IEC 63067

Edition 1.0 2020-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electrical installations for lighting and beaconing of aerodromes – Connecting devices – General requirements and tests

Installations électriques pour l'éclairage et le balisage des aérodromes – Dispositifs de connexion – Exigences générales et essais

IEC 63067:2020-06(en-fr)

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INTERNATIONAL
ELECTROTECHNICAL
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ELECTROTECHNIQUE
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ICS 29.140.50; 93.120

ISBN 978-2-8322-8516-9

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ELECTRICAL INSTALLATIONS FOR LIGHTING AND BEACONING OF AERODROMES – CONNECTING DEVICES – GENERAL REQUIREMENTS AND TESTS

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

FDIS	Report on voting
97/216/FDIS	97/217/RVD

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

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

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INTRODUCTION

This document is based on the Federal Aviation Administration circular AC No. 150/5345-26D, which is listed in the bibliography for convenience.

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ELECTRICAL INSTALLATIONS FOR LIGHTING AND BEACONING OF AERODROMES – CONNECTING DEVICES – GENERAL REQUIREMENTS AND TESTS

1 Scope

This document applies to plugs and receptacles for single or multiple pole connecting devices used for aeronautical ground lighting applications.

Additional requirements and usage of connecting devices are given in different parts of IEC 61820 series.

Connecting devices complying with this document are suitable for use in environmental class E11 according to IEC 61820-1.

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 60352-2:2006, *Solderless connections – Part 2: Crimped connections – General requirements, test methods and practical guidance*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61820-1, *Electrical installations for aeronautical ground lighting at aerodromes – Part 1: Fundamental principles*

ISO 2859-1, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61820-1, and the following apply.

NOTE Where the terms "voltage" and "current" are used in this document, they are RMS values, unless otherwise specified.

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

- IEC Electropedia: available at http://www.electropedia.org/
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3.1
plug
accessory having pin(s) designed to engage with the socket contact(s) of a receptacle, incorporating means for the electrical connection and insulated mechanical casting for retention of cable or wires

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[SOURCE: IEC 60050-442:1998, 442-03-01, modified – "socket-outlet" was replaced by "receptacle", “mechanical retention” was replaced by “insulated mechanical casting for retention” and "cords" was replaced by "wires".]

3.2
receptacle
accessory having socket contact(s) designed to engage with the pin(s) of a plug, incorporating means for the electrical connection and insulated mechanical casting for retention of cables and wires

3.3
type test
conformity test made on one or more items representative of the production

3.4
production test
test that is carried out for samples of certain lot according to ISO 2859-1

3.5
class A connecting device
accessory that is completed by insulating material moulded around pre-assembled components that are terminated to cable(s) or wire(s) in factory

3.6
class B connecting device
accessory consisting of a pre-moulded housing and interface contacts that are meant to be assembled on the field

3.7
primary circuit
electric circuit that transfers energy from a power source to the primary winding of an AGL transformer

3.8
secondary circuit
electric circuit that transfers energy from the secondary winding of the AGL transformer to a load

3.9
screen continuity conductor
copper wire used to make a connection to the screen of a cable for the purpose of continuity or earthing

4 General requirements

Plugs and receptacles shall be so designed and constructed that, in normal use, their performance is reliable, and safety is achieved by reducing risk to a tolerable level in airfield environment.

Compliance is checked by meeting all the relevant requirements and tests specified in this document.

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5 General remarks on tests

5.1 Tests shall be carried out to check compliance with the relevant requirements of this document.

Tests are as follows:

– type tests shall be made on representative specimens of each type of connecting device;
– production tests shall be made according to Annex A.

Conditions of 5.2 to 5.5 are applicable to type tests.

5.2 Tests shall be carried out at 23 °C ± 3 °C unless otherwise defined.

5.3 Test shall be performed on six pairs (plugs and receptacles) of samples of each style to demonstrate compliance with the requirements in this document.

All tested connecting devices shall pass all the relevant tests of this document. Failure of any one of the connecting devices in any one of the tests shall indicate failure of this product to comply with this specification unless otherwise noted in a particular test.

