

INTERNATIONAL STANDARD



**Radio-frequency connectors –
Part 24: Sectional specification – Radio frequency coaxial connectors with screw
coupling, typically for use in 75 Ω cable networks (type F)**

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CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Interface dimensions	6
4.1 Dimensions	6
4.1.1 Connector “F” type female socket (indoor) physical dimensions	7
4.1.2 Connector “F” type male plug (indoor) physical dimensions	8
4.2 Mechanical gauges	10
4.2.1 Mating socket centre conductor acceptance diameter test	10
4.2.2 Mating port centre conductor acceptance electrical test	11
4.2.3 Reference plane electrical contact	11
5 Quality assessment procedures	12
5.1 General	12
5.2 Ratings and characteristics	12
5.3 Environmental characteristics for outdoor sockets (see Annex A)	13
5.4 Test schedule and inspection requirements	14
5.4.1 Acceptance tests	14
5.4.2 Periodic tests	15
5.5 Procedures	17
5.5.1 Quality conformance inspection	17
5.5.2 Qualification approval and its maintenance	17
6 Instructions for preparation of detail specifications	17
6.1 General	17
Identification of the detail specification	17
6.2 Identification of the component	17
6.3 Performance	18
6.4 Marking, ordering information and related matters	18
6.5 Selection of tests, test conditions and severities	18
6.6 Blank detail specification pro-forma for type F connector	18
Annex A (informative) Recommended outdoor “F” type socket / Plug physical dimensions	25
A.1 Outdoor “F” type female socket	25
A.2 Outdoor “F” type male plug	26
Annex B (informative) Recommended satellite broadcasting “F” type socket / Plug physical dimensions	28
B.1 Satellite broadcasting “F” type female socket	28
B.2 Satellite broadcasting “F” type male plug	28
Figure 1 – Connector “F” type female socket (indoor) (for dimensions, see Table 1)	7
Figure 2 – Connector “F” type male plug (indoor) (for dimensions, see Table 2)	9
Figure 3 – Gauge for the centre socket conductor	11
Figure A.1 – Outdoor female “F” socket (for dimensions, see Table A.1)	25
Figure A.2 – Outdoor “F” type male plug (for dimensions, see Table A.2)	26
Figure B.1 – Satellite broadcasting “F” socket (for dimensions, see Table B.1)	28

Figure B.2 – Satellite broadcasting “F” type male plug (for dimensions, see Table B.2).....	29
Table 1 – Connector “F” type female socket (indoor).....	8
Table 2 – Connector “F” type male plug (indoor)	10
Table 3 – Test sequence for the centre socket conductor.....	11
Table 4 – Ratings and characteristics	13
Table 5 – Acceptance tests	15
Table 6 – Periodic tests	16
Table A.1 – Outdoor female “F” socket dimensions	26
Table A.2 – Outdoor “F” type male plug dimensions	27
Table B.1 – Satellite broadcasting “F” type socket dimensions	28
Table B.2 – Satellite broadcasting “F” type male plug dimensions	29

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RADIO-FREQUENCY CONNECTORS –

Part 24: Sectional specification – Radio frequency coaxial connectors with screw coupling, typically for use in 75 Ω cable networks (type F)

FOREWORD

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International Standard IEC 61169-24 has been prepared by subcommittee 46F: RF and microwave passive components, of IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories.

This third edition cancels and replaces the second edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition: all drawings have been reworked and improved to allow frequency extension up to 3 GHz.

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

CDV	Report on voting
46F/417/CDV	46F/436A/RVC

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.

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 document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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RADIO-FREQUENCY CONNECTORS –

Part 24: Sectional specification – Radio frequency coaxial connectors with screw coupling, typically for use in 75 Ω cable networks (type F)

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 RF coaxial connectors with screw coupling, typically for use in 75 Ω cable networks (type F).

It describes the interface dimensions with gauging information and the mandatory tests selected from IEC 61169-1, applicable to all DS relating to type F connectors.

