INTERNATIONAL STANDARD

IEC
61360-1

Second edition
2002-02

Standard data element types with associated classification scheme for electric components –

Part 1:
Definitions – Principles and methods

Types normalisés d'éléments de données avec plan de classification pour composants électriques –

Partie 1:
Définitions – Principes et méthodes

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INTERNATIONAL ELECTROTECHNICAL COMMISSION
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STANDARD DATA ELEMENT TYPES WITH ASSOCIATED CLASSIFICATION SCHEME FOR ELECTRIC COMPONENTS –

Part 1: Definitions – Principles and methods

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.

3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61360-1 has been prepared by subcommittee 3D: Data sets for libraries, of IEC technical committee 3: Information structures, documentation and graphical symbols.

This second edition cancels and replaces the first edition published in 1995 and constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
3D/93/FDIS	3D/96/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annexes A, B and C form an integral part of this standard.

Annex D is for information only.

IEC 61360 consists of the following parts, under the general title *Standard data element types with associated classification scheme for electric components*

– Part 1: Definitions – Principles and methods
– Part 2: EXPRESS dictionary schema
– Part 3: Maintenance and validation procedures
– Part 4: IEC reference collection of standard data element types, component classes and terms
– Part 5: Extensions to the EXPRESS dictionary schema [1]

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be:

• reconfirmed;
• withdrawn;
• replaced by a revised edition, or
• amended.

A bilingual version of this publication may be issued at a later date.

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[1] To be published.

STANDARD DATA ELEMENT TYPES WITH ASSOCIATED CLASSIFICATION SCHEME FOR ELECTRIC COMPONENTS –

Part 1: Definitions – Principles and methods

1 General

1.1 Scope and object

This part of IEC 61360 provides a firm basis for the clear and unambiguous definition of characteristic properties (data element types) of all elements of electrotechnical systems from basic components to subassemblies and full systems. Although originally conceived in the context of providing a basis for the exchange of information on electric/electronic components, the principles and methods of this standard may be used in areas outside the original conception such as assemblies of components and electrotechnical systems and subsystems.

In addition, the standard provides for establishing a classification hierarchy and the allocation of applicable and relevant properties to each of the classes so established in order to describe fully the characteristics of objects belonging to that class. Provision is also made for definition of the terms used in classification.

Use of this standard facilitates the exchange of data describing electrotechnical systems through a defined structure for the information to be exchanged in a computer-sensible form. Each property to be exchanged will have an unambiguously defined meaning and consistent naming, where relevant a defined value list, a prescribed format and defined units of measure for all quantitative values. There is also provision for

– control of changes to definitions of the properties through version and revision numbers;

– inclusion of notes and remarks to clarify and help in the application of the definitions;

– indication of the sources of definitions and value lists;

– associated figures and formulae.

1.2 ISO/IEC EXPRESS information model

Closely associated with this part of IEC 61360 is IEC 61360-2. This part contains the information model, using the EXPRESS modelling language. In this model, the definition and structure of IEC 61360-1 is formalized and presented in a computer-sensible form. Use of this information model allows dictionary information to be exchanged between different systems using the STEP Physical File Format as defined in ISO 10303-21.

This information model has also been accepted as the common information model and is reproduced as ISO 13584-42. Use may be made of other standards in the ISO 13584 series of standards for extension of the concepts defined in this standard. In particular ISO 13584-24 contains provisions which allow

– extensions of the class structure to include feature and functional model classes;

– tabulation of properties;

– functional relationships among properties;

– references to graphical information;

– structuring of parts libraries.

1.3 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 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60747 (all parts), *Semiconductor devices – Discrete devices*

IEC 60748 (all parts), *Semiconductor devices – Integrated circuits*

IEC 61360-2: 2002, *Standard data element types with associated classification scheme for electric components – Part 2: EXPRESS dictionary schema*

IEC 61360-4:1997, *Standard data element types with associated classification scheme for electric components – Part 4: IEC reference collection of standard data element types, component classes and terms*

ISO/IEC 646:1991, *Information technology – ISO 7-bit coded character set for information interchange*

ISO/IEC 6429:1992, *Information technology – Control functions for coded character sets*

ISO/IEC 10646-1:2000, *Information technology – Universal Multiple-Octet Coded Character Set (UCS) – Part 1: Architecture and Basic Multilingual Plane*

ISO/IEC 11179-3:1994, *Information technology – Specification and standardization of data elements – Part 3: Basic attributes of data elements*

ISO 31 (all parts), *Quantities and units*

ISO 843:1997, *Information and documentation – Conversion of Greek characters into Latin characters*

ISO 2382 (all parts), *Information technology – Vocabulary*

ISO 6093:1985, *Information processing – Representation of numerical values in character strings for information interchange*

ISO 9735:1988, *Electronic data interchange for administration, commerce and transport (EDIFACT) – Application level syntax rules*

ISO 10303-21:1994, *Industrial automation systems and integration – Product data representation and exchange – Part 21: Implementation methods: Clear text encoding of the exchange structure*

ISO 13584-24, *Industrial automation systems and integration – Parts library – Part 24: Logical resources: Logical model of supplier library[2)]*

ISO 13584-42:1998, *Industrial automation systems and integration – Parts library – Part 42: Description methodology: Methodology for structuring part families*

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[2)] To be published.

