

Multiport Handbook

2021

Rev. 2023-04-04



Spectrum
Elektrotechnik GmbH

when Quality is needed

80905 Munich, Germany

Telephone: +49-89-3548-040

WWW.SPECTRUM-ET.COM

P.O. Box 450533

Facsimile: +49-89-3548-0490

Email: sales@spectrum-et.com

General Information



The Company: Spectrum Elektrotechnik GmbH was founded in 1981 and has become a leading supplier of state-of-the-art components used in RF and microwave technology, including connectors, adapters, cable assemblies, phase shifters, couplers, gain amplitude equalizers, terminations, and calibration kits. In addition, a number of complex and integrated components have been engineered and manufactured for specialized programs and various customers' special needs. Throughout the world, Spectrum Elektrotechnik GmbH has established a reputation as a design, development, and manufacturing center. The company has attained recognition for setting standards, introducing new ideas into the field, and for its leadership in cutting-edge technologies. The Products: Spectrum's products are used in many commercial systems including cellular applications, radios, SatCom/VSAT, satellites, space applications, test centers, and wireless communication. Spectrum's products are also used in various defense applications including airborne radars, electronic intelligence, electronic warfare, jamming systems, and missile guidance. Wherever RF or microwave expertise and advanced manufacturing technologies are needed, you will find Spectrum Elektrotechnik GmbH.

www.spectrum-et.com

Spectrum Elektrotechnik GmbH is a leading manufacturer of RF and Microwave Components in the Frequency Range of DC to 71 GHz. The products are published in eight individual catalogs, showing detailed information and comprehensive data.

- Adapters**, DC to 71 GHz, 50 Ohms
 - Coaxial Adapters (In Series and Between Series)
 - High Power Adapters
 - Push-On Adapters
 - Waveguide to Coax Adapters, Rectangular and Double Ridge
- Cable Assemblies**, DC to 71 GHz, 50 Ohms
 - ANA Test Cables
 - Flexible Cable Assemblies
 - Coaxial Delay Lines
 - Commercial Cable Assemblies
 - HandyForm Cable Assemblies
 - High Performance
 - Interchangeable Connector Assemblies
 - Multiport Assemblies, short overview
 - Phase matched Assemblies
 - Phase King Assemblies
 - Phase stable Assemblies
 - Semi Rigid Cable Assemblies
 - Spectrum Flex Assemblies
 - Connector Outline Drawings
 - General Information
- Circulators & Isolators**
 - Connectorized Isolators and Circulators
 - Drop In Isolators and Circulators
 - Lumped Design Isolators
- Connectors**, DC to 71 GHz, 50 Ohms
 - Blind Mate Connectors
 - Coaxial Connectors for Flexible Canle
 - Coaxial Connectors for Semi Rigid Cable
 - High Power Connectors
 - Multi Pin / Multi Port Connectors
 - Push-On Connectors**
 - Stripline Connectors
- Multiport Connectors and Assemblies**, DC to 65 GHz
 - Circular Connectors, SQ-, TQ-, IQ-, BQ-, CQ-Series
 - Rectangular Connectors, RQ-Series,
- Phase Adjusters**
 - DC to 2 GHz
 - DC to 12 GHz
 - DC to 18 GHz
 - DC to 26 GHz
 - DC to 40 GHz
 - DC to 50 GHz
 - DC to 63 GHz**
- Product Portfolio**
 - A Shortt Form Catalog showing a product overview
- Quick Connections**, 50 Ohms, DC to 65 GHz
 - Blind Mate Connectors
 - Multi Coax Connections, DC to 65 GHz, short overview
 - SQ-, TQ-, IQ-, BQ-, CQ-, RQ-Series,
 - Push - On Adapters
 - Push - On Connectors
 - Push - On Cable Assemblies
- Test Necessities and Accessories**, DC to 65 GHz, 50 Ohms
 - ANA Cable Assemblies
 - Calibration Kits
 - Interface Gauges
 - LRL, TRL Calibration and Verification Kits
 - Torque Wrenches and Tools
 - Terminations

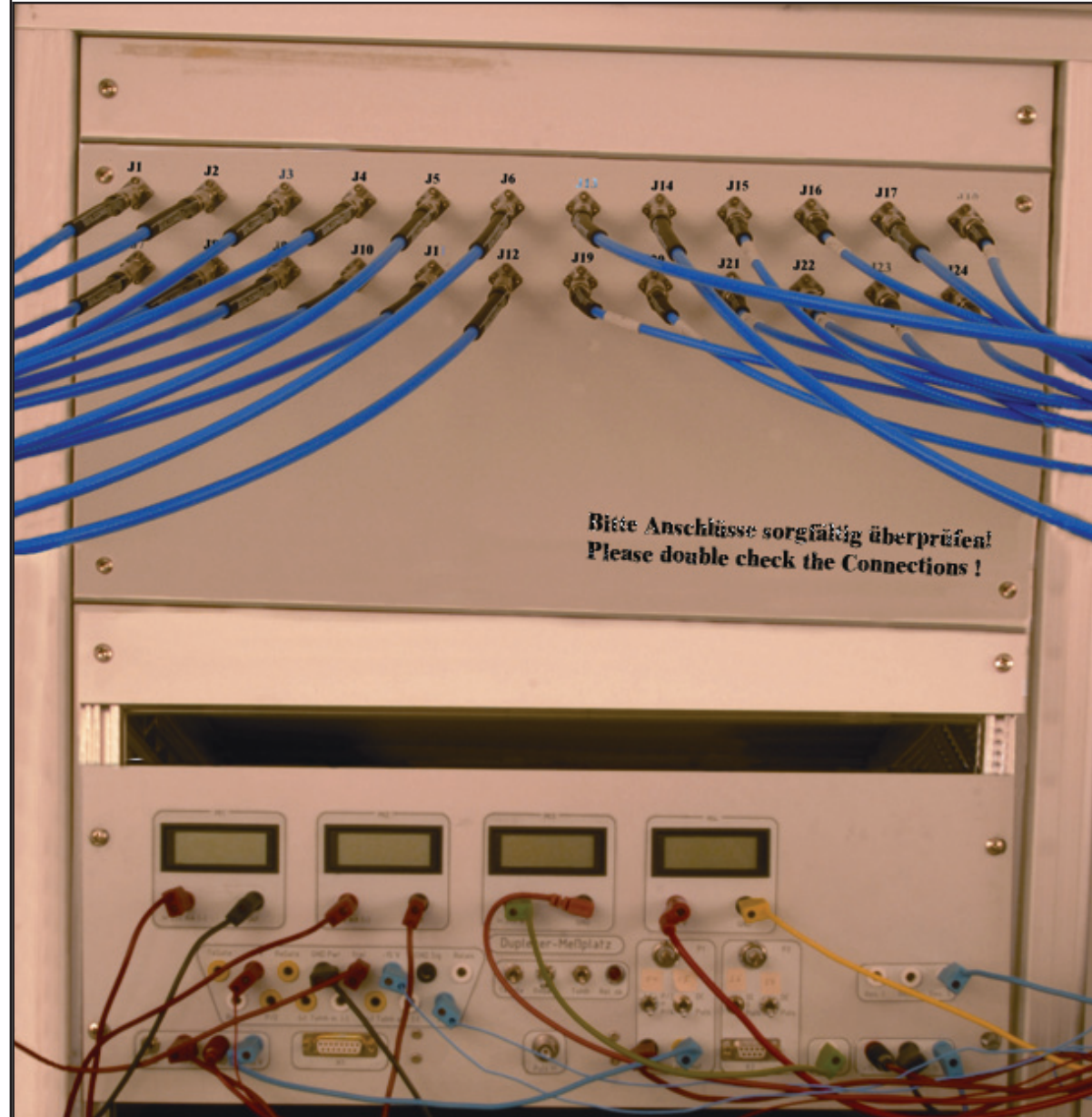
Contents



Description	Page No.	Description	Page No.
AQ-Series, Multiport Adapter, using 10 connections	22	High Performance Cables, Type 677	121
AQ-Series, Multiport Adapter, using 37 connections	24	High Performance Cables, Type 89F Spectrum-Flex	117
Cable Assemblies	131	Inserts, Q24-, DC-24 GHz	80
Catalog overview	139	Inserts, Q24-Inserts, DC-24 GHz Specification	76
Circ. Backparts of Size 21Shells	58	Inserts, What is an Insert	74
Circ. Backparts of Size 25Shells	59	Inserts, X40 Inserts, DC-40 GHz, Specification	78
Circ. BQ-Series Connector Features	32	Inserts, X40-, DC-40 GHz	81
Circ. Connectivity TQ-IQ & BQ-CQ Overview	56	Keying for SQ-, TQ-, IQ- & BQ-	47
Circ. CQ-Series Connector Features	36	MIL-DTL-38999 Series I, Panel Cutout Dim.	49
Circ. HQ-Series Connector Features, Hermetics	26	MQ Spezifications	90
Circ. IQ-Series Connector Features	28	Multiport Code	101
Circ. MIL-DTL-38999 Series I Dimensions	48	Multiport, Circular, Overview	4
Circ. MIL-DTL-38999 Series III Dim.	52	Multiport, Rectangular, Overview	8
Circ. SQ-8, Traditional Connector	9	Our other Products	125
Circ. TQ/IQ & BQ/CQ Series I and III Gen. Info	38	Phase Adjusters	128
Circ. TQ/IQ-04, Size 21, 4 Cables, Series III	40	Push-On Connectors	126
Circ. TQ/IQ-04, Size 25, 4 Cables, Series III	42	Q-Inserts, Details	82
Circ. TQ/IQ-07, Size 25, 7 Cables, Series III	43	Rectangular Honey Comb, 8 Cables	68
Circ. TQ/IQ-08, Size 21, 8 Cables, Series III	41	Rectangular Multi, Overview	60
Circ. TQ/IQ-09, Size 13, 9 Cables, Series III	20	Rectangular RQ-05, 5 Cables	72
Circ. TQ/IQ-10, Size 25, 10 Cables, Series III	44	Rectangular RQ-07, 7 Cables	70
Circ. TQ/IQ-12, Size 25, 12 Cables, Series III	45	Rectangular RQ23-DC26	62
Circ. TQ/IQ-19, Size 25, 19 Cables, Series III	21	Rectangular RQ80-DC120; 80 x RF; 120 x Signal	73
Circ. TQ/IQ-19, Size 25, 19 Cables, Series III	46	RF Measurement Chart	124
Circ. TQ-Series Features	14	Sales Representatives Asia	135
Commercial Cable 178 B/U	123	Sales Representatives Europe	132
Commercial Cable 316 B/U	122	Sales Representatives USA	134
Connector Selection Chart	105	Size 16 Contacts	92
Connector Selection vs. Frequ.	104	SMA PUSH-ON Insert Specifications	84
Design Table for Multiports	51,55,94	SMP Inserts Specifications	86
General Information Multiports	2	SMPM Inserts Specifications	88
Hermetically Sealed Adapters	130	Specifying the Harness Part Number	100
High Performance Cables, Type 100	119	Specifying the individual Cable Assembly	98
High Performance Cables, Type 11	112	Specifying the proper Multiport Shell	96
High Performance Cables, Type 141	120	Table of Build your own Multiport	94
High Performance Cables, Type 39	113	Table of Contents	3
High Performance Cables, Type 39S	114	Terms and Conditions	138
High Performance Cables, Type 43	115	Warrenty	138
High Performance Cables, Type 47F Spectrum-Flex	116	WG-Coax Adapters	129

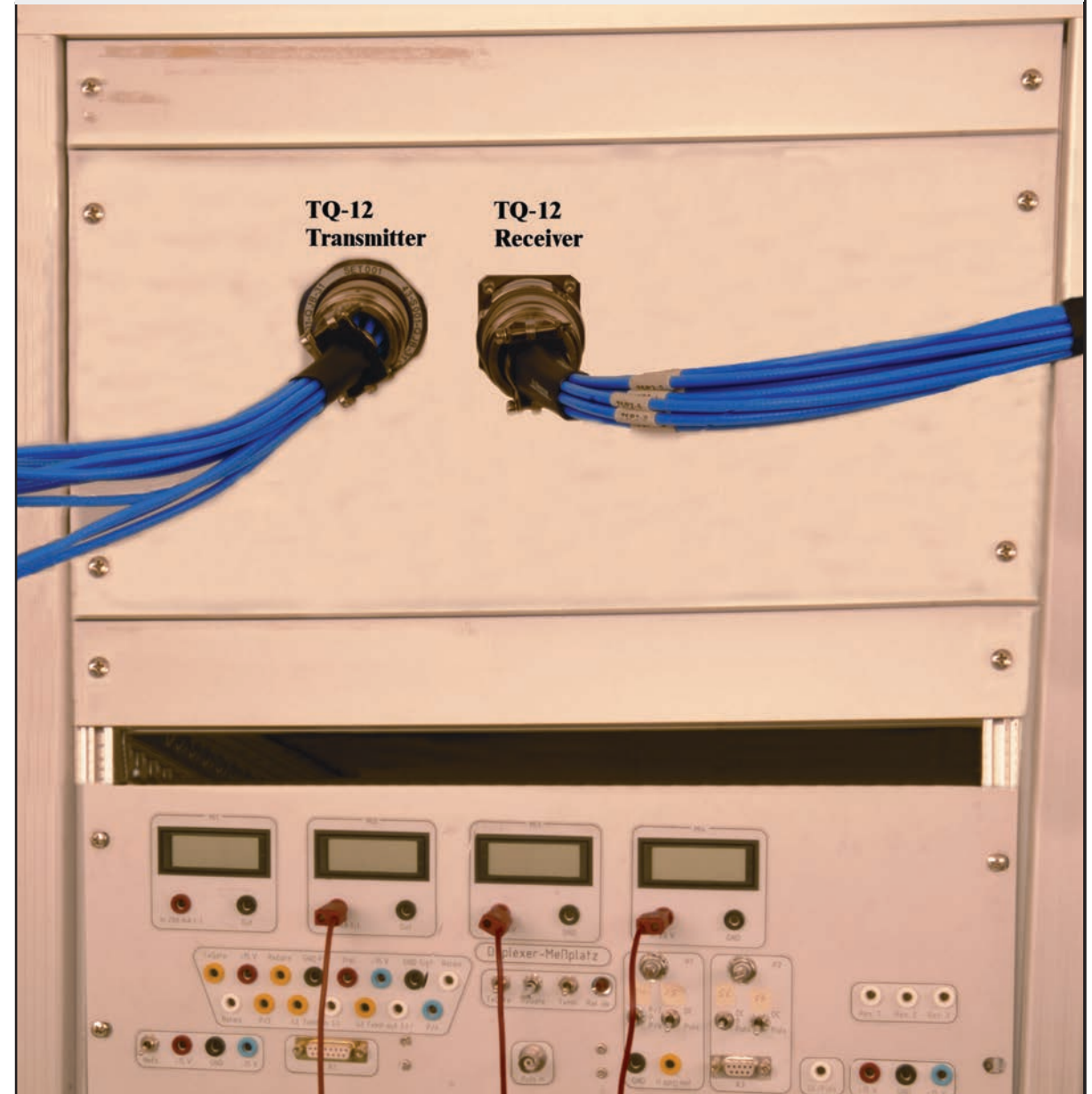


The Problem: In various applications many coaxial microwave links have to be connected and disconnected. This means threading and unthreading, torquing and untorquing. Very dense packaging is not possible, as there is still room needed for manual threading and for the use of a torque wrench. All connectors in helicopters and aircrafts usually have to be safely secured, e.g. by wiring the coupling nuts of the connectors, using wire holes, a time-consuming process. Threading and torquing, unthreading and untorquing 24 connections, a time consuming process, and lots of space is needed.



The Solution: Spectrum's Multipin Connectors are available with four (4), seven (7), eight (8), ten (10), twelve (12) and twenty-three (23) coaxial inserts (terminating the coaxial cable assemblies) at the Multipin end, connecting all the coaxial cable assemblies at once and in seconds with no need of a torque wrench, no need for safety wires and using minimum space.

24 cable assemblies in 2 connectors, safely connected and disconnected within seconds.





Circular Multiports

The traditional RF Multipin Connector SQ-8, per MIL-DTL-38999, Series III

The traditional model is the SQ-8 Multipin Connector using the circular size 21 shell per MIL-DTL-38999 Series III, supplied with eight (8) coaxial microwave inserts, terminating always one end of each cable assembly. As the inserts are spring loaded and use a bayonet catch, the cable assemblies can be inserted and replaced in seconds. The inserts were designed for Spectrum's Type 11 and Type 43 cables. The SQ-8 does not mate with the TQ-, IQ-, BQ or CQ-Series.



RF Multipin Connectors TQ- & IQ- Series, per MIL-DTL-38999, Series III

The new TQ-Series Multipin Connectors are using the circular size 21 shell per MIL-DTL-38999 Series III with four (4) or eight (8) inserts and size 25 with seven (7), ten (10) or twelve (12) inserts allowing the use of four different cables, Type 11, Type 43, Type 100 and Type 141, depending on flexibility and/or loss needed.



The new IQ-Series Multipin Connectors are almost identical with the TQ-series, with one major difference: The outer conductors of the coaxial lines and the connector shell do not use the same ground. So the coaxial lines can be guided in a metal hose, netmesh or armor, for lightning protection. TQ- and IQ-Series do mate with each other.



Circular Multiports

RF Multipin Connectors BQ- & CQ- Series, per MIL-DTL-38999, Series I

The new BQ-Series Multipin Connectors are almost identical with the TQ-Series. The only difference is in the shell. The BQ-Series do use the Bayonet catch shell per MIL-DTL-38999 Series I instead of the thread on shell per MIL-DTL-38999 Series III.



The new CQ-Series Multipin Connectors are almost identical with the BQ-Series, having one major difference: The outer conductor of the coaxial cable assemblies and the connector shell per MIL-DTL-38999 series 1 are not using the same ground. The coaxial lines can be guided in a metal hose, net mesh or armor, connected to the shells for lightning protection. TQ-, IQ-, BQ-, and CQ-Series mate with each other.



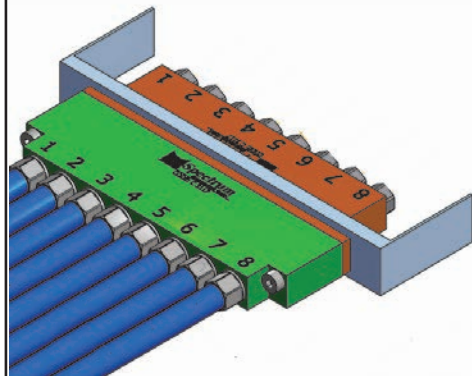
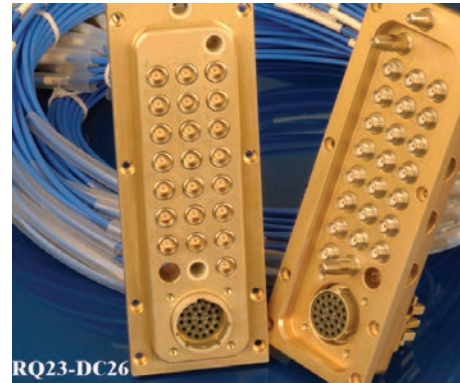


Rectangular Multiports

The RQ- Multiport Connectors are using a rectangular shells, developed by Spectrum Elektrotechnik GmbH, allowing dense packaging. The operating frequency depends on the inserts for frequencies to 65 GHz.

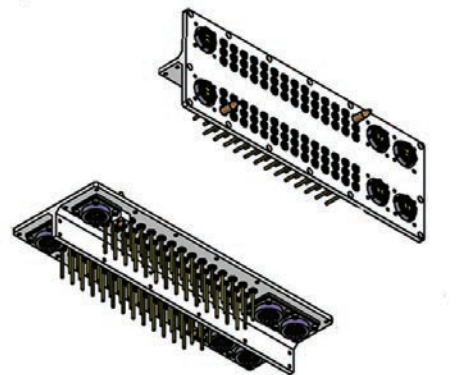
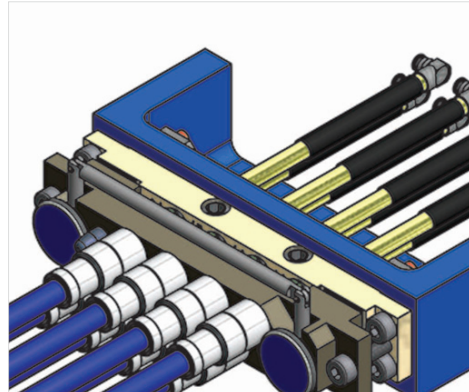
Details can be seen at pages 54 to 67

The RQ23-DC26 is employing twenty-three (23) coaxial cable assemblies plus twenty-six (26) signal lines in one connector and has been qualified in an airborne program. Coaxial cable of Type 11 and/or Type 43 and AWG20 wire for the lower frequency signals or supplies are being used. It can be modified for other coaxial cables.



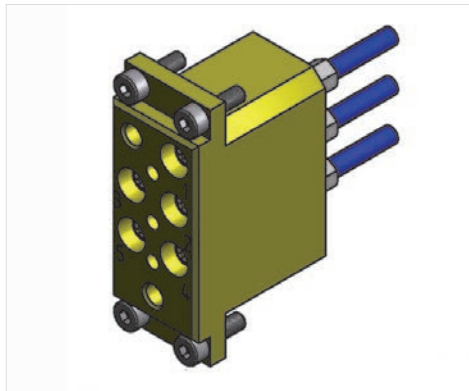
This RQ-8 design is using 8 coaxial connectors in-line in a very narrow package (7mm).

This RQ-8 with quick connect/release mechanism employs 8 coaxial lines in a Honeycomb package for space advantage



The most dense packaging ever proposed for a program, 80 coaxial connections and 120 signal lines.

Multiport Connector with 5 coaxial connections is operating to 40 GHz.



The traditional
RF Multipin Connector
SQ-8

**Circular Multipin Connector guiding 8 Coaxial Lines
in a MIL - DTL - 38999 Shell of size 21**

SQ-8 traditional

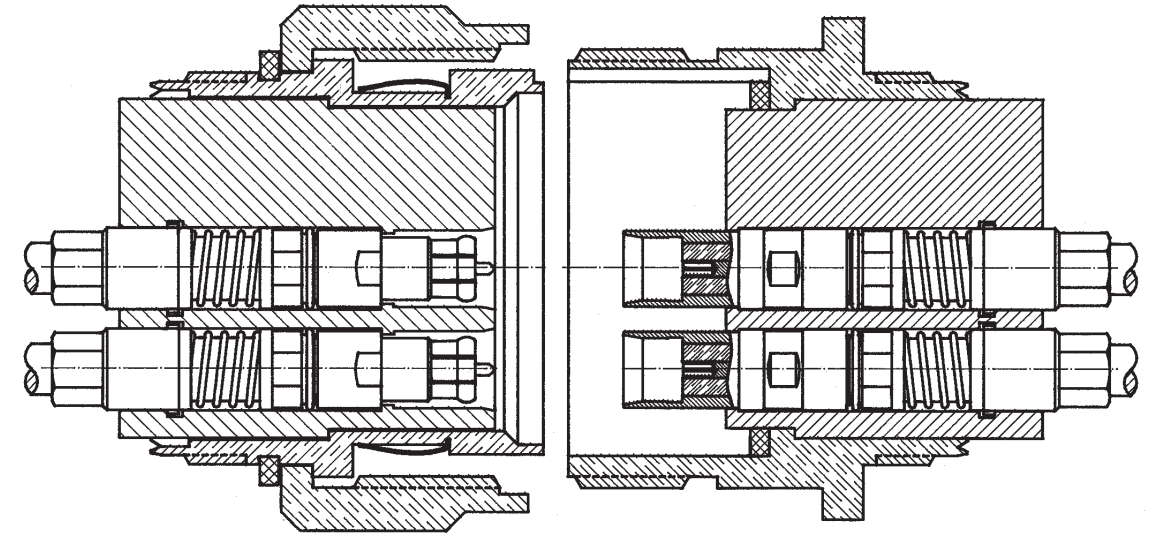
SQ-8

FEATURES

*** SHELLS:**
per MIL-DTL-38999 Series III, sizes 21

*** CONNECTOR TYPES:**
Male
Female Four Hole Flange
Bulkhead Feedthrough Jack

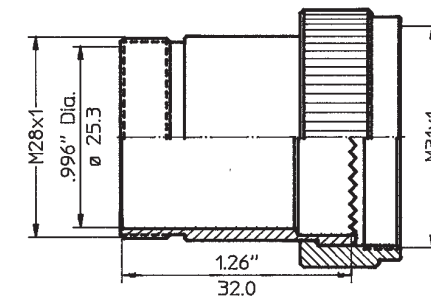
*** INSERTS (to be specified with the Cable Assemblies):**
Spring loaded



The cross section view demonstrates the perfect engineering that has led to the success of the SQ-8: Every cable assembly terminated with an SQ-8 Insert can be replaced in minimum time by simply engaging/disengaging a bayonet catch. The inserts are spring loaded for blind mating / self alignment purposes. The outer conductor of the female insert protrudes above the reference plane of the SQ-8. During the mating process the female outer conductors will catch first the mating plane, align all eight female outer conductors prior to capturing and aligning the male outer conductors, before the center conductors will even come close to their mating positions.

SQ-8 Standard Back Body

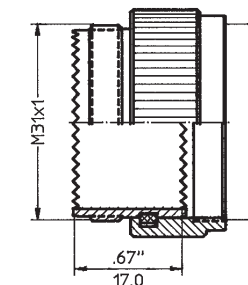
SQ-8 Back Standard Body Part Number	Surface Treatment
BPSQ-2101-07	Black anodized
BPSQ-2101-15	Nickel plated



Material of Back Body is aluminium

SQ-8 Adapter Back Body

SQ-8 Back Standard Body Part Number	Surface Treatment
BPSQ-2102-07	Black anodized
BPSQ-2102-15	Nickel plated

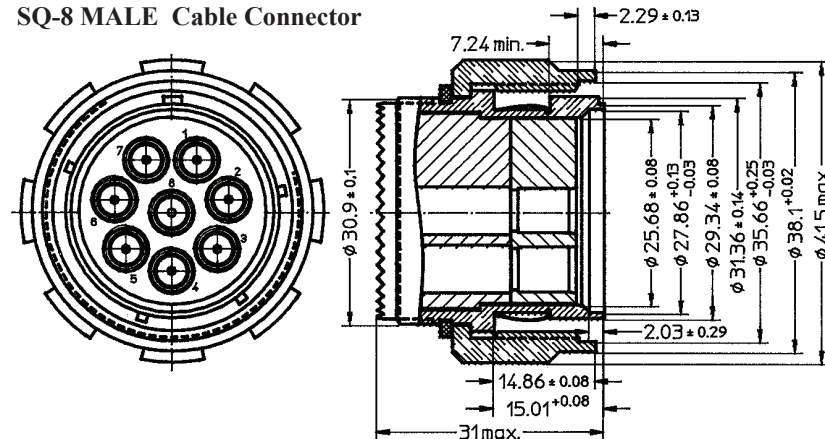


Material of Back Body is aluminium



Interface Mating Dimensions (Per MIL-DTL-38999, Series III, Shell Size 21)

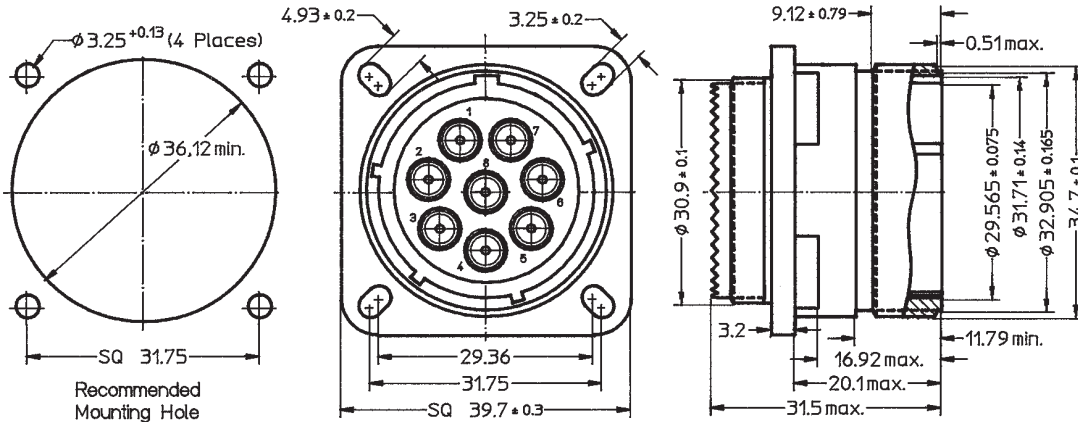
SQ-8 MALE Cable Connector



The Connector Part Number consists of 12 Characters. Please refer to Page 84 for explanation.

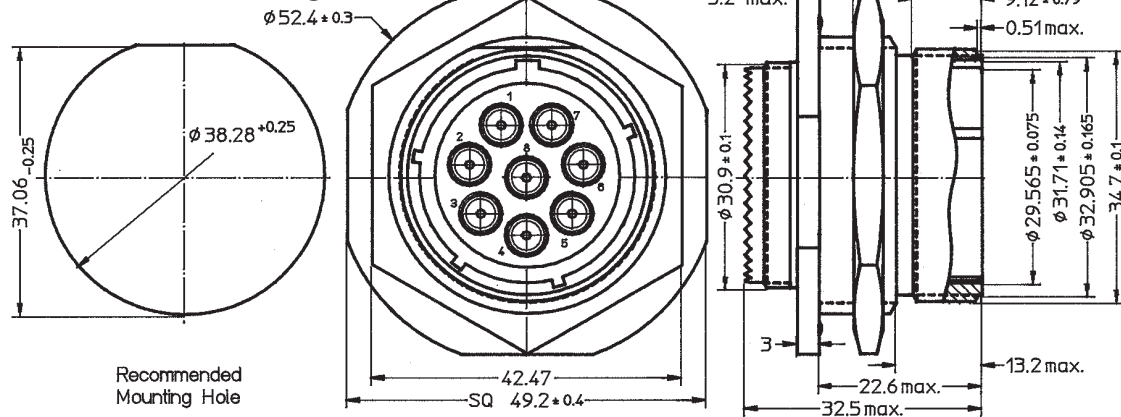
Please fill in at the Part Number for Character 11: Key N, A, B C, D
for Character 12: Shell Surface Treatment, C = Cadmium, N = Nickel

SQ-8 4 - Hole Flange Mount Jack



Please fill in at the Part Number for Character 11: Key N, A, B C, D
for Character 12: Shell Surface Treatment, C = Cadmium, N = Nickel

SQ-8 Bulkhead Feedthrough Jack



Please fill in at the Part Number for Character 11: Key N, A, B C, D
for Character 12: Shell Surface Treatment, C = Cadmium, N = Nickel

SPECIFICATIONS OF THE SQ - 8 INSERTS

ELECTRICAL

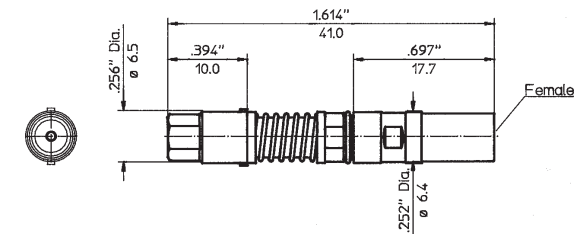
Frequency Range	DC - 24.0 GHz min., DC - 40.0 GHz optional.
Insulation Resistance	The insulation resistance shall not be less than 5,000 megohms.
Voltage Standing Wave Ratio (VSWR)	1.02 + .005 * f (GHz)
Contact Resistance	The center contact resistance drop shall not exceed 3.0 milliohms and the outer contact resistance drop shall not exceed 2.0 milliohms.
Dielectric Withstanding Voltage	The magnitude of the test voltage shall be 1,000 volts rms at sea level.
RF High Potential Withstanding Voltage	The RF high potential withstanding voltage is 670 volts rms at 5 MHz.
RF Leakage	-(100 - f (GHz)) dB
Insertion Loss	(.03 SQT(f(GHz))) dB

MECHANICAL

Connector Durability	The connector is to be tested and its mating connector shall be subjected to 500 insertions and withdrawal cycles at 12 cycles per minute max. The connector shall show no evidence of mechanical failure and the connector shall meet the mating characteristic requirements.
Cable Retention Force	60 pounds (267 N) min., without stress relief.
Coupling Nut Retention Force	Not applicable.
Force to Engage and Disengage	Not applicable.
Longitudinal Force max.	Longitudinal force is not applicable.
Mating Characteristics	Applicable to Females only: oversize pin .0372 inch (.945 mm) max. dia., .045 inch (1.14 mm) deep; insertion force 3 lbs. (13.34 N) max. with .037 inch (.94 mm) min. dia. pin; withdrawal force 1.00 oz (.278 N) min. with .0355 inch (.90 mm) max. dia. pin.
Recommended Mating Torque	Not applicable.

SQ-8 Insert Female

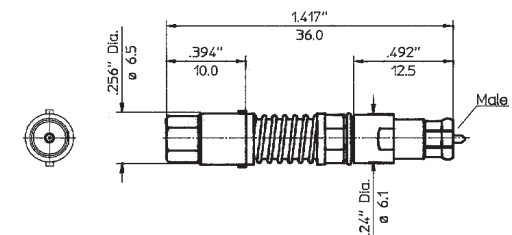
SQ-8 Insert female, P/N	Connector Code	Cable Type
SQ15-2101-02	QF	43



Connector outer conductor is passivated stainless steel.
Center contact is beryllium copper gold plated.
Dielectric is PTFE.

SQ-8 Insert Male

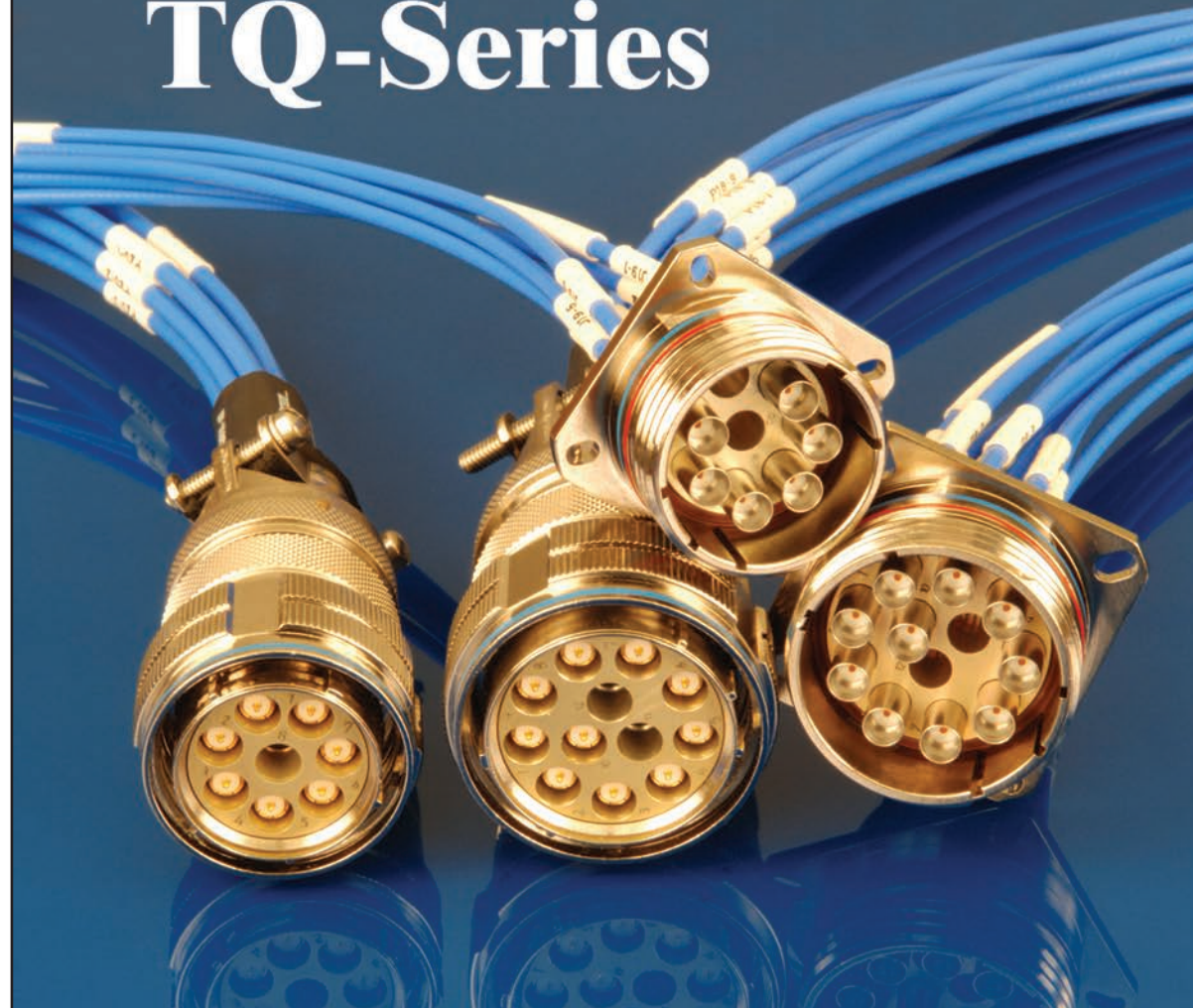
SQ-8 Insert male, P/N	Connector Code	Cable Type
SQ15-1102-02	QM	43



Connector outer conductor is passivated stainless steel.
Center contact is beryllium copper gold plated.
Dielectric is PTFE.