This specification indicates the recommended performance characteristics to be considered when writing a DS and covers test schedules and inspection requirements.

NOTE Millimetres are original dimensions. All undimensioned pictorial configurations are for reference purposes only.

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 61169-1:1992/2013, *Radio-frequency connectors – Part 1: Generic specification – General requirements and measuring methods*

~~Amendment 1 (1996)~~

~~Amendment 2 (1997)~~

EN 60068-2-52, *Environmental testing – Test methods. Tests. Test Kb. Salt mist, cyclic (sodium chloride solution)*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

4 Interface dimensions

4.1 Dimensions

~~Millimetres are original dimensions.~~

~~All undimensioned pictorial configurations are for reference purposes only.~~

4.1.1 Connector “F” type female socket (indoor) physical dimensions

Figure 1 shows a connector “F” type female socket (indoor).

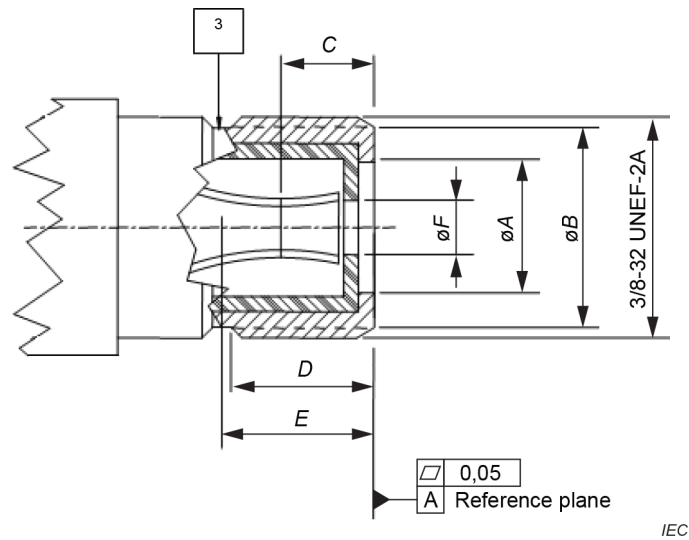


Figure 1 – Connector “F” type female socket (indoor)
(for dimensions, see Table 1)

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Table 1 – Connector “F” type female socket (indoor)

Description	Reference	mm		inch		Note
		Min.	Max.	Min.	Max.	
Reference plane opening inner diameter	A	3,90	7,4	0,154	0,291	2
Reference plane outer diameter	B	7,50	8,50	0,295	0,335	
Positive contact point depth	C	-	4,70	-	0,185	4
Port minimum full thread length	D	7,50	-	0,295	--	3
Minimum center contact depth	E	9,00	-	0,354	-	5
Center conductor guide inner diameter	F	1,2	1,5	0,047	0,059	
NOTE 1—Drawing not to scale.						
NOTE 2—No protrusion of the dielectric beyond the reference plane is permitted.						
NOTE 3—Thread relief not to exceed two full threads.						
NOTE 4—Recommended mating male center conductor diameter: 0,025 in (0,64 mm) min. to 0,042 in. (1,07 mm) max.						
NOTE 5—Center contact geometry optional.						

Description	Reference	mm		Remarks
		Min.	Max.	
Reference plane opening inner diameter	A	3,90	7,4	1, 4
Reference plane outer diameter	B	7,50	8,50	
Positive contact point depth	C	-	4,70	2
Port minimum full thread length	D	7,50	-	3
Minimum center contact depth	E	9,00	-	4
Center conductor guide inner diameter	F	1,2	1,5	
¹ No protrusion of the dielectric beyond the reference plane is permitted. ² Recommended mating male center conductor diameter: 0,025 in (0,64 mm) min. to 0,042 in. (1,07 mm) max. ³ Thread relief not to exceed two full threads. ⁴ Center contact geometry optional.				

4.1.2 Connector “F” type male plug (indoor) physical dimensions

Figure 2 shows a connector “F” type male plug (indoor).

