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

**Part 2:  
EXPRESS Dictionary schema**

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

*Partie 2:  
Schéma d'un dictionnaire EXPRESS*

IEC 61360-2:1998

<https://standards.iteh.ai/en/standards/iec/a84ba894-1cca-4cd1-9e74-8687df584ac7/iec-61360-2-1998>

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\* See web site address on title page.

# INTERNATIONAL STANDARD

# IEC 61360-2

Second edition  
2002-02

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

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International Electrotechnical Commission  
Международная Электротехническая Комиссия

PRICE CODE **XC**

*For price, see current catalogue*

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2: EXPRESS Dictionary schema

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.
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International Standard IEC 61360-2 has been prepared by subcommittee 3D: Data sets for libraries, of IEC technical committee 3: Documentation and graphical symbols.

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

FDIS	Report on voting
3D/53/FDIS	3D/58/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.

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.

Annexes A and B are for information only.



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

## Part 2: EXPRESS Dictionary schema

### 1 General

#### 1.1 Scope and object

The scope of this part of IEC 61360 is the common ISO/IEC dictionary schema based on the intersection of the scopes of the two base standards:

- IEC 61360-1, *Standard data element types with associated classification scheme for electric components - Part 1: Definitions - Principles and methods*, and
- ISO 13584-42, *Methodology for structuring part families*

The presented EXPRESS model represents a common formal model for the two standards and facilitates a harmonization of both.

Relevant parts of their scope clauses are cited below.

#### From IEC 61360-1:

" This part of IEC 61360 specifies the principles to be used for defining technical data element types with associated classification schemes needed to describe fully electric components, including electronic and electromechanical components and materials used in electro-technical equipment and systems."

#### From ISO 13584-42:

" This part of ISO 13584 specifies:

- the attributes that shall be provided by library suppliers to describe the families and properties of parts. These attributes are part of the content of their parts library and shall be stored in the dictionary of the user library;
- the specifications of these attributes in the EXPRESS information model that provides for the exchange of such dictionary data".

The object of this standard is to provide a formal model for data according to the scope as given above, and thus to provide a means for the computer-sensible representation and exchange of such data.

The intention is to provide a common information model for the work of both committees, thus allowing for the implementation of dictionary systems dealing with data delivered according to either of the standards elaborated by both committees.

Two schemas are provided in this part of IEC 61360 defining the two options that may be selected by an implementation. Each of these options is referred to as a conformance class.

- The **ISO13584\_IEC61360\_dictionary\_schema**<sup>1</sup> provides for modelling and exchanging technical data element types with associated classification scheme but without modelling the definitions of the terms used in the data element type definitions. It constitutes conformance class 1 of this part of IEC 61360.
- The **IEC61360\_extended\_dictionary\_schema** provides for modelling and exchanging technical data element types with associated classification scheme together with modelling definitions of and references to the terms used in the data element type definitions. It constitutes conformance class 2 of this part of IEC 61360.

<sup>1</sup> All the names that stand for items, formally defined within the EXPRESS model, are presented in **bold face**.

When used together with ISO 10303-21, each schema defines one single exchange format.

The exchange format defined by conformance class 1 is fully compatible with the ISO 13584 series.

The exchange format defined by conformance class 2 provides also for exchanging the definitions of the terms used in the definitions of data element types and their associated classification scheme when such an exchange is required, despite the lack of compatibility with implementations compliant with the ISO 13584 series.

Both committees agreed NOT to change and/or modify the presented EXPRESS model independent of each other in order to guarantee the harmonization and the reusability of the work from both committees. Requests for amendments should therefore be sent to both committees. These requests should be adopted by both committees before modifying the EXPRESS information model.

## 1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61360. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 61360 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 61360 (all parts),	<i>Standard data element types with associated classification scheme for electric components</i>
IEC 61360-1: 1995,	<i>Standard data element types with associated classification scheme for electric components - Part 1: Definitions - Principles and methods</i>
IEC 61360-4: 1997,	<i>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</i>
ISO 31 (all parts),	<i>Quantities and units</i>
ISO 639: 1988,	<i>Code for the representation of names of languages</i>
ISO 843: 1997,	<i>Information and documentation - Conversion of Greek characters into Latin characters</i>
ISO 4217: 1995,	<i>Codes for the representation of currencies and funds</i>
ISO 6093: 1985,	<i>Information processing - Representation of numerical values in character strings for information interchange</i>
ISO 8601: 1988,	<i>Data elements and interchange formats - Information interchange - Representation of dates and times</i>
ISO 8859-1: 1987,	<i>Information processing - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No. 1</i>
ISO 8879: 1986,	<i>Information processing - Text and office systems - Standard Generalized Markup Language (SGML)</i>
ISO 9735: 1988,	<i>Electronic data interchange for administration, commerce and transport (EDIFACT) - Application level syntax rules</i>

