

INTERNATIONAL STANDARD

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**Radio-frequency connectors –
Part 26: Sectional specification for TNCA series RF coaxial connectors**

**Connecteurs pour fréquences radioélectriques –
Partie 26: Spécification intermédiaire pour les connecteurs coaxiaux RF série
TNCA**

STANDARD PREVIEW
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IEC 61169-26:2013
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RADIO-FREQUENCY CONNECTORS –

**Part 26: Sectional specification for TNCA series
RF coaxial connectors**

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

FDIS	Report on voting
46F/220/FDIS	46F/225/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 parts of the IEC 61169 series, 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

- reconfirmed,
- withdrawn,
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RADIO-FREQUENCY CONNECTORS –

Part 26: Sectional specification for TNCA series 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 TNCA series RF coaxial connectors, with characteristic impedance of 50 Ω , with threaded coupling and operating frequency limit up to 18 GHz, used in wireless, communication, instrument, antenna, test and measurements, radar, 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 TNCA 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).

TNCA connectors are recommended for applications above 11 GHz. TNCA connectors are compatible with TNC connectors as described in the IEC 60169-17 and IEC 60169-26 provided that the dielectric of connector with socket-centre contact does not extend beyond reference plane. However when mated with these connectors, the performances are not ensured.

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NOTE Attention is drawn to the fact that TNCA interface does not utilize overlapping PTFE dielectric for increased voltage breakdown resistance.

2 Normative reference

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

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

3 Mating face and gauge information

3.1 Dimensions – General connectors – Grade 1

3.1.1 Connector with pin-centre contact (see Figure 1)

Metric dimensions are original dimensions.

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

All undimensioned pictorial configurations are for reference purpose only.

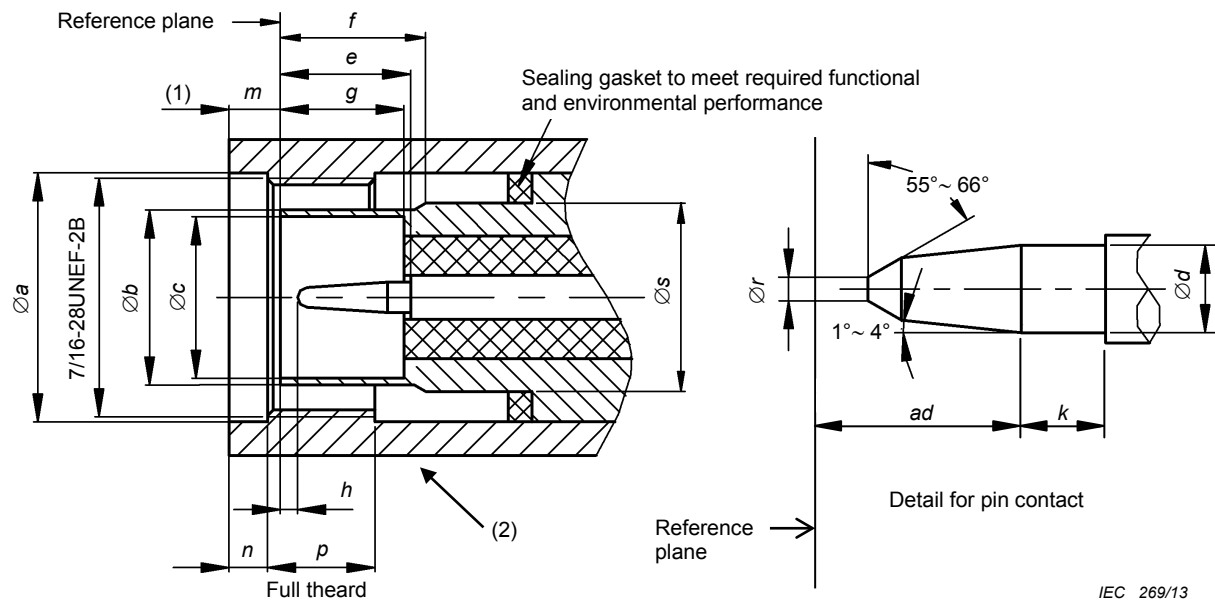


Figure 1 – Connector with pin-centre contact
(for dimensions and key, see Table 1)

