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Radio-frequency connectors –

Part 44: Sectional specification for series SMP push-on radio-frequency coaxial connectors

Connecteurs pour fréquences radioélectriques –

Partie 44: Spécification intermédiaire relative aux connecteurs coaxiaux pour fréquences radioélectriques glissants, série SMP



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Radio-frequency connectors –

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Partie 44: Spécification intermédiaire relative aux connecteurs coaxiaux pour fréquences radioélectriques glissants, série SMP

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RADIO-FREQUENCY CONNECTORS –**Part 44: Sectional specification for series SMP
push-on radio-frequency coaxial connectors**

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International Standard IEC 61169-44 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 first edition cancels and replaces IEC/PAS 61169-44, published in 2010, of which it constitutes a minor revision. The only change is that the PAS has been changed into an International Standard.

This bilingual version (2014-01) corresponds to the monolingual English version, published in 2012-12.

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

CDV	Report on voting
46F/184/CDV	46F/194/RVC

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 parts of 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 44: Sectional specification for series SMP push-on radio-frequency coaxial connectors

1 Scope

This part of IEC 61169 which is a sectional specification (SS) provides information and rules for preparation of detail specification of SMP series push-on RF coaxial connectors together with the pro-forma blank detail specification.

The SMP push-on series connectors with characteristic impedance of 50 Ω are used with RF cables or micro-strips in microwave, telecommunication, wireless and other fields. The operating frequency limit is up to 40 GHz.

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

NOTE Metric dimension are original dimensions.

All undimensioned pictorial configurations are for reference purpose only.

2 Normative references

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*¹

Amendment 1:1996

Amendment 2:1997

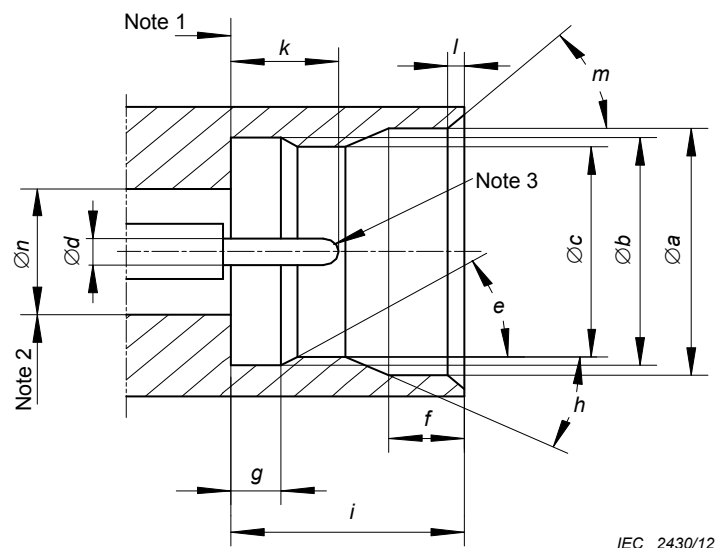
¹ There exists a consolidated edition 1.2 (1998) that comprises IEC 61169-1:1992, its Amendment 1:1996 and its Amendment 2:1997.

3 Mating face and gauge information

3.1 Dimensions – General connectors – Grade 1

3.1.1 Connector with pin-centre contact

3.1.1.1 Connector with pin-centre contact – Limited detent and full detent



IEC 2430/12

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

Table 1 – Dimensions of connector with pin-centre contact – Limited detent and full detent

Ref.	mm		Notes
	Min.	Max.	
a	3,53	3,68	
b	3,15	3,20	
c	3,02	3,07	Limited detent
	2,92	2,97	Full detent
d	0,38	0,41	
e	$30^\circ \pm 1^\circ$		Angle
f	0,84	0,94	
g	0,52	0,60	
h	$32^\circ \pm 1^\circ$		Angle
i	2,74	2,84	
k	1,14	1,40	
l	0,08	0,20	
m	40°	50°	Angle
n	—	—	

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 The diameter is chosen to meet the nominal impedance of 50 Ω and electrical and mechanical requirements.