- ISO 10303-11: 1994, *Industrial automation systems and integration - Product data representation and exchange - Part 11: Description methods: The EXPRESS language reference manual*
- 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 10303-41: 1994, *Industrial automation systems and integration - Product data representation and exchange - Part 41: Integrated generic resources: Fundamentals of product description and support*
- ISO 10303-42: 1994, *Industrial automation systems and integration - Product data representation and exchange - Part 42: Integrated generic resources: Geometric and topological representation*
- ISO 12083: 1994, *Information and documentation - Electronic manuscript preparation and markup*
- ISO 13584 (all parts), *Industrial automation systems and integration - Parts library<sup>2</sup>*
- ISO 13584-42:---, *Industrial automation systems and integration - Parts library - Part 42: Description methodology: Methodology for structuring part families<sup>3</sup>*

## 2 Definitions

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

### 2.1

#### Basic Semantic Unit (BSU)

entity that provides an absolute and universal identification of certain objects of the application domain (e.g. classes, data element types)

### 2.2

#### dictionary element

set of attributes that constitutes the dictionary description of certain objects of the application domain (e.g. classes, data element types)

### 2.3

#### common dictionary schema

information model for a dictionary, using the information modelling language EXPRESS

### 2.4

#### data type

set of allowed values of a data element type

NOTE – Within IEC the **data\_type** that is either a unit of measure or a value domain is defined separately for each data element type.

### 2.5

#### IEC root class

class that is the superclass of all the classes defined in IEC 61360-4; its class code is 'AAA000' and its version is '001'

<sup>2</sup> To be published.

<sup>3</sup> To be published.

## 2.6

### applicable data element type

data element type that is defined for a component class and that applies to any component that belongs to this component class

## 2.7

### visible data element type

data element type that is defined for a component class and that may or may not apply to the different components of this component 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 IEC all data element types are defined as visible at the level of the root class, that is the superclass of both the component class and the material class.

## 3 Abbreviations

In this standard the following abbreviations are used:

- BSU: Basic Semantic Unit
- DET: Data Element Type
- ICS: International Classification of Standards
- SI: International System of Units

## 4 Overview of the common dictionary schema and compatibility with ISO 13584

In the following subclauses the architecture of the common dictionary schema will be presented and it will be explained how the same information model has to be used in the International Standards to ensure their compatibility.

The common dictionary schema combines the requirements of IEC 61360 and ISO 13584. Therefore, it contains resources to accommodate the specific requirements of both International Standards. These resources are provided either as optional capability or as subtypes of the types defined to fulfil the common requirements.

### 4.1 Use of the common dictionary schema to exchange IEC 61360-1 compliant data

- a) The ISO 13584 specific extensions shall not be used for the exchange of dictionary elements defined according to IEC 61360-1. These extensions are **present\_translations**, **translated\_label** and **translated\_text** that provide for multilingual capabilities.
- b) The fixed length of some strings is greater than the size defined in IEC 61360-1. When, however, these strings are exchanged using the common dictionary schema, they shall be padded as follows:
  - **code** of a component class: the six character long IEC code shall be left justified in the fourteen character long exchange format that shall be padded with eight underscores ('\_');
  - **code** of a data element type: the six character long IEC code shall be left justified in the fourteen character long exchange format that shall be padded with eight underscores ('\_');
  - **value code** of the value of a data element type: the variable character length of the IEC code shall be left justified in the eighteen character long exchange format that shall be padded with underscores ('\_');
  - **coded name** of a component class: the variable character length of the IEC code shall be left justified in the eighteen character long exchange format that shall be padded with underscores ('\_');
  - **revision number**: the two character long IEC code shall be right justified and shall be padded with one zero ('0').
- c) If a component class has a superclass, the **coded\_name** shall be defined as a **value\_code** in the **domain** of the classifying data element type of the superclass.
- d) If a classifying data element type exists within a specific component class, for each **value** in its **domain** a subclass and a **term** shall be defined.

- e) A classifying data element type, optional in conformance class 2 in the common dictionary schema, shall always be provided for the component classes defined according to IEC 61360-1.
- f) Only SI units shall be used although the common dictionary schema enables the use of many kinds of system units. When using this schema however for the exchange of IEC 61360 compliant data, only SI units shall be used for quantitative data element types.

#### 4.2 Compatibility with ISO 13584-42

An implementation compliant with this part of IEC 61360 shall support all the entities, types and associated constraints that belong to the conformance class it claims to support.