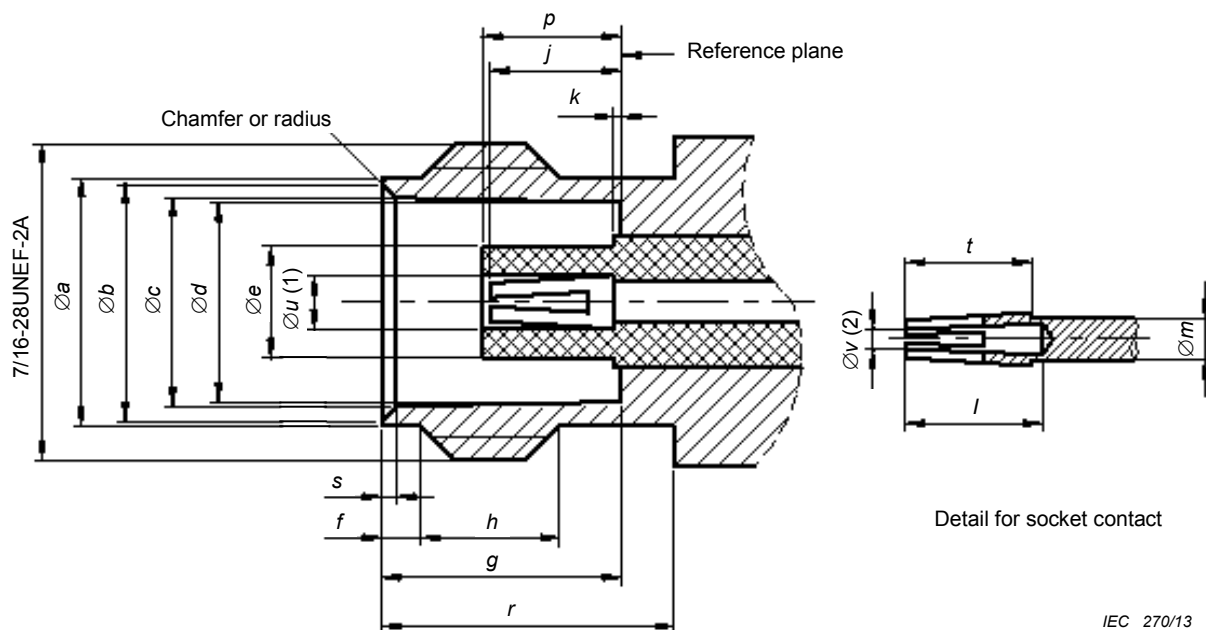
Table 1 – Dimensions of connector with pin-centre contact

Ref.	mm		inch		Additional notes
	Min.	Max.	Min.	Max.	
a	11,18	-	0,440	-	
b	7,98	8,08	0,314	0,318	
c	6,05	6,15	0,238	0,242	
d	1,32	1,37	0,052	0,054	
e	5,28	-	0,208	-	
f	5,38	-	0,212	-	
g	5,28	-	0,208	-	
h	0,08	-	0,003	-	
k	1,98	-	0,078	-	
m	-	1,98	-	0,078	(1)
n	1,60	-	0,063	-	
p	3,96	-	0,156	-	
r	-	0,64	-	0,025	
s	-	8,18	-	0,322	
ad	3,66	3,98	0,144	0,157	

(1) This dimension shows the position with nut biased fully forward.

(2) Three holes 0,69 mm (0,027 inch) minimum diameter equally spaced for safety wiring when required. Location of holes on coupling nut is optional and consistent with electrical/mechanical performance.

3.1.2 Connector with socket-centre contact (see Figure 2)



IEC 270/13

Figure 2 – Connector with socket-centre contact
(for dimensions and key, see Table 2)

Table 2 – Dimensions of connector with socket-centre contact

Ref.	mm		inch		Additional notes
	Min.	Max.	Min.	Max.	
a	9,60	9,68	0,378	0,381	
b	8,79	9,04	0,346	0,356	
c	8,31	8,46	0,327	0,333	
d	8,10	8,15	0,319	0,321	
e	4,62	4,72	0,182	0,186	
f	1,73	2,24	0,068	0,088	
g	8,31	8,51	0,327	0,335	
h	4,75	-	0,187	-	
j	5,03	5,28	0,198	0,208	
k	-	0,15	-	0,006	
l	4,95	-	0,195	-	
m	2,13	2,21	0,084	0,087	
p	5,03	5,28	0,198	0,208	
r	10,52	-	0,414	-	
s	0,38	0,76	0,015	0,030	
t	4,57	4,98	0,180	0,196	
u	-	2,34	-	0,092	(1)
v					(2)

(1) Diameter *u* is the ID of dielectric based on the assumption that the dielectric used has a dielectric constant of 2,02.

