IEC 62056-6-1

Edition 4.0 2023-12
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Electricity metering data exchange – The DLMS®/COSEM suite – Part 6-1: Object Identification System (OBIS)

IEC 62056-6-1:2023-12 RLV(en)

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC 62056-6-1

Edition 4.0 2023-12
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Electricity metering data exchange – The DLMS®/COSEM suite – Part 6-1: Object Identification System (OBIS)

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 17.220, 35.110, 91.140.50

ISBN 978-2-8322-7997-7

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

ELECTRICITY METERING DATA EXCHANGE – THE DLMS®/COSEM SUITE –

Part 6-1: Object Identification System (OBIS)

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 IEC on technical matters express, as clearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62056-6-1:2013. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 62056-6-1 has been prepared by IEC technical committee 13: Electrical energy measurement and control. It is an International Standard.

This fourth edition cancels and replaces the third edition of IEC 62056-6-1, published in 2017. This edition constitutes a technical revision.

The main technical changes with respect to the previous edition are listed in Annex B (informative).

The text of this International Standard is based on the following documents:

Draft	Report on voting
13/1852/CDV	13/1883/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all the parts in the IEC 62056 series, published under the general title *Electricity metering data exchange – The DLMS®/COSEM suite*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This ~~third~~ fourth edition of IEC 62056-6-1 has been prepared by IEC TC13 ~~WG14~~ with a significant contribution of the DLMS® User Association, its ~~D~~A-type liaison partner.

This edition is in line with the DLMS® UA Blue Book Edition ~~12.2~~14. This edition specifies new OBIS codes related to new applications ~~and includes some editorial improvements~~.

Data identification

The competitive electricity market requires an ever-increasing amount of timely information concerning the usage of electrical energy. Recent technology developments enable to build intelligent static metering equipment, which is capable of capturing, processing and communicating this information to all parties involved.

To facilitate the analysis of metering information, for the purposes of billing, load, customer and contract management, it is necessary to uniquely identify data items, whether collected manually or automatically, via local or remote data exchange, in a manufacturer-independent way. The definition of identification codes to achieve this – the OBIS codes – is based on DIN 43863-3:1997, *Electricity meters – Part 3: Tariff metering device as additional equipment for electricity meters – EDIS – Energy Data Identification System.*

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this International Standard may involve the use of a maintenance service concerning the stack of protocols on which the present standard IEC 62056-6-1 is based.

The IEC takes no position concerning the evidence, validity and scope of this maintenance service.

The provider of the maintenance service has assured the IEC that he is willing to provide services under reasonable and non-discriminatory terms and conditions for applicants throughout the world. In this respect, the statement of the provider of the maintenance service is registered with the IEC. Information may be obtained from:

DLMS User Association
www.dlms.com

ELECTRICITY METERING DATA EXCHANGE – THE DLMS®/COSEM SUITE –

Part 6-1: Object Identification System (OBIS)

1 Scope

This part of IEC 62056 specifies the overall structure of the OBject Identification System (OBIS) and the mapping of all commonly used data items in metering equipment to their identification codes.

OBIS provides a unique identifier for all data within the metering equipment, including not only measurement values, but also abstract values used for configuration or obtaining information about the behaviour of the metering equipment. The ID codes defined in this document are used for the identification of:

- logical names of the various instances of the ICs, or objects, as defined in IEC 62056-6-2:2023;
- data transmitted through communication lines;
- data displayed on the metering equipment, see Clause A.2 in Annex A.

This document applies to all types of metering equipment, such as fully integrated meters, modular meters, tariff attachments, data concentrators, etc.

To cover metering equipment measuring energy types other than electricity, combined metering equipment measuring more than one type of energy or metering equipment with several physical measurement channels, the concepts of medium and channels are introduced. This allows meter data originating from different sources to be identified. While this document fully defines the structure of the identification system for other media, the mapping of non-electrical energy related data items to ID codes is completed separately.

NOTE EN 13757-1:2014 defines identifiers for metering equipment other than electricity: heat cost allocators, thermal energy, gas, cold water and hot water.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

~~IEC TR 61000-2-8:2002, *Electromagnetic compatibility (EMC) – Part 2-8: Environment – Voltage dips and short interruptions on public electric power supply systems with statistical measurement results*~~

IEC TR 62051:1999, *Electricity metering – Glossary of terms*

IEC TR 62051-1:2004, *Electricity metering – Data exchange for meter reading, tariff and load control – Glossary of terms – Part 1: Terms related to data exchange with metering equipment using DLMS®/COSEM*

~~IEC 62053-23:2003, *Electricity metering equipment (a.c.) – Particular requirements – Part 23: Static meters for reactive energy (classes 2 and 3)*~~

IEC 62056-21:2002, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 21: Direct local data exchange*

IEC 62056-6-2:~~2017~~2023, *Electricity metering data exchange – The DLMS®/COSEM suite – Part 6-2: COSEM interface classes*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TR 62051:1999 and IEC TR 62051-1:2004 apply.

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

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.2 Abbreviated terms

COSEM	Companion Specification for Energy Metering
COSEM object	An instance of a COSEM interface class
DLMS	Device Language Message Specification
DLMS UA	DLMS User Association
GSM	Global System for Mobile Communications
IC	Interface Class
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
OBIS	OBject Identification System
VZ	Billing period counter

4 OBIS code structure

4.1 Value groups and their use

OBIS codes identify data items used in energy metering equipment, in a hierarchical structure using six value groups A to F, see Table 1.

Table 1 – OBIS code structure and use of value groups

Value group	Use of the value group
A	Identifies the media (energy type) to which the metering is related. Non-media related information is handled as abstract data.
B	Generally, identifies the measurement channel number, i.e. the number of the input of a metering equipment having several inputs for the measurement of energy of the same or different types (for example in data concentrators, registration units). Data from different sources can thus be identified. It may also identify the communication channel, and in some cases it may identify other elements. The definitions for this value group are independent from the value group A.
C	Identifies abstract or physical data items related to the information source concerned, for example current, voltage, power, volume, temperature. The definitions depend on the value in the value group A. Further processing, classification and storage methods are defined by value groups D, E and F. For abstract data, value groups D to F provide further classification of data identified by value groups A to C.
D	Identifies types, or the result of the processing of physical quantities identified by values in value groups A and C, according to various specific algorithms. The algorithms can deliver energy and demand quantities as well as other physical quantities.
E	Identifies further processing or classification of quantities identified by values in value groups A to D.
F	Identifies historical values of data, identified by values in value groups A to E, according to different billing periods. Where this is not relevant, this value group can be used for further classification.

4.2 Manufacturer specific codes

In value groups B to F, the following ranges are available for manufacturer-specific purposes:

- group B: 128…199;
- group C: 128…199, 240;
- group D: 128…254;
- group E: 128…254;
- group F: 128…254.

If any of these value groups contain a value in the manufacturer specific range, then the whole OBIS code shall be considered as manufacturer specific, and the value of the other groups does not necessarily carry a meaning defined in this document or in IEC 62056-6-2:2023.

In addition, manufacturer specific ranges are defined in Table 8 with A = 0, C = 96 and in Table 20 with A = 1, C = 96.

4.3 Reserved ranges

By default, all codes not allocated are reserved[1].

4.4 Summary of rules for manufacturer, utility, consortia and country specific codes

Table 2 summarizes the rules for manufacturer specific codes specified in 4.2, utility specific codes specified in 5.2, consortia specific codes specified in 5.4.2 and country specific codes specified in 5.4.3.

[1] Administered by the DLMS® User Association (see ~~Foreword~~ Introduction).

Table 2 – Rules for manufacturer, utility, consortia and country specific codes

Code type	Value group					
	A	B	C	D	E	F
Manufacturer specific [1]	0, 1, 4…9, F	128…199	*c*	*d*	*e*	*f*
		b	128… 199, 240	*d*	*e*	*f*
		b	*c*	128…254	*e*	*f*
		b	*c*	*d*	128…254	*f*
		b	*c*	*d*	*e*	128…254
Manufacturer specific abstract [2]	0	0…64	96	50…99	0…255	0…255
Manufacturer specific, media related general purpose [2]	1, 4…9, F	0…64	96	50…99	0…255	0…255
Utility specific [3]	0, 1, 4…9, F	65…127	0…255	0…255	0…255	0…255
Consortia specific [4]	0, 1, 4…9, F	0…64	93	See Table 6.		
Country specific [5]		0…64	94	See Table 7.		

[1] "b", "c", "d", "e", "f" means any value in the relevant value group.

[2] The range D = 50…99 is available for identifying objects, which are not represented by another defined code, but need representation on the display as well. If this is not required, the range D = 128…254 should be used.

[3] If the value in value group B is 65…127, the whole OBIS code should be considered as utility specific and the value of other groups does not necessarily carry a meaning defined neither in this document nor in IEC 62056-6-2:2023.

[4] The usage of value group E and F are defined in consortia specific documents.

[5] The usage of value group E and F are defined in country specific documents.

Objects for which this document defines standard identifiers shall not be re-identified by manufacturer, utility, consortia or country specific identifiers.

On the other hand, an object previously identified by a manufacturer-, utility-, consortia- or country-specific identifier may receive a standard identifier in the future, if its use is of common interest for the users of this document.

4.5 Standard object codes

Standard object codes are meaningful combinations of defined values of the six value groups.

Notation: In the following tables, in the various value groups, *"b", "c", "d", "e", "f"* signify any value in the respective value group. If only one object is instantiated, the value shall be 0. If a value group is shaded, then this value group is not used.

NOTE The DLMS® UA maintains a list of standard COSEM object definitions at www.dlms.com. The validity of the combination of OBIS codes and class_id-s as well as the data types of the attributes are tested during conformance testing.

5 Value group definitions – overview

5.1 Value group A

The range for value group A is 0 to 15; see Table 3.

Table 3 – Value group A codes

Value group A	
0	Abstract objects
1	Electricity related objects
…	
4	Heat cost allocator related objects
5, 6	Thermal energy related objects
7	Gas related objects
8	Cold water related objects
9	Hot water related objects
…	
15	Other media
All other	Reserved

The following subclauses contain value group definitions B to F common for all values of value group A.

5.2 Value group B

The range for value group B is 0 to 255; see Table 4.

Table 4 – Value group B codes

Value group B	
0	No channel specified
1…64	Channel 1..64
65…127	Utility specific codes
128…199	Manufacturer specific codes
200…255	Reserved

If channel information is not essential, the value 0 shall be assigned.

The range 65…127 is available for utility specific use. If the value of value group B is in this range, the whole OBIS code shall be considered as utility specific and the value of other groups does not necessarily carry a meaning defined neither in this document nor in IEC 62056-6-2:2023.

5.3 Value group C

5.3.1 General

The range for value group C is 0 to 255. The definitions depend on the value in value group A. The codes for abstract objects are specified in 5.3.2. See also:

- electricity related codes specified in 7.1;
- ~~heat cost allocator, thermal energy, gas and water related codes specified in EN 13757-1:2014;~~
- other media related codes specified in 8.2.

5.3.2 Abstract objects

Abstract objects are data items, which are not related to a certain type of physical quantity. See Table 5.

Table 5 – Value group C codes – Abstract objects

Value group C Abstract objects (A = 0)	
0…89	Context specific identifiers [a]
93	Consortia specific identifiers (See 5.4.2).
94	Country specific identifiers (See 5.4.3)
96	General and service entry objects – Abstract (See 6.1)
97	Error register objects – Abstract (See 6.2)
98	List objects – Abstract (See 6.3, 6.4)
99	Data profile objects – Abstract (See 6.5)
…	
127	Inactive objects [b]
128…199, 240	Manufacturer specific codes
All other	Reserved

[a] Context specific identifiers identify objects specific to a certain protocol and/or application. For the COSEM context, the identifiers are defined in IEC 62056-6-2:2023, 6.2.

[b] An inactive object is an object, which is defined and present in a meter, but which has no assigned functionality.

5.4 Value group D

5.4.1 General

The range for value group D is 0 to 255.

5.4.2 Consortia specific identifiers

Table 6 specifies the use of value group D for consortia specific applications. In this table, there are no reserved ranges for manufacturer specific codes. The usage of value group E and F are defined in consortia specific documents.

Objects that are already identified in this document shall not be re-identified by consortia specific identifiers.

Table 6 – Value group D codes – Consortia specific identifiers

Value group D Consortia specific identifiers (A = any, C = 93)	
~~All values~~	~~Reserved~~
0	Reserved
1	STS Association
2...255	Reserved
NOTE At the time of the publication of this document, no consortia specific identifiers are allocated.	

5.4.3 Country specific identifiers

Table 7 specifies the use of value group D for country specific applications. Wherever possible, the country calling codes are used. In this table, there are no reserved ranges for manufacturer specific codes. The usage of value group E and F are defined in country specific documents.

Objects that are already identified in this document shall not be re-identified by country specific identifiers.

Table 7 – Value group D codes – Country specific identifiers

Value group D Country specific identifiers (A = any, C = 94)			
00	Finland (Country calling code = 358)	50	
01	USA (= Country calling code)	51	Peru (= Country calling code)
02	Canada (Country calling code = 1)	52	South Korea (Country calling code = 82)
03	Serbia (Country calling code = 381)	53	Cuba (= Country calling code)
04		54	Argentina (= Country calling code)
05		55	Brazil (= Country calling code)
06		56	Chile (= Country calling code)
07	Russia (Country calling code = 7)	57	Colombia (= Country calling code)
08		58	Venezuela (= Country calling code)
09		59	
10	Czech Republic (Country calling code = 420)	60	Malaysia (= Country calling code)
11	Bulgaria (Country calling code = 359)	61	Australia (= Country calling code)
12	Croatia (Country calling code = 385)	62	Indonesia (= Country calling code)
13	Ireland (Country calling code = 353)	63	Philippines (= Country calling code)
14	Israel (Country calling code = 972)	64	New Zealand (= Country calling code)
15	Ukraine (Country calling code = 380)	65	Singapore (= Country calling code)
16	Yugoslavia [a]	66	Thailand (= Country calling code)
17	Qatar (Country calling code = 974)	67	
18		68	
19		69	
20	Egypt (= Country calling code)	70	
21		71	Latvia (Country calling code = 371)
22	Morocco (Country calling code = 212)	72	
23	Algeria (Country calling code = 213)	73	Moldova (Country calling code = 373)

Value group D Country specific identifiers (A = any, C = 94)			
24	Nigeria (Country calling code = 234)	**74**	
25	Ivory Coast (Country calling code = 225)	**75**	Belarus (Country calling code = 375)
26	Tunisia (Country calling code = 216)	**76**	
27	South Africa (= Country calling code)	**77**	
28		**78**	
29		**79**	
30	Greece (= Country calling code)	**80**	
31	Netherlands (= Country calling code)	**81**	Japan (= Country calling code)
32	Belgium (= Country calling code)	**82**	Mexico
33	France (= Country calling code)	**83**	
34	Spain (= Country calling code)	**84**	
35	Portugal (Country calling code = 351)	**85**	Hong Kong (Country calling code = 852)
36	Hungary (= Country calling code)	**86**	China (= Country calling code)
37	Lithuania (Country calling code = 370)	**87**	Bosnia and Herzegovina (Country calling code = 387)
38	Slovenia (Country calling code = 386)	**88**	
39	Italy (= Country calling code)	**89**	
40	Romania (= Country calling code)	**90**	Turkey (= Country calling code)
41	Switzerland (= Country calling code)	**91**	India (= Country calling code)
42	Slovakia (Country calling code = 421)	**92**	Pakistan (= Country calling code)
43	Austria (= Country calling code)	**93**	
44	United Kingdom (= Country calling code)	**94**	
45	Denmark (= Country calling code)	**95**	
46	Sweden (= Country calling code)	**96**	Saudi Arabia (Country calling code = 966)
47	Norway (= Country calling code)	**97**	United Arab Emirates (Country calling code = 971)
48	Poland (= Country calling code)	**98**	Iran (= Country calling code)
49	Germany (= Country calling code)	**99**	
	All other codes are reserved		
NOTE With the dissolution of the former Yugoslavia into separate nations, country code 38 was decommissioned.			

5.4.4 Identification of general and service entry objects

For the use of value group D to identify:

- abstract general and service entry objects, see 6.1, Table 8;
- electricity related general and service entry objects, see 7.5, Table 20.
- ~~heat cost allocator, thermal energy, gas and water related objects see EN 13757-1:2014.~~

5.5 Value group E

The range for value group E is 0 to 255. It can be used for identifying further classification or processing of values defined by values in value groups A to D, as specified in the relevant energy type specific clauses. The various classifications and processing methods are exclusive.

For the use of value group E to identify:

- abstract general and service entry objects, see 6.1, Table 8;
- electricity related general and service entry objects, see Table 20.
- ~~heat cost allocator, thermal energy, gas and water related objects see EN 13757-1:2014.~~

5.6 Value group F

5.6.1 General

The range for value group F is 0 to 255. In all cases, if value group F is not used, it is set to 255.

5.6.2 Identification of billing periods

Value group F specifies the allocation to different billing periods (sets of historical values) for the objects defined by value groups A to E, where storage of historical values is relevant. A billing period scheme is identified with its billing period counter, number of available billing periods, time stamp of the billing period and billing period length. Several billing period schemes may be possible. For more, see 7.4.1, Clause A.3 and IEC 62056-6-2:2023, 6.2.2.

6 Abstract objects (Value group A = 0)

6.1 General and service entry objects – Abstract

Table 8 specifies OBIS codes for abstract objects. See also IEC 62056-6-2:2023, Table 49 for value group C.

Table 8 – OBIS codes for general and service entry objects

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Billing period values/reset counter entries (First billing period scheme if there are two)						
Billing period counter (1)	0	*b*	0	1	0	VZ or 255
Billing period counter (1) in a recent billing period	0	*b*	0	1	0	101-125
Billing period counters (1) in unspecified number of recent billing periods	0	*b*	0	1	0	126
Number of available billing periods (1)	0	*b*	0	1	1	
Time stamp of the most recent billing period (1)	0	*b*	0	1	2	
Time stamp of the billing period (1) VZ (last reset)	0	*b*	0	1	2	VZ
Time stamp of the billing period (1) VZ_{-1}	0	*b*	0	1	2	VZ_{-1}
…	…	…	…	…	…	…
Time stamp of the billing period (1) VZ_{-n}	0	*b*	0	1	2	VZ_{-n}
Time stamp of the billing period (1) in a recent billing period	0	*b*	0	1	2	101-125
Time stamp of the billing period (1) in unspecified number of recent billing periods	0	*b*	0	1	2	126
Billing period values/reset counter entries (Second billing period scheme)						
Billing period counter (2)	0	*b*	0	1	3	VZ or 255
Billing period counter (2) in a recent billing period	0	*b*	0	1	3	101-125
Billing period counters (2) in unspecified number of recent billing periods	0	*b*	0	1	3	126
Number of available billing periods (2)	0	*b*	0	1	4	
Time stamp of the most recent billing period (2)	0	*b*	0	1	5	
Time stamp of the billing period (2) VZ (last reset)	0	*b*	0	1	5	VZ
Time stamp of the billing period (2) VZ_{-1}	0	*b*	0	1	5	VZ_{-1}
…	…	…	…	…	…	…
Time stamp of the billing period (2) VZ_{-n}	0	*b*	0	1	5	VZ_{-n}
Time stamp of the billing period (2) in a recent billing period	0	*b*	0	1	5	101-125
Time stamp of the billing period (2) in unspecified number of recent billing periods	0	*b*	0	1	5	126
Program entries						
Active firmware identifier	0	*b*	0	2	0	
Active firmware version	0	*b*	0	2	1	
Active firmware signature	0	*b*	0	2	8	
Time entries						
Local time	0	*b*	0	9	1	
Local date	0	*b*	0	9	2	
Device IDs						
Complete device ID	0	*b*	96	1		
Device ID # 1 (manufacturing number)	0	*b*	96	1	0	
…			…	…	…	
Device ID # 10	0	*b*	96	1	9	
Metering point ID (abstract)	0	0	96	1	10	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Parameter changes, calibration and access						
Number of configuration program changes	0	*b*	96	2	0	
Date [a] of last configuration program change	0	*b*	96	2	1	
Date [a] of last time switch program change	0	*b*	96	2	2	
Date [a] of last ripple control receiver program change	0	*b*	96	2	3	
Status of security switches	0	*b*	96	2	4	
Date [a] of last calibration	0	*b*	96	2	5	
Date [a] of next configuration program change	0	*b*	96	2	6	
Date [a] of activation of the passive calendar	0	*b*	96	2	7	
Number of protected configuration program changes [b]	0	*b*	96	2	10	
Date [a] of last protected configuration program change [b]	0	*b*	96	2	11	
Date [a] (corrected) of last clock synchronization/setting	0	*b*	96	2	12	
Date of last firmware activation	0	*b*	96	2	13	
Input/output control signals						
State of input/output control signals, global [c]	0	*b*	96	3	0	
State of input control signals (status word 1)	0	*b*	96	3	1	
State of output control signals (status word 2)	0	*b*	96	3	2	
State of input/output control signals (status word 3)	0	*b*	96	3	3	
State of input/output control signals (status word 4)	0	*b*	96	3	4	
Disconnect control	0	*b*	96	3	10	
Arbitrator	0	*b*	96	3	20.. 29	
Internal control signals						
Internal control signals, global [c]	0	*b*	96	4	0	
Internal control signals (status word 1)	0	*b*	96	4	1	
Internal control signals (status word 2)	0	*b*	96	4	2	
Internal control signals (status word 3)	0	*b*	96	4	3	
Internal control signals (status word 4)	0	*b*	96	4	4	
Internal operating status						
Internal operating status, global [c]	0	*b*	96	5	0	
Internal operating status (status word 1)	0	*b*	96	5	1	
Internal operating status (status word 2)	0	*b*	96	5	2	
Internal operating status (status word 3)	0	*b*	96	5	3	
Internal operating status (status word 4)	0	*b*	96	5	4	
Battery entries						
Battery use time counter	0	*b*	96	6	0	
Battery charge display	0	*b*	96	6	1	
Date of next battery change	0	*b*	96	6	2	
Battery voltage	0	*b*	96	6	3	
Battery initial capacity	0	*b*	96	6	4	
Battery installation date and time	0	*b*	96	6	5	
Battery estimated remaining use time	0	*b*	96	6	6	
Aux. supply use time counter	0	*b*	96	6	10	
Aux. voltage (measured)	0	*b*	96	6	11	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Power failure monitoring						
Number of power failures						
In all three phases	0	0	96	7	0	
In phase L1	0	0	96	7	1	
In phase L2	0	0	96	7	2	
In phase L3	0	0	96	7	3	
In any phase [sic]	0	0	96	7	21	
Auxiliary supply	0	0	96	7	4	
Number of long power failures						
In all three phases	0	0	96	7	5	
In phase L1	0	0	96	7	6	
In phase L2	0	0	96	7	7	
In phase L3	0	0	96	7	8	
In any phase	0	0	96	7	9	
Time of power failure [d]						
In all three phases	0	0	96	7	10	
In phase L1	0	0	96	7	11	
In phase L2	0	0	96	7	12	
In phase L3	0	0	96	7	13	
In any phase	0	0	96	7	14	
Duration of long power failure [e]						
In all three phases	0	0	96	7	15	
In phase L1	0	0	96	7	16	
In phase L2	0	0	96	7	17	
In phase L3	0	0	96	7	18	
In any phase	0	0	96	7	19	
Time threshold for long power failure						
Time threshold for long power failure	0	0	96	7	20	
NOTE 1 See *Number of power failures in any phase* above	*0*	*b*	*96*	*7*	*21*	
Operating time						
Time of operation	0	b	96	8	0	
Time of operation rate 1…rate 63	0	b	96	8	1…63	
Environment related parameters						
Ambient temperature	0	*b*	96	9	0	
Ambient pressure	0	*b*	96	9	1	
Relative humidity	0	*b*	96	9	2	
Status register						
Status register (Status register 1 if several status registers are used)	0	*b*	96	10	1	
Status register 2	0	*b*	96	10	2	
…	0	*b*	96	10	…	
Status register 10	0	*b*	96	10	10	
Event code						
Event code objects # 1…#100	0	*b*	96	11	0…99	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Communication port log parameters						
Reserved	0	*b*	96	12	0	
Number of connections	0	*b*	96	12	1	
Reserved	0	*b*	96	12	2	
Reserved	0	*b*	96	12	3	
Communication port parameter 1	0	*b*	96	12	4	
GSM field strength	0	*b*	96	12	5	
Telephone number / Communication address of the physical device	0	*b*	96	12	6	
Consumer messages						
Consumer message via local consumer information port	0	*b*	96	13	0	
Consumer message via the meter display and / or via consumer information port	0	*b*	96	13	1	
Currently active tariff						
Currently active tariff objects # 1…#16 NOTE 2 Object #16 (E = 15) carries the name of register with the lowest tariff (default tariff register)	0	*b*	96	14	0…15	
Event counter objects						
Event counter objects #1…#100	0	*b*	96	15	0…99	
Profile entry digital signature objects						
Profile entry digital signature objects #1…#10	0	*b*	96	16	0…9	
Profile entry counter objects						
Profile entry digital counter objects #1..#128	0	*b*	96	17	0…127	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Meter tamper event related objects						
Meter open event counter	0	*b*	96	20	0	
Meter open event, time stamp of current event occurrence	0	*b*	96	20	1	
Meter open event, duration of current event	0	*b*	96	20	2	
Meter open event, cumulative duration	0	*b*	96	20	3	
Reserved	0	*b*	96	20	4	
Terminal cover open event counter	0	*b*	96	20	5	
Terminal cover open event, time stamp of current event occurrence	0	*b*	96	20	6	
Terminal cover open event, duration of current event	0	*b*	96	20	7	
Terminal cover open event, cumulative duration	0	*b*	96	20	8	
Reserved	0	*b*	96	20	9	
Tilt event counter	0	*b*	96	20	10	
Tilt event, time stamp of current event occurrence	0	*b*	96	20	11	
Tilt event, duration of current event	0	*b*	96	20	12	
Tilt event, cumulative duration	0	*b*	96	20	13	
Reserved	0	*b*	96	20	14	
Strong DC magnetic field event counter	0	*b*	96	20	15	
Strong DC magnetic field event, time stamp of current event occurrence	0	*b*	96	20	16	
Strong DC magnetic field event, duration of current event	0	*b*	96	20	17	
Strong DC magnetic field event, cumulative duration	0	*b*	96	20	18	
Reserved	0	*b*	96	20	19	
Supply control switch / valve tamper event counter	0	*b*	96	20	20	
Supply control switch / valve tamper event, time stamp of current event occurrence	0	*b*	96	20	21	
Supply control switch / valve tamper event, duration of current event	0	*b*	96	20	22	
Supply control switch / valve tamper event, cumulative duration	0	*b*	96	20	23	
Reserved	0	*b*	96	20	24	
Metrology tamper event counter	0	*b*	96	20	25	
Metrology tamper event, time stamp of current event occurrence	0	*b*	96	20	26	
Metrology tamper event, duration of current event	0	*b*	96	20	27	
Metrology tamper event, cumulative duration	0	*b*	96	20	28	
Reserved	0	*b*	96	20	29	
Communication tamper event counter	0	*b*	96	20	30	
Communication tamper event, time stamp of current event occurrence	0	*b*	96	20	31	
Communication tamper event, duration of current event	0	*b*	96	20	32	
Communication tamper event, cumulative duration	0	*b*	96	20	33	
Reserved	0	*b*	96	20	34	
Manufacturer specific [f]	0	*b*	96	50	*e*	*f*
…						
Manufacturer specific	0	*b*	96	99	*e*	*f*
All other codes are reserved						

