

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Radio-frequency connectors –  
Part 43: Sectional specification for RBMA series blind mating RF coaxial  
connectors**

**Connecteurs pour fréquences radioélectriques –  
Partie 43: Spécification intermédiaire relative aux connecteurs coaxiaux RF à  
accouplement en aveugle, série RBMA**



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**RADIO-FREQUENCY CONNECTORS –**

**Part 43: Sectional specification for RBMA series  
blind mating RF coaxial connectors**

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International Standard IEC 61169-43 has been prepared by subcommittee 46F: R.F. and microwave passive components, of IEC technical committee 46: Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories.

This bilingual version (2014-01) corresponds to the monolingual English version, published in 2013-03.

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

FDIS	Report on voting
46F/221/FDIS	46F/227/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.

The French version of this standard has not been voted upon.

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

A list of all the parts in the IEC 61169 series, published under the general title *Radio-frequency connectors*, 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 web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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## RADIO-FREQUENCY CONNECTORS –

### Part 43: Sectional specification for RBMA series blind mating RF coaxial connectors

#### 1 Scope

This part of IEC 61169 which is a sectional specification (SS) provides information and rules for the preparation of detail specifications (DS) for RBMA series RF coaxial connectors, with characteristic impedance of 50  $\Omega$ , with threaded coupling and operating frequency limit up to 12,4 GHz, used in wireless, microwave, telecommunication, and other fields, connecting with RF cables or micro-strips.

It also prescribes mating face dimensions for general connectors-grade 2, dimensional details of standard test connectors-grade 0, gauging information and tests selected from IEC 61169-1, applicable to all detail specifications relating to RBMA series connectors.

This specification indicates the recommended performance characteristics to be considered when writing a detail specification and it covers test schedules and inspection requirements for assessment levels M and H (see Tables 8 and 9).

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#### 2 Normative references (standards.iteh.ai)

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61169-1:1992, *Radio-frequency connectors – Part 1: Generic specification – General requirements and measuring methods*<sup>1</sup>

Amendment 1:1996

Amendment 2:1997

#### 3 Mating face and gauge information

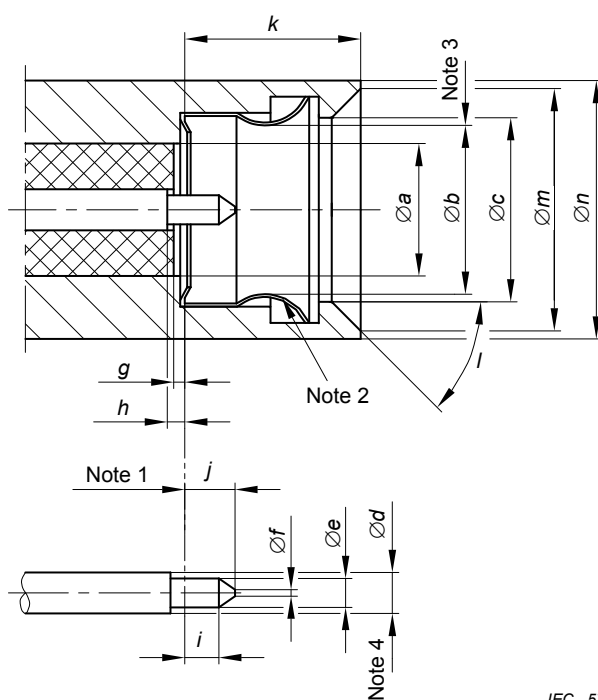
##### 3.1 Dimensions – General connectors – Grade 2

##### 3.1.1 Connector with pin-centre contact

All undimensioned pictorial configurations are for reference purpose only.

<sup>1</sup> There exists a consolidated edition 1.2 (1998) that comprises IEC 61169-1:1992, its Amendment 1:1996 and its Amendment 2:1997.