5.4 Assembled connecting devices of class A, shall be subjected to all the relevant tests of this document.

5.5 Class B connecting devices shall be assembled in accordance with the manufacturer's instructions to lengths of wire or cable, as appropriate, of at least 0,6 m for all the relevant tests of this document.

6 Ratings

Rated values for receptacles and plugs are according to IEC 61820-1 voltage classes.

NOTE For connecting devices different rating voltages are used. E.g. 600 V or 750 V between phases and 1 500 V between ground and phase.

7 Classification

Connecting devices are classified as shown in Table 1.

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Table 1 – Classification of connecting devices

Type	Class	Interface	Figure	Style	Cable Type	Dimensions
Type I (1 conductor, 25 A, 5 000 V) Primary connecting devices	Class A (Factory moulded)	Plug	Figure 1	Style 2	One-core cable	Table 2
			Figure 1	Style 15	Screened/Shielded	
		Receptacle	Figure 2	Style 9	One-core cable	
			Figure 2	Style 16	Screened/Shielded	
	Class B (Field assembled)	Plug	Figure 1	Style 3	One-core cable	
			Figure 1	Style 13	Screened/Shielded	
		Receptacle	Figure 2	Style 10	One-core cable	
			Figure 2	Style 14	Screened/Shielded	
Type II (2 conductor, 20 A, 1 000 V) Secondary connecting devices	Class A (Factory moulded)	Plug	Figure 3	Style 1	Two single wires	Table 3
			Figure 3	Style 6	Two single wires	
		Receptacle	Figure 4	Style 7	Two-core cable	
			Figure 5	Style 8	Two-core cable	
	Class B (Field assembled)	Plug	Figure 3	Style 4	Two single wires	
		Receptacle	Figure 4	Style 11	Two single wires	
		Plug	Figure 3	Style 5	Two-core cable	
		Receptacle	Figure 4	Style 12	Two-core cable	

NOTE 1 Figures refer only to the interface of the connecting devices.

NOTE 2 If a new type of connecting device is required, new configurations will be introduced on this table.

NOTE 3 A new system for connecting devices of secondary circuit, parallel circuits, ELV systems including multipole constructions, which defines arrangement of contacts and their combinations including earthing (grounding) contact and pilot/signalling contacts, if any, will be introduced in future as systems become available.

NOTE 4 Column "Style" is for information and it refers to different configurations of connecting devices which are given in Federal Aviation Administration circular AC No. 150/5345-26D.

8 Marking and documentation

8.1 Connecting devices shall be marked with manufacturer's name, product identification or catalogue number, style and type reference of a product.

Compliance is checked by inspection.

8.2 Markings shall be readily visible. Minimum height of letters/symbols shall be 3 mm.

Compliance is checked by inspection.

8.3 Markings shall be made impression, moulding, pressing or engraving or any other method that provides legibility over life time of the product.

Compliance is checked by inspection.

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8.4 The manufacturer's installation instructions shall be furnished with each class B connecting device.

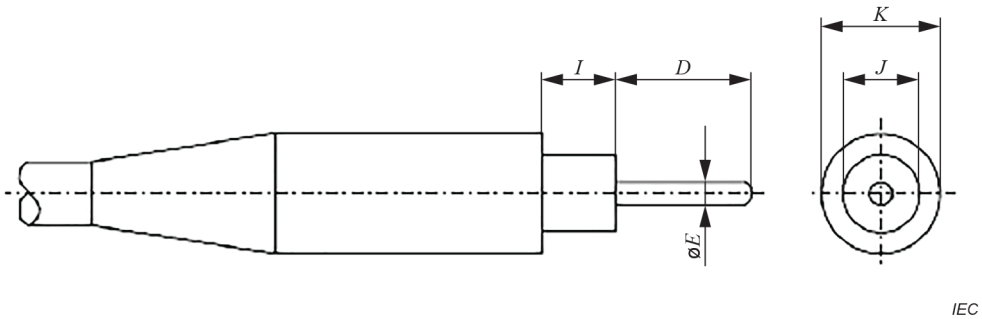
8.5 The manufacturer's installation instructions for class A connecting devices shall include instructions how to ensure that counter parts of primary connecting devices do not separate from each other after installation.