[a] Date of the event may contain the date only, the time only or both, encoded as specified in IEC 62056-6-2:2023, 4.5.1.

[b] Protected configuration is characterized by the need to open the main meter cover to modify it, or to break a metrological seal.

[c] Global status words with E = 0 contain the individual status words E = 1…4. The contents of the status words are not defined in this document.

[d] Time of power failure is recorded when either a short or long power failure occurs.

[e] Duration of long power failure holds the duration of the last long power failure.

[f] The range D = 50…99 is available for identifying objects, which are not represented by another defined code, but need representation on the display as well. If this is not required, the range D = 128…254 should be used.

6.2 Error registers, alarm registers / filters / descriptor objects – Abstract

The OBIS codes for abstract error registers, alarm registers and alarm filters are shown in Table 9.

Table 9 – OBIS codes for error registers, alarm registers and alarm filters – Abstract

Error register, alarm register and alarm filter objects – Abstract	OBIS code					
	A	B	C	D	E	F
Error register objects 1…10	0	*b*	97	97	0…9	
Alarm register objects 1…10	0	*b*	97	98	0…9	
Alarm filter objects 1…10	0	*b*	97	98	10…19	
Alarm descriptor objects 1…10	0	*b*	97	98	20…29	
NOTE The information to be included in the error objects is not defined in this document.						

6.3 List objects – Abstract

Lists – identified with a single OBIS code – are defined as a series of any kind of data (for example measurement value, constants, status, events). See Table 10.

Table 10 – OBIS codes for list objects – Abstract

List objects – Abstract	OBIS code					
	A	B	C	D	E	F
Data of billing period (with billing period scheme 1 if there are more than one schemes available)	0	*b*	98	1	*e*	255 [a]
Data of billing period (with billing period scheme 2)	0	*b*	98	2	*e*	255 [a]
[a] F = 255 means a wildcard here. See Clause A.3.						

6.4 Register table objects – Abstract

Register tables are defined to hold a number of values of the same type. See Table 11.

Table 11 – OBIS codes for Register Table objects – Abstract

Register table objects – Abstract	OBIS code					
	A	B	C	D	E	F
General use, abstract	0	*b*	98	10	*e*	

6.5 Data profile objects – Abstract

Abstract data profiles – instances of the “Profile generic IC” and identified with one single OBIS code as specified in Table 12 – are used to hold a series of measurement values of one or more similar quantities and/or to group various data.

Table 12 – OBIS codes for data profile objects – Abstract

Data profile objects – Abstract	OBIS code					
	A	B	C	D	E	F
Load profile with recording period 1 [a]	0	*b*	99	1	*e*	
Load profile with recording period 2 [a]	0	*b*	99	2	*e*	
Load profile during test [a]	0	*b*	99	3	0	
Connection profile	0	*b*	99	12	*e*	
GSM diagnostic profile	0	*b*	99	13	*e*	
Charge collection history (Payment metering)	0	*b*	99	14	e	
Token credit history (Payment metering)	0	*b*	99	15	e	
Parameter monitor log	0	*b*	99	16	*e*	
Token transfer log (Payment metering)	0	*b*	99	17	*e*	
LTE monitoring profile	0	*b*	99	18	*e*	
Event log [a]	0	*b*	99	98	*e*	
[a] These objects should be used if they (also) hold data not specific to the energy type.						

7 Electricity (Value group A = 1)

7.1 Value group C codes – Electricity

Table 13 specifies the use of value group C for electricity related objects.

The quadrant definitions for active and reactive power are shown in Figure 1.

Table 13 – Value group C codes – Electricity

Value group C codes – Electricity (A = 1)				
0	General purpose objects (See 7.5.1)			
ΣL_i	L_1	L_2	L_3	(See also NOTE 2)
1	**21**	**41**	**61**	Active power+ (QI+QIV)
2	**22**	**42**	**62**	Active power− (QII+QIII)
3	**23**	**43**	**63**	Reactive power+ (QI+QII)
4	**24**	**44**	**64**	Reactive power− (QIII+QIV)
5	**25**	**45**	**65**	Reactive power QI
6	**26**	**46**	**66**	Reactive power QII
7	**27**	**47**	**67**	Reactive power QIII
8	**28**	**48**	**68**	Reactive power QIV
9	**29**	**49**	**69**	Apparent power+ (QI+QIV) (See also NOTE 3)
10	**30**	**50**	**70**	Apparent power– (QII+QIII)
11	**31**	**51**	**71**	Current: any phase (C = 11) / L_i phase [a] (C= 31, 51, 71)
12	**32**	**52**	**72**	Voltage: any phase (C = 12) / L_i phase [a] (C= 32, 52, 72)
13	**33**	**53**	**73**	Power factor (See also NOTE 4)
14	**34**	**54**	**74**	Supply frequency
15	**35**	**55**	**75**	Active power (abs(QI+QIV)+(abs(QII+QIII)) [a]
16	**36**	**56**	**76**	Active power (abs(QI+QIV)-abs(QII+QIII))
17	**37**	~~58~~57[d]	**77**	Active power QI
18	**38**	**58**	**78**	Active power QII
19	**39**	**59**	**79**	Active power QIII

Value group C codes – Electricity (A = 1)				
20	**40**	**60**	**80**	Active power QIV
….				
81	Angles [b]			
82	Unitless quantity (pulses or pieces)			
83	Transformer and line loss quantities [c]			
84	ΣL_i Power factor – (See also NOTE 4)			
85	L_1 Power factor –			
86	L_2 Power factor –			
87	L_3 Power factor –			
88	ΣL_i Ampere-squared hours (QI+QII+QIII+QIV)			
89	ΣL_i Volt-squared hours (QI+QII+QIII+QIV)			
90	ΣL_i current (algebraic sum of the – unsigned – value of the currents in all phases)			
91	L_0 current (neutral) [a]			
92	L_0 voltage (neutral) [a]			
93	Consortia specific identifiers (See 5.4.2)			
94	Country specific identifiers (See 5.4.3)			
96	General and service entry objects – Electricity (See 7.5.1)			
97	Error register objects – Electricity (See 7.5.2)			
98	List objects – Electricity (See 7.5.3)			
99	Data profile objects – Electricity (See 7.5.4)			
ΣL_i	L_1	L_2	L_3	(See also NOTE 2)
100	101	102	103	Reactive power inductive (QI+QIII)
104	105	106	107	Reactive power capacitive (QII+QIV)
108..123	Reserved			
124	$L_1 – L_2$ line voltage			
125	$L_2 – L_3$ line voltage			
126	$L_3 – L_1$ line voltage			
~~100…~~127	Reserved			

Value group C codes – Electricity (A = 1)	
128…199, 240	Manufacturer specific codes
All other	Reserved

NOTE 1 L_i *Quantity* is the value (to be measured) of a measurement system connected between the phase *i* and a reference point. In 3-phase 4-wire systems, the reference point is the neutral. In 3-phase 3-wire systems, the reference point is the phase L_2.

NOTE 2 ΣL_i *Quantity* is the total measurement value across all systems.

NOTE 3 If just one apparent energy/demand value is calculated over the four quadrants, C = 9 shall be used.

NOTE 4 Power factor quantities with C = 13, 33, 53, 73 are calculated either as PF = Active power+ (C = 1, 21, 41, 61) / Apparent power+ (C = 9, 29, 49, 69) or PF = Active power– (C = 2, 22, 42, 62) / Apparent power- (C = 10, 30, 50, 70).

In the first case, the sign is positive (no sign), it means power factor in the import direction (PF+).

In the second case, the sign is negative, it means power factor in the export direction (PF–).

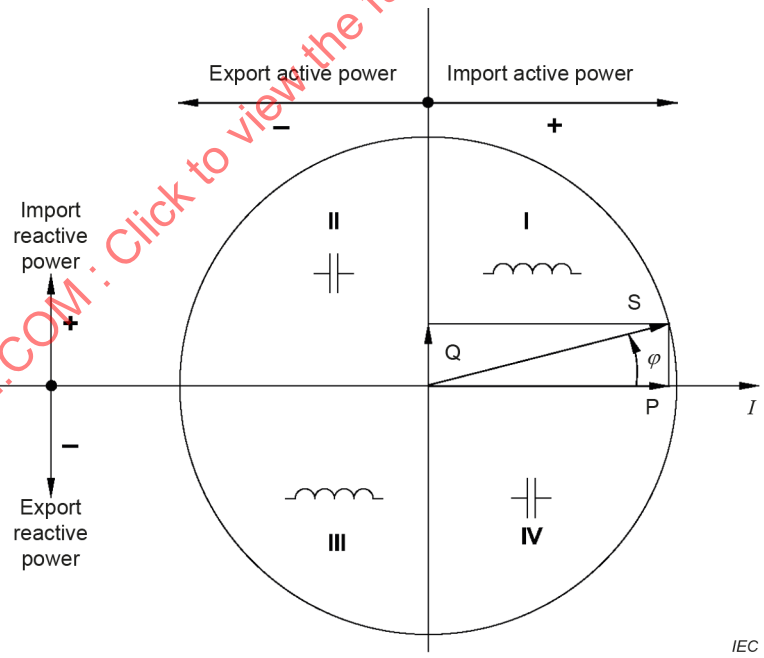
Power factor quantities C = 84, 85, 86 and 87 are always calculated as PF− = Active power− / Apparent power−. This quantity is the power factor in the export direction; it has no sign.

[a] For details of extended codes, see 7.3.3.

[b] For details of extended codes, see 7.3.4.

[c] For details of extended codes, see 7.3.5.

[d] This was recorded erroneously as 58 in earlier versions.



NOTE The quadrant definitions shown in Figure 1 are in line with IEC 62053-23:~~2003~~2020.

Figure 1 – Quadrant definitions for active and reactive power

7.2 Value group D codes – Electricity

7.2.1 Processing of measurement values

Table 14 specifies the use of value group D for electricity related objects.

Table 14 – Value group D codes – Electricity

Value group D codes – Electricity (A = 1, C <> 0, 93, 94, 96, 97, 98, 99)	
0	Billing period average (since last reset)
1	Cumulative minimum 1
2	Cumulative maximum 1
3	Minimum 1
4	Current average 1
5	Last average 1
6	Maximum 1
7	Instantaneous value
8	Time integral 1
9	Time integral 2
10	Time integral 3
11	Cumulative minimum 2
12	Cumulative maximum 2
13	Minimum 2
14	Current average 2
15	Last average 2
16	Maximum 2
17	Time integral 7
18	Time integral 8
19	Time integral 9
20	Time integral 10
21	Cumulative minimum 3
22	Cumulative maximum 3
23	Minimum 3
24	Current average 3
25	Last average 3
26	Maximum 3
27	Current average 5
28	Current average 6
29	Time integral 5
30	Time integral 6
31	Under limit threshold
32	Under limit occurrence counter
33	Under limit duration
34	Under limit magnitude
35	Over limit threshold
36	Over limit occurrence counter
37	Over limit duration
38	Over limit magnitude
39	Missing threshold
40	Missing occurrence counter
41	Missing duration
42	Missing magnitude

Value group D codes – Electricity (A = 1, C <> 0, 93, 94, 96, 97, 98, 99)	
43	Time threshold for under limit
44	Time threshold for over limit
45	Time threshold for missing magnitude
46	Contracted value
49	Average value for recording interval 1
50	Average value for recording interval 2
51	Minimum for recording interval 1
52	Minimum for recording interval 2
53	Maximum for recording interval 1
54	Maximum for recording interval 2
55	Test average
56	Current average 4 for harmonics measurement
58	Time integral 4
128...254	Manufacturer specific codes
All other	Reserved
NOTES	
Averaging scheme 1	Controlled by measurement period 1 (see Table 20), a set of registers is calculated by a metering device (codes 1…6). The typical usage is for billing purposes.
Averaging scheme 2	Controlled by measurement period 2, a set of registers is calculated by a metering device (codes 11…16). The typical usage is for billing purposes.
Averaging scheme 3	Controlled by measurement period 3, a set of registers is calculated by a metering device (codes 21…26). The typical usage is for instantaneous values.
Averaging scheme 4	Controlled by measurement period 4, a test average value (code 55) is calculated by the metering device.
Current average 1, 2, 3	See the definition of the “Demand register” IC in IEC 62056-6-2:2023, 4.3.4. The value is calculated using measurement period 1, 2 and/or 3 respectively.
Last average 1,2,3	See the definition of the “Demand register” IC in in IEC 62056-6-2:2023, 4.3.4. The value is calculated using measurement period 1, 2 or 3 respectively.
Minimum	The smallest of last average values during a billing period, see Table 20.
Maximum	The largest of last average values during a billing period.
Cumulative min.	The cumulative sum of minimum values over all the past billing periods.
Cumulative max.	The cumulative sum of maximum values over all the past billing periods.
Current average 4	For harmonics measurement
Current average 5	See the definition of the “Demand register” IC in in IEC 62056-6-2:2023, 4.3.4. The value is calculated using recording interval 1; see Table 20.
Current average 6	See the definition of the “Demand register” IC in in IEC 62056-6-2:2023, 4.3.4. The value is calculated using recording interval 2.
Time integral 1	For a current billing period (F= 255): Time integral of the quantity calculated from the origin (first start of measurement) to the instantaneous time point. For a historical billing period (F= 0…99): Time integral of the quantity calculated from the origin to the end of the billing period given by the billing period code.
Time integral 2	For a current billing period (F = 255): Time integral of the quantity calculated from the beginning of the current billing period to the instantaneous time point. For a historical billing period (F = 0…99): Time integral of the quantity calculated over the billing period given by the billing period code.
Time integral 3	Time integral of the positive difference between the quantity and a prescribed threshold value.

Value group D codes – Electricity (A = 1, C <> 0, 93, 94, 96, 97, 98, 99)	
Time integral 4 ("Test time integral")	Time integral of the quantity calculated over a time specific to the device or determined by test equipment.
Time integral 5	Used as a base for load profile recording: Time integral of the quantity calculated from the beginning of the current recording interval to the instantaneous time point for recording period 1, see Table 20.
Time integral 6	Used as a base for load profile recording: Time integral of the quantity calculated from the beginning of the current recording interval to the instantaneous time point for recording period 2, see Table 20.
Time integral 7	Time integral of the quantity calculated from the origin (first start of measurement) up to the end of the last recording period with recording period 1, see Table 20.
Time integral 8	Time integral of the quantity calculated from the origin (first start of measurement) up to the end of the last recording period with recording period 2, see Table 20.
Time integral 9	Time integral of the quantity calculated from the beginning of the current billing period up to the end of the last recording period with recording period 1, see Table 20.
Time integral 10	Time integral of the quantity calculated from the beginning of the current billing period up to the end of the last recording period with recording period 2, see Table 20.
Under limit values	Values under a certain threshold (for example dips).
Over limit values	Values above a certain threshold (for example swells).
Missing values	Values considered as missing (for example interruptions).

7.2.2 Use of value group D for identification of other objects

For identifiers of electricity related general purpose objects see 7.5.1.

7.3 Value group E codes – Electricity

7.3.1 General

The following subclauses define the use of value group E for identifying further classification or processing the measurement quantities defined by values in value groups A to D. The various classifications and processing methods are exclusive.

7.3.2 Tariff rates

Table 15 shows the use of value group E for identification of tariff rates typically used for energy (consumption) and demand quantities.

Table 15 – Value group E codes – Electricity – Tariff rates

Value group E codes – Electricity – Tariff rates (A = 1)	
0	Total
1	Rate 1
2	Rate 2
3	Rate 3
…	…
63	Rate 63
128…254	Manufacturer specific codes
All other	Reserved

7.3.3 Harmonics

Table 16 shows the use of value group E for the identification of harmonics of instantaneous values of voltage, current or active power.

Table 16 – Value group E codes – Electricity – Harmonics

Value group E codes – Electricity – Measurement of harmonics of voltage, current or active power (A = 1, C = 12, 32, 52, 72, 92, 11, 31, 51, 71, 90, 91, 15, 35, 55, 75, D = 7, 24, 56)	
0	Total (fundamental + all harmonics)
1	1st harmonic (fundamental)
2	2nd harmonic
...	*n*th harmonic
120	120th harmonic
124	Total Harmonic Distortion (THD) [a]
125	Total Demand Distortion (TDD) [b]
126	All harmonics [c]
127	All harmonics to nominal value ratio [d]
128...254	Manufacturer specific codes
All other	Reserved

[a] THD is calculated as the ratio of the square root of the sum of the squares of each harmonic to the value of the fundamental quantity, expressed as a percent of the value of the fundamental.

[b] TDD is calculated as the ratio of the square root of the sum of the squares of each harmonic to the maximum value of the fundamental quantity, expressed as percent of the maximum value of the fundamental.

[c] Calculated as the square root of the sum of the squares of each harmonic.

[d] This is calculated as ratio of the square root of the sum of the squares of each harmonic, to the nominal value of the fundamental quantity, expressed as percent of the nominal value of the fundamental.

7.3.4 Phase angles

Table 17 shows the use of value group E for identification of phase angles.

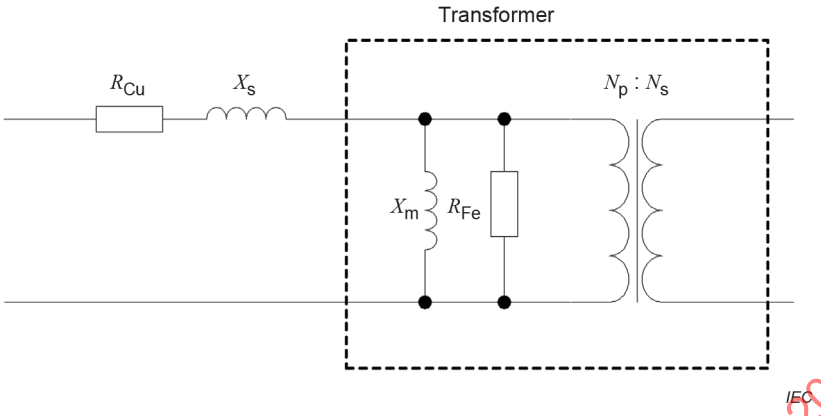
Table 17 – Value group E codes – Electricity – Extended phase angle measurement

Value group E codes – Electricity – Extended phase angle measurement (A = 1, C = 81; D = 7)								
Angle	**U(L1)**	**U(L2)**	**U(L3)**	**I(L1)**	**I(L2)**	**I(L3)**	**I(L0)**	**<= From**
U(L1)	(00)	01	02	04	05	06	07	
U(L2)	10	(11)	12	14	15	16	17	
U(L3)	20	21	(22)	24	25	26	27	
I(L1)	40	41	42	(44)	45	46	47	
I(L2)	50	51	52	54	(55)	56	57	
I(L3)	60	61	62	64	65	(66)	67	
I(L0)	70	71	72	74	75	76	(77)	
^ To (reference)								

7.3.5 Transformer and line loss quantities

Table 18 shows the meaning of value group E for the identification of transformer and line loss quantities. The use of value group D shall be according to Table 14, the use of value group F shall be according to Table A.2. For these quantities, no tariffication is available.

The model of the line and the transformer used for loss calculation is shown on Figure 2.



Key

R_{Cu} Line resistance losses, OBIS code 1.x.0.10.2.VZ

X_s Line reactance losses, OBIS code 1.x.0.10.3.VZ

X_m Transformer magnetic losses, OBIS code 1.x.0.10.0.VZ

R_{Fe} Transformer iron losses, OBIS code 1.x.0.10.1.VZ

N_p Number of turns on the primary side of the transformer

N_s Number of turns on the secondary side of the transformer

NOTE Serial elements of the transformer are normally low compared to that of the line, therefore they are not considered here.