TQ-Series

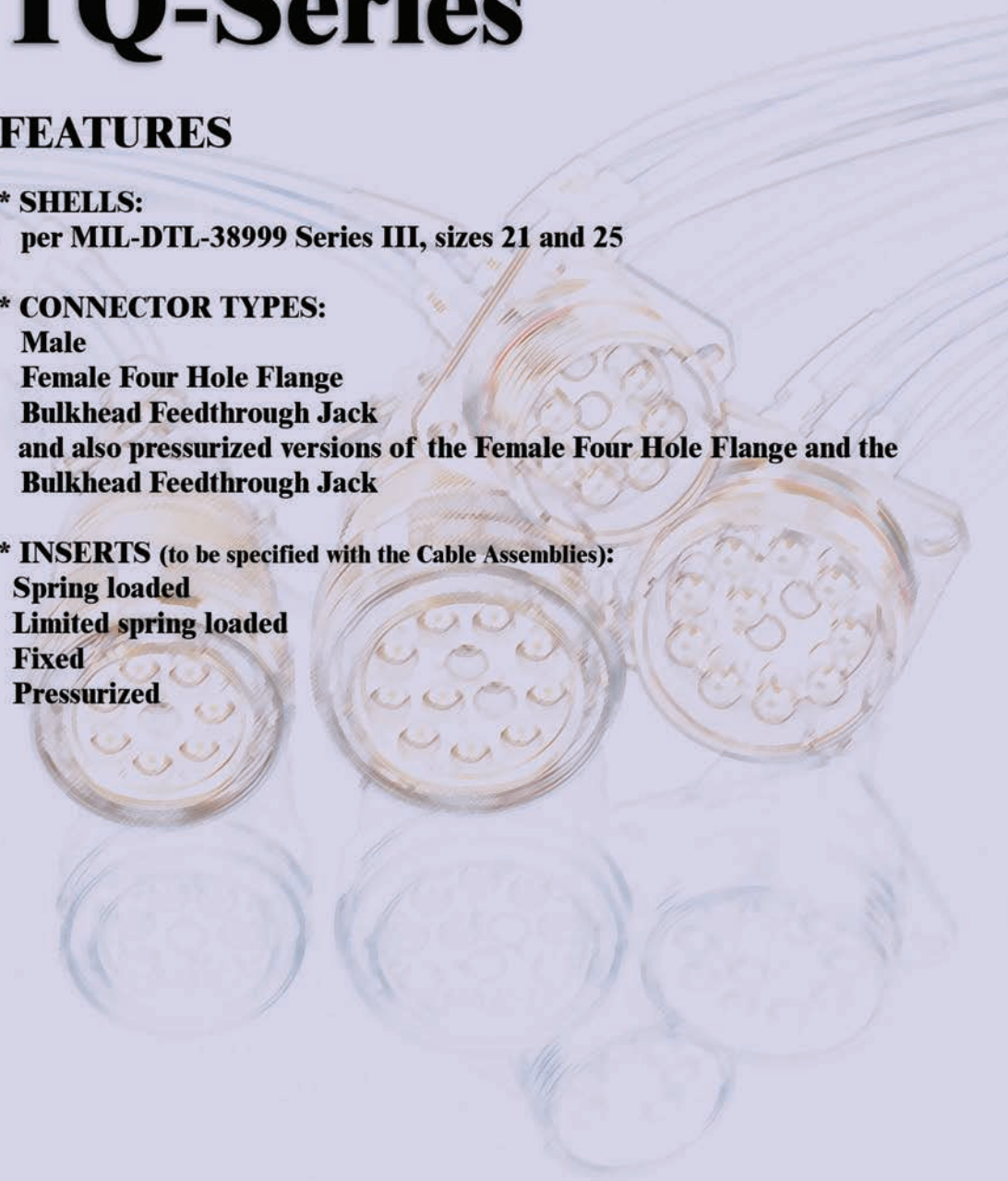


**Circular Multipin Connectors with 4,
7, 8, 9, 10, 12, 19 and 37 Coaxial Cable
Assemblies using MIL-DTL-38999 Shells,
sizes 21 and 25**

TQ-Series

FEATURES

- * **SHELLS:**
per MIL-DTL-38999 Series III, sizes 21 and 25
- * **CONNECTOR TYPES:**
Male
Female Four Hole Flange
Bulkhead Feedthrough Jack
and also pressurized versions of the Female Four Hole Flange and the Bulkhead Feedthrough Jack
- * **INSERTS (to be specified with the Cable Assemblies):**
Spring loaded
Limited spring loaded
Fixed
Pressurized





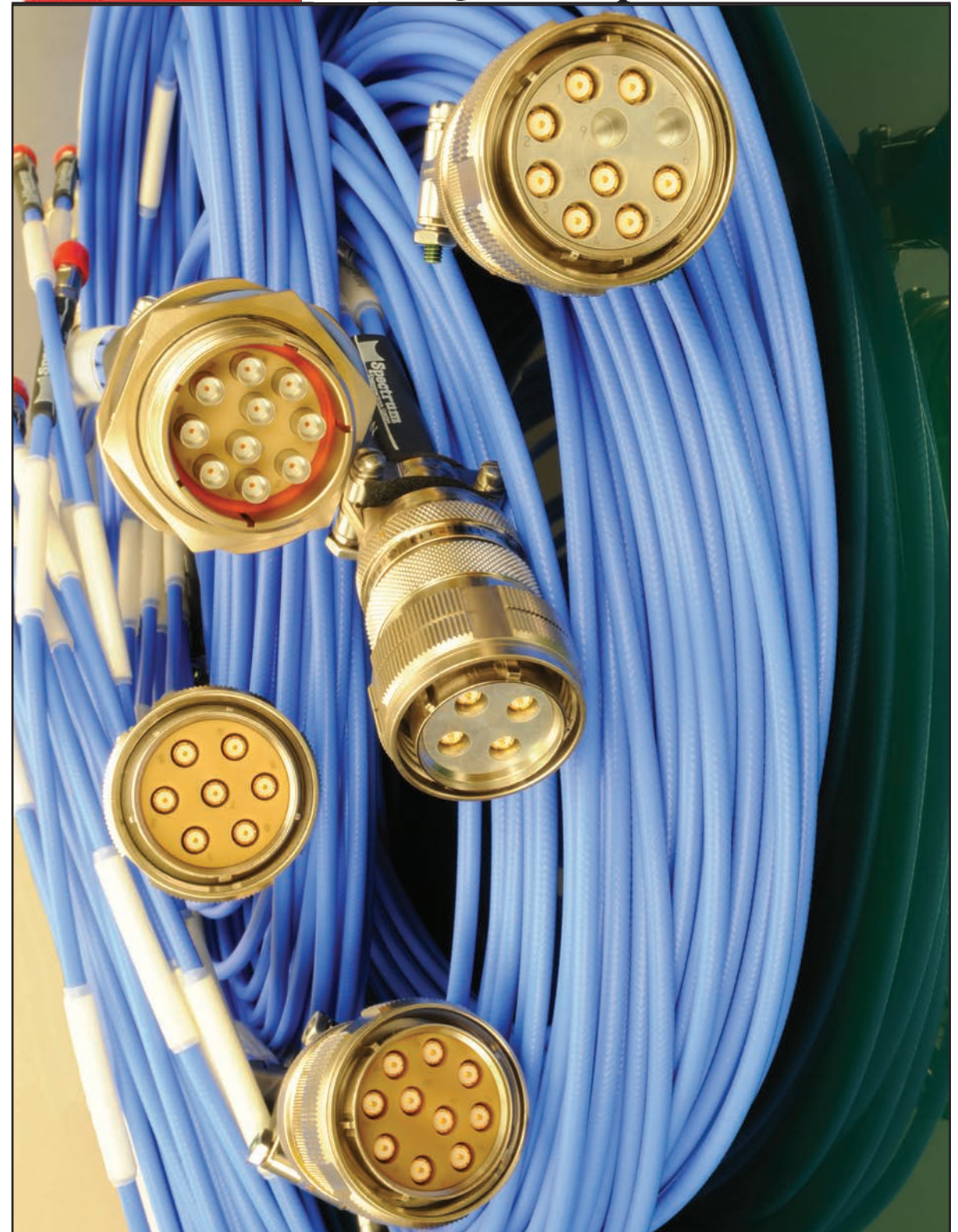
TQ-Series



Circular Multipin Connectors with 4, 7, 8, 9, 12, 19, 37, or any other quantity of Coaxial Cable Assemblies using MIL-DTL-38999 Series III Shells, currently with sizes 13, 21 and 25, but any other size may be used in future.

TQ-Series





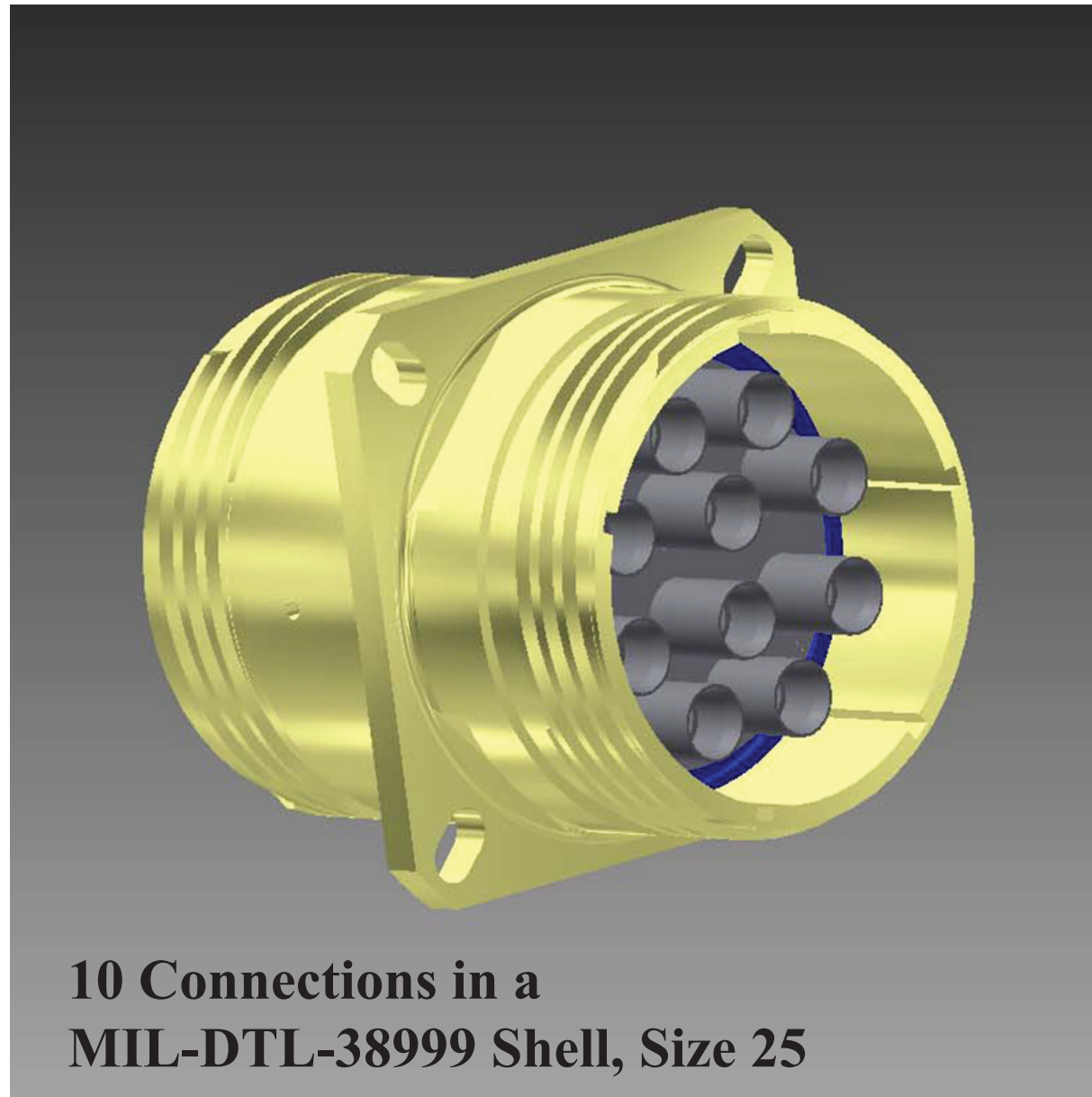
TQ-09 Multiport DC to 65.0 GHz



TQ-19 Multiport DC to 65.0 GHz

AQ-TR0-001NN

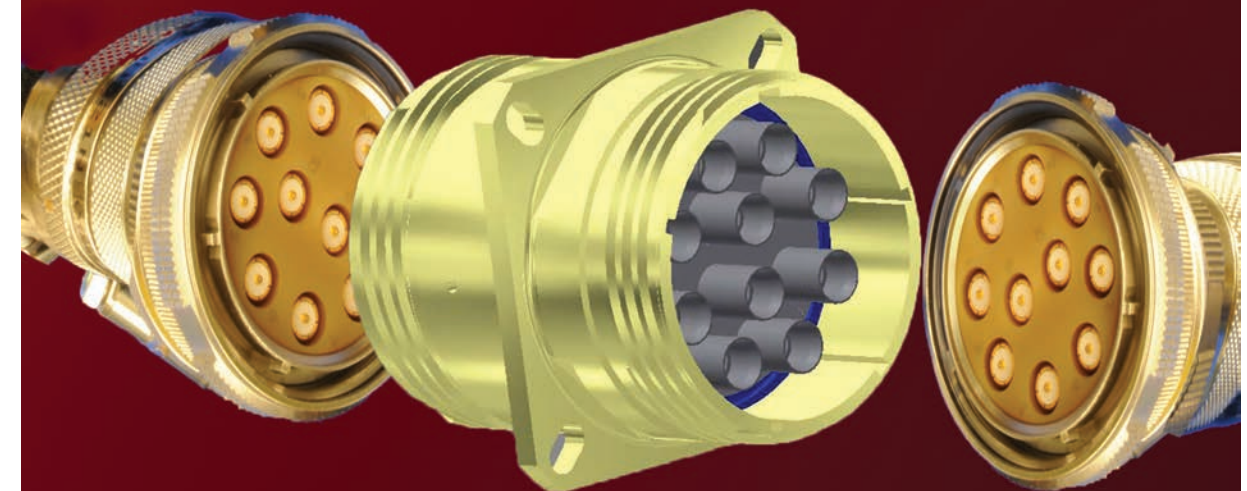
4-Hole flanged Adapter to mate with 10 RF Cable Assemblies at both sides in the frequency range to 24 .0 GHz, 40.0 GHz option is available as well.



10 Connections in a
MIL-DTL-38999 Shell, Size 25

Dimensions shown are Inches over Millimeters or vice versa. Standard units have stainless finish (last 2 digits of the P/N are -02). Interfaces are per DIN 47 223, DIN 47 226, IEC 169-4, IEC 169-7, IEC 169-8, IEC 457-2, IEC 60169-5, IEEE 287, MIL-PRF-39012, MIL DTL-24044, MIL DTL-3643, MIL-STD-348B, where applicable

Connecting 2 x 10 Cable Assemblies in Seconds



The foolproof connection,
eliminating human errors.

Dimensions shown are Inches over Millimeters or vice versa. Standard units have stainless finish (last 2 digits of the P/N are -02). Interfaces are per DIN 47 223, DIN 47 226, IEC 169-4, IEC 169-7, IEC 169-8, IEC 457-2, IEC 60169-5, IEEE 287, MIL-PRF-39012, MIL DTL-24044, MIL DTL-3643, MIL-STD-348B, where applicable



AQ-SB0-001NN

BFJ flanged Adapter (also available as 4-hole flange) to mate with 37 RF Cable Assemblies at both sides in the frequency range to 40.0 GHz, using size 16 contacts.

37 Connections in a MIL-DTL-38999 Shell, Size 25

Dimensions shown are Inches over Millimeters or vice versa. Standard units have stainless finish (last 2 digits of the P/N are -02). Interfaces are per DIN 47 223, DIN 47 226, IEC 169-4, IEC 169-7, IEC 169-8, IEC 457-2, IEC 60169-5, IEEE 287, MIL-PRF-39012, MIL DTL-24044, MIL DTL-3643, MIL-STD-348B, where applicable

Connecting 2 x 37 Cable Assemblies in Seconds



The foolproof connection, eliminating human errors.

Dimensions shown are Inches over Millimeters or vice versa. Standard units have stainless finish (last 2 digits of the P/N are -02). Interfaces are per DIN 47 223, DIN 47 226, IEC 169-4, IEC 169-7, IEC 169-8, IEC 457-2, IEC 60169-5, IEEE 287, MIL-PRF-39012, MIL DTL-24044, MIL DTL-3643, MIL-STD-348B, where applicable



Hermetically sealed Multiport Connectors

HQ-Series

The TQ-Series and the HQ-Series are identical as well as the IQ and HQ identical, with just one major difference, the **Hermeticity**. The difference is seen in the P/N at position 6, H for the „revolver“ from aluminum, D for the „revolver“ from PEI, catching the cable inserts please refer to pages 51, 55 or 93

HQ-Series:

The coaxial cable assemblies in the MIL-DTL-38999 shell are hermetically sealed in the outer conductor of the female shell.

The circular female connector, either as Bulkhead Feedthrough, or 4-Hole Flange can have minimum 4 cable assemblies and currently maximum 37 cable assemblies.

The female MIL-DTL-38999 shell can be mounted in the skin of the Vacuum Chamber and makes the need of hermetically sealed adapters unnecessary.

MQ-SeriesArt



IQ-Series



Circular Multipin Connectors with 4, 7, 8, 9, 12, 19, 37, or any other quantity of Coaxial Cable Assemblies using MIL-DTL-38999 Series III Shells, currently with sizes 13, 21 and 25, but any other size may be used in future.

IQ-Series

IQ-Series

The TQ-Series and the IQ-Series are identical with just one major difference, the grounding of the assemblies.

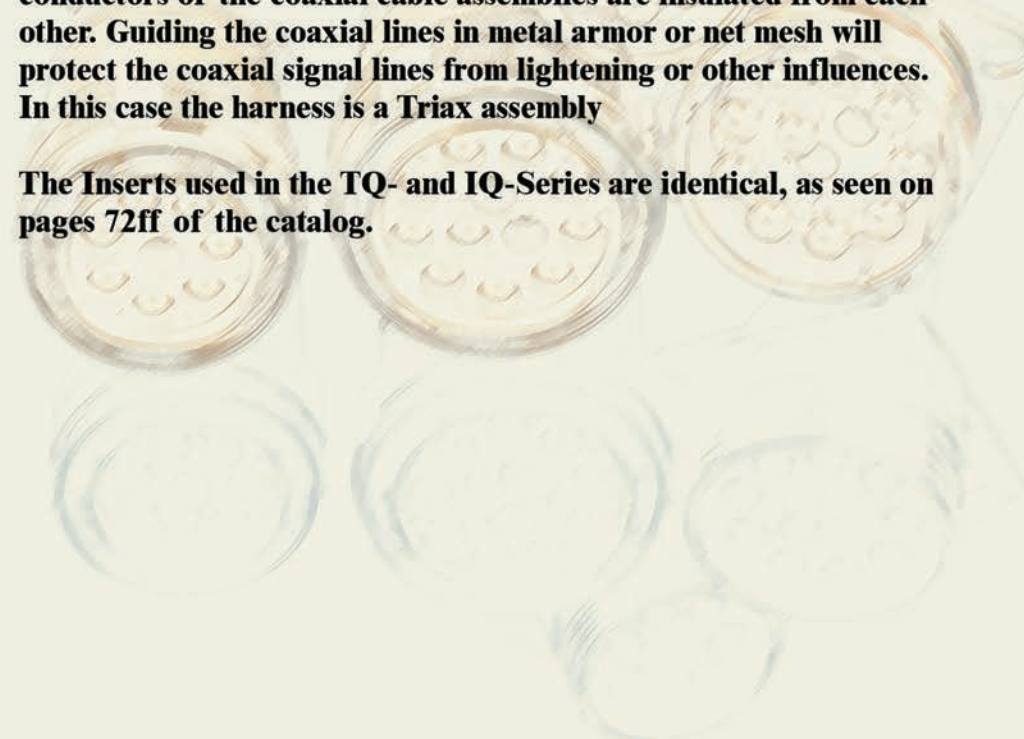
TQ-Series:

The connector Body of the MIL-DTL-38999 shell and the outer conductors of the coaxial cable assemblies are using one common ground.

IQ-Series:

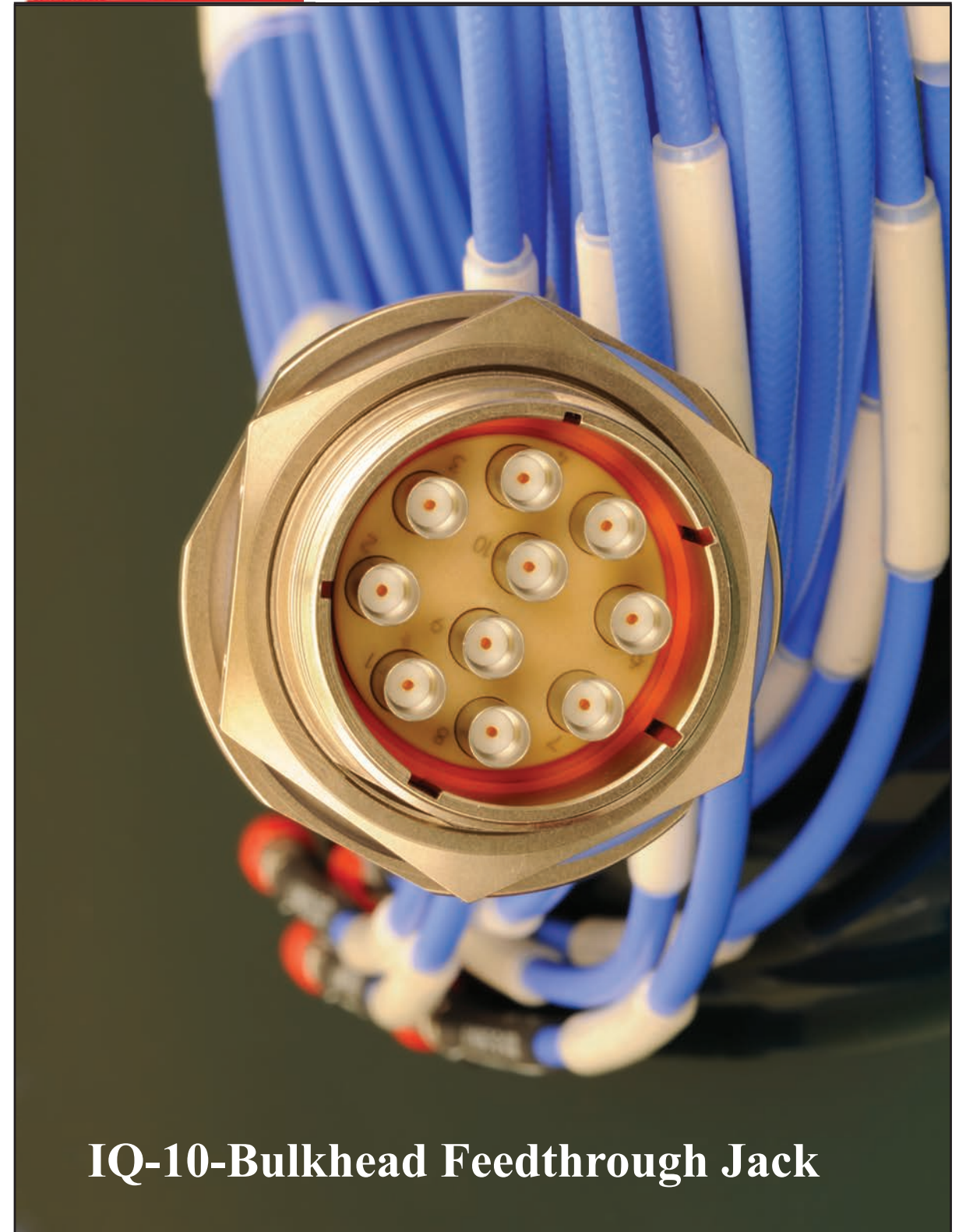
The connector Body of the MIL-DTL-38999 shell and the outer conductors of the coaxial cable assemblies are insulated from each other. Guiding the coaxial lines in metal armor or net mesh will protect the coaxial signal lines from lightning or other influences. In this case the harness is a Triax assembly

The Inserts used in the TQ- and IQ-Series are identical, as seen on pages 72ff of the catalog.





IQ-7 Male



IQ-10-Bulkhead Feedthrough Jack



BQ-Series



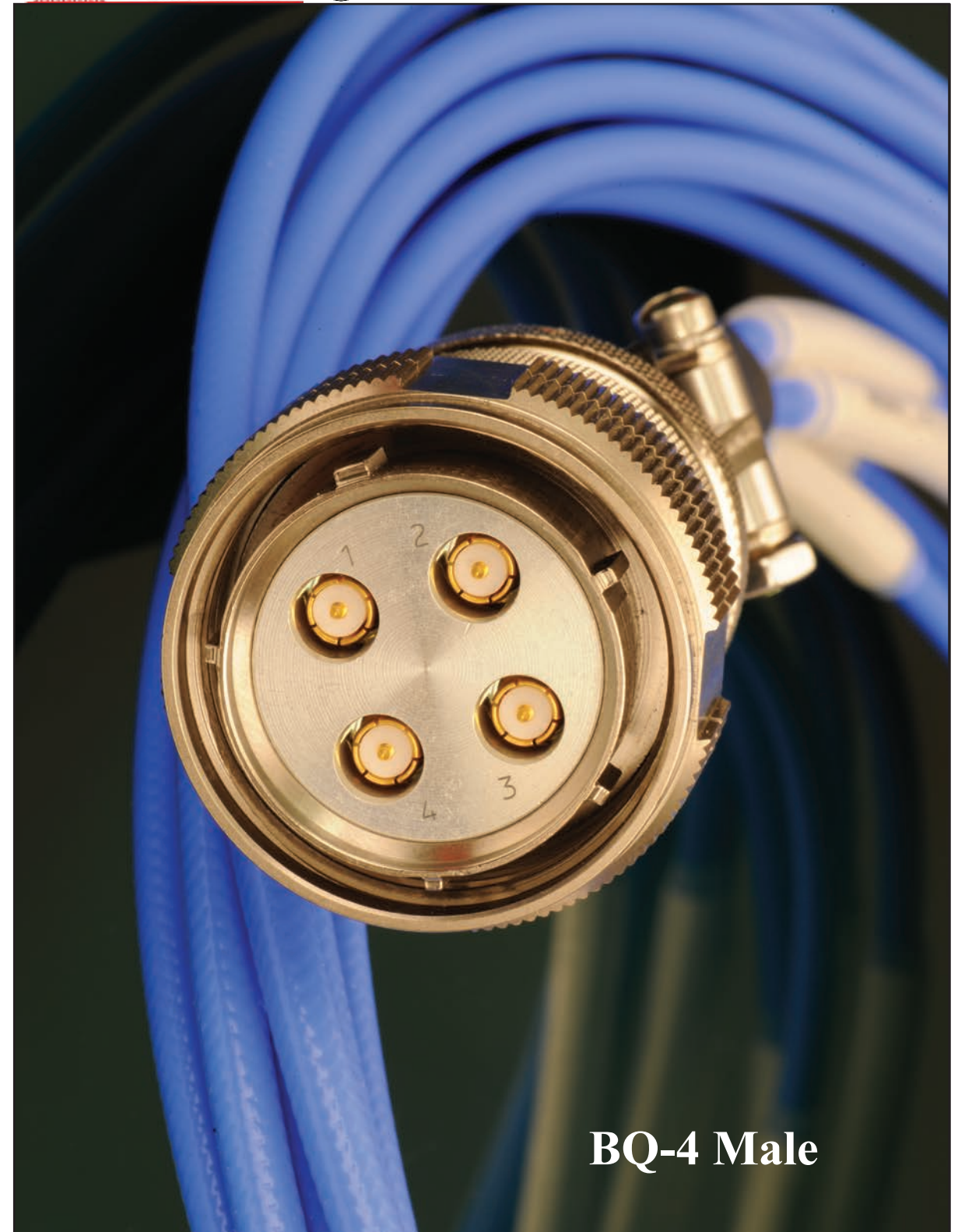
Circular Multipin Connectors with 4, 7, 8, 9, 12, 19, 37, or any other quantity of Coaxial Cable Assemblies using MIL-DTL-38999 Series I Shells, currently with sizes 13, 21 and 25, but any other size may be used in future.



BQ-Series

FEATURES

- * **SHELLS:**
per MIL-DTL-38999 Series I, sizes 21 and 25
- * **CONNECTOR TYPES:**
Male
Female Four Hole Flange
Bulkhead Feedthrough Jack
and also pressurized versions of the Female Four Hole Flange and the Bulkhead Feedthrough Jack
- * **INSERTS (to be specified with the Cable Assemblies):**
Spring loaded
Limited spring loaded
Fixed
Pressurized



BQ-4 Male



CQ-Series



Circular Multipin Connectors with 4, 7, 8, 9, 12, 19, 37, or any other quantity of Coaxial Cable Assemblies using MIL-DTL-38999 Series III Shells, currently with sizes 13, 21 and 25, but any other size may be used in future.



CQ-Series

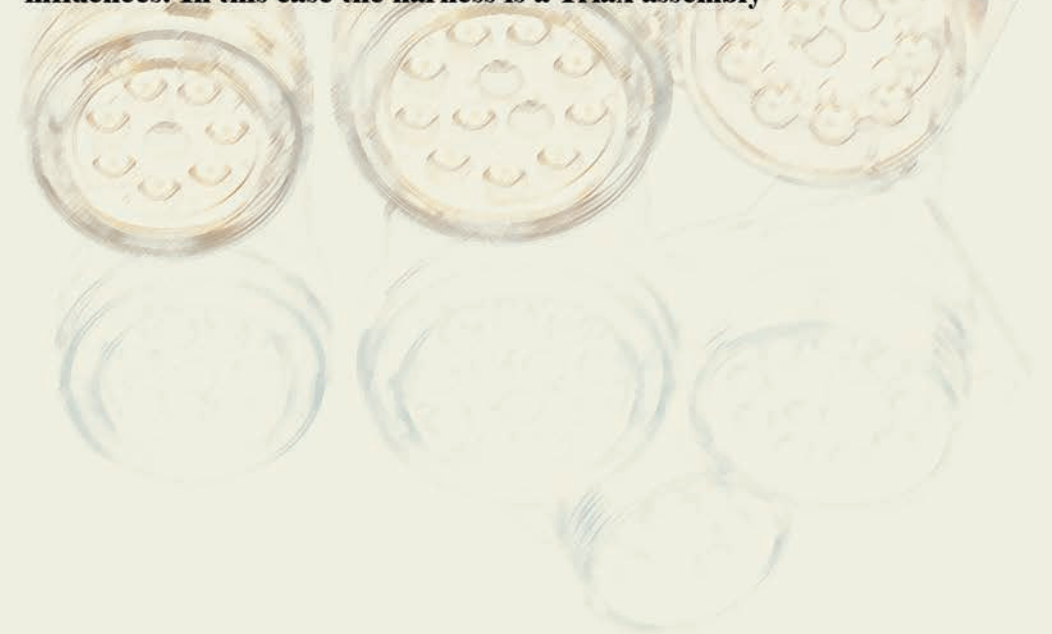
The BQ-Series and the CQ-Series are identical with just one major difference, the grounding of the assemblies.

BQ-Series:

The connector Body of the MIL-DTL-38999 Series I Shell and the outer conductors of the coaxial cable assemblies are using one common ground.

CQ-Series:

The connector Body of the MIL-DTL-38999 Series I Shell and the outer conductors of the coaxial cable assemblies are insulated from each other. Guiding the coaxial lines in metal armor or net mesh will protect the coaxial signal lines from lightning or other influences. In this case the harness is a Triax assembly





In the following we do show some examples of Multiport Connectors, using

- 9 cable assemblies using Shell Size 15
- 4 and 8 assemblies using Shell Size 21
- 4 and 7 assemblies using Shell Size 25
- 10 and 12 assemblies using Shell Size 25
- 19 cable assemblies using Shell Size 25
- 37 cable assemblies using Shell Size 25

The examples show Series III connectors, but same configurations are available in Series I.

It is also mentioned in the following examples TQ and IQ - Series, but same applies to BQ- and CQ-Series.

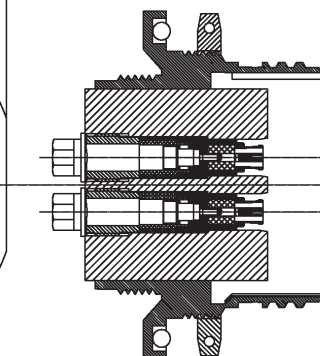
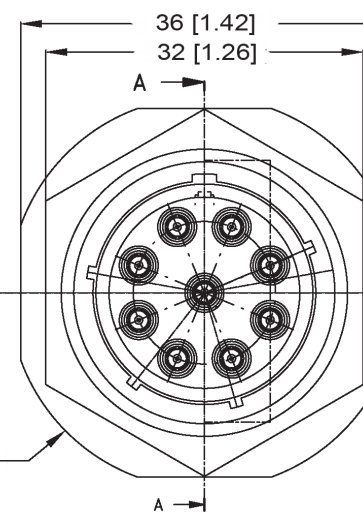
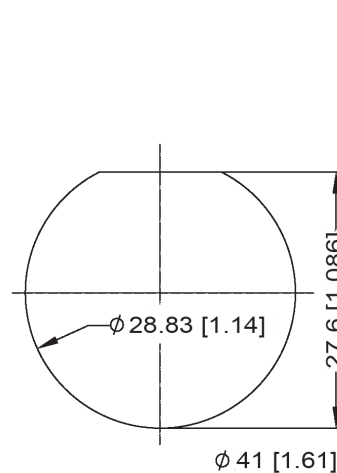
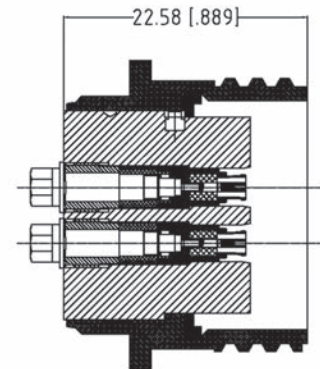
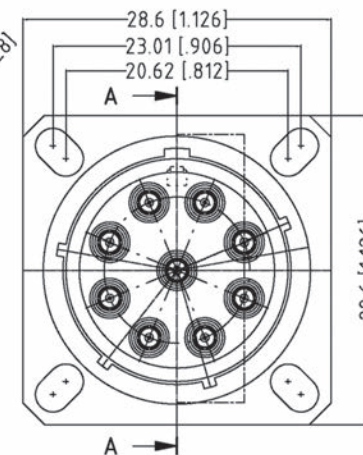
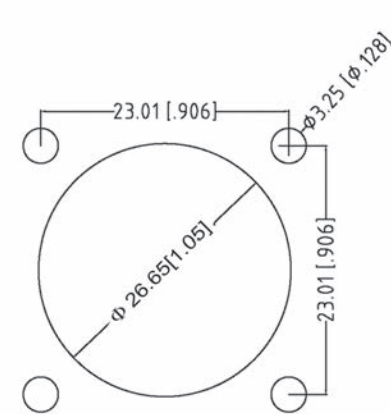
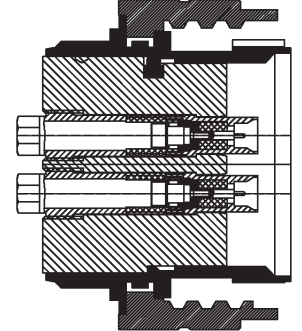
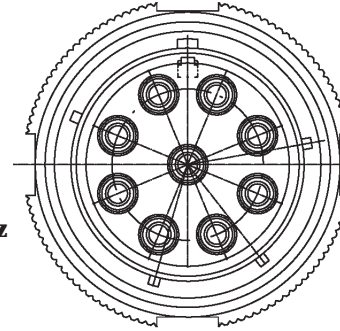
Spectrum Elektrotechnik GmbH is an engineering company. Whatever you need, but is not seen here, please talk to customer service. We even may have it already.