NOTE 3 Spherical or chamfered.

3.1.1.2 Connector with pin-centre contact – Smooth bore

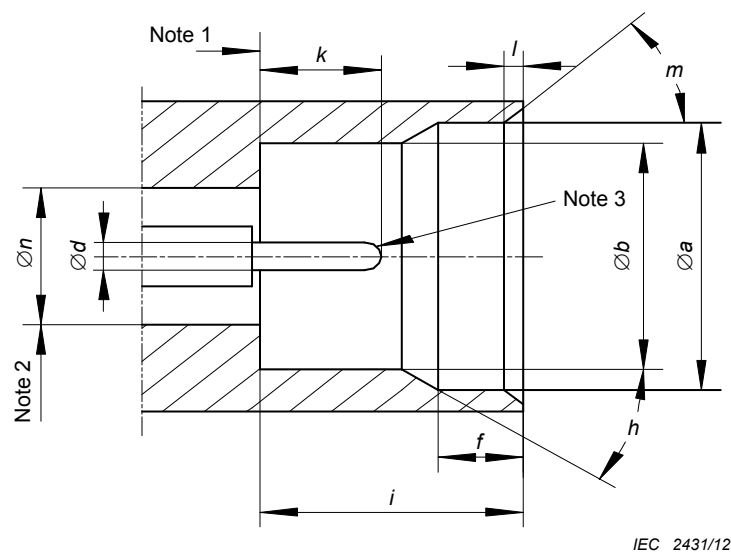
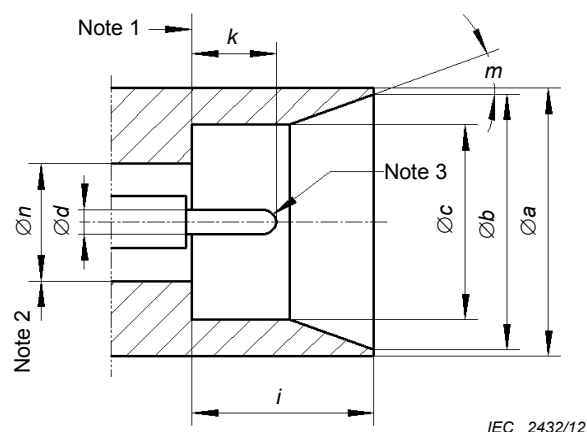


Figure 2 – Connector with pin- centre contact – Smooth bore
(for dimensions and notes, see Table 2)

Table 2 – Dimensions of connector with pin-centre contact – Smooth bore

Ref.	mm		Notes
	Min.	Max.	
<i>a</i>	3,53	3,68	
<i>b</i>	3,15	3,20	
<i>d</i>	0,38	0,41	
<i>f</i>	0,84	0,94	
<i>h</i>	$32^{\circ} \pm 1^{\circ}$		Angle
<i>i</i>	2,74	2,84	
<i>k</i>	1,14	1,40	
<i>l</i>	0,08	0,20	
<i>m</i>	40°	50°	Angle
<i>n</i>	—	—	
NOTE 1 Mechanical and electrical reference plane.			
NOTE 2 The diameter is chosen to meet the nominal impedance of 50 Ω and electrical and mechanical requirements.			
NOTE 3 Spherical or chamfered.			

3.1.1.3 Connector with pin-centre contact – Catchers mit



IEC 2432/12

Figure 3 – Connector with pin- centre contact – Catchers mit
(for dimensions and notes, see Table 3)

Table 3 – Dimensions of connector with pin-centre contact – Catchers mit

Ref.	mm		Notes
	Min.	Max.	
<i>a</i>	5,84	—	
<i>b</i>	5,38	5,54	
<i>c</i>	3,15	3,20	
<i>d</i>	0,38	0,41	
<i>i</i>	2,74	2,84	—
<i>k</i>	1,14	1,40	
<i>m</i>	$45^\circ \pm 2^\circ$		Angle
<i>n</i>	—	—	
NOTE 1 Mechanical and electrical reference plane.			
NOTE 2 The diameter is chosen to meet the nominal impedance of 50 Ω and electrical and mechanical requirements.			
NOTE 3 Spherical or chamfered.			

