted that the letter codes in ISO 14617-6 are intended to be used as qualifying symbols to graphical symbols for measurement and control functions. Although they do not represent a classification scheme in a very strict sense, their application may lead to sufficiently differentiating single-level reference designations in most cases. Example: A temperature sensor may be assigned class BT if the designation according to class B alone is not sufficient for an intended purpose.

NOTE 2 Table 2 defines the subclasses, and provides also a non-exhaustive list of components considered to be related to the actual subclass. It is not in the scope of this International standard to list all components related to a certain subclass.

NOTE 3 In Table 2, the phrase "*Not used*" indicates that the corresponding letter code is not defined in this classification scheme. It does not prohibit the use of such a letter code if required for a class not defined so far. There is however a risk that in a later edition of the standard these letter codes will represent additional standardized classes that are different from the freely applied ones.

Table 2 – Definitions and letter codes of subclasses related to main classes
(Class A)

Main class A Two or more purposes or tasks		
Code	**Definition of subclass**	**Examples of components**
AA	Objects related to electrical energy (free for definition by the user	
AB		
AC		
AD		
AE		
AF	Objects related to information and signals (free for definition by the user)	
AG		
AH		
AJ		
AK		
AL	Objects related to process, mechanical and civil engineering (free for definition by the user)	
AM		
AN		
AP		
AQ		
AR		
AS		
AT		
AU		
AV		
AW		
AX		
AY		
AZ	Combined tasks	
NOTE Main class A is only for objects for which no main intended purpose or task can be identified.		

Table 2 *(continued, class B)*

Main class B Converting an input variable (physical property, condition or event) into a signal for further processing		
Code	**Definition of subclass based on input measured variable**	**Examples of components**
BA	Electrical potential	Measuring relay (voltage), measuring shunt (voltage), measuring transformer (voltage), voltage transformer
BB	*Not used*	
BC	Electrical current	Current transformer, measuring relay (current), measuring transformer (current), overload relay (current)
BD	Density	
BE	Other electrical or electromagnetic variable	Measuring relay, measuring shunt (resistance), measuring transformer
BF	Flow	Flow meter, gas meter, water meter
BG	Gauge, position, length (including distance, elongation, amplitude)	Motion sensor, movement detector, position switch, proximity switch, proximity sensor
BH	*Not used*	
BJ	Power	
BK	Time	Clock, time counter
BL	Level	Sonic depth finder (sonar)
BM	Moisture, humidity	Humidity meter
BN	*Not used*	
BP	Pressure, vacuum	Pressure gauge, pressure sensor
BQ	Quality (composition, concentration, purity, material property)	Gas analyzer, non-destructive testing device, ph electrode
BR	Radiation	Flame detector, photocell, smoke detector
BS	Speed, frequency (including acceleration)	Accelerometer, speedometer, tachometer, vibration pickup
BT	Temperature	Temperature sensor
BU	Multi-variable	Buchholz relay
BV	*Not used*	
BW	Weight, force	Load cell
BX	Other quantities	Microphone, video camera
BY	*Not used*	
BZ	Number of events, counts, combined tasks	Switching cycle detector
NOTE The letter codes in accordance with 7.3.1 of ISO 14617-6:2002 are used for the subclasses together with some additions required for the purpose of this standard. Descriptions of letter codes BA, BC, BV and BX have been added. The letter code BZ is additionally made available for “combined tasks” which allows it to be in line with the other main classes.		

Table 2 *(continued, class C)*

Main class C Storing of energy, information or material		
Code	**Definition of subclass based on kind of storage**	**Examples of components**
CA	Capacitive storage of electric energy	Capacitor
CB	Inductive storage of electric energy	Coil, superconductor
CC	Chemical storage of electric energy	Buffer battery NOTE Batteries seen as energy sources are assigned to main Class G.
CD	*Not used*	
CE	*Not used*	
CF	Storage of information	CD-ROM, EPROM, event recorder, hard disk, magnetic tape recorder, memory, RAM, video recorder, voltage recorder
CG	*Not used*	
CH	*Not used*	
CJ	*Not used*	
CK	*Not used*	
CL	Open storage of material at fixed location (collection, housing)	Bunker, cistern, paper reel stand, pit, pool
CM	Closed storage of material at fixed location (collection, housing)	Accumulator, barrel, boiler, buffer, container, depository, flash tank, gas holder, safe, silo, tank
CN	Moveable storage of material (collection, housing)	Container, drum, gas cylinder, shipping container
CP	Storage of thermal energy	Hot water accumulator, hybrid heat storage, ice tank, steam storage, thermal energy storage, underground thermal energy storage
CQ	Storage of mechanical energy	Flywheel, rubber band
CR	*Not used*	
CS	*Not used*	
CT	*Not used*	
CU	*Not used*	
CV	*Not used*	
CW	*Not used*	
CX	*Not used*	
CY	*Not used*	
CZ	Combined tasks	