Connectors per MIL-DTL-38999, Series III 9 Cable Assemblies using either

- the 2.3 mm cable of Type 677
3.46 dB/m @ 18 GHz;
- the 1.4 mm cable of Type 47F
3.46 dB/m @ 18 GHz; 13 dB/m @ 65 GHz

Cable details and specifications at pages 110 and 121



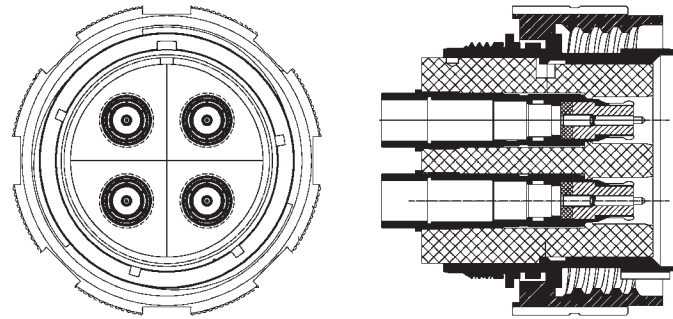


Connectors per MIL-DTL-38999, Series III

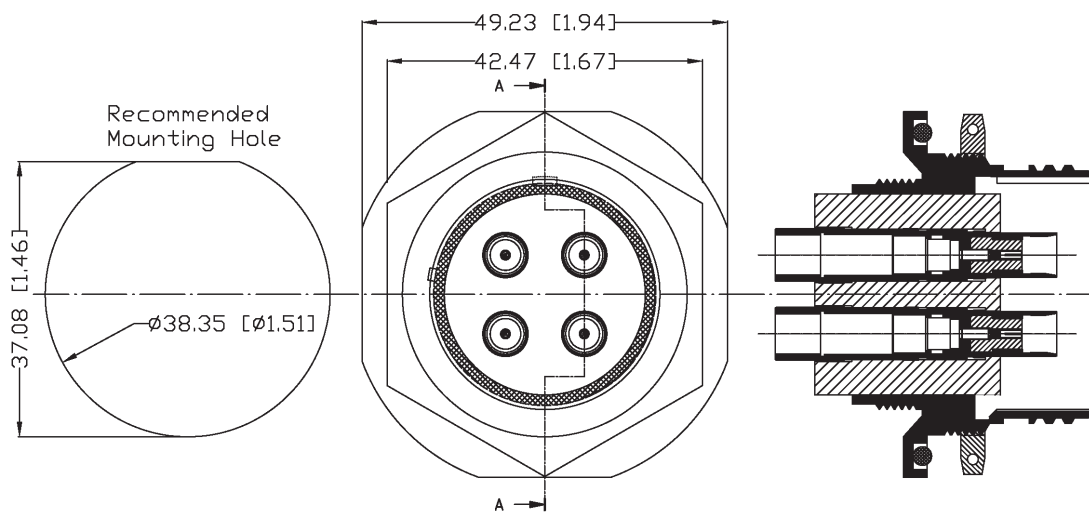
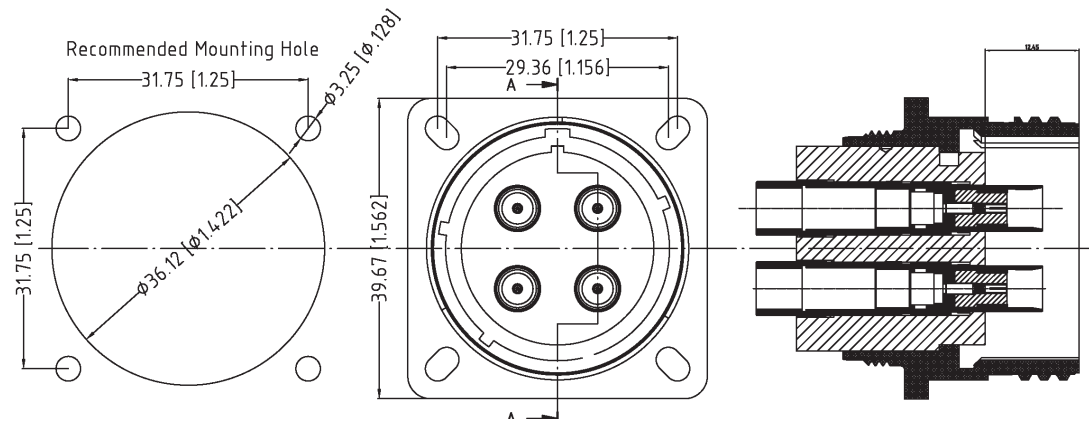
4 Cable Assemblies

using either:

- the 3.2 mm cable of **Type 11**
2.53 dB/m @ 18 GHz; 3.9 dB/m @ 40 GHz
- the 4.3 mm cable of **Type 43**
2.12 dB/m @ 18 GHz; 2.6 dB/m @ 26.5 GHz
- the 5.2 mm cable of **Type 100**
1.2 dB/m @ 18 GHz; 1.48 dB/m @ 26.5 GHz



Cable details and specifications at pages 98, 99 and 100

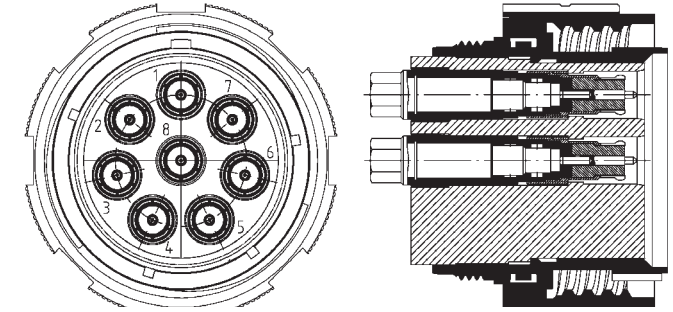


Connectors per MIL-DTL-38999, Series III

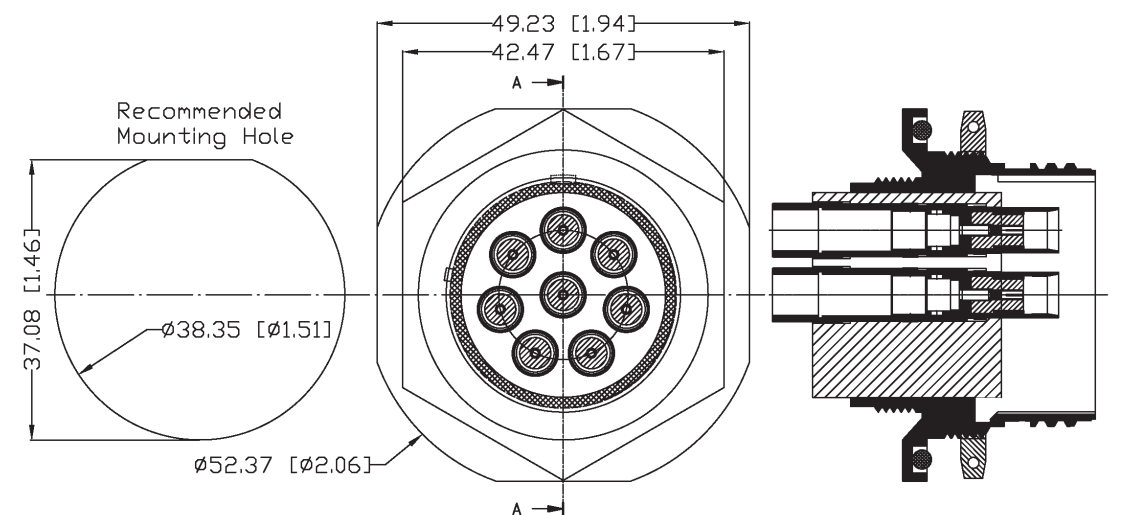
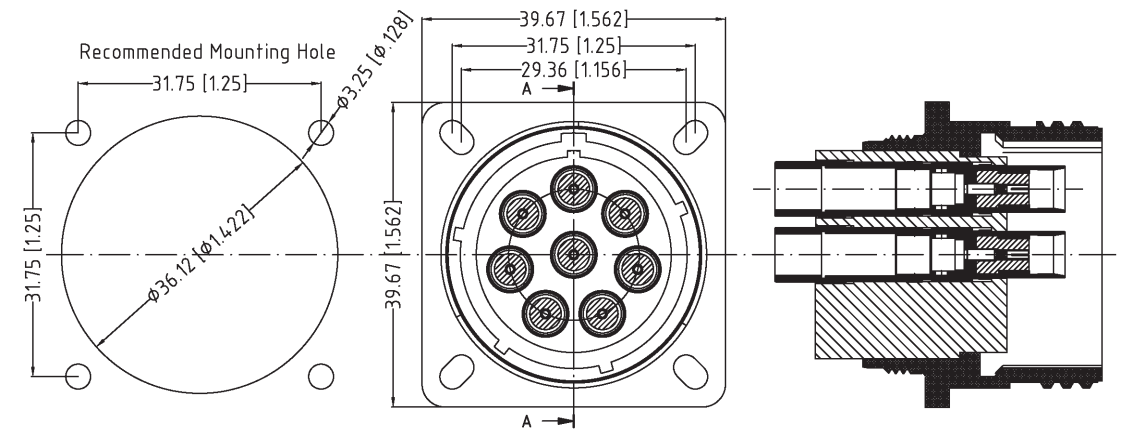
8 Cable Assemblies

using either:

- the 3.2 mm cable of **Type 11**
2.53 dB/m @ 18 GHz; 3.9 dB/m @ 40 GHz
- the 4.3 mm cable of **Type 43**
2.12 dB/m @ 18 GHz; 2.6 dB/m @ 26.5 GHz



Cable details and specifications at pages 98 and 99



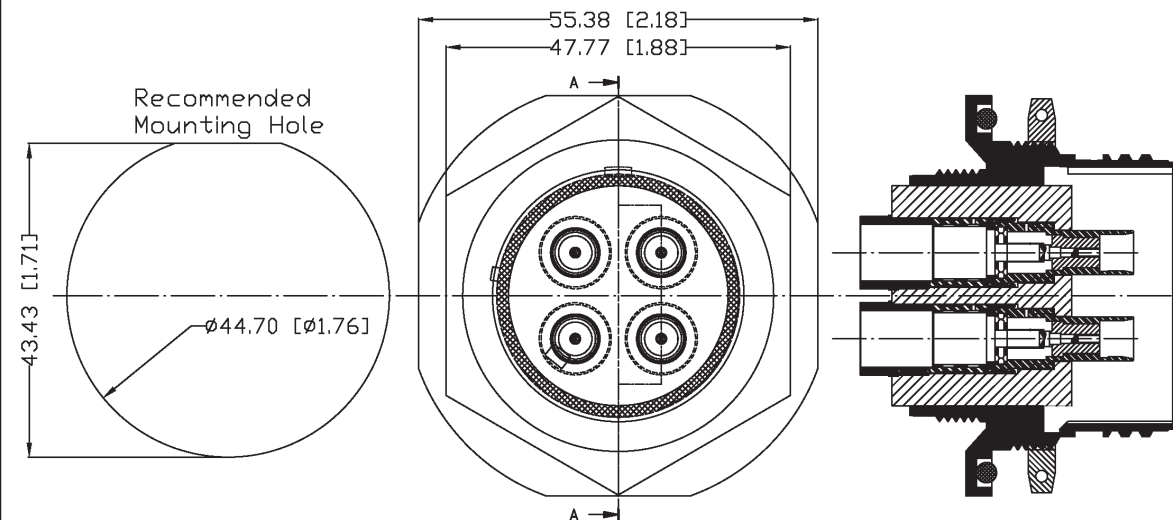
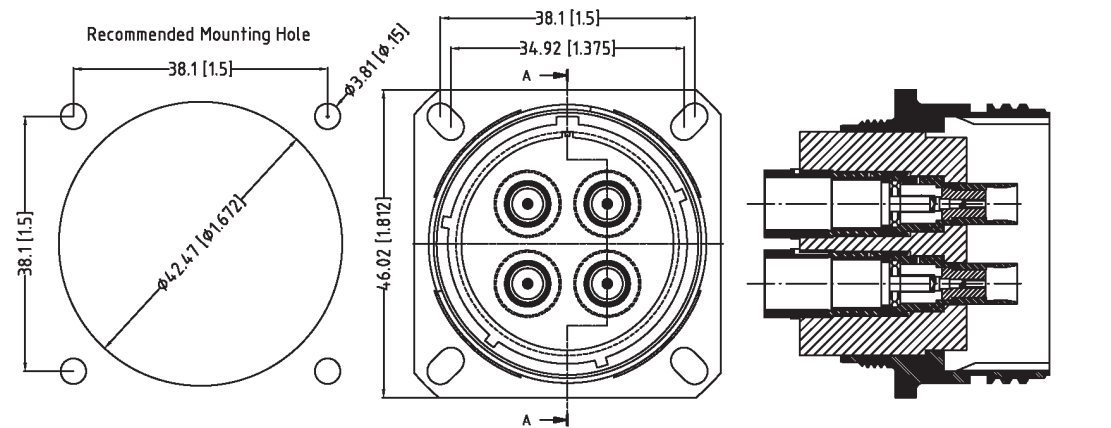
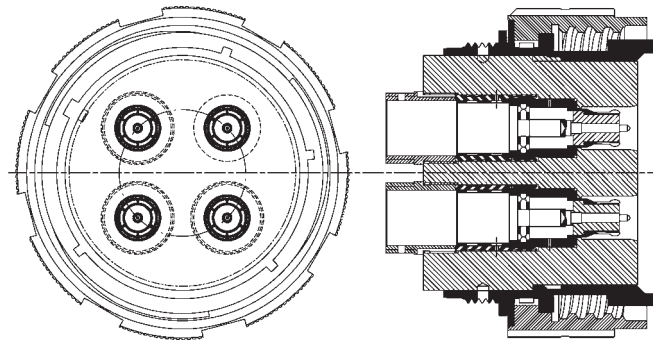


Connectors per MIL-DTL-38999, Series III 4 Cable Assemblies

using either:

- the 7.75 mm cable of **Type 141**
0.66 dB/m @ 18 GHz;
- The cables of **Types 100, 43 and 11** use normally the Shell Size 21, as seen at page 40

Cable details and specifications at pages 98, 99, 101 and 103

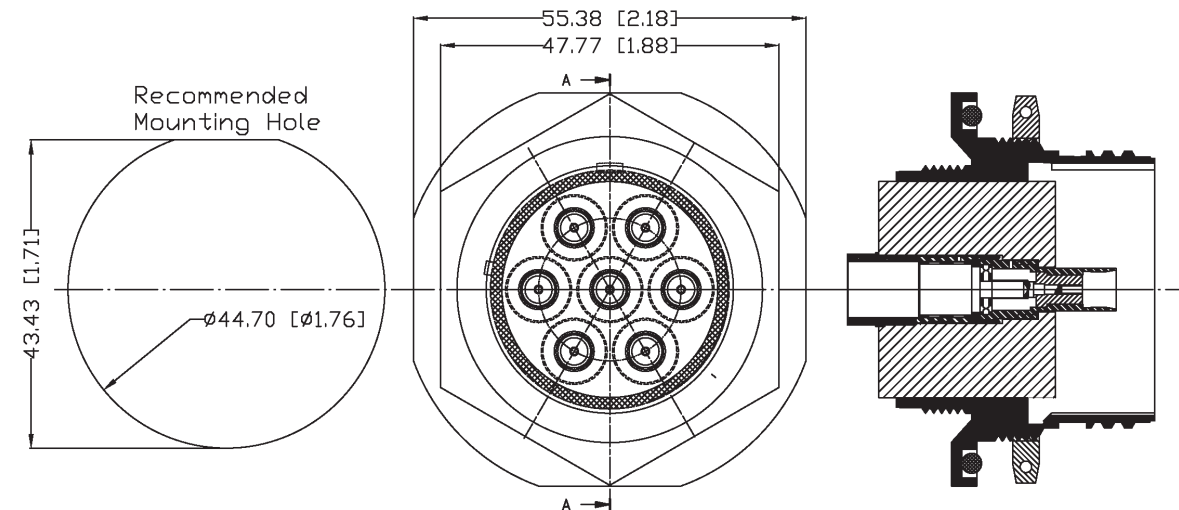
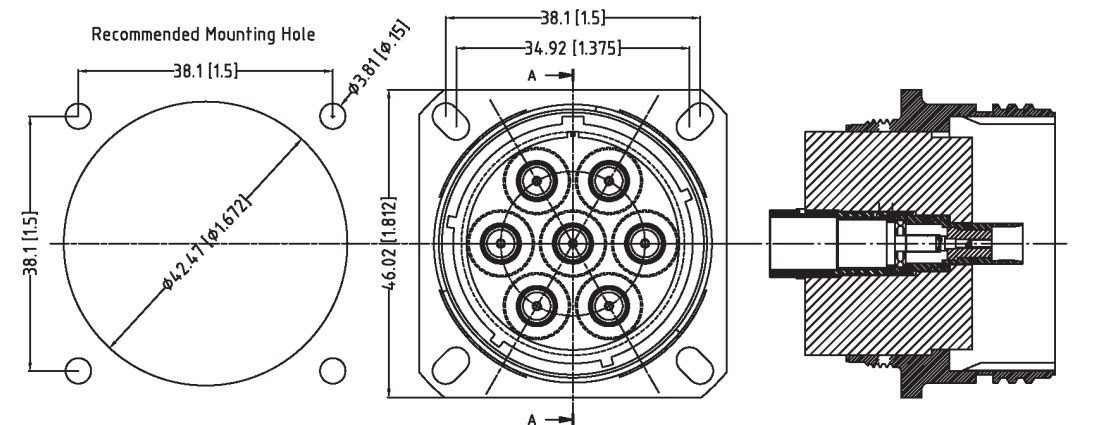
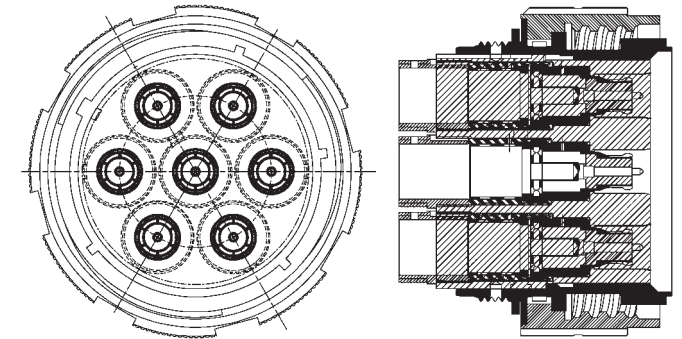


Connectors per MIL-DTL-38999, Series III 7 Cable Assemblies

using either:

- the 5.2 mm cable of **Type 100**
1.2 dB/m @ 18 GHz; 1.48 dB/m @ 26.5 GHz
- the 4.3 mm cable of **Type 43**
2.12 dB/m @ 18 GHz; 2.6 dB/m @ 26.5 GHz
- the 3.2 mm cable of **Type 11**
2.53 dB/m @ 18 GHz; 3.9 dB/m @ 40 GHz

Cable details and specifications at pages 98, 99, 101 and 103



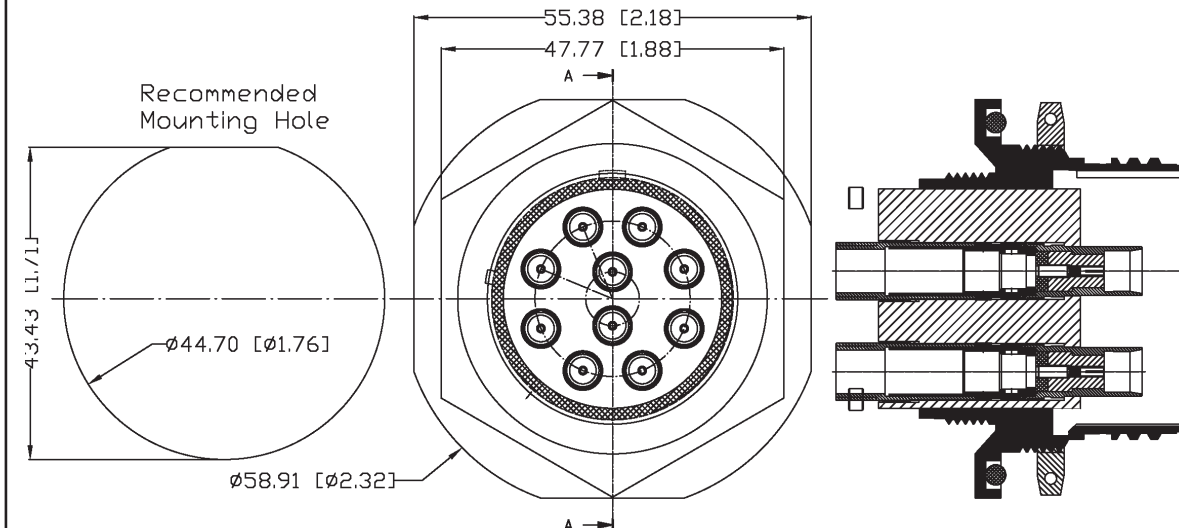
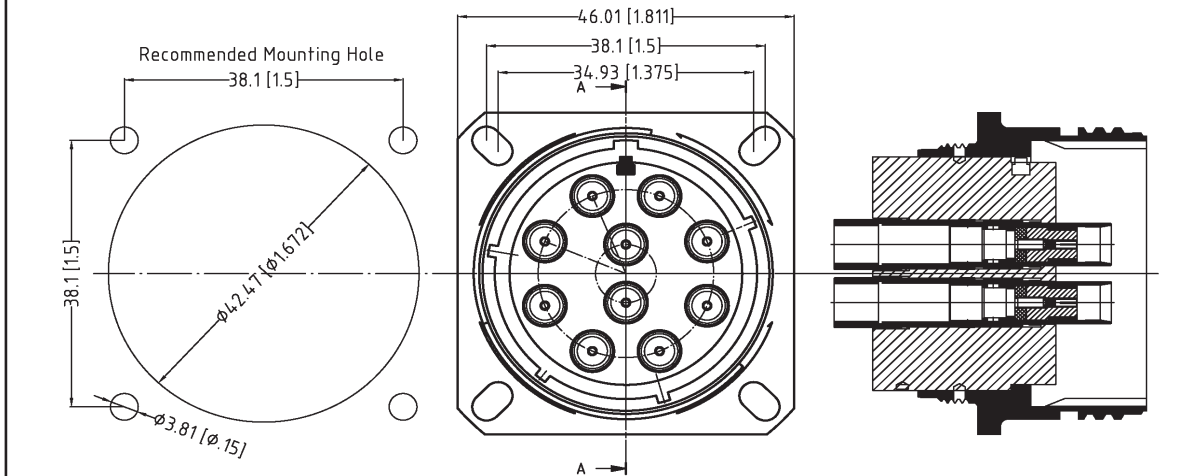
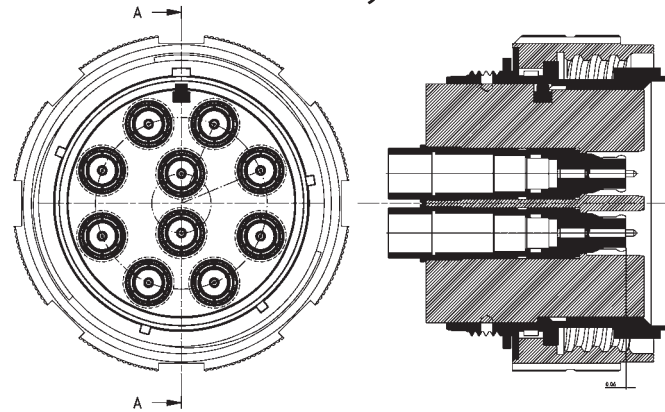


Connectors per MIL-DTL-38999, Series III

10 Cable Assemblies using either:

- the 5.2 mm **red cable of Type 100**
1.2 dB/m @ 18 GHz; 1.48 dB/m @ 26.5 GHz
- the 4.3 mm **red cable of Type 43**
2.12 dB/m @ 18 GHz; 2.6 dB/m @ 26.5 GHz
- the 3.2 mm **red cable of Type 11**
2.53 dB/m @ 18 GHz; 3.9 dB/m @ 40 GHz

Cable details and specifications at pages 98, 99 and 101

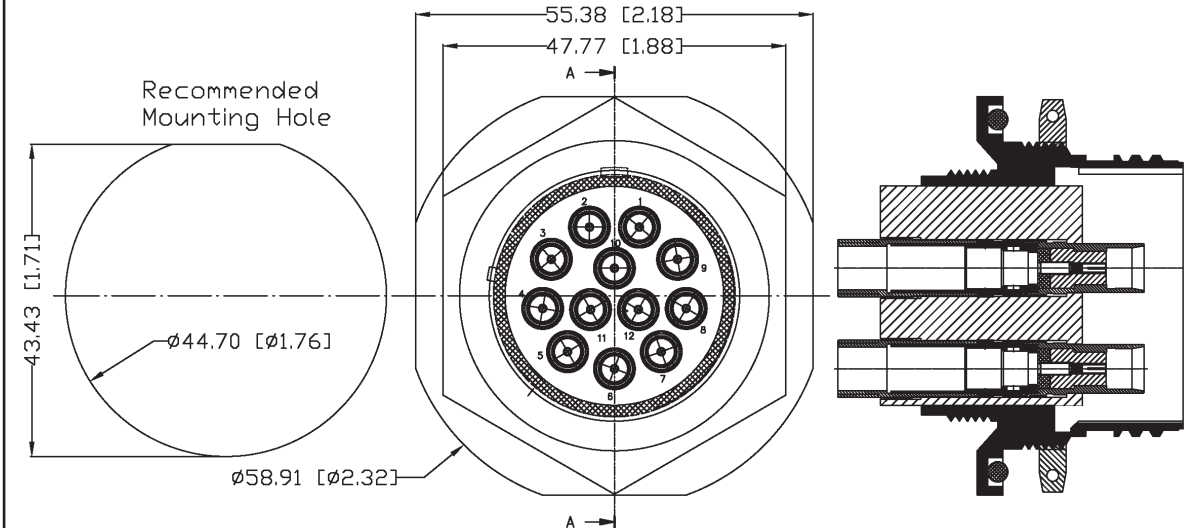
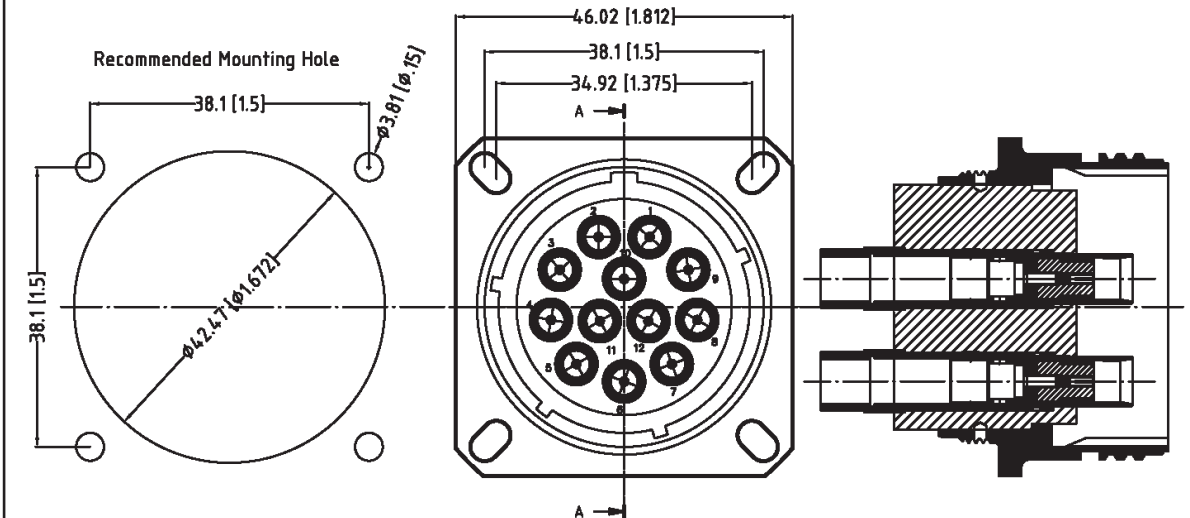
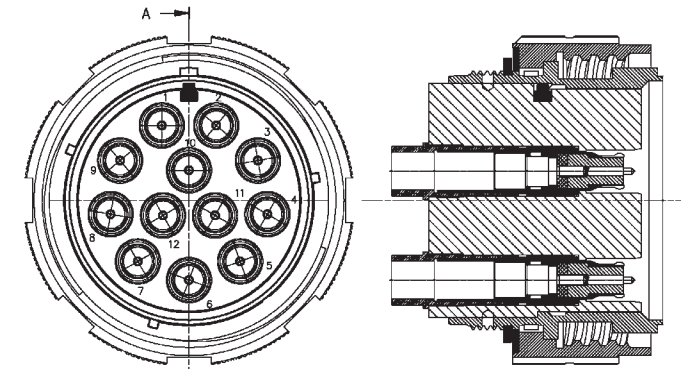


Connectors per MIL-DTL-38999, Series III

12 Cable Assemblies using either:

- the 4.3 mm **red cable of Type 43**
2.12 dB/m @ 18 GHz; 2.6 dB/m @ 26.5 GHz
- the 3.2 mm **red cable of Type 11**
2.53 dB/m @ 18 GHz; 3.9 dB/m @ 40 GHz

Cable details and specifications at pages 98 and 99



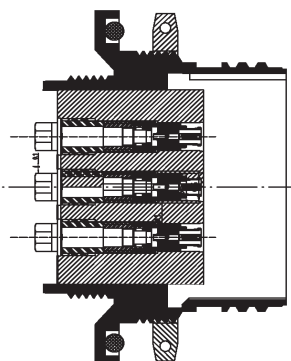
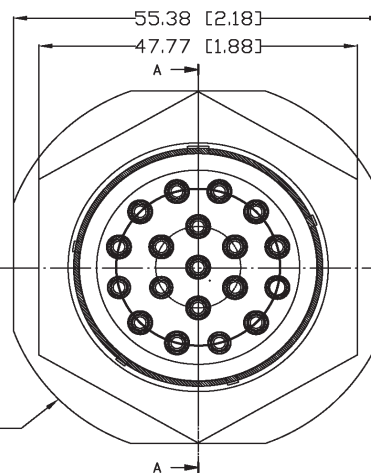
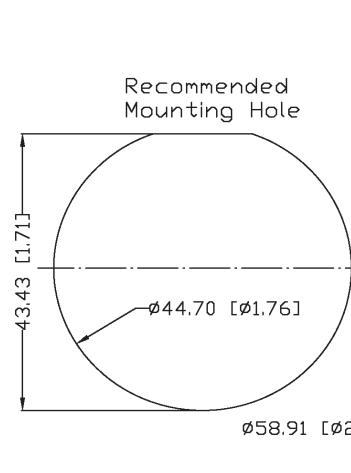
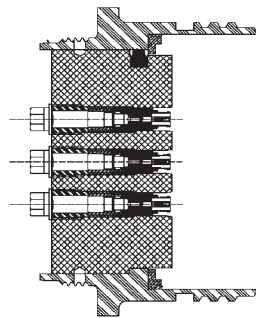
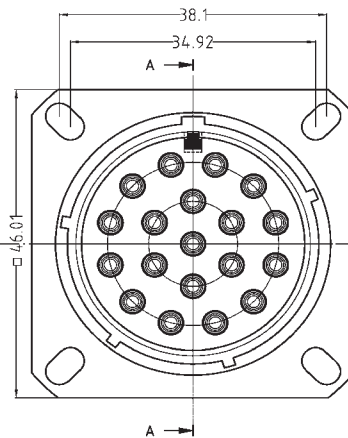
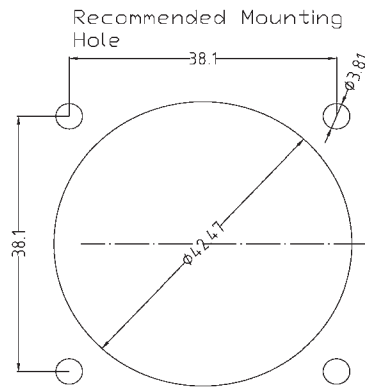
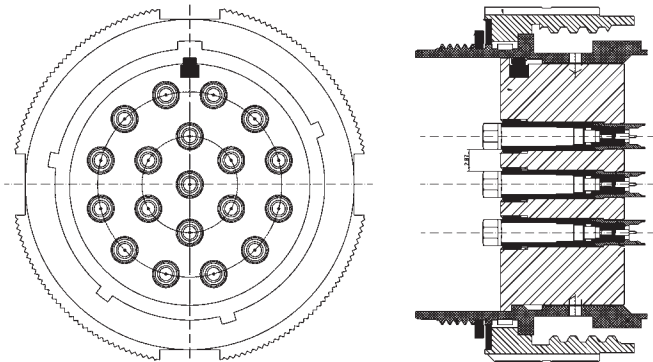


Connectors per MIL-DTL-38999, Series III

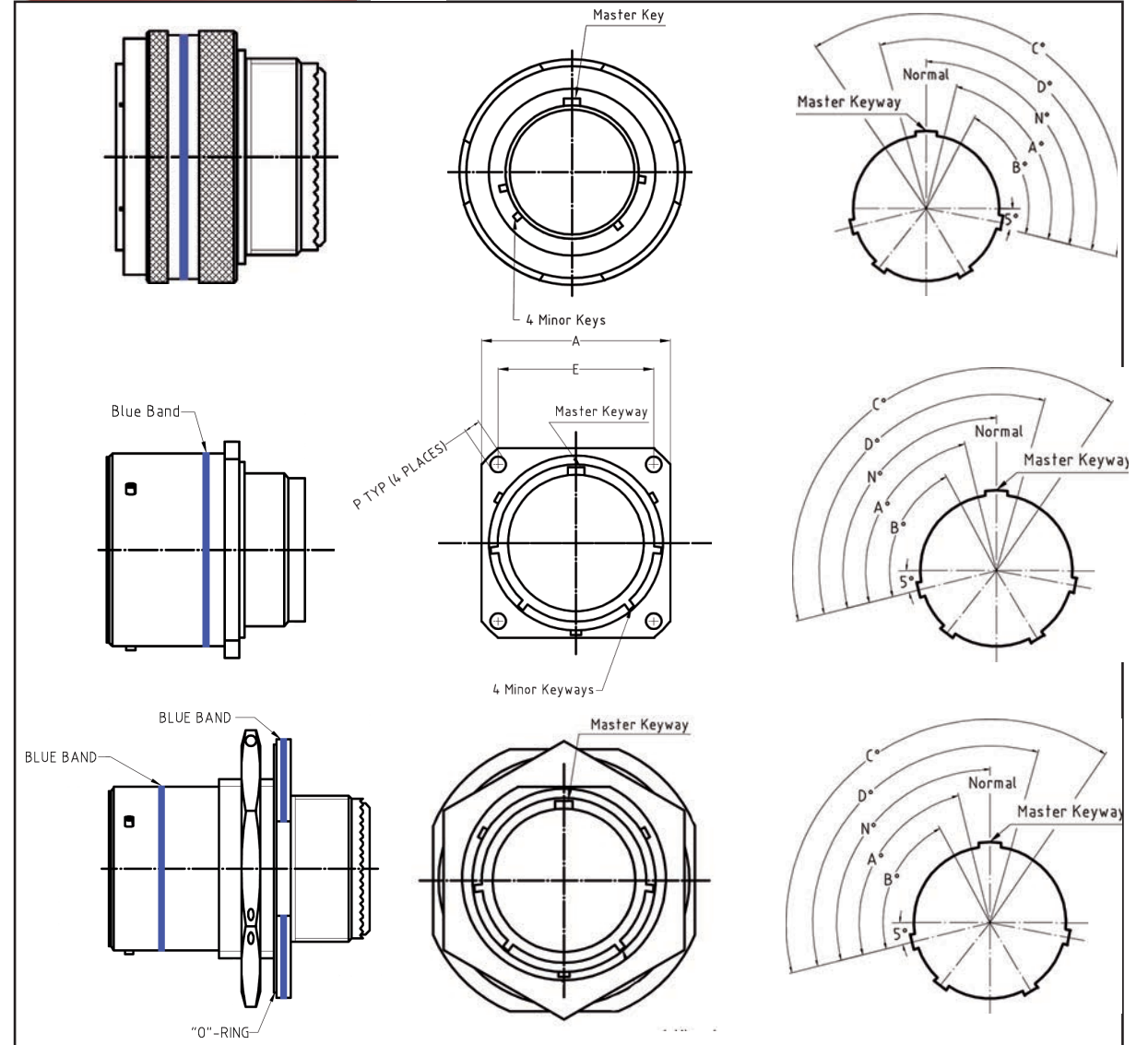
19 Cable Assemblies using either

- the 2.3 mm cable of Type 677
3.46 dB/m @ 18 GHz;
- the 1.4 mm cable of Type 47F
3.46 dB/m @ 18 GHz; 13 dB/m @ 65 GHz

Cable details and specifications at pages 100 and 103



Keying per MIL-DTL-38999



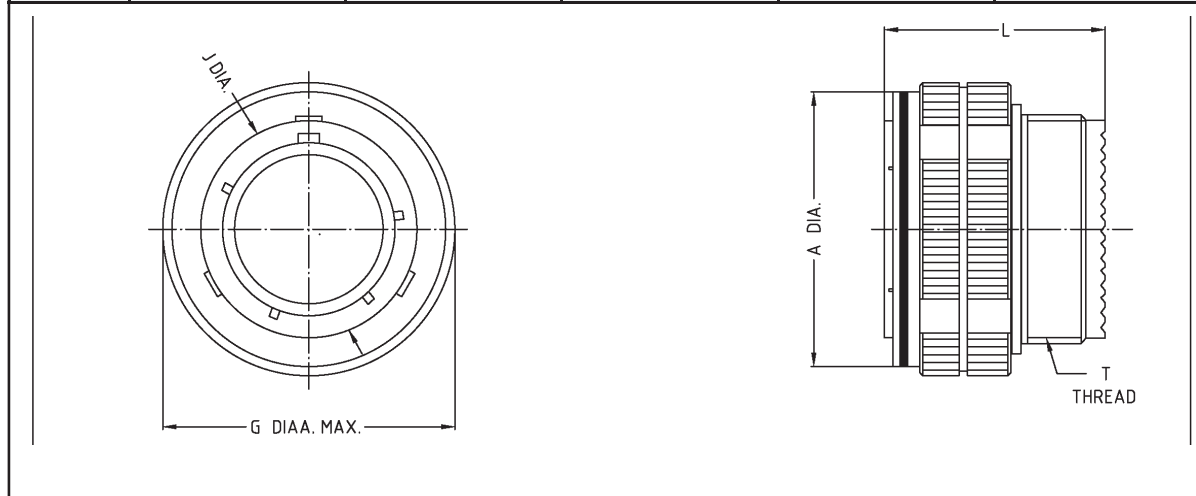
Keying for Shell Size 15					Keying for Shell Sizes 21 & 25				
Key	A°	B°	C°	D°	Key	A°	B°	C°	D°
N	80	142	196	293	N	80	142	196	293
A	135	170	200	310	A	113	156	182	292
B	49	169	200	244	B	90	145	195	252
C	66	140	200	257	C	53	156	220	255
D	62	145	180	280	D	119	146	176	298
E	79	153	197	272	E	51	141	184	242