2 Definitions

For the purpose of this part of IEC 61360, the following definitions apply.

2.1
entity
any concrete or abstract object of interest, including relations among things

2.2
relation
observed connection between entities

2.3
data element type
unit of data for which the identification, description and value representation have been specified

2.4
data element type class
class of data element types with the same type of representation, or description or value representation

2.5
quantitative data element type
data element type with a numerical value representing a measurable physical quantity, a quantity of information or a count of objects

2.6
non-quantitative data element type
data element type which identifies or describes an object by means of codes, abbreviations, names, references or descriptions

2.7
condition data element type
kind of data element type whose value affects the value of another data element type

NOTE 1   A condition data element type has only a meaning when it is used in combination with another data element type.

NOTE 2   A condition data element type does not form part of the classification tree and can be used on every level of the classification.

2.8
classifying data element type
data element type applicable for a particular component class, addressing a single elementary attribute of that component and having a homogeneous complementary value list, whose values define the component subclasses

2.9
classification
systematic division of a set of items into subsets according to their difference in some predetermined characteristics

2.10
attribute
any one of the properties to describe an entity, possibly involving one or more other entities

2.11
product
result of labour or of a natural or industrial process

2.12
component
industrial product which serves a specific function or functions, which is not decomposable or physically divisible and which is intended for use in a higher order assembled product

2.13
electric component
component with conductive terminals through which voltages or currents may be applied or delivered

NOTE   Electric components and electric transducers are included in this definition.

2.14
component class
set of components of which each component can be described by the same group of data element types

2.15
term
designation of a defined concept in a special language by a linguistic expression

NOTE   A term may consist of one or more words (i.e. simple term or complex term) or even contain symbols.

2.16
material
basic matter (such as metal, wood, plastic, fibre) from which the greater part of something physical is made

2.17
feature
generalized property described by a group of related properties

2.18
geometry
a surface shape (as of a mechanical part or a crystal)

2.19
computer-sensible information
information which can be exchanged and manipulated with the interactive use of computer systems, programs and procedures

2.20
applicable data element type
data element type that is defined for a component class and which applies to all components belonging to that class

2.21
visible data element type
data element type that is defined for a component class but which may or may not apply to any component belonging to that class

NOTE 1   The code of the class where a data element type is defined as visible is part of the identification of this data element type.

NOTE 2   Within the IEC, all data element types are defined as visible at the level of the root class, that is the superclass of the component class, material class and geometry class.

3   Data element type specification attributes

In this clause the various attributes of data element types as encountered in the specifications are explained. For a list of these attributes, see table 1. These attributes are related to identification, description, value of data element types and relationships between data element types.

Table 1 – List of attributes of data element types

Attributes	Subclause
Code	3.2.1
Version number	3.2.2
Revision number	3.2.3
Preferred name	3.2.4
Synonymous name	3.2.5
Short name	3.2.6
Preferred letter symbol	3.2.7
Synonymous letter symbol	3.2.8
Definition	3.3.1
Note	3.3.2
Remark	3.3.3
Formula	3.3.4
Figure	3.3.5
Source document of data element type definition	3.3.6
Data type	3.4.1
Value format	3.4.2
Unit of measure	3.4.3
Value list	3.4.4
Value	3.4.4.1
Value code	3.4.4.2
Value meaning	3.4.4.3
Source document(s) of value list(s)	3.4.4.4
Referenced class identifier	3.4.5
Condition data element type	3.5.1
Data element type class	3.5.2

For the representation of the attributes of the data element types, in general upper-case letters and lower-case letters are used according to the existing international standards from which the attributes are taken. When no standard exists, the commonly used IEC methodology is followed (IEC 60027 and IEC 60748). Characters are compliant with the character set as defined in annex A.
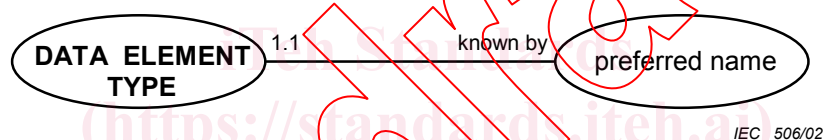
3.1   Information model of a data element type

Based on the principles as described in ISO/IEC 11179-3, the attributes of a data element type are divided into four main groups:

– identifying related attributes;

– semantic related attributes;

– value related attributes;

– relationship attributes of a data element type related to relations among entities.

In the following subclauses, the attributes are specified and clarified by the information models.