IEC 573/13

**Figure 1 – Connector with pin-centre contact**  
(for dimensions and notes, see Table 1)

**Table 1 – Dimensions of connector with pin-centre contact**

Ref.	mm		Notes
	Min.	Max.	
a	–	4,18	Note 4
b	–	–	Note 3
c	5,55	5,60	
d	–	–	Note 4
e	0,90	0,94	
f	–	0,30	
g	0,00	0,25	
h	0,00	0,25	
i	1,27	–	
j	–	2,54	
k	5,45	5,55	
l	42°	48°	Angle
m	7,40	7,60	
n	8,00	–	

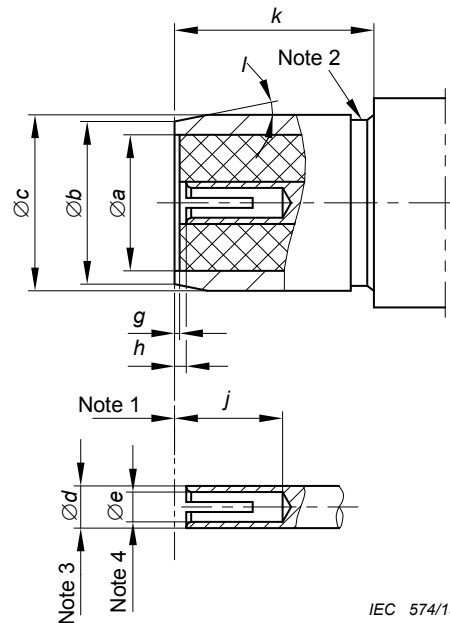
NOTE 1 Mechanical and electrical reference plane.

NOTE 2 Spring fingers, the structure is optional.

NOTE 3 Dimensions are chosen to meet mechanical performance requirements.

NOTE 4 These diameters are for PTFE insulation with a dielectric constant of 2,02. Characteristic impedance of transmission is determined by diameters "a" and "d" to be 50 Ω within the tolerances as stated in the DS.

3.1.2 Connector with socket-centre contact



IEC 574/13

Figure 2 – Connector with socket-centre contact

(for dimensions and notes, see Table 2)

Table 2 – Dimensions of connector with socket-centre contact

Ref.	IEC 61169-43:2013		Notes
	Min.	Max.	
a	–	4,18	Note 3
b	4,85	4,95	
c	5,31	5,36	
d	–	–	Note 3
e	–	–	Note 4
g	0,00	0,25	
h	0,00	0,25	
j	2,00	–	
k	5,60	–	
l	8 °	12 °	Angle

NOTE 1 Mechanical and electrical reference plane.

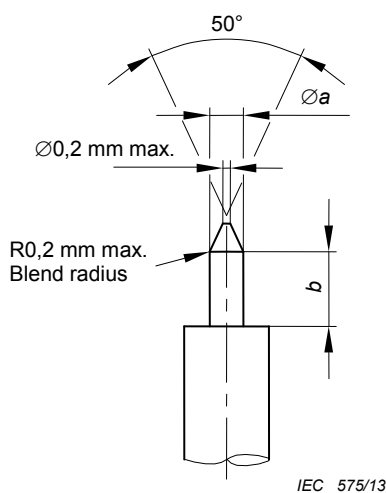
NOTE 2 Design and location of the seal feature is optional, in order to meet environmental performance requirements when mating interface separation is not more than 0,38 mm.

NOTE 3 These diameters are for PTFE insulation with a dielectric constant of 2,02. Characteristic impedance of transmission is determined by diameters "a" and "d" to be 50 Ω within the tolerances as stated in the DS.

NOTE 4 Design for slotting is optional, to meet electrical and mechanical requirements, when mating with φ 0,90 mm to φ 0,94 mm pin.

## 3.2 Gauges

### 3.2.1 Gauge pin for socket-centre contact



**Figure 3 – Gauge pin for socket-centre contact**

(for dimensions and notes, see Table 3)

**Table 3 – Dimensions of gauge pin for socket-centre contact**

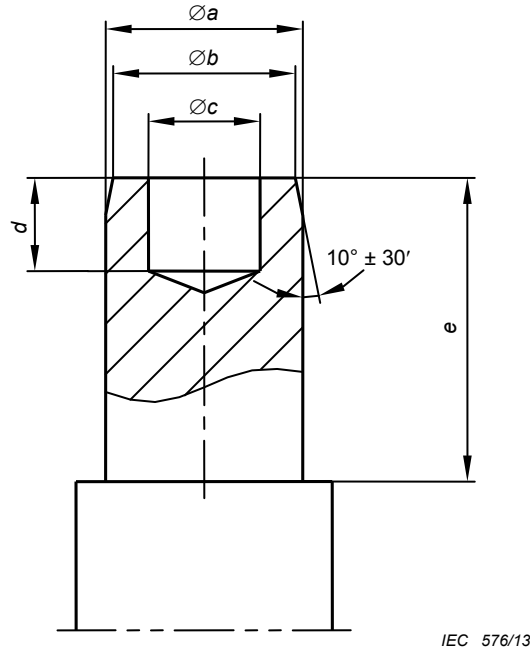
Ref.	Gauge A IEC 61169-43:2013 Maximum material for sizing purposes		Gauge B Minimum material for measurement of retention force Mass of gauge: 28 g +2 g	
	mm		mm	
	Min.	Max.	Min.	Max.
<i>a</i>	0,940	0,945	0,899	0,902
<i>b</i>	0,76	1,14	1,27	1,90
Material: steel, polished. Surface roughness: $R_a = 0,4 \mu\text{m}$ maximum on the cylindrical surface of length <i>b</i> .				