MIL-DTL-38999 Series I Shells



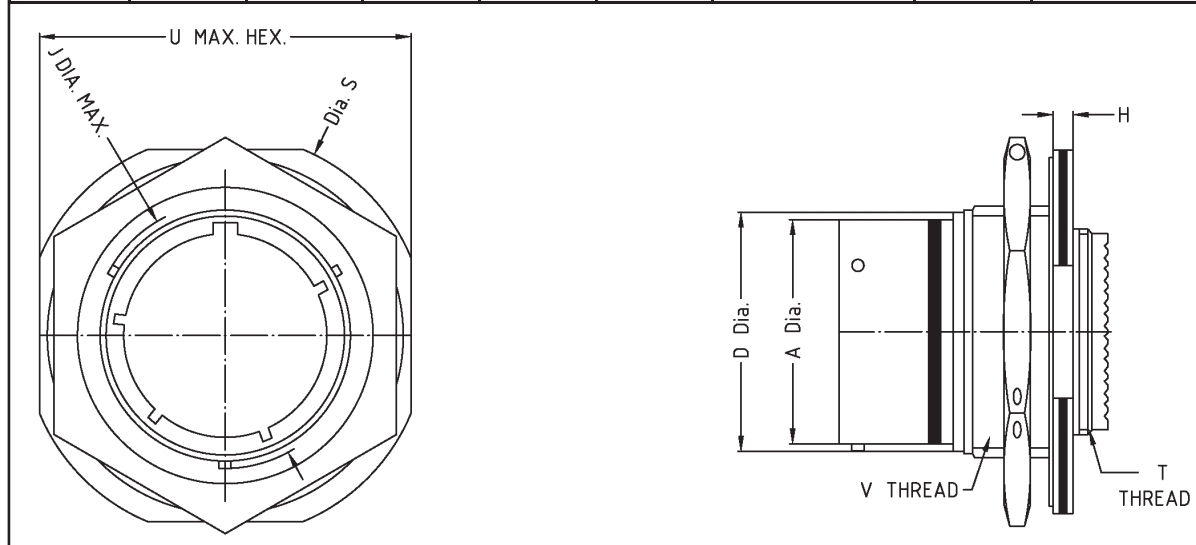
MIL-DTL-38999 Series I Straight Plug Dimensions

Shell Size	A max inch (mm)	G Dia. max. inch (mm)	J Dia. max. inch (mm)	L max. inch (mm)	Thread
15	1.186 (30.12)	1.281 (32.54)	0.884 (22.45)	1.234 (31.34)	13/16-24UNEF-2A
21	1.544 (39.22)	1.641 (41.68)	1.240 (31.50)	1.234 (31.34)	1-3/16-18UNEF-2A
25	1.793 (45.54)	1.891 (48.03)	1.490 (37.85)	1.234 (31.34)	1-7/16-18UNEF-2A



MIL-DTL-38999 Series I Bulkhead Feedthrough Jack Dimensions

Shell Size	A Dia max inch (mm)	D max. inch (mm)	H max. inch (mm)	J Dia. max. inch (mm)	S Dia. max. inch (mm)	T Thread	U Hex. ax. inch (mm)	Thread Class 2A
15	0.976 (24.79)	1.066 (27.08)	0.120 (3.05)	1.085 (27.56)	1.641 (41.68)	11/16-24UNEF-2A	1.329 (33.76)	1-1/8-18UNEF
21	1.333 (33.86)	1.441 (36.60)	0.151 (3.84)	1.442 (36.63)	2.078 (52.78)	1-3/16-18UNEF-2A	1.705 (43.31)	1-1/2-18UNEF
25	1.583 (40.21)	1.691 (42.95)	0.151 (3.84)	1.692 (42.98)	2.328 (59.13)	1-7/16-18UNEF-2A	20.17 (51.23)	1-3/4-18UNS

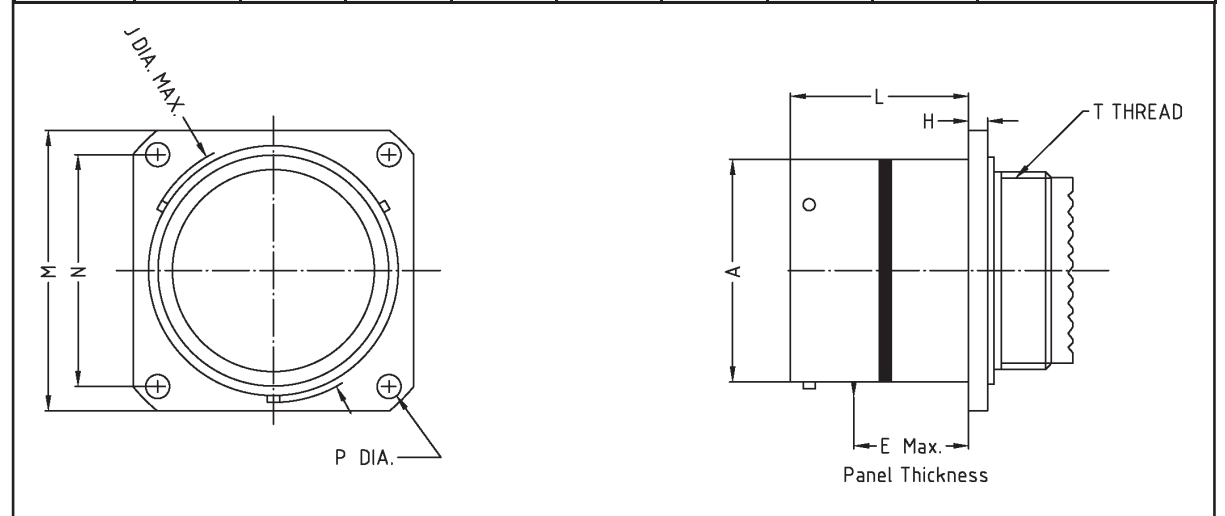


MIL-DTL-38999 Series I Shells



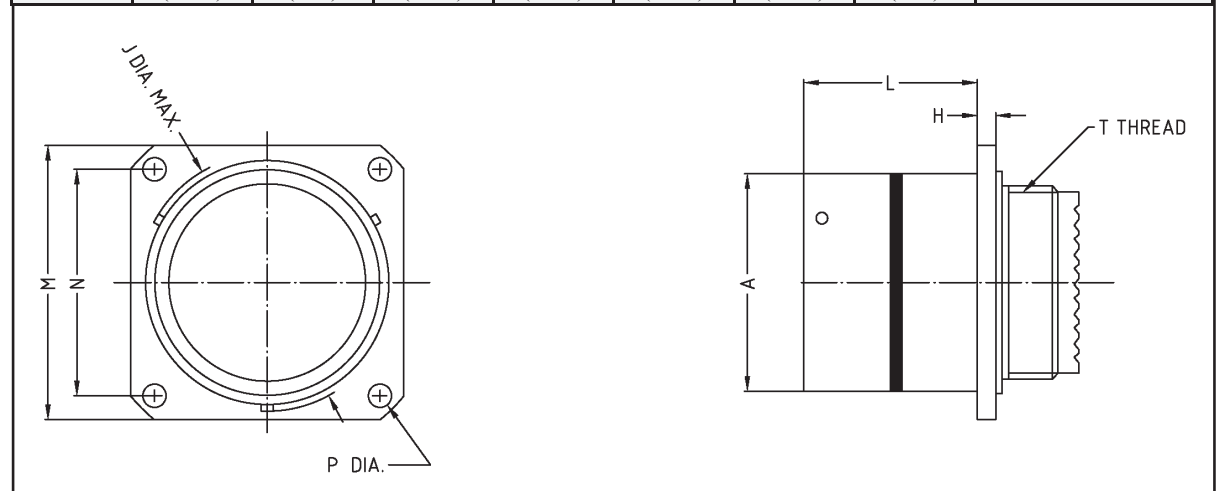
MIL-DTL-38999 Series I Wall Mounting Receptacle (Back Panel) Dimensions

Shell Size	A Dia max inch (mm)	E max. inch (mm)	H Dia. max. inch (mm)	J max. inch (mm)	L max. inch (mm)	M max. inch (mm)	N T.P. inch (mm)	P Dia. max. inch (mm)	Thread
15	0.976 (24.79)	0.234 (5.94)	0.100 (2.54)	1.085 (27.56)	.820 (20.83)	1.329 (31.47)	0.969 (24.61)	0.138 (3.51)	13/16-20UNEF-2A
21	1.333 (33.86)	0.204 (5.18)	0.130 (3.30)	1.442 (36.63)	0.790 (20.07)	1.582 (40.18)	1.250 (31.75)	0.138 (3.51)	1-3/16-18UNEF-2A
25	1.583 (40.21)	0.193 (4.90)	0.130 (3.30)	1.692 (42.98)	0.790 (20.07)	1.832 (46.53)	1.500 (38.10)	0.157 (3.99)	1-7/16-18UNEF-2A



MIL-DTL-38999 Series I Wall Mounting Receptacle (Front Panel) Dimensions

Shell Size	A Dia max inch (mm)	H max. inch (mm)	J Dia. max. inch (mm)	L max. inch (mm)	M max. inch (mm)	N T.P. inch (mm)	P Dia. max. inch (mm)	Thread
15	0.976 (24.79)	0.100 (2.54)	1.085 (27.56)	0.632 (16.05)	1.239 (31.47)	0.969 (24.61)	0.138 (3.51)	13/16-20UNEF-2A
21	1.333 (33.86)	0.130 (3.30)	1.442 (36.63)	0.602 (15.29)	1.582 (40.18)	1.250 (31.75)	0.138 (3.51)	1-3/16-18UNEF-2A
25	1.583 (40.21)	0.130 (3.30)	1.692 (42.98)	0.602 (15.29)	1.832 (46.53)	1.500 (38.10)	0.157 (3.99)	1-7/16-18UNEF-2A



MIL-DTL-38999 Series I Shells



MIL-DTL-38999 Series I Panel Cutouts Dimensions						
Shell Size	A Dia. inch (mm)	P Dia. inch (mm)	R inch (mm)	Mounting Screws	D +0.01 (0.25) -0 (0) inch (mm)	E +0 (0) -0.01 (0.25) inch (mm)
15	1.135 (28.83)	0.128 (3.25)	0.969 (24.61)	#4 (M3)	1.135 (28.83)	1.085 (27.56)
21	1.447 (36.75)	0.128 (3.25)	1.25 (31.75)	#4 (M3)	1.51 (38.35)	1.46 (37.08)
25	1.703 (43.25)	0.15 (3.81)	1.5 (38.1)	#6 (M3.5)	1.76 (44.7)	1.71 (43.43)

Part Number (12 Characters)	
Characters 1 & 2	MIL-DTL-38999, Series 1: S1-, T1-, I1-, B1-, C1-, or RQ-
Character 3	"-" (=straight connector), "+" (=right angled connector)
Character 4	Shell Size & number of inserts
Character 5	Insert Connector configuration & sex,
Character 6	Pressure configuration, Normal, Pressurized, Hermetic
Character 7	"-"
Character 8	Back Body configuration
Character 9 & 10	Cable Type
Character 11	Keying configuration, N,A, B, C, D, or E
Character 12	Surface treatment, Nickel or Cadmium

Detailed explanations of the specific Codes you will find at Pages 45, 49, or 84



Part Number System of the traditional SQ-Multipin/Multiport Connector. The Part Number consists of 12 digits, e.g. SQ-8M0-BIINN											
1 & 2 Series	3 SQ per MIL-DTL-38999, Series3	4 Shell Size	5 Sex & Connector Conf.	6 Pressure	7	8 Insert Back Body	9 and 10 Cable Type				12 Surface Treatment
							11 Key	12 Surface Treatment			
MIL-DTL-38999, Series3		21	M, F, R, B	0	"-"	B	IN, IS, 2S, 4F, 6A, 8F, 10, 11, 31, 39, 41, 42, 43, 44, 78, 83, 89, 94, 8D, M1, M4, M8, S9, X7	N	N, A, B, C, D	N=Nickel, C=Cadmium	

Part Number System of the TQ-, IQ-, BQ-, CQ and AQ-Multipin/Multiport Connectors. The Part Number consists of 12 digits, e.g. TQ-TM0-T10NC											
1 & 2 Series	3	4	5	6	7	8	9 and 10 Cable Type				12 Surface Treatment
							11 Key	12 Surface Treatment			
MIL-DTL-38999, Series3		21	M, H, F, B	0, P, H, V	"-"	B, T, L	IN, IS, 2S, 4F, 6A, 8F, 10, 11, 31, 39, 41, 42, 43, 44, 78, 83, 89, 94, 8D, M1, M4, M8, S9, X7	N, A, B, C, D	N=Nickel, C=Cadmium		

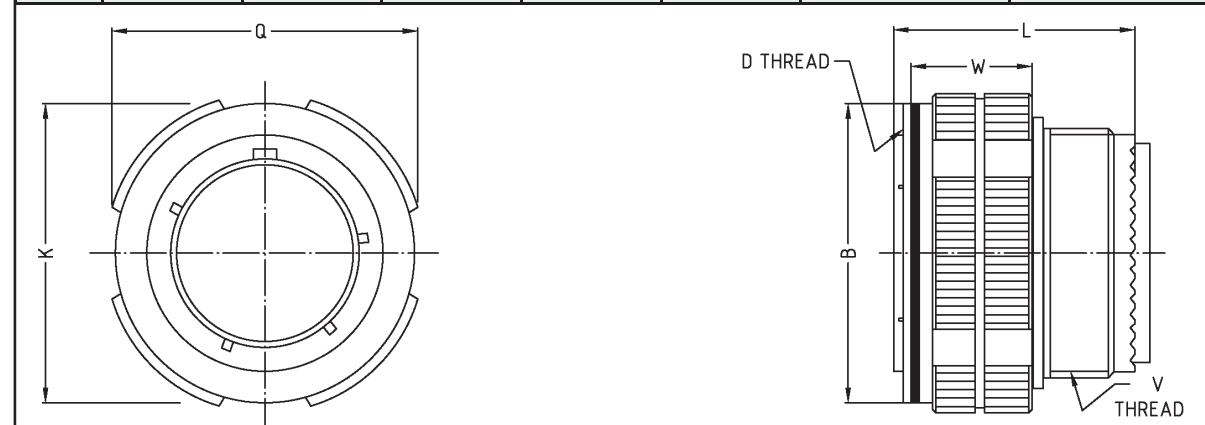
Part Number System of the RQ-Multipin/Multiport Connector. The Part Number consists of 12 digits, e.g. RQ-RM0-T110S											
1 & 2 Series	3	4	5	6	7	8	9 and 10 Cable Type				12 Surface Treatment
							11 Key	12 Surface Treatment			
RQ		21	M, F	0	"-"	T, Q, L	IN, IS, 2S, 4F, 6A, 8F, 10, 11, 31, 39, 41, 42, 43, 44, 78, 83, 89, 94, 8D, M1, M4, M8, S9, X7	0	G, S	G=Gold Chromate, S=Surtech	

A larger picture of this table you find on pages 92/93



MIL-DTL-38999 Series III Straight Plug Dimensions

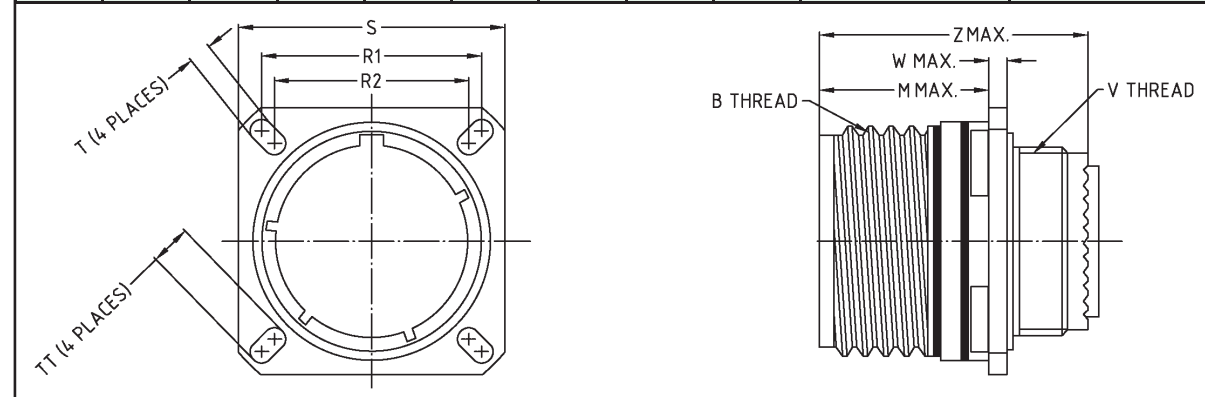
Shell Size	B +0.008 (0.2) -0 (0) inch (mm)	K max. inch (mm)	L max. inch (mm)	O Dia. max. inch (mm)	W +0.008 (0.2) -0.04 (0.1) inch (mm)	V Thread	D Thread Class 2A (Plated)
15	1.09 (27.65)	1.1 (27.9)	1.234 (31.34)	1.16 (29.4)	0.76 (19.3)	M22X1-6g0.100R	1.0-0.1P-0.3L-TS
21	1.5 (38.1)	1.524 (38.7)	1.234 (31.34)	1.625 (41.28)	0.76 (19.3)	M31X1-6g0.100R	1.3750-0.1P-0.3L-TS
25	1.744 (44.3)	1.768 (44.9)	1.234 (31.34)	1.875 (47.62)	0.76 (19.3)	M37X1-6g0.100R	1.6250-0.1P-0.3L-TS



MIL-DTL-38999 Series III Wall Mounting Receptacle Dimensions

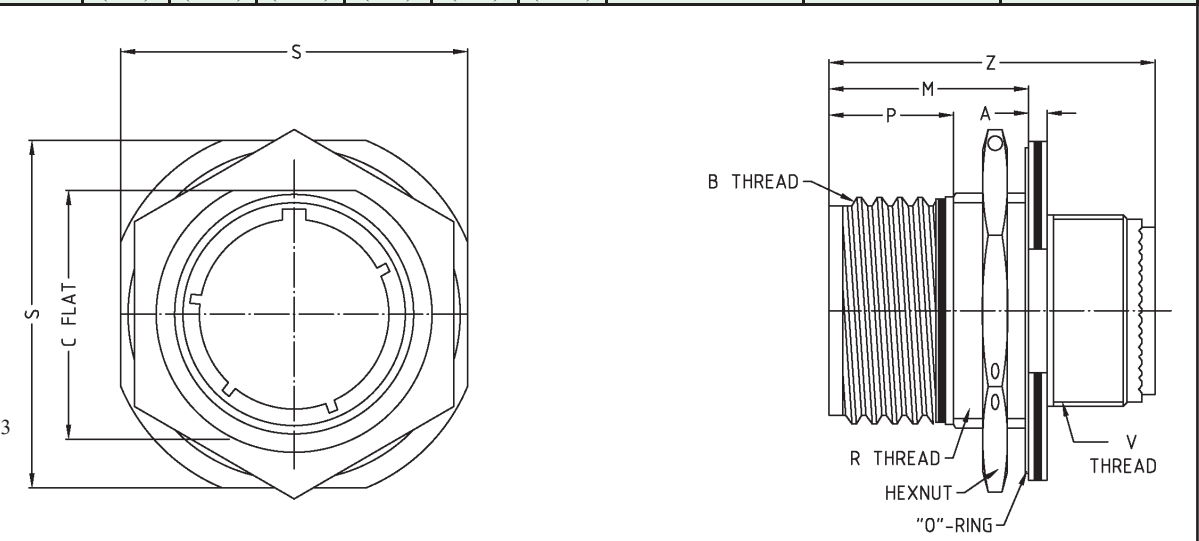
Update 2020-01-3

Shell Size	M max.	R1 typ. inch (mm)	R2 typ. inch (mm)	S +/-0.005 (0.13) inch (mm)	T +0.004 (0.1) -0.002 (0.05) inch (mm)	TT +0.004 (0.1) -0.002 (0.05) inch (mm)	W max. inch (mm)	Z +0.005 (0.13) -0.10 (0.25) inch (mm)	V Thread	B Thread Class 2A (Plated)
15	.822 (20.88)	0.969 (24.61)	.906 (23.01)	1.22 (30.99)	0.128 (3.25)	0.173 (4.39)	0.096 (2.44)	1.24 (31.5)	M22X1-6g0.100R	1.0-0.1P-0.3L-TS
21	0.790 (20.07)	1.25 (31.75)	1.156 (29.36)	1.562 (39.67)	0.128 (3.25)	0.194 (4.93)	.126 (3.20)	1.235 (31.36)	M31X1-6g0.100R	1.3750-0.1P-0.3L-TS
25	0.790 (20.07)	1.5 (38.10)	1.375 (34.93)	1.811 (46.00)	0.154 (3.91)	0.242 (6.15)	.126 (3.20)	1.235 (31.36)	M37X1-6g0.100R	1.6250-0.1P-0.3L-TS



MIL-DTL-38999 Series III Bulkhead Feedthrough Dimensions

Shell Size	A +0.010 (0.25) -0.005 (0.130)	C +0.004 (0.1) -0.01 (0.25) inch (mm)	Z +0.005 (0.13) -0.04 (0.1) inch (mm)	M +0.005 (0.13) -0.04 (0.1) inch (mm)	P +0.004 (0.41) -0.04 (0.1) inch (mm)	S +0.004 (0.1) -0.002 (0.05) inch (mm)	R Thread Class 2A (Plated)	V Thread (Plated)	B Thread Class 2A (Plated)
15	0.104 (26.4)	1.059 (26.9)	1.243 (31.57)	0.878 (22.3)	0.563 (14.3)	1.417 (36)	M28X1-6g0.100R	M22X1-6g0.100R	1.0-0.1P-0.3L-TS
21	0.135 (3.43)	1.437 (36.5)	1.243 (31.57)	0.878 (22.3)	0.563 (14.3)	1.938 (49.23)	M38X1-6g0.100R	M31X1-6g0.100R	1.3750-0.1P-0.3L-TS
25	0.135 (3.43)	1.687 (42.85)	1.243 (31.57)	0.878 (22.3)	0.563 (14.3)	2.188 (55.38)	M44X1-6g0.100R	M37X1-6g0.100R	1.6250-0.1P-0.3L-TS



Note: The dimensions of Shell size 15, do not meet completely the dimensions, as requested by MIL-DTL-38999. The customer, who requested initially the product to be designed for his program, insisted on some minor changes, and named it Size "13" originally. As other customers did not mind the dimensional differences, we stuck with them, but we decided to change the shell size to 15, not 13 anymore. But some of the dimensions are smaller then requested by the official Norm. Please refer to the table for the dimensions.

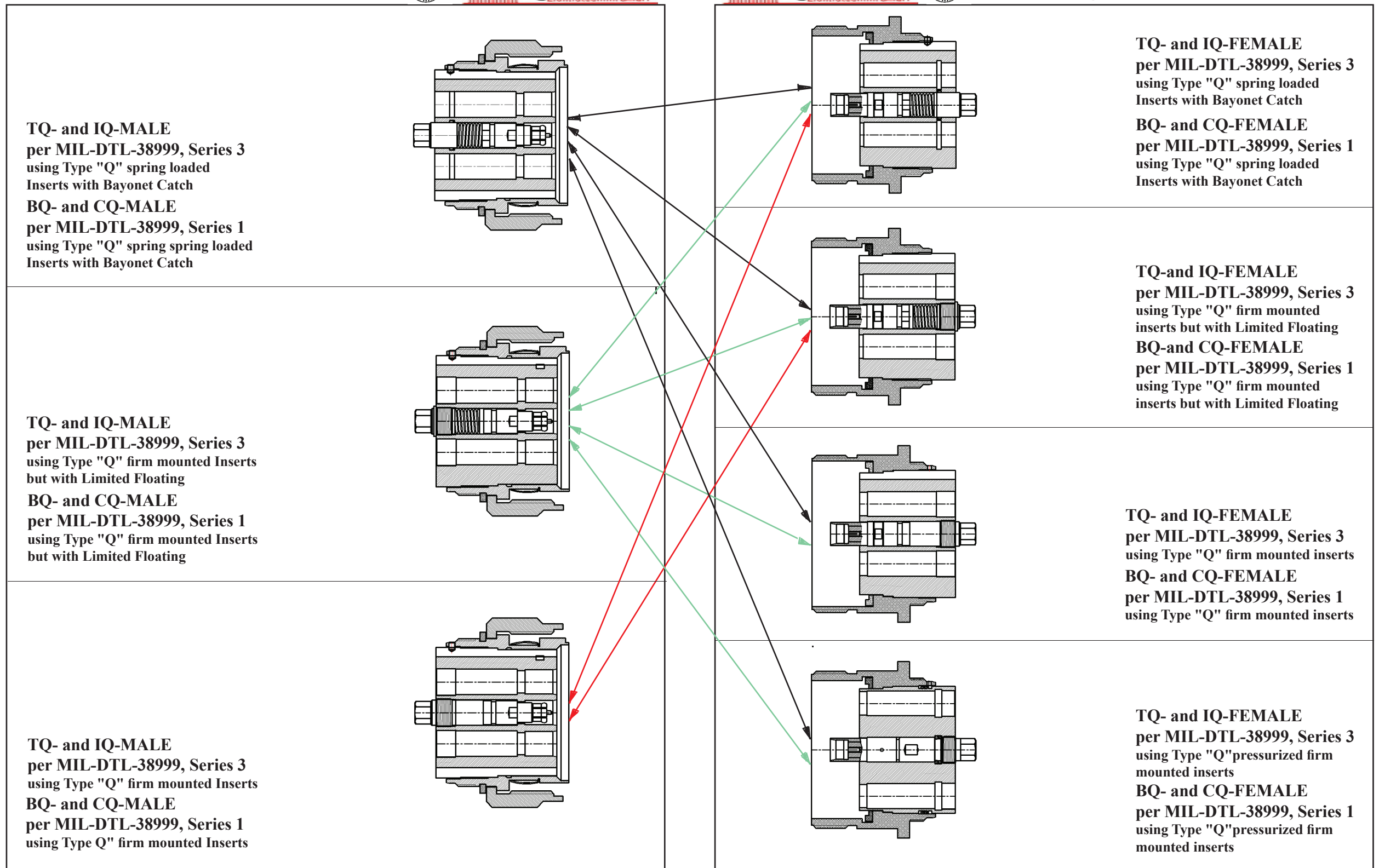


Table with 7 columns: Shell Size, A (+0.01, -0), B (+0, -0.01), Dia. H1 min. inch (mm), Dia. H2 min. inch (mm), R typ. inch (mm), Dia. T +/- 0.050 (0.13). Rows for sizes 15, 21, 25.

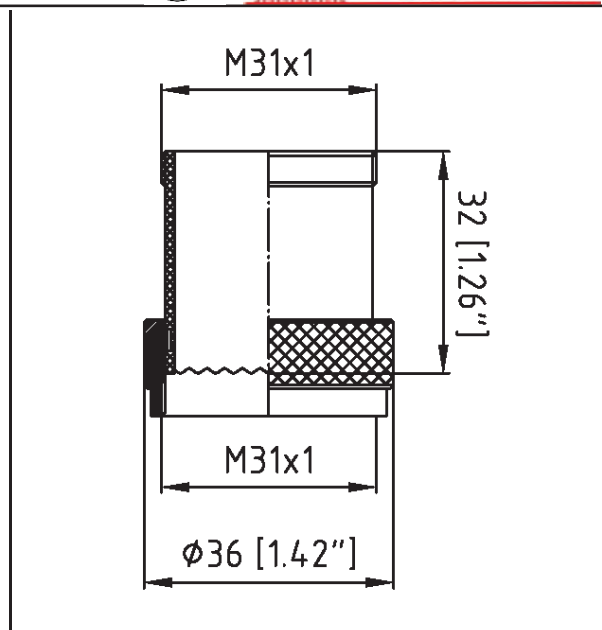
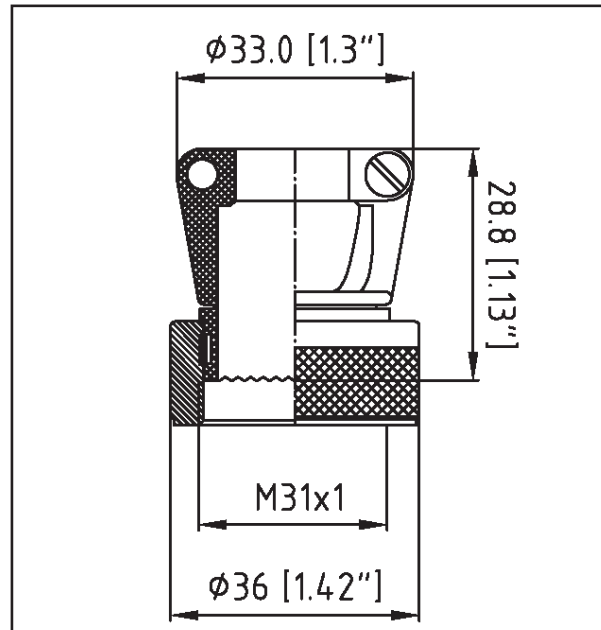
Part Number (12 Characters) breakdown table. Columns: Characters 1 & 2, Character 3, Character 4, Character 5, Character 6, Character 7, Character 8, Character 9 & 10, Character 11, Character 12. Includes detailed explanations for each character.

Vertical table for SQ, HQ, BQ, and CQ series. It details connector configurations, sex & connector configurations, pressure ratings, and shell sizes. Includes a large yellow callout box on the right side.

A larger picture of this table you find on pages 92/93

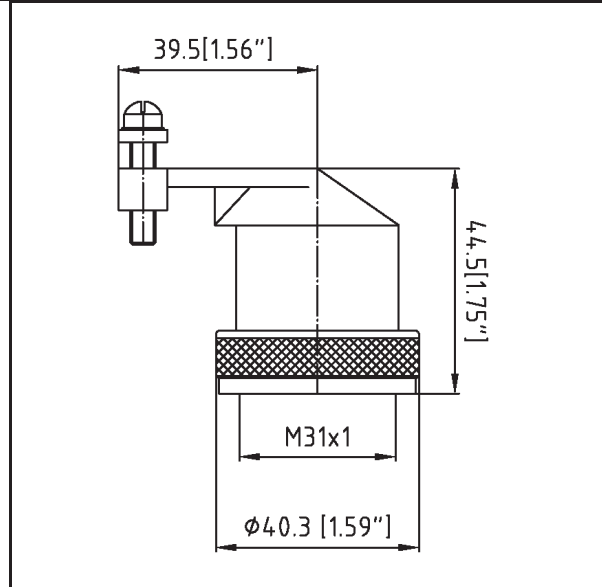
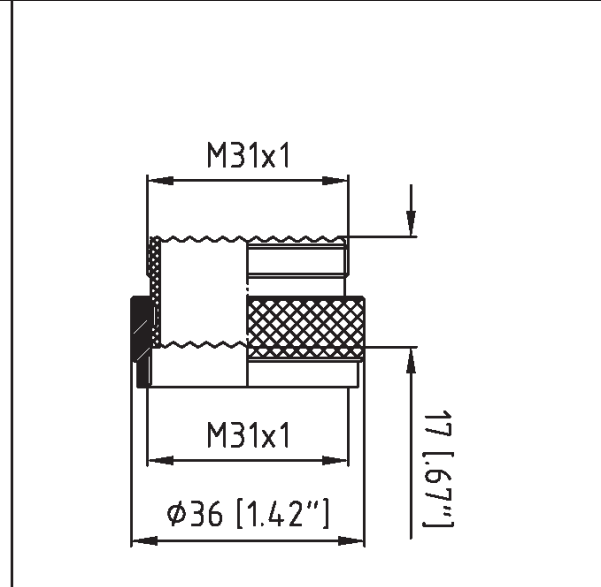


Circular Multipin Backparts of Size 21Shells



Straight Back Body with Clamps	
Standard Back Body Part Number	Material and Surface treatment
BPTQ-2101-07	Aluminum black anodized
BPTQ-2101-15	Aluminum nickel plated

Extender Back Body	
Standard Back Body Part Number	Material and Surface treatment
BPTQ-2102-07	Aluminum black anodized
BPTQ-2102-15	Aluminum nickel plated

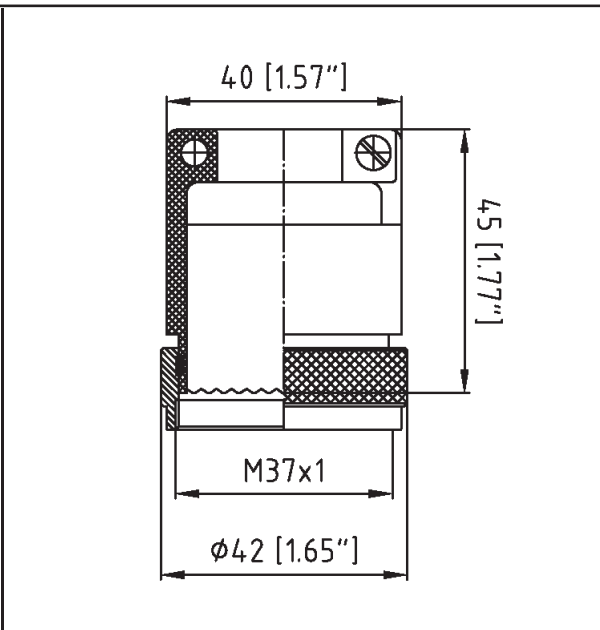
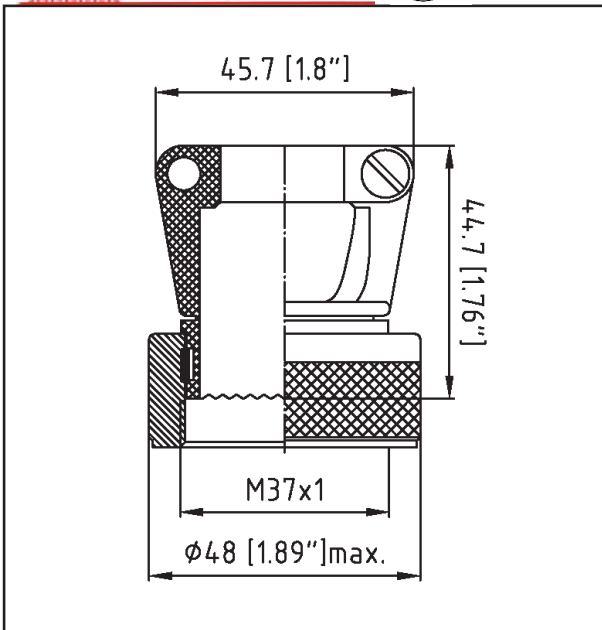


Short Back Body	
Standard Back Body Part Number	Material and Surface treatment
BPTQ-2103-07	Aluminum black anodized
BPTQ-2103-15	Aluminum nickel plated

Right Angle Back Body	
Standard Back Body Part Number	Material and Surface treatment
BPTQ-2104-07	Aluminum black anodized
BPTQ-2104-15	Aluminum nickel plated

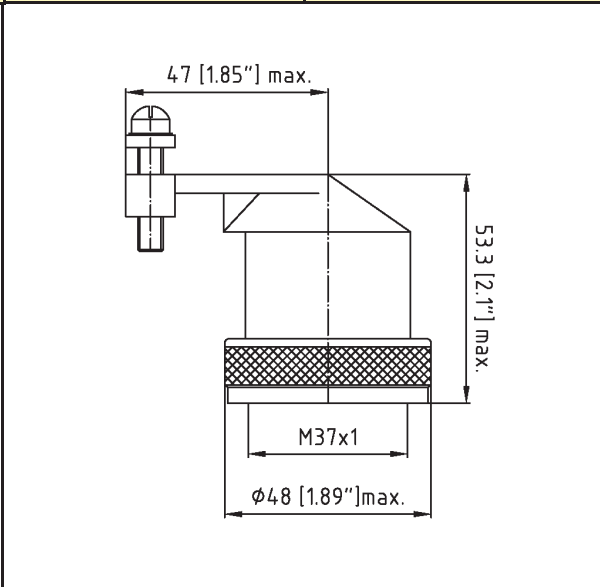
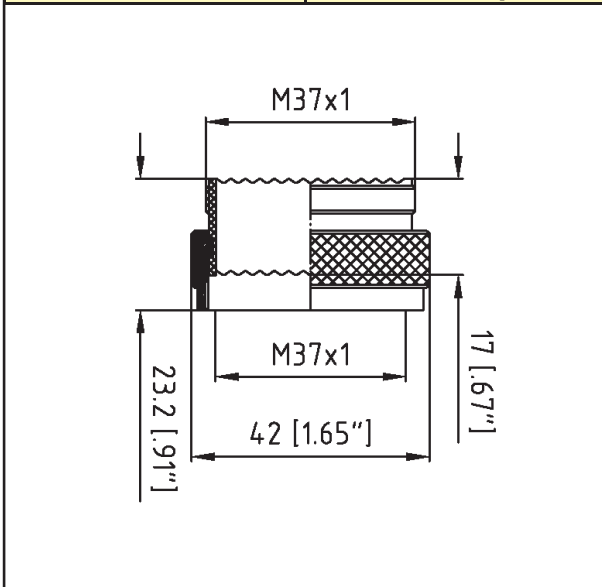
More Backbodies are available or can be developed on request.