Therefore, conformity with conformance class 1 of this part of IEC 61360 requires that all the entities, types and associated constraints defined in the common dictionary schema be supported. ISO 13584 data conforming to the common dictionary schema may thus be processed by an IEC 61360 implementation, whether it conforms to conformance class 1 or to conformance class 2 that includes all the features of conformance class 1.

In ISO 13584, a specific conformance class<sup>4</sup> is intended to contain all the entities, types and associated constraints defined in the common dictionary schema. An ISO 13584 compliant implementation conforming to this conformance class shall therefore be able to support IEC data that belongs to conformance class 1 of this part of IEC 61360.

#### 4.3 Naming correspondence between IEC 61360-1 and IEC 61360-2

Due to specific application restrictions - e.g. the EXPRESS language allows no spaces in names -, a number of similar 'EXPRESS names' are created by replacing the blank in a name by an underscore (e.g. preferred name is presented as **preferred\_name**).

At other places names are used in the EXPRESS model that deviate from those used in IEC 61360-1. This is a consequence of the effort to reach one common EXPRESS information model together with parts libraries.

The table below offers a guide for matching the names used in the two parts of IEC 61360.

X-REFERENCE table

Naming in 61360-2	Naming in 61360-1
<b>component_class</b> <b>condition_DET</b> <b>dependent_P_DET</b> <b>det_classification</b> <b>(DER)dic_identifier</b> <b>dic_value</b> <b>material_class</b> <b>meaning</b> <b>non_dependent_P_DET</b> <b>preferred_symbol</b> <b>revision</b> <b>source_doc_of_definition</b> <b>source_doc_of_definition</b> <b>source_doc_of_definition</b> <b>synonymous_symbols</b> <b>unit</b> <b>value_code</b> <b>version</b>	Component class Condition data element type Data element type Data element type class Identifier Value Material class Value meaning Data element type Preferred letter symbol Revision number Source document of data element type definition Source document of component class definition Source document of term definition Synonymous letter symbol Unit of measure Value code Version number

<sup>4</sup> This conformance class is defined as conformance class 0 in ISO 13584-24.

#### 4.4 Main structure of the common dictionary schema

This subclause explains the main resource constructs provided by the common dictionary schema.

- **dictionary\_element** is any element defined in the dictionary;
- **supplier\_element** captures the data of suppliers of dictionary elements (classes, properties, data types);
- **class** models the dictionary element of classes (families) which are described by properties;
- **property\_DET** is the dictionary element of a property;
- **data\_type** specifies the type of a property.

These parts of the dictionary schema are presented in more detail in clause 5: ISO13584\_IEC61360\_dictionary\_schema.

In the presentation of the common dictionary schema, some overview diagrams are provided as planning models (figures 1 to 11). These planning models use the EXPRESS-G graphical notation for the EXPRESS language.

For clarification of the diagrams, some of the relationships that are defined in the EXPRESS model are omitted. Figure 1 below outlines as a planning model the main structure of the common dictionary schema.

Most of these figures contain overview models (or planning models) but show only that level of detail which is appropriate at a certain place.

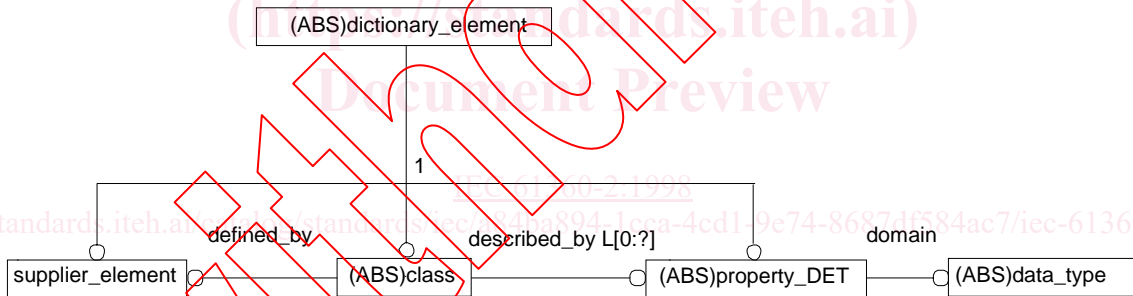


Figure 1 - Overview of the Dictionary Schema

### 5 ISO13584\_IEC61360\_dictionary\_schema

This clause, which constitutes the main part of the common information model of ISO 13584-42 and IEC 61360, contains the full EXPRESS listing of the dictionary schema, annotated with comments and explanatory text. The order of text in this clause is determined firstly by the order imposed by the EXPRESS language, secondly by importance.

\*)  
 SCHEMA ISO13584\_IEC61360\_dictionary\_schema;  
 (\*

#### 5.1 References to other schemata

This subclause contains references to other EXPRESS schemata which are used in the Dictionary Schema. Their source is indicated in the respective comment.