



BSI Standards Publication

BIM Properties for lighting — Luminaires and sensing devices

National foreword

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A list of organizations represented on this committee can be obtained on request to its committee manager.

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Date	Text affected
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English Version

BIM Properties for lighting - Luminaires and sensing devices

BIM Propriétés pour l'éclairage - Luminaires et capteurs

BIM Merkmale für die Beleuchtung - Leuchten und Sensoren

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European foreword

This document (CEN/TS 17623:2021) has been prepared by Technical Committee CEN/TC 169 “Light and lighting”, the secretariat of which is held by DIN.

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Introduction

Building Information Modelling (BIM) is a concurrent process that gives engineering and construction professionals the tools to more efficiently plan, construct, and manage buildings and infrastructure.

Within standardization committees much work is being performed to define the fundamental principles of BIM that will allow this to happen in an effective and consistent manner.

For lighting applications, it is essential that this work is monitored and, where required, input is made to ensure that the requirements for lighting applications are considered.

1 Scope

This document identifies and clarifies lighting properties for digital building design and maintenance.

This document provides all the needed properties to design and to describe luminaires and sensing devices. These properties are intended to be used as mapping properties for property providers and requesters. The mapping of the identifiers enables the exchange of luminaire and sensing device data within different databases.

The unambiguous mapping and description of properties improve the data quality, reduce misinterpretations and the processing time in digital environments. Therefore, the properties listed in this document establish the essential description of luminaires and sensing devices in BIM systems and databases.

The listed properties in this document are used to structure the product data sheet which is complemented with real product information.

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.

EN 12464-1:2011, *Light and lighting - Lighting of work places - Part 1: Indoor work places*

EN 60598-1, *Luminaires - Part 1: General requirements and tests*

EN 60598-2-13:2006,¹ *Luminaires - Part 2-13: Particular requirements - Ground recessed luminaires*

EN 60598-2-22:2014,² *Luminaires - Part 2-22: Particular requirements - Luminaires for emergency lighting*

EN 61231, *International lamp coding system (ILCOS) (IEC 61231)*

EN ISO 23386, *Building information modelling and other digital processes used in construction - Methodology to describe, author and maintain properties in interconnected data dictionaries (ISO 23386)*

ISO 8601-1, *Date and time - Representations for information interchange - Part 1: Basic rules*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

¹ As impacted by corrigendum EN 60598-2-13:2006/corrigendum Dec. 2006 and amendments EN 60598-2-13:2006/A1:2012 and EN 60598-2-13:2006/A1:2016.

² As impacted by amendment EN 60598-2-22:2014/A1:2020.

3.1 building information modelling BIM

use of a shared digital representation of a built object (including buildings, bridges, roads, process plants, etc.) to facilitate design, construction and operation processes to form a reliable basis for decisions

Note 1 to entry: The acronym BIM also stands for the shared digital representation of the physical and functional characteristics of any construction works.

[SOURCE: EN ISO 29481-1:2017, 3.2]

3.2 data dictionary information resource dictionary database that contains metadata

[SOURCE: ISO/IEC 2382:2015, 2121501; modified: Notes to entry removed]

3.3 attribute data element for the computer-sensible description of a property, a group of properties, etc.

Note 1 to entry: An attribute describes only one single detail of a property or a group of properties.

EXAMPLE The name of a property, the definition of a group of properties.

[SOURCE: EN ISO 23386:2020, 3.4]

3.4 property inherent or acquired feature of an item

EXAMPLE Thermal efficiency, diameter, luminous flux.

[SOURCE: EN ISO 23386:2020, 3.17, modified: The example was modified.]

4 Principle structure

4.1 General

The properties for luminaires and sensing devices have been organized in eight tables listed in Clause 5 according to different disciplines. This sub-division is indicative only and not to be taken as exclusive.

- Mechanical properties – ID 01 (Table 1)
- Electrical properties – ID 02 (Table 2)
- Emergency lighting properties – ID 03 (Table 3)
- Photometric properties – ID 04 (Table 4)
- Sensing device properties – ID 05 (Table 5)
- Mounting and accessory properties – ID 06 (Table 6)
- Marketing properties – ID 07 (Table 7)
- Operations and maintenance properties – ID 08 (Table 8)

4.2 Detailed description of set of attributes

4.2.1 General

The structure of the attributes is according to EN ISO 23386 and enhanced by the property ID.