Table 2 *(continued, class E)*

Main class E Providing radiant or thermal energy		
Code	**Definition of subclass based on generated output and method for generation**	**Examples of components**
EA	Generation of electromagnetic radiation for lighting purposes using electrical energy	Fluorescent lamp, fluorescent tube, incandescent lamp, lamp, lamp bulb, laser, LED lamp, maser, UV radiator
EB	Generation of heat by conversion of electrical energy	Electrical boiler, electrical furnace, electrical heater, electrical radiator, electrode steam boiler, heating rod, heating wire, infrared heating element
EC	Generation of cooling energy by conversion of electrical energy	Compression chiller, cooling unit, freezer, freezing unit, Peltier element, refrigerator, turbine-driven chiller
ED	*Not used*	
EE	Generation of other electromagnetic radiation by means of electrical energy	
EF	Generation of electromagnetic radiation for signalling purposes	
EG	*Not used*	
EH	*Not used*	
EJ	*Not used*	
EK	*Not used*	
EL	Generation of electromagnetic radiation for lighting purposes by combustion of fossil fuels	Gas light, gas lamp, paraffin lamp
EM	Generation of heat by conversion of chemical energy	Boiler, burner, combustion grate, furnace
EN	Generation of cooling energy by conversion of chemical energy	Cold pump, refrigerator
EP	Generation of heat by convection	Boiler, condenser, evaporator, economizer, feed water heater, heat exchanger, heat recovery steam generator, radiator, steam generator
EQ	Generation of cooling energy by convection	Cold pump, freezer, refrigerator
ER	Generation of heat by conversion of mechanical energy	
ES	Generation of cooling energy by conversion of mechanical energy	Mechanical refrigerator
ET	Generation of heat by nuclear fission	Nuclear reactor
EU	Generation of particle radiation	Magnetron sputter, neutron generator
EV	*Not used*	
EW	*Not used*	
EX	*Not used*	
EY	*Not used*	
EZ	Combined tasks	

Table 2 *(continued, class F)*

Main class F Direct protection (self-acting) of a flow of energy, signals, personnel or equipment from dangerous or unwanted conditions, including systems and equipment for protective purposes		
Code	**Definition of subclass based on kind of phenomenon to protect against**	**Examples of components**
FA	Protection against overvoltage	Arrester, surge arrester
FB	Protection against residual current	Residual current device
FC	Protection against overcurrent	Fuse, fuse unit, miniature circuit-breaker, thermal overload release
FD	*Not used*	
FE	Protection against other electrical hazards	Enclosure for electromagnetic shielding, Faraday cage
FF	*Not used*	
FG		
FH		
FJ		
FK		
FL	Protection against hazardous pressure condition	Automatic drains trap, rupture disc, safety valve, vacuum breaker
FM	Protection against effects of fire	Fire damper, fire protection door, fire protection facility, lock
FN	Protection against hazardous operating condition or damage	Impact protection, protection device, protective shield, protective sleeve for thermocouple, safety clutch
FP	Protection against hazardous emission (e.g. radiation, chemical emissions, noise)	Reactor protection equipment
FQ	Protection against hazards or unwanted situations for person or animals (e.g. safeguarding)	Airbag, barriers, contact protection, escape door, escape window, fence, gates, glare protection, guard, vision protection, railing, safety belt
FR	Protection against wear (e.g. corrosion)	Cathodic protection anode
FS	Protection against environmental effects (e.g. weather, geophysical effects)	Avalanche protection device, geophysical protection device, weather protection device
FT	*Not used*	
FU	*Not used*	
FV	*Not used*	
FW	*Not used*	
FX	*Not used*	
FY	*Not used*	
FZ	Combined tasks	

Table 2 *(continued, class G)*

Main class G Initiating a flow of energy or material Generating signals used as information carriers or reference source		
Code	**Definition of subclass based on kind of initiation and kind of flow**	**Examples of components**
GA	Initiation of an electrical energy flow by use of mechanical energy	Dynamo, generator, motor-generator set, power generator, rotating generator
GB	Initiation of an electrical energy flow by chemical conversion	Battery, dry cell battery, fuel cell
GC	Initiation of an electrical energy flow using light	Solar cell
GD	*Not used*	
GE	*Not used*	
GF	Generation of signals as an information carrier	Signal generator, transducer, wave generator
GG	*Not used*	
GH	*Not used*	
GJ	*Not used*	
GK	*Not used*	
GL	Initiation of a continuous flow of solid matter	Belt, chain conveyor, distributor
GM	Initiation of a discontinuous flow of solid matter	Crane, elevators, forklift, lifting gear, manipulator, lifting device
GN	*Not used*	
GP	Initiation of a flow of liquid or flowable substances driven by an energy supply	Pump, screw conveyor
GQ	Initiation of a flow of gaseous substances by a mechanical driver	Aspirator, blower, compressor, fan, vacuum pump, ventilator
GR	*Not used*	
GS	Initiation of a flow of liquid or gaseous substances by driving medium	Ejector, injector, jet
GT	Initiation of a flow of liquid or gaseous substances by gravity	Lubricator, oiler
GU	*Not used*	
GV	*Not used*	
GW	*Not used*	
GX	*Not used*	
GY	*Not used*	
GZ	Combined tasks	