Figure 2 – Model of the line and the transformer for calculation of loss quantities

Table 18 – Value group E codes – Electricity – Transformer and line losses

Value group E codes – Electricity – Transformer and line losses (A = 1, C = 83)			
E=	**Quantity**	**Formula**	**Quadrant / comment**
1	ΣL_i Active line losses+	On Load Active, positive OLA+ = (CuA_1+) + (CuA_2+) + (CuA_3+)	QI+QIV
2	ΣL_i Active line losses–	On Load Active, negative OLA– = (CuA_1–) + (CuA_2–) + (CuA_3–)	QII+QIII
3	ΣL_i Active line losses	On Load Active OLA = (CuA_1) + (CuA_2) + (CuA_3)	QI+QII+QIII+QIV
4	ΣL_i Active transformer losses+	No Load Active, positive NLA+ = (FeA_1+) + (FeA_2+) + (FeA_3+)	QI+QIV
5	ΣL_i Active transformer losses–	No Load active, negative NLA– = (FeA_1–) + (FeA_2–) + (FeA_3–)	QII+QIII
6	ΣL_i Active transformer losses	No Load Active NLA = (FeA_1) + (FeA_2) + (FeA_3)	QI+QII+QIII+QIV
7	ΣL_i Active losses+	Total Losses Active, positive TLA+ = (OLA+) + (NLA+)	QI+QIV
8	ΣL_i Active losses–	Total Losses Active, negative TLA– = (OLA–) + (NLA–)	QII+QIII
9	ΣL_i Active losses	Total Losses Active TLA = OLA + NLA = TLA_1 + TLA_2 + TLA_3	QI+QII+QIII+QIV

Value group E codes – Electricity – Transformer and line losses (A = 1, C = 83)			
E=	**Quantity**	**Formula**	**Quadrant / comment**
10	ΣL_i Reactive line losses+	On Load Reactive, positive OLR+ = (CuR_1+) + (CuR_2+) + (CuR_3+)	QI+QII
11	ΣL_i Reactive line losses–	On Load Reactive, negative OLR– = (CuR_1–) + (CuR_2–) + (CuR_3–)	QIII+QIV
12	ΣL_i Reactive line losses	On Load Reactive OLR = (CuR_1) + (CuR_2) + (CuR_3)	QI+QII+QIII+QIV
13	ΣL_i Reactive transformer losses+	No Load reactive, positive NLR+ = (FeR_1+) + (FeR_2+) + (FeR_3+)	QI+QII
14	ΣL_i Reactive transformer losses–	No Load Reactive, negative NLR– = (FeR_1–) + (FeR_2–) + (FeR_3–)	QIII+QIV
15	ΣL_i Reactive transformer losses	No Load Reactive NLR = (FeR_1) + (FeR_2) + (FeR_3)	QI+QII+QIII+QIV
16	ΣL_i Reactive losses+	Total Losses Reactive, positive TLR+ = (OLR+) + (NLR+)	QI+QII
17	ΣL_i Reactive losses–	Total Losses Reactive, negative TLR– = (OLR–) + (NLR–)	QIII+QIV
18	ΣL_i Reactive losses	Total Losses Reactive TLR = OLR + NLR = TLR_1 + TLR_2 + TLR_3	QI+QII+QIII+QIV
19	Total transformer losses with normalized R_{Fe} = 1 MΩ	U^2h 1/R_{Fe} × (U^2h_{L1} + U^2h_{L2} + U^2h_{L3})	QI+QII+QIII+QIV
20	Total line losses with normalized R_{Cu} = 1 Ω	I^2h R_{Cu} × (I^2h_{L1} + I^2h_{L2} + I^2h_{L3})	QI+QII+QIII+QIV
21	Compensated active gross+	CA+ = (A+) + (TLA+)	QI+QIV; A+ is the quantity A = 1, C = 1
22	Compensated active net+	CA+ = (A+) – (TLA+)	QI+QIV
23	Compensated active gross–	CA– = (A–) + (TLA–)	QII+QIII, A– is the quantity A = 1, C = 2
24	Compensated active net–	CA– = (A–) – (TLA–)	QII+QIII
25	Compensated reactive gross+	CR+ = (R+) + (TLR+)	QI+QII; R+ is the quantity A = 1, C = 3
26	Compensated reactive net+	CR+ = (R+) – (TLR+)	QI+QII
27	Compensated reactive gross–	CR– = (R–) + (TLR–)	QIII+QIV;R– is the quantity A = 1, C = 4
28	Compensated reactive net–	CR– = (R–) – (TLR–)	QIII+QIV
29	Reserved		
30	Reserved		
31	L_1 Active line losses+	CuA_1+ = I^2h_{L1} × R_{Cu}	QI+QIV R_{Cu} is the serial resistive element of the line loss, OBIS code 1.x.0.10.2.VZ
32	L_1 Active line losses–	CuA_1– = I^2h_{L1} × R_{Cu}	QII+QIII
33	L_1 Active line losses	CuA_1 = I^2h_{L1} × R_{Cu}	QI+QII+QIII+QIV
34	L_1 Active transformer losses+	FeA_1+ = U^2h_{L1}/R_{Fe}	QI+QIV R_{Fe} is the parallel resistive element of the transformer loss, OBIS code 1.x.0.10.1.VZ
35	L_1 Active transformer losses–	FeA_1– = U^2h_{L1}/R_{Fe}	QII+QIII
36	L_1 Active transformer losses	FeA_1 = U^2h_{L1}/R_{Fe}	QI+QII+QIII+QIV

Value group E codes – Electricity – Transformer and line losses (A = 1, C = 83)			
E=	**Quantity**	**Formula**	**Quadrant / comment**
37	L_1 Active losses+	$TLA_1+ = (CuA_1+) + (FeA_1+)$	QI+QIV
38	L_1 Active losses–	$TLA_1– = (CuA_1–) + (FeA_1–)$	QII+QIII
39	L_1 Active losses	$TLA_1 = CuA_1 + FeA_1$	QI+QII+QIII+QIV
40	L_1 Reactive line losses+	$CuR_1+ = I^2hL_1 \times X_s$	QI+QII X_s is the serial reactive element of the line loss, OBIS code 1.x.0.10.3.VZ
41	L_1 Reactive line losses–	$CuR_1– = I^2h_{L1} \times X_s$	QIII+QIV
42	L_1 Reactive line losses	$CuR_1 = I^2h_{L1} \times X_s$	QI+QII+QIII+QIV
43	L_1 Reactive transformer losses+	$FeR_1+ = U^2h_{L1}/X_m$	QI+QII X_m is the parallel reactive element of the transformer loss, OBIS code 1.x.0.10.0.VZ
44	L_1 Reactive transformer losses–	$FeR_1– = U^2h_{L1}/X_m$	QIII+QIV
45	L_1 Reactive transformer losses	$FeR_1 = U^2h_{L1}/X_m$	QI+QII+QIII+QIV
46	L_1 Reactive losses+	$TLR_1+ = (CuR_1+) + (FeR_1+)$	QI+QII
47	L_1 Reactive losses–	$TLR_1– = (CuR_1–) + (FeR_1–)$	QIII+QIV
48	L_1 Reactive losses	$TLR_1 = CuR_1 + FeR_1$	QI+QII+QIII+QIV
49	L_1 Ampere-squared hours	A^2h_{L1}	QI+QII+QIII+QIV
50	L_1 Volt-squared hours	V^2h_{L1}	QI+QII+QIII+QIV
51	L_2 Active line losses+	$CuA_2+ = I^2h_{L2} \times R_{Cu}$	QI+QIV R_{Cu} is the serial resistive element of the line loss, OBIS code 1.x.0.10.2.VZ
52	L_2 Active line losses–	$CuA_2– = I^2h_{L2} \times R_{Cu}$	QII+QIII
53…70	L_2 quantities, (See 33…48)		
71	L_3 Active line losses +	$CuA_3+ = I^2h_{L3} \times R_{Cu}$	QI+QIV R_{Cu} is the serial resistive element of the line loss, OBIS code 1.x.0.10.2.VZ
72	L_3 Active line losses -	$CuA_3– = I^2h_{L3} \times R_{Cu}$	QII+QIII
73…90	L_3 quantities (See 33…48)		
91…255	Reserved		
NOTE In this table, no manufacturer specific range is available.			

7.3.6 UNIPEDE voltage dips

Table 19 shows the use of value group E for the identification of voltage dips according to the UNIPEDE classification.

Table 19 – Value group E codes – Electricity – UNIPEDE voltage dips

Value group E codes – Electricity – UNIPEDE voltage dips measurement (A = 1, C = 12, 32, 52, 72,124…126 D = 32)							
Depth in % of U_n	Residual voltage U in % of U_n	Duration Δt s					
		0,01 < Δt ≤ 0,1	0,1 < Δt ≤ 0,5	0,5 < Δt ≤ 1	1 < Δt ≤ 3	3 < Δt ≤ 20	20 < Δt ≤ 60
10 % … < 15 %	90 > U ≥ 85	00	01	02	03	04	05
15 % … < 30 %	85 > U ≥ 70	10	11	12	13	14	15
30 % … < 60 %	70 > U ≥ 40	20	21	22	23	24	25
60 % … < 90 %	40 > U ≥ 10	30	31	32	33	34	35
90 % … < 100 %	10 > U ≥ 0	40	41	42	43	44	45
NOTE These *dip classes* form a subset of the classes defined in IEC TR 61000-2-8:2002, Table 2.							

7.3.7 Use of value group E for the identification of other objects

For identifiers of electricity related general purpose objects see 7.5.1.

7.4 Value group F codes – Electricity

7.4.1 Billing periods

Value group F specifies the allocation to different billing periods (sets of historical values) for the objects with following codes:

- value group A: 1;
- value group C: as defined in Table 13;
- value group D:
  - 0: Billing period average (since last reset);
  - 1, 2, 3, 6: (Cumulative) minimum / maximum 1;
  - 8, 9, 10: Time integral 1 / 2 / 3;
  - 11, 12, 13, 16: (Cumulative) minimum / maximum 2;
  - 21, 22, 23, 26: (Cumulative) minimum / maximum 3.

There are two billing period schemes available (for example to store weekly and monthly values). For each billing period scheme, the following general purpose objects are available:

- billing period counter;
- number of available billing periods;
- time stamp of most recent and historical billing periods;
- billing period length.

For OBIS codes see Table 20. For additional information, see Clause A.3 and IEC 62056-6-2:2023, 6.2.2.

7.4.2 Multiple thresholds

Value group F is also used to identify several thresholds for the same quantity, identified with the following codes:

- value group A = 1;
- value group C = 1…20, 21…40, 41…60, 61…80, 82, 84…89, 90… 92;
- value group D = 31, 35, 39 (under limit, over limit and missing thresholds);
- value group F = 0…99.

NOTE All quantities monitored are instantaneous values: D = 7 or D = 24.

When multiple thresholds are identified by value group F, then the Under limit / Over limit / Missing Occurrence counter / Duration / Magnitude quantities relative to a threshold are identified with the same value in value group F. In this case, value group F cannot be used to identify values relative to billing period. However, such values can be held by “Profile generic” objects.

Example:

– Over limit threshold #1 for current in any phase is identified with OBIS code 1-0:11.35.0*0;

– Over limit duration above threshold # 1 for current in any phase is identified with OBIS code 1-0:11.37.0*0.

To avoid ambiguity, value group F cannot be used to identify historical values of Under limit / Over limit / Missing Occurrence counter / Duration / Magnitude quantities. For historical values of these quantities “Profile generic” objects can be used and values related to previous billing periods can be accessed using selective access.

7.5 OBIS codes – Electricity

7.5.1 General and service entry objects – Electricity

Table 20 specifies OBIS codes for electricity related general and service entry objects.

Table 20 – OBIS codes for general and service entry objects – Electricity

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Free ID-numbers for utilities						
Complete combined electricity ID	1	*b*	0	0		
Electricity ID 1	1	*b*	0	0	0	
…	…	…	…	…	…	
Electricity ID 10	1	*b*	0	0	9	
Billing period values/reset counter entries (First billing period scheme if there are more than one)						
Billing period counter (1)	1	*b*	0	1	0	VZ or 255
Billing period counter (1) in a recent billing period	1	*b*	0	1	0	101-125
Billing period counters (1) in unspecified number of recent billing periods	1	*b*	0	1	0	126
Number of available billing periods (1)	1	*b*	0	1	1	
Time stamp of the most recent billing period (1)	1	*b*	0	1	2	
Time stamp of the billing period (1) VZ (last reset)	1	*b*	0	1	2	VZ
Time stamp of the billing period (1) VZ_{-1}	1	*b*	0	1	2	VZ_{-1}
…	…	…	…	…	…	…
Time stamp of the billing period (1) VZ_{-n}	1	*b*	0	1	2	VZ_{-n}
Time stamp of the billing period (1) in a recent billing period	1	*b*	0	1	2	101-125
Time stamp of the billing period (1) in unspecified number of recent billing periods	1	*b*	0	1	2	126
Billing period values/reset counter entries (Second billing period scheme)						
Billing period counter (2)	1	*b*	0	1	3	VZ or 255
Billing period counter (2) in a recent billing period	1	*b*	0	1	3	101-125
Billing period counters (2) in unspecified number of recent billing periods	1	*b*	0	1	3	126
Number of available billing periods (2)	1	*b*	0	1	4	
Time stamp of the most recent billing period (2)	1	*b*	0	1	5	
Time stamp of the billing period (2) VZ (last reset)	1	*b*	0	1	5	VZ
Time stamp of the billing period (2) VZ_{-1}	1	*b*	0	1	5	VZ_{-1}
…	…	…	…	…	…	…
Time stamp of the billing period (2) VZ_{-n}	1	*b*	0	1	5	VZ_{-n}
Time stamp of the billing period (2) in a recent billing period	1	*b*	0	1	5	101-125
Time stamp of the billing period (2) in unspecified number of recent billing periods	1	*b*	0	1	5	126

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Program entries						
Active firmware identifier (Previously: Configuration program version number)	1	*b*	0	2	0	
Parameter record number	1	*b*	0	2	1	
Parameter record number, line 1	1	*b*	0	2	1	1
Reserved for future use	1	*b*	0	2	1	2 … 127
Manufacturer specific	1	*b*	0	2	1	128 … 254
Time switch program number	1	*b*	0	2	2	
RCR program number	1	*b*	0	2	3	
Meter connection diagram ID	1	*b*	0	2	4	
Passive calendar name	1	*b*	0	2	7	
Active firmware signature	1	*b*	0	2	8	
Output pulse values or constants NOTE For units, see IEC 62056-6-2:2023, 4.3.2						
Active energy, metrological LED	1	*b*	0	3	0	
Reactive energy, metrological LED	1	*b*	0	3	1	
Apparent energy, metrological LED	1	*b*	0	3	2	
Active energy, output pulse	1	*b*	0	3	3	
Reactive energy, output pulse	1	*b*	0	3	4	
Apparent energy, output pulse	1	*b*	0	3	5	
Volt-squared hours, metrological LED	1	*b*	0	3	6	
Ampere-squared hours, metrological LED	1	*b*	0	3	7	
Volt-squared hours, output pulse	1	*b*	0	3	8	
Ampere-squared hours, output pulse	1	*b*	0	3	9	
Ratios						
Reading factor for power	1	*b*	0	4	0	
Reading factor for energy	1	*b*	0	4	1	
Transformer ratio – current (numerator) [a]	1	*b*	0	4	2	VZ
Transformer ratio – voltage (numerator) [a]	1	*b*	0	4	3	VZ
Overall transformer ratio (numerator) [a]	1	*b*	0	4	4	VZ
Transformer ratio – current (denominator) [a]	1	*b*	0	4	5	VZ
Transformer ratio – voltage (denominator) [a]	1	*b*	0	4	6	VZ
Overall transformer ratio (denominator) [a]	1	*b*	0	4	7	VZ
Demand limits for excess consumption metering						
Reserved for Germany	1	*b*	0	5		
Nominal values						
Voltage	1	*b*	0	6	0	
Basic/nominal current	1	*b*	0	6	1	
Frequency	1	*b*	0	6	2	
Maximum current	1	*b*	0	6	3	
Reference voltage for power quality measurement	1	*b*	0	6	4	VZ
Reference voltage for aux. power supply	1	*b*	0	6	5	

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Input pulse values or constants [b] NOTE For units, see IEC 62056-6-2:2023, 4.3.2						
Active energy	1	*b*	0	7	0	
Reactive energy	1	*b*	0	7	1	
Apparent energy	1	*b*	0	7	2	
Volt-squared hours	1	*b*	0	7	3	
Ampere-squared hours	1	*b*	0	7	4	
Unitless quantities	1	*b*	0	7	5	
Active energy, export	1	*b*	0	7	10	
Reactive energy, export	1	*b*	0	7	11	
Apparent energy, export	1	*b*	0	7	12	
Measurement period- / recording interval- / billing period duration						
Measurement period 1, for averaging scheme 1	1	*b*	0	8	0	VZ
Measurement period 2, for averaging scheme 2	1	*b*	0	8	1	VZ
Measurement period 3, for instantaneous value	1	*b*	0	8	2	VZ
Measurement period 4, for test value	1	*b*	0	8	3	VZ
Recording interval 1, for load profile	1	*b*	0	8	4	VZ
Recording interval 2, for load profile	1	*b*	0	8	5	VZ
Billing period (Billing period 1 if there are two billing period schemes)	1	*b*	0	8	6	VZ
Billing period 2	1	*b*	0	8	7	VZ
Measurement period 4, for harmonics measurement	1	*b*	0	8	8	VZ
Time entries						
Time expired since last end of billing period (First billing period scheme if there are more than one)	1	*b*	0	9	0	
Local time	1	*b*	0	9	1	
Local date	1	*b*	0	9	2	
Reserved for Germany	1	*b*	0	9	3	
Reserved for Germany	1	*b*	0	9	4	
Week day (0…7)	1	*b*	0	9	5	
Time of last reset (First billing period scheme if there are more than one)	1	*b*	0	9	6	
Date of last reset (First billing period scheme if there are more than one)	1	*b*	0	9	7	
Output pulse duration	1	*b*	0	9	8	
Clock synchronization window	1	*b*	0	9	9	
Clock synchronization method	1	*b*	0	9	10	
Clock time shift limit (default value: s)	1	*b*	0	9	11	
Billing period reset lockout time (First billing period scheme if there are more than one)	1	*b*	0	9	12	
Second billing period scheme						
Time expired since last end of billing period	1	*b*	0	9	13	
Time of last reset	1	*b*	0	9	14	
Date of last reset	1	*b*	0	9	15	
Billing period reset lockout time	1	*b*	0	9	16	
Coefficients						
Transformer magnetic losses, X_m	1	*b*	0	10	0	VZ
Transformer iron losses, R_{Fe}	1	*b*	0	10	1	VZ
Line resistance losses, R_{Cu}	1	*b*	0	10	2	VZ
Line reactance losses, X_s	1	*b*	0	10	3	VZ

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Measurement methods						
Algorithm for active power measurement	1	*b*	0	11	1	
Algorithm for active energy measurement	1	*b*	0	11	2	
Algorithm for reactive power measurement	1	*b*	0	11	3	
Algorithm for reactive energy measurement	1	*b*	0	11	4	
Algorithm for apparent power measurement	1	*b*	0	11	5	
Algorithm for apparent energy measurement	1	*b*	0	11	6	
Algorithm for power factor calculation	1	*b*	0	11	7	
Metering point ID (electricity related)						
Metering point ID 1 (electricity related)	1	0	96	1	0	
.....						
Metering point ID 10 (electricity related)	1	0	96	1	9	
Internal operating status, electricity related						
Internal operating status, global [c]	1	*b*	96	5	0	
Internal operating status (status word 1)	1	*b*	96	5	1	
Internal operating status (status word 2)	1	*b*	96	5	2	
Internal operating status (status word 3)	1	*b*	96	5	3	
Internal operating status (status word 4)	1	*b*	96	5	4	
Meter started status flag	1	*b*	96	5	5	
Electricity related status data						
Status information missing voltage	1	0	96	10	0	
Status information missing current	1	0	96	10	1	
Status information current without voltage	1	0	96	10	2	
Status information auxiliary power supply	1	0	96	10	3	
Manufacturer specific [d]	1	*b*	96	50	*e*	*f*
.....	…	…	…	…	…	…
Manufacturer specific	1	*b*	96	99	*e*	*f*

[a] If a transformer ratio is expressed as a fraction the ratio is numerator, divided by denominator. If the transformer ratio is expressed by an integer or real figure, only the numerator is used.

[b] The codes for export active, reactive and apparent energy shall be used only if meters measuring import energy and meters measuring export energy are connected to the pulse inputs.

[c] Global status words with E = 0 contain the individual status words E = 1…5. The contents of the status words are not defined In this document.

[d] The range D = 50…99 is available for identifying objects, which are not represented by another defined code, but need representation on the display as well. If this is not required, the range D = 128…254 should be used.

It should be noted, that some of the codes above are normally used for display purposes only, as the related data items are attributes of objects having their own OBIS name. See IEC 62056-6-2:2023, Clause 4.

7.5.2 Error register objects – Electricity

Table 21 specifies the OBIS codes for electricity related error register objects.

Table 21 – OBIS codes for error register objects – Electricity

Error register objects – Electricity	OBIS code					
	A	B	C	D	E	F
Error register	1	*b*	97	97	*e*	
NOTE The information to be included in the error objects is not defined in this document.						

7.5.3 List objects – Electricity

Table 22 specifies the OBIS codes for electricity related list objects.

Table 22 – OBIS codes for list objects – Electricity

List objects – Electricity	OBIS code					
	A	B	C	D	E	F
Electricity related data of billing period (with billing period scheme 1 if there are two schemes available)	1	*b*	98	1	*e*	255 [a]
Electricity related data of billing period (with billing period scheme 2)	1	*b*	98	2	*e*	255 [a]
[a] F = 255 means a wildcard here. See Clause A.3.						

7.5.4 Data profile objects – Electricity

Electricity related data profiles – identified with one single OBIS code – are used to hold a series of measurement values of one or more similar quantities and/or to group various data. The OBIS codes are specified in Table 23.

Table 23 – OBIS codes for data profile objects – Electricity

Data profile objects – Electricity	OBIS code					
	A	B	C	D	E	F
Load profile with recording period 1	1	*b*	99	1	*e*	
Load profile with recording period 2	1	*b*	99	2	*e*	
Load profile during test	1	*b*	99	3	0	
Dips voltage profile	1	*b*	99	10	1	
Swells voltage profile	1	*b*	99	10	2	
Cuts voltage profile	1	*b*	99	10	3	
Voltage harmonic profile	1	*b*	99	11	n^{th}	
Current harmonic profile	1	*b*	99	12	n^{th}	
Voltage unbalance profile	1	*b*	99	13	0	
Power quality	1	*b*	99	14	0	
Power failure event log	1	*b*	99	97	*e*	
Event log	1	*b*	99	98	*e*	
Certification data log	1	*b*	99	99	*e*	

7.5.5 Register table objects – Electricity

Register tables – identified with a single OBIS code – are defined to hold a number of values of the same type. The OBIS codes are specified in Table 24.

Table 24 – OBIS codes for register Table objects – Electricity

Register table objects – Electricity	OBIS code					
	A	B	C	D	E	F
UNIPEDE voltage dips, any phase	1	*b*	12	32		
UNIPEDE voltage dips, L_1	1	*b*	32	32		
UNIPEDE voltage dips, L_2	1	*b*	52	32		
UNIPEDE voltage dips, L_3	1	*b*	72	32		
Extended angle measurement	1	*b*	81	7		
General use, electricity related	1	*b*	98	10	*e*	

8 Other media (Value group A = 15)

8.1 General

This Clause specifies naming of objects related to other media than what is defined with values A = 1, 4…9. Typical application is distributed energy generation using renewable energy sources.

NOTE The details of OBIS codes will be specified as application of DLMS®/COSEM in this area grows.

8.2 Value group C codes – Other media

Table 25 specifies the use of value group C for other media.

Table 25 – Value group C codes – Other media

Value group C codes – Other media	
0	General purpose objects
1…10	Solar
11…20	Wind
128…254	Manufacturer specific codes
All other	Reserved

8.3 Value group D codes – Other media

To be specified later.

8.4 Value group E codes – Other media

To be specified later.

8.5 Value group F codes – Other media

To be specified later.

Annex A
(normative)

Code presentation

A.1 Reduced ID codes (e.g. for IEC 62056-21)

To comply with the syntax defined for protocol modes A to D of IEC 62056-21 the range of ID codes is reduced to fulfil the limitations which usually apply to the number of digits and their ASCII representation. Values in all value groups are limited to a range of 0…99 and within that range, to the values specified in the clauses specifying the use of the value groups.