3.1.2 Connector with socket-centre contact

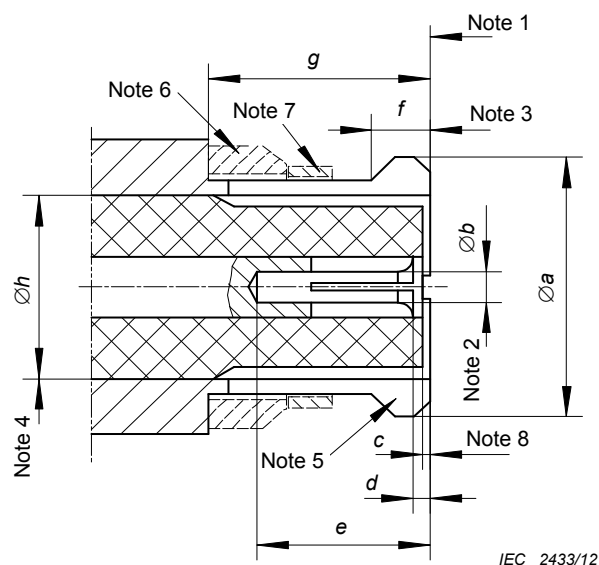


Figure 4 – Connector with socket-centre contact
(for dimensions and notes, see Table 4)

Table 4 – Dimensions of connector with socket-centre contact

Ref.	mm		Notes
	Min.	Max.	
<i>a</i>	—	3,43	
<i>b</i>	—	—	
<i>c</i>	0,00	—	
<i>d</i>	0,00	0,20	
<i>e</i>	1,78	—	
<i>f</i>	0,46	0,64	Uncabled
	0,64	0,89	Cabled
<i>g</i>	2,84	—	
<i>h</i>	—	—	

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 Bore diameter and closure to meet electrical and mechanical requirements.

NOTE 3 The form and dimensions of outer conductor to meet mechanical and electrical requirements.

NOTE 4 Diameter is chosen upon the assumption that the PTFE dielectric has a dielectric constant of 2,02 to give an impedance of 50 Ω.

NOTE 5 The number and dimension of slots allows to meet mechanical and electrical requirements.

NOTE 6 Anti-rock ring is required for cabled connectors, optional for all others.

NOTE 7 EMI ring (shield) is required for cabled connectors, optional for all others.

NOTE 8 To meet electrical requirement.

3.2 Gauges

3.2.1 Gauge pin for socket-centre contact

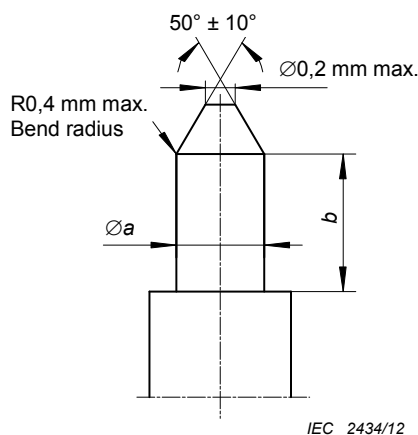


Figure 5 – Gauge pin for socket-centre contact
(for dimensions and notes, see Table 5)

Table 5 – Dimensions of gauge pin for socket-centre contact

Ref.	Gauge A (for sizing purposes)		Gauge B (for measurement of retention force for inner conductor) Mass of gauge: (14±2) g	
	mm		mm	
	Min.	Max.	Min.	Max.
<i>a</i>	0,410	0,415	0,375	0,380
<i>b</i>	1,00	1,14	1,00	1,14
Material: steel, polished.				
Surface roughness: $Ra \leq 0,4 \mu\text{m}$, 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 1,00 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 be inserted into socket-centre contact. The contact shall retain the mass of the gauge in a vertical downward position. The test should also be carried out on connector when the socket-centre contact is not removed.