Circular Multipin Backparts of Size 25Shells



Straight Back Body with Clamps	
Standard Back Body Part Number	Material and Surface treatment
BPTQ-2501-07	Aluminum black anodized
BPTQ-2501-15	Aluminum nickel plated

Straight Back Body with Clamps	
Standard Back Body Part Number	Material and Surface treatment
BPTQ-2502-07	Aluminum black anodized
BPTQ-2502-15	Aluminum nickel plated



Short Back Body	
Standard Back Body Part Number	Material and Surface treatment
BPTQ-2503-07	Aluminum black anodized
BPTQ-2503-15	Aluminum nickel plated

Right Angle Back Body	
Standard Back Body Part Number	Material and Surface treatment
BPTQ-2504-07	Aluminum black anodized
BPTQ-2504-15	Aluminum nickel plated

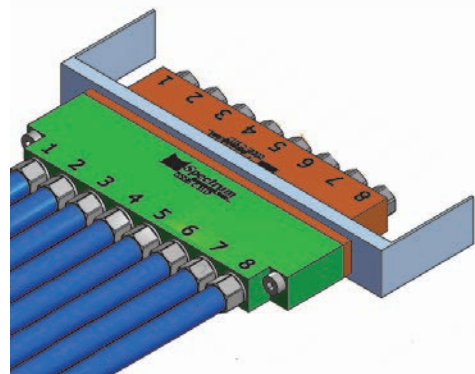
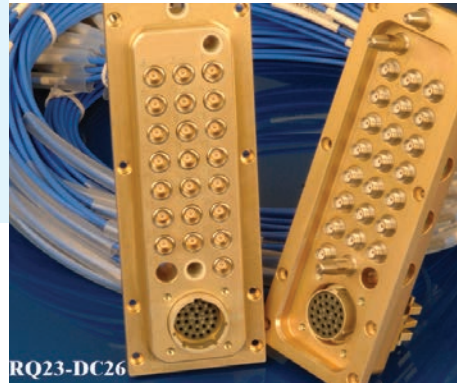
More Backbodies are available or can be developed on request.



Rectangular Multiports

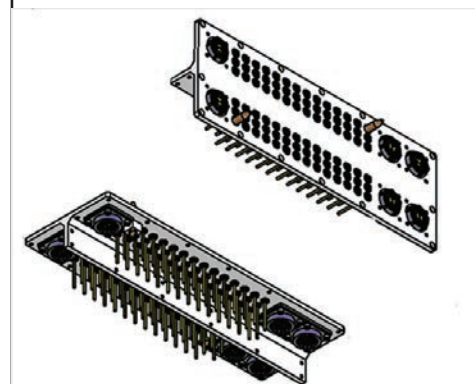
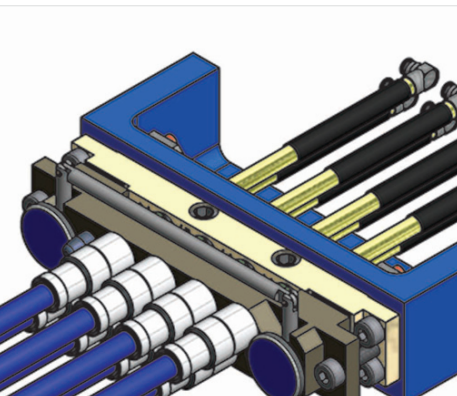
The RQ- Multiport Connectors are using rectangular shells, developed by Spectrum Elektrotechnik GmbH, allowing dense packaging. The operating frequency depends on the inserts used, operating up to 65 GHz. Details can be seen on pages 56 to 67

The RQ23-DC26 is employing twenty-three (23) coaxial cable assemblies plus twenty-six (26) signal lines in one connector and has been qualified in an airborne program. Coaxial cable of Type 11 and/or Type 43 and AWG20 wire for the lower frequency signals or supplies are being used. It can be modified for other coaxial cables.



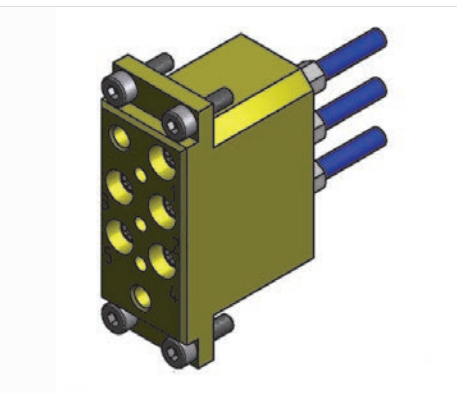
This RQ-8 design is using 8 coaxial connectors in-line in a very narrow package (7mm).

This RQ-8 with quick connect/release mechanism employs 8 coaxial lines in a Honey-comb package for space advantage



The most dense packaging ever proposed for a program, 80 coaxial connections and 120 signal lines.

Multiport Connector with 5 coaxial connections is operating to 40 GHz.



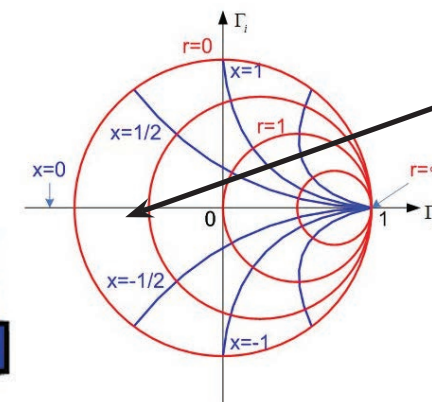
YOU NEED SOMETHING DIFFERENT?

SPECTRUM DESIGNS, MANUFACTURES, ASSEMBLES AND TESTS ALMOST EVERYTHING **IN-HOUSE**, RESULTING IN:

- SHORT WAYS
- FAST RESPONSE TIME
- SHORT DELIVERY
- HIGHEST QUALITY



Quality Assurance

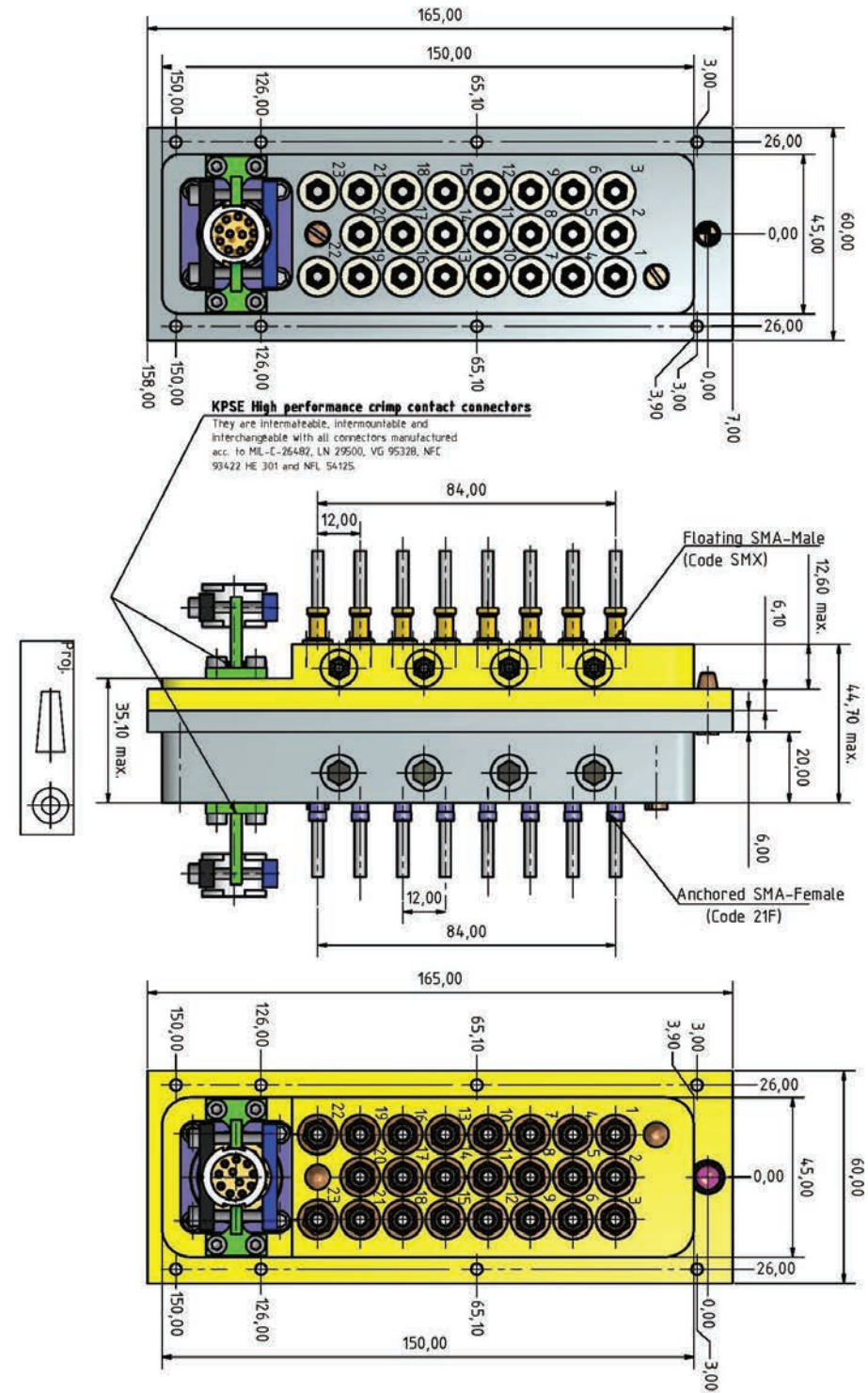


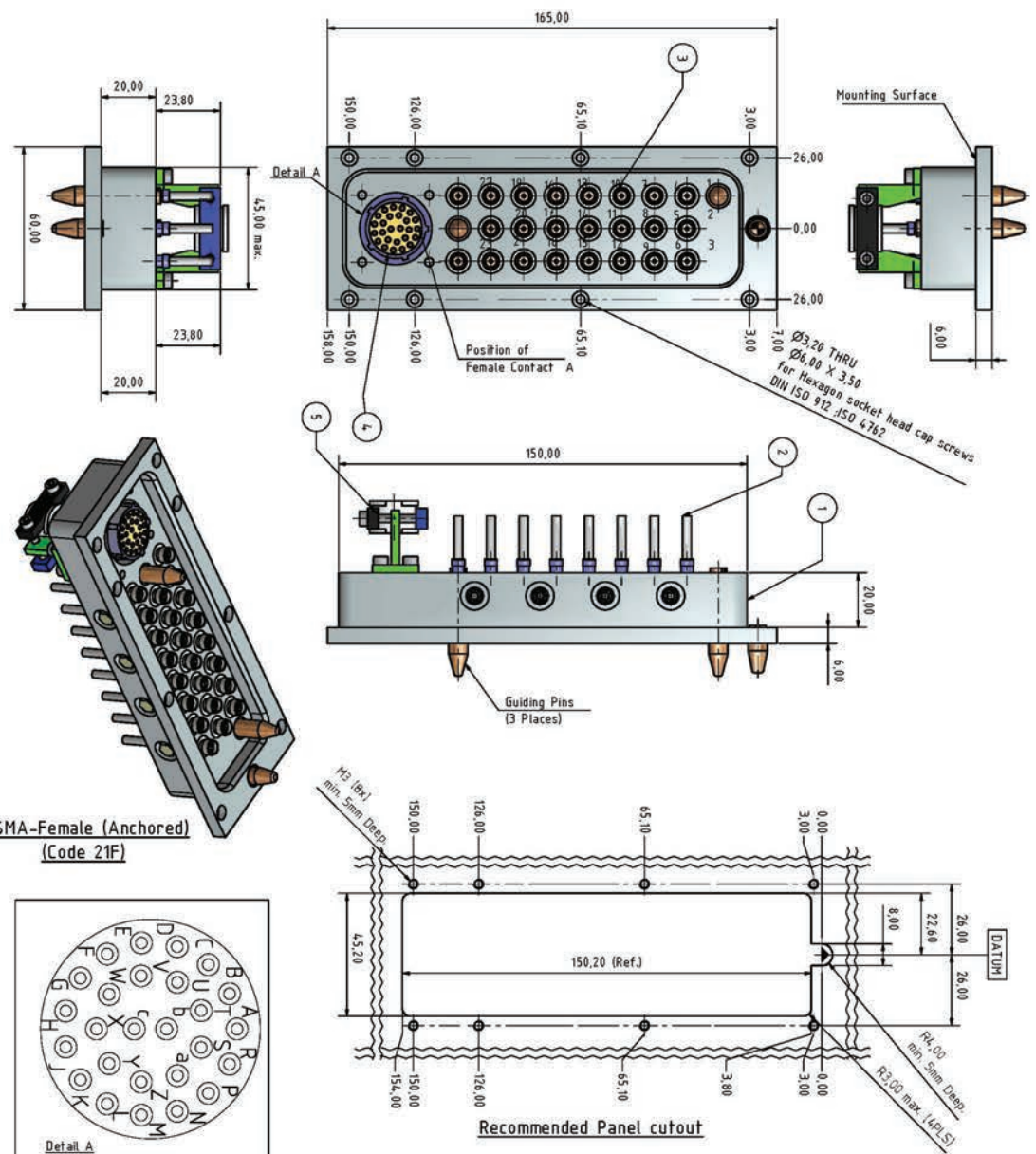


RQ23-DC26

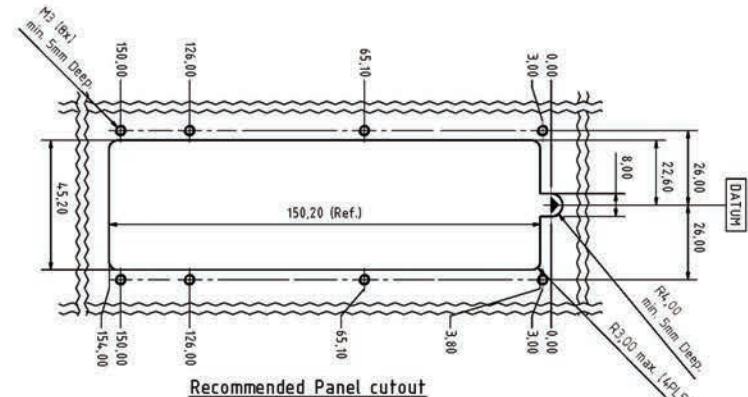
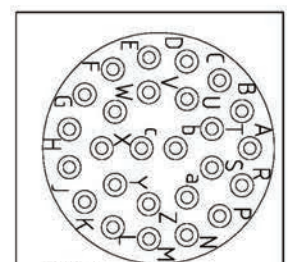


23 Coaxial Cable Assemblies & 26 Signal and Supply Lines

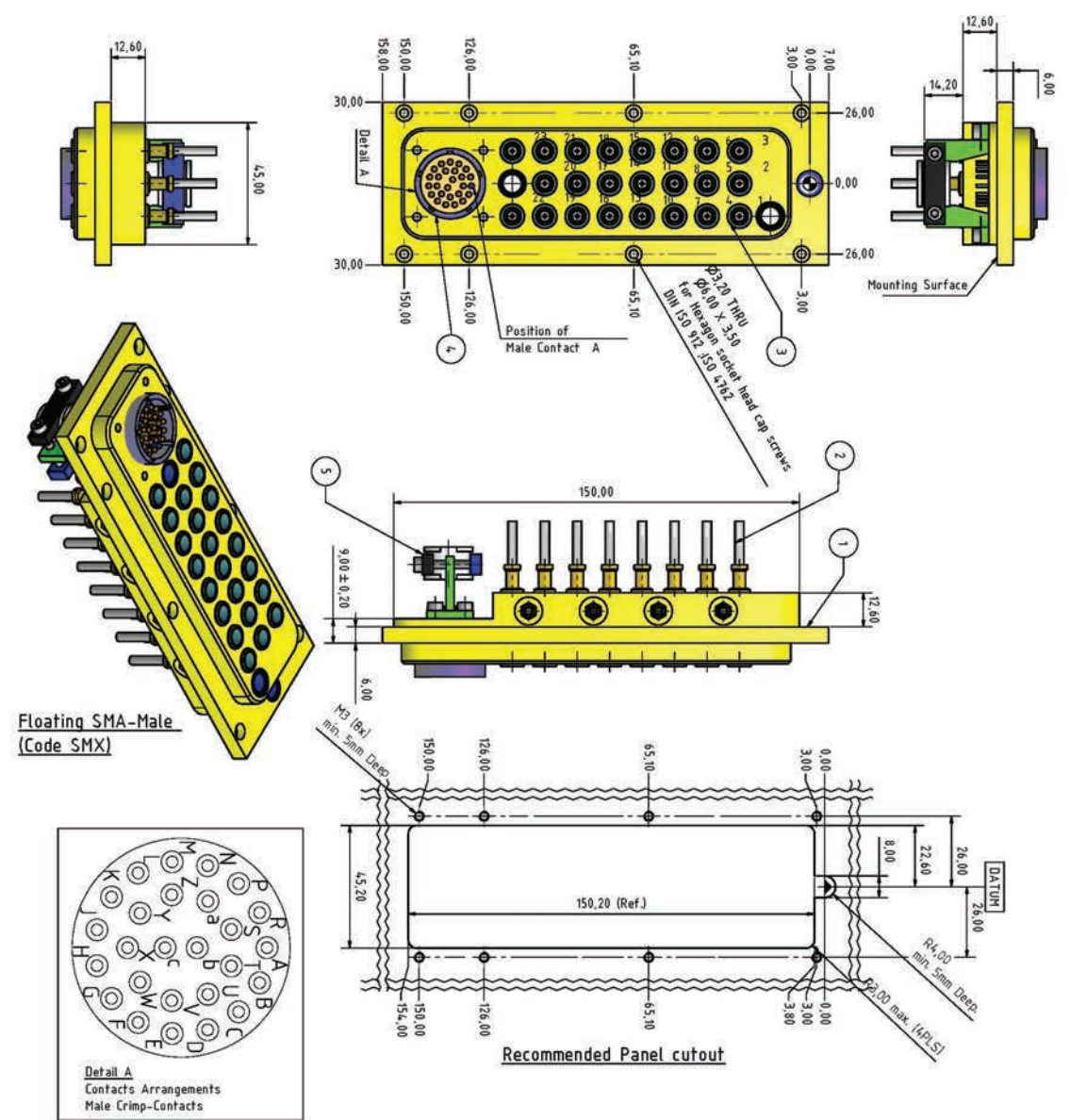
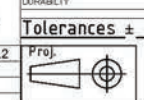




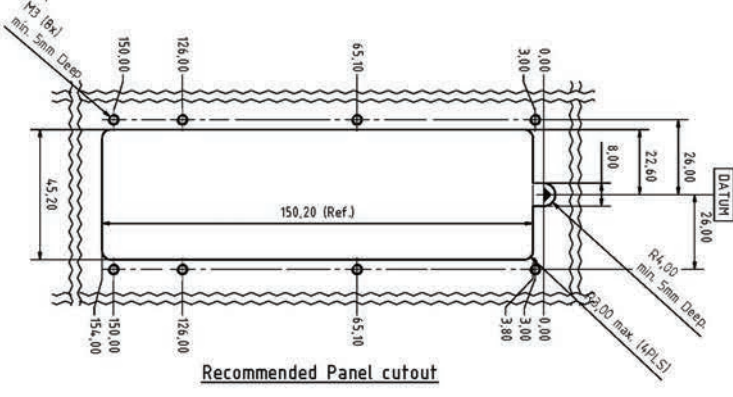
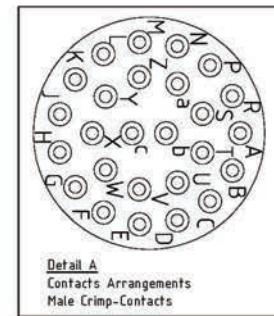
SMA-Female (Anchored)
(Code 21F)



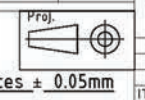
ITEM	Qty.	PART NUMBER	DESCRIPTION	MATERIAL AND FINISH
5	1	07-146-Z	Back Shell for AWG20-22	Material: AlMg4.5Mn; Alodine
4	1	07-058-Z	Receptacle Housing 06-KPT/KPSE-16 (26 Pole) With 26 Crimp Contacts AWG-20	Receptacle Housing: Interface Per MIL-C-26482 / VG95328 ;Alodine (or Anodized Finish) With Crimp Contacts AWG-20 Gold Plated.
3	23	RQ23-2101-02 RQ23-2102-02	SMA-Female Anchored	Interface Per MIL-STD-348A, Fig.310.2
2	23	TYP 11 TYP 43	Cable Typ 11 Cable Typ 43	Spectrum TYP 11 Spectrum TYP 43
1	1	07-058-1	Housing	Material: AlMg4.5Mn; Alodine



Floating SMA-Male
(Code SMX)



DESCRIPTION	SPECIFICATIONS	5	1	07-146-Z	Back Shell for AWG20-22	Material: AlMg4.5Mn; Alodine
INSERTION AND WITHDRAWAL OF WHOLE CONNECTOR	150 N max.	4	1	07-057-Z	Receptacle Housing 02-16KPT (26 Pole) With 26 Crimp Contacts AWG-20	Receptacle Housing: Interface Per MIL-C-26482 / VG95328 ;Alodine (or Anodized Finish) With Crimp Contacts AWG-20 Gold Plated.
DURABILITY	200 CYCLES MIN	3	23	RQ23-1101-02 RQ23-1102-02	SMA-male floating mount	Interface Per MIL-STD-348A, Fig.310.1
		2	23	TYP 11 TYP 43	Cable Typ 11 Cable Typ 43	Spectrum TYP 11 Spectrum TYP 43
		1	1	07-057-1	Housing	Material: AlMg4.5Mn; Alodine





RQ-23 Cable Assembly Set

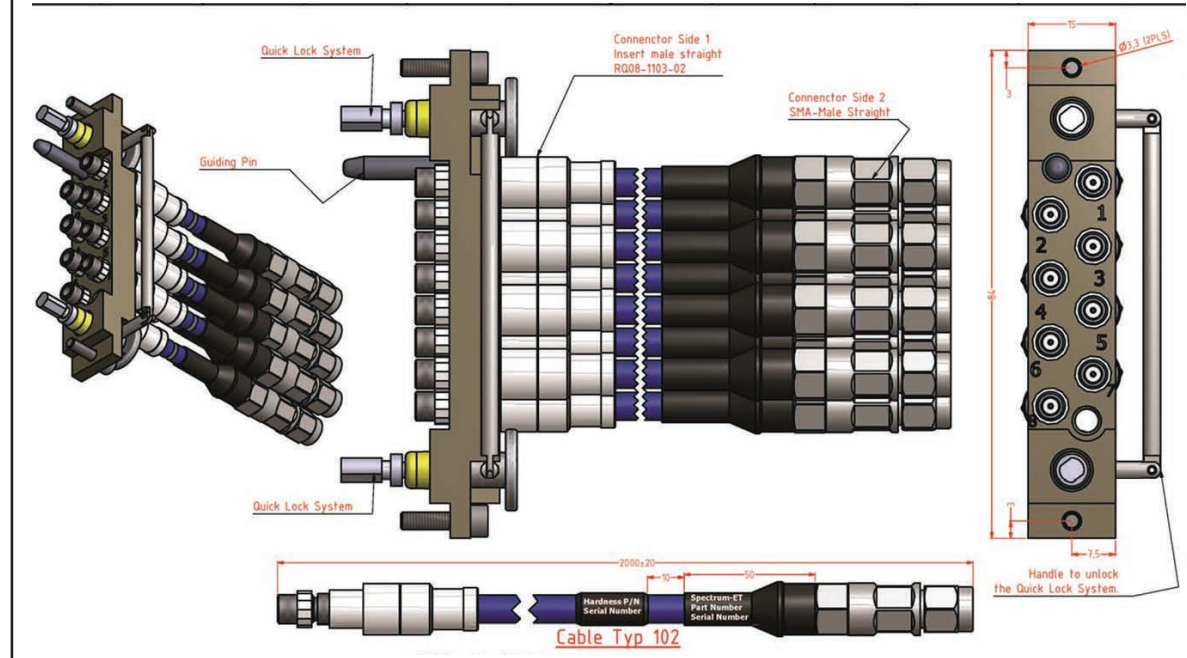


For certain applications even the coaxial connections of our circular TQ- and IQ- or CQ- and BQ- Series were too little, plus there was a need for DC signal and driver signals, challenging Spectrum to design a Multi COAX/DC Connector, the SR23-DC26, connecting and disconnecting 23 coaxial RF lines and 26 signal and supply lines at once and in seconds, and by using the smallest possible size for this complex design. The male coaxial insert is a modified version of our successful SMA Push-On for lower insertion force and withdrawal force, as we are specifying 150N maximum in total for the insertion and withdrawal of all 23 coaxial lines plus the 26 signal and supply lines. The female coax inserts terminating the cable use the standard SMA female interface, mating with any standard SMA male connector, while the male SMA Push-Ons mate with any standard SMA female connector by just being pushed on, instead of threadening and torquing. Using the standard SMA connector styles ensures that existing test cables terminated with SMA connectors can be used during testing.

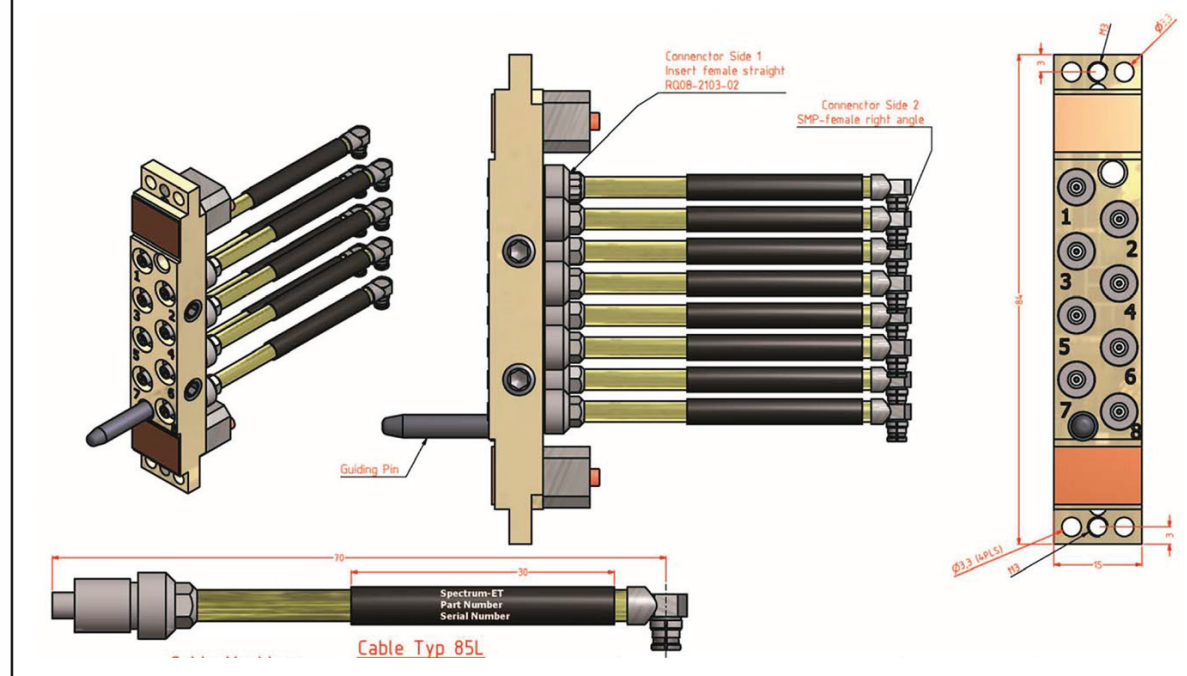
With 23 coaxial cable assemblies there is a good chance that one, or even several may be damaged at some time and need to be replaced. Therefore the connectors were designed such that any of the coaxial cable assemblies can be replaced in a very short time by just taking out the proper mounting bolt, holding the coaxial inserts in groups of 4 or 8 in place, and replacing the assembly or assemblies and inserting and securing the mounting bolt again. The maximum operating frequency of the design to the left is guaranteed to 25 GHz when using the cable of Types 11 or 43.

Several modern systems require phase match of the cable assemblies of a harness. Spectrum is using utmost cable manufacturing, interface cutting techniques and advanced adjustable connector designs meeting almost any requirement a customer may have for phase match among the assemblies.

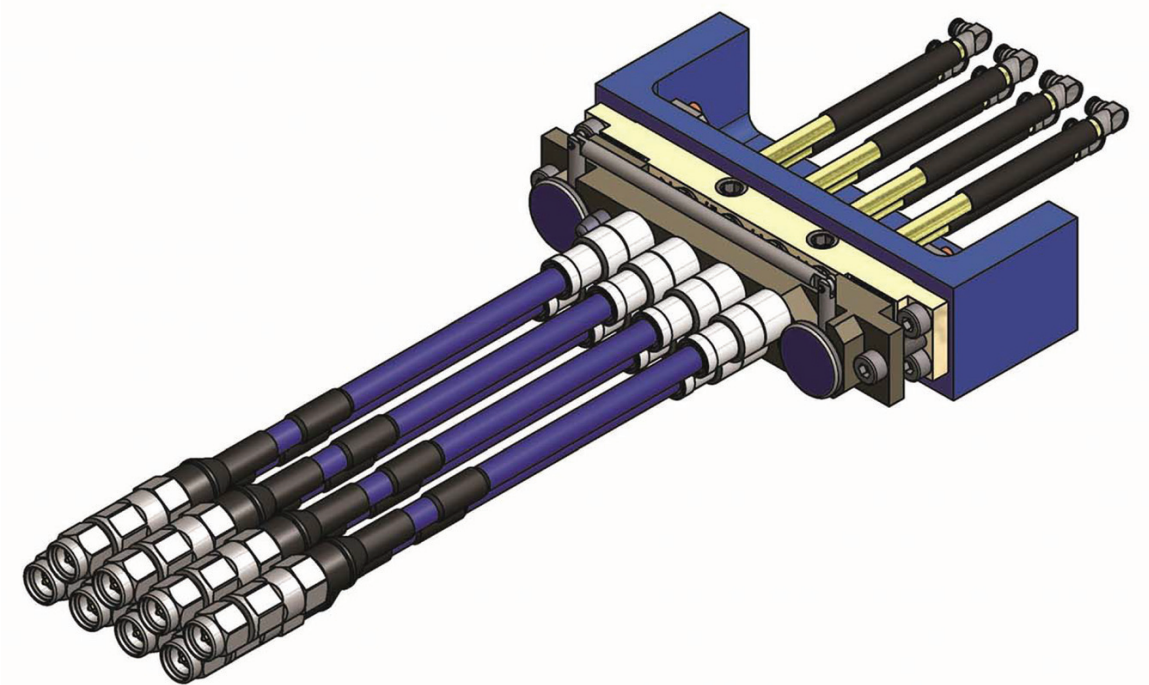
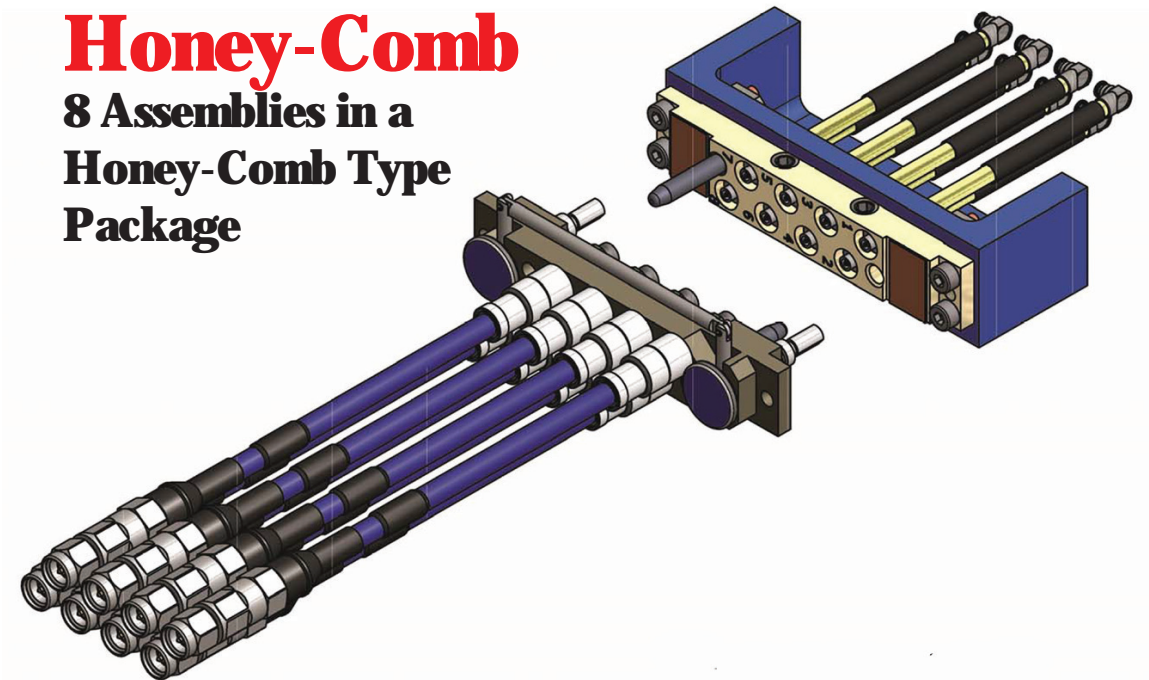
Selecting the proper materials and aging techniques in well defined processes is an important parameter as well to make cable assemblies and harnesses to operate in temperature ranges of minus 54°C to plus 115°C as standard. Spectrum offers also extended temperature ranges from minus 72° C to plus 200°C. All connectors are RoHS compliant and meet the condition and corrosion requirement to MIL-STD-202, method 101, condition B. The Connector series are compliant to thermal shock to MIL-STD-202, method 107, condition B, vibration to MIL-STD-202, method 204, condition D, and shock to MIL-STD-202, method 213.

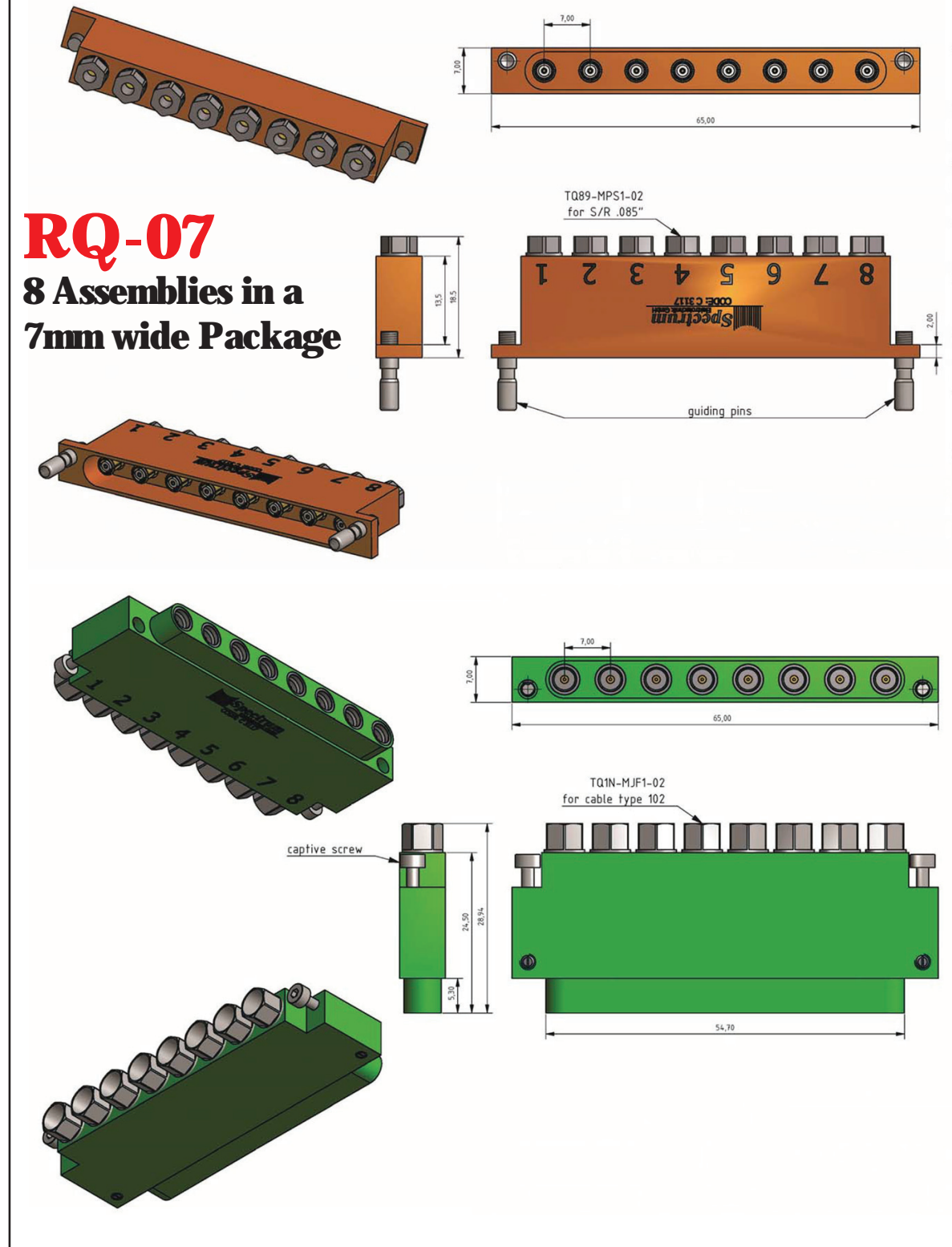


Honey-Comb 8 Cable Assemblies in a small package.