#### 3.2.1.1 Test procedure

The gauge A shall be inserted into the socket-centre contact three times with a minimum depth of 0,76 mm. This is a sizing operation and should only be carried out when the socket-centre contact is removed from the connector.

After this, the gauge B shall have a withdrawal force of 0,28 N minimum after being inserted into socket-centre contact. The contact shall retain the mass of the gauge in a vertical downward position. This test shall also be carried out on connector when the socket-centre contact is not removed.

3.2.2 Gauge for outer contact of connector with pin-centre contact



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Figure 4 – Gauge for outer contact of connector with pin-centre contact

(for dimensions and notes, see Table 4)

IEC 61169-43:2013

Table 4 – Gauge for outer contact of connector with pin-centre contact

Ref.	Gauge A		Gauge B	
	Maximum material for sizing purposes		Minimum material for measurement of retention force	
	mm		mm	
	Min.	Max.	Min.	Max.
a	5,360	5,365	5,305	5,310
b	4,85	4,95	4,85	4,95
c	2,50	–	2,50	–
d	4,00	–	4,00	–
e	5,60	–	5,60	–

Material: steel, polished.  
Surface roughness: Ra ≤ 0,4 µm on the cylindrical surface of length e.

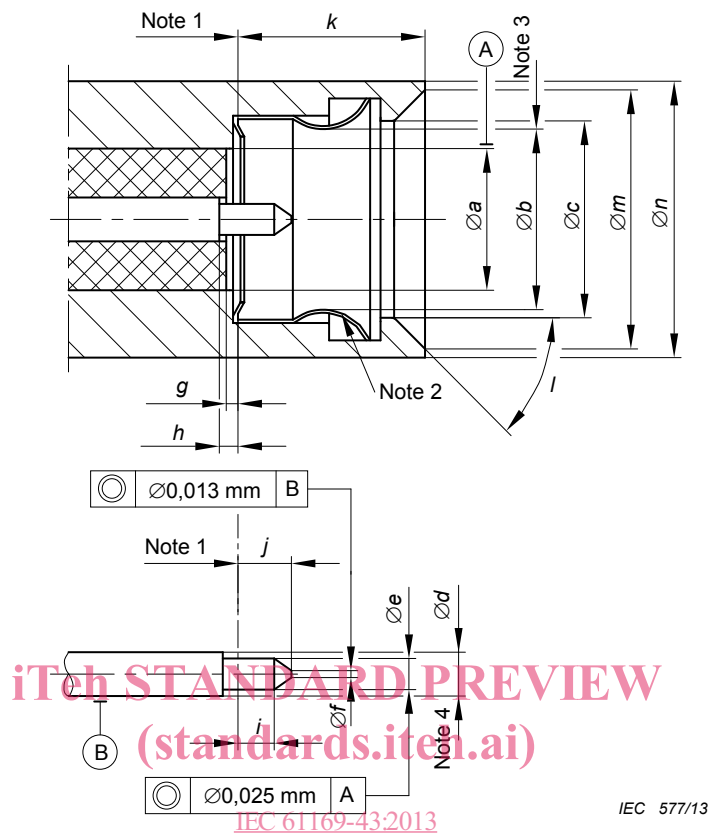
3.2.2.1 Test procedure

The gauge A shall be inserted into the outer contact three times. This is a sizing operation.

After this, the gauge B shall have a withdrawal force of 0,56 N minimum after being inserted into outer contact. The contact shall retain the mass of the gauge in a vertical downward position.