Some value groups may be suppressed, if they are not relevant to an application:

- optional value groups: A, B, E, F;
- mandatory value groups: C, D.

To allow the interpretation of shortened codes delimiters are inserted between all value groups, see Figure A.1:

Figure A.1 – Reduced ID code presentation

The delimiter between value groups E and F can be modified to carry some information about the source of a reset (& instead of * if the reset was performed manually).

The manufacturer shall ensure that the combination of the OBIS code and the class_id (see IEC 62056-6-2:2023, Clause 4) uniquely identifies each COSEM object.

A.2 Display

The usage of OBIS codes to display values is normally limited in a similar way as for data transfer, for example according to IEC 62056-21.

Some codes in value group C and D may be replaced by letters to clearly indicate the differences from other data items; see Table A.1.

Table A.1 – Example of display code replacement

Value group C and D	
OBIS code	**Display code**
96	C
97	F
98	L
99	P
NOTE The letter codes may also be used in protocol modes A to D.	

A.3 Special handling of value group F

Unless otherwise specified, the value group F is used for the identification of values of billing periods.

The billing periods can be identified relative to the status of the billing period counter or relative to the current billing period.

For electricity, there are two billing period schemes available in Table 20, each scheme defined by the length of the billing period, the billing period counter, the number of available billing periods and the time stamps of the billing period. See also 7.4.1 and IEC 62056-6-2:2023, 6.2.2.

With 0 ≤ F ≤ 99, a single billing period is identified relative to the value of the billing period counter, VZ. If the value of the value group of any OBIS code is equal to VZ, this identifies the most recent (youngest) billing period. VZ_{-1} identifies the second youngest, etc. The billing period counter may have different operating modes, for example modulo-12 or modulo-100. The value after reaching the limit of the billing period counter is 0 for the operating mode modulo-100 and 1 for other operating modes (for example modulo-12).

With 101 ≤ F ≤ 125, a single billing period or a set of billing periods are identified relative to the current billing period. F = 101 identifies the last billing period, F = 102 the second last / two last billing periods, etc., F = 125 identifies the 25th last / 25 last billing periods.

F = 126 identifies an unspecified number of last billing periods, therefore it can be used as a wildcard.

F = 255 means that the value group F is not used, or identifies the current billing period value(s).

For use of ICs for representing values of historical billing periods, see IEC 62056-6-2:2023, 6.2.2 and Table A.2:

Table A.2 – Value group F – Billing periods

Value group F	
VZ	Most recent value
VZ_{-1}	Second most recent value
VZ_{-2}	Third most recent value
VZ_{-3}	Fourth most recent value
VZ_{-4}	…
etc.	
101	Last value
102	Second / two last value(s)
….	
125	25th/25 last value(s)
126	Unspecified number of last values

A.4 COSEM

The usage of OBIS codes in the COSEM environment shall be as defined in IEC 62056-6-2:2023, Clause 6.

Annex B
(informative)

Significant technical changes with respect to IEC 62056-6-1:~~2015~~2017

- ~~in 5.4.3, Table 7, a country identifier has been added for Latvia;~~
- ~~in 6.5, Table 12, abstract profile objects related to payment metering as well as an LTE monitoring profile have been added;~~
- ~~in 7.2, Table 14, D = 56, Current average 4 for harmonics measurement allocated;~~
- ~~in 7.5.1, Table 20, Measurement period 4, for harmonics measurement 1.b.0.8.8.VZ has been added.~~
- 5.4.2, Table 6, Consortia code added for STS Association.
- 5.4.3, Table 7, a country identifier has been added for Qatar, Morocco, Algeria, Nigeria, Ivory Coast, Tunisia.
- 6.1, Table 8, Billing period counters and time stamps added.
- 7.3.6, Table 19, values 124…126 added for values of C.
- 7.5.1, Table 20, Billing period counters and time stamps added.

Bibliography

IEC TR 61000-2-8:2002, *Electromagnetic compatibility (EMC) – Part 2-8: Environment – Voltage dips and short interruptions on public electric power supply systems with statistical measurement results*

IEC 62053-23:2020, *Electricity metering equipment – Particular requirements – Part 23: Static meters for reactive energy (classes 2 and 3)*

DLMS UA 1000-1, the “Blue Book” Ed. 12.2:2017, *COSEM interface classes and OBIS identification system*

DLMS UA 1000-2, the “Green Book” Ed. 8.2:2017, *DLMS/COSEM Architecture and Protocols*

DLMS UA 1001-1, the “Yellow Book” Ed. 5.0:2015, *DLMS/COSEM Conformance test and certification process*

DLMS UA 1002, the “White Book” Ed. 1.0:2003, *COSEM Glossary of terms*

DIN 43863-3:1997, *Electricity meters – Part 3: Tariff metering device as additional equipment for electricity meters – EDIS – Energy Data Identification System*

EN 13757-1:2014, *Communication system for meters – Part 1: Data exchange*

Index

IEC 62056-6-1

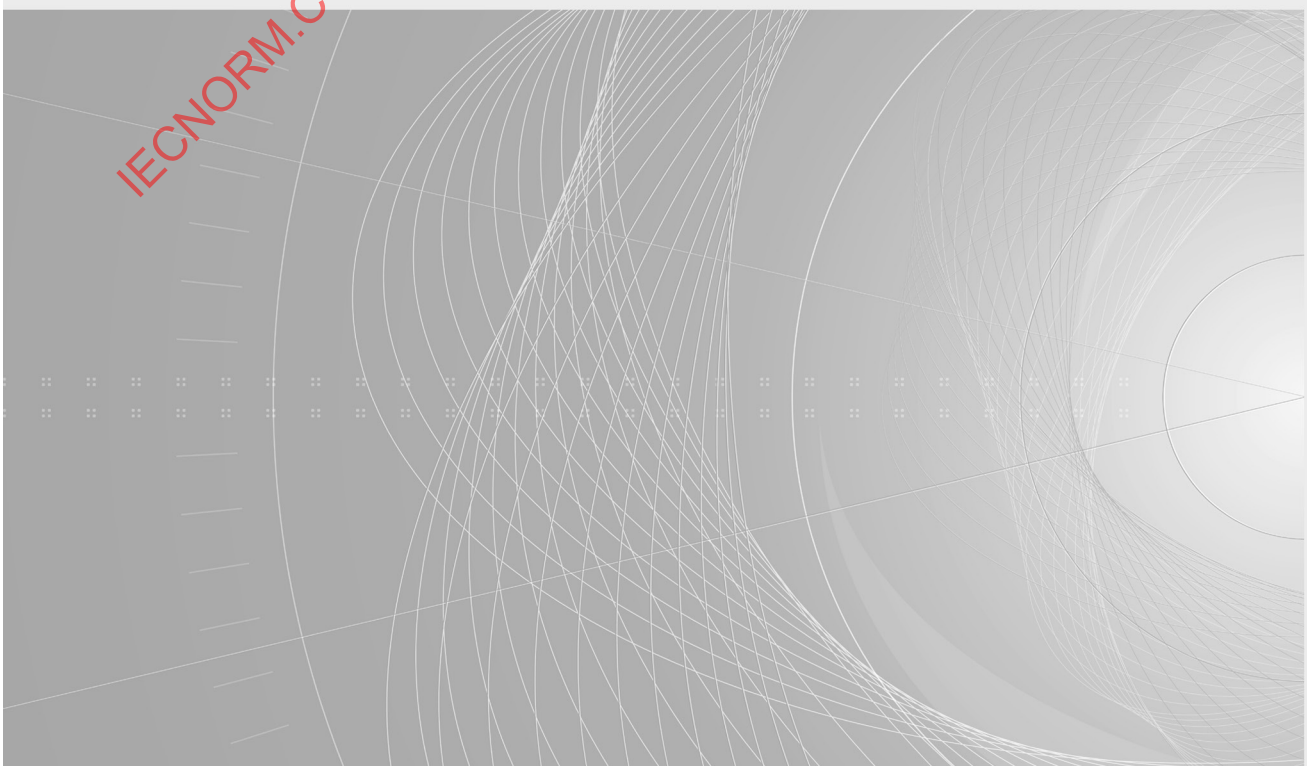
Edition 4.0 2023-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electricity metering data exchange – The DLMS®/COSEM suite – Part 6-1: Object Identification System (OBIS)

Echange des données de comptage de l'électricité – La suite DLMS®/COSEM – Partie 6-1: Système d'identification des objets (OBIS)



IEC 62056-6-1:2023-12(en-fr)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

ELECTRICITY METERING DATA EXCHANGE – THE DLMS®/COSEM SUITE –

Part 6-1: Object Identification System (OBIS)

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 IEC on technical matters express, as closely as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62056-6-1 has been prepared by IEC technical committee 13: Electrical energy measurement and control. It is an International Standard.

This fourth edition cancels and replaces the third edition of IEC 62056-6-1, published in 2017. This edition constitutes a technical revision.

The main technical changes with respect to the previous edition are listed in Annex B (informative).

The text of this International Standard is based on the following documents:

Draft	Report on voting
13/1852/CDV	13/1883/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all the parts in the IEC 62056 series, published under the general title *Electricity metering data exchange – The DLMS®/COSEM suite*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

This fourth edition of IEC 62056-6-1 has been prepared by IEC TC13 with a significant contribution of the DLMS® User Association, its A-type liaison partner.

This edition is in line with the DLMS® UA Blue Book Edition 14. This edition specifies new OBIS codes related to new applications.

Data identification

The competitive electricity market requires an ever-increasing amount of timely information concerning the usage of electrical energy. Recent technology developments enable to build intelligent static metering equipment, which is capable of capturing, processing and communicating this information to all parties involved.

To facilitate the analysis of metering information, for the purposes of billing, load, customer and contract management, it is necessary to uniquely identify data items, whether collected manually or automatically, via local or remote data exchange, in a manufacturer-independent way. The definition of identification codes to achieve this – the OBIS codes – is based on DIN 43863-3:1997, *Electricity meters – Part 3: Tariff metering device as additional equipment for electricity meters – EDIS – Energy Data Identification System.*

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this International Standard may involve the use of a maintenance service concerning the stack of protocols on which the present standard IEC 62056-6-1 is based.

The IEC takes no position concerning the evidence, validity and scope of this maintenance service.

The provider of the maintenance service has assured the IEC that he is willing to provide services under reasonable and non-discriminatory terms and conditions for applicants throughout the world. In this respect, the statement of the provider of the maintenance service is registered with the IEC. Information may be obtained from:

DLMS User Association
www.dlms.com

ELECTRICITY METERING DATA EXCHANGE – THE DLMS®/COSEM SUITE –

Part 6-1: Object Identification System (OBIS)

1 Scope

This part of IEC 62056 specifies the overall structure of the OBject Identification System (OBIS) and the mapping of all commonly used data items in metering equipment to their identification codes.

OBIS provides a unique identifier for all data within the metering equipment, including not only measurement values, but also abstract values used for configuration or obtaining information about the behaviour of the metering equipment. The ID codes defined in this document are used for the identification of:

- logical names of the various instances of the ICs, or objects, as defined in IEC 62056-6-2:2023;
- data transmitted through communication lines;
- data displayed on the metering equipment, see Clause A.2 in Annex A.

This document applies to all types of metering equipment, such as fully integrated meters, modular meters, tariff attachments, data concentrators, etc.

To cover metering equipment measuring energy types other than electricity, combined metering equipment measuring more than one type of energy or metering equipment with several physical measurement channels, the concepts of medium and channels are introduced. This allows meter data originating from different sources to be identified. While this document fully defines the structure of the identification system for other media, the mapping of non-electrical energy related data items to ID codes is completed separately.

NOTE EN 13757-1:2014 defines identifiers for metering equipment other than electricity: heat cost allocators, thermal energy, gas, cold water and hot water.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TR 62051:1999, *Electricity metering – Glossary of terms*

IEC TR 62051-1:2004, *Electricity metering – Data exchange for meter reading, tariff and load control – Glossary of terms – Part 1: Terms related to data exchange with metering equipment using DLMS®/COSEM*

IEC 62056-21:2002, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 21: Direct local data exchange*

IEC 62056-6-2:2023, *Electricity metering data exchange – The DLMS®/COSEM suite – Part 6-2: COSEM interface classes*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TR 62051:1999 and IEC TR 62051-1:2004 apply.

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

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.2 Abbreviated terms

COSEM	Companion Specification for Energy Metering
COSEM object	An instance of a COSEM interface class
DLMS	Device Language Message Specification
DLMS UA	DLMS User Association
GSM	Global System for Mobile Communications
IC	Interface Class
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
OBIS	OBject Identification System
VZ	Billing period counter

4 OBIS code structure

4.1 Value groups and their use

OBIS codes identify data items used in energy metering equipment, in a hierarchical structure using six value groups A to F, see Table 1.

Table 1 – OBIS code structure and use of value groups

Value group	Use of the value group
A	Identifies the media (energy type) to which the metering is related. Non-media related information is handled as abstract data.
B	Generally, identifies the measurement channel number, i.e. the number of the input of a metering equipment having several inputs for the measurement of energy of the same or different types (for example in data concentrators, registration units). Data from different sources can thus be identified. It may also identify the communication channel, and in some cases it may identify other elements. The definitions for this value group are independent from the value group A.
C	Identifies abstract or physical data items related to the information source concerned, for example current, voltage, power, volume, temperature. The definitions depend on the value in the value group A. Further processing, classification and storage methods are defined by value groups D, E and F. For abstract data, value groups D to F provide further classification of data identified by value groups A to C.
D	Identifies types, or the result of the processing of physical quantities identified by values in value groups A and C, according to various specific algorithms. The algorithms can deliver energy and demand quantities as well as other physical quantities.
E	Identifies further processing or classification of quantities identified by values in value groups A to D.
F	Identifies historical values of data, identified by values in value groups A to E, according to different billing periods. Where this is not relevant, this value group can be used for further classification.

4.2 Manufacturer specific codes

In value groups B to F, the following ranges are available for manufacturer-specific purposes:

- group B: 128…199;
- group C: 128…199, 240;
- group D: 128…254;
- group E: 128…254;
- group F: 128…254.

If any of these value groups contain a value in the manufacturer specific range, then the whole OBIS code shall be considered as manufacturer specific, and the value of the other groups does not necessarily carry a meaning defined in this document or in IEC 62056-6-2:2023.

In addition, manufacturer specific ranges are defined in Table 8 with A = 0, C = 96 and in Table 20 with A = 1, C = 96.

4.3 Reserved ranges

By default, all codes not allocated are reserved[1].

4.4 Summary of rules for manufacturer, utility, consortia and country specific codes

Table 2 summarizes the rules for manufacturer specific codes specified in 4.2, utility specific codes specified in 5.2, consortia specific codes specified in 5.4.2 and country specific codes specified in 5.4.3.

[1] Administered by the DLMS® User Association (see Introduction).

Table 2 – Rules for manufacturer, utility, consortia and country specific codes

Code type	Value group					
	A	B	C	D	E	F
Manufacturer specific [1]	0, 1, 4…9, F	128…199	*c*	*d*	*e*	*f*
		b	128… 199, 240	*d*	*e*	*f*
		b	*c*	128…254	*e*	*f*
		b	*c*	*d*	128…254	*f*
		b	*c*	*d*	*e*	128…254
Manufacturer specific abstract [2]	0	0…64	96	50…99	0…255	0…255
Manufacturer specific, media related general purpose [2]	1, 4…9, F	0…64	96	50…99	0…255	0…255
Utility specific [3]	0, 1, 4…9, F	65…127	0…255	0…255	0…255	0…255
Consortia specific [4]	0, 1, 4…9, F	0…64	93	See Table 6.		
Country specific [5]		0…64	94	See Table 7.		

[1] "b", "c", "d", "e", "f" means any value in the relevant value group.

[2] The range D = 50…99 is available for identifying objects, which are not represented by another defined code, but need representation on the display as well. If this is not required, the range D = 128…254 should be used.

[3] If the value in value group B is 65…127, the whole OBIS code should be considered as utility specific and the value of other groups does not necessarily carry a meaning defined neither in this document nor in IEC 62056-6-2:2023.

[4] The usage of value group E and F are defined in consortia specific documents.

[5] The usage of value group E and F are defined in country specific documents.

Objects for which this document defines standard identifiers shall not be re-identified by manufacturer, utility, consortia or country specific identifiers.

On the other hand, an object previously identified by a manufacturer-, utility-, consortia- or country-specific identifier may receive a standard identifier in the future, if its use is of common interest for the users of this document.

4.5 Standard object codes

Standard object codes are meaningful combinations of defined values of the six value groups.

Notation: In the following tables, in the various value groups, *"b", "c", "d", "e", "f"* signify any value in the respective value group. If only one object is instantiated, the value shall be 0. If a value group is shaded, then this value group is not used.

NOTE The DLMS® UA maintains a list of standard COSEM object definitions at www.dlms.com. The validity of the combination of OBIS codes and class_id-s as well as the data types of the attributes are tested during conformance testing.

5 Value group definitions – overview

5.1 Value group A

The range for value group A is 0 to 15; see Table 3.

Table 3 – Value group A codes

Value group A	
0	Abstract objects
1	Electricity related objects
…	
4	Heat cost allocator related objects
5, 6	Thermal energy related objects
7	Gas related objects
8	Cold water related objects
9	Hot water related objects
…	
15	Other media
All other	Reserved

The following subclauses contain value group definitions B to F common for all values of value group A.

5.2 Value group B

The range for value group B is 0 to 255; see Table 4.

Table 4 – Value group B codes

Value group B	
0	No channel specified
1…64	Channel 1..64
65…127	Utility specific codes
128…199	Manufacturer specific codes
200…255	Reserved

If channel information is not essential, the value 0 shall be assigned.

The range 65…127 is available for utility specific use. If the value of value group B is in this range, the whole OBIS code shall be considered as utility specific and the value of other groups does not necessarily carry a meaning defined neither in this document nor in IEC 62056-6-2:2023.

5.3 Value group C

5.3.1 General

The range for value group C is 0 to 255. The definitions depend on the value in value group A. The codes for abstract objects are specified in 5.3.2. See also:

- electricity related codes specified in 7.1;
- other media related codes specified in 8.2.

5.3.2 Abstract objects

Abstract objects are data items, which are not related to a certain type of physical quantity. See Table 5.

Table 5 – Value group C codes – Abstract objects

Value group C Abstract objects (A = 0)	
0…89	Context specific identifiers [a]
93	Consortia specific identifiers (See 5.4.2).
94	Country specific identifiers (See 5.4.3)
96	General and service entry objects – Abstract (See 6.1)
97	Error register objects – Abstract (See 6.2)
98	List objects – Abstract (See 6.3, 6.4)
99	Data profile objects – Abstract (See 6.5)
…	
127	Inactive objects [b]
128…199, 240	Manufacturer specific codes
All other	Reserved

[a] Context specific identifiers identify objects specific to a certain protocol and/or application. For the COSEM context, the identifiers are defined in IEC 62056-6-2:2023, 6.2.

[b] An inactive object is an object, which is defined and present in a meter, but which has no assigned functionality.

5.4 Value group D

5.4.1 General

The range for value group D is 0 to 255.

5.4.2 Consortia specific identifiers

Table 6 specifies the use of value group D for consortia specific applications. In this table, there are no reserved ranges for manufacturer specific codes. The usage of value group E and F are defined in consortia specific documents.

Objects that are already identified in this document shall not be re-identified by consortia specific identifiers.

Table 6 – Value group D codes – Consortia specific identifiers

Value group D Consortia specific identifiers (A = any, C = 93)	
0	Reserved
1	STS Association
2…255	Reserved
NOTE At the time of the publication of this document, no consortia specific identifiers are allocated.	

5.4.3 Country specific identifiers

Table 7 specifies the use of value group D for country specific applications. Wherever possible, the country calling codes are used. In this table, there are no reserved ranges for manufacturer specific codes. The usage of value group E and F are defined in country specific documents.

Objects that are already identified in this document shall not be re-identified by country specific identifiers.

Table 7 – Value group D codes – Country specific identifiers

Value group D Country specific identifiers (A = any, C = 94)			
00	Finland (Country calling code = 358)	**50**	
01	USA (= Country calling code)	**51**	Peru (= Country calling code)
02	Canada (Country calling code = 1)	**52**	South Korea (Country calling code = 82)
03	Serbia (Country calling code = 381)	**53**	Cuba (= Country calling code)
04		**54**	Argentina (= Country calling code)
05		**55**	Brazil (= Country calling code)
06		**56**	Chile (= Country calling code)
07	Russia (Country calling code = 7)	**57**	Colombia (= Country calling code)
08		**58**	Venezuela (= Country calling code)
09		**59**	
10	Czech Republic (Country calling code = 420)	**60**	Malaysia (= Country calling code)
11	Bulgaria (Country calling code = 359)	**61**	Australia (= Country calling code)
12	Croatia (Country calling code = 385)	**62**	Indonesia (= Country calling code)
13	Ireland (Country calling code = 353)	**63**	Philippines (= Country calling code)
14	Israel (Country calling code = 972)	**64**	New Zealand (= Country calling code)
15	Ukraine (Country calling code = 380)	**65**	Singapore (= Country calling code)
16	Yugoslavia [a]	**66**	Thailand (= Country calling code)
17	Qatar (Country calling code = 974)	**67**	
18		**68**	
19		**69**	
20	Egypt (= Country calling code)	**70**	
21		**71**	Latvia (Country calling code = 371)
22	Morocco (Country calling code = 212)	**72**	
23	Algeria (Country calling code = 213)	**73**	Moldova (Country calling code = 373)
24	Nigeria (Country calling code = 234)	**74**	
25	Ivory Coast (Country calling code = 225)	**75**	Belarus (Country calling code = 375)
26	Tunisia (Country calling code = 216)	**76**	
27	South Africa (= Country calling code)	**77**	
28		**78**	
29		**79**	
30	Greece (= Country calling code)	**80**	
31	Netherlands (= Country calling code)	**81**	Japan (= Country calling code)
32	Belgium (= Country calling code)	**82**	Mexico
33	France (= Country calling code)	**83**	
34	Spain (= Country calling code)	**84**	

Value group D Country specific identifiers (A = any, C = 94)			
35	Portugal (Country calling code = 351)	**85**	Hong Kong (Country calling code = 852)
36	Hungary (= Country calling code)	**86**	China (= Country calling code)
37	Lithuania (Country calling code = 370)	**87**	Bosnia and Herzegovina (Country calling code = 387)
38	Slovenia (Country calling code = 386)	**88**	
39	Italy (= Country calling code)	**89**	
40	Romania (= Country calling code)	**90**	Turkey (= Country calling code)
41	Switzerland (= Country calling code)	**91**	India (= Country calling code)
42	Slovakia (Country calling code = 421)	**92**	Pakistan (= Country calling code)
43	Austria (= Country calling code)	**93**	
44	United Kingdom (= Country calling code)	**94**	
45	Denmark (= Country calling code)	**95**	
46	Sweden (= Country calling code)	**96**	Saudi Arabia (Country calling code = 966)
47	Norway (= Country calling code)	**97**	United Arab Emirates (Country calling code = 971)
48	Poland (= Country calling code)	**98**	Iran (= Country calling code)
49	Germany (= Country calling code)	**99**	
	All other codes are reserved		
NOTE With the dissolution of the former Yugoslavia into separate nations, country code 38 was decommissioned.			

5.4.4 Identification of general and service entry objects

For the use of value group D to identify:

- abstract general and service entry objects, see 6.1, Table 8;
- electricity related general and service entry objects, see 7.5, Table 20.

5.5 Value group E

The range for value group E is 0 to 255. It can be used for identifying further classification or processing of values defined by values in value groups A to D, as specified in the relevant energy type specific clauses. The various classifications and processing methods are exclusive.

For the use of value group E to identify:

- abstract general and service entry objects, see 6.1, Table 8;
- electricity related general and service entry objects, see Table 20.

5.6 Value group F

5.6.1 General

The range for value group F is 0 to 255. In all cases, if value group F is not used, it is set to 255.