Table 2 *(continued, class H)*

Main class H Producing a new kind of material or product		
Code	**Definition of subclass based on method applied to produce material or product**	**Examples of components**
HA	*Not used*	
HB	*Not used*	
HC	*Not used*	
HD	*Not used*	
HE	*Not used*	
HF	*Not used*	
HG	*Not used*	
HH	*Not used*	
HJ	*Not used*	
HK	*Not used*	
HL	Generation of a new product by assembling	Assembly robot, component insertion machine, hemming equipment
HM	Separation of mixtures of substances by centrifugal force	Centrifuge, cyclone device
HN	Separation of mixtures of substances by gravity	Separator, settling tank, vibrator
HP	Separation of mixtures of substances by thermal processes	Distillation column, drying (Munters air dryer), extraction system
HQ	Separation of mixtures of substances by filtering or classification	Fluid filter, gas filter, grate, rake, screen
HR	Separation of mixtures of substances by electrostatic or magnetic forces	Electrostatic precipitator, magnetic separator
HS	Separation of mixtures of substances by physical processes	Absorption washer, active charcoal absorber, ion exchanger, wet ash scrubber
HT	Generation of new gaseous substances	Gasifier
HU	Generation of new form of solid material by crushing	Crusher, mill
HV	Generation of new form of solid material by coarsening	Briquette maker, pellet maker, sintering facility, tablet maker
HW	Generation of new substances by mixing	Emulsifier, humidifier (steam), kneader, mixer, mixing vessel, static mixer, stirrer
HX	Generation of new substances by chemical reaction	Reaction furnace, reactor
HY	Generation of new substances by biological reaction	Composter, fermenter
HZ	Combined tasks	

Table 2 *(continued, class K)*

Main class K Processing (receiving, treating and providing) signals or information (excluding objects for protective purposes, see Class F)		
Code	**Definition of subclass based on kind of signals to be processed**	**Examples of components**
KA	*Not used*	
KB	*Not used*	
KC	*Not used*	
KD	*Not used*	
KE	*Not used*	
KF	Processing of electrical and electronic signals	All-or-nothing relay, analogue integrated circuit, automatic paralleling device, binary elements, binary integrated circuit, contactor relay, CPU, delay element, delay line, electronic valve, electronic tube, feedback controller, filter (a.c. or d.c.), induction stirrer, input/output module, microprocessor, optocoupler, process computer, programmable controller, receiver, safety logic module, synchronizing device, time relay, transistor, transmitter
KG	Processing of optical and acoustical signals	Mirror, controller, test unit
KH	Processing of fluid and pneumatic signals	Controller (valve position controller), fluid feedback controller, pilot valve, valve assembly
KJ	Processing of mechanical signals	Controller, linkage
KK	Processing of various input/output information carriers (e.g. electrical/pneumatic)	Controller, electro-hydraulic converter, electric pilot valve
KL	*Not used*	
KM	*Not used*	
KN	*Not used*	
KP	*Not used*	
KQ	*Not used*	
KR	*Not used*	
KS	*Not used*	
KT	*Not used*	
KU	*Not used*	
KV	*Not used*	
KW	*Not used*	
KX	*Not used*	
KY	*Not used*	
KZ	Combined tasks	

Table 2 *(continued, class M)*

Main class M Providing mechanical energy (rotational or linear mechanical motion) for driving purposes		
Code	**Definition of subclass based on kind of driving force**	**Examples of components**
MA	Driving by electromagnetic force	Electric motor, linear motor
MB	Driving by magnetic force	Actuating coil, actuator, electromagnet
MC	*Not used*	
MD	*Not used*	
ME	*Not used*	
MF	*Not used*	
MG	*Not used*	
MH	*Not used*	
MJ	*Not used*	
MK	*Not used*	
ML	Driving by mechanical force	Friction wheel drive, mechanical actuator, spring force, stored-energy spring actuator, weight
MM	Driving by hydraulic or pneumatic force	Fluid actuator, fluid cylinder, fluid motor, hydraulic cylinder, servomotor
MN	Driving by steam flow force	Steam turbine
MP	Driving by gas flow force	Gas turbine
MQ	Driving by wind force	Wind turbine
MR	Driving by fluid flow force	Hydraulic turbine
MS	Driving by force using chemical conversion means	Combustion engine
MT	*Not used*	
MU	*Not used*	
MV	*Not used*	
MW	*Not used*	
MX	*Not used*	
MY	*Not used*	
MZ	Combined tasks	

Table 2 *(continued, class P)*

Main class P Presenting information		
Code	**Definition of subclass based on kind of presented information and presentation medium**	**Examples of components**
PA	*Not used*	
PB	*Not used*	
PC	*Not used*	
PD	*Not used*	
PE	*Not used*	
PF	Visible presentation of discrete states	Door lock, LED, semaphore, signal lamp
PG	Visible presentation of values of discrete variables	Ammeter, barometer, clock, counter, event counter, flow meter, frequency meter, Geiger counter, manometer, sight glass, synchroscope, thermometer, voltmeter, watt-hour meter, wattmeter, weight display
PH	Visible presentation of information in drawing, pictorial and/or textual form	Analogue recorder, barcode printer, event recorder (mainly for presenting information), printer, recording voltmeter, text display, video screen,
PJ	Audible presentation of information	Bell, horn, loudspeaker, whistle
PK	Tactile presentation of information	Vibrator
PL	*Not used*	
PM	*Not used*	
PN	*Not used*	
PP	*Not used*	
PQ	*Not used*	
PR	*Not used*	
PS	*Not used*	
PT	*Not used*	
PU	*Not used*	
PV	*Not used*	
PW	*Not used*	
PX	*Not used*	
PY	*Not used*	
PZ	Combined tasks	