3.3 Dimensions – Standard test connectors – Grade 0

3.3.1 Connector with pin-centre contact



IEC 577/13

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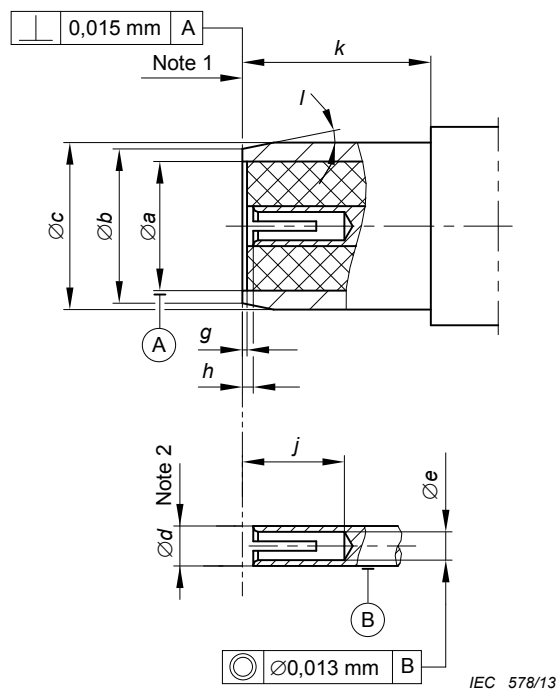
**Figure 5 – Connector with pin-centre contact (G0)**  
(for dimensions and notes, see Table 5)

**Table 5 – Dimensions of connector with pin-centre contact (G0)**

Ref.	mm		Notes
	Min.	Max.	
a	4,10	4,13	
b	–	–	Note 3
c	5,55	5,60	
d	1,27 nominal		
e	0,902	0,927	
f	–	0,30	
g	0,00	0,15	
h	0,00	0,15	
i	1,27	1,37	
j	2,03	2,29	
k	5,45	5,55	
l	42 °	48 °	Angle
m	7,40	7,60	
n	8,00	–	

NOTE 1 Mechanical and electrical reference plane.  
 NOTE 2 Spring fingers, the structure is optional.  
 NOTE 3 Dimensions are chosen to meet mechanical performance requirements.  
 NOTE 4 The diameter is chosen upon the assumption that the PTFE dielectric has a dielectric constant of 2,02 to give an impedance of  $50 \Omega \pm 0,5 \Omega$ .

**3.3.2 Connector with socket-centre contact**



**Figure 6 – Connector with socket-centre contact**  
 (for dimensions and notes, see Table 6)

**Table 6 – Dimensions of connector with socket-centre contact**

Ref.	mm		Notes
	Min.	Max.	
<i>a</i>	4,10	4,13	
<i>b</i>	4,85	4,95	
<i>c</i>	5,31	5,36	
<i>d</i>	1,27 nominal		
<i>e</i>	–	–	Note 3
<i>g</i>	0,00	0,15	
<i>h</i>	0,00	0,15	
<i>j</i>	3,05	3,30	
<i>k</i>	5,60	–	
<i>l</i>	8°	12°	Angle

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 The diameters are chosen upon the assumption that the PTFE dielectric has a dielectric constant of 2,02 to give an impedance of  $50 \Omega \pm 0,5 \Omega$ .

NOTE 3 Design for slotting optional, to meet electrical and mechanical requirements, when mating with  $\varnothing 0,902$  mm to  $\varnothing 0,927$  mm pin.

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**3.4 General requirements for connector mounting in modules and on panels**

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**3.4.1 Limits of permissible connector radial misalignment and axial misalignment**

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**3.4.1.1 General**[https://standards.iteh.ai/catalog/standards/sist/b5afac1e-1446-4adc-ba27-](https://standards.iteh.ai/catalog/standards/sist/b5afac1e-1446-4adc-ba27-585a4abe390b/iec-61169-43-2013)[585a4abe390b/iec-61169-43-2013](https://standards.iteh.ai/catalog/standards/sist/b5afac1e-1446-4adc-ba27-585a4abe390b/iec-61169-43-2013)

When designing the mounting arrangements for RBMA series connectors, it is essential that the disposition of individual pairs of connectors and their engagement is controlled within the following general limiting conditions.

**3.4.1.2 Radial misalignment**

The radial misalignment between engaging connectors refers to the concentricity error between diameter *c* of a connector with pin-centre contact and diameter *c* of a connector with socket-centre contact at the beginning and during the engagement (see 3.1).

A rigidly mounted connector with socket-centre contact and a rigidly mounted connector with pin-centre contact (see Figure 7) shall accept a radial misalignment within *aa* (0,095 mm) at the beginning and during the engagement.