(2) Design for slotting is optional. It is chosen to meet electrical and mechanical requirements, when mated with a 1,32 mm (0,052 in) ~ 1,37 mm (0,054 in) diameter pin.

3.2 Gauges

3.2.1 Gauge pins for socket-centre contact (see Figure 3)

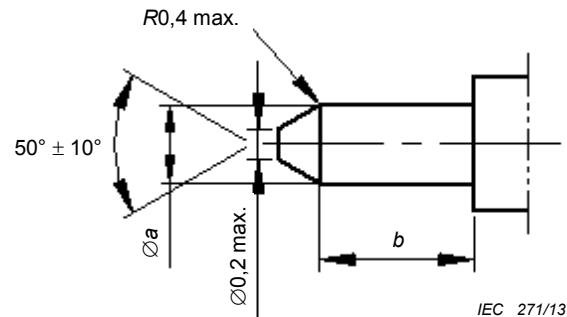


Figure 3 – Gauge pins for socket-centre contact
(for dimensions, see Table 3)

Table 3 – Dimensions of gauge pins for socket-centre contact

	Gauge A Maximum material for sizing purpose				Gauge B Minimum material for measurement of retention force			
	mm		in		mm		in	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
a	1,450	1,455	0,057 1	0,057 3	1,315	1,320	0,051 8	0,052 0
b	3,18	3,50	0,125 2	0,137 8	3,18	3,50	0,125 2	0,137 8
Material: steel, polished.								
Surface roughness: $Ra \leq 0,4 \mu\text{m}$ on the cylindrical surface of length b and $R0,4$.								