Table 2 *(continued, class Q)*

Main class Q Controlled switching or varying a flow of energy, of signals or of material		
Code	**Definition of subclass based on purpose of switching or variation**	**Examples of components**
QA	Switching and variation of electrical energy circuits	Circuit-breaker, contactor, motor starter, power transistor, thyristor
QB	Isolation of electrical energy circuits	Disconnector, fuse switch, fuse-switch disconnector, isolating switch, load-break switch
QC	Earthing of electrical energy circuits	Earthing switch
QD	*Not used*	
QE	*Not used*	
QF	*Not used*	
QG	*Not used*	
QH	*Not used*	
QJ	*Not used*	
QK	*Not used*	
QL	Braking	Brake
QM	Switching of flow of flowable substances in closed enclosures	Blank, blanking plate, damper, shutoff valve (including drain valve), solenoid valve
QN	Varying of flow of flowable substances in closed enclosure	Control damper, control valve, gas control path
QP	Switching or varying of flow of liquid substances in open enclosures	Dam plate, lock gate
QQ	Providing access to an area	Bar (lock), cover, door, gate, lock, turnstile, window
QR	Shut-off of flow of flowable substances (no valves)	Isolation device, rotary lock (open/close)
QS	*Not used*	
QT	*Not used*	
QU	*Not used*	
QV	*Not used*	
QW	*Not used*	
QX	*Not used*	
QY	*Not used*	
QZ	Combined tasks	

Table 2 *(continued, class R)*

Main class R Restricting or stabilizing motion or a flow of energy, information or material		
Code	**Definition of subclass based on the purpose of the restriction**	**Examples of components**
RA	Limiting a flow of electrical energy	Arc-suppressing reactor, diode, inductor, limiter, resistor
RB	Stabilizing a flow of electrical energy	Uninterruptible power supply (UPS)
RC	*Not used*	
RD	*Not used*	
RE	*Not used*	
RF	Stabilizing a signal	Equalizer, filter
RG	*Not used*	
RH	*Not used*	
RJ	*Not used*	
RK	*Not used*	
RL	Restricting an unauthorized operation and/or movement (mechanical)	Blocking device, latch, lock, stop
RM	Restricting a return flow of gaseous, liquid and flowable substances	Check valve
RN	Restricting a flow of liquid and gaseous substances	Flow restrictor, orifice plate, Venturi nozzle, water-proof seal
RP	Restricting a sound propagation	Noise protection, sound absorber
RQ	Restricting a thermal flow	Insulation, jacket, lagging, lining, thermal insulation louver damper
RR	Restricting a mechanical effect	Brick lining, compensator, shock absorber, vibration absorption
RS	Restricting a chemical effect	Brick lining, explosion protection, fire-extinguisher, gas penetration protection, splash protection
RT	Restricting a light propagation	Blind, screen, shutter
RU	Restricting access to an area	Fence
RV	*Not used*	
RW	*Not used*	
RX	*Not used*	
RY	*Not used*	
RZ	Combined tasks	

Table 2 *(continued, class S)*

Main class S Converting a manual operation into a signal for further processing		
Code	**Definition of subclass based on kind of output signal carrier**	**Examples of components**
SA	*Not used*	
SB	*Not used*	
SC	*Not used*	
SD	*Not used*	
SE	*Not used*	
SF	Providing an electrical signal	Control switch, discrepancy switch, keyboard, light pen, pushbutton switch, selector switch, set-point adjuster, switch
SG	Providing an electromagnetic, optical or acoustical signal	Cordless mouse
SH	Providing a mechanical signal	Hand wheel, selector switch
SJ	Providing a fluid or pneumatic signal	Push-button valve
SK	*Not used*	
SL	*Not used*	
SM	*Not used*	
SN	*Not used*	
SP	*Not used*	
SQ	*Not used*	
SR	*Not used*	
SS	*Not used*	
ST	*Not used*	
SU	*Not used*	
SV	*Not used*	
SW	*Not used*	
SX	*Not used*	
SY	*Not used*	
SZ	Combined tasks	

Table 2 *(continued, class T)*

Main class T Conversion of energy maintaining the kind of energy Conversion of an established signal maintaining the content of information Conversion of the form or shape of a material		
Code	**Definition of subclass based on kind of transformation/conversion**	**Examples of components**
TA	Converting electrical energy while retaining the energy type and energy form	AC/DC converter, frequency converter, power transformer, transformer
TB	Converting electrical energy while retaining the energy type and changing the energy form	Inverter, rectifier
TC	*Not used*	
TD	*Not used*	
TE	*Not used*	
TF	Converting signals (retention of information content)	Aerial, amplifier, electrical transducer, impulse amplifier, isolating converter, signal converter
TG	*Not used*	
TH	*Not used*	
TJ	*Not used*	
TK	*Not used*	
TL	Converting speed of rotation, torque, force into the same kind	Automatic gear, control coupling, fluid amplifier, indexing gear, pressure amplifier, speed convertor, torque converter
TM	Converting a mechanical form by machining	Machine tool, saw, shear
TN	*Not used*	
TP	Converting a mechanical form by cold forming (chipless deforming)	Cold drawing equipment, cold rolling equipment, deep drawing equipment
TQ	Converting a mechanical form by hot forming (chipless deforming)	Casting machine, extruder, forging, hot drawing equipment, hot rolling
TR	Converting radiation energy while retaining energy form	Magnifying glass, parabolic mirror
TS	*Not used*	
TT	*Not used*	
TU	*Not used*	
TV	*Not used*	
TW	*Not used*	
TX	*Not used*	
TY	*Not used*	
TZ	Combined tasks	