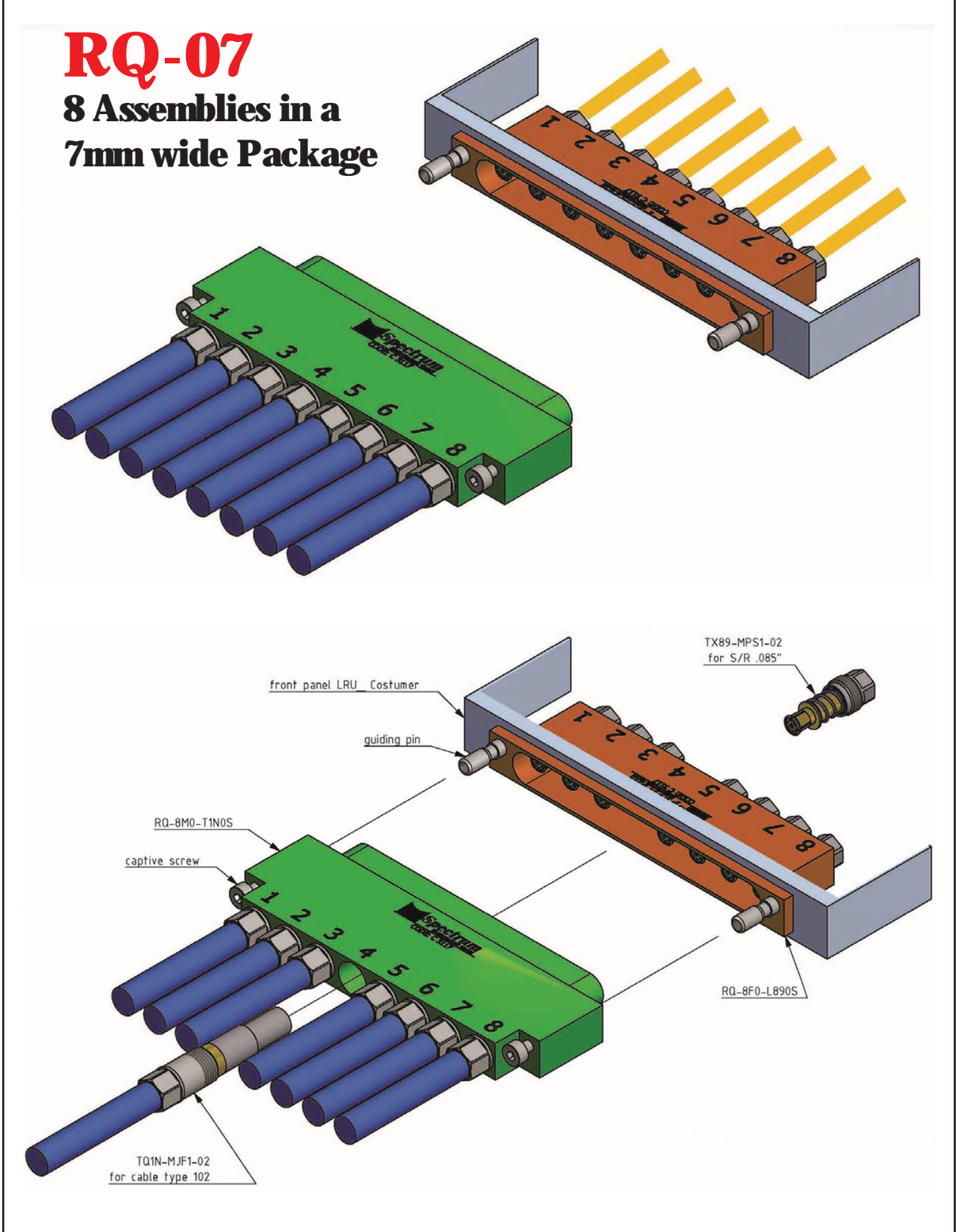
Honey-Comb 8 Assemblies in a Honey-Comb Type Package





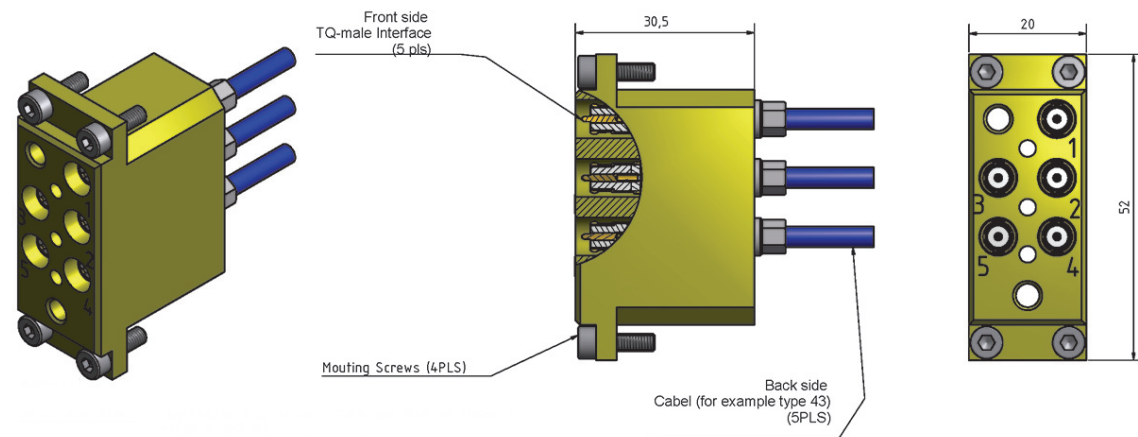
RQ-07

8 Assemblies in a 7mm wide Package



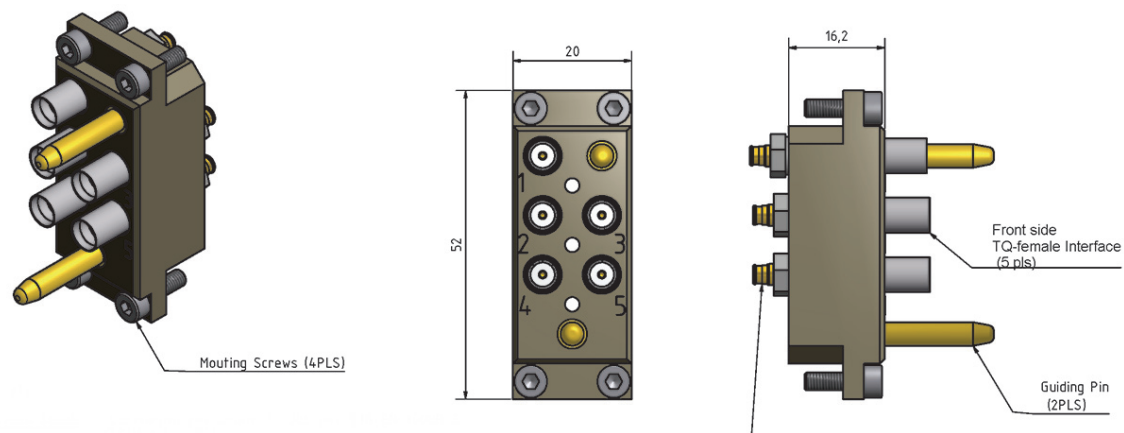
RQ-07

8 Assemblies in a 7mm wide Package



RQ-05

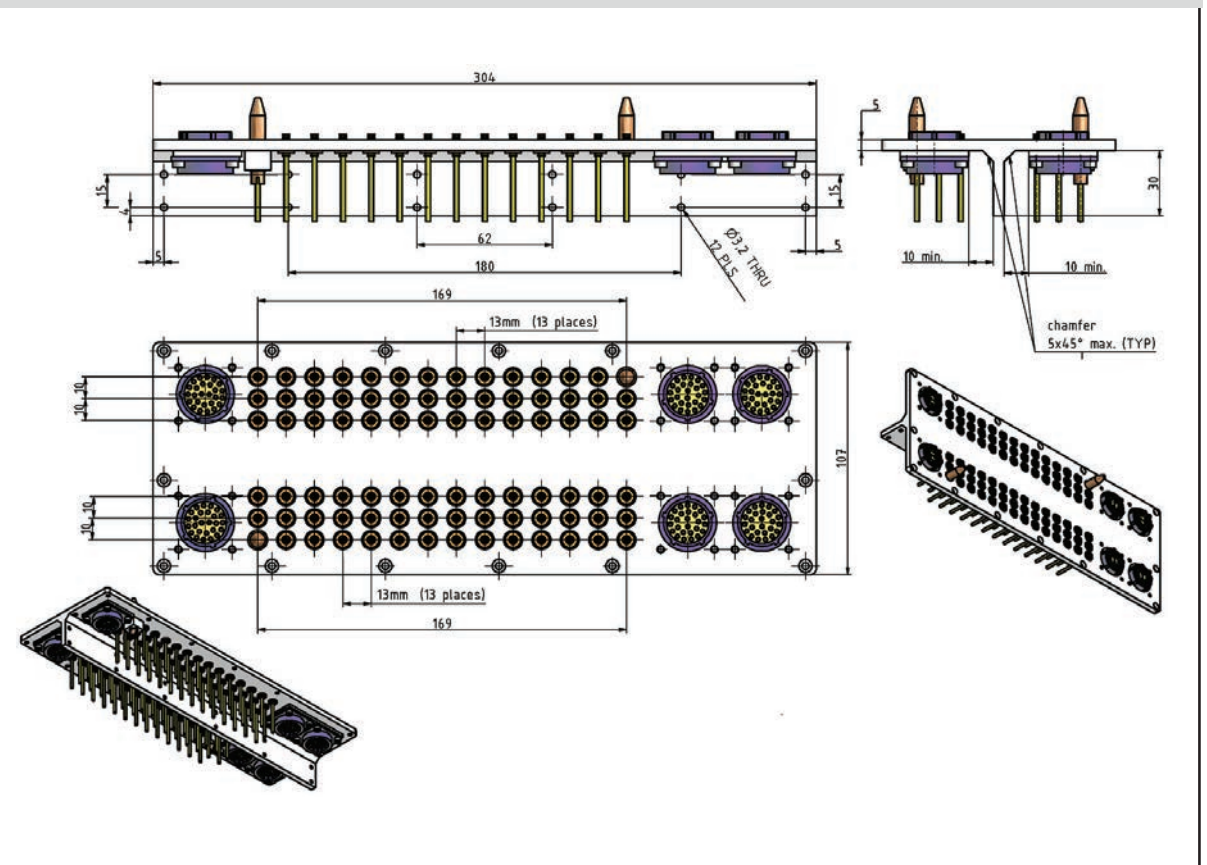
5 Cable Assemblies in a dense rectangular Package



RQ80-DC120

A study for packaging 80 RF Connectors and 120 Signal Connectors in one Unit. Sizewise it can be done within the given limits.

Probematic is the insertion- and withdrawal force. A brand new connector design would need to be engineered for low insertion- and withdrawal force but still for guaranteeing safe and secured connection.



What is an Insert and where is it used?

We call the little connector that is located in the Multiport and terminated to the cable the "Insert", or "Insert-Connector".

The Inserts and specifications are shown on the following pages:

- 1) The standard Q24 Insert, is used in most applications with the MIL-DTL-38999 shells, usually of sizes 21 and 25 and in the frequency range of DC to 24.0 GHz. Already the traditional SQ-Series are using this unit. The Inserts are available in different versions, spring loaded, limited spring loaded, fixed and pressurized.
- 2) The standard Q40 Insert, is used in most applications with the MIL-DTL-38999 shells, usually of sizes 21 and 25 and in the frequency range of DC to 40.0 GHz. The Inserts are also available in different versions, spring loaded, limited spring loaded, fixed and pressurized.
- 3) The Push-On SMA male, together with the standard SMA female, as used in the rectangular Multiport RQ23-DC26.
The reason for using this connector configuration was the customer request that a standard series connector had to be used for best test application with his standard SMA test cables he wanted to have in place.
- 3) The SMP connector, used in some special Multiports.
- 4) The SMPM connector, as used in the TQ-09 and the TQ-19 of the MIL-DTL- 38999 Size 13 and Size 25 shell. 9 cable assemblies were to be hooked up in the small shell of size 13, and 19 cable assemblies in the size 25 shell.

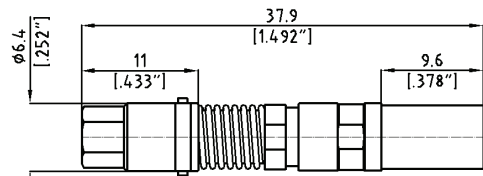


SMPM Inserts and Spectrum Q24 Inserts

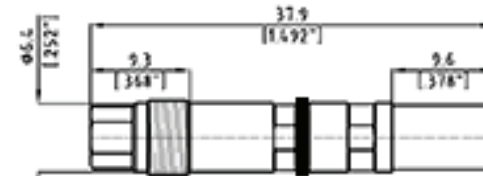
Cable Type over Insert Part Number		
11	141	43
TQ11-2101-02	TQ41-2101-02	TQ43-2101-02
Connector Code: QF		
Q-Inserts female spring loaded, Bayonet Catch for TQ-, IQ-, BQ-, CQ- Shells		
Cable Type over Insert Part Number		
11	141	43
TQ11-21S1-02	TQ41-21S1-02	TQ43-21S1-02
Connector Code: QFE		
Q-Inserts female, limited spring loaded, treaded nut for TQ-, IQ-, BQ-, CQ- Shells		
Cable Type over Insert Part Number		
11	141	43
TQ11-21E1-02	TQ41-21E1-02	TQ43-21E1-02
Connector Code: QFF		
Q-Inserts female, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		
Cable Type over Insert Part Number		
11	141	43
TQ11-21P1-02	TQ41-21P1-02	TQ43-21P1-02
Connector Code: QPF		
Q-Inserts female, pressurized, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		
Cable Type over Insert Part Number		
11	141	43
TQ11-1102-02	TQ41-1102-02	TQ43-1102-02
Connector Code: QM		
Q-Inserts male spring loaded, Bayonet Catch for TQ-, IQ-, BQ-, CQ- Shells		
Cable Type over Insert Part Number		
11	141	43
TQ11-11S1-02	TQ41-11S1-02	TQ43-11S1-02
Connector Code: QME		
Q-Inserts male, limited spring loaded, treaded nut for TQ-, IQ-, BQ-, CQ- Shells		
Cable Type over Insert Part Number		
11	141	43
TQ11-11F1-02	TQ41-11F1-02	TQ43-11F1-02
Connector Code: QMF		
Q-Inserts male, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		

The specifications below are general specifications for all Q-Inserts for TQ-, IQ-, BQ-, and CQ- Shells. Specific Data for VSWR, Insertion Loss, R.F. leakage, etc., are available from the factory upon request. Specifications in the following table are recommended for any procurement documents or drawings. In the event of any conflict between these specifications and General Specifications MIL-PRF-39012, these specifications shall govern. The paragraph numbers refer to the associated requirement paragraphs of MIL-PRF-39012/C. These specifications are subject to change according to the latest revision.

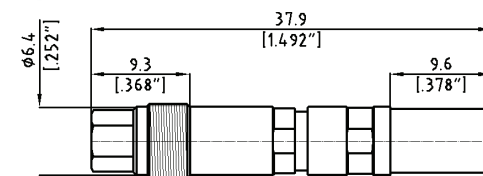
REQUIREMENT	§	GENERAL SPECIFICATIONS
GENERAL		
Standard Materials	3.3	STEEL corrosion resistant 1.4305 per DIN 17440 (QQ-S-764, class 303 or ASTM-A-582-80). ALUMINUM AlMg4.5Mn per DIN 1725, AlMgSi0.5 per DIN 1725, AlMgSi1 per DIN 1725 (6061-T6 per QQ-A-225/8). BRASS CuZn39Pb3 per DIN 17660 (UNS C 38500). COPPER BERYLLIUM 33-25 CuBe2Pb H per DIN 17666 (ASTM B 196). TFE Fluorocarbon per DIN 52900 (MIL-P-19468 and L-P403). SILICONE RUBBER per DIN 3771 (MIL-R-5847 and ZZ-R-765, Class II B,) Grade 50 - 75. BORRIMUM NITRIDE Dielectric for high power applications per inhouse specification.
Finish for COPPER BERYLLIUM	3.3.1	Center Contacts shall be gold plated to a minimum thickness of .00005 inch (1.25 µm) in accordance with ASTM B 488, Type 3, Code C, Class 1.25. shall be passivated per ASTM A 967. Conductive Parts shall have an iridited finish per MIL-C-5541. Other parts, such as Coupling Nuts and Back-Bodies shall be anodized per MIL-A-8625. .00003 inch (0.75 µm) min. gold plating per ASTM B 488, Type 3, Code C, or nicle plating per QQ-N-290, as specified. Imoloy .0001 inch (2.5 µm) min. plating, consisting of 55% Copper / 20% Zinc / 25% Tin (on special request).
STAINLESS STEEL		
ALUMINUM		
BRASS		
VARIOUS		
Design	3.4	The design shall be such that the outline dimensions in this catalog are met. In addition, the assembled connector shall meet the interface dimensions.
ELECTRICAL		
Frequency Range		DC - 18.0 GHz min.
Insulation Resistance	3.11	The insulation resistance shall not be less than 5,000 megohms.
Voltage Standing Wave Ratio (VSWR)	3.14	1.02 + .005 * f (GHz)
Contact Resistance	3.16	The center contact resistance drop shall not exceed 2.0 milliohms and the outer contact resistance drop shall not exceed 2.0 milliohms.
Dielectric Withstanding Voltage	3.17	The magnitude of the test voltage shall be 1,000 volts rms at sea level.
RF High Potential	3.23	The RF high potential withstanding voltage is 670 volts rms at 5 MHz. Leakage is not applicable.
RF Leakage	3.26	- (90 - f (GHz)) dB
Insertion Loss	3.27	(.03 SQT(f(GHz))) dB
MECHANICAL		
Connector Durability	3.15	The Insert is to be tested and its mating connector shall be subjected to 500 insertions and withdrawal cycles at 12 cycles per minute max. The Insert shall show no evidence of mechanical failure and the Insert shall meet the mating characteristic requirements.
Cable Retention Force	3.24	60 pounds (267 N) min.
Coupling Nut Retention Force	3.25	Not applicable
Force to Engage and Disengage	3.5.1	Not applicable
Longitudinal Force max.		Longitudinal force is not applicable.
Mating Characteristics	3.7	See interface dimensions.
ENVIRONMENTAL		
Corrosion (Salt Spray)	3.13	Specification MIL-STD-202, Method 101, Test Condition B. The salt solution shall be 5%.
Vibration	3.18	Specification MIL-STD-202, Method 204, Test Condition D.
Shock	3.19	Specification MIL-STD-202, Method 213, Test Condition I.
Thermal Shock	3.20	Specification MIL-STD-202, Method 107, Test Condition B, except high temperature shall be + 200°C
Moisture Resistance	3.21	Specification MIL-STD-202, Method 106. Step 7b (vibration) shall be omitted. Insulation resistance shall be 200 megohms min. within 5 minutes of removal from humidity.
Corona Level	3.22	The connector shall not exhibit breakdown (corona) when the applied voltage is 250 volts rms and the altitude is 70,000 feet.



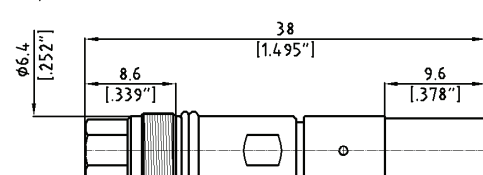
Cable Type over Insert Part Number
11
TX11-2101-02
Connector Code: XF
X-Inserts female, spring loaded, Bayonet Catch for TQ-, IQ-, BQ-, CQ- Shells



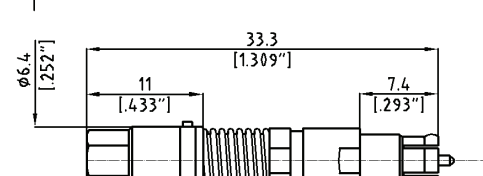
Cable Type over Insert Part Number
11
TX11-21S1-02
Connector Code: XFE
X-Inserts female, limited spring loaded, treaded nut for TQ-, IQ-, BQ-, CQ- Shells



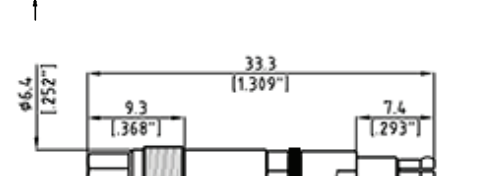
Cable Type over Insert Part Number
11
TX11-21E1-02
Connector Code: XFF
X-Inserts female, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells



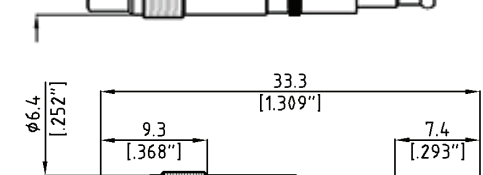
Cable Type over Insert Part Number
11
TX11-21P1-02
Connector Code: XPF
X-Inserts female, pressurized, threaded nut for TQ-, IQ-, BQ-, CQ- Shells



Cable Type over Insert Part Number
11
TX11-1102-02
Connector Code: XM
X-Inserts male, spring loaded, Bayonet Catch for TQ-, IQ-, BQ-, CQ- Shells



Cable Type over Insert Part Number
11
TX11-11S1-02
Connector Code: XME
X-Inserts male, limited spring loaded, treaded nut for TQ-, IQ-, BQ-, CQ- Shells



Cable Type over Insert Part Number
11
TX11-11F1-02
Connector Code: XMF
X-Inserts male, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells

The specifications below are general specifications for all Q-Inserts for TQ-, IQ-, BQ-, and CQ- Shells. Specific Data for VSWR, Insertion Loss, R.F. leakage, etc., are available from the factory upon request. Specifications in the following table are recommended for any procurement documents or drawings. In the event of any conflict between these specifications and General Specifications MIL-PRF-39012, these specifications shall govern. The paragraph numbers refer to the associated requirement paragraphs of MIL-PRF-39012/C. These specifications are subject to change according to the latest revision.

REQUIREMENT	§	GENERAL SPECIFICATIONS
GENERAL		
Standard Materials	3.3	STEEL corrosion resistant 1.4305 per DIN 17440 (QQ-S-764, class 303 or ASTM-A-582-80). ALUMINUM AlMg4.5Mn per DIN 1725, AlMgSi0.5 per DIN 1725, AlMgSi1 per DIN 1725 (6061-T6 per QQ-A-225/8). BRASS CuZn39Pb3 per DIN 17660 (UNS C 38500). COPPER BERYLLIUM 33-25 CuBe2Pb H per DIN 17666 (ASTM B 196). TFE Fluorocarbon per DIN 52900 (MIL-P-19468 and L-P403). SILICONE RUBBER per DIN 3771 (MIL-R-5847 and ZZ-R-765, Class II B,) Grade 50 - 75. BORRIMUM NITRIDE Dielectric for high power applications per inhouse specification.
Finish for COPPER BERYLLIUM	3.3.1	Center Contacts shall be gold plated to a minimum thickness of .00005 inch (1.25 µm) in accordance with ASTM B 488, Type 3, Code C, Class 1.25. shall be passivated per ASTM A 967. Conductive Parts shall have an iridited finish per MIL-C-5541. Other parts, such as Coupling Nuts and Back-Bodies shall be anodized per MIL-A-8625. .00003 inch (0.75 µm) min. gold plating per ASTM B 488, Type 3, Code C, or nicle plating per QQ-N-290, as specified. Imoloy .0001 inch (2.5 µm) min. plating, consisting of 55% Copper / 20% Zinc / 25% Tin (on special request).
STAINLESS STEEL		
ALUMINUM		
BRASS		
VARIOUS	3.4	The design shall be such that the outline dimensions in this catalog are met. In addition, the assembled connector shall meet the interface dimensions.
ELECTRICAL		
Frequency Range		DC - 40.0 GHz min.
Insulation Resistance	3.11	Insulation resistance is not applicable.
Voltage Standing Wave Ratio (VSWR)	3.14	1.01 + .003 * f (GHz)
Contact Resistance	3.16	The center contact resistance drop shall not exceed 2.0 milliohms and the outer contact resistance drop shall not exceed 2.0 milliohms.
Dielectric Withstanding Voltage	3.17	The magnitude of the test voltage shall be 1,000 volts rms at sea level.
RF High Potential	3.23	RF high potential withstanding voltage not applicable.
RF Leakage	3.26	- (90- f (GHz)) dB
Insertion Loss	3.27	(.03 SQT(f(GHz)))
MECHANICAL		
Connector Durability	3.15	The Insert is to be tested and its mating connector shall be subjected to 500 insertions and withdrawal cycles at 12 cycles per minute max. The Insert shall show no evidence of mechanical failure and the Insert shall meet the mating characteristic requirements.
Cable Retention Force	3.24	60 pounds (267 N) min.
Coupling Nut Retention Force	3.25	Not applicable
Force to Engage and Disengage	3.5.1	Not applicable
Longitudinal Force max.		Longitudinal force is not applicable.
Mating Characteristics	3.7	See interface dimensions.
ENVIRONMENTAL		
Corrosion (Salt Spray)	3.13	Specification MIL-STD-202, Method 101, Test Condition B. The salt solution shall be 5%.
Vibration	3.18	Specification MIL-STD-202, Method 204, Test Condition D.
Shock	3.19	Specification MIL-STD-202, Method 213, Test Condition I.
Thermal Shock	3.20	Specification MIL-STD-202, Method 107, Test Condition B, except high temperature shall be + 200°C
Moisture Resistance	3.21	Specification MIL-STD-202, Method 106. Step 7b (vibration) shall be omitted. Insulation resistance shall be 200 megohms min. within 5 minutes of removal from humidity.
Corona Level	3.22	The connector shall not exhibit breakdown (corona) when the applied voltage is 250 volts rms and the altitude is 70,000 feet.



Cable Type over Insert Part Number		
11	141	43
TQ11-2101-02	TQ41-2101-02	TQ43-2101-02
Connector Code: QF		
Q-Inserts female spring loaded, Bayonet Catch for TQ-, IQ-, BQ-, CQ- Shells		

Cable Type over Insert Part Number		
11	141	43
TQ11-21S1-02	TQ41-21S1-02	TQ43-21S1-02
Connector Code: QFE		
Q-Inserts female, limited spring loaded, treaded nut for TQ-, IQ-, BQ-, CQ- Shells		

Cable Type over Insert Part Number		
11	141	43
TQ11-21E1-02	TQ41-21E1-02	TQ43-21E1-02
Connector Code: QFF		
Q-Inserts female, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		

Cable Type over Insert Part Number		
11	141	43
TQ11-21P1-02	TQ41-21P1-02	TQ43-21P1-02
Connector Code: QPF		
Q-Inserts female, pressurized, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		

Cable Type over Insert Part Number		
11	141	43
TQ11-1102-02	TQ41-1102-02	TQ43-1102-02
Connector Code: QM		
Q-Inserts male spring loaded, Bayonet Catch for TQ-, IQ-, BQ-, CQ- Shells		

Cable Type over Insert Part Number		
11	141	43
TQ11-11S1-02	TQ41-11S1-02	TQ43-11S1-02
Connector Code: QME		
Q-Inserts male, limited spring loaded, treaded nut for TQ-, IQ-, BQ-, CQ- Shells		

Cable Type over Insert Part Number		
11	141	43
TQ11-11F1-02	TQ41-11F1-02	TQ43-11F1-02
Connector Code: QMF		
Q-Inserts male, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		

Cable Type over Insert Part Number	
11	
TX11-2101-02	
Connector Code: XF	
X-Inserts female, spring loaded, Bayonet Catch for TQ-, IQ-, BQ-, CQ- Shells	

Cable Type over Insert Part Number	
11	
TX11-21S01-02	
Connector Code: XFE	
X-Inserts female, limited spring loaded, treaded nut for TQ-, IQ-, BQ-, CQ- Shells	

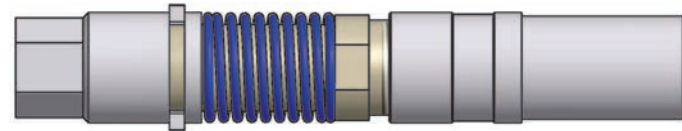
Cable Type over Insert Part Number	
11	
TX11-21E01-02	
Connector Code: XFF	
X-Inserts female, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells	

Cable Type over Insert Part Number	
11	
TX11-21P01-02	
Connector Code: XPF	
X-Inserts female, pressurized, threaded nut for TQ-, IQ-, BQ-, CQ- Shells	

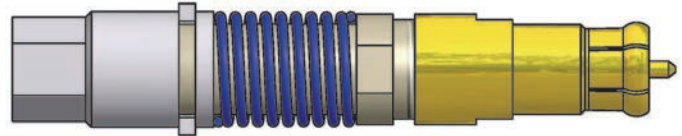
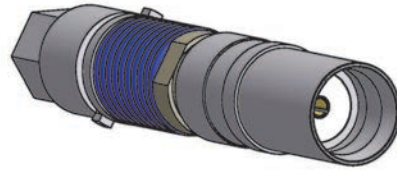
Cable Type over Insert Part Number	
11	
TX11-1102-02	
Connector Code: XM	
X-Inserts male, spring loaded, Bayonet Catch for TQ-, IQ-, BQ-, CQ- Shells	

Cable Type over Insert Part Number	
11	
TX11-11S1-02	
Connector Code: XME	
X-Inserts male, limited spring loaded, treaded nut for TQ-, IQ-, BQ-, CQ- Shells	

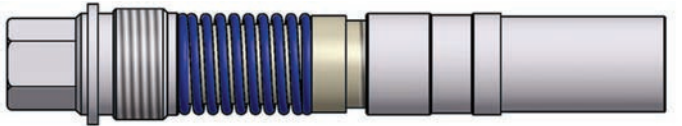
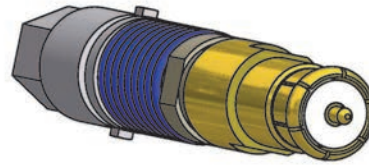
Cable Type over Insert Part Number	
11	
TX11-11F1-02	
Connector Code: XMF	
X-Inserts male, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells	



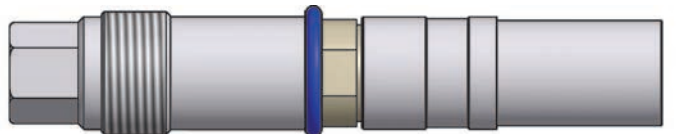
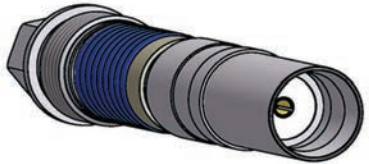
SQ-Insert female, spring loaded, Bayonet Catch



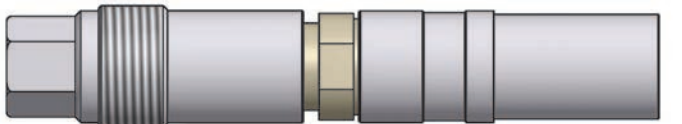
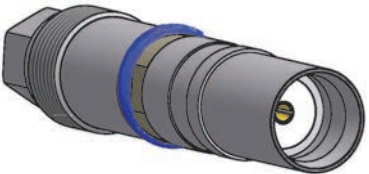
SQ-Insert male, spring loaded, Bayonet Catch



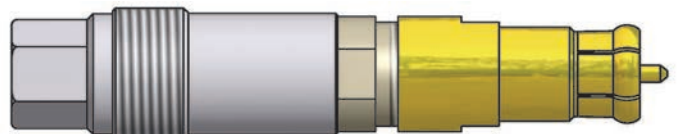
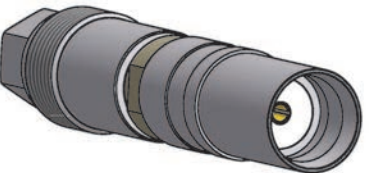
TQ-Insert female, spring loaded, Threaded Nut



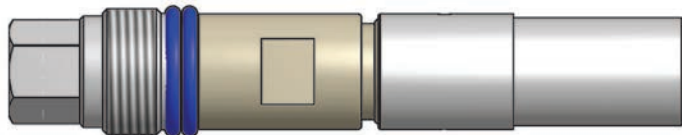
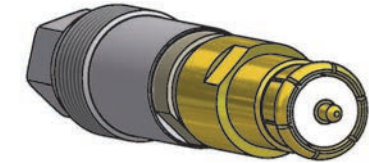
TQ-Insert female, limited spring loaded, Threaded Nut



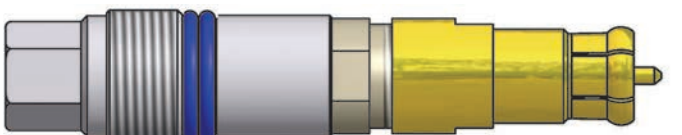
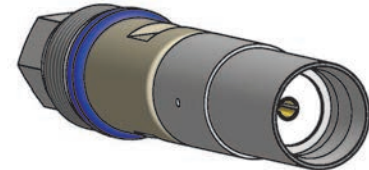
TQ-Insert female, fixed, Threaded Nut



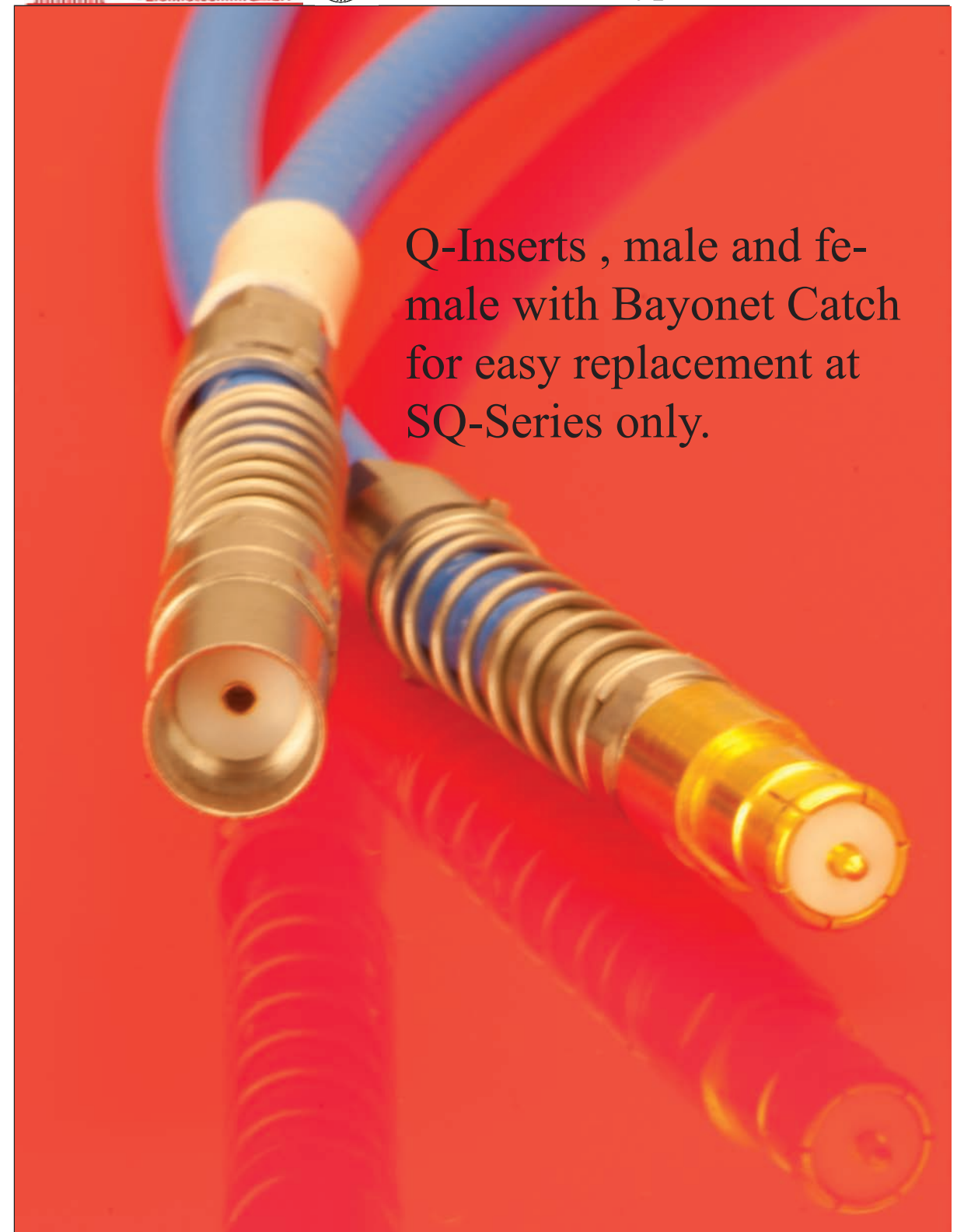
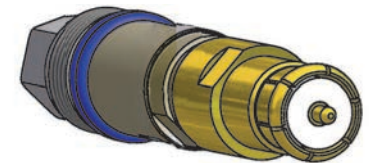
TQ-Insert male, fixed, Threaded Nut



TQ-Insert female, pressurized, Threaded Nut



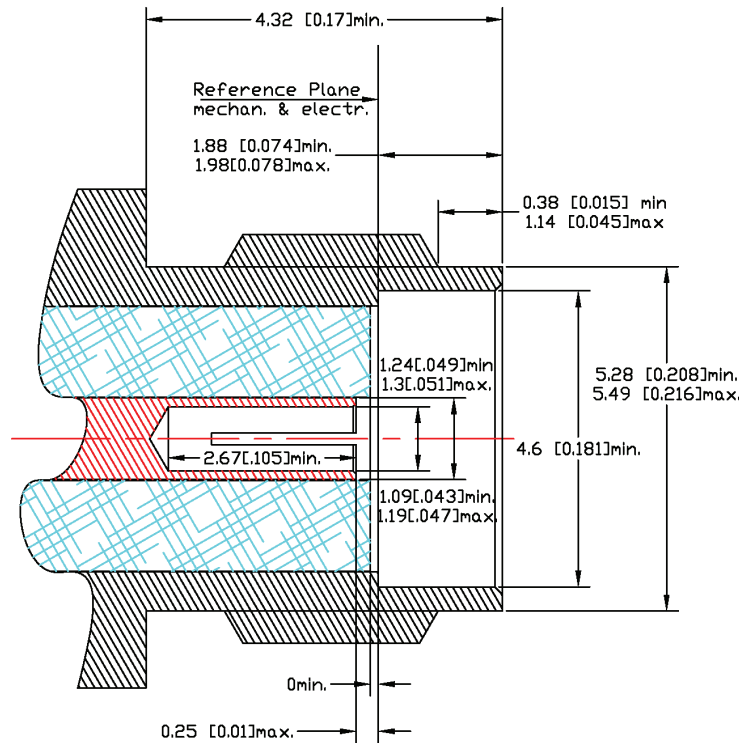
TQ-Insert male, pressurized, Threaded Nut



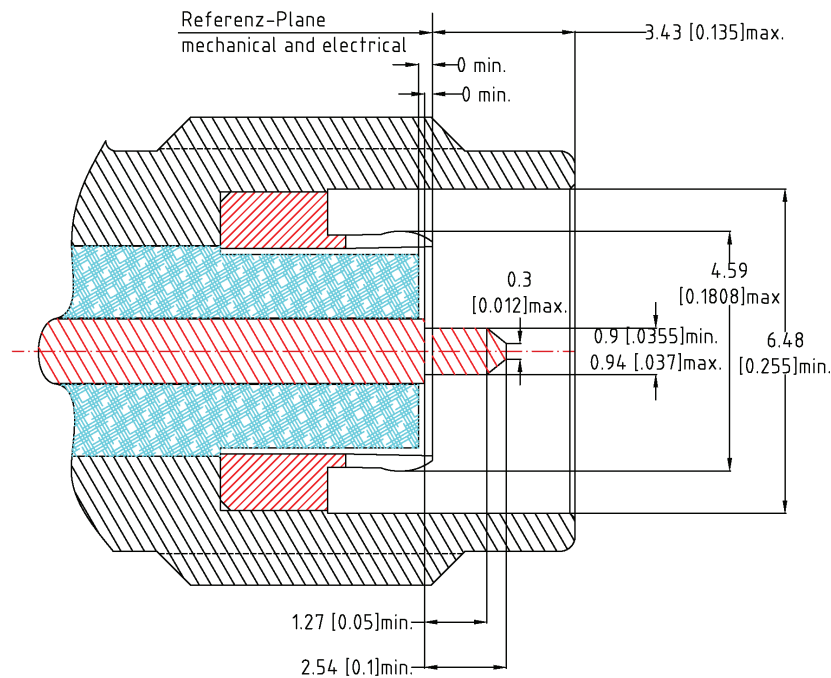
Q-Inserts , male and female with Bayonet Catch for easy replacement at SQ-Series only.



