13/1852/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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IEC TC 13 : ELECTRICAL ENERGY MEASUREMENT AND CONTROL	
SECRETARIAT: Hungary	SECRETARY: Mr Bela Bodi
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 57	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING **Attention IEC-CENELEC parallel voting** The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

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

PROPOSED STABILITY DATE: 2024

NOTE FROM TC/SC OFFICERS:

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 6-1: Object Identification System (OBIS)

FOREWORD

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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
Zug/Switzerland
www.dlms.com

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

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

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

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

FDIS	Report on voting
13/xxxx/FDIS	13/xxxx/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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 publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

This fourth edition of IEC 62056-6-1 has been prepared by IEC TC13 WG14 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 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.*

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 62056-6-2:2021;
- data transmitted through communication lines;
- data displayed on the metering equipment, see Clause A.2.

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 62053-23:2020, *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 62056-6-2:2021, *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, and the following apply.

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

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

3.2 Abbreviated terms

AGA	American Gas Association
AGA 8	Method for calculation of compressibility (Gas Metering)
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
HCA	Heat Cost Allocator
IC	Interface Class
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
OBIS	OBject Identification System
SGERG 88	Method for calculation of compressibility (Gas Metering)
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 62056-6-2:2021.

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).

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

Code type	Value group					
	A	B	C	D	E	F
Manufacturer specific, NOTE 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, NOTE 2	0	0…64	96	50…99	0…255	0…255
Manufacturer specific, media related general purpose, NOTE 2	1, 4…9, F	0…64	96	50…99	0…255	0…255
Utility specific, NOTE 3	0, 1, 4…9, F	65…127	0…255	0…255	0…255	0…255
Consortia specific, NOTE 4	0, 1, 4…9, F	0…64	93	See Table 6.		
Country specific, NOTE 5		0…64	94	See Table 7.		

NOTE 1 “b”, “c”, “d”, “e”, “f” means any value in the relevant value group.

NOTE 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.

NOTE 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 62056-6-2:2021.

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

NOTE 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”* signifies 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 62056-6-2:2021.

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 62056-6-2:2021, 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] (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)

Value group D Country specific identifiers[a] (A = any, C = 94)			
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		

[a] 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 62056-6-2:2021, 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 62056-6-2:2021, 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	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
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	
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						

General and service entry objects	OBIS code					
	A	B	C	D	E	F
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	
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	

General and service entry objects	OBIS code					
	A	B	C	D	E	F
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	
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	
Meter tamper event related objects						

General and service entry objects	OBIS code					
	A	B	C	D	E	F
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] … Manufacturer specific	0 0	*b* *b*	96 96	50 99	*e* *e*	*f* *f*
All other codes are reserved						

General and service entry objects	OBIS code					
	A	B	C	D	E	F

[a] Date of the event may contain the date only, the time only or both, encoded as specified in IEC 62056-6-2:2021, 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
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)			

Value group C codes – Electricity (A = 1)				
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			
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.

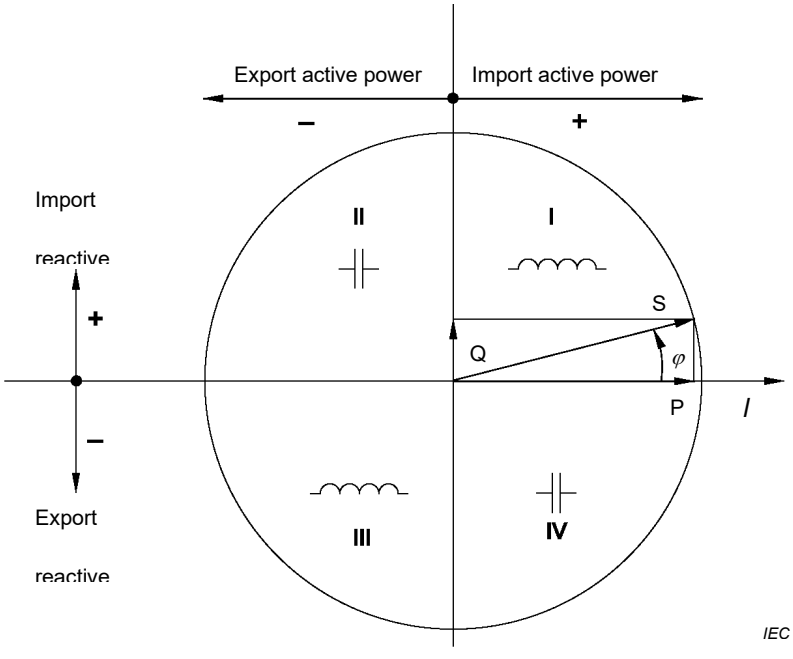
[a] For details of extended codes, see 7.3.3.