Table 2 *(continued, class U)*

Main class U Keeping objects in a defined position		
Code	**Definition of subclass based on kind of object to be kept in a position**	**Examples of components**
UA	Holding and supporting electrical energy equipment	Insulator, supporting structure
UB	Holding and supporting electrical energy cables and conductors	Cable duct, cable rack, cable tray, cable trough, insulator, mast, portal, post insulator
UC	Enclosing and supporting electrical energy equipment	Cubicle, encapsulation, housing
UD	*Not used*	
UE	*Not used*	
UF	Holding and supporting instrumentation, control and communication equipment	Printed circuit board, sub-rack, transducer rack
UG	Holding and supporting instrumentation, control and communication cables and conductors	Cable rack, duct, shaft
UH	Enclosing and supporting instrumentation, control and communication equipment	Cabinet
UJ	*Not used*	
UK	*Not used*	
UL	Holding and supporting machinery	Machine foundation
UM	Holding and supporting structural objects	Building foundation, duct (not cable duct, see UG), shaft, structural elements (e.g. column, joist, lintel, suspender beam)
UN	Holding and supporting piping objects	Bracket for pipes, pipe bridge, pipe hanger
UP	Holding and guiding of shafts and rotors	Ball bearing, roller bearing, sliding bearing
UQ	Holding and guiding objects for manufacturing or erection	Centring device, clamping, fixture
UR	Fastening and anchoring machinery	Anchor plate, bracket, carrier, erection frame, erection plate
US	Spatial objects, housing and supporting other objects	Corridor, duct, hall, passage, room, shaft, stairwell
UT	*Not used*	
UU	*Not used*	
UV	*Not used*	
UW	*Not used*	
UX	*Not used*	
UY	*Not used*	
UZ	Combined tasks	

Table 2 *(continued, class V)*

Main class V Processing (treating) of material or products (including preparatory and post-treatment)		
Code	**Definition of subclass based on kind of processing**	**Examples of components**
VA	*Not used*	
VB	*Not used*	
VC	*Not used*	
VD	*Not used*	
VE	*Not used*	
VF	*Not used*	
VG	*Not used*	
VH	*Not used*	
VJ	*Not used*	
VK	*Not used*	
VL	Filling material	Drum, sack, tank car filling equipment
VM	Packaging product	Packaging machine, palletizer, wrapping machines
VN	Treating surface	Burnisher, grinding, painting machine, polishing machine
VP	Treating material or product	Annealing furnace, balancing machine, blast furnace, melting furnace
VQ	Cleaning material, product or facility	Building cleaning equipment, vacuum cleaner, washing machine,
VR	*Not used*	
VS	*Not used*	
VT	*Not used*	
VU	*Not used*	
VV	*Not used*	
VW	*Not used*	
VX	*Not used*	
VY	*Not used*	
VZ	Combined tasks	

Table 2 *(continued, class W)*

Main class W Guiding or transporting energy, signals, material or products from one place to another		
Code	**Definition of subclass based on characteristics of energy, signal, material or product to be conducted or routed**	**Examples of components**
WA	Distributing high voltage electrical energy (> 1 000 V a.c. or > 1 500 V d.c.)	Busbar, motor control centre, switchgear assembly
WB	Transporting high voltage electrical energy (> 1 000 V a.c. or > 1 500 V d.c.)	Bushing, cable, conductor
WC	Distributing low voltage electrical energy (≤ 1 000 V a.c. or ≤ 1 500 V d.c.)	Busbar, motor control centre, switchgear assembly
WD	Transporting low voltage electrical energy (≤ 1 000 V a.c. or ≤ 1 500 V d.c.)	Bushing, cable, conductor
WE	Conducting earth potential or reference potential	Bonding conductor, earthing busbar, earthing conductor, earth rod
WF	Distributing electrical or electronic signal	Data bus, field bus
WG	Transporting electrical or electronic signal	Control cable, data line, measuring cable
WH	Transporting and routing optical signal	Optical fibre, optical fibre cable, optical wave guide
WJ	*Not used*	
WK	*Not used*	
WL	Transporting material or product (not driven)	Conductor, inclined plane, roller table
WM	Conducting or guiding flow of substance in open enclosure	Channel
WN	Conducting or guiding flow of substance in flexible, closed enclosure	Hose
WP	Conducting or guiding flow of substance in rigid, closed enclosure	Air duct, pipe, stack
WQ	Transporting mechanical energy	chain, linkage, rotor, shaft, V-belt
WR	Conducting or guiding track-bound transport equipment	Points, rails, railway, turntable
WS	Conducting or guiding persons (access equipment)	Catwalk, platform, stair
WT	Conducting or guiding mobile transport equipment	Path, road, shipping routes
WU	*Not used*	
WV	*Not used*	
WW	*Not used*	
WX	*Not used*	
WY	*Not used*	
WZ	Combined tasks	

