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Letter codes – Main classes and subclasses of objects according to their purpose and task

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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IEC-PAS 62400 has been processed by IEC technical committee 3: Information structures, documentation and graphical symbols.

The text of this PAS is based on the following document:	This PAS was approved for publication by the members of the committee concerned as indicated in the following document:
Draft PAS	Report on voting
3/746/NP	3/761/RVN

Following publication of this PAS, the technical committee will investigate the possibility of incorporating the contents of it into a part of IEC 61346, in the context of the maintenance of this standard.

This PAS shall remain valid for an initial maximum period of three years starting from 2005-06. The validity may be extended for a single three-year period, following which it shall be revised to become another type of normative document, or shall be withdrawn.

STRUCTURING PRINCIPLES FOR TECHNICAL PRODUCTS AND TECHNICAL PRODUCT DOCUMENTATION –

LETTER CODES – MAIN CLASSES AND SUBCLASSES OF OBJECTS ACCORDING TO THEIR PURPOSE AND TASK

1   Scope

This PAS extends the letter codes of the main classes for purposes or tasks of objects in accordance with IEC 61346-2, Table 1, with a second-letter code for subclasses. These specifications are generally applicable. They apply equally for all disciplines, such as construction, process and electrical engineering, and for standards, for example, for power generation, power distribution, process engineering facilities, naval architecture and ocean engineering. Additional letter codes may be specified for further subdivision of the classes.

Specification of letter codes for the main and subclasses for infrastructure objects in accordance with IEC 61346-2, Table 2, are not part of this document.

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

ISO 3511-1, *Process measurement, control functions and instrumentation – Symbolic representation – Part 1: Basic requirements*

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

3   Specification of letter codes

Letter codes are specified and are generally applicable for objects fulfilling the following purposes or tasks.

– Control functions, functional allocation   = =   Functional allocation
– Functional equipment unit, equipment unit   =   Function, system
– Product, components   –   Product, component

4 Letter codes for objects based on their purpose or task

4.1 Overview of main classes of objects with associated letter codes

Table 1 – Letter codes for objects in accordance with IEC 61346-2 (main classes)

Letter code	Purpose or task of object
A	Two or more purposes or tasks
B	Conversion of an input variable (physical property, condition or event) to a specific signal for further processing
C	Storage of energy, information or material
D	*Reserved for future standardization*
E	Providing radiant or thermal energy
F	Direct (self-acting) protection of an energy or signal flow, of personnel or facilities from dangerous or unwanted conditions including systems and equipment for protective purposes
G	Initiation of an energy or material flow; generation of signals which are used as an information carrier or reference source
H	Production of a new type of material or products
J	*Reserved for future standardization*
K	Processing (receipt, processing and providing) signals or information (with the exception of objects for protection purposes; see class F)
L	*Reserved for future standardization*
M	Providing mechanical energy (rotational or linear mechanical motion) for driving purposes
N	*Reserved for future standardization*
P	Presentation of information
Q	Controlled switching or variation of a flow of energy, signal or material (see classes K and S for signals in closed/open feedback control loops)
R	Restricting or stabilization of movement or flow of energy, information or material
S	Conversion of a manual operation to a specific signal for further processing
T	Conversion of energy while maintaining the kind of energy, conversion of an established signal while maintaining the content of information, conversion of the form or shape of a material
U	Keeping objects in a defined position
V	Processing (handling) of material or products (including pre-treatment and post-treatment)
W	Conducting or routing energy, signals, materials or products from one location to another
X	Connecting objects
Y	*Reserved for future standardization*
Z	*Reserved for future standardization*

4.2 Rules for generating subclasses

The following rules have been observed for determining the letter codes for the subclasses (2nd data character).

– The main classes as defined in Table 1 are subdivided into subclasses as shown in Table 2, with the exception of the main class with the letter code B.

– The letter codes for subclasses of the main class with the letter code B are specified according to ISO 3511-1.