The properties have no mandatory or optional aspect. All properties are equal in importance and hierarchy. The use case and the application provide structure and mandatory to the properties.

4.2.2 GUID

In EN ISO 23386 named “Globally unique identifier”.

Identifier given to a product that guarantees its uniqueness throughout its entire life (see ISO 6707-2:2017, 3.2.46).

This attribute identifies the property unambiguously. A Globally Unique identifier GUID is generated using an algorithm. This machine-readable code will allow matching across databases, lists and data template.

In IFC and EN ISO 12006-3 the compressed version of GUID is used. It can be uncompressed to the standard GUID with open tools.

4.2.3 ID

This attribute identifies the property unambiguously. It is human-readable and corresponds to the globally unique identifier.

Note The ID always starts with the table number from 4.1 followed by a dash and an individual serial number with four digits.

4.2.4 Name

In EN ISO 23386 named “Names in language en-EN”.

The name of the property.

4.2.5 Description

In EN ISO 23386 named “Descriptions in language en-EN”.

This attribute is used to provide a plain language description of the property.

For some descriptions the name is enough. To avoid the repeating of the name, just “*identical with name.*” is entered.

4.2.6 Symbol

In EN ISO 23386 named “Symbols of the property in a given property group”.

Symbol of a property if existing. Character or combination of characters denoting a property (see the ISO/IEC 80000 series and the EN 60027 series).

4.2.7 Format, unit

In EN ISO 23386 named “Digital format”.

Precision is the maximum number of significant digits that can be represented in a format, or the number of digits that a result is rounded to (see also ISO/IEC 60559).

In EN ISO 23386 named “Units”.

Concept type representing a scale that enables a value to be measured. Properties that do not have a unit are be designated as not applicable (n.a.).

4.2.8 Value set

In EN ISO 23386 named “List of possible values in language en-EN”.

Collection of acceptable values for a property. Values outside the value set are not permitted. Multiple values may be possible for some properties.

4.2.9 Examples

In EN ISO 23386 named “Examples in language en-EN”.

A sample for a value of the specific property.

4.3 Further IT-related attributes

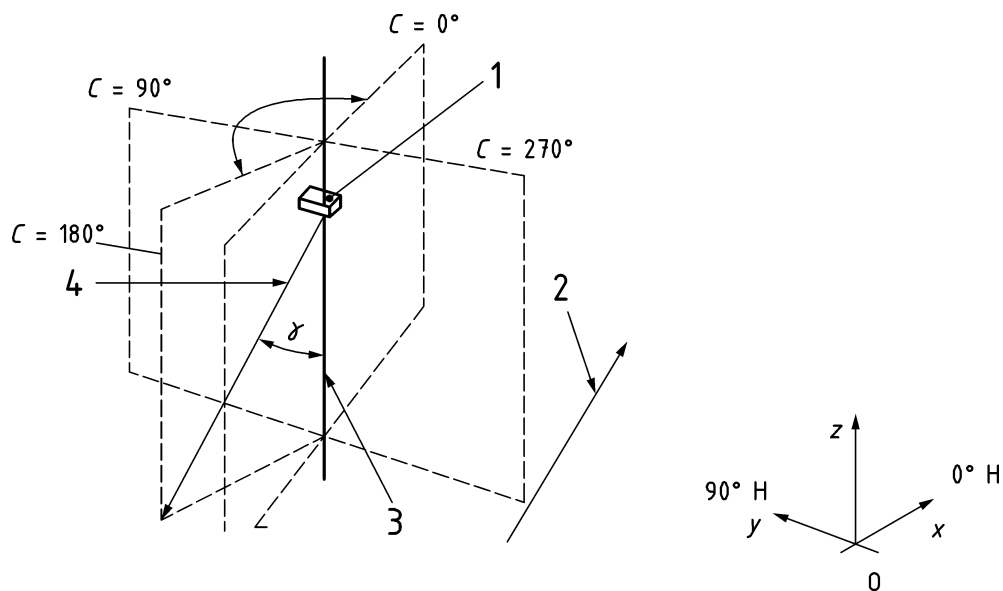
Where potential attributes are not specified in 4.2, they may be defined separately within a data-dictionary. These attributes can be found in EN ISO 23386:

- **Definitions in language en-EN:** A description of the attribute in order to define it unambiguously.
- **Method of measurement:** Evaluation of construction products to ensure their suitability according to requirements in harmonized technical specifications.
- **Number of values:** This attribute provides information about the number of values to specify. It may be one value or a table of values (ifcPropertyTableValue in EN ISO 16739-1). In case of a table value, the number of values represent the number of rows of a 2 columns table.
- **Name of the index values:** In a table of values, this attribute provides the name of the defining values (IfcPropertyTableValue in EN ISO 16739-1).
- **Data type:** Format for expressing the value of the property. This can be understood as the storage type from a software perspective (see also ISO/IEC 11404:2007, 8.1). Examples: String, Float, Integer.
- **Status:** Status of the property during its life cycle. Example: Active.
- **Date of creation:** Date of validation of the property creation request. All dates in accordance with ISO 8601-1. Format=YYYY-MM-DDThh:mm:ssZ. Example: 2014-04-30T10:39:53Z.
- **Date of activation:** Date after when the property can be used.
- **Date of last change:** Date of validation of the last change request.
- **Date of revision**
- **Date of version**

- **Date of deactivation:** Date when property becomes obsolete. The property is maintained in the dictionary.
- **Version number:** Enables tracking of major changes.
- **Revision number:** Enables tracking of minor changes. If the version number changes, the revision number starts again at 1. Examples: new translation, changes of typos.
- **Replaces:** Identifier of the replaced property (or properties). List of GUIDs.
- **Replaced by:** Identifier of the replacing property (or properties). List of GUIDs.
- **Deprecation explanation:** Reason of deprecation. Deprecation may indicate the property will be removed in the future. This explanation shall be written in international English (EN).

5 Properties for luminaires and sensing devices

5.1 Mechanical properties



Key

- 1 luminaire
- 2 length
- 3 photometric z-axis
- 4 intensity direction

Figure 1 — Orientation of a luminaire in C plane and gamma angle coordination system

Table 1 — Mechanical properties

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
2GZ1YB8enFVhDHOKgLc\$BU	01-0001	overall diameter	Overall diameter of the housing of the luminaire or sensing device.		1E0, mm	n.a.	
19Z9XKYDT4p8HR0ZbD\$wO_	01-0002	height	Height of the housing of the luminaire or sensing device. Corresponds to z-axis, gamma angle 180° and 180° vertical of the light distribution curve. This definition is regardless of orientation of luminaires. See Figure 1.		1E0, mm	n.a.	
1uIglYpRnFpQ4tStHaR2Pf	01-0003	length	Length of the housing of the luminaire or sensing device. Length is set parallel to the C90-C270 plane. Corresponds to y-axis and with 90° horizontal of the Light Distribution Curve. This definition is regardless of orientation of luminaires. See Figure 1.		1E0, mm	n.a.	
1dPvrZN3vEIb0n0vwYvDcX	01-0004	width	Width of the housing of the luminaire or sensing device. Width is set parallel to the C0-C180 plane. Corresponds to the x-axis and with 0° horizontal of the Light Distribution Curve. This definition is regardless of orientation of luminaires. See Figure 1.		1E0, mm	n.a.	
1RPyGAgMf4hRTZ0DogLFnU	01-0005	weight	Weight of the luminaire or sensing device.		1E-2, kg	n.a.	
2A6xVlUTj9QP1G\$qb4FIWv	01-0006	cut-out diameter	Diameter of the cut-out hole (for recessed or flush mount).		1E0, mm	n.a.	
1RIsLltoX1whNaYkaCoHXJ	01-0007	recessed required depth	Required minimum installation depth, height of the invisible / hidden mounting part of the luminaire (for recessed or flush mount).		1E0, mm	n.a.	
2VEYAfId7j4FQtJgAb_riA5	01-0008	cutting out length	Length of the cut-out hole (for recessed or flush mount).		1E0, mm	n.a.	