3.2.1.2 Additional test

At the conclusion of the tests and if prescribed in the DS, the force necessary to insert gauge A shall be measured. When the additional test is required, the force required shall not exceed 6,67 N.

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

3.2.2.1 Gauge with limited detent for outer contact of connector with socket-centre contact

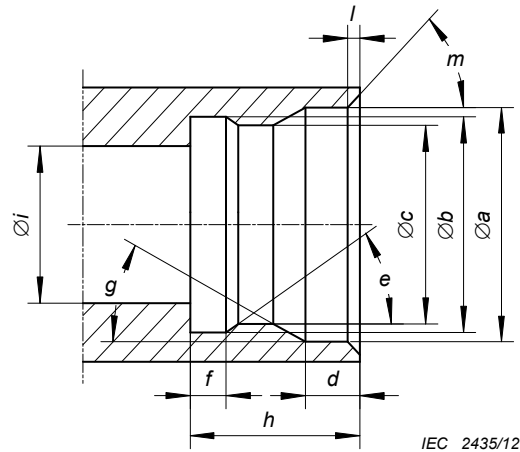


Figure 6 – Gauge with limited detent for outer contact of connector with socket-outer contact
(for dimensions and notes, see Table 6)

Table 6 – Gauge with limited detent for outer contact of connector with socket-outer contact

Ref	Gauge A (for sizing purposes)		Gauge B (for measurement of retention force for inner conductor) Mass of gauge: (900±20) g		Notes
	mm		mm		
	Min.	Max.	Min.	Max.	
a	3,53	3,68	3,53	3,68	
b	3,13	3,23	3,13	3,23	
c	3,00	3,02	3,08	3,10	Note 1
d	0,84	0,94	0,84	0,94	
e	28°	32°	28°	32°	Note 2
f	0,52	0,60	0,52	0,60	
g	33°	37°	33°	37°	Note 3
h	2,74	2,84	2,74	2,84	
i	—	2,40	—	2,40	
l	0,08	0,20	0,08	0,20	
m	40°	50°	40°	50°	
Material: steel, polished.					
NOTE 1 Surface roughness: $Ra \leq 0,4 \mu\text{m}$, on the cylindrical surface of length c.					
NOTE 2 Surface roughness: $Ra \leq 0,4 \mu\text{m}$, on the slope surface of angle e.					
NOTE 3 Surface roughness: $Ra \leq 0,4 \mu\text{m}$, on the slope surface of angle g.					

3.2.2.1.1 Test procedure

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

After this, the outer contact shall be inserted into the gauge B. The outer contact shall retain the gauge in a vertical downward direction.

3.2.2.1.2 Additional test

After the sizing and if prescribed in the DS, the force required to insert gauge A shall be measured. This force shall not exceed 45 N.