5.6.2 Identification of billing periods

Value group F specifies the allocation to different billing periods (sets of historical values) for the objects defined by value groups A to E, where storage of historical values is relevant. A billing period scheme is identified with its billing period counter, number of available billing

periods, time stamp of the billing period and billing period length. Several billing period schemes may be possible. For more, see 7.4.1, Clause A.3 and IEC 62056-6-2:2023, 6.2.2.

6 Abstract objects (Value group A = 0)

6.1 General and service entry objects – Abstract

Table 8 specifies OBIS codes for abstract objects. See also IEC 62056-6-2:2023, Table 49 for value group C.

Table 8 – OBIS codes for general and service entry objects

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Billing period values/reset counter entries (First billing period scheme if there are two)						
Billing period counter (1)	0	*b*	0	1	0	VZ or 255
Billing period counter (1) in a recent billing period	0	*b*	0	1	0	101-125
Billing period counters (1) in unspecified number of recent billing periods	0	*b*	0	1	0	126
Number of available billing periods (1)	0	*b*	0	1	1	
Time stamp of the most recent billing period (1)	0	*b*	0	1	2	
Time stamp of the billing period (1) VZ (last reset)	0	*b*	0	1	2	VZ
Time stamp of the billing period (1) VZ_{-1}	0	*b*	0	1	2	VZ_{-1}
…	…	…	…	…	…	…
Time stamp of the billing period (1) VZ_{-n}	0	*b*	0	1	2	VZ_{-n}
Time stamp of the billing period (1) in a recent billing period	0	*b*	0	1	2	101-125
Time stamp of the billing period (1) in unspecified number of recent billing periods	0	*b*	0	1	2	126
Billing period values/reset counter entries (Second billing period scheme)						
Billing period counter (2)	0	*b*	0	1	3	VZ or 255
Billing period counter (2) in a recent billing period	0	*b*	0	1	3	101-125
Billing period counters (2) in unspecified number of recent billing periods	0	*b*	0	1	3	126
Number of available billing periods (2)	0	*b*	0	1	4	
Time stamp of the most recent billing period (2)	0	*b*	0	1	5	
Time stamp of the billing period (2) VZ (last reset)	0	*b*	0	1	5	VZ
Time stamp of the billing period (2) VZ_{-1}	0	*b*	0	1	5	VZ_{-1}
…	…	…	…	…	…	…
Time stamp of the billing period (2) VZ_{-n}	0	*b*	0	1	5	VZ_{-n}
Time stamp of the billing period (2) in a recent billing period	0	*b*	0	1	5	101-125
Time stamp of the billing period (2) in unspecified number of recent billing periods	0	*b*	0	1	5	126
Program entries						
Active firmware identifier	0	*b*	0	2	0	
Active firmware version	0	*b*	0	2	1	
Active firmware signature	0	*b*	0	2	8	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Time entries						
Local time	0	*b*	0	9	1	
Local date	0	*b*	0	9	2	
Device IDs						
Complete device ID	0	*b*	96	1		
Device ID # 1 (manufacturing number)	0	*b*	96	1	0	
…			…	…	…	
Device ID # 10	0	*b*	96	1	9	
Metering point ID (abstract)	0	0	96	1	10	
Parameter changes, calibration and access						
Number of configuration program changes	0	*b*	96	2	0	
Date [a] of last configuration program change	0	*b*	96	2	1	
Date [a] of last time switch program change	0	*b*	96	2	2	
Date [a] of last ripple control receiver program change	0	*b*	96	2	3	
Status of security switches	0	*b*	96	2	4	
Date [a] of last calibration	0	*b*	96	2	5	
Date [a] of next configuration program change	0	*b*	96	2	6	
Date [a] of activation of the passive calendar	0	*b*	96	2	7	
Number of protected configuration program changes [b]	0	*b*	96	2	10	
Date [a] of last protected configuration program change [b]	0	*b*	96	2	11	
Date [a] (corrected) of last clock synchronization/setting	0	*b*	96	2	12	
Date of last firmware activation	0	*b*	96	2	13	
Input/output control signals						
State of input/output control signals, global [c]	0	*b*	96	3	0	
State of input control signals (status word 1)	0	*b*	96	3	1	
State of output control signals (status word 2)	0	*b*	96	3	2	
State of input/output control signals (status word 3)	0	*b*	96	3	3	
State of input/output control signals (status word 4)	0	*b*	96	3	4	
Disconnect control	0	*b*	96	3	10	
Arbitrator	0	*b*	96	3	20.. 29	
Internal control signals						
Internal control signals, global [c]	0	*b*	96	4	0	
Internal control signals (status word 1)	0	*b*	96	4	1	
Internal control signals (status word 2)	0	*b*	96	4	2	
Internal control signals (status word 3)	0	*b*	96	4	3	
Internal control signals (status word 4)	0	*b*	96	4	4	
Internal operating status						
Internal operating status, global [c]	0	*b*	96	5	0	
Internal operating status (status word 1)	0	*b*	96	5	1	
Internal operating status (status word 2)	0	*b*	96	5	2	
Internal operating status (status word 3)	0	*b*	96	5	3	
Internal operating status (status word 4)	0	*b*	96	5	4	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Battery entries						
Battery use time counter	0	*b*	96	6	0	
Battery charge display	0	*b*	96	6	1	
Date of next battery change	0	*b*	96	6	2	
Battery voltage	0	*b*	96	6	3	
Battery initial capacity	0	*b*	96	6	4	
Battery installation date and time	0	*b*	96	6	5	
Battery estimated remaining use time	0	*b*	96	6	6	
Aux. supply use time counter	0	*b*	96	6	10	
Aux. voltage (measured)	0	*b*	96	6	11	
Power failure monitoring						
Number of power failures						
In all three phases	0	0	96	7	0	
In phase L1	0	0	96	7	1	
In phase L2	0	0	96	7	2	
In phase L3	0	0	96	7	3	
In any phase [sic]	0	0	96	7	21	
Auxiliary supply	0	0	96	7	4	
Number of long power failures						
In all three phases	0	0	96	7	5	
In phase L1	0	0	96	7	6	
In phase L2	0	0	96	7	7	
In phase L3	0	0	96	7	8	
In any phase	0	0	96	7	9	
Time of power failure [d]						
In all three phases	0	0	96	7	10	
In phase L1	0	0	96	7	11	
In phase L2	0	0	96	7	12	
In phase L3	0	0	96	7	13	
In any phase	0	0	96	7	14	
Duration of long power failure [e]						
In all three phases	0	0	96	7	15	
In phase L1	0	0	96	7	16	
In phase L2	0	0	96	7	17	
In phase L3	0	0	96	7	18	
In any phase	0	0	96	7	19	
Time threshold for long power failure						
Time threshold for long power failure	0	0	96	7	20	
NOTE 1 See *Number of power failures in any phase* above	*0*	*b*	*96*	*7*	*21*	
Operating time						
Time of operation	0	b	96	8	0	
Time of operation rate 1…rate 63	0	b	96	8	1… 63	
Environment related parameters						
Ambient temperature	0	*b*	96	9	0	
Ambient pressure	0	*b*	96	9	1	
Relative humidity	0	*b*	96	9	2	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Status register						
Status register (Status register 1 if several status registers are used)	0	*b*	96	10	1	
Status register 2	0	*b*	96	10	2	
…	0	*b*	96	10	…	
Status register 10	0	*b*	96	10	10	
Event code						
Event code objects # 1…#100	0	*b*	96	11	0…99	
Communication port log parameters						
Reserved	0	*b*	96	12	0	
Number of connections	0	*b*	96	12	1	
Reserved	0	*b*	96	12	2	
Reserved	0	*b*	96	12	3	
Communication port parameter 1	0	*b*	96	12	4	
GSM field strength	0	*b*	96	12	5	
Telephone number / Communication address of the physical device	0	*b*	96	12	6	
Consumer messages						
Consumer message via local consumer information port	0	*b*	96	13	0	
Consumer message via the meter display and / or via consumer information port	0	*b*	96	13	1	
Currently active tariff						
Currently active tariff objects # 1…#16 NOTE 2 Object #16 (E = 15) carries the name of register with the lowest tariff (default tariff register)	0	*b*	96	14	0…15	
Event counter objects						
Event counter objects #1…#100	0	*b*	96	15	0…99	
Profile entry digital signature objects						
Profile entry digital signature objects #1…#10	0	*b*	96	16	0…9	
Profile entry counter objects						
Profile entry digital counter objects #1..#128	0	*b*	96	17	0…127	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
Meter tamper event related objects						
Meter open event counter	0	*b*	96	20	0	
Meter open event, time stamp of current event occurrence	0	*b*	96	20	1	
Meter open event, duration of current event	0	*b*	96	20	2	
Meter open event, cumulative duration	0	*b*	96	20	3	
Reserved	0	*b*	96	20	4	
Terminal cover open event counter	0	*b*	96	20	5	
Terminal cover open event, time stamp of current event occurrence	0	*b*	96	20	6	
Terminal cover open event, duration of current event	0	*b*	96	20	7	
Terminal cover open event, cumulative duration	0	*b*	96	20	8	
Reserved	0	*b*	96	20	9	
Tilt event counter	0	*b*	96	20	10	
Tilt event, time stamp of current event occurrence	0	*b*	96	20	11	
Tilt event, duration of current event	0	*b*	96	20	12	
Tilt event, cumulative duration	0	*b*	96	20	13	
Reserved	0	*b*	96	20	14	
Strong DC magnetic field event counter	0	*b*	96	20	15	
Strong DC magnetic field event, time stamp of current event occurrence	0	*b*	96	20	16	
Strong DC magnetic field event, duration of current event	0	*b*	96	20	17	
Strong DC magnetic field event, cumulative duration	0	*b*	96	20	18	
Reserved	0	*b*	96	20	19	
Supply control switch / valve tamper event counter	0	*b*	96	20	20	
Supply control switch / valve tamper event, time stamp of current event occurrence	0	*b*	96	20	21	
Supply control switch / valve tamper event, duration of current event	0	*b*	96	20	22	
Supply control switch / valve tamper event, cumulative duration	0	*b*	96	20	23	
Reserved	0	*b*	96	20	24	
Metrology tamper event counter	0	*b*	96	20	25	
Metrology tamper event, time stamp of current event occurrence	0	*b*	96	20	26	
Metrology tamper event, duration of current event	0	*b*	96	20	27	
Metrology tamper event, cumulative duration	0	*b*	96	20	28	
Reserved	0	*b*	96	20	29	
Communication tamper event counter	0	*b*	96	20	30	
Communication tamper event, time stamp of current event occurrence	0	*b*	96	20	31	
Communication tamper event, duration of current event	0	*b*	96	20	32	
Communication tamper event, cumulative duration	0	*b*	96	20	33	
Reserved	0	*b*	96	20	34	
Manufacturer specific [f]	0	*b*	96	50	*e*	*f*
…						
Manufacturer specific	0	*b*	96	99	*e*	*f*
All other codes are reserved						

[a] Date of the event may contain the date only, the time only or both, encoded as specified in IEC 62056-6-2:2023, 4.5.1.

[b] Protected configuration is characterized by the need to open the main meter cover to modify it, or to break a metrological seal.

[c] Global status words with E = 0 contain the individual status words E = 1…4. The contents of the status words are not defined in this document.

[d] Time of power failure is recorded when either a short or long power failure occurs.

[e] Duration of long power failure holds the duration of the last long power failure.

[f] The range D = 50…99 is available for identifying objects, which are not represented by another defined code, but need representation on the display as well. If this is not required, the range D = 128…254 should be used.

6.2 Error registers, alarm registers / filters / descriptor objects – Abstract

The OBIS codes for abstract error registers, alarm registers and alarm filters are shown in Table 9.

Table 9 – OBIS codes for error registers, alarm registers and alarm filters – Abstract

Error register, alarm register and alarm filter objects – Abstract	OBIS code					
	A	B	C	D	E	F
Error register objects 1…10	0	*b*	97	97	0…9	
Alarm register objects 1…10	0	*b*	97	98	0…9	
Alarm filter objects 1…10	0	*b*	97	98	10…19	
Alarm descriptor objects 1…10	0	*b*	97	98	20…29	
NOTE The information to be included in the error objects is not defined in this document.						

6.3 List objects – Abstract

Lists – identified with a single OBIS code – are defined as a series of any kind of data (for example measurement value, constants, status, events). See Table 10.

Table 10 – OBIS codes for list objects – Abstract

List objects – Abstract	OBIS code					
	A	B	C	D	E	F
Data of billing period (with billing period scheme 1 if there are more than one schemes available)	0	*b*	98	1	*e*	255 [a]
Data of billing period (with billing period scheme 2)	0	*b*	98	2	*e*	255 [a]
[a] F = 255 means a wildcard here. See Clause A.3.						

6.4 Register table objects – Abstract

Register tables are defined to hold a number of values of the same type. See Table 11.

Table 11 – OBIS codes for Register Table objects – Abstract

Register table objects – Abstract	OBIS code					
	A	B	C	D	E	F
General use, abstract	0	*b*	98	10	*e*	

6.5 Data profile objects – Abstract

Abstract data profiles – instances of the “Profile generic IC” and identified with one single OBIS code as specified in Table 12 – are used to hold a series of measurement values of one or more similar quantities and/or to group various data.

Table 12 – OBIS codes for data profile objects – Abstract

Data profile objects – Abstract	OBIS code					
	A	B	C	D	E	F
Load profile with recording period 1 [a]	0	*b*	99	1	*e*	
Load profile with recording period 2 [a]	0	*b*	99	2	*e*	
Load profile during test [a]	0	*b*	99	3	0	
Connection profile	0	*b*	99	12	*e*	
GSM diagnostic profile	0	*b*	99	13	*e*	
Charge collection history (Payment metering)	0	*b*	99	14	e	
Token credit history (Payment metering)	0	*b*	99	15	e	
Parameter monitor log	0	*b*	99	16	*e*	
Token transfer log (Payment metering)	0	*b*	99	17	*e*	
LTE monitoring profile	0	*b*	99	18	*e*	
Event log [a]	0	*b*	99	98	*e*	
[a] These objects should be used if they (also) hold data not specific to the energy type.						

7 Electricity (Value group A = 1)

7.1 Value group C codes – Electricity

Table 13 specifies the use of value group C for electricity related objects.

The quadrant definitions for active and reactive power are shown in Figure 1.

Table 13 – Value group C codes – Electricity

Value group C codes – Electricity (A = 1)				
0	General purpose objects (See 7.5.1)			
ΣL_i	**L_1**	**L_2**	**L_3**	(See also NOTE 2)
1	**21**	**41**	**61**	Active power+ (QI+QIV)
2	**22**	**42**	**62**	Active power− (QII+QIII)
3	**23**	**43**	**63**	Reactive power+ (QI+QII)
4	**24**	**44**	**64**	Reactive power− (QIII+QIV)
5	**25**	**45**	**65**	Reactive power QI
6	**26**	**46**	**66**	Reactive power QII
7	**27**	**47**	**67**	Reactive power QIII
8	**28**	**48**	**68**	Reactive power QIV
9	**29**	**49**	**69**	Apparent power+ (QI+QIV) (See also NOTE 3)
10	**30**	**50**	**70**	Apparent power– (QII+QIII)
11	**31**	**51**	**71**	Current: any phase (C = 11) / L_i phase [a] (C= 31, 51, 71)
12	**32**	**52**	**72**	Voltage: any phase (C = 12) / L_i phase [a] (C= 32, 52, 72)
13	**33**	**53**	**73**	Power factor (See also NOTE 4)
14	**34**	**54**	**74**	Supply frequency
15	**35**	**55**	**75**	Active power (abs(QI+QIV)+(abs(QII+QIII)) [a]
16	**36**	**56**	**76**	Active power (abs(QI+QIV)-abs(QII+QIII))
17	**37**	**57**[d]	**77**	Active power QI
18	**38**	**58**	**78**	Active power QII
19	**39**	**59**	**79**	Active power QIII

Value group C codes – Electricity (A = 1)				
20	**40**	**60**	**80**	Active power QIV
….				
81	Angles [b]			
82	Unitless quantity (pulses or pieces)			
83	Transformer and line loss quantities [c]			
84	ΣL_i Power factor – (See also NOTE 4)			
85	L_1 Power factor –			
86	L_2 Power factor –			
87	L_3 Power factor –			
88	ΣL_i Ampere-squared hours (QI+QII+QIII+QIV)			
89	ΣL_i Volt-squared hours (QI+QII+QIII+QIV)			
90	ΣL_i current (algebraic sum of the – unsigned – value of the currents in all phases)			
91	L_0 current (neutral) [a]			
92	L_0 voltage (neutral) [a]			
93	Consortia specific identifiers (See 5.4.2)			
94	Country specific identifiers (See 5.4.3)			
96	General and service entry objects – Electricity (See 7.5.1)			
97	Error register objects – Electricity (See 7.5.2)			
98	List objects – Electricity (See 7.5.3)			
99	Data profile objects – Electricity (See 7.5.4)			
ΣL_i	L_1	L_2	L_3	(See also NOTE 2)
100	101	102	103	Reactive power inductive (QI+QIII)
104	105	106	107	Reactive power capacitive (QII+QIV)
108..123	Reserved			
124	$L_1 – L_2$ line voltage			
125	$L_2 – L_3$ line voltage			
126	$L_3 – L_1$ line voltage			
127	Reserved			

Value group C codes – Electricity (A = 1)	
128…199, 240	Manufacturer specific codes
All other	Reserved

NOTE 1 L_i *Quantity* is the value (to be measured) of a measurement system connected between the phase *i* and a reference point. In 3-phase 4-wire systems, the reference point is the neutral. In 3-phase 3-wire systems, the reference point is the phase L_2.

NOTE 2 ΣL_i *Quantity* is the total measurement value across all systems.

NOTE 3 If just one apparent energy/demand value is calculated over the four quadrants, C = 9 shall be used.

NOTE 4 Power factor quantities with C = 13, 33, 53, 73 are calculated either as PF = Active power+ (C = 1, 21, 41, 61) / Apparent power+ (C = 9, 29, 49, 69) or PF = Active power– (C = 2, 22, 42, 62) / Apparent power- (C = 10, 30, 50, 70).

In the first case, the sign is positive (no sign), it means power factor in the import direction (PF+).

In the second case, the sign is negative, it means power factor in the export direction (PF–).

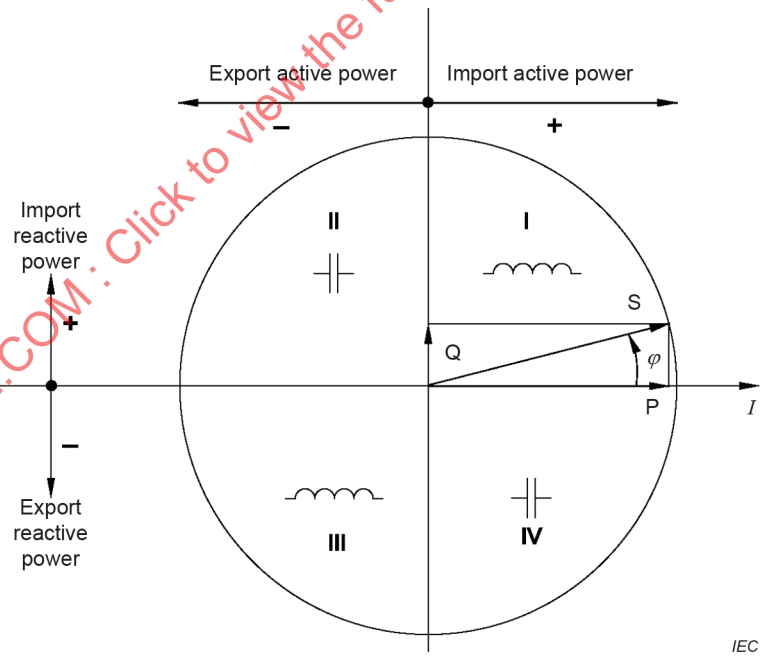
Power factor quantities C = 84, 85, 86 and 87 are always calculated as PF− = Active power− / Apparent power−. This quantity is the power factor in the export direction; it has no sign.

[a] For details of extended codes, see 7.3.3.

[b] For details of extended codes, see 7.3.4.

[c] For details of extended codes, see 7.3.5.

[d] This was recorded erroneously as 58 in earlier versions.



NOTE The quadrant definitions shown in Figure 1 are in line with IEC 62053-23:2020.

Figure 1 – Quadrant definitions for active and reactive power

7.2 Value group D codes – Electricity

7.2.1 Processing of measurement values

Table 14 specifies the use of value group D for electricity related objects.

Table 14 – Value group D codes – Electricity

Value group D codes – Electricity (A = 1, C <> 0, 93, 94, 96, 97, 98, 99)	
0	Billing period average (since last reset)
1	Cumulative minimum 1
2	Cumulative maximum 1
3	Minimum 1
4	Current average 1
5	Last average 1
6	Maximum 1
7	Instantaneous value
8	Time integral 1
9	Time integral 2
10	Time integral 3
11	Cumulative minimum 2
12	Cumulative maximum 2
13	Minimum 2
14	Current average 2
15	Last average 2
16	Maximum 2
17	Time integral 7
18	Time integral 8
19	Time integral 9
20	Time integral 10
21	Cumulative minimum 3
22	Cumulative maximum 3
23	Minimum 3
24	Current average 3
25	Last average 3
26	Maximum 3
27	Current average 5
28	Current average 6
29	Time integral 5
30	Time integral 6
31	Under limit threshold
32	Under limit occurrence counter
33	Under limit duration
34	Under limit magnitude
35	Over limit threshold
36	Over limit occurrence counter
37	Over limit duration
38	Over limit magnitude
39	Missing threshold
40	Missing occurrence counter
41	Missing duration
42	Missing magnitude

Value group D codes – Electricity (A = 1, C <> 0, 93, 94, 96, 97, 98, 99)	
43	Time threshold for under limit
44	Time threshold for over limit
45	Time threshold for missing magnitude
46	Contracted value
49	Average value for recording interval 1
50	Average value for recording interval 2
51	Minimum for recording interval 1
52	Minimum for recording interval 2
53	Maximum for recording interval 1
54	Maximum for recording interval 2
55	Test average
56	Current average 4 for harmonics measurement
58	Time integral 4
128...254	Manufacturer specific codes
All other	Reserved
NOTES	
Averaging scheme 1	Controlled by measurement period 1 (see Table 20), a set of registers is calculated by a metering device (codes 1…6). The typical usage is for billing purposes.
Averaging scheme 2	Controlled by measurement period 2, a set of registers is calculated by a metering device (codes 11…16). The typical usage is for billing purposes.
Averaging scheme 3	Controlled by measurement period 3, a set of registers is calculated by a metering device (codes 21…26). The typical usage is for instantaneous values.
Averaging scheme 4	Controlled by measurement period 4, a test average value (code 55) is calculated by the metering device.
Current average 1, 2, 3	See the definition of the “Demand register” IC in IEC 62056-6-2:2023, 4.3.4. The value is calculated using measurement period 1, 2 and/or 3 respectively.
Last average 1,2,3	See the definition of the “Demand register” IC in in IEC 62056-6-2:2023, 4.3.4. The value is calculated using measurement period 1, 2 or 3 respectively.
Minimum	The smallest of last average values during a billing period, see Table 20.
Maximum	The largest of last average values during a billing period.
Cumulative min.	The cumulative sum of minimum values over all the past billing periods.
Cumulative max.	The cumulative sum of maximum values over all the past billing periods.
Current average 4	For harmonics measurement
Current average 5	See the definition of the “Demand register” IC in in IEC 62056-6-2:2023, 4.3.4. The value is calculated using recording interval 1; see Table 20.
Current average 6	See the definition of the “Demand register” IC in in IEC 62056-6-2:2023, 4.3.4. The value is calculated using recording interval 2.
Time integral 1	For a current billing period (F= 255): Time integral of the quantity calculated from the origin (first start of measurement) to the instantaneous time point. For a historical billing period (F= 0…99): Time integral of the quantity calculated from the origin to the end of the billing period given by the billing period code.
Time integral 2	For a current billing period (F = 255): Time integral of the quantity calculated from the beginning of the current billing period to the instantaneous time point. For a historical billing period (F = 0…99): Time integral of the quantity calculated over the billing period given by the billing period code.
Time integral 3	Time integral of the positive difference between the quantity and a prescribed threshold value.