Table 2 – General assignment of groups of letter codes for subclasses to application areas

Letter code for subclasses	Object, task based on
A	
B	
C	Electrical energy
D	
E	
F	
G	
H	Information or signals
J	
K	
L	
M	
N	
P	
Q	
R	Mechanical engineering
S	Structural engineering
T	(Non-electrical engineering)
U	
V	
W	
X	
Y	
Z	Combined tasks

4.3 Definition of subclasses of objects

Table 3 – Definitions and letter codes of subclasses related to main classes

A[a]	Purpose or task of object: two or more purposes or tasks	
Class and subclass	Task related to subclass	Examples of components
AA	Free for the subdivision of objects, tasks obtained on electrical energy	
AB		
AC		
AD		
AE		
AF	Free for the subdivision of objects, tasks obtained on information or signals	
AG		
AH		
AJ		
AK		
AL	Free for the subdivision of objects, tasks obtained on mechanical engineering, structural engineering (non-electrical engineering)	
AM		
AN		
AP		
AQ		
AR		
AS		
AT		
AU		
AV		
AW		
AX		
AY		
AZ	Combined tasks	
[a] This class is only for objects for which no main purpose or no main task can be identified.		

Table 3 (continued) B

B^b	Purpose or task of object: conversion of an input variable (physical property, condition or event) to a specific signal for further processing.	
Class and subclass	Task related to subclass	Examples of components
BA	*Reserved for future standardization*	
BB	Conversion of input variables for protection purposes	Protection relay, overload relay (thermal), Buchholtz relay
BC	*Reserved for future standardization*	
BD	Density	
BE	Electrical units	Current transformer, measuring relay, voltage transformer, measuring transformer, measuring resistance (shunt)
BF	Flow, throughput	Measuring orifice, pressure difference transducer, flow meter, gas meter, water meter
BG	Distance, length, position, elongation, amplitude	(Radar), motion sensor, position switch, proximity switch, proximity sensor
BH	*Reserved for future standardization*	
BJ	Output	
BK	Time	Clock, time counter
BL	Height, level	Sonic depth finder, (sonar), sight glass
BM	Moisture content	Humidity meter
BN	Open	
BP	Pressure, vacuum	Pressure sensor, pressure gauge
BQ	Material property, quality parameter, analysis (except D, M, V), pH, SO_2 content	X-ray device
BR	Radiation values, neutron flux measurement	Photocell, flame detector, smoke detector
BS	Velocity, speed of rotation, frequency, vibration, oscillation	Vibration pick-up, speedometer, tachometer
BT	Temperature	Temperature sensor, thermometer
BU	Combined units, multiple variables	
BV^c	Viscosity	
BW	Weight force, mass	
BX	Other units	Video camera, microphone
BY	*Reserved for future standardization*	
BZ	Number of events, amount	Switching cycle detector, (radar device)

[b]   The letter codes in accordance with ISO 14617-6:2002, 7.3.1, were used for the subclasses. In accordance with the specifications of ISO 14617-6, subclass Z in the main class B is not available for "combined tasks".

[c]   In accordance with ISO 14617-6:2002, 7.3.1, the letter code "V" is "released for use". No letter code is specified in this standard for measurements/measuring equipment for "viscosity". As it is necessary to designate measurements/measuring equipment for viscosity, the letter "V" is assigned to viscosity here for the letter B.