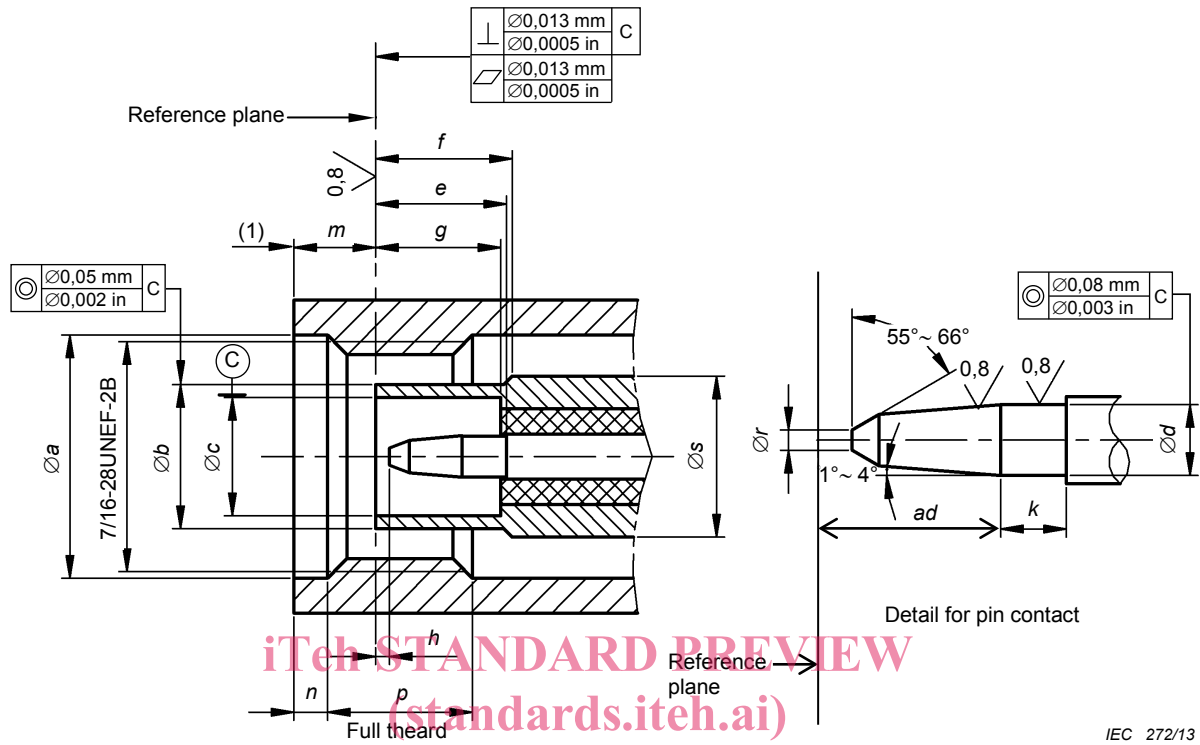
3.2.2 Test procedure

The gauge A shall be inserted into the socket-centre contact one time with a minimum depth of 3,18 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 the socket-centre contact. The contact shall retain the mass of the gauge in a vertical downward position. The test shall be carried out on connector when the socket-centre contact is not removed.

3.3 Dimensions – Standard test connectors – Grade 0

3.3.1 Connector with pin-centre contact (see Figure 4)



IEC 272/13

IEC 61169-26:2013
 Figure 4 – Connector with pin-centre contact
 (for dimensions and key see Table 4)

Table 4 – Dimensions of connector with pin-centre contact

Ref.	mm		inch		Additional notes
	Min.	Max.	Min.	Max.	
a	11,18	-	0,440	-	
b	8,06	8,08	0,317 3	0,318 1	
c	6,07	6,12	0,239	0,241	
d	1,34	1,37	0,053	0,054	
e	5,28	-	0,208	-	
f	5,38	-	0,212	-	
g	5,28	-	0,208	-	
h	0,08	1,02	0,003	0,040	
k	1,98	-	0,078	-	
m	-	1,98	-	0,078	(1)
n	1,60	-	0,063	-	
p	3,96	-	0,156	-	
r	-	0,64	-	0,025	
s	-	8,18	-	0,322	
ad	3,66	3,98	0,144	0,157	

(1) This dimension shows the position with nut biased fully forward.

3.3.2 Connector with socket-centre contact (see Figure 5)

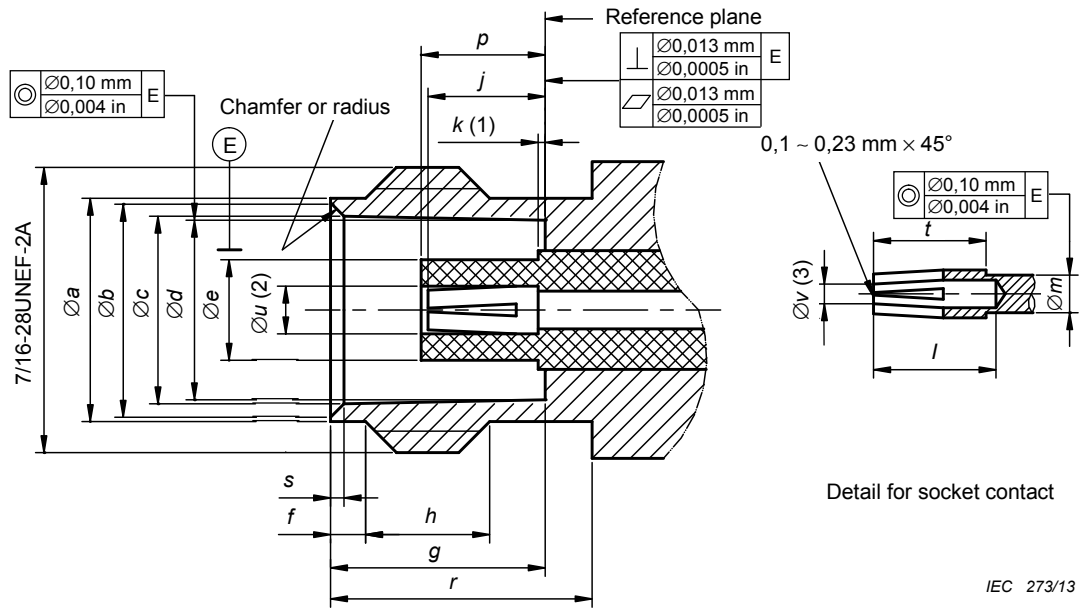


Figure 5 – Connector with socket-centre contact
(for dimensions and key, see Table 5)