8.6 The manufacturer's installation instructions shall include necessary instructions for maintenance of connecting devices.

9 Checking of dimensions

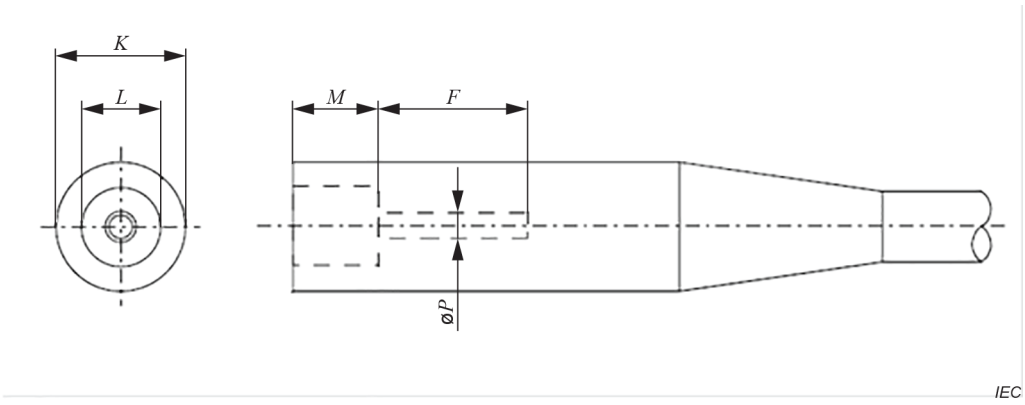
9.1 Each plug and receptacle shall conform to the dimensions of appropriate Figure 1, Figure 2, Figure 3, Figure 4 or Figure 5 and Table 2 and Table 3.

Compliance is checked by inspection and measurement.



NOTE The sketch is not intended to govern design except as regards the dimensions shown.

Figure 1 – Primary plug (IEC 61823)



NOTE The sketch is not intended to govern design except as regards the dimensions shown.

Figure 2 – Primary receptacle (IEC 61823)

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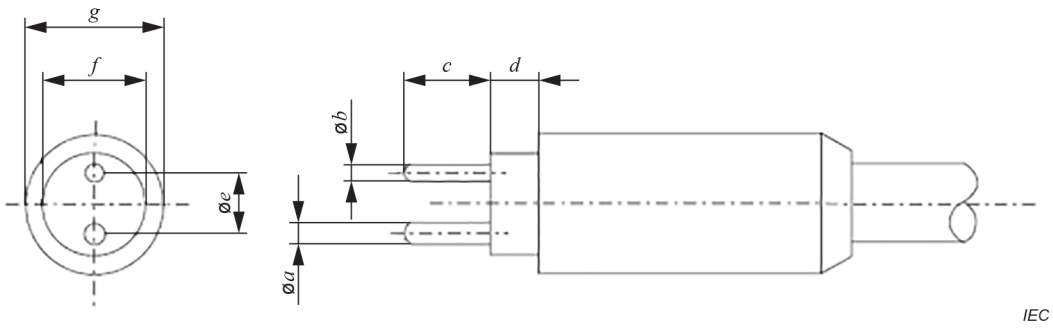
Table 2 – Interface dimensions of primary plug and receptacle

Dimension	Dimension mm
D	27,00 ± 0,2
E	4,70 ± 0,05
F	27,43 min
I	15,2 ± 0,1
J	15,4 0/+0,2
K[a]	23,5 ± 0,5
L	14,3 0/+0,3
M	15,3 −0,1/+0,2
P[b]	4,8 ± 0/+0,2