Value group D codes – Electricity (A = 1, C <> 0, 93, 94, 96, 97, 98, 99)	
Time integral 4 ("Test time integral")	Time integral of the quantity calculated over a time specific to the device or determined by test equipment.
Time integral 5	Used as a base for load profile recording: Time integral of the quantity calculated from the beginning of the current recording interval to the instantaneous time point for recording period 1, see Table 20.
Time integral 6	Used as a base for load profile recording: Time integral of the quantity calculated from the beginning of the current recording interval to the instantaneous time point for recording period 2, see Table 20.
Time integral 7	Time integral of the quantity calculated from the origin (first start of measurement) up to the end of the last recording period with recording period 1, see Table 20.
Time integral 8	Time integral of the quantity calculated from the origin (first start of measurement) up to the end of the last recording period with recording period 2, see Table 20.
Time integral 9	Time integral of the quantity calculated from the beginning of the current billing period up to the end of the last recording period with recording period 1, see Table 20.
Time integral 10	Time integral of the quantity calculated from the beginning of the current billing period up to the end of the last recording period with recording period 2, see Table 20.
Under limit values	Values under a certain threshold (for example dips).
Over limit values	Values above a certain threshold (for example swells).
Missing values	Values considered as missing (for example interruptions).

7.2.2 Use of value group D for identification of other objects

For identifiers of electricity related general purpose objects see 7.5.1.

7.3 Value group E codes – Electricity

7.3.1 General

The following subclauses define the use of value group E for identifying further classification or processing the measurement quantities defined by values in value groups A to D. The various classifications and processing methods are exclusive.

7.3.2 Tariff rates

Table 15 shows the use of value group E for identification of tariff rates typically used for energy (consumption) and demand quantities.

Table 15 – Value group E codes – Electricity – Tariff rates

Value group E codes – Electricity – Tariff rates (A = 1)	
0	Total
1	Rate 1
2	Rate 2
3	Rate 3
…	…
63	Rate 63
128…254	Manufacturer specific codes
All other	Reserved

7.3.3 Harmonics

Table 16 shows the use of value group E for the identification of harmonics of instantaneous values of voltage, current or active power.

Table 16 – Value group E codes – Electricity – Harmonics

Value group E codes – Electricity – Measurement of harmonics of voltage, current or active power (A = 1, C = 12, 32, 52, 72, 92, 11, 31, 51, 71, 90, 91, 15, 35, 55, 75, D = 7, 24, 56)	
0	Total (fundamental + all harmonics)
1	1st harmonic (fundamental)
2	2nd harmonic
…	*n*th harmonic
120	120th harmonic
124	Total Harmonic Distortion (THD) [a]
125	Total Demand Distortion (TDD) [b]
126	All harmonics [c]
127	All harmonics to nominal value ratio [d]
128…254	Manufacturer specific codes
All other	Reserved

[a] THD is calculated as the ratio of the square root of the sum of the squares of each harmonic to the value of the fundamental quantity, expressed as a percent of the value of the fundamental.

[b] TDD is calculated as the ratio of the square root of the sum of the squares of each harmonic to the maximum value of the fundamental quantity, expressed as percent of the maximum value of the fundamental.

[c] Calculated as the square root of the sum of the squares of each harmonic.

[d] This is calculated as ratio of the square root of the sum of the squares of each harmonic, to the nominal value of the fundamental quantity, expressed as percent of the nominal value of the fundamental.

7.3.4 Phase angles

Table 17 shows the use of value group E for identification of phase angles.

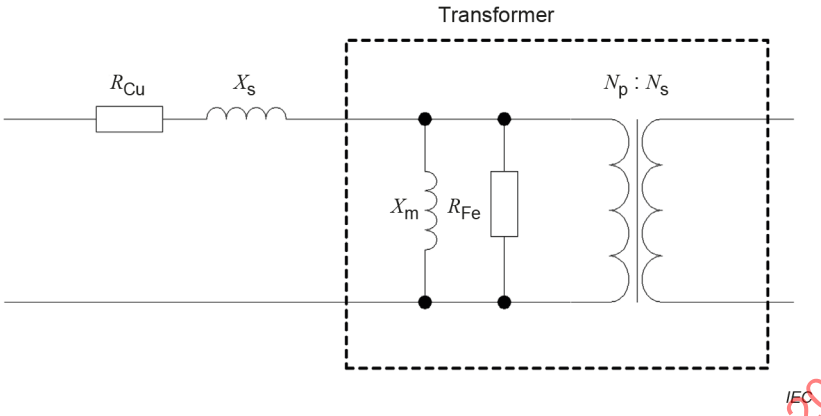
Table 17 – Value group E codes – Electricity – Extended phase angle measurement

Value group E codes – Electricity – Extended phase angle measurement (A = 1, C = 81; D = 7)								
Angle	**U(L1)**	**U(L2)**	**U(L3)**	**I(L1)**	**I(L2)**	**I(L3)**	**I(L0)**	**<= From**
U(L1)	(00)	01	02	04	05	06	07	
U(L2)	10	(11)	12	14	15	16	17	
U(L3)	20	21	(22)	24	25	26	27	
I(L1)	40	41	42	(44)	45	46	47	
I(L2)	50	51	52	54	(55)	56	57	
I(L3)	60	61	62	64	65	(66)	67	
I(L0)	70	71	72	74	75	76	(77)	
^ To (reference)								

7.3.5 Transformer and line loss quantities

Table 18 shows the meaning of value group E for the identification of transformer and line loss quantities. The use of value group D shall be according to Table 14, the use of value group F shall be according to Table A.2. For these quantities, no tariffication is available.

The model of the line and the transformer used for loss calculation is shown on Figure 2.



Key

R_{Cu} Line resistance losses, OBIS code 1.x.0.10.2.VZ

X_s Line reactance losses, OBIS code 1.x.0.10.3.VZ

X_m Transformer magnetic losses, OBIS code 1.x.0.10.0.VZ

R_{Fe} Transformer iron losses, OBIS code 1.x.0.10.1.VZ

N_p Number of turns on the primary side of the transformer

N_s Number of turns on the secondary side of the transformer

NOTE Serial elements of the transformer are normally low compared to that of the line, therefore they are not considered here.

Figure 2 – Model of the line and the transformer for calculation of loss quantities

Table 18 – Value group E codes – Electricity – Transformer and line losses

Value group E codes – Electricity – Transformer and line losses (A = 1, C = 83)			
E=	**Quantity**	**Formula**	**Quadrant / comment**
1	ΣL_i Active line losses+	On Load Active, positive OLA+ = (CuA_1+) + (CuA_2+) + (CuA_3+)	QI+QIV
2	ΣL_i Active line losses–	On Load Active, negative OLA– = (CuA_1–) + (CuA_2–) + (CuA_3–)	QII+QIII
3	ΣL_i Active line losses	On Load Active OLA = (CuA_1) + (CuA_2) + (CuA_3)	QI+QII+QIII+QIV
4	ΣL_i Active transformer losses+	No Load Active, positive NLA+ = (FeA_1+) + (FeA_2+) + (FeA_3+)	QI+QIV
5	ΣL_i Active transformer losses–	No Load active, negative NLA– = (FeA_1–) + (FeA_2–) + (FeA_3–)	QII+QIII
6	ΣL_i Active transformer losses	No Load Active NLA = (FeA_1) + (FeA_2) + (FeA_3)	QI+QII+QIII+QIV
7	ΣL_i Active losses+	Total Losses Active, positive TLA+ = (OLA+) + (NLA+)	QI+QIV
8	ΣL_i Active losses–	Total Losses Active, negative TLA– = (OLA–) + (NLA–)	QII+QIII
9	ΣL_i Active losses	Total Losses Active TLA = OLA + NLA = TLA_1 + TLA_2 + TLA_3	QI+QII+QIII+QIV

Value group E codes – Electricity – Transformer and line losses (A = 1, C = 83)			
E=	**Quantity**	**Formula**	**Quadrant / comment**
10	ΣL_i Reactive line losses+	On Load Reactive, positive OLR+ = (CuR_1+) + (CuR_2+) + (CuR_3+)	QI+QII
11	ΣL_i Reactive line losses–	On Load Reactive, negative OLR– = (CuR_1–) + (CuR_2–) + (CuR_3–)	QIII+QIV
12	ΣL_i Reactive line losses	On Load Reactive OLR = (CuR_1) + (CuR_2) + (CuR_3)	QI+QII+QIII+QIV
13	ΣL_i Reactive transformer losses+	No Load reactive, positive NLR+ = (FeR_1+) + (FeR_2+) + (FeR_3+)	QI+QII
14	ΣL_i Reactive transformer losses–	No Load Reactive, negative NLR– = (FeR_1–) + (FeR_2–) + (FeR_3–)	QIII+QIV
15	ΣL_i Reactive transformer losses	No Load Reactive NLR = (FeR_1) + (FeR_2) + (FeR_3)	QI+QII+QIII+QIV
16	ΣL_i Reactive losses+	Total Losses Reactive, positive TLR+ = (OLR+) + (NLR+)	QI+QII
17	ΣL_i Reactive losses–	Total Losses Reactive, negative TLR– = (OLR–) + (NLR–)	QIII+QIV
18	ΣL_i Reactive losses	Total Losses Reactive TLR = OLR + NLR = TLR_1 + TLR_2 + TLR_3	QI+QII+QIII+QIV
19	Total transformer losses with normalized R_{Fe} = 1 MΩ	U^2h 1/R_{Fe} × (U^2h_{L1} + U^2h_{L2} + U^2h_{L3})	QI+QII+QIII+QIV
20	Total line losses with normalized R_{Cu} = 1 Ω	I^2h R_{Cu} × (I^2h_{L1} + I^2h_{L2} + I^2h_{L3})	QI+QII+QIII+QIV
21	Compensated active gross+	CA+ = (A+) + (TLA+)	QI+QIV; A+ is the quantity A = 1, C = 1
22	Compensated active net+	CA+ = (A+) – (TLA+)	QI+QIV
23	Compensated active gross–	CA– = (A–) + (TLA–)	QII+QIII, A– is the quantity A = 1, C = 2
24	Compensated active net–	CA– = (A–) – (TLA–)	QII+QIII
25	Compensated reactive gross+	CR+ = (R+) + (TLR+)	QI+QII; R+ is the quantity A = 1, C = 3
26	Compensated reactive net+	CR+ = (R+) – (TLR+)	QI+QII
27	Compensated reactive gross–	CR– = (R–) + (TLR–)	QIII+QIV;R– is the quantity A = 1, C = 4
28	Compensated reactive net–	CR– = (R–) – (TLR–)	QIII+QIV
29	Reserved		
30	Reserved		
31	L_1 Active line losses+	CuA_1+ = I^2h_{L1} × R_{Cu}	QI+QIV R_{Cu} is the serial resistive element of the line loss, OBIS code 1.x.0.10.2.VZ
32	L_1 Active line losses–	CuA_1– = I^2h_{L1} × R_{Cu}	QII+QIII
33	L_1 Active line losses	CuA_1 = I^2h_{L1} × R_{Cu}	QI+QII+QIII+QIV
34	L_1 Active transformer losses+	FeA_1+ = U^2h_{L1}/R_{Fe}	QI+QIV R_{Fe} is the parallel resistive element of the transformer loss, OBIS code 1.x.0.10.1.VZ
35	L_1 Active transformer losses–	FeA_1– = U^2h_{L1}/R_{Fe}	QII+QIII
36	L_1 Active transformer losses	FeA_1 = U^2h_{L1}/R_{Fe}	QI+QII+QIII+QIV

Value group E codes – Electricity – Transformer and line losses (A = 1, C = 83)			
E=	**Quantity**	**Formula**	**Quadrant / comment**
37	L_1 Active losses+	$TLA_1+ = (CuA_1+) + (FeA_1+)$	QI+QIV
38	L_1 Active losses–	$TLA_1– = (CuA_1–) + (FeA_1–)$	QII+QIII
39	L_1 Active losses	$TLA_1 = CuA_1 + FeA_1$	QI+QII+QIII+QIV
40	L_1 Reactive line losses+	$CuR_1+ = I^2hL_1 \times X_s$	QI+QII X_s is the serial reactive element of the line loss, OBIS code 1.x.0.10.3.VZ
41	L_1 Reactive line losses–	$CuR_1– = I^2h_{L1} \times X_s$	QIII+QIV
42	L_1 Reactive line losses	$CuR_1 = I^2h_{L1} \times X_s$	QI+QII+QIII+QIV
43	L_1 Reactive transformer losses+	$FeR_1+ = U^2h_{L1}/X_m$	QI+QII X_m is the parallel reactive element of the transformer loss, OBIS code 1.x.0.10.0.VZ
44	L_1 Reactive transformer losses–	$FeR_1– = U^2h_{L1}/X_m$	QIII+QIV
45	L_1 Reactive transformer losses	$FeR_1 = U^2h_{L1}/X_m$	QI+QII+QIII+QIV
46	L_1 Reactive losses+	$TLR_1+ = (CuR_1+) + (FeR_1+)$	QI+QII
47	L_1 Reactive losses–	$TLR_1– = (CuR_1–) + (FeR_1–)$	QIII+QIV
48	L_1 Reactive losses	$TLR_1 = CuR_1 + FeR_1$	QI+QII+QIII+QIV
49	L_1 Ampere-squared hours	A^2h_{L1}	QI+QII+QIII+QIV
50	L_1 Volt-squared hours	V^2h_{L1}	QI+QII+QIII+QIV
51	L_2 Active line losses+	$CuA_2+ = I^2h_{L2} \times R_{Cu}$	QI+QIV R_{Cu} is the serial resistive element of the line loss, OBIS code 1.x.0.10.2.VZ
52	L_2 Active line losses–	$CuA_2– = I^2h_{L2} \times R_{Cu}$	QII+QIII
53…70	L_2 quantities, (See 33…48)		
71	L_3 Active line losses +	$CuA_3+ = I^2h_{L3} \times R_{Cu}$	QI+QIV R_{Cu} is the serial resistive element of the line loss, OBIS code 1.x.0.10.2.VZ
72	L_3 Active line losses -	$CuA_3– = I^2h_{L3} \times R_{Cu}$	QII+QIII
73…90	L_3 quantities (See 33…48)		
91…255	Reserved		
NOTE In this table, no manufacturer specific range is available.			

7.3.6 UNIPEDE voltage dips

Table 19 shows the use of value group E for the identification of voltage dips according to the UNIPEDE classification.

Table 19 – Value group E codes – Electricity – UNIPEDE voltage dips

Value group E codes – Electricity – UNIPEDE voltage dips measurement (A = 1, C = 12, 32, 52, 72,124…126 D = 32)							
Depth in % of U_n	Residual voltage U in % of U_n	Duration Δt s					
		0,01 < Δt ≤ 0,1	0,1 < Δt ≤ 0,5	0,5 < Δt ≤ 1	1 < Δt ≤ 3	3 < Δt ≤ 20	20 < Δt ≤ 60
10 % … < 15 %	90 > U ≥ 85	00	01	02	03	04	05
15 % … < 30 %	85 > U ≥ 70	10	11	12	13	14	15
30 % … < 60 %	70 > U ≥ 40	20	21	22	23	24	25
60 % … < 90 %	40 > U ≥ 10	30	31	32	33	34	35
90 % … < 100 %	10 > U ≥ 0	40	41	42	43	44	45
NOTE These *dip classes* form a subset of the classes defined in IEC TR 61000-2-8:2002, Table 2.							

7.3.7 Use of value group E for the identification of other objects

For identifiers of electricity related general purpose objects see 7.5.1.

7.4 Value group F codes – Electricity

7.4.1 Billing periods

Value group F specifies the allocation to different billing periods (sets of historical values) for the objects with following codes:

- value group A: 1;
- value group C: as defined in Table 13;
- value group D:
  - 0: Billing period average (since last reset);
  - 1, 2, 3, 6: (Cumulative) minimum / maximum 1;
  - 8, 9, 10: Time integral 1 / 2 / 3;
  - 11, 12, 13, 16: (Cumulative) minimum / maximum 2;
  - 21, 22, 23, 26: (Cumulative) minimum / maximum 3.

There are two billing period schemes available (for example to store weekly and monthly values). For each billing period scheme, the following general purpose objects are available:

- billing period counter;
- number of available billing periods;
- time stamp of most recent and historical billing periods;
- billing period length.

For OBIS codes see Table 20. For additional information, see Clause A.3 and IEC 62056-6-2:2023, 6.2.2.

7.4.2 Multiple thresholds

Value group F is also used to identify several thresholds for the same quantity, identified with the following codes:

- value group A = 1;
- value group C = 1…20, 21…40, 41…60, 61…80, 82, 84…89, 90… 92;
- value group D = 31, 35, 39 (under limit, over limit and missing thresholds);
- value group F = 0…99.

NOTE All quantities monitored are instantaneous values: D = 7 or D = 24.

When multiple thresholds are identified by value group F, then the Under limit / Over limit / Missing Occurrence counter / Duration / Magnitude quantities relative to a threshold are identified with the same value in value group F. In this case, value group F cannot be used to identify values relative to billing period. However, such values can be held by “Profile generic” objects.

Example:

– Over limit threshold #1 for current in any phase is identified with OBIS code 1-0:11.35.0*0;

– Over limit duration above threshold # 1 for current in any phase is identified with OBIS code 1-0:11.37.0*0.

To avoid ambiguity, value group F cannot be used to identify historical values of Under limit / Over limit / Missing Occurrence counter / Duration / Magnitude quantities. For historical values of these quantities “Profile generic” objects can be used and values related to previous billing periods can be accessed using selective access.

7.5 OBIS codes – Electricity

7.5.1 General and service entry objects – Electricity

Table 20 specifies OBIS codes for electricity related general and service entry objects.

Table 20 – OBIS codes for general and service entry objects – Electricity

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Free ID-numbers for utilities						
Complete combined electricity ID	1	*b*	0	0		
Electricity ID 1	1	*b*	0	0	0	
…	…	…	…	…	…	
Electricity ID 10	1	*b*	0	0	9	
Billing period values/reset counter entries (First billing period scheme if there are more than one)						
Billing period counter (1)	1	*b*	0	1	0	VZ or 255
Billing period counter (1) in a recent billing period	1	*b*	0	1	0	101-125
Billing period counters (1) in unspecified number of recent billing periods	1	*b*	0	1	0	126
Number of available billing periods (1)	1	*b*	0	1	1	
Time stamp of the most recent billing period (1)	1	*b*	0	1	2	
Time stamp of the billing period (1) VZ (last reset)	1	*b*	0	1	2	VZ
Time stamp of the billing period (1) VZ_{-1}	1	*b*	0	1	2	VZ_{-1}
…	…	…	…	…	…	…
Time stamp of the billing period (1) VZ_{-n}	1	*b*	0	1	2	VZ_{-n}
Time stamp of the billing period (1) in a recent billing period	1	*b*	0	1	2	101-125
Time stamp of the billing period (1) in unspecified number of recent billing periods	1	*b*	0	1	2	126

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Billing period values/reset counter entries (Second billing period scheme)						
Billing period counter (2)	1	*b*	0	1	3	VZ or 255
Billing period counter (2) in a recent billing period	1	*b*	0	1	3	101-125
Billing period counters (2) in unspecified number of recent billing periods	1	*b*	0	1	3	126
Number of available billing periods (2)	1	*b*	0	1	4	
Time stamp of the most recent billing period (2)	1	*b*	0	1	5	
Time stamp of the billing period (2) VZ (last reset)	1	*b*	0	1	5	VZ
Time stamp of the billing period (2) VZ_{-1}	1	*b*	0	1	5	VZ_{-1}
…	…	…	…	…	…	…
Time stamp of the billing period (2) VZ_{-n}	1	*b*	0	1	5	VZ_{-n}
Time stamp of the billing period (2) in a recent billing period	1	*b*	0	1	5	101-125
Time stamp of the billing period (2) in unspecified number of recent billing periods	1	*b*	0	1	5	126
Program entries						
Active firmware identifier (Previously: Configuration program version number)	1	*b*	0	2	0	
Parameter record number	1	*b*	0	2	1	
Parameter record number, line 1	1	*b*	0	2	1	1
Reserved for future use	1	*b*	0	2	1	2 … 127
Manufacturer specific	1	*b*	0	2	1	128 … 254
Time switch program number	1	*b*	0	2	2	
RCR program number	1	*b*	0	2	3	
Meter connection diagram ID	1	*b*	0	2	4	
Passive calendar name	1	*b*	0	2	7	
Active firmware signature	1	*b*	0	2	8	
Output pulse values or constants NOTE For units, see IEC 62056-6-2:2023, 4.3.2						
Active energy, metrological LED	1	*b*	0	3	0	
Reactive energy, metrological LED	1	*b*	0	3	1	
Apparent energy, metrological LED	1	*b*	0	3	2	
Active energy, output pulse	1	*b*	0	3	3	
Reactive energy, output pulse	1	*b*	0	3	4	
Apparent energy, output pulse	1	*b*	0	3	5	
Volt-squared hours, metrological LED	1	*b*	0	3	6	
Ampere-squared hours, metrological LED	1	*b*	0	3	7	
Volt-squared hours, output pulse	1	*b*	0	3	8	
Ampere-squared hours, output pulse	1	*b*	0	3	9	

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Ratios						
Reading factor for power	1	*b*	0	4	0	
Reading factor for energy	1	*b*	0	4	1	
Transformer ratio – current (numerator) [a]	1	*b*	0	4	2	VZ
Transformer ratio – voltage (numerator) [a]	1	*b*	0	4	3	VZ
Overall transformer ratio (numerator) [a]	1	*b*	0	4	4	VZ
Transformer ratio – current (denominator) [a]	1	*b*	0	4	5	VZ
Transformer ratio – voltage (denominator) [a]	1	*b*	0	4	6	VZ
Overall transformer ratio (denominator) [a]	1	*b*	0	4	7	VZ
Demand limits for excess consumption metering						
Reserved for Germany	1	*b*	0	5		
Nominal values						
Voltage	1	*b*	0	6	0	
Basic/nominal current	1	*b*	0	6	1	
Frequency	1	*b*	0	6	2	
Maximum current	1	*b*	0	6	3	
Reference voltage for power quality measurement	1	*b*	0	6	4	VZ
Reference voltage for aux. power supply	1	*b*	0	6	5	
Input pulse values or constants [b] NOTE For units, see IEC 62056-6-2:2023, 4.3.2						
Active energy	1	*b*	0	7	0	
Reactive energy	1	*b*	0	7	1	
Apparent energy	1	*b*	0	7	2	
Volt-squared hours	1	*b*	0	7	3	
Ampere-squared hours	1	*b*	0	7	4	
Unitless quantities	1	*b*	0	7	5	
Active energy, export	1	*b*	0	7	10	
Reactive energy, export	1	*b*	0	7	11	
Apparent energy, export	1	*b*	0	7	12	
Measurement period- / recording interval- / billing period duration						
Measurement period 1, for averaging scheme 1	1	*b*	0	8	0	VZ
Measurement period 2, for averaging scheme 2	1	*b*	0	8	1	VZ
Measurement period 3, for instantaneous value	1	*b*	0	8	2	VZ
Measurement period 4, for test value	1	*b*	0	8	3	VZ
Recording interval 1, for load profile	1	*b*	0	8	4	VZ
Recording interval 2, for load profile	1	*b*	0	8	5	VZ
Billing period (Billing period 1 if there are two billing period schemes)	1	*b*	0	8	6	VZ
Billing period 2	1	*b*	0	8	7	VZ
Measurement period 4, for harmonics measurement	1	*b*	0	8	8	VZ
Time entries						
Time expired since last end of billing period (First billing period scheme if there are more than one)	1	*b*	0	9	0	
Local time	1	*b*	0	9	1	
Local date	1	*b*	0	9	2	
Reserved for Germany	1	*b*	0	9	3	
Reserved for Germany	1	*b*	0	9	4	
Week day (0…7)	1	*b*	0	9	5	

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Time of last reset	1	*b*	0	9	6	
(First billing period scheme if there are more than one)						
Date of last reset	1	*b*	0	9	7	
(First billing period scheme if there are more than one)						
Output pulse duration	1	*b*	0	9	8	
Clock synchronization window	1	*b*	0	9	9	
Clock synchronization method	1	*b*	0	9	10	
Clock time shift limit (default value: s)	1	*b*	0	9	11	
Billing period reset lockout time	1	*b*	0	9	12	
(First billing period scheme if there are more than one)						
Second billing period scheme						
Time expired since last end of billing period	1	*b*	0	9	13	
Time of last reset	1	*b*	0	9	14	
Date of last reset	1	*b*	0	9	15	
Billing period reset lockout time	1	*b*	0	9	16	
Coefficients						
Transformer magnetic losses, X_m	1	*b*	0	10	0	VZ
Transformer iron losses, R_{Fe}	1	*b*	0	10	1	VZ
Line resistance losses, R_{Cu}	1	*b*	0	10	2	VZ
Line reactance losses, X_s	1	*b*	0	10	3	VZ
Measurement methods						
Algorithm for active power measurement	1	*b*	0	11	1	
Algorithm for active energy measurement	1	*b*	0	11	2	
Algorithm for reactive power measurement	1	*b*	0	11	3	
Algorithm for reactive energy measurement	1	*b*	0	11	4	
Algorithm for apparent power measurement	1	*b*	0	11	5	
Algorithm for apparent energy measurement	1	*b*	0	11	6	
Algorithm for power factor calculation	1	*b*	0	11	7	
Metering point ID (electricity related)						
Metering point ID 1 (electricity related)	1	0	96	1	0	
.....						
Metering point ID 10 (electricity related)	1	0	96	1	9	
Internal operating status, electricity related						
Internal operating status, global [c]	1	*b*	96	5	0	
Internal operating status (status word 1)	1	*b*	96	5	1	
Internal operating status (status word 2)	1	*b*	96	5	2	
Internal operating status (status word 3)	1	*b*	96	5	3	
Internal operating status (status word 4)	1	*b*	96	5	4	
Meter started status flag	1	*b*	96	5	5	
Electricity related status data						
Status information missing voltage	1	0	96	10	0	
Status information missing current	1	0	96	10	1	
Status information current without voltage	1	0	96	10	2	
Status information auxiliary power supply	1	0	96	10	3	

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Manufacturer specific [d]	1	*b*	96	50	*e*	*f*
.....	…	…	…	…	…	…
Manufacturer specific	1	*b*	96	99	*e*	*f*

[a] If a transformer ratio is expressed as a fraction the ratio is numerator, divided by denominator. If the transformer ratio is expressed by an integer or real figure, only the numerator is used.