[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.

300



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302 **Figure 1 – Quadrant definitions for active and reactive power**

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

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

Value group D codes – Electricity (A = 1, C <> 0, 93, 94, 96, 97, 98, 99)	
39	Missing threshold
40	Missing occurrence counter
41	Missing duration
42	Missing magnitude
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 62056-6-2:2021, 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 62056-6-2:2021, 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 62056-6-2:2021, 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 62056-6-2:2021, 4.3.4. The value is calculated using recording interval 2.

Value group D codes – Electricity (A = 1, C <> 0, 93, 94, 96, 97, 98, 99)	
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.
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.

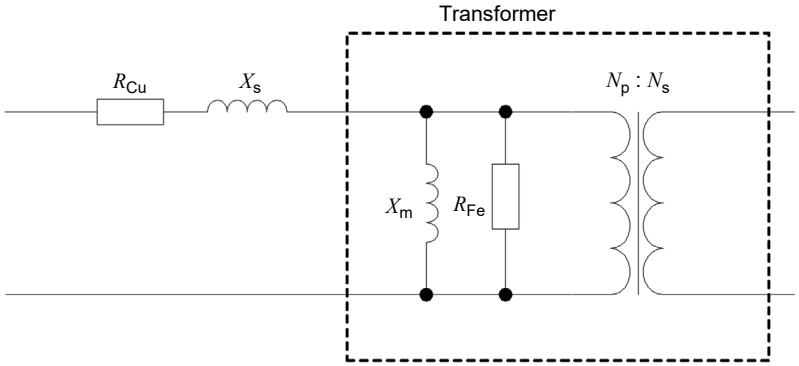
Table 17 – Value group E codes – Electricity – Extended phase angle measurement

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

346 **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
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

Value group E codes – Electricity – Transformer and line losses (A = 1, C = 83)			
E=	**Quantity**	**Formula**	**Quadrant / comment**
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+	$CuA_1+ = I^2h_{L1} \times R_{Cu}$	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–	$CuA_1– = I^2h_{L1} \times R_{Cu}$	QII+QIII
33	L_1 Active line losses	$CuA_1 = I^2h_{L1} \times R_{Cu}$	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
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

Value group E codes – Electricity – Transformer and line losses (A = 1, C = 83)			
E=	**Quantity**	**Formula**	**Quadrant / comment**
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					
		$0{,}01 < \Delta t \leq 0{,}1$	$0{,}1 < \Delta t \leq 0{,}5$	$0{,}5 < \Delta t \leq 1$	$1 < \Delta t \leq 3$	$3 < \Delta t \leq 20$	$20 < \Delta t \leq 60$
10 %…< 15 %	$90 > U \geq 85$	00	01	02	03	04	05
15 %…< 30 %	$85 > U \geq 70$	10	11	12	13	14	15
30 %…< 60 %	$70 > U \geq 40$	20	21	22	23	24	25
60 %…< 90 %	$40 > U \geq 10$	30	31	32	33	34	35
90 %…< 100 %	$10 > U \geq 0$	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 62056-6-2:2021, 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
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	

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
Active firmware signature	1	*b*	0	2	8	
Output pulse values or constants NOTE For units, see IEC 62056-6-2:2021, 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	
Input pulse values or constants [b] NOTE For units, see IEC 62056-6-2:2021, 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

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
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
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	

General and service entry objects – Electricity	OBIS code					
	A	B	C	D	E	F
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 62056-6-2:2021, 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:

IEC

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 62056-6-2:2021, 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 62056-6-2:2021, 6.2.2.

With $0 \leq F \leq 99$, 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 $101 \leq F \leq 125$, 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 62056-6-2:2021, 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 62056-6-2:2021, Clause 6.

Annex B
(informative)

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

- 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.

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