Table 5 – Dimensions of connector with socket-centre contact
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Ref.	mm		inch		Additional notes
	Min.	Max.	Min.	Max.	
a	9,60	9,68	0,378	0,381	
b	8,79	9,04	0,346	0,356	
c	8,31	8,46	0,327	0,333	
d	8,10	8,15	0,319	0,321	
e	4,62	4,72	0,182	0,186	
f	1,73	2,24	0,068	0,088	
g	8,31	8,51	0,327	0,335	
h	4,73	-	0,187	-	
j	5,03	5,28	0,198	0,208	
k	-	0,15	-	0,006	(1)
l	4,95	-	0,195	-	
m	2,18	2,21	0,086	0,087	
p	5,18	5,28	0,204	0,208	
r	10,52	-	0,414	-	
s	0,38	0,76	0,015	0,030	
t	4,57	4,98	0,180	0,196	
u	2,24	2,34	0,088	0,092	(2)
v	1,38	1,41	0,054 3	0,055 5	(3)

(1) Dimension k applies to that portion (if applicable) of the dielectric which protrudes beyond the reference plane.

(2) Diameter u is the ID of dielectric based on the assumption that the dielectric used has a dielectric constant of 2,02.

(3) Design for slotting is optional. It is chosen to meet electrical and mechanical requirements, when mated with a 1,32 mm (0,052 in) ~ 1,37 mm (0,054 in) contact.

4 Quality assessment procedure

4.1 General

The following subclauses provide recommended rating, performance and test conditions to be considered when writing a detail specification. They also provide an appropriate schedule of tests with minimum levels of conformance inspection sampling, together with the pro-forma blank detail specification (BDS) and instructions for the preparation of a detail specification.

4.2 Rating and characteristics (see Clause 6 of IEC 61169-1:1992)

The values indicated below are recommended for TNCA series RF connectors and are given for the writer of the detail specification. They are applicable for the condition when the connectors are fully mated.

Certain tests are listed without any recommended values being given. Test requirements are shown in Tables 8 and 9 and when such tests are required, appropriate values shall be entered in the detail specification at the discretion of the specification writer.

Climatic categories are given in Table 6 while ratings and characteristics are given in Table 7.

Table 6 – Preferred climatic categories (see IEC 60068-1)

Category designation *	Letter	Temperature range °C	Damp heat steady state
40/85/21	A	-40 to +85	21 days
55/155/56	B	-55 to +155	56 days

* To be included in the IEC type designation. [IEC 61169-26:2013](#)

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Table 7 – Ratings and characteristics

Ratings and characteristics	IEC 61169-1:1992 Subclause	Values	Remarks, deviations from standard test method
Electrical			
Nominal impedance		50 Ω	
Frequency range		Up to 18 GHz	Or upper frequency limit of cable
Reflection factor ^a Grade 1 connectors – For semi-rigid and semi-flexible cable – straight styles – right-angle styles – For flexible cable – straight styles – right-angle styles – component mounting styles – solder bucket and PCB mounting styles	9.2.1	0,05 GHz to 18 GHz 0,048+0,0035f, max. See DS See DS See DS See DS See DS	
Centre contact resistance ^b – initial – after conditioning	9.2.3	$\leq 1,5 \text{ m}\Omega$ $\leq 3,0 \text{ m}\Omega$	
Outer conductor resistance ^b – initial – after conditioning	9.2.3 IEC 61169-26:2013	$\leq 0,4 \text{ m}\Omega$ $\leq 1,2 \text{ m}\Omega$	
Insulation resistance – initial – after conditioning	9.2.5	$\geq 5\,000 \text{ M}\Omega$ $\geq 200 \text{ M}\Omega$	
Proof voltage at sea level ^{c, d}	9.2.6	1 500 V	
Proof voltage at 4,4 kPa ^{c, d}	9.2.6	375 V	4,4 kPa approximately equivalent to 20 km
Environmental test voltage at sea level ^{c, d}	9.2.6	500 V	
Environmental test voltage at 4,4 kPa ^{c, d}	9.2.6	125 V	4,4 kPa approximately equivalent to 20 km
Screening effectiveness (straight cabled connectors only) ^e	9.2.8	$\geq 90 \text{ dB}$ at 1 GHz	
Discharge test (corona effect)	9.2.9	375 V	Extinction voltage at 4,4 kPa
Mechanical			
Gauge retention force (resilient contacts) – centre	9.3.4	$\geq 0,6 \text{ N}$	
Centre contact captivation – axial force – axial torque	9.3.5	26,7 N na ^f	Conform with interface