**Standard
SMA Female**



**Push-On
SMA Male**



The SMA Male Push-On is used at the rectangular RQ26-DC26 Connector

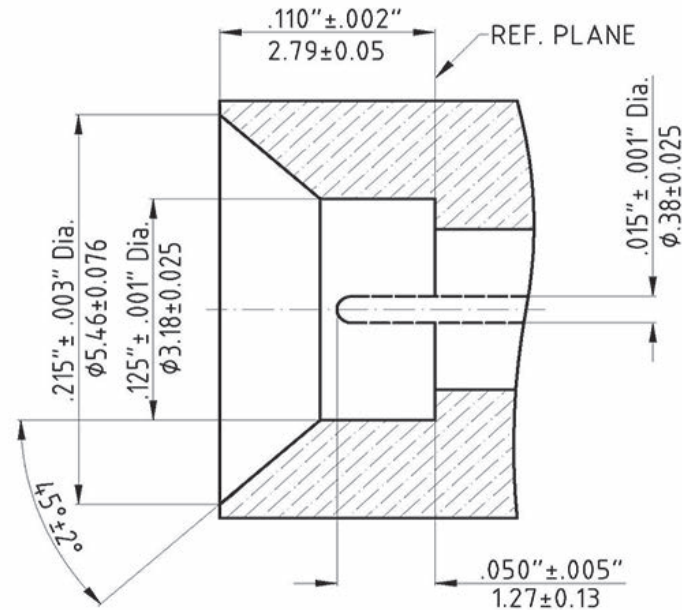


The specifications below are general specifications for all SMA PUSH-ON connectors. Specifications in the following table are recommended for any procurement documents or drawings. In the event of any conflict, these specifications shall govern. The PUSH-ON Connectors were developed to eliminate the time consuming lightening, torquing and loosening of connectors during test. The connector slides directly onto any Female of the same connector style, allowing quick connecting and disconnecting. Its mechanism locks safely onto the standard thread of the Female connector.

REQUIREMENT	§	GENERAL SPECIFICATIONS
GENERAL		
Standard Materials	3.3	STEEL corrosion resistant 1.4305 per DIN 17440 (QQ-S-764, class 303 or ASTM-A-582-80). ALUMINUM AlMg4.5Mn per DIN 1725, AlMgSi0.5 per DIN 1725, AlMgSi1 per DIN 1725 (6061-T6 per QQ-A-225/8). BRASS CuZn39Pb3 per DIN 17660 (UNS C 38500). COPPER BERYLLIUM 33-25 CuBe2Pb H per DIN 17666 (ASTM B 196). TFE Fluorocarbon per DIN 52900 (MIL-P-19468 and L-P403). SILICONE RUBBER per DIN 3771 (MIL-R-5847 and ZZ-R-765, Class II B,) Grade 50 - 75. BORRIMUM NITRIDE Dielectric for high power applications per inhouse specification.
Finish for COPPER BERYLLIUM	3.3.1	Center Contacts shall be gold plated to a minimum thickness of .00005 inch (1.25 µm) in accordance with ASTM B 488, Type 3, Code C, Class 1.25. shall be passivated per ASTM A 967. Conductive Parts shall have an iridited finish per MIL-C-5541. Other parts, such as Coupling Nuts and Back-Bodies shall be anodized per MIL-A-8625. .00003 inch (0.75 µm) min. gold plating per ASTM B 488, Type 3, Code C, or nicle plating per QQ-N-290, as specified. Imoloy .0001 inch (2.5 µm) min. plating, consisting of 55% Copper / 20% Zinc / 25% Tin (on special request).
STAINLESS STEEL		
ALUMINUM		
BRASS		
VARIOUS		
Design	3.4	The design shall be such that the outline dimensions in this catalog are met. In addition, the assembled connector shall meet the interface dimensions.
ELECTRICAL		
Frequency Range		DC - 26.5 GHz min.
Insulation Resistance	3.11	The insulation resistance shall not be less than 5,000 megohms.
Voltage Standing Wave Ratio (VSWR)	3.14	1.15 : 1 (DC - 18.0 GHz), 1.20 : 1 (18.0 - 26.5 GHz).
Contact Resistance	3.16	The center contact resistance drop shall not exceed 3.0 milliohms and the outer contact resistance drop shall not exceed 3.0 milliohms.
Dielectric Withstanding Voltage	3.17	The magnitude of the test voltage shall be 1,000 volts rms at sea level.
RF High Potential	3.23	The RF high potential withstanding voltage is 670 volts rms at 5 MHz. Leakage is not applicable.
RF Leakage	3.26	-80 dB max. to 3.0 GHz, -65 dB max. to 26.5 GHz
Insertion Loss	3.27	(.03 SQT(f(GHz))) dB
MECHANICAL		
Connector Durability	3.15	The connector is to be tested and its mating connector shall be subjected to 500 insertion min. Withdrawal cycles / minute are not applicable. The connector shall show no evidence of mechanical failure and the connector shall meet the mating characteristic requirements.
Cable Retention Force	3.24	60 pounds (267 N) min.
Coupling Nut Retention Force	3.25	Not applicable
Force to Engage and Disengage	3.5.1	Not applicable
Longitudinal Force max.		Longitudinal force is not applicable.
Mating Characteristics	3.7	See interface dimensions.
ENVIRONMENTAL		
Corrosion (Salt Spray)	3.13	Specification MIL-STD-202, Method 101, Test Condition B. The salt solution shall be 5%.
Vibration	3.18	Specification MIL-STD-202, Method 204, Test Condition D.
Shock	3.19	Specification MIL-STD-202, Method 213, Test Condition I.
Thermal Shock	3.20	Specification MIL-STD-202, Method 107, Test Condition B, except high temperature shall be + 200°C
Moisture Resistance	3.21	Specification MIL-STD-202, Method 106. Step 7b (vibration) shall be omitted. Insulation resistance shall be 200 megohms min. within 5 minutes of removal from humidity.
Corona Level	3.22	The connector shall not exhibit breakdown (corona) when the applied voltage is 250 volts rms and the altitude is 70,000 feet.

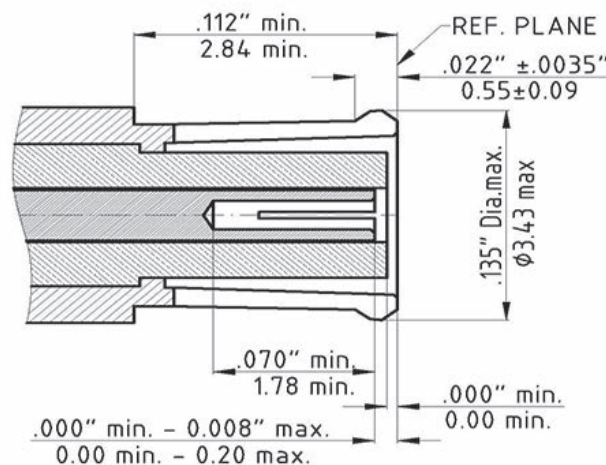
SMP DC - 40.0 GHz

SMP-Male, Catcher's Mitt



male

SMP-Female, uncabled



female

The specifications below are general specifications for all SMP connectors. Specific Data for VSWR, Insertion loss, R.F. leakage etc., are available from the factory upon request. Specifications in the following table are recommended for any procurement documents or drawings. In the event of any conflict between these specifications and General Specifications MIL-STD-348B, these specifications shall govern. These specifications are subject to change according to the latest revision.

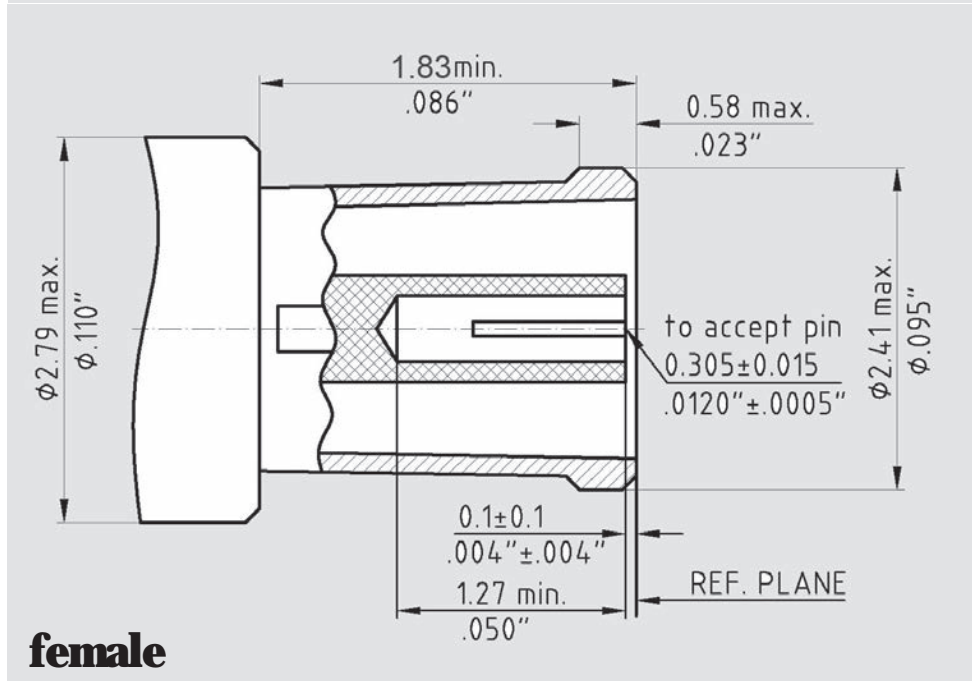
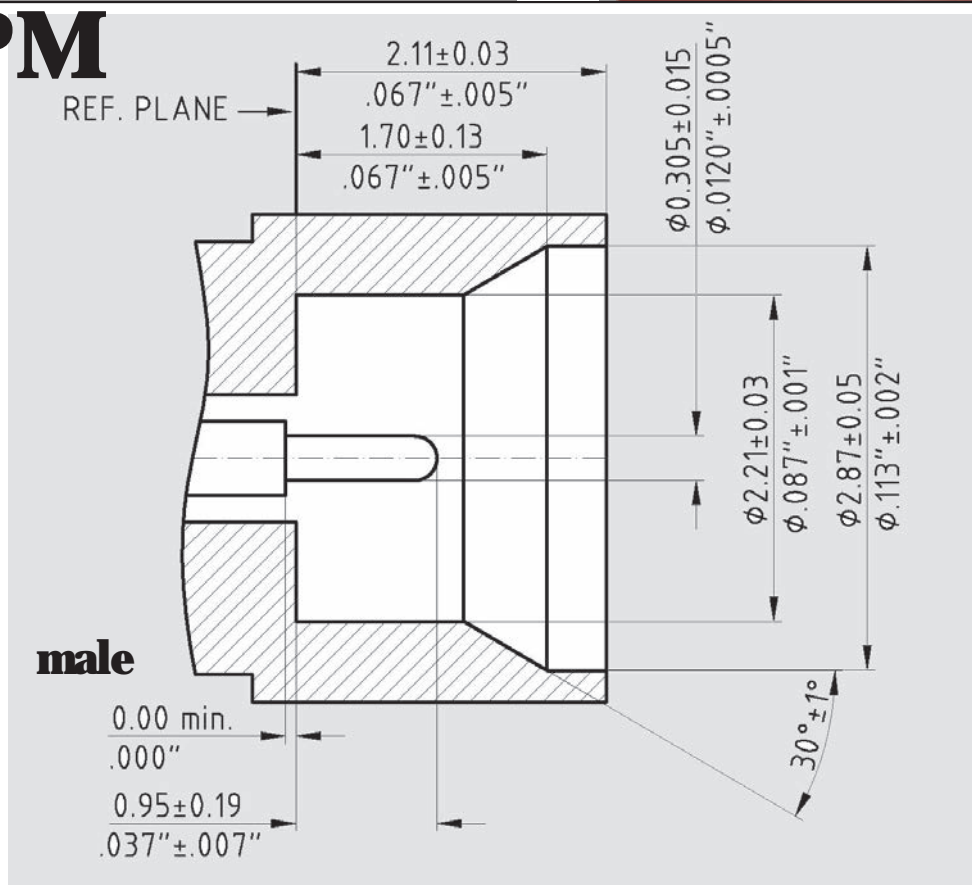
REQUIREMENT	§	GENERAL SPECIFICATIONS
GENERAL		
Standard Materials	3.3	STEEL corrosion resistant 1.4305 per DIN 17440 (QQ-S-764, class 303 or ASTM-A-582-80). ALUMINUM AlMg4.5Mn per DIN 1725, AlMgSi0.5 per DIN 1725, AlMgSi per DIN 1725 (6061-T6 per QQ-A-225/8). BRASS CuZn39Pb3 per DIN 17660 (UNS C 38500). COPPER BERYLLIUM 33-25 CuBe2Pb H per DIN 17666 (ASTM B 196). TFE Fluorocarbon per DIN 52900 (MIL-P-19468 and L-P403). SILICONE RUBBER per DIN 3771 (MIL-R-5847 and ZZ-R-765, Class II B,) Grade 50 - 75. BORRRIUM NITRIDE Dielectric for high power applications per inhouse specification.
Finish for COPPER BERYLLIUM	3.3.1	Center Contacts shall be gold plated to a minimum thickness of .00005 inch (1.25 μ m) in accordance with ASTM B 488, Type 3, Code C, Class 1.25. Conductive Parts shall have an iridited finish per MIL-C-5541. Other parts, such as Coupling Nuts and Back-Bodies shall be anodized per MIL-A-8625.
STAINLESS STEEL		
ALUMINUM		
BRASS		
VARIOUS		.00003 inch (0.75 μ m) min. gold plating per ASTM B 488, Type 3, Code C, or nicle plating per QQ-N-290, as specified. Imoloy .0001 inch (2.5 μ m) min. plating, consisting of 55% Copper / 20% Zinc / 25% Tin (on special request).
Design	3.4	The design shall be such that the outline dimensions in this catalog are met. In addition, the assembled connector shall meet the interface dimensions.
ELECTRICAL		
Frequency Range		DC - 40.0 GHz min.
Insulation Resistance	3.11	The insulation resistance shall not be less than 5,000 megohms.
Voltage Standing Wave Ratio (VSWR)	3.14	1.5 : 1 max. to 40.0 GHz
Contact Resistance	3.16	The center contact resistance drop is 6.0 milliohms max.
Dielectric Withstanding Voltage	3.17	The magnitude of the test voltage shall be 500 volts rms at sea level.
RF High Potential	3.23	The RF high potential withstanding voltage is 325 volts rms at 5 MHz. Leakage is not applicable.
RF Leakage	3.26	RF Leakage is not applicable.
Insertion Loss	3.27	(.10 SQT(f(GHz))) dB
MECHANICAL		
Connector Durability	3.15	The connector is to be tested and its mating connector shall be subjected to 100 insertions min.. Withdrawal cycles /minute are not applicable. The connector shall show no evidence of mechanical failure and the connector shall meet the mating characteristic requirements.
Cable Retention Force	3.24	20 pounds (88.9 N) min.
Coupling Nut Retention Force	3.25	Not applicable
Force to Engage and Disengage	3.5.1	The torque required to engage shall not exceed 15 lbs. (66.7 N). The disengage torque shall not exceed 2 lbs. (8.9 N) min. (full detent).
Longitudinal Force max.		Longitudinal force is not applicable.
Mating Characteristics	3.7	See interface dimensions.
ENVIRONMENTAL		
Corrosion (Salt Spray)	3.13	Specification MIL-STD-202, Method 101, Test Condition B. The salt solution shall be 5%.
Vibration	3.18	Specification MIL-STD-202, Method 204, Test Condition D.
Shock	3.19	Specification MIL-STD-202, Method 213, Test Condition I.
Thermal Shock	3.20	Specification MIL-STD-202, Method 107, Test Condition B, except high temperature shall be +200°C
Moisture Resistance	3.21	Specification MIL-STD-202, Method 106. Step 7b (vibration) shall be omitted. Insulation resistance shall be 200 megohms min. within 5 minutes of removal from humidity.
Corona Level	3.22	The connector shall not exhibit breakdown (corona) when the applied voltage is 250 volts rms and the altitude is 70,000 feet.



SMPM

**SMPM
DC -
65.0 GHz**

**The SMPM
Inserts are
used in the
65 GHz
Multiports
of sizes 15
and 25**



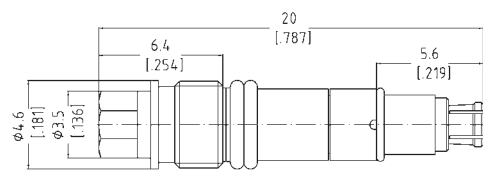
The specifications below are general specifications for all SMPM connectors. Specific Data for VSWR, Insertion loss, R.F. leakage etc., are available from the factory upon request. Specifications in the following table are recommended for any procurement documents or drawings. In the event of any conflict between these specifications and other documentation, these specifications shall govern. These specifications are subject to change according to the latest revision.

REQUIREMENT	GENERAL SPECIFICATIONS
Standard Materials	STEEL corrosion resistant 1.4305 per DIN EN 10088; ASTM-A582 (303), or 1.4404 (316L) respectively. ALUMINUM AlMg4.5Mn per DIN EN 1706, AlMgSi0.5 per DIN EN 1706, AlMgSi1 per DIN EN 1706 (6061-T6 per QQ-A-225/8). BRASS CuZn39Pb3 per DIN 17660 (QQ-B-626 (ASTM-B124), half hard). COPPER BERYLLIUM 33-25 CuBe2PbH per DIN17666(DIN CENT/S;DIN SPEC 9700)(QQ-C530). TFE Fluorocarbon per DIN 52900 (ASTM-D-1710), or Thermoplast per DIN EN ISO 10350, or PEI per in-house specification respectively for higher temperature applications. SILICONE RUBBER per DIN ISO 3601)(A-A-59588,Class IIB) Gr. 50 - 75. BORIUM NITRIDE Dielectric for high power applications per in-house specification
Finish for COPPER BERYLLIUM STAINLESS STEEL ALUMINUM BRASS VARIOUS	Center Contacts shall be gold plated to a minimum thickness of .00005-inch in accordance with ASTM-B-488, Type III, Code C, Class 1.25 shall be passivated per ASTM-A967 Conductive Parts shall have an iridited finish per MIL-DTL-5541 Other parts, such as Coupling Nuts and Back-Bodies shall be anodized per MIL-A-8625. .00003 inch (0.8 μm) min. gold plating per MIL-DTL-45204, or nickel plating per QQ-N-290, as specified. Imoloy .0001 inch (2.5 μm) min. plating, consisting of 55% Copper / 20% Zinc / 25% Tin (on special request).
Design	The design shall be such that the outline dimensions in this catalog are met. In addition, the assembled connector shall meet the interface dimensions.
ELECTRICAL	
Frequency Range Insulation Resistance Voltage Standing Wave Ratio (VSWR) Contact Resistance Dielectric Withstanding Voltage RF Leakage Insertion Loss	DC - 65.0 GHz min. The insulation resistance shall not be less than 5,000 megohms. 1.06 + .005 x f (GHz) The center contact resistance drop shall not exceed 6.0 milliohms and the outer contact resistance drop shall not exceed 2.0 milliohms. The magnitude of the test voltage shall be 375 volts rms at sea level. RF Leakage: 80 dB max @ 3 GHz; approx. 60 dB @ 26.5 GHz (at full detent proper mated) (.04 SQT(f(GHz))) dB
MECHANICAL	
Connector Durability Force to Engage Force to Disengage. Center Contacts Captivation Force	The connector is to be tested and its mating connector shall be subjected to 500 (smooth bore) respectively 100 (full detent) insertions and withdrawal cycles. The connector shall show no evidence of mechanical failure and the connector shall meet the mating characteristic requirements. The force required to engage is 4.5lbs.(20N) typical for Full Detent and 2.5lbs (11.1N) for Smooth Bore The force required to disengage is 6.5lbs.(28.9N) typical for Full Detent and 1.5lbs (6.7N) for Smooth Bore 1.5lbs. (6.7N) min.
ENVIRONMENTAL	
Corrosion (Salt Spray) Vibration Shock Thermal Shock Moisture Resistance Corona Level	Specification MIL-STD-202, Method 101, Test Condition B. The salt solution shall be 5%. Specification MIL-STD-202, Method 204, Test Condition D. Specification MIL-STD-202, Method 213, Test Condition I. Specification MIL-STD-202, Method 107, Test Condition B, rating -65 °C to +165 °C. Specification MIL-STD-202, Method 106. Step 7b (vibration) shall be omitted. Insulation resistance shall be 200 megohms min. within 5 minutes of removal from humidity. The connector shall not exhibit breakdown (corona) when the applied voltage is 350 volts rms and the altitude is 70,000 feet.

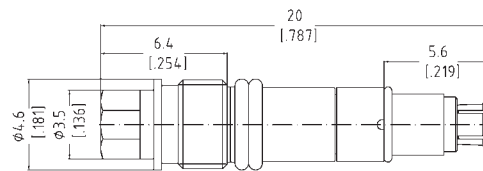
Specification for SMPM Inserts



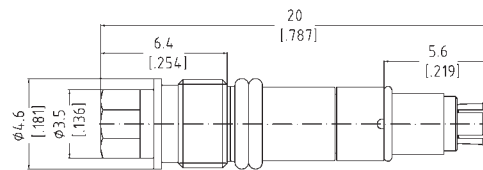
Cable Type over Insert Part Number		
6A = Type 677	4F = Type 47F	89 = 0.085" S.R.
MQ6A-21E1-02	MQ4F-21E1-02	MQ89-21E1-02
Connector Code: MFF		
Q-Inserts female, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



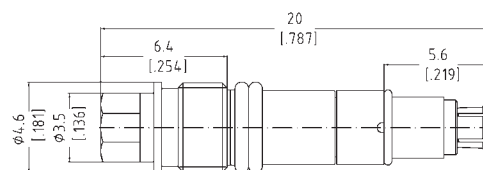
Cable Type over Insert Part Number		
6A = Type 677	4F = Type 47F	89 = 0.085" S.R.
MQ6A-21P1-02	MQ4F-21P1-02	MQ89-21P1-02
Connector Code: MPF		
Q-Inserts female, pressurized, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



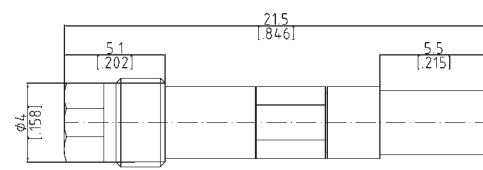
Cable Type over Insert Part Number		
6A = Type 677	4F = Type 47F	89 = 0.085" S.R.
MQ6A-21H1-02	MQ4F-21H1-02	MQ89-21H1-02
Connector Code: MHF		
Q-Inserts female, hermetic sealed, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



Cable Type over Insert Part Number		
6A = Type 677	4F = Type 47F	89 = 0.085" S.R.
MQ6A-21S1-02	MQ4F-21S1-02	MQ89-21S1-02
Connector Code: MHF		
Q-Inserts female, lim, spring loaded, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



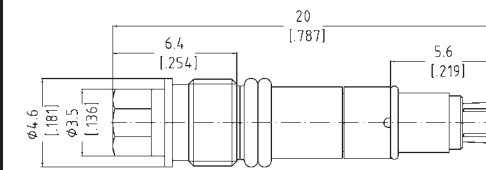
Cable Type over Insert Part Number		
6A = Type 677	4F = Type 47F	89 = 0.085" S.R.
MQ6A-11F1-02	MQ4F-11F1-02	MQ89-11F1-02
Connector Code: MMF		
Q-Inserts male, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



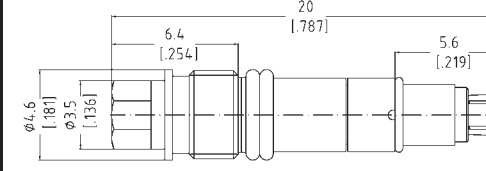
Specifications SMPM Inserts



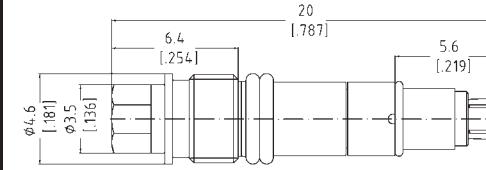
Cable Type over Insert Part Number		
31 = RG 316/U	8D = RG 188/DS	78 = RG-178B/U
MQ31-21E1-02	MQ8D-21E1-02	MQ78-21E1-02
Connector Code: MFF		
Q-Inserts female, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



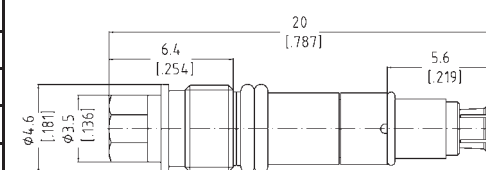
Cable Type over Insert Part Number		
31 = RG 316/U	8D = RG 188/DS	78 = RG-178B/U
MQ31-21P1-02	MQ8D-21P1-02	MQ78-21P1-02
Connector Code: MPF		
Q-Inserts female, pressurized, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



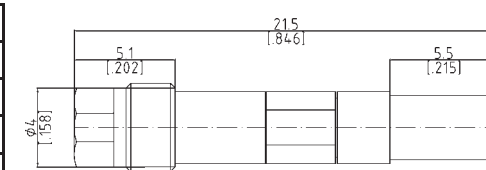
Cable Type over Insert Part Number		
31 = RG 316/U	8D = RG 188/DS	78 = RG-178B/U
MQ31-21S1-02	MQ8D-21S1-02	MQ78-21S1-02
Connector Code: MPF		
Q-Inserts female, lim, spring loaded, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



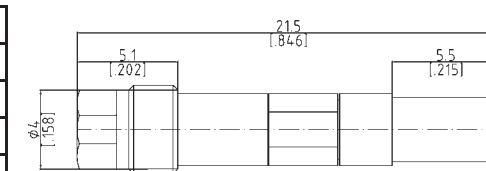
Cable Type over Insert Part Number		
		8F = Type 89F
		MQ8F-21S1-02
Connector Code: MF		
Q-Inserts female, lim, spring loaded, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



Cable Type over Insert Part Number		
31 = RG 316/U	8D = RG 188/DS	78 = RG-178B/U
MQ31-11F1-02	MQ8DF-11F1-02	MQ78-11F1-02
Connector Code: MMF		
Q-Inserts male, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



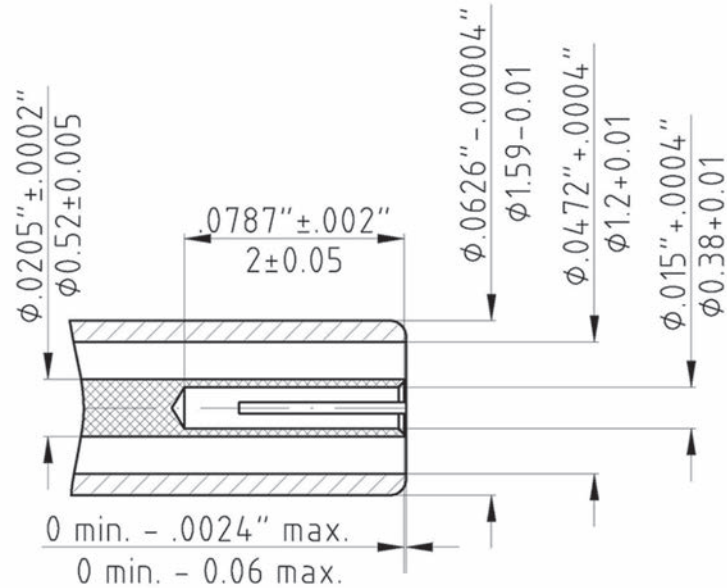
Cable Type over Insert Part Number		
		8F = Type 89F
		MQ8F-11F1-02
Connector Code: MMF		
Q-Inserts male, firm, threaded nut for TQ-, IQ-, BQ-, CQ- Shells		



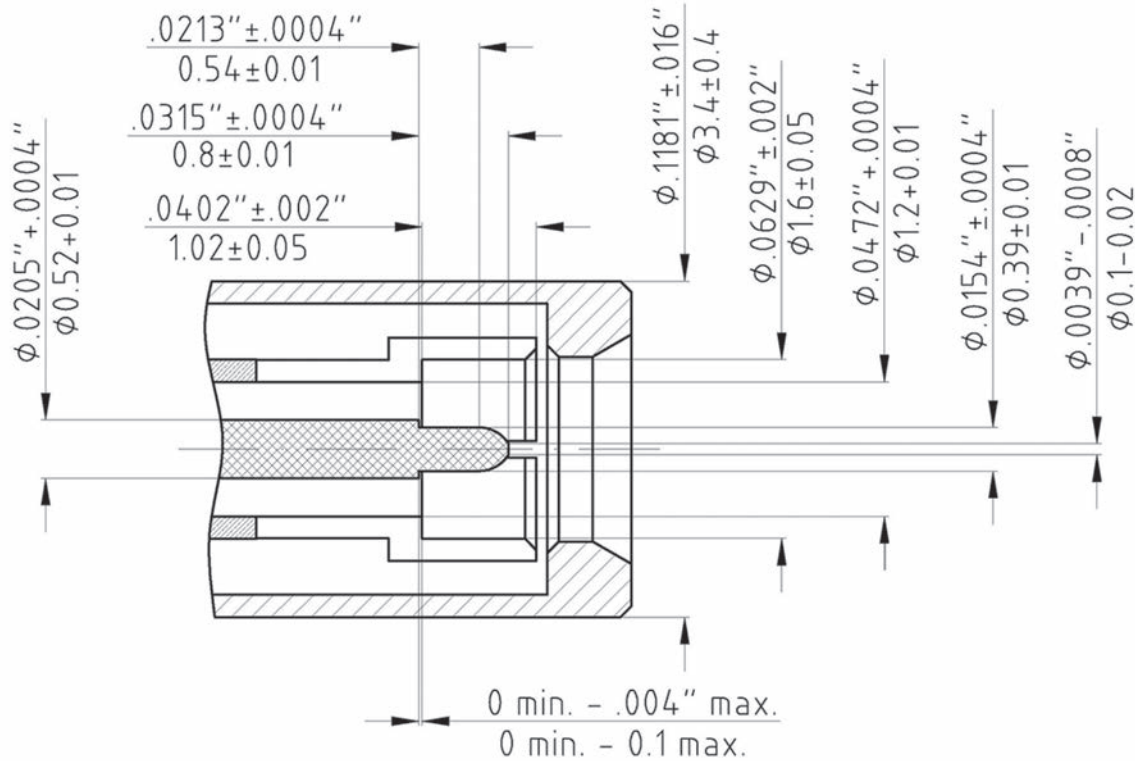


Update 2019-08-03

Female



Male



The specifications below are general specifications for all Size 16 contacts. Specific Data for VSWR, Insertion loss, R.F. leakage etc., are available from the factory upon request. Specifications in the following table are recommended for any procurement documents or drawings. In the event of any conflict between these specifications and General Specifications of SAE-AS39029 these specifications shall govern. These specifications are subject to change according to the latest revision.