3.2.2.2 Gauge pin – Full detent for outer contact of connector with socket-centre

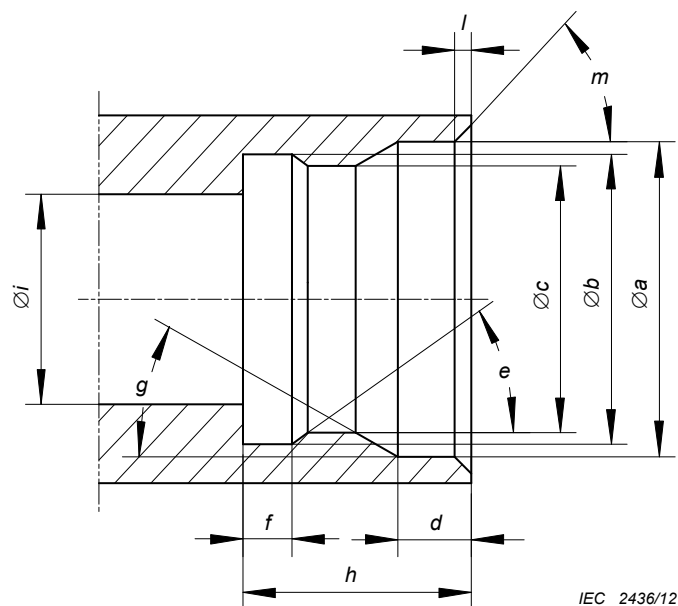


Figure 7 – Gauge pin – Full detent for outer contact of connector with socket-centre
(for dimensions and notes, see Table 7)

Table 7 – Gauge pin – Full detent for outer contact of connector with socket-centre

Ref	Gauge A (for sizing purposes)		Gauge B (for measurement of retention force for inner conductor) Mass of gauge: (2 200+20) g		Notes	
	mm		mm			
	Min.	Max.	Min..	Max.		
<i>a</i>	3,53	3,68	3,53	3,68		
<i>b</i>	3,13	3,23	3,13	3,23		
<i>c</i>	2,90	2,92	2,98	3,00	Note 1	
<i>d</i>	0,84	0,94	0,84	0,94		
<i>e</i>	28°	32°	28°	32°	Note 2	
<i>f</i>	0,52	0,60	0,52	0,60		
<i>g</i>	33°	37°	33°	37°	Note 3	
<i>h</i>	2,74	2,84	2,74	2,84		
<i>i</i>	—	2,40	—	2,40		
<i>l</i>	0,08	0,20	0,08	0,20		
<i>m</i>	40°	50°	40°	50°		
Material: steel, polished,						
NOTE 1 Surface roughness: $Ra\leq0,4\text{ }\mu\text{m}$, on the cylindrical surface of length <i>c</i> .						
NOTE 2 Surface roughness: $Ra\leq0,4\text{ }\mu\text{m}$, on the slope surface of angle <i>e</i> .						
NOTE 3 Surface roughness: $Ra\leq0,4\text{ }\mu\text{m}$, on the slope surface of angle <i>g</i> .						

3.2.2.2.1 Test procedure

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

After this, the outer contact shall be inserted into the gauge B. The outer contact shall retain the gauge in a vertical downward direction.

3.2.2.2.2 Additional test

After the sizing and if prescribed in the DS, the force required to insert gauge A shall be measured. This force shall not exceed 68 N.

3.2.2.3 Gauge pin – Smooth bore for outer contact of connector with socket-centre

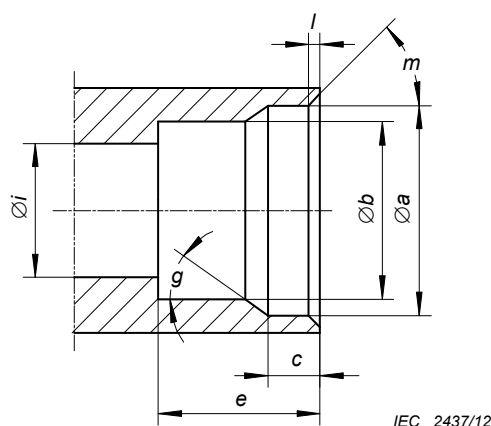


Figure 8 – Gauge pin – Smooth bore for outer contact of connector with socket-centre
(for dimensions and notes, see Table 8)

Table 8 – Gauge pin – Smooth bore for outer contact of connector with socket-centre