Table 2 *(continued, class X)*

Main class X Connecting objects		
Code	**Definition of subclass based on characteristics of energy, signal, material or component to be connected**	**Examples of components**
XA	*Not used*	
XB	Connecting high voltage objects (> 1 000 V a.c. or > 1 500 V d.c.)	Terminal, junction box, socket
XC	*Not used*	
XD	Connecting low voltage objects (≤ 1 000 V a.c. or ≤ 1 500 V d.c.)	Connector, junction box, plug connector, socket-outlet, terminal, terminal block, terminal strip
XE	Connecting to earth potential or reference potential	Bonding terminal, earthing terminal, shield connection terminal
XF	Connecting data network carriers	Hub
XG	Connecting electrical signal carriers	Connection element, plug connector, signal distributor
XH	Connecting optical signal carriers	Optical connection
XJ	*Not used*	
XK	*Not used*	
XL	Connecting rigid enclosures for flows of substances	Piping fitting, piping flange, piping coupling
XM	Connecting flexible enclosures for flows of substances	Hose connection, hose coupling
XN	Connecting objects for transport of mechanical energy, non-detachable	Rigid coupling
XP	Connecting objects for transport of mechanical energy, detachable	Control coupling, disengaging coupling
XQ	Connecting objects irreversible	Bonded connection, soldered connection, welded connection
XR	Connecting objects reversible	Hook, lug
XS	*Not used*	
XT	*Not used*	
XU	*Not used*	
XV	*Not used*	
XW	*Not used*	
XX	*Not used*	
XY	*Not used*	
XZ	Combined tasks	

5.3 Classes of objects according to infrastructure

Each object can basically be classified according to Table 1 and Table 2 and be coded with the associated letter codes. However, objects such as industrial complexes consisting of different production facilities, or factories consisting of different production lines and related auxiliary facilities, often have the same intended purpose or task and therefore belong to a restricted number of classes. In the context of this standard, these types of objects are called infrastructure objects.

NOTE 1 Infrastructure is to be understood as the basic structure of an industrial installation.

In many cases, it is advantageous to apply an alternative classification scheme and related letter codes for the differentiation of the constituent objects in a given level of a structure.

Table 3 provides a frame for setting up classification schemes and associated letter codes for infrastructure objects (see also Annex B). Some facilities are identified that are common to most applications. These should be assigned letter codes according to classes A and V to Z of Table 3.

NOTE 2 Objects indicated in the table as “not related to the main process” can in other cases be regarded as main-process facilities. It is possible to shift these objects then to the more appropriate section in Table 3.

The classification of the main facilities of the process described is, to a great extent, branch-related. Classes B to U of Table 3 are reserved for this purpose.

Rule 7 The use of a classification scheme according to infrastructure and its relation to objects represented in a tree-like structure shall be explained in the document where it is applied or in supporting documentation.

NOTE 3 The use of different classification schemes in a reference designation makes their interpretation more difficult or even impossible without explanation.

Examples for some possible branch-related applications of classes B to U are shown in Table 4.

NOTE 4 The letter codes shown in Table 4 are not intended to prescribe any future branch-related standardization. They only illustrate the principle.

NOTE 5 In Table 4, the phrase “*Not used*” indicates that the corresponding letter code is not defined in the relevant classification scheme. It does not prohibit the use of such a letter code if required for a class not defined so far. There is however a risk that in a later edition of the standard these letter codes will represent additional standardized classes that are different from the freely applied ones

Table 3 – Classes of infrastructure objects

Class	Class code	Object class definition	Examples
Objects for common tasks	A	Objects for overall management of other infrastructure objects	Supervisory control system
Objects for main-process facilities	B … U	Reserved for branch-related class-definitions NOTE Letters I and O are not to be used.	See examples in Table 4
Objects not related to the main-process	V	Objects for storage of material or goods	Finished goods store Fresh-water tank plant Garbage store Oil tank plant Raw materials store
	W	Objects for administrative or social purposes or tasks	Canteen Exhibition hall Garage Office Recreation area
	X	Objects for fulfilling auxiliary purposes or tasks without the process (for example, on a site, in a plant or building)	Air conditioning system Alarm system Clock system Crane-system Electric power distribution Fire protection system Gas-supply Lighting installation Security system Sewage disposal plant Water-supply
	Y	Objects for communication and information tasks	Antenna system Computer network Loudspeaker system Paging system Railway signal system Staff locating system Telephone system Television system Traffic light system Video surveillance system
	Z	Objects for housing or enclosing technical systems or installations such as areas and buildings	Building Constructional facilities Factory site Fence Railway line Road Wall

Table 4 – Examples of branch-related classes B to U of Table 3

	Oil refinery
A	As required in Table 3
B	Catalytic cracking plant
C	Catalytic reformer
D	*Not used*
E	Desulphurizing plant
F	Distillation plant
G	*Not used*
H	Gas-separating plant
J	Lubricating oil refinery
K	*Not used*
L	*Not used*
M	*Not used*
N	*Not used*
P	*Not used*
Q	*Not used*
R	Electric power and steam generating station
S	Electric power distribution station
T	*Not used*
U	*Not used*
V … Z	As required in Table 3

	Electric power distribution station
A	As required in Table 3
B	Installations with U_n > 420 kV
C	Installations with 380 kV ≤ U_n ≤ 420 kV
D	Installations with 220 kV ≤ U_n < 380 kV
E	Installations with 110 kV ≤ U_n < 220 kV
F	Installations with 60 kV ≤ U_n < 110 kV
G	Installations with 45 kV ≤ U_n < 60 kV
H	Installations with 30 kV ≤ U_n < 45 kV
J	Installations with 20 kV ≤ U_n < 30 kV
K	Installations with 10 kV ≤ U_n < 20 kV
L	Installations with 6 kV ≤ U_n < 10 kV
M	Installations with 1 kV ≤ U_n < 6 kV
N	Installations with U_n < 1 kV
P	*Not used*
Q	*Not used*
R	*Not used*
S	*Not used*
T	Transformer plants
U	*Not used*
V … Z	As required in Table 3

	Canteen
A	As required in Table 3
B	*Not used*
C	Kitchen
D	*Not used*
E	Counter
F	*Not used*
G	Cash-desk
H	*Not used*
J	Dish-washer facilities
K	*Not used*
L	*Not used*
M	*Not used*
N	*Not used*
P	*Not used*
Q	*Not used*
R	*Not used*
S	*Not used*
T	*Not used*
U	*Not used*
V … Z	As required in Table 3

The classification schemes from different branches may be used in subsequent levels of a structure.