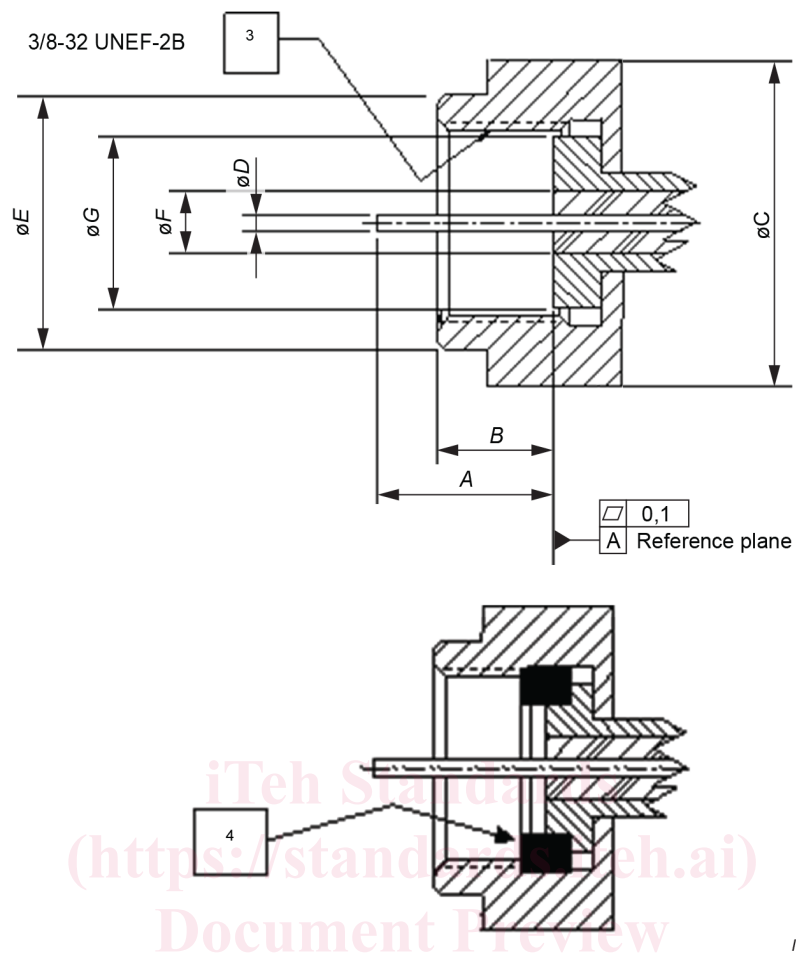


Figure 2 – Connector “F” type male plug (indoor)
(for dimensions, see Table 2)

Table 2 – Connector “F” type male plug (indoor)

Description	Reference	mm		inch		Note
		Min.	Max.	Min.	Max.	
Inner conductor length	A	6,35	8,63	0,250	0,340	
Length of nut	B	4,00	7,29	0,157	0,287	2
Maximum envelope dimension	C	-	16,61	-	0,654	
Inner conductor diameter	D	0,64	1,13	0,025	0,044	
Sealing surface diameter for seal ring	E	10,41	11,04	0,410	0,435	
Reference plane opening inner diameter	F	-	5,84	-	0,230	2
Reference plane opening outer diameter	G	7,88		0,310		

NOTE 1—Drawing not to scale.

NOTE 2—No protrusion of the dielectric beyond the reference plane is permitted.

NOTE 3—The mating of the F female socket to the reference plane is not impeded.

NOTE 4—Gasket seal optional, if used, does not avoid to meet all performance requirements.