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
2pFfNB0uv1Tf_RTQpYktGL	01-0009	cutting out width	Width of the cut-out hole (for recessed or flush mount).		1E0, mm	n.a.	
1zs4Cj96j3d8TWAeeixlga	01-0010	luminaire housing shape 3D	Three-dimensional simplified shape of luminaire or sensing device.		n.a.	Cylinder, Cuboid, Cube, Cone, Pyramid, Sphere, Half-Sphere, User Defined.	
1Zek8UyXfE6gTon8_RDHFg	01-0011	shipping weight	Weight of the shipping package of the luminaire or sensing device.		1E-2, kg	n.a.	
1i_XY2Awj5RRadNmgs3yQ	01-0012	shipping height	Height of the packed luminaire or sensing device as it is shipped.		1E0, mm	n.a.	
10UDC\$GOvEHexmf_I8j9xG	01-0013	shipping length	Length of the packed luminaire or sensing device as it is shipped.		1E0, mm	n.a.	
1ybyhd8TbACg99OxpWMoOg	01-0014	shipping width	Width of the packed luminaire or sensing device as it is shipped.		1E0, mm	n.a.	
0yvFhm4xvDggZvLzgzhiyq	01-0015	type of packaging	Type of packaging. Available types of packaging to be specified by the manufacturers.		n.a.	Carton, Pallet, Container, Without, Other	

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
16XdmXw8T3HOli0TOcc8LH	01-0016	impact protection rating IK	Degree of protection provided by enclosures for electrical equipment against external mechanical impacts (see EN 62262 and EN 60068-2-75).		n.a.	IK00, IK01, IK02, IK03, IK04, IK05, IK06, IK07, IK08, IK09, IK10.	
1LrBLaYtnCARKperF_2Ykh	01-0017	glow wire resistance	The glow wire test for fire hazard (see EN 60695-2-10) to test electrical products, assemblies or individual components.		1E0, °C	550°C, 650°C, 750°C, 850°C, 960°C	
1284Zyx8D4uR55X2cRsWzu	01-0018	needle flame test	Method for testing and assessment of the fire hazard of plastic material using a needle flame (see EN 60695-11-5).		n.a.	Yes No	
1PMNxHS2z4tRuwiQxyzRfs	01-0019	number of light outputs	Number of plane surfaces with light output.		1E0, n.a.	n.a.	
1mHV_4yHLEFuxOaIDINmNn	01-0020	diameter of the luminous area	<i>Identical with name.</i>		1E0, mm	n.a.	
0WXXZRI6CD2KfL4xC1uuLBF	01-0021	height of the luminous area	To be aligned with z-axis and gamma 180°.		1E0, mm	n.a.	
1aulwSthrFvRTJgX6Nf09Z	01-0022	length of the luminous area	Length is parallel to the C90-C270 plane. Aligned with the y-axis and with 90° horizontal.		1E0, mm	n.a.	

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
2SqBhDZKD1hBjGWsv4q_GQ	01-0023	width of the luminous area	Width is parallel to the C0-C180 plane. Aligned with the x-axis and with 0° horizontal.		1E0, mm	n.a.	
2gBflmCfGwR3hT_QVGtQ	01-0024	cable length	Cable for power supply. Zero means no cable supplied.		1E0, mm	n.a.	
1oCak0l6v9Bew_SHOfRFnw	01-0025	pliable	The luminaire body is flexible.		n.a.	Yes No	
3CckyLFxX8KxZVvgilS7lt	01-0026	ground recessed accessibility class	Specific application class for ground recessed luminaires according to temperature limits, dimensions and static load resistance in kN, according to EN 60598-2-13:2006.		n.a.	A1-non-accessible A2-pedestrians A3-parking A4-snow-ploughs A5-particular	A2
0f2af0EifB1Qi6xaITs1Xn	01-0029	sealing material	Material of the sealing of a luminaire.		n.a.	n.a.	
3iAmXEFtn9oPIBD_o04BfE	01-0030	silicon-free	States whether the luminaire is silicon-free.		n.a.	Yes No	
2DjLgonKH2zvtUyIGDt0L3	01-0031	halogen-free	States whether the product is halogen-free (see EN 61249-2-21).		n.a.	Yes No	
3IPpBFdz17PB0W0suiESss	01-0032	temperature on light aperture	Average temperature of light emitting surface of a luminaire.		1E0, °C	n.a.	
30M\$RN1TX7\$gz008\$bv0j4	01-0033	operating temperature	Range defined by the minimum and maximum operating temperatures at which the luminaire operates normally as specified by the supplier or manufacturer.		1E0, °C	n.a.	