[b] The codes for export active, reactive and apparent energy shall be used only if meters measuring import energy and meters measuring export energy are connected to the pulse inputs.

[c] Global status words with E = 0 contain the individual status words E = 1…5. The contents of the status words are not defined In this document.

[d] The range D = 50…99 is available for identifying objects, which are not represented by another defined code, but need representation on the display as well. If this is not required, the range D = 128…254 should be used.

It should be noted, that some of the codes above are normally used for display purposes only, as the related data items are attributes of objects having their own OBIS name. See IEC 62056-6-2:2023, Clause 4.

7.5.2 Error register objects – Electricity

Table 21 specifies the OBIS codes for electricity related error register objects.

Table 21 – OBIS codes for error register objects – Electricity

Error register objects – Electricity	OBIS code					
	A	B	C	D	E	F
Error register	1	*b*	97	97	*e*	
NOTE The information to be included in the error objects is not defined in this document.						

7.5.3 List objects – Electricity

Table 22 specifies the OBIS codes for electricity related list objects.

Table 22 – OBIS codes for list objects – Electricity

List objects – Electricity	OBIS code					
	A	B	C	D	E	F
Electricity related data of billing period (with billing period scheme 1 if there are two schemes available)	1	*b*	98	1	*e*	255 [a]
Electricity related data of billing period (with billing period scheme 2)	1	*b*	98	2	*e*	255 [a]
[a] F = 255 means a wildcard here. See Clause A.3.						

7.5.4 Data profile objects – Electricity

Electricity related data profiles – identified with one single OBIS code – are used to hold a series of measurement values of one or more similar quantities and/or to group various data. The OBIS codes are specified in Table 23.

Table 23 – OBIS codes for data profile objects – Electricity

Data profile objects – Electricity	OBIS code					
	A	B	C	D	E	F
Load profile with recording period 1	1	*b*	99	1	*e*	
Load profile with recording period 2	1	*b*	99	2	*e*	
Load profile during test	1	*b*	99	3	0	
Dips voltage profile	1	*b*	99	10	1	
Swells voltage profile	1	*b*	99	10	2	
Cuts voltage profile	1	*b*	99	10	3	
Voltage harmonic profile	1	*b*	99	11	n^{th}	
Current harmonic profile	1	*b*	99	12	n^{th}	
Voltage unbalance profile	1	*b*	99	13	0	
Power quality	1	*b*	99	14	0	
Power failure event log	1	*b*	99	97	*e*	
Event log	1	*b*	99	98	*e*	
Certification data log	1	*b*	99	99	*e*	

7.5.5 Register table objects – Electricity

Register tables – identified with a single OBIS code – are defined to hold a number of values of the same type. The OBIS codes are specified in Table 24.

Table 24 – OBIS codes for register Table objects – Electricity

Register table objects – Electricity	OBIS code					
	A	B	C	D	E	F
UNIPEDE voltage dips, any phase	1	*b*	12	32		
UNIPEDE voltage dips, L_1	1	*b*	32	32		
UNIPEDE voltage dips, L_2	1	*b*	52	32		
UNIPEDE voltage dips, L_3	1	*b*	72	32		
Extended angle measurement	1	*b*	81	7		
General use, electricity related	1	*b*	98	10	*e*	

8 Other media (Value group A = 15)

8.1 General

This Clause specifies naming of objects related to other media than what is defined with values A = 1, 4…9. Typical application is distributed energy generation using renewable energy sources.

NOTE The details of OBIS codes will be specified as application of DLMS®/COSEM in this area grows.

8.2 Value group C codes – Other media

Table 25 specifies the use of value group C for other media.

Table 25 – Value group C codes – Other media

Value group C codes – Other media	
0	General purpose objects
1…10	Solar
11…20	Wind
128…254	Manufacturer specific codes
All other	Reserved

8.3 Value group D codes – Other media

To be specified later.

8.4 Value group E codes – Other media

To be specified later.

8.5 Value group F codes – Other media

To be specified later.

Annex A
(normative)

Code presentation

A.1 Reduced ID codes (e.g. for IEC 62056-21)

To comply with the syntax defined for protocol modes A to D of IEC 62056-21 the range of ID codes is reduced to fulfil the limitations which usually apply to the number of digits and their ASCII representation. Values in all value groups are limited to a range of 0…99 and within that range, to the values specified in the clauses specifying the use of the value groups.

Some value groups may be suppressed, if they are not relevant to an application:

- optional value groups: A, B, E, F;
- mandatory value groups: C, D.

To allow the interpretation of shortened codes delimiters are inserted between all value groups, see Figure A.1:

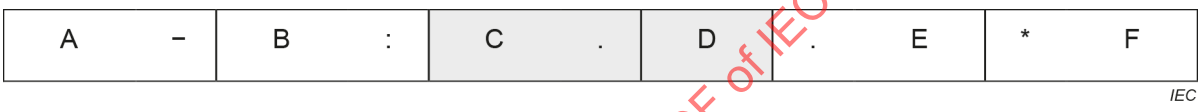


Figure A.1 – Reduced ID code presentation

The delimiter between value groups E and F can be modified to carry some information about the source of a reset (& instead of * if the reset was performed manually).

The manufacturer shall ensure that the combination of the OBIS code and the class_id (see IEC 62056-6-2:2023, Clause 4) uniquely identifies each COSEM object.

A.2 Display

The usage of OBIS codes to display values is normally limited in a similar way as for data transfer, for example according to IEC 62056-21.

Some codes in value group C and D may be replaced by letters to clearly indicate the differences from other data items; see Table A.1.

Table A.1 – Example of display code replacement

Value group C and D	
OBIS code	**Display code**
96	C
97	F
98	L
99	P
NOTE The letter codes may also be used in protocol modes A to D.	

A.3 Special handling of value group F

Unless otherwise specified, the value group F is used for the identification of values of billing periods.

The billing periods can be identified relative to the status of the billing period counter or relative to the current billing period.

For electricity, there are two billing period schemes available in Table 20, each scheme defined by the length of the billing period, the billing period counter, the number of available billing periods and the time stamps of the billing period. See also 7.4.1 and IEC 62056-6-2:2023, 6.2.2.

With 0 ≤ F ≤ 99, a single billing period is identified relative to the value of the billing period counter, VZ. If the value of the value group of any OBIS code is equal to VZ, this identifies the most recent (youngest) billing period. VZ_{-1} identifies the second youngest, etc. The billing period counter may have different operating modes, for example modulo-12 or modulo-100. The value after reaching the limit of the billing period counter is 0 for the operating mode modulo-100 and 1 for other operating modes (for example modulo-12).

With 101 ≤ F ≤ 125, a single billing period or a set of billing periods are identified relative to the current billing period. F = 101 identifies the last billing period, F = 102 the second last / two last billing periods, etc., F = 125 identifies the 25th last / 25 last billing periods.

F = 126 identifies an unspecified number of last billing periods, therefore it can be used as a wildcard.

F = 255 means that the value group F is not used, or identifies the current billing period value(s).

For use of ICs for representing values of historical billing periods, see IEC 62056-6-2:2023, 6.2.2 and Table A.2:

Table A.2 – Value group F – Billing periods

Value group F	
VZ	Most recent value
VZ_{-1}	Second most recent value
VZ_{-2}	Third most recent value
VZ_{-3}	Fourth most recent value
VZ_{-4}	…
etc.	
101	Last value
102	Second / two last value(s)
….	
125	25th/25 last value(s)
126	Unspecified number of last values

A.4 COSEM

The usage of OBIS codes in the COSEM environment shall be as defined in IEC 62056-6-2:2023, Clause 6.

Annex B
(informative)

Significant technical changes with respect to IEC 62056-6-1:2017

- 5.4.2, Table 6, Consortia code added for STS Association.
- 5.4.3, Table 7, a country identifier has been added for Qatar, Morocco, Algeria, Nigeria, Ivory Coast, Tunisia.
- 6.1, Table 8, Billing period counters and time stamps added.
- 7.3.6, Table 19, values 124…126 added for values of C.
- 7.5.1, Table 20, Billing period counters and time stamps added.

Bibliography

IEC TR 61000-2-8:2002, *Electromagnetic compatibility (EMC) – Part 2-8: Environment – Voltage dips and short interruptions on public electric power supply systems with statistical measurement results*

IEC 62053-23:2020, *Electricity metering equipment – Particular requirements – Part 23: Static meters for reactive energy (classes 2 and 3)*

DLMS UA 1000-1, the “Blue Book” Ed. 12.2:2017, *COSEM interface classes and OBIS identification system*

DLMS UA 1000-2, the “Green Book” Ed. 8.2:2017, *DLMS/COSEM Architecture and Protocols*

DLMS UA 1001-1, the “Yellow Book” Ed. 5.0:2015, *DLMS/COSEM Conformance test and certification process*

DLMS UA 1002, the “White Book” Ed. 1.0:2003, *COSEM Glossary of terms*

DIN 43863-3:1997, *Electricity meters – Part 3: Tariff metering device as additional equipment for electricity meters – EDIS – Energy Data Identification System*

EN 13757-1:2014, *Communication system for meters – Part 1: Data exchange*

SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

_____

ÉCHANGE DES DONNÉES DE COMPTAGE DE L'ÉLECTRICITÉ – LA SUITE DLMS®/COSEM –

Partie 6-1: Système d'identification des objets (OBIS)

AVANT-PROPOS

1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'IEC attire l'attention sur le fait que la mise en application du présent document peut entraîner l'utilisation d'un ou de plusieurs brevets. L'IEC ne prend pas position quant à la preuve, à la validité et à l'applicabilité de tout droit de brevet revendiqué à cet égard. À la date de publication du présent document, l'IEC n'a pas reçu notification qu'un ou plusieurs brevets pouvaient être nécessaires à sa mise en application. Toutefois, il y a lieu d'avertir les responsables de la mise en application du présent document que des informations plus récentes sont susceptibles de figurer dans la base de données de brevets, disponible à l'adresse https://patents.iec.ch. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié tout ou partie de tels droits de propriété.

L'IEC 62056-6-1 a été établie par le comité d'études 13 de l'IEC: Comptage et pilotage de l'énergie électrique. Il s'agit d'une Norme internationale.

Cette quatrième édition annule et remplace la troisième édition de l'IEC 62056-6-1 parue en 2017. Cette édition constitue une révision technique.

Les modifications techniques majeures par rapport à l'édition précédente sont énumérées dans l'Annexe B (informative).

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
13/1852/CDV	13/1883/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications/.

Une liste de toutes les parties de la série IEC 62056, publiées sous le titre général *Échange des données de comptage de l'électricité – La suite DLMS®/COSEM*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé, ou
- révisé.

INTRODUCTION

La présente quatrième édition de l'IEC 62056-6-1 a été établie par le comité d'études 13 de l'IEC avec la contribution significative de la DLMS® User Association, son partenaire de liaison de type A.

La présente édition est conforme à l'Edition 14 du Livre Bleu de la DLMS® UA. Elle spécifie les nouveaux codes OBIS en rapport avec les nouvelles applications.

Identification des données

Le marché concurrentiel de l'électricité exige une quantité sans cesse croissante d'informations pertinentes concernant l'utilisation de l'énergie électrique. Les récents développements technologiques permettent de fabriquer des équipements de comptage statiques intelligents, capables d'acquérir, de traiter et de communiquer ces informations à toutes les parties concernées.

Pour faciliter l'analyse des informations de comptage, à des fins de gestion de la facturation, de la charge électrique, des clients et des contrats, il est nécessaire d'identifier les éléments de données de façon unique, qu'ils soient collectés manuellement ou automatiquement, par un échange de données en local ou à distance, d'une manière indépendante du fabricant. La définition des codes d'identification permettant d'y parvenir – les codes OBIS – est basée sur la DIN 43863-3:1997, *Elektrizitätszähler – Teil 3: Tarifgeräte als Zusatzeinrichtung zum Elektrizitätszähler – EDIS – Energie-Daten-Identifikations-System* (disponible en allemand seulement).

La Commission Électrotechnique Internationale (IEC) attire l'attention sur le fait qu'il est déclaré que la conformité avec les dispositions du présent document peut impliquer l'utilisation d'un service de maintenance concernant la pile de protocoles sur laquelle est basée la présente Norme IEC 62056-6-1.

L'IEC ne prend pas position quant à la preuve, à la validité et à la portée de ce service de maintenance.

Le fournisseur du service de maintenance a donné l'assurance à l'IEC qu'il consent à fournir des services aux demandeurs du monde entier, à des termes et conditions raisonnables et non discriminatoires. A ce propos, la déclaration du fournisseur du service de maintenance est enregistrée à l'IEC. Des informations peuvent être demandées à:

DLMS User Association
www.dlms.com

ÉCHANGE DES DONNÉES DE COMPTAGE DE L'ÉLECTRICITÉ – LA SUITE DLMS®/COSEM –

Partie 6-1: Système d'identification des objets (OBIS)

1 Domaine d'application

La présente partie de l'IEC 62056 spécifie la structure globale du système d'identification des objets (OBIS) et la correspondance entre tous les éléments de données couramment utilisés dans les équipements de comptage et leurs codes d'identification.

Le système OBIS fournit un identifiant unique pour toutes les données des équipements de comptage, incluant non seulement les valeurs de mesure, mais aussi les valeurs abstraites utilisées pour la configuration ou pour obtenir des informations sur le comportement des équipements de comptage. Les codes d'identification définis dans le présent document sont utilisés pour identifier:

- les noms logiques des différentes instances des classes d'interfaces ou des objets, tels que définis dans l'IEC 62056-6-2:2023;
- les données transmises par des lignes de communication;
- les données affichées sur l'équipement de comptage (voir l'Article A.2 de l'Annexe A).

Le présent document s'applique à tous les types d'équipements de comptage, tels que les compteurs entièrement intégrés, les compteurs modulaires, les appareils tarifaires associés aux compteurs, les concentrateurs de données, etc.

Les concepts de support et de canaux sont introduits afin de couvrir les équipements de comptage mesurant d'autres types d'énergie que l'électricité, ainsi que les équipements de comptage combinés mesurant plusieurs types d'énergie ou les équipements de comptage avec plusieurs canaux de mesure physiques. Ceci permet d'identifier les données de comptage provenant de différentes sources. Bien que le présent document définisse entièrement la structure du système d'identification pour d'autres supports, la mise en correspondance d'éléments de données associés à une énergie non électrique avec des codes d'identification est effectuée séparément.

NOTE L'EN 13757-1:2014 définit des identifiants pour des équipements de comptage mesurant d'autres types d'énergie que l'électricité: répartiteurs de frais de chauffage, énergie thermique, gaz, eau froide et eau chaude.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC TR 62051:1999, *Electricity metering – Glossary of terms* (disponible en anglais seulement)

IEC TR 62051-1:2004, *Electricity metering – Data exchange for meter reading, tariff and load control – Glossary of terms – Part 1: Terms related to data exchange with metering equipment using DLMS®/COSEM (disponible en anglais seulement)*

IEC 62056-21:2002, *Équipements de mesure de l'énergie électrique – Échange des données pour la lecture des compteurs, le contrôle des tarifs et de la charge – Partie 21: Échange des données directes en local*

IEC 62056-6-2:2023, *Échange des données de comptage de l'électricité – La suite DLMS®/COSEM – Partie 6-2: Classes d'interfaces COSEM*

3 Termes, définitions et abréviations

3.1 Termes et définitions

Pour les besoins du présent document, les termes et les définitions de l'IEC TR 62051:1999 et l'IEC TR 62051-1:2004 s'appliquent.

L'ISO et l'IEC tiennent à jour des bases de données terminologiques destinées à être utilisées en normalisation, consultables aux adresses suivantes:

- IEC Electropedia: disponible à l'adresse https://www.electropedia.org/
- ISO Online browsing platform: disponible à l'adresse https://www.iso.org/obp

3.2 Abréviations

COSEM	COmpanion Specification for Energy Metering
Objet COSEM	Instance d'une classe d'interface COSEM
DLMS	Device Language Message Specification (Spécification des messages de langage de dispositif)
DLMS UA	DLMS User Association (Association des utilisateurs de DLMS)
GSM	Global System for Mobile Communications (Système mondial de communications mobiles)
IC	Interface Class (Classe d'interfaces)
IEC	International Electrotechnical Commission (Commission électrotechnique internationale)
ISO	International Organization for Standardization (Organisation internationale de normalisation)
OBIS	OBject Identification System (Système d'identification des objets)
VZ	Compteur de périodes de facturation

4 Structure des codes OBIS

4.1 Groupes de valeurs et leur utilisation

Les codes OBIS identifient les éléments de données utilisés dans les équipements de comptage d'énergie, selon une structure hiérarchique organisée en six groupes de valeurs A à F (voir Tableau 1).

Tableau 1 – Structure des codes OBIS et fonction des groupes de valeurs

Groupe de valeurs	Fonction du groupe de valeurs
A	Identifie les supports (type d'énergie) associés au comptage. Les informations qui ne sont associées à aucun support sont traitées comme des données abstraites.
B	Identifie généralement le numéro du canal de mesure, c'est-à-dire le numéro de l'entrée d'un équipement de comptage ayant plusieurs entrées pour le mesurage d'énergies de même type ou de types différents (par exemple, dans des concentrateurs de données, des unités d'enregistrement). Des données provenant de différentes sources peuvent ainsi être identifiées. Il peut également identifier le canal de communication et, dans certains cas, d'autres éléments. Les définitions pour ce groupe de valeurs sont indépendantes du groupe de valeurs A.
C	Identifie des éléments de données abstraites ou physiques relatifs à la source d'informations concernée, par exemple un courant, une tension, une puissance, un volume ou une température. Les définitions dépendent de la valeur définie dans le groupe de valeurs A. D'autres méthodes de traitement, de classification et de stockage sont définies par les groupes de valeurs D, E et F. Pour les données abstraites, les groupes de valeurs D à F fournissent une classification complémentaire des données identifiées par les groupes de valeurs A à C.
D	Identifie des types ou le résultat du traitement de grandeurs physiques identifiées par des valeurs définies dans les groupes de valeurs A et C, selon divers algorithmes spécifiques. Les algorithmes peuvent délivrer des grandeurs d'énergie et de puissance ainsi que d'autres grandeurs physiques.
E	Identifie d'autres traitements ou classifications de grandeurs identifiées par des valeurs définies dans les groupes de valeurs A à D.
F	Identifie des valeurs historiques de données, identifiées par des valeurs définies dans les groupes de valeurs A à E, selon différentes périodes de facturation. Lorsque ce groupe de valeurs n'est pas approprié, il peut être utilisé pour une autre classification.

4.2 Codes spécifiques au fabricant

Dans les groupes de valeurs B à F, les plages suivantes sont disponibles pour des usages spécifiques au fabricant:

- groupe B: 128…199;
- groupe C: 128…199, 240;
- groupe D: 128…254;
- groupe E: 128…254;
- groupe F: 128…254.

Si l'un de ces groupes de valeurs contient une valeur située dans la plage spécifique au fabricant, l'ensemble du code OBIS doit alors être considéré comme spécifique au fabricant et la valeur des autres groupes n'a pas nécessairement une signification définie dans le présent document ou dans l'IEC 62056-6-2:2023.

De plus, des plages spécifiques au fabricant sont définies dans le Tableau 8 avec A = 0, C = 96 et dans le Tableau 20 avec A = 1, C = 96.

4.3 Plages réservées

Par défaut, tous les codes qui ne sont pas alloués sont réservés[1].

[1] Processus de réservation administré par la DLMS® User Association (voir Introduction).

4.4 Résumé des règles pour les codes spécifiques au fabricant, au fournisseur de service, aux consortiums et au pays

Le Tableau 2 résume les règles pour les codes spécifiques au fabricant spécifiés en 4.2, les codes spécifiques au fournisseur de service spécifiés en 5.2, les codes spécifiques aux consortiums spécifiés en 5.4.2 et les codes spécifiques au pays spécifiés en 5.4.3.

Tableau 2 – Règles pour les codes spécifiques au fabricant, au fournisseur de service, aux consortiums et au pays

Type de code	Groupe de valeurs					
	A	B	C	D	E	F
Spécifique au fabricant [1]	0, 1, 4…9, F	128…199	*c*	*d*	*e*	*f*
		b	128… 199, 240	*d*	*e*	*f*
		b	*c*	128…254	*e*	*f*
		b	*c*	*d*	128…254	*f*
		b	*c*	*d*	*e*	128…254
Objet abstrait spécifique au fabricant [2]	0	0…64	96	50…99	0…255	0…255
Spécifique au fabricant, à usage général relatif aux supports [2]	1, 4…9, F	0…64	96	50…99	0…255	0…255
Spécifique au fournisseur de service [3]	0, 1, 4…9, F	65…127	0…255	0…255	0…255	0…255
Spécifique aux consortiums [4]	0, 1, 4…9, F	0…64	93	Voir Tableau 6.		
Spécifique au pays [5]		0…64	94	Voir Tableau 7.		

[1] “b”, “c”, “d”, “e”, “f” signifie toute valeur dans le groupe de valeurs approprié.

[2] La plage D = 50...99 est disponible pour identifier des objets qui ne sont pas représentés par un autre code défini, mais qui ont également besoin d’une représentation sur l’affichage. Si ceci n’est pas exigé, il convient d’utiliser la plage D = 128…254.