Description	Reference	mm		Remarks
		Min.	Max.	
Inner conductor length	A	6,35	8,63	
Length of nut	B	4,00	7,29	1,2
Maximum envelope dimension	C	-	16,61	
Inner conductor diameter	D	0,64	1,13	
Sealing surface diameter for seal ring	E	10,41	11,04	
Reference plane opening inner diameter	F	-	5,84	1, 2
Reference plane opening outer diameter	G	7,88		

1 No protrusion of the dielectric beyond the reference plane is permitted.

2 The mating of the F female socket to the reference plane is not impeded.

3 Gasket seal optional, if used, does not avoid to meet all performance requirements.

4.2 Mechanical gauges

~~Millimetres are original dimensions.~~

~~All undimensioned pictorial configurations are for reference purposes only.~~

4.2.1 Mating socket centre conductor acceptance diameter test

In order to verify that the centre female contact of the socket does not suffer from mechanical deformation when mated with the full range of indicated inner conductor diameters, a test has been devised. This test measures the force required to insert and withdraw a selection of precision test pins into and out of the “F” female socket under test.

~~NOTE—Retention of the inner conductor should be by means of pressure exerted by the conductive centre female contact, not by means of any other non-conductive insert within the reference plane opening.~~

The test apparatus should be so designed as to enable accurate alignment of the “F” female socket under test with the precision test pin. The apparatus should hold either the socket or the test pin in a fixed position, and the moving part of the apparatus should be fitted with an instrument capable of measuring the insertion and withdrawal force.

Using the test sequence shown below, the insertion and withdrawal force shall be measured and recorded in newtons.

Figure 3 shows a gauge for the centre socket conductor.

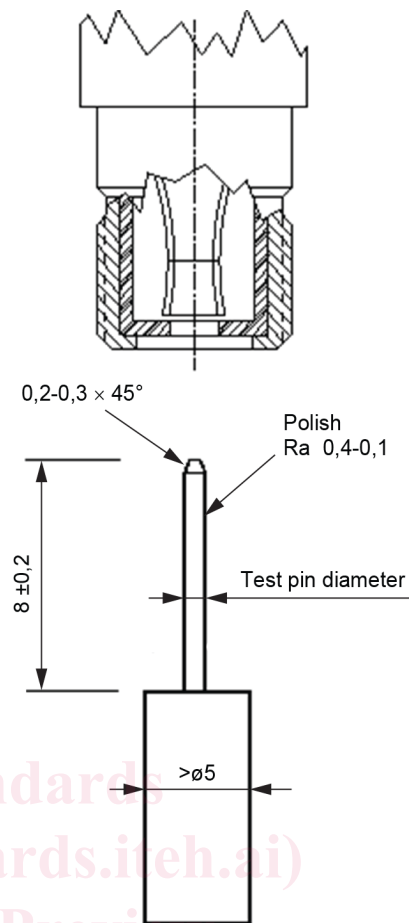


Figure 3 – Gauge for the centre socket conductor

Table 3 – Test sequence for the centre socket conductor

Test sequence	1 st test	2 nd test	3 rd test	4 th test	5 th test	6 th test
Test pin diameter	0,635 ± 0,005 mm	0,850 ± 0,005 mm	1,136 ± 0,005 mm	0,635 ± 0,005 mm	1,136 ± 0,005 mm	0,635 ± 0,005 mm

The insertion force required to insert the test pin into the socket centre female contact shall not exceed 20 N under all circumstances.

The withdrawal force required to withdraw the test pin from the socket centre female contact shall be a minimum of 0,3 N under all circumstances.

4.2.2 Mating port centre conductor acceptance electrical test

After completion of the mechanical tests described in 4.2.1, the centre conductor contact resistance, when re-mated with a male “F” plug whose centre conductor diameter is 0,635 mm, shall not exceed 10 mΩ with an applied test ampere rate of 1 A.

4.2.3 Reference plane electrical contact

The electrical contact shall be made by the mating of the reference plane face of the “F” female socket with the mating face of the “F” male plug and not by the threads alone.

5 Quality assessment procedures

5.1 General

The following subclauses provide recommended ratings, performance and test conditions to be considered when writing a detail specification (DS). They also provide an appropriate schedule of tests with minimum levels of conformance inspection.

5.2 Ratings and characteristics

The RF connectors defined in this document are designed for use with a variety of flexible and semi-rigid coaxial cables and in microwave integrated circuits and similar uncabled applications.

Rating and characteristics are given in Table 4.

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