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
0JRoUrK2nF5QFenmXXlBTS	01-0034	minimum distance	Describes the minimum required distance of the luminaire housing to other objects.		1E0, mm	n.a.	
3GwYrPINbAYu8gPA0JZgwc	01-0035	maximum orientation angle	Maximum of possible values for the rotation of the orientation angle (z-axis).		1E0, °	n.a.	
3qn7sE55H1FuwsBozcktbX	01-0036	minimum orientation angle	Minimum possible value for the rotation of the orientation angle (z-axis).		1E0, °	n.a.	
26KAJOVBvF8gIM0ZaA0FTV	01-0037	orientation angle steps	Step width for the orientation angle (z-axis).		1E0, °	n.a.	
2NmVhTk4TFfvwDNSYyqj\$4	01-0038	orientation angle default	Default value for the orientation angle (z-axis).		1E0, °	n.a.	
0qiz0v1kLAPBRWAW6wO1PA	01-0039	orientation angle selected value	Selected value for the orientation angle (z-axis).		1E0, °	n.a.	
05nmPIMs186u1u1s5MSd23	01-0040	maximum tilt angle	Maximum possible value for the rotation of the tilt angle (x-axis).		1E0, °	n.a.	
3ZWzCOV090TukLTsY8Vcua	01-0041	minimum tilt angle	Minimum possible value for the rotation of the tilt angle (x-axis).		1E0, °	n.a.	
0_oftQZ_JB\$e1oGoWeQWoV	01-0042	tilt angle steps	Step width for the tilt angle (x-axis).		1E0, °	n.a.	
0w56LObA94ivbailkyEXf2	01-0043	tilt angle default	Default value for the tilt angle (x-axis).		1E0, °	n.a.	
3VHFOwj113sv6CBYkwU2wh	01-0044	tilt angle selected value	Selected value for the tilt angle (x-axis).		1E0, °	n.a.	

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
3zsZztBEH9sPA24POLstWn	01-0045	maximum turn angle	Maximum possible value for the rotation of the turn angle (y-axis). Turn can also be referred to as 'twist' or 'cant'.		1E0, °	n.a.	
3WFOEtzHjE2gEwIqwNt23B	01-0046	minimum turn angle	Minimum possible value for the rotation of the turn angle (y-axis). Turn can also be referred to as 'twist' or 'cant'.		1E0, °	n.a.	
1S1ul1hob00AsYAUDvnB5e	01-0047	turn angle steps	Step width for the turn angle (y-axis). Turn can also be referred to as 'twist' or 'cant'.		1E0, °	n.a.	
0Y3iFNJcH3Xh_0Axe6FRZy	01-0048	turn angle default	Default value for the turn angle (y-axis). Turn can also be referred to as 'twist' or 'cant'.		1E0, °	n.a.	
0HKPIHCMXF00mtqPiFpiwZ	01-0049	turn angle selected value	Selected value for the turn angle (y-axis). Turn can also be referred to as 'twist' or 'cant'.		1E0, °	n.a.	
3ejPldyc9Bau0HaTHZMtva	01-0050	3D model file	The description of a location of the 3D model file.		n.a.	n.a.	C:\ URL