The information models (entity-relation diagrams), given in figures 2, 3, 4, 5 and 6, of a data element type shall be read as follows:

– from inside outwards starting with the entity in bold capital letters;

– (related) entities are indicated by ellipses;

– relation between an entity and an (related) entity is indicated by the line between those ellipses;

– text accompanying the line between an entity and an (related) entity describes the relation;

– the combination of a relation and an entity constitutes the attribute of a data element type;

– two figures separated by a dot indicate the occurrence of the attribute: the first digit indicates the minimum number of occurrences, the second one, the maximum number of occurrences;

– relations and the corresponding occurrence indications are on the same side of the relation-line positioned;

– in the information models the name of the entities shall be given in capitals and the name of the related entities shall be given in lower case.

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Entity: DATA ELEMENT TYPE
Relation: known by
Related entity: preferred name
Attribute: known by preferred name
                    NOTE   The attribute is composed of the relation and the relevant entity.
Cardinality: 1.1 (one and not more than one)

Figure 1 – Information model principle

3.2   Identifying attributes

To identify a data element type uniquely within the IEC reference collection, IEC 61360-4 and, for electronic information exchange, a language independent combination of characters shall be used.

The identifier of a data element type shall consist of the combination of the six-character data element type code, followed by a hyphen followed by the three-digit version number of the data element type. The identifier shall be used for the identification of different occurrences of the same data element type code.

Figure 2 shows the possible attributes of a data element used to identify a data element type.
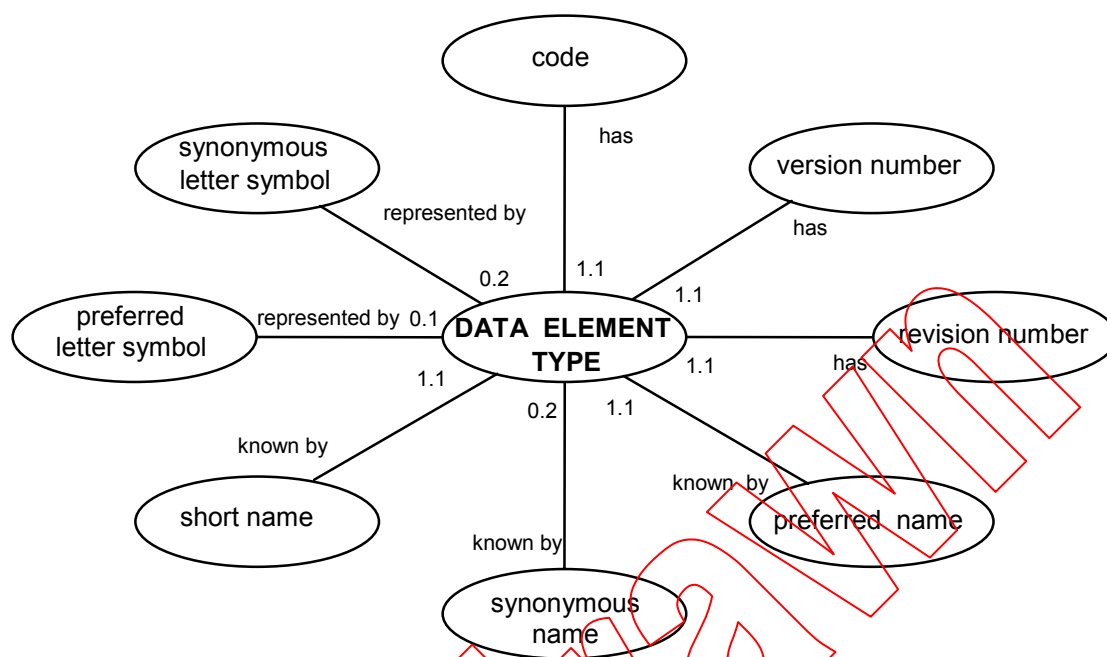
Figure 2 – Identifying attributes for data element type

3.2.1 Code

Attribute name:	code
Attribute definition:	unique six-character code of a data element type
Comments:	the first three characters shall be alphabetic, the last three numeric (format AAANNN). The character "X" [3] shall not be used as first character. The codes are issued sequential and should not have any relationship with the meaning of the data element types.

In case of at least one attribute of the data element type, which affects the meaning and or communication of the data element type is changed, a new (other) data element type, having a new code, shall be defined. Such attributes are:

– definition;
– unit of measure;
– condition data element type;
– value format;
– value code [4]
– data type

Obligation:	mandatory
Character type of values:	upper-case latin letters A through Z (to avoid misunderstanding, the upper-case Latin letters O and I shall not be used) digits 0 through 9

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[3] For local or private use within users' environment, codes starting with XAA up to and including codes starting with XZZ, may be used and are therefore excluded from the IEC reference collection of standard data element types (IEC 61360-4).

[4] Whether the code should be changed, so that a new data element type is generated, or whether the version number of a data element type should be changed, is to be determined for each case separately.