Table 3 (continued) C

C	Purpose or task of object: storage of energy, information or material	
Class and subclass	**Task related to subclass**	**Examples of components**
CA	Capacitive storage of electric energy	Capacitor
CB	Inductive storage of electric energy	Superconductor, coil
CC	Chemical storage of electric energy	Buffer battery, battery
CD		
CE		
CF	Storage of information	RAM, EPROM, CD-ROM, event recorder, hard disc, magnetic tape recorder, voltage recorder
CG		
CH		
CJ		
CK		
CL	Storage, collection and housing of materials (fixed location, open)	Pits, pools, bunkers, cisterns
CM	Storage, collection and housing of materials (fixed location, closed)	Containers, tanks, boilers, silos, gas holders, accumulators, buffers, flash tanks
CN	Storage, collection and housing of materials (mobile)	Containers, shipping containers, gas cylinder, drum
CP	Storage of thermal energy (heat and cold energy, direct)	Ice tank, hybrid heat storage, underground thermal energy storage, thermal energy storage, hot water storage, steam storage
CQ	Storage of mechanical energy	Flywheel
CR		
CS		
CT		
CU		
CV		
CW		
CX		
CY		
CZ	Combined tasks	
NOTE Storage batteries are assigned to main group "G".		

Table 3 (continued) E

E	Purpose or task of object: providing radiant or thermal energy	
Class and subclass	Task related to subclass	Examples of components
EA	Generation of electromagnetic radiation for lighting purposes using electrical energy	Incandescent lamp, fluorescent tubes, UV radiators
EB	Generation of thermal energy (heat) by conversion of electrical energy	Heating wire, heating rod, electrical heating, electrical boiler, electrode steam boiler, electric furnace, infrared heating element, electric radiator
EC	Generation of thermal energy (cold) by conversion of electrical energy	Cooling unit, freezing unit, refrigerator, freezer, compression chiller, turbine-driven chiller
ED		
EE		
EF	Generation of other electromagnetic radiation	
EG		
EH		
EJ		
EK		
EL	Generation of electromagnetic radiation for lighting purposes by combustion of fossil fuels	Gas light, gas lamp
EM	Generation of thermal energy by conversion of chemical energy	Boiler, burner, furnace, combustion grate
EN	Generation of cold energy by conversion of chemical energy	Refrigerator, cold pump
EP	Generation of heat energy by energy transfer	Condenser, heat exchanger, evaporator, economizer, feed-water heater, steam generator, heat-recovery steam generator, radiator, boiler
EQ	Generation of cold energy by energy transfer	Refrigerator, freezer, cold pump
ER	Generation of heat by conversion of mechanical energy	
ES	Generation of cold by conversion of mechanical energy	Mechanical refrigerator
ET	Generation of thermal energy by nuclear fission	Nuclear reactor
EU	Generation of particle radiation	Neutron generator
EV		
EW		Heater, radiator, boiler, heating stove
EX		
EY		
EZ	Combined tasks	

Table 3 (continued) F

F	Purpose or task of object: direct (self-acting) protection of an energy or signal flow, of personnel or facilities from dangerous or unwanted conditions, including systems and equipment for protective purposes	
Class and subclass	Task related to subclass	Examples of components
FA	Free for subdivision of objects, tasks based on electrical energy	Fuse, arrester, Faraday cage, miniature circuit-breaker, surge arrester, thermal overload trip
FB		
FC		
FD		
FE		
FF	Free for subdivision of objects, tasks based on information and signals	
FG		
FH		
FJ		
FK		
FL	Protection of mechanical and building objects from hazardous pressure conditions	Rupture disc, safety valve, also automatic directly loaded air inlet and vent valve), automatic drains trap, vacuum breaker
FM	Protection of mechanical and building objects from effects of fire	Fire protection facilities (risk detection and initiation of protective measures), fire damper, fire protection door, locks
FN	Protection of mechanical and building objects from hazardous operating conditions or damage	Protective shield, protection device, protective sleeve for thermocouple, safety clutch, impact protection
FP	Protection of the environment from emissions (for example, radiation, chemical emissions, noise)	Reactor protection equipment
FQ	Protection of persons/animals	Railings, barriers, gates, fence, contact protection, vision protection, glare protection, escape door, escape window, airbag, safety belt
FR	Protection of mechanical and building objects from wear (for example, corrosion)	Protective anode (cathodic),
FS	Protection against environmental effects (for example, weather, geophysical effects)	Weather, avalanche protection, geophysical protection
FT		
FU		
FV		
FW		
FX		
FY		
FZ	Combined tasks	