5.2 Electrical properties

Table 2 — Electrical properties

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
2FA0ih18LF_uKt46c5ErIv	02-0001	apparent load	Apparent load of the product.	S	1E0, VA	n.a.	
17a067965CqhDelQ\$Y3mcP	02-0002	rated input power	Input power consumed by the light source(s), control gear and control circuit in or associated with a luminaire including any standby power when the luminaire is turned on.		1E0, W	n.a.	
3LBrQkLDDFheBOxrGk8Zr_	02-0003	power factor	Ratio of the amount of the active power to the apparent power at 100 % load. See also IEC 80000-6.	cos φ	1E0, n.a.	n.a.	
0zjByQSTX24wsxTl25Lzj\$	02-0004	active power	Consumption of the power corresponding to the dim level of the luminaire. It is presented as a table of power (W) related to the luminous flux emitted (lm) or the percentage of dimming (%).		1E-2, W 1E0, lm OR 1E0, %	n.a.	

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
3krkQTVbv0\$g9Xj9eYC6nh	02-0005	compensation type	Identifies the form of compensation used for power factor correction and radio interference suppression.		n.a.	Capacitive, Inductive, Other	
0TzE4sMDv1pwfygK1xxjm5	02-0006	standby power	Power consumption of switched off luminaire. All electrical components including emergency and lighting controls components have to be considered. Is also known as parasitic power. See also EN 15193-1.		1E-2, W	n.a.	
2wiaN2gSf0\$RFeAF8d_51K	02-0007	power consumption of the controls	Power consumption of the detector with the light switched off and without motion detection / presence detection (idle state).		1E-2, W	n.a.	
0G4TAennPD5gzRoG2rIzv_	02-0008	ILCOS light source type	Light Source type definition according to ILCOS, EN 61231.		n.a.	n.a.	IAA/C-40-220/230-E27-60
1fBDdf6YP208_JFTCLHktp	02-0009	socket	A device which mechanically supports and provides electrical connections for a compatible electric light source. See also EN 60061.		n.a.	n.a.	E27

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
1nKr7A75b8reMNAFPW1iw1	02-0010	nominal light source output power	Approximate power output used to designate or identify the light source.		1E0, W	n.a.	
1A3s\$Z4Sj7jQFfzbfe7Yu	02-0011	multilamp light source wattage	Luminaires that could be equipped with more than one light source wattage. Selection of all possible nominal light source output wattage.		1E0, W	n.a.	
018C_3ZRn5IufwY89oB9NV	02-0012	light source included	States whether the luminaire is supplied with light source.		n.a.	Yes No	
2LJHyobk57buKgQhTXFFR_	02-0013	maximum nominal output power of light source	<i>Identical with name.</i>		1E0, W	n.a.	
1RGMcZL0X4SvXP9H1tpT7e	02-0014	default light source power	Recommended light source power by supplier or manufacturer.		1E0, W	n.a.	
1ELEjiwITBhANPTqofV2Tl	02-0015	light source position of usage	Light Source usage position (Horizontal/Vertical) possibly with range of angle.		n.a.	Horizontal, Vertical	

GUID	ID	Name	Description	Symbol	Format, Unit	Value set	Examples
2U00chRyr2eQDXabAwecx5	02-0016	light source count	Number of light sources in one luminaire. Not valid for LED luminaires.		1E0, n.a.	n.a.	
0FWc9hC5PEqgfN0fVzc2Yo	02-0017	Zhaga standard	<i>Identical with name.</i>		n.a.	Yes No	
21GF1lrRP4denYC8o6ot\$N	02-0018	control gear	Type of control gear, which is required to control the electrical operation of the light source(s).		n.a.	n.a.	Magnetic, Electronic
06Vbbmtwv85QArFTsBPUPQ	02-0019	control gear required	States if control gear is necessary.		n.a.	Yes No	
3kZ3Cj9Xb9DBPoZ15k3vIQ	02-0020	control gear included	Shipped with or without ballast.		n.a.	Yes No	
2mGS7VdXfBo8rV8OFHuW7b	02-0021	control gear quantity	The quantity of control gears.		1E0, n.a.	n.a.	
3M6mU\$FIP6KQ80BVaK5PC0	02-0022	control gear location	Describes the location of the control gear. Inside or outside of the luminaire. Or distance to light source.		n.a.	n.a.	