[3] Si la valeur dans le groupe de valeurs B se situe dans la plage 65…127, il convient de considérer l’ensemble du code OBIS comme spécifique au fournisseur de service et la valeur des autres groupes n’a pas nécessairement une signification définie dans le présent document ou dans l’IEC 62056-6-2:2023.

[4] L’utilisation des groupes de valeurs E et F est définie dans les documents spécifiques aux consortiums.

[5] L’utilisation des groupes de valeurs E et F est définie dans les documents spécifiques au pays.

Les objets pour lesquels le présent document définit des identifiants normalisés ne doivent pas être de nouveau identifiés par des identifiants spécifiques au fabricant, au fournisseur de service, aux consortiums ou au pays.

D’autre part, un objet précédemment identifié par un identifiant spécifique à un fabricant, à un fournisseur de service, à des consortiums ou à un pays pourra à l’avenir recevoir un identifiant normalisé, si son utilisation présente un intérêt commun pour les utilisateurs du présent document.

4.5 Codes d’objets normalisés

Les codes d’objets normalisés sont des combinaisons significatives de valeurs définies des six groupes de valeurs.

Notation: Dans les tableaux suivants, dans les différents groupes de valeurs, *"b", "c", "d", "e", "f"* signifient une valeur quelconque dans le groupe de valeurs respectif. Si un seul objet est instancié, la valeur doit être 0. Si un groupe de valeurs est en grisé, alors ce groupe de valeurs n'est pas utilisé.

NOTE La DLMS® UA gère une liste de définitions d'objets COSEM normalisés à l'adresse: www.dlms.com. La validité de la combinaison des codes OBIS et des codes class_id, ainsi que les types de données des attributs, sont contrôlés au moment des essais de conformité.

5 Définition des groupes de valeurs – Vue d'ensemble

5.1 Groupe de valeurs A

La plage pour le groupe de valeurs A est de 0 à 15 (voir Tableau 3).

Tableau 3 – Codes du groupe de valeurs A

Groupe de valeurs A	
0	Objets abstraits
1	Objets relatifs à l'électricité
…	
4	Objets relatifs aux répartiteurs de frais de chauffage
5, 6	Objets relatifs à l'énergie thermique
7	Objets relatifs au gaz
8	Objets relatifs à l'eau froide
9	Objets relatifs à l'eau chaude
…	
15	Autres supports
Tous les autres	Réservés

Les paragraphes suivants contiennent les définitions des groupes de valeurs B à F communes à toutes les valeurs du groupe de valeurs A.

5.2 Groupe de valeurs B

La plage pour le groupe de valeurs B est de 0 à 255 (voir Tableau 4).

Tableau 4 – Codes du groupe de valeurs B

Groupe de valeurs B	
0	Aucun canal spécifié
1…64	Canal 1…64
65…127	Codes spécifiques au fournisseur de service
128…199	Codes spécifiques au fabricant
200…255	Réservés

Si les informations de canal ne sont pas essentielles, la valeur 0 doit être attribuée.

La plage 65…127 est disponible pour usage spécifique au fournisseur de service. Si la valeur du groupe de valeurs B se situe dans cette plage, l'ensemble du code OBIS doit être considéré comme spécifique au fournisseur de service et la valeur des autres groupes n'a pas

nécessairement une signification définie dans le présent document ou dans l'IEC 62056-6-2:2023.

5.3 Groupe de valeurs C

5.3.1 Généralités

La plage pour le groupe de valeurs C est de 0 à 255. Les définitions dépendent de la valeur spécifiée dans le groupe de valeurs A. Les codes pour les objets abstraits sont spécifiés en 5.3.2. Voir aussi:

- les codes relatifs à l'électricité spécifiés en 7.1;
- les codes relatifs à d'autres supports spécifiés en 8.2.

5.3.2 Objets abstraits

Les objets abstraits sont des éléments de données qui ne sont pas associés à un certain type de grandeur physique. Voir Tableau 5.

Tableau 5 – Codes du groupe de valeurs C – Objets abstraits

Groupe de valeurs C Objets abstraits (A = 0)	
0…89	Identifiants spécifiques au contexte [a]
93	Identifiants spécifiques aux consortiums (voir 5.4.2).
94	Identifiants spécifiques au pays (voir 5.4.3)
96	Objets généraux et d'entrée de service – Objets abstraits (voir 6.1)
97	Objets registres d'erreurs – Objets abstraits (voir 6.2)
98	Objets listes – Objets abstraits (voir 6.3, 6.4)
99	Objets profils de données – Objets abstraits (voir 6.5)
…	
127	Objets inactifs [b]
128…199, 240	Codes spécifiques au fabricant
Tous les autres	Réservés

[a] Les identifiants spécifiques au contexte identifient des objets spécifiques à un certain protocole et/ou une certaine application. Dans le contexte de la COSEM, les identifiants sont définis dans l'IEC 62056-6-2:2023, 6.2.

[b] Un objet inactif est un objet qui est défini et présent dans un compteur, mais qui n'a aucune fonctionnalité assignée.

5.4 Groupe de valeurs D

5.4.1 Généralités

La plage pour le groupe de valeurs D est de 0 à 255.

5.4.2 Identifiants spécifiques aux consortiums

Le Tableau 6 spécifie l'utilisation du groupe de valeurs D pour les applications spécifiques aux consortiums. Dans ce tableau, aucune plage n'est réservée pour des codes spécifiques au

fabricant. L'utilisation des groupes de valeurs E et F est définie dans les documents spécifiques aux consortiums.

Les objets déjà définis dans le présent document ne doivent pas être identifiés à nouveau par les identifiants spécifiques aux consortiums.

Tableau 6 – Codes du groupe de valeurs D – Identifiants spécifiques aux consortiums

Groupe de valeurs D Identifiants spécifiques aux consortiums (A = quelconque, C = 93)	
0	Réservés
1	Association STS
2…255	Réservés
NOTE Au moment de la publication du présent document, aucun identifiant spécifique aux consortiums n'est alloué.	

5.4.3 Identifiants spécifiques au pays

Le Tableau 7 spécifie l'utilisation du groupe de valeurs D pour les applications spécifiques au pays. Les indicatifs téléphoniques nationaux sont utilisés dans la mesure du possible. Dans ce tableau, aucune plage n'est réservée pour des codes spécifiques au fabricant. L'utilisation des groupes de valeurs E et F est définie dans les documents spécifiques au pays.

Les objets déjà définis dans le présent document ne doivent pas être identifiés à nouveau par les identifiants spécifiques au pays.

Tableau 7 – Codes du groupe de valeurs D – Identifiants spécifiques au pays

Groupe de valeurs D Identifiants spécifiques au pays (A = quelconque, C = 94)			
00	Finlande (indicatif téléphonique = 358)	**50**	
01	États-Unis (= indicatif téléphonique)	**51**	Pérou (= indicatif téléphonique)
02	Canada (indicatif téléphonique = 1)	**52**	Corée du Sud (indicatif téléphonique = 82)
03	Serbie (indicatif téléphonique = 381)	**53**	Cuba (= indicatif téléphonique)
04		**54**	Argentine (= indicatif téléphonique)
05		**55**	Brésil (= indicatif téléphonique)
06		**56**	Chili (= indicatif téléphonique)
07	Russie (indicatif téléphonique = 7)	**57**	Colombie (= indicatif téléphonique)
08		**58**	Venezuela (= indicatif téléphonique)
09		**59**	
10	République tchèque (indicatif téléphonique = 420)	**60**	Malaisie (= indicatif téléphonique)
11	Bulgarie (indicatif téléphonique = 359)	**61**	Australie (= indicatif téléphonique)
12	Croatie (indicatif téléphonique = 385)	**62**	Indonésie (= indicatif téléphonique)
13	Irlande (indicatif téléphonique = 353)	**63**	Philippines (= indicatif téléphonique)
14	Israël (indicatif téléphonique = 972)	**64**	Nouvelle-Zélande (= indicatif téléphonique)
15	Ukraine (indicatif téléphonique = 380)	**65**	Singapour (= indicatif téléphonique)
16	Yougoslavie [a]	**66**	Thaïlande (= indicatif téléphonique)
17	Qatar (indicatif téléphonique = 974)	**67**	
18		**68**	

Groupe de valeurs D Identifiants spécifiques au pays (A = quelconque, C = 94)			
19		**69**	
20	Égypte (= indicatif téléphonique)	**70**	
21		**71**	Lettonie (indicatif téléphonique = 371)
22	Maroc (indicatif téléphonique = 212)	**72**	
23	Algérie (indicatif téléphonique = 213)	**73**	Moldavie (indicatif téléphonique = 373)
24	Nigéria (indicatif téléphonique = 234)	**74**	
25	Côte d'Ivoire (indicatif téléphonique = 225)	**75**	Biélorussie (indicatif téléphonique = 375)
26	Tunisie (indicatif téléphonique = 216)	**76**	
27	Afrique du Sud (= indicatif téléphonique)	**77**	
28		**78**	
29		**79**	
30	Grèce (= indicatif téléphonique)	**80**	
31	Pays-Bas (= indicatif téléphonique)	**81**	Japon (= indicatif téléphonique)
32	Belgique (= indicatif téléphonique)	**82**	Mexique
33	France (= indicatif téléphonique)	**83**	
34	Espagne (= indicatif téléphonique)	**84**	
35	Portugal (indicatif téléphonique = 351)	**85**	Hong Kong (indicatif téléphonique = 852)
36	Hongrie (= indicatif téléphonique)	**86**	Chine (= indicatif téléphonique)
37	Lituanie (indicatif téléphonique = 370)	**87**	Bosnie-Herzégovine (indicatif téléphonique = 387)
38	Slovénie (indicatif téléphonique = 386)	**88**	
39	Italie (= indicatif téléphonique)	**89**	
40	Roumanie (= indicatif téléphonique)	**90**	Turquie (= indicatif téléphonique)
41	Suisse (= indicatif téléphonique)	**91**	Inde (= indicatif téléphonique)
42	Slovaquie (indicatif téléphonique = 421)	**92**	Pakistan (= indicatif téléphonique)
43	Autriche (= indicatif téléphonique)	**93**	
44	Royaume-Uni (= indicatif téléphonique)	**94**	
45	Danemark (= indicatif téléphonique)	**95**	
46	Suède (= indicatif téléphonique)	**96**	Arabie Saoudite (indicatif téléphonique = 966)
47	Norvège (= indicatif téléphonique)	**97**	Émirats arabes unis (indicatif téléphonique = 971)
48	Pologne (= indicatif téléphonique)	**98**	Iran (= indicatif téléphonique)
49	Allemagne (= indicatif téléphonique)	**99**	
	Tous les autres codes sont réservés		
NOTE Après la scission de l'ancienne Yougoslavie en différents pays, l'indicatif national 38 a été déclassé.			

5.4.4 Identification des objets généraux et d'entrée de service

Pour utiliser le groupe de valeurs D afin d'identifier:

- les objets généraux et d'entrée de service abstraits, voir 6.1, Tableau 8;
- les objets généraux et d'entrée de service relatifs à l'électricité, voir 7.5, Tableau 20.

5.5 Groupe de valeurs E

La plage pour le groupe de valeurs E est de 0 à 255. Ce groupe peut être utilisé pour identifier une autre classification ou un autre traitement de valeurs définies dans les groupes de valeurs A à D, tel que cela est spécifié dans les paragraphes correspondants spécifiques aux types d'énergie. Les diverses classifications et méthodes de traitement sont exclusives.

Pour utiliser le groupe de valeurs E afin d'identifier:

- les objets généraux et d'entrée de service abstraits, voir 6.1, Tableau 8;
- les objets généraux et d'entrée de service relatifs à l'électricité, voir le Tableau 20.

5.6 Groupe de valeurs F

5.6.1 Généralités

La plage pour le groupe de valeurs F est de 0 à 255. Dans tous les cas, si le groupe de valeurs F n'est pas utilisé, il est fixé à 255.

5.6.2 Identification des périodes de facturation

Le groupe de valeurs F spécifie l'allocation de différentes périodes de facturation (ensembles de valeurs historiques) aux objets définis par les groupes de valeurs A à E, lorsque le stockage de valeurs historiques est pertinent. Une configuration de période de facturation est identifiée par son compteur de périodes de facturation, le nombre de périodes de facturation disponibles, l'horodatage de la période de facturation et la durée de la période de facturation. Plusieurs configurations de périodes de facturation sont possibles. Pour plus d'informations, voir 7.4.1, l'Article A.3 et l'IEC 62056-6-2:2023, 6.2.2.

6 Objets abstraits (groupe de valeurs A = 0)

6.1 Objets généraux et d'entrée de service – Objets abstraits

Le Tableau 8 spécifie les codes OBIS pour les objets abstraits. Voir aussi l'IEC 62056-6-2:2023, Tableau 49 pour le groupe de valeurs C.

Tableau 8 – Codes OBIS pour les objets généraux et d'entrée de service

Objets généraux et d'entrée de service	Code OBIS					
	A	B	C	D	E	F
Valeurs des périodes de facturation/réinitialisation d'entrées de compteur (Première configuration de période de facturation s'il y en a deux)						
Compteur de périodes de facturation (1)	0	*b*	0	1	0	VZ ou 255
Compteur de périodes de facturation (1) sur une période de facturation récente	0	*b*	0	1	0	101-125
Compteurs de périodes de facturation (1) sur un nombre non spécifié de périodes de facturation récentes	0	*b*	0	1	0	126
Nombre de périodes de facturation disponibles (1)	0	*b*	0	1	1	
Horodatage de la période de facturation la plus récente (1)	0	*b*	0	1	2	
Horodatage de la période de facturation (1) VZ (dernière réinitialisation)	0	*b*	0	1	2	VZ
Horodatage de la période de facturation (1) VZ_{-1}	0	*b*	0	1	2	VZ_{-1}
…	…	…	…	…	…	…
Horodatage de la période de facturation (1) VZ_{-n}	0	*b*	0	1	2	VZ_{-n}
Horodatage de la période de facturation (1) sur une période de facturation récente	0	*b*	0	1	2	101-125
Horodatage de la période de facturation (1) sur un nombre non spécifié de périodes de facturation récentes	0	*b*	0	1	2	126
Valeurs des périodes de facturation/réinitialisation d'entrées de compteur (Deuxième configuration de période de facturation)						
Compteur de périodes de facturation (2)	0	*b*	0	1	3	VZ ou 255
Compteur de périodes de facturation (2) sur une période de facturation récente	0	*b*	0	1	3	101-125
Compteurs de périodes de facturation (2) sur un nombre non spécifié de périodes de facturation récentes	0	*b*	0	1	3	126
Nombre de périodes de facturation disponibles (2)	0	*b*	0	1	4	
Horodatage de la période de facturation la plus récente (2)	0	*b*	0	1	5	
Horodatage de la période de facturation (2) VZ (dernière réinitialisation)	0	*b*	0	1	5	VZ
Horodatage de la période de facturation (2) VZ_{-1}	0	*b*	0	1	5	VZ_{-1}
…	…	…	…	…	…	…
Horodatage de la période de facturation (2) VZ_{-n}	0	*b*	0	1	5	VZ_{-n}
Horodatage de la période de facturation (2) sur une période de facturation récente	0	*b*	0	1	5	101-125
Horodatage de la période de facturation (2) sur un nombre non spécifié de périodes de facturation récentes	0	*b*	0	1	5	126
Entrées de programme						
Identifiant du progiciel actif	0	*b*	0	2	0	
Version du progiciel actif	0	*b*	0	2	1	
Signature du progiciel actif	0	*b*	0	2	8	
Entrées de temps						
Heure locale	0	*b*	0	9	1	
Date locale	0	*b*	0	9	2	

Objets généraux et d'entrée de service	Code OBIS					
	A	B	C	D	E	F
Numéros d'ID du dispositif						
Ensemble des numéros d'ID du dispositif	0	*b*	96	1		
ID n°1 du dispositif (numéro de fabrication)	0	*b*	96	1	0	
…			…	…	…	
ID n° 10 du dispositif	0	*b*	96	1	9	
ID de point de comptage (abstrait)	0	0	96	1	10	
Modifications de paramètre, étalonnage et accès						
Nombre de modifications de programme de configuration	0	*b*	96	2	0	
Date [a] de la dernière modification du programme de configuration	0	*b*	96	2	1	
Date [a] de la dernière modification du programme de changement d'heure	0	*b*	96	2	2	
Date [a] de la dernière modification du programme du récepteur de télécommande centralisée	0	*b*	96	2	3	
État des commutateurs de sécurité	0	*b*	96	2	4	
Date [a] du dernier étalonnage	0	*b*	96	2	5	
Date [a] de la prochaine modification du programme de configuration	0	*b*	96	2	6	
Date [a] d'activation du calendrier passif	0	*b*	96	2	7	
Nombre de modifications du programme de configuration protégé [b]	0	*b*	96	2	10	
Date [a] de la dernière modification du programme de configuration protégé [b]	0	*b*	96	2	11	
Date [a] (corrigée) du dernier réglage/de la dernière synchronisation d'horloge	0	*b*	96	2	12	
Date de la dernière activation du progiciel	0	*b*	96	2	13	
Signaux de commande d'entrée/sortie						
État des signaux de commande d'entrée/sortie, globaux [c]	0	*b*	96	3	0	
État des signaux de commande d'entrée (mot d'état 1)	0	*b*	96	3	1	
État des signaux de commande de sortie (mot d'état 2)	0	*b*	96	3	2	
État des signaux de commande d'entrée/sortie (mot d'état 3)	0	*b*	96	3	3	
État des signaux de commande d'entrée/sortie (mot d'état 4)	0	*b*	96	3	4	
Commande de déconnexion	0	*b*	96	3	10	
Arbitre	0	*b*	96	3	20.. 29	
Signaux de commande internes						
Signaux de commande internes, globaux [c]	0	*b*	96	4	0	
Signaux de commande internes (mot d'état 1)	0	*b*	96	4	1	
Signaux de commande internes (mot d'état 2)	0	*b*	96	4	2	
Signaux de commande internes (mot d'état 3)	0	*b*	96	4	3	
Signaux de commande internes (mot d'état 4)	0	*b*	96	4	4	
État de fonctionnement interne						
État de fonctionnement interne, global [c]	0	*b*	96	5	0	
État de fonctionnement interne (mot d'état 1)	0	*b*	96	5	1	
État de fonctionnement interne (mot d'état 2)	0	*b*	96	5	2	
État de fonctionnement interne (mot d'état 3)	0	*b*	96	5	3	
État de fonctionnement interne (mot d'état 4)	0	*b*	96	5	4	

Objets généraux et d'entrée de service	Code OBIS					
	A	B	C	D	E	F
Informations relatives à la batterie						
Durée d'utilisation de la batterie	0	*b*	96	6	0	
Affichage de la charge de la batterie	0	*b*	96	6	1	
Date du prochain changement de la batterie	0	*b*	96	6	2	
Tension de la batterie	0	*b*	96	6	3	
Capacité initiale de la batterie	0	*b*	96	6	4	
Date et heure de l'installation de la batterie	0	*b*	96	6	5	
Durée d'utilisation restante estimée de la batterie	0	*b*	96	6	6	
Durée d'utilisation en alimentation auxiliaire	0	*b*	96	6	10	
Tension auxiliaire (mesurée)	0	*b*	96	6	11	
Surveillance des coupures secteur						
Nombre de coupures secteur						
Sur les trois phases	0	0	96	7	0	
Sur la phase L1	0	0	96	7	1	
Sur la phase L2	0	0	96	7	2	
Sur la phase L3	0	0	96	7	3	
Sur n'importe quelle phase [sic]	0	0	96	7	21	
Alimentation auxiliaire	0	0	96	7	4	
Nombre de coupures secteur de longue durée						
Sur les trois phases	0	0	96	7	5	
Sur la phase L1	0	0	96	7	6	
Sur la phase L2	0	0	96	7	7	
Sur la phase L3	0	0	96	7	8	
Sur n'importe quelle phase	0	0	96	7	9	
Heure de la coupure secteur [d]						
Sur les trois phases	0	0	96	7	10	
Sur la phase L1	0	0	96	7	11	
Sur la phase L2	0	0	96	7	12	
Sur la phase L3	0	0	96	7	13	
Sur n'importe quelle phase	0	0	96	7	14	
Durée de la coupure secteur de longue durée [e]						
Sur les trois phases	0	0	96	7	15	
Sur la phase L1	0	0	96	7	16	
Sur la phase L2	0	0	96	7	17	
Sur la phase L3	0	0	96	7	18	
Sur n'importe quelle phase	0	0	96	7	19	
Seuil temporel de coupure secteur de longue durée						
Seuil temporel de coupure secteur de longue durée	0	0	96	7	20	
NOTE 1 Voir *Nombre de coupures secteur sur n'importe quelle phase* ci-dessus	*0*	*b*	*96*	*7*	*21*	
Temps de fonctionnement						
Temps de fonctionnement	0	b	96	8	0	
Temps de fonctionnement, tarif 1…63	0	b	96	8	1…63	
Paramètres liés à l'environnement						
Température ambiante	0	*b*	96	9	0	
Pression ambiante	0	*b*	96	9	1	
Humidité relative	0	*b*	96	9	2	

Objets généraux et d'entrée de service	Code OBIS					
	A	B	C	D	E	F
Registre d'état						
Registre d'état (registre d'état 1 si plusieurs registres d'état sont utilisés)	0	*b*	96	10	1	
Registre d'état 2	0	*b*	96	10	2	
…	0	*b*	96	10	…	
Registre d'état 10	0	*b*	96	10	10	
Code d'événement						
Objets code d'événement n° 1…100	0	*b*	96	11	0…99	
Paramètres de journaux de communication						
Réservés	0	*b*	96	12	0	
Nombre de connexions	0	*b*	96	12	1	
Réservés	0	*b*	96	12	2	
Réservés	0	*b*	96	12	3	
Paramètre du port de communication 1	0	*b*	96	12	4	
Puissance du champ GSM	0	*b*	96	12	5	
Numéro de téléphone / adresse de communication du dispositif physique	0	*b*	96	12	6	
Messages au consommateur						
Message au consommateur via le port d'information consommateur local	0	*b*	96	13	0	
Message au consommateur via l'afficheur du compteur et/ou le port d'information consommateur	0	*b*	96	13	1	
Tarif actuellement actif						
Objets de tarif actuellement actif n° 1…16 NOTE 2 L'objet n° 16 (E = 15) comporte le nom du registre avec le tarif le plus bas (registre de tarif par défaut)	0	*b*	96	14	0…15	
Objets de comptage d'événements						
Objets de comptage d'événements n° 1…100	0	*b*	96	15	0…99	
Signature numérique des entrées de profil						
Objets de signature numérique des entrées de profil n° 1…10	0	*b*	96	16	0…9	
Objets de comptage des entrées de profil						
Objets de comptage numérique des entrées de profil n° 1…128	0	*b*	96	17	0…127	
Objets liés aux événements de fraude du compteur						
Compteur d'événements d'ouverture du compteur	0	*b*	96	20	0	
Événement d'ouverture du compteur, horodatage de l'événement actuel	0	*b*	96	20	1	
Événement d'ouverture du compteur, durée de l'événement actuel	0	*b*	96	20	2	
Événement d'ouverture du compteur, durée cumulée	0	*b*	96	20	3	
Réservés	0	*b*	96	20	4	
Compteur d'événements d'ouverture du couvre-bornes	0	*b*	96	20	5	
Événement d'ouverture du couvre-bornes, horodatage de l'événement actuel	0	*b*	96	20	6	
Événement d'ouverture du couvre-bornes, durée de l'événement actuel	0	*b*	96	20	7	
Événement d'ouverture du couvre-bornes, durée cumulée	0	*b*	96	20	8	
Réservés	0	*b*	96	20	9	
Compteur d'événements de position de fonctionnement anormale	0	*b*	96	20	10	
Événement de position de fonctionnement anormale, horodatage de l'événement actuel	0	*b*	96	20	11	
Événement de position de fonctionnement anormale, durée de l'événement actuel	0	*b*	96	20	12	