Ref	Gauge A (for sizing purposes)		Gauge B (for measurement of retention force for inner conductor) Mass of gauge: (220±20) g		Notes
	mm		mm		
	Min.	Max.	Min.	Max.	
<i>a</i>	3,53	3,68	3,53	3,68	
<i>b</i>	3,13	3,15	3,21	3,23	Note 1
<i>c</i>	0,84	0,94	0,84	0,94	
<i>e</i>	2,74	2,84	2,74	2,84	
<i>g</i>	33°	37°	33°	37°	Note 2
<i>i</i>	—	2,40	—	2,40	
<i>l</i>	0,08	0,20	0,08	0,20	
<i>m</i>	40°	50°	40°	50°	
Material: steel, polished.					
NOTE 1 Surface roughness: $Ra \leq 0,4 \mu\text{m}$, on the cylindrical surface of length <i>c</i> .					
NOTE 2 Surface roughness: $Ra \leq 0,4 \mu\text{m}$, on the slope surface of angle <i>g</i> .					

3.2.2.3.1 Test procedure

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

After this, the outer contact shall be inserted into the gauge B. The outer contact shall retain the gauge in a vertical downward direction.

3.2.2.3.2 Additional test

After the sizing and if prescribed in the DS, the force required to insert the gauge A shall be measured. This force shall not exceed 9 N.

3.3 Dimensions – standard test connectors – grade 0

3.3.1 Connector with pin-centre contact

3.3.1.1 Connector with pin-centre contact – Limited detent and full detent

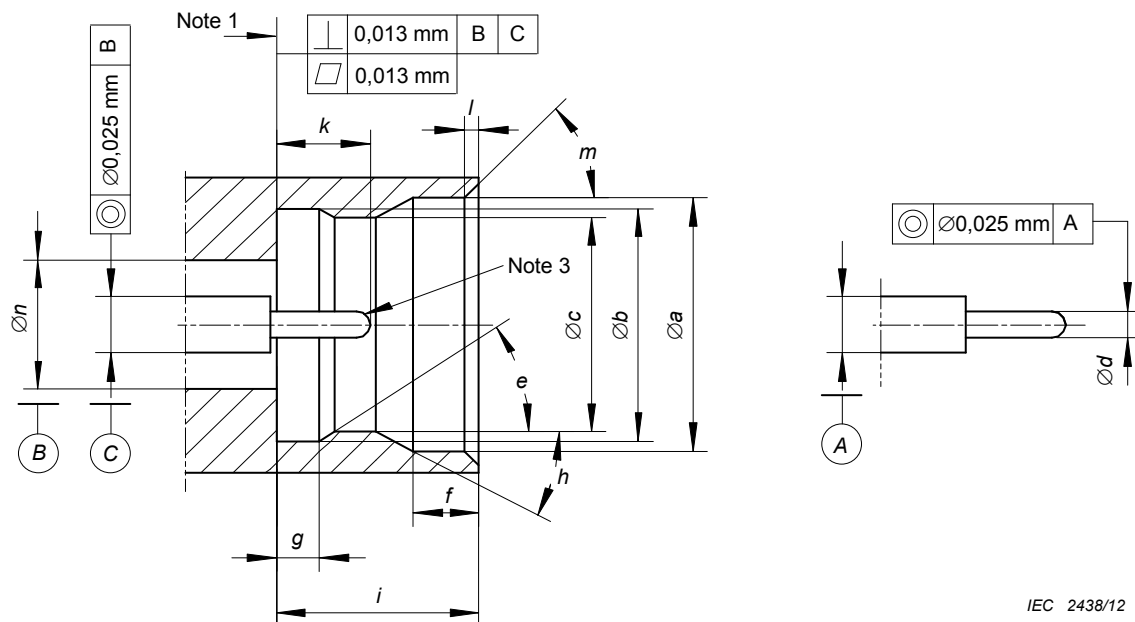
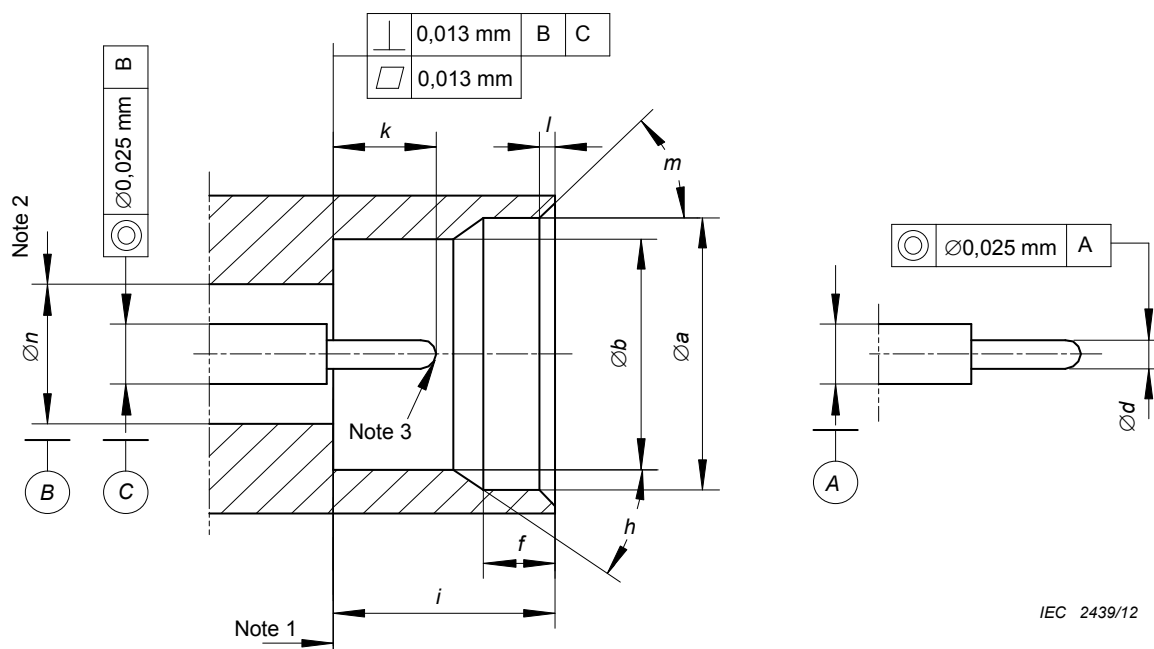