EXAMPLES Possible combinations of the above examples:

For an electric power distribution system: the designation =S1E1 or #S1E1 may indicate the first 110 kV plant in the first electric power distribution station of an oil refinery.

For a canteen: the designation -W1E1 or +W1E1 may indicate the counter facilities in the canteen of the same oil refinery.

Annex A
(informative)

Object-classes related to a generic process

Figure A.1 shows classes of objects according to Table 1 related to a generic process. The objects perform activities that directly initiate or influence the flow, and activities that indirectly influence the flow or monitor its condition. Both are supported by activities or tasks that do not influence the flow, but are necessary resources, sometimes acting in a static way. Some of the latter are also valid for objects that are not related to any flow, for example pillars in a building.

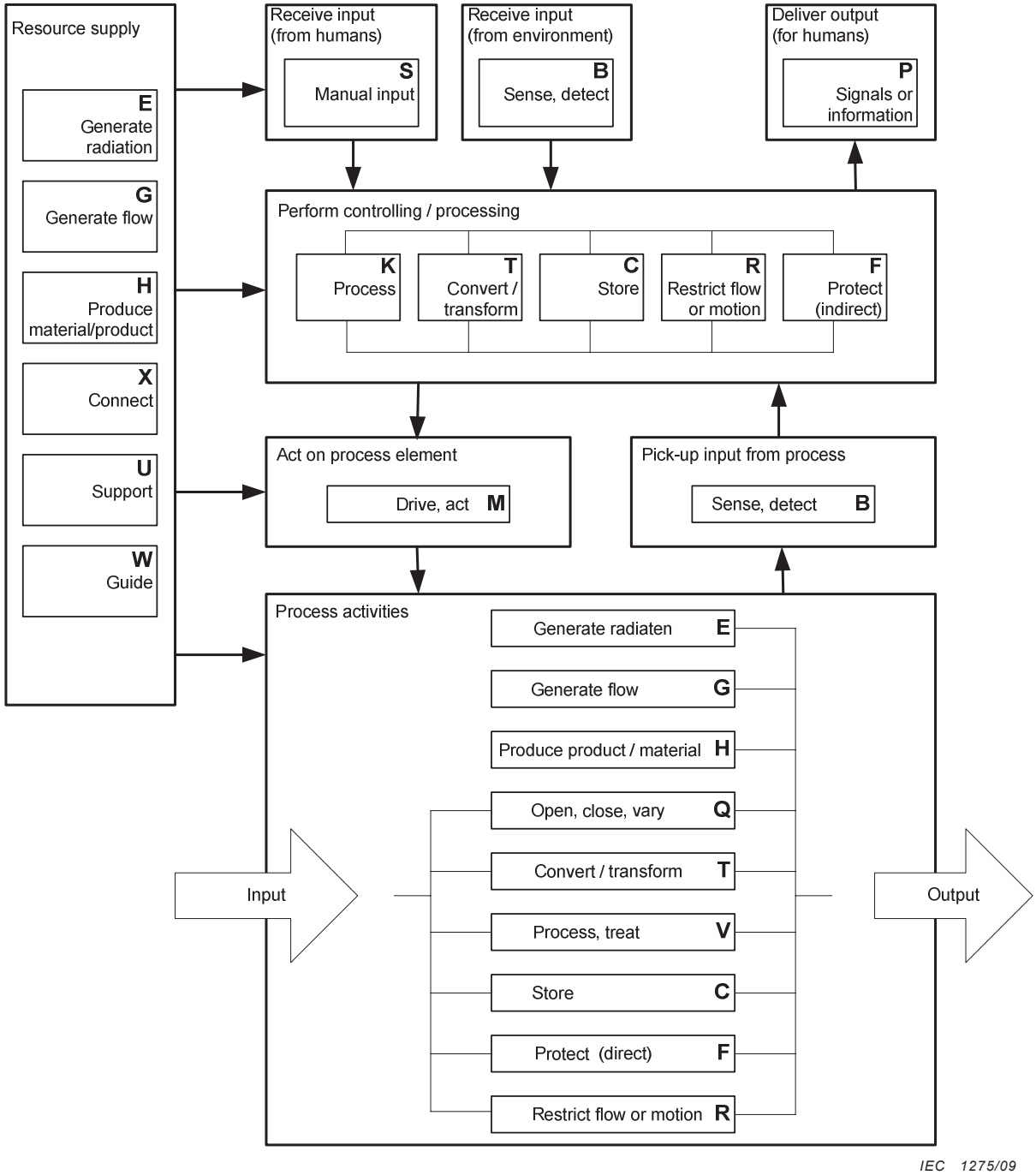


Figure A.1 – Object-classes related to a process

The same class of objects appears at different places in this model. This is to be understood so that “real” objects may be assigned classes and letter codes without considering the position of the object in the process.

The model is independent of technology. Therefore, it is possible to use it in all technical areas. It is also independent of the size or importance of the object under consideration and may be used as a means for classification of small objects as well as of big ones. It may be used repeatedly in all levels of a tree-like structure.

It should, however, be noted that this model is only used as a basis for classifying objects. It is not intended to establish a model for a real process and process environment.

Annex B
(informative)

Object-classes related to objects in a generic infrastructure

Figure B.1 shows classes of objects according to Table 3 related to a technical system environment. It contains objects that represent main-process facilities (Classes B to U) and objects for secondary tasks besides objects for the main process (Classes V to Z). Main-process facilities are normally defined by the owner of the complete installation or predefined by branch-related standards. For example, different production plants in an industrial complex could be seen as main-process facilities. A power generating plant in the same complex could, depending on the point of view, be classified also as a main-process facility or as an auxiliary facility.

While the definition of classes for main-process facilities may change from case to case, the definition of classes for auxiliary facilities is fixed for most applications. Facilities like air-conditioning, lighting installation, water supply, offices, telephone system, buildings or roads occur in most different kinds of installations. They do not directly influence the main processes but are nevertheless important constituents of the infrastructure.

Class A is reserved for objects that act on more than one object related to Classes B to Z. An example is a centralized control panel, controlling different production plants as well as the air-conditioning system and other equipment.

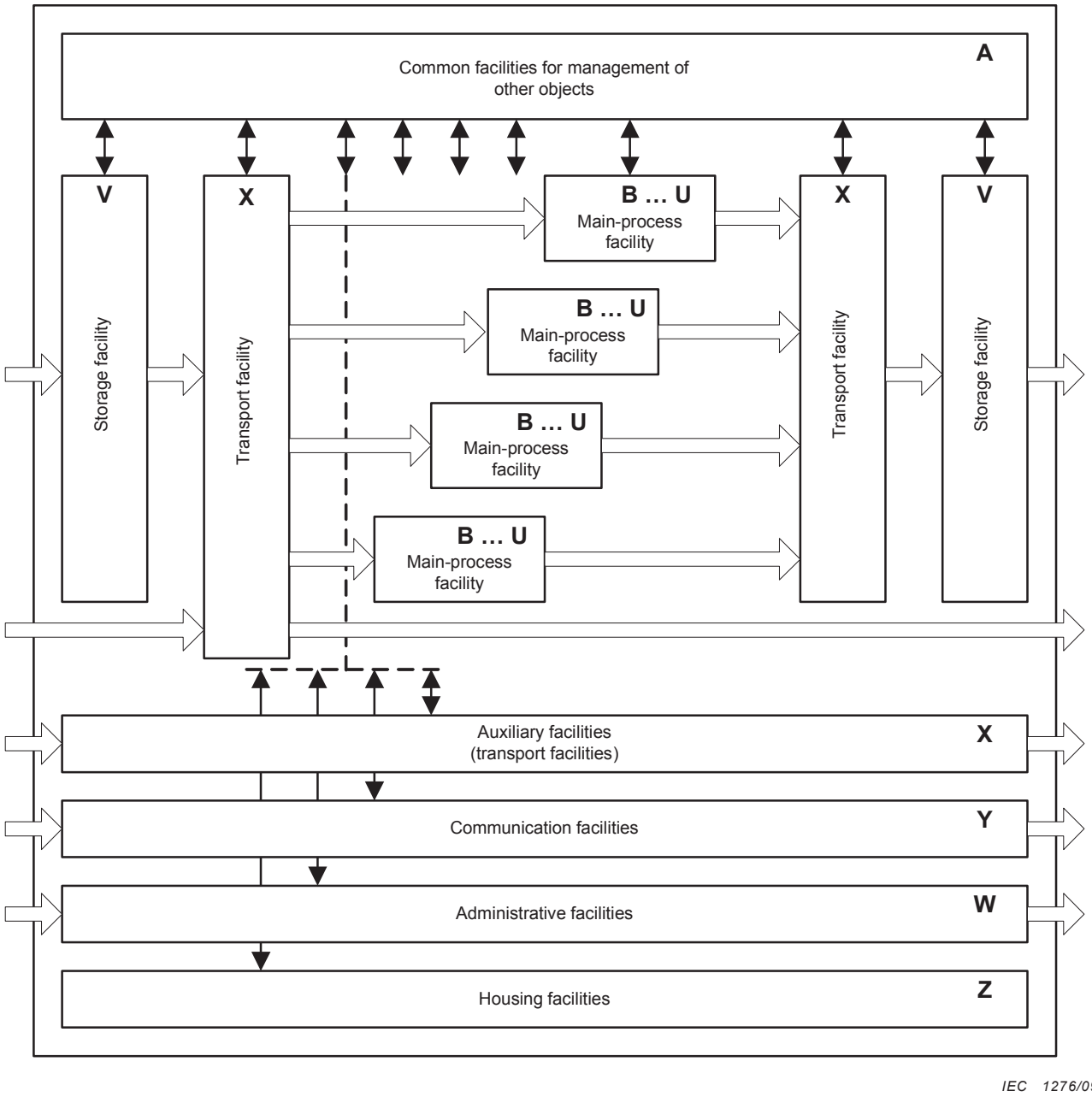


Figure B.1 – Object-classes related to objects in a generic infrastructure

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