REQUIREMENT	§	GENERAL SPECIFICATIONS
GENERAL		
Standard Materials	3.3	STEEL corrosion resistant 1.4305 per DIN EN 10088 (ASTM-A-484 or ASTM-A-582-80). ALUMINUM AlMg4.5Mn per DIN EN 1706, AlMgSi0.5 per DIN EN 1706, AlMgSi1 per DIN EN 1706 (6061-T6 per QQ-A-225/8). BRASS CuZn39Pb3 per DIN 17660 (QQ-B-626). COPPER BERYLLIUM 33-25 CuBe2Pb H per DIN CEN/TS 13388, SPEC 9700 (QQ-C 530). TFE Fluorocarbon per DIN 52900 (MIL-P-19468 and L-P403). SILICONE RUBBER per DIN ISO 3601 (A-A-59588, Class II B,) Grade 50 - 75. BORRUIUM NITRIDE Dielectric for high power applications per in-house specification.
Finish for COPPER BERYLLIUM	3.3.1	Center Contacts shall be gold plated to a minimum thickness of .00005 inch (1.25 µm) in accordance with MIL-DTL-45204, Type II, Grade C.
STAINLESS STEEL		shall be passivated per ASTM A 967.
ALUMINUM		Conductive Parts shall have an iridited finish per MIL-C-5541. Other parts, such as Coupling Nuts and Back-Bodies shall be anodized per MIL-A-8625.
BRASS		.00003 inch (0.75 µm) min. gold plating per ASTM B 488, Type 3, Code C, or nicle plating per QQ-N-290, as specified.
VARIOUS		Imoloy .0001 inch (2.5 µm) min. plating, consisting of 55% Copper / 20% Zinc / 25% Tin (on special request).
Design	3.4	The design shall be such that the outline dimensions in this catalog are met. In addition, the assembled connector shall meet the interface dimensions.
ELECTRICAL		
Frequency Range		DC - 45.0 GHz min.
Insulation Resistance	3.11	The insulation resistance shall not be less than 5,000 megohms.
Voltage Standing Wave Ratio (VSWR)	3.14	1.5 : 1 max. to 45.0 GHz
Contact Resistance	3.16	The center contact resistance drop is 55 milliohms max.
Dielectric Withstanding Voltage	3.17	The magnitude of the test voltage shall be 800 volts rms at sea level.
RF High Potential	3.23	The RF high potential withstanding voltage is 325 volts rms at 5 MHz. Leakage is not applicable.
RF Leakage	3.26	RF Leakage is not applicable.
Insertion Loss	3.27	(.10 SQT(f(GHz))) dB
MECHANICAL		
Connector Durability	3.15	The connector is to be tested and its mating connector shall be subjected to 500 insertions min. Withdrawal cycles /minute are not applicable. The connector shall show no evidence of mechanical failure and the connector shall meet the mating characteristic requirements.
Cable Retention Force	3.24	Not applicable
Coupling Nut Retention Force	3.25	Not applicable
Force to Engage and Disengage	3.5.1	The force required to engage shall not exceed 14 ounces (3.89 N). The disengage force shall not exceed 0.5 ounces (0.14 N).
Longitudinal Force max.		Longitudinal force is not applicable.
Mating Characteristics	3.7	See interface dimensions.
ENVIRONMENTAL		
Corrosion (Salt Spray)	3.13	Specification MIL-STD-1344, Method 1001, Test Condition B.
Vibration	3.18	Specification MIL-STD-1344, Method 2005, Test Condition VI, Letter J..
Shock	3.19	Specification MIL-STD-1344, Method 2004, Test Condition D.
Thermal Shock	3.20	Specification MIL-STD-202, Method 107, Test Condition B, except high temperature shall be + 200°C
Moisture Resistance	3.21	Specification MIL-STD-202, Method 106. Step 7b (vibration) shall be omitted. Insulation resistance shall be 200 Megohms min. within 5 minutes of removal from humidity.
Corona Level	3.22	The connector shall not exhibit breakdown (corona) when the applied voltage is 250 volts rms and the altitude is 70,000 feet.



Build your own Multipin/Multiport Connector by using the Table below.

Part Number System of the traditional SQ-Multipin/Multiport Connector. The Part Number consists of 12 digits, e.g. SQ-8M0-B11NN																																																		
1 & 2	3	4				5		6		7	8		9 and 10		11	12																																		
Series	"-"	Shell Size	Number of Inserts				Sex & Connector Conf.		Pressure	"-"	Insert Back Body	Cable Type		Key	Surface Treatment																																			
SQ per MIL-DTL-38999, Series3	= straight; "+" = 90° angled	21	8				M	Male	0	Normal	"-"	B	Bayonet Catch	11	Type 11	N	N=Nickel																																	
							F	Fem. 4-Hole Front Mount																																										
							R	Fem. 4-Hole Rear Mount																																										
							B	Bulkhead Feedthr. Jack																																										
												43	Type 43	C	C=Cadmium																																			
Part Number System of the TQ-, IQ-,BQ-, CQ and AQ-Multipin/Multiport Connectors. The Part Number consists of 12 digits, e.g. TQ-TM0-T10NC																																																		
1 & 2	3	4				5		6		7	8		9 and 10		11	12																																		
Series	"-"	Remarks	Number of Inserts				Sex & Connector Conf.		Pressure	"-"	Insert Back Body	Cable Type		Key	Surface Treatment																																			
TQ & IQ per MIL-DTL-38999, Series3	"-"	No of Inserts	4	4	4	7	8	9	9	10	12	13	19	37	M	M=Male	0	NormL	B	B=Bayonet Catch currently only at the SQ-Series	1N	Type 102	N	N=Nickel																										
		Codes	V	F	4	7	8	E	9	T	Z	D	N	S		H=Female 4-Hole Front Mount					1S	Type 10			2S	SFT205	4F	Type 47F	6A	Type 677	8F	Type 89F	10	Type 100																
HQ per MIL-DTL-38999, Series3	"_"	Cable Types	15	25	21	25	21	21	15	25	25	21	25	25	H	F=Female 4-Hole Rear Mount	0	P=Pressurized	T	T=Thread Fixed	11	Type 11	A	A=Nickel																										
BQ per MIL-DTL-38999, Series1	"+"		47F	89F	141	43	43	11	11	39	47F	11	43	43		677					677	47F			F	B=Bulkhead Feedthrough Jack	0	H or D=Hermetic H has Alu, D has PEI revolver	D	D=Hermetic	41	Type 141	42	SFT142	43	Type 43	44	Type 44A	78	RG178 B/U	83	.086"S.R. CC=Cu	89	.086"S.R.CC=Steel	94	.086"OC=Steel	8D	RG188-DS	M1	Molex 10067-1047
CQ per MIL-DTL-38999, Series1	"_"	Cable Types	15	25	21	25	21	21	15	25	25	21	25	25	B	B=Bulkhead Feedthrough Jack	0	V=Venting Holes	L	L=Limited Spring Loaded & threaded	11	Type 11	C	C=Cadmium																										
AQ per MIL-DTL-38999, Series3 Multiport Adapter	"_"		No of Inserts	4	4	4	7	8	9	9	10	12	13	19							37	F			F = 4-Hole Mount	0	0=Normal	I	I=Isolated	M	M = Male	D	D=Cadmium																	
		Codes	V	F	4	7	8	E	9	T	Z	D	N	S	R	R = 4-Hole Mount (Round Flange)	P	P=Pressurized			F		F = Female																											
															B	B = Bulkhead Feedthrough Jack	V	V=Venting																																
Part Number System of the RQ-Multipin/Multiport Connector. The Part Number consists of 12 digits, e.g. RQ-RM0-T110S																																																		
1 & 2	3	4				5		6		7	8		9 and 10		11	12																																		
Series	"-"	Number of Inserts				Sex		Pressure		"-"	Insert Back Body	Cable Type		Key	Surface Treatment																																			
RQ	"-"	F	F= Five (size 52 x 24 mm)				M	M=Male		0	Normal	"-"	T	T=Thread	11	Type 11	0	G	G=Gold Chromate																															
		H	H=8 in Honeycomb Configuration					F	F=Female						Q	Q=Quick Lock				39	Type 39	S	S=Surtech																											
		L	L=8 inline Configuration						L											L=Lim. spring loaded	43			Type 43																										
		R	R = 23													44					Type 44A	6A	Type 677	SL	Stripline	85	Type 85L	89	Type 89																					



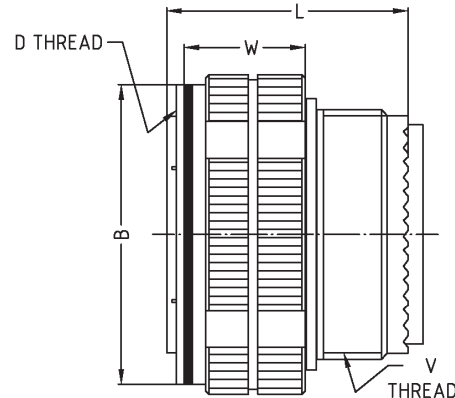
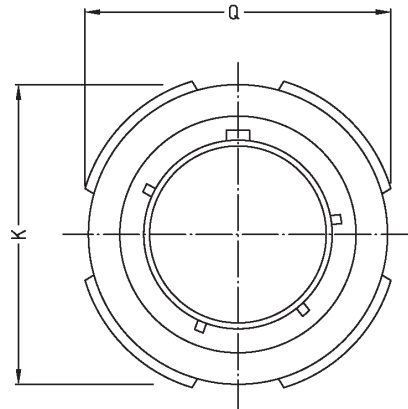
Step 1:

Identifying the Multiport Connector that is supposed to be used. You find detailed information at pages 42 to 47

Example; The subject connector is supposed to be per **MIL-DTL-38999 Series III Straight Plug, Size 25**, as shown below

MIL-DTL-38999 Series III Straight Plug Dimensions

Shell Size	B +0.008 (0.2) -0 (0) inch (mm)	K max. inch (mm)	L max. inch (mm)	O Dia. max. inch (mm)	W +0.008 (0.2) -0.04 (0.1) inch (mm)	V Thread	D Thread Class 2A (Plated)
25	1.744 (44.3)	1.768 (44.9)	1.234 (31.34)	1.875 (47.62)	0.76 (19.3)	M37X1-6g0.100R	1.6250-0.1P-0.3L-TS



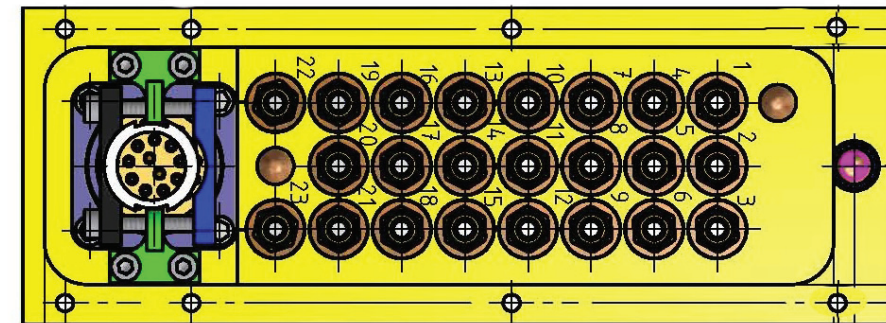
You may identify the Part Number by using the table at Page 84/85 for

- Connector Series
- Straight or Right Angle
- Shell Size
- Number of Inserts
- Sex
- Normal Application, or Pressure tight, or Hermetic, or Venting Holes required
- Specifics of the Back Body of the Insert
- Cable Type selected from Pages 98 to 103. But please note that the Multiport Dimension may limit the dimension of the outer diameter of the cable.
- Keying Selection at the Multiport from Page 41
- Surface treatment of the Multiport

or contact Customer Support and let them do it for you.



In order to identify the Rectangular Multiport Connector that can be used, you will find detailed information at pages 54 to 67



You may identify the Part Number by using the table at Page 84/85 for

- Connector Series
- Straight or Right Angle
- Shell Size
- Number of Inserts
- Sex
- Normal Application, or Pressure tight, or Hermetic, or Venting Holes required
- Specifics of the Back Body of the Insert
- Cable Type you selected from Pages 98 to 103 But please note that the Multiport Dimension may limit the dimension of outer diameter of the cable diameter.
- Surface treatment of the Multiport

or contact Customer Support and let them do it for you.

Step 2:

Identifying the P/N of the Cable Assemblies that are supposed to be used
The Part Number Sequence for each Cable is:

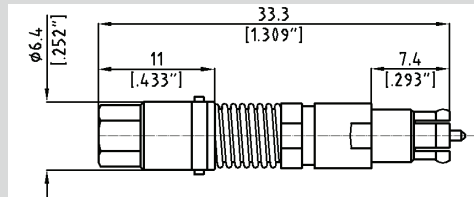
ABCD-EFGH-JKL-MNO
Cable-Code Length in mm Connector1 Code Connector2 Code

a) Specifying the Cable:
The Cable used should be Type 100, as seen on Page 101
The Cable Code ABCD becomes 0100, omitting the leading 0 = 100

b) Specifying the length EFGH of the cable from interface to Interface (for angled connectors the middle of the mitred unit is used):
Length of 650mm: the code is 0650 (not omitting the leading 0)
Length of 32m: 32000mm = 320 dm = D320 (320 Decimeters)

c) As Insert Connector JKL the following unit has been picked:

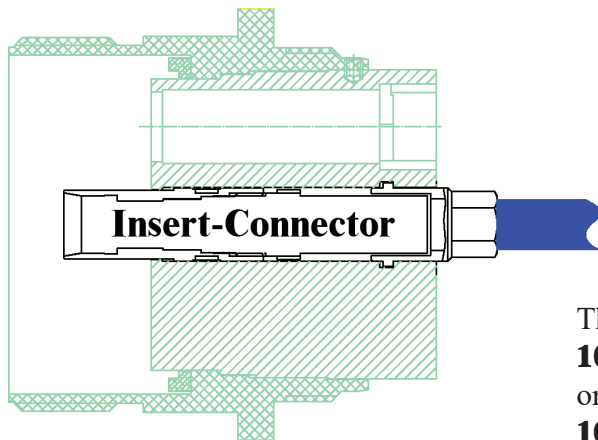
Cable Type over Insert Part Number		
11	141	43
TQ11-1102-02	TQ41-1102-02	TQ43-1102-02
Connector Code: QM		
Q-Inserts male spring loaded, Bayonet Catch for TQ-, IQ-, BQ-, CQ- Shells		



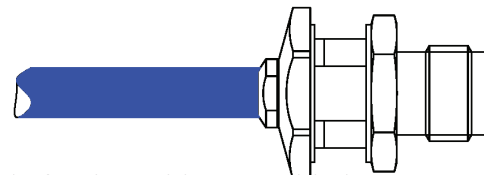
The Code is QM (omitting the blank character)

d) As opposite Connector the TNC BfJ has been picked. The Code MNO becomes 43, as seen on Page 91ff (omitting the blank character)

Female	Bulkhead Feedthrough	Pressure Tight	43P
Female	Bulkhead Feedthrough		43
Female	Mitred Right Angle	4-Hole Flange	48



Opposite Connector



The Code for the Cable Assembly becomes:
100-0650-QM-43
or alternatively for 32m length:
100-D320-QM-43

Besides the Spectrum Inserts of Types "Q" (Q24) and "X" (X40) also other Connectors Styles have been used as Inserts in several Multiports:

- SMP
- SMPM
- SMA Push-On male Connector
- Size 16 Contact

Using Connector SMP as Insert			
Cable Type over Insert Part Number			
11	39	47F	677
TM11-1101-02	TM39-1101-02	TM47-1101-02	TM67-1101-02
Connector Code: TMM			
TMM-Inserts male fixed, threaded nut for TQ-, IQ-, BQ-, CQ- Shells			
Cable Type over Insert Part Number			
11	39	47F	677
TM11-21S1-02	TM39-21S1-02	TM47-21S1-02	TM67-21S1-02
Connector Code: TMF			
TMF-Inserts female limited spring loaded, threaded nut for TQ-, IQ-, BQ-, CQ- Shells			

Using Connector SMPM as Insert			
Cable Type over Insert Part Number			
11	39	47F	677
TP11-1101-02	TP39-1101-02	TP47-1101-02	TP67-1101-02
Connector Code: TPM			
TPM-Inserts male fixed threaded nut for TQ-, IQ-, BQ-, CQ- Shells			

Cable Type over Insert Part Number			
11	39	47F	677
TP11-21S1-02	TP39-21S1-02	TP47-21S1-02	TP67-21S1-02
Connector Code: TPF			
TPF-Inserts female limited spring loaded, threaded nut for TQ-, IQ-, BQ-, CQ- Shells			

Using Connector SMA Push-On male as Insert			
Cable Type over Insert Part Number			
11	39	43	100
SM11-1101-02	SM39-1101-02	SM43-1101-02	SM10-1101-02
Connector Code: SM			
TPF-Inserts male fixes for TQ-, IQ-, BQ-, CQ- Shells			

Using Size 16 Connector as Insert			
Cable Type over Insert Part Number			
	89F	47F	677
	TQST-1101-02		
Connector Code: 16F			
TMM-Inserts male fixed, threaded nut for TQ-, IQ-, BQ-, CQ- Shells			



Step 3:

Spectrum will then assign a special Part Number for the Harness and will, if required, issue a data sheet showing all details of the product.

ITEM Set of Cable Assemblies

P/N

SPECTRUM
Harness P/N

Marking see Table 5
Black Shrink Tubing with White Marking

Harness P/N Set No.

Table 1. NOMINAL MECHANICAL ASSEMBLY CHARACTERISTICS	
Order diameter in mm	Type 100
Order diameter in mm at Sea Level and +20°C	5.2
Minimum Bend Radius Inside, Static (mm)	28
Minimum Bend Radius Inside, Dynamic (mm)	54
Order length	330

Table 2. NOMINAL ELECTRICAL ASSEMBLY CHARACTERISTICS	
Impedance in Ohms at Sea Level and +20°C	50±1
Voltage in V AC	75
Characteristic Impedance in V AC	87
Frequency Range	DC-18 GHz
Max. Operating Voltage at Sea Level, in V AC rms, 60Hz	1.4

Table 3. ENVIRONMENTAL CHARACTERISTICS	
Operating Temperature	-55°C to +125°C
General	MIL-STD 202 or equivalent

Table 4. MATERIAL AND FINISH OF THE CONNECTORS	
Contact	Beryllium Copper 2525 G-30P24 per DIN 19248 (ASTM B 189), gold plate per ASTM B 488, Type 3, Code C, Class 1.25
Outer conductive and Back Body	Stainless steel per DIN 1.4305 and passivated per ASTM A 967
Housing	Aluminum, Nickel plated per MIL-C-28014E (for Multiplex only)
Insulator	PTFE Fluorocarbon per ASTM D1710
Female	BRASS CuZn30Pb2 per DIN 17660 gold plated per ASTM B 488

Table 5. SUMMARY OF THE CABLE (MULTIPORT)		Table 6. STRIP AND OBTIMATE		Table 7. ELECTRICAL SPECIFICATION TABLE ASSEMBLY		Table 8. CABLE ASSEMBLY TYPE	
Cable Length No. Label	Spectrum P/N	Marking P1	CABS Marking P2	Strip Mode (Strip Width) (mm)	Strip Mode (Strip Width) (mm)	Strip Mode (Strip Width) (mm)	Strip Mode (Strip Width) (mm)
01 5000 +HS0	10L5000ZQ2-11			2.5 1.0 2.0 0.1 2255	2.5 1.0 2.0 0.1 1130	2.5 1.0 2.0 0.1 750	2.5 1.0 2.0 0.1 488
02 1000 +HS0	10L1000ZQ2-11			2.5 1.0 2.0 0.1 2255	2.5 1.0 2.0 0.1 1130	2.5 1.0 2.0 0.1 750	2.5 1.0 2.0 0.1 488
03 5000 +HS0	10L5000ZQ2-11			2.5 1.0 2.0 0.1 2255	2.5 1.0 2.0 0.1 1130	2.5 1.0 2.0 0.1 750	2.5 1.0 2.0 0.1 488
04 1000 +HS0	10L1000ZQ2-11			2.5 1.0 2.0 0.1 2255	2.5 1.0 2.0 0.1 1130	2.5 1.0 2.0 0.1 750	2.5 1.0 2.0 0.1 488
05 5000 +HS0	10L5000ZQ2-11			2.5 1.0 2.0 0.1 2255	2.5 1.0 2.0 0.1 1130	2.5 1.0 2.0 0.1 750	2.5 1.0 2.0 0.1 488
06 1000 +HS0	10L1000ZQ2-11			2.5 1.0 2.0 0.1 2255	2.5 1.0 2.0 0.1 1130	2.5 1.0 2.0 0.1 750	2.5 1.0 2.0 0.1 488
07 5000 +HS0	10L5000ZQ2-11			2.5 1.0 2.0 0.1 2255	2.5 1.0 2.0 0.1 1130	2.5 1.0 2.0 0.1 750	2.5 1.0 2.0 0.1 488
08							
09							
10							
11							
12							

Always keep in mind that customer service at Spectrum Elektrotechnik GmbH will be happy to do all this for you. Just a short communication is needed.



Assigning the 3 Digit Code of a Multiport at a Cable Assembly

First Key of the Code

Series	Number of Inserts										
	4	4	5	7	8	9	10	12	19	23	37
Size	21	25		25	21	13	25	25	25		25
SQ					5						
TQ	4	P		7	8	N	T	Z	K		S
IQ	3	Q		6	9	B	U	W	D		F
BQ	V			S	A		N	L			
CQ	C			M	E	G	H	J			
RQ			F		C or H					R	
AQ							B				Q

C = In Line Positioning, H = Honey Comb Positioning

Second Key of the Code

Detailed Description

Male Cadmi-um	Male Nickel plated	Male pressur-ized Cadmi-um	Male pressur-ized Nickel	Male hermetic Cadmi-um	Male hermetic Nickel plated	BFJ Cad-ium plated	BFJ Nickel plated	BFJ pressur-ized Cadmi-um"	BFJ pressur-ized Nickel"	BFJ hermetic Cadmi-um"	BFJ hermetic Nickel"
M	A	L	E	S	X	F	R	O	N	T	P
	Female 4-Hole Flange Cadmi-um	Female 4-Hole Flange Nickel	Female 4-Hole Flange pressur-ized Cadmi-um	Female 4-Hole Flange pressur-ized Nickel	Female 4-Hole Flange hermet-ic Cadmi-um	Female 4-Hole Flange hermet-ic Nickel	Female 4-Hole Flange Nickel, venting holes	Male, Nickel plated with venting holes			
	4	5	6	7	8	9	W	V			

Third Key of the Code

Key
N
A
B
C
D

Example: The Code is needed for the following Multiport:

- 1) TQ with 12 Inserts
- 2) BFJ Nickel plated
- 3) Key "B"

The Code is ZRB



Connector Selection vs. Frequency Range



Coaxial Connector Frequency Range Chart													
Frequency in (GHz) →	1	2	3	4	8	12.0	15	18	26.5	30	40	50	65
Band	L	S	C	X	KU	K	KA						
Connector Type	Operational Range →			Applicable MIL, DIN or IEC Spec									
1.4/4.4	DC - 20.0 GHz					DIN 47298							
1.8/5.6	DC - 10.0 GHz				DIN 47226								
2/5.5	DC - 14.0 GHz					DIN 47235							
1.85 mm	DC - 71.0 GHz for some Designs										IEEE-STD 287		
2.4 mm	DC - 50.0 GHz										IEEE-STD 287		
2.92 mm	DC - 40.0 GHz										MIL-STD-348A		
3.5 mm	DC - 35.0 GHz										IEEE-STD 287		
7 mm	DC - 18.0 GHz					IEEE-STD 287							
7/16	DC - 7.5 GHz				DIN 47223								
BMA	DC - 22.0 GHz					MIL-PRF-39012/1B							
BNC	DC - 4.0 GHz			MIL-STD-348A/MIL-PRF-39012									
C	DC - 10.0 GHz				MIL-STD-348A/MIL-PRF-39012								
HN	DC - 8.0 GHz				MIL-STD-348A/MIL-PRF-39012								
N	DC - 18.0 GHz min., optional DC - 20.0 GHz					MIL-STD-348A/MIL-PRF-39012							
SBC	Frequency Range depending on Design and Application					Spectrum Specification							
SBX	DC - 8.0 GHz				Spectrum Specification								
SBY	DC - 12.0 GHz					Spectrum Specification							
SBZ	Frequency Range depending on Design and Application												
SC	DC - 10.0 GHz				MIL-STD-348A/MIL-PRF-39012								
SMA	DC - 18.0 GHz					MIL-STD-348A/MIL-PRF-39012							
SMP	DC - 40.0 GHz										MIL-STD-348A/MIL-PRF-39012		
SMPM	DC - 65.0 GHz												
TNC	DC - 11.0 GHz				MIL-STD-348A/MIL-PRF-39012								
TNCA	DC - 18.0 GHz					MIL-STD-348A/MIL-PRF-39012							
TNX	DC - 18.0 GHz												

**Advanced Designs
fitting your needs !**

when Quality is needed

**Gain
Amplitude
Equalizers
and Fine Grain Equalizers**

80905 Munich, Germany **P.O. Box 450533**
Telephone: +49-89-3548-040 **Facsimile: +49-89-3548-0490**
WWW.SPECTRUM-ET.COM **Email: Sales@Spectrum-et.com**



Type	Sex	Description	Details	Code	Finish		
1.4/4.4	Male	Straight		03	Brass Silver Plated		
.8/5.6	Female	Mitred Right Angle		06	Brass Gold Plated		
	Female	Straight		04			
	Male	Mitred Right Angle		05			
	Male	Straight		07			
	Female	Radius Right Angle		VF9			
1.85mm	Female	Straight		VF	Stainless Steel Passivated		
	Female	Straight	NMD	V2			
	Male	Straight	Maxi Nut	MV			
	Male	Radius Right Angle		VM9			
	Male	Straight		VM			
	Male	Straight	NMD	V2M			
	Female	Straight		ZB1		Brass Silver Plated	
Male	Straight		Z13				
2.4mm	Female	Bulkhead Feedthrough		HB	Stainless Steel Passivated		
	Female	Radius Right Angle		HF9			
	Female	Straight	2-Hole Flange Mount	HF2			
	Female	Straight	4-Hole Flange Mount	HF4			
	Female	Straight	NMD	H2			
	Female	Straight		HF			
	Male	Radius Right Angle		HM9			
	Male	Straight	Maxi Nut	M2			
	Male	Straight	NMD	H2M			
	Male	Straight		HM			
	Male	Straight	High Power	HMU			
	2/5.5	Male	Mitred Right Angle			02	Brass Silver Plated
	2.92mm	Female	Bulkhead Feedthrough			KFB	Stainless Steel Passivated
Female		Radius Right Angle		KF9			
Male		Radius Right Angle		KM9			
Male		Radius Right Angle	Venting Holes	K9V			
Male		Radius Right Angle	Ultem Bead	KU9			
Male		Radius Right Angle	Ultem Bead	KUN	Stainless Steel Gold Plated		
Female		Straight	2-Hole Flange Mount	KF2	Stainless Steel Passivated		
Female		Straight	4-Hole Flange Mount	KF4			
Female		Straight	NMD	WI			
Female		Straight		KF			
Female		Straight	Venting Holes	KFV			
Male		Straight	Hex Nut	KM			
Male		Straight	Hex/Knur1 Nut	KMK			
Male		Straight	Extreme Short Connector	KMS			
Male		Straight	High Power Hex/Knur1 Nut	KMQ			
Male		Straight	High Power Hex Nut	KMU			
Male		Straight	Venting Holes	KMV			
Male		Straight Factory Phase Adjust	Venting Holes	KLV			
Male		Straight	Maxi-Nut	MK			
Male		Straight	NMD	WIM			



Type	Sex	Description	Details	Code	Finish		
3.5mm	Female	Straight	2-Hole Flange Mount	922	Stainless Steel Passivated		
	Female	Straight	4-Hole Flange Mount	924			
	Female	Straight	NMD	H3			
	Female	Straight		92			
	Female	Straight	Venting Holes	92V			
	Male	Straight	Maxi Nut	M3			
	Male	Straight	NMD	H3M			
	Male	Straight		91			
	Male	Straight	High Power	91U			
	Male	Straight	Venting Holes	91V			
	7 mm	Male	Straight	4 Slots Center Contact		90	Stainless Steel Passivated
		Male	Straight	6 Slots Center Contact		96	
		Male	Straight	Field Replaceable 4 sl.		E90	
Male		Straight	Field Replaceable 6 sl.	E96			
7/16	Female	Bulkhead Feedthrough		753	Stainless Steel Passivated		
	Female	Straight	4-Hole Flange Mount	754			
	Female	Straight	High Power	76H			
	Female	Straight		76			
	Male	Mitred Right Angle		755			
	Male	Mitred Right Angle	High Power	75P			
	Male	Straight	High Power	75H			
	Male	Straight		75			
	BMA	Female	Bulkhead Feedthrough			BB	Stainless Steel Passivated
Female		Straight	2-Hole Flange	BF			
Female		Straight		BW			
Female		Right Angle		BWR			
Female		Straight	Customer Phase Adjustable	BWA			
Male		Bulkhead Feedthrough		BM			
Male		Straight	2 hole flange	BM2			
Male		Straight	Customer Phase Adjustable	BMA			
BNC	Female	Bulkhead Feedthrough		81B	Brass Nickel Plated		
	Female	Bulkhead Feedthrough		85			
	Female	Mitred Right Angle		83			
	Female	Straight	4-Hole Flange	84			
	Female	Straight		81			
	Male	Mitred Right Angle		74			
	Male	Straight		71			
	Male	Straight		72			
	Male	Straight		72			
C	Female	Straight		89	Stainless Steel Passivated		
	Male	Straight		88			
EIA 1 5/8	Male	Straight		EA5	Brass Silver Plated		
EIA 3 1/8	Female	Straight	6-Hole Flange Round	EA3	Brass Silver Plated		
		Right Angle		RA3			
HN	Female	Bulkhead Feedthrough		68B	Stainless Steel Passivated		
	Female	Straight		68			
	Male	Right Angle		67			
	Male	Straight	for Armoring	69			



Type	Sex	Description	Details	Code	Finish		
Multi Inserts for BQ, CO, IQ SQ, TQ	Female	Firm, DC - 24.0 GHz		QFF	BeCu gold plated		
	Female	Firm, DC - 24.0 GHz	Test Connector	TFF			
	Female	Firm, DC - 24.0 GHz	Venting Holes	VFF			
	Female	Firm, DC - 40.0 GHz		XFF			
	Female	Lim. Spring Load, DC - 24.0 GHz		QFE			
	Female	Lim. Spring Load, DC - 40.0 GHz		XFE			
	Female	Pressurized DC - 24.0 GHz		QPF			
	Female	Pressurized DC - 40.0 GHz		XPF			
	Female	Spring Loaded, DC - 24.0 GHz		QF			
	Female	Spring Loaded, DC - 40.0 GHz		XF			
	Female	Lim.Sprg.Load. DC - 40.0 GHz	SMPM-Insert BFJ	MQB			
	Female	Lim.Sprg.Load. DC - 40.0 GHz	SMPM-Insert Female	MQF			
	Male	Firm, DC - 24.0 GHz		QMF			
	Male	Firm, DC - 24.0 GHz	Test Connector	TMF			
	Male	Firm, DC - 40.0 GHz		XMF			
	Male	Lim.Sprg.Load, DC - 24.0 GHz		QME			
	Male	Lim.Sprg.Load, DC - 40.0 GHz		XME			
	MX	Male	Spring Loaded, DC - 24.0 GHz			QM	Stainless Steel Passivated
Male		Spring Loaded, DC - 40.0 GHz		XM			
Male		Firm DC - 40.0 GHz	SMPM-Insert Male	MQM			
Female		Connector Mix, 1 connector plus 1 Adapter at 1 side		MX			
N		Female	Bulkhead Feedthrough		63	Stainless Steel Passivated	
		Female	Mitred Right Angle		5B		
		Female	Mitred Right Angle	4-Hole Flange	5C		
		Female	Mitred Right Angle	Bulkhead Feedthrough	5A		
		Female	Straight	4-Hole Flange	65		
		Female	Straight	4-Hole Flange Hi.Power	64H		
		Female	Straight	High Power	61H		
		Female	Straight	Hugh Power Bead	61U		
		Female	Straight	Interchangeable Connector	E61		
		Female	Straight		61		
		Male	135° Angle		53		
		Male	Mitred Right Angle		55		
		Male	Mitred Right Angle	High Power	55P		
		Male	Mitred Right Angle	Water Protected IP66	55W		
	Male	Push-On, Full Locking		NS			
	Male	Push-On, Full Locking	Double "D"	ND			
	Male	Push-On, Full Locking	Double "D"	NDB			
	Male	Push-On, Full Locking		NDS			
	Male	Right Angle	Double "D", Hi. Power	55H			
	Male	Straight	90° Cable Bent	51B			
	Male	Straight	Factory Phase Adjustable	51L			
	Male	Straight	Water Protected IP66	51W			
	Male	Straight	Hex/Knurl Nut without wire holes	510			
	Male	Straight	Hex/Knurl Nut with wire holes	511			
	Male	Straight	High Power	50			
	Male	Straight	High Power	51H			
	Male	Straight	Interchangeable Connector	E51			
	Male	Straight	Phase Adj. C. .100°@18GHz	51A			
	Male	Straight	Phase Adj. C. .240°@18GHz	51C			
	Male	Straight	Phase Adj. C. .280°@18GHz	51B			
	Male	Straight	Ruggedized	52			
	Male	Straight	Venting Holes (S=Space)	51S			
	Male	Straight	Venting Holes	51V			
	Male	Straight	Water protected IP66	51W			
	Male	Straight		51			
	Male	Straight	GOST Norm	51G			
	Male	Straight, Push-On, Full Lockg		NSB			
	Male	Straight	Edelst. 1.4404	51Z			
	Male	Straight	Edelst. 1.4404; water protected	51Y			



Type	Sex	Description	Details	Code	Finish		
QMA	Female	Straight		Q2	Stainless Steel Passivated		
	Female	Bulkhead Feedthr. Locking	factory phase adjustable	QFL			
	Female	4-Hole Flange Locking	factory phase adjustable	Q4L			
	Male	Straight		Q1			
	Male	Straight Locking		Q1L			
	Male	Straight Locking	factory phase adjustable	Q1P			
	Male	Bulkhead Feedthr. Locking	factory phase adjustable	QML			
	Male	Bulkhead Feedthr. Locking	factory phase adjustable	QML			
RQ23	Female	Insert, Firm	Multipin Insert	21F	Stainless Steel Passivated		
	Male	Insert, Spring Loaded		SMX			
SBX	Female	Bulkhead Feedthrough		XFR	Stainless Steel Passivated		
	Female	Push-On; 4-Hole Flge Rectangular	High Power	XF4			
SBY	Female	Push-On; 4-Hole Flge Round	High Power	XF5	Stainless Steel Passivated		
	Female	Straight		YF			
SC	Male	Straight		YM	Stainless Steel Passivated		
	Female	4-Hole Flange	High Power	794			
	Female	Bulkhead Feedthrough	High Power	78H			
	Female	Bulkhead Feedthrough		78			
	Female	Straight	High Power	79H			
	Female	Straight		79			
	Male	Mitred Right Angle		77			
	Male	Mitred Right Angle	High Power	77H			
	Male	Straight	High Power; phase adjustable	80L			
	Male	Straight	High Power	80H			
	Male	Straight	High Power & Water protected	8HP			
	Male	Straight	Venting Holes	80V			
	Male	Straight		80			
	SMA continuing at next Page	Female	Radius Right Angle	Reverse Sex		R99	Stainless Steel Passivated
		Female	Bulkhead Feedthrough			22	Stainless Steel gold plated
		Female	Bulkhead Feedthrough	IP65 water protected		22P	Stainless Steel gold plated
Female		Bulkhead Feedthrough		23	Stainless Steel Passivated		
Female		Mitred Right Angle	Long Neck	18L			
Female		Mitred Right Angle	Regular Neck	18R	Stainless Steel Gold Plated		
Female		Mitred Right Angle		18			
Female		Mitred Right Angle		19	Stainless Steel Passivated		
Female		Radius Right Angle		28	Stainless Steel Gold Plated		
Female		Radius Right Angle	4-Hole Flange	29			
Female		Right Angle, Water Protected	Water Protected	14P	Stainless Steel Passivated		
Female		Straight		20	Stainless Steel Gold Plated		
Female		Straight	2-Hole Flange	26			
Female		Straight	4-Hole Flange	24	Stainless Steel Passivated		
Female		Straight	4-Hole Flange	25			
Female		Straight for RQ Multiport	Right Angled Multiport	21F			
Female		Straight	High Power	21H			
Female		Straight	Venting Holes	21V			
Female		Straight	Interchangeable Connector	E21			
Female		Straight		21			
Female		Straight	Water Protected	21P			
Female		Radius Right Angle		18			
Female		Straight, Phase Adjustable	4-Hole Flange	PH1			
Male		180 Degree Bow		8W			
Male		Mitred Right Angle	Long Neck	153		Stainless Steel Passivated	
Male		Mitred Right Angle	Regular Neck	151			
Male		Mitred Right Angle	Short Neck	152			
Male		Mitred Right Angle		14			
Male		Mitred Right Angle		15	Stainless Steel Gold Plated		
Male		Mitred Right Angle		15P	Stainless Steel 1.4305 Pass. pressurized		
Male		Mitred Right Angle	Stainless Steel 1.4404	15Z	Stainless Steel 1.4404 Pass.		
Male		Mitred Right Angle, Wire-holes	Long	156	Stainless Steel 1.4305 Pass.		



Type	Sex	Description	Details	Code	Finish
SMA continued	Male	Mitred Right Angle, Wire-holes	Regular	154	Stainless Steel 1.4305 Passivated
	Male	Mitred Right Angle, Wire-holes	Short Neck	155	
	Male	Push-On		SM	
	Male	Push-On für RQ Multiport	Right Angled Multiport	SMX	
	Male	Radius Right Angle		16	
	Male	Radius Right Angle		17	
	Male	Radius Right Angle		17E	
	Male	Radius Right Angle	Factory Phase Adjustable	17P	
	Male	Radius Right Angle 60°		176	
	Male	Straight	2-Hole Flange	27	
	Male	Straight	Across Flats at the cable entry	1S	
	Male	Straight	for Armoring	1E	
	Male	Straight	Maxi Nut	MA	
	Male	Straight	Phase Adjustable	PH	
	Male	Straight	Regular	10	
	Male	Straight	Short Connector	10S	
	Male	Straight	Regular	11	
	Male	Straight, Self Locking	Phase Adj. C. .280°@18GHz	11B	
	Male	Straight, Self Locking	Phase Adj. C. .240°@18GHz	11C	
	Male	Straight, Self Locking	Phase Adj. C. .100°@18GHz	11A	
	Male	Straight	Water Protected	11P	
	Male	Straight	Phase Adjustable Connector	11D