Figure 9 – Connector with pin- centre contact – Limited detent and full detent
(for dimensions and notes, see Table 9)

Table 9 – Dimensions of connector with pin-centre contact – Limited detent and full detent

Ref.	mm		Notes
	Min.	Max.	
a	3,53	3,68	
b	3,15	3,20	
c	3,02	3,07	Limited detent
	2,92	2,97	Full detent
d	0,38	0,41	
e	$30^{\circ} \pm 1^{\circ}$		Angle
f	0,84	0,94	
g	0,52	0,60	
h	$32^{\circ} \pm 1^{\circ}$		Angle
i	2,74	2,84	
k	1,14	1,40	
l	0,08	0,20	
m	40°	50°	Angle
n	—	—	
NOTE 1 Mechanical and electrical reference plane.			
NOTE 2 Diameter is chosen to obtain a characteristic impedance of $(50 \pm 0,5) \Omega$.			
NOTE 3 Spherical or chamfered.			

3.3.1.2 Connector with pin-centre contact – Smooth bore



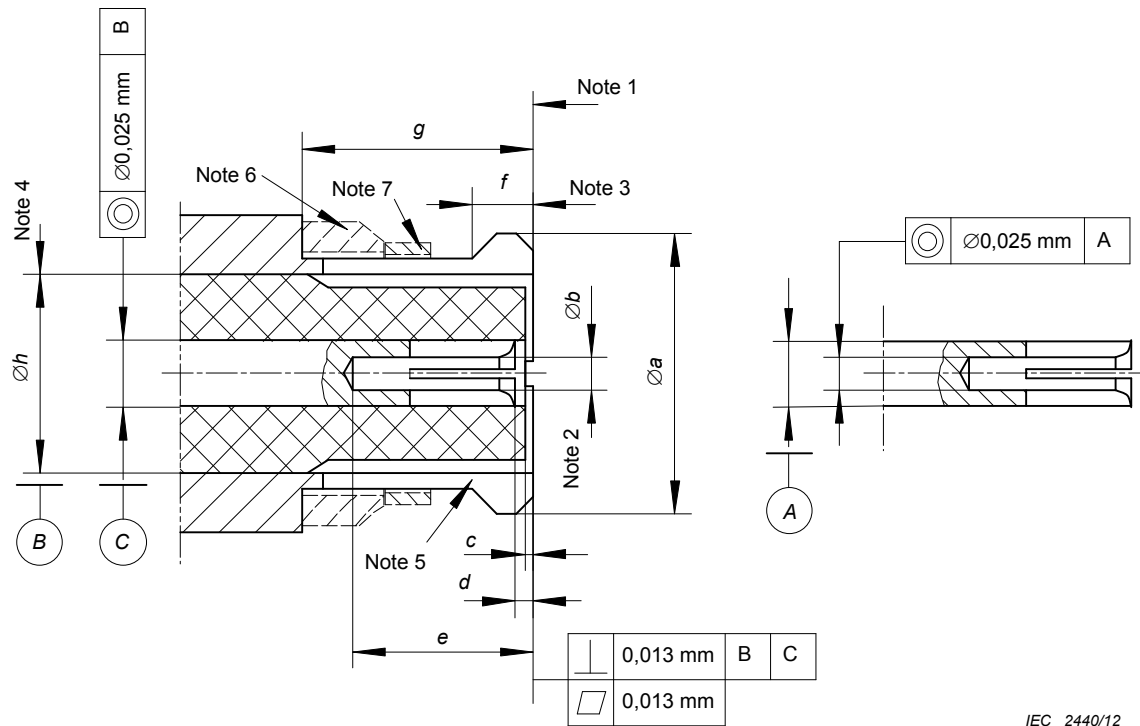
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Figure 10 – Connector with pin- centre contact – Smooth bore
(for dimensions and notes, see Table 10)

Table 10 – Dimensions of connector with pin-centre contact – Smooth bore

Ref.	mm		Notes
	Min.	Max.	
a	3,53	3,68	
b	3,15	3,20	
d	0,38	0,41	
f	0,84	0,94	
h	$32^\circ \pm 1^\circ$		Angle
i	2,74	2,84	
k	1,14	1,40	
l	0,08	0,20	
m	40°	50°	Angle
n	—	—	
NOTE 1 Mechanical and electrical reference plane.			
NOTE 2 Diameter is chosen to obtain a characteristic impedance of $(50 \pm 0,5) \Omega$.			
NOTE 3 Spherical or chamfered.			

3.3.2 Connector with socket-centre contact



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Figure 11 – Connector with socket-centre contact
(for dimensions and notes, see Table 11)

Table 11 – Dimensions of connector with socket-centre contact

Ref.	mm		Notes
	Min.	Max.	
a	—	3,43	
b	—	—	
c	0,00	—	
d	0,00	0,20	
e	1,78	—	
f	0,46	0,64	
g	2,84	—	
h	—	—	

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 Bore diameter and closure to meet electrical and mechanical requirements.

NOTE 3 The form and dimensions of outer conductor to meet mechanical and electrical requirements.

NOTE 4 Diameter is chosen to obtain a characteristic impedance of $(50 \pm 0,5) \Omega$.

NOTE 5 The number and dimension of slots allows to meet mechanical and electrical requirements.

NOTE 6 Anti-rock ring is optional.

NOTE 7 EMI shield is optional.

NOTE 8 To meet electrical requirement.