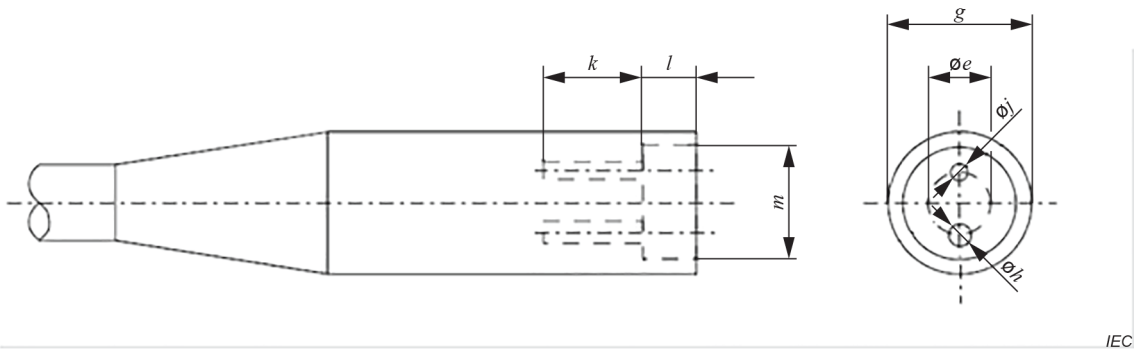
[a] Dimension *K* shall remain unchanged within a distance of 15 mm from the interface (behind dimension *I* towards the cable).

[b] Diameter before splitting.



NOTE The sketch is not intended to govern design except as regards the dimensions shown.

Figure 3 – Secondary plug



NOTE The sketch is not intended to govern design except as regards the dimensions shown.

Figure 4 – Secondary receptacle

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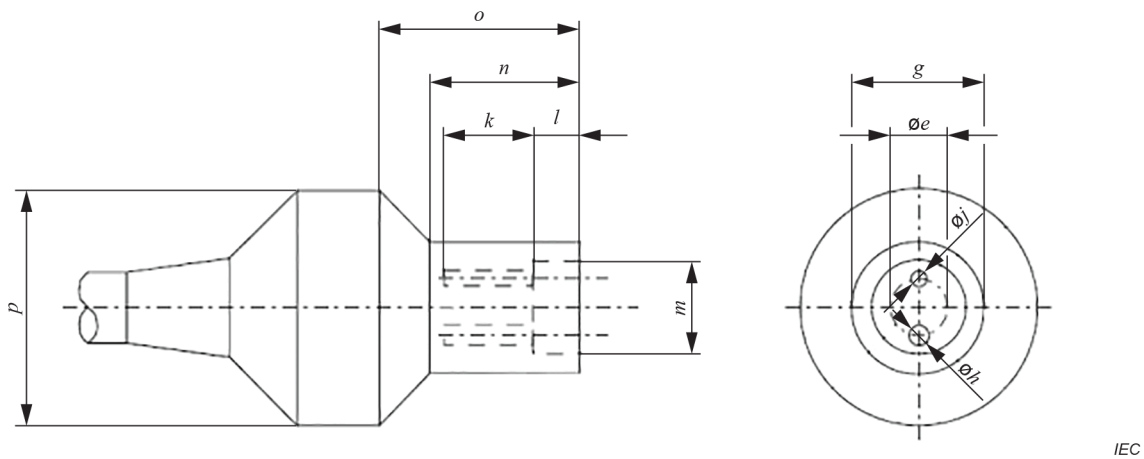

NOTE The sketch is not intended to govern design except as regards the dimensions shown.

Figure 5 – Secondary receptacle with moulded frangible coupler

Table 3 – Interface dimensions for secondary plugs and receptacles

Dimension	Dimension mm
a	3,94 ± 0,05
b	3,15 ± 0,05
c	15,90 −0,4/0
d	8,7 ± 0,4
e	11,0 ± 0,2
f	18,4 0/ +0,2
g	25,0 ± 0,4
h[a]	4,0 ± 0,05
j[a]	3,20 ± 0,05
k	16,3 min
l	9,1 0/+0,4
m	17,5 ± 0,2
n	28,6 ± 0,8
o	38,1 ± 0,8
p	44,4 ± 0,8
[a] Diameter before splitting.	

10 Protection against electric shock

Protective measures against electric shock shall be practiced according to national safety regulations and electrical maintenance instructions of airports.

11 Provision for continuity of screened cable

11.1 Plug and receptacle for screened cables shall be provided with screen continuity conductors. The length of each screen continuity conductor shall be at least 300 mm in order to ensure the continuity of the circuit when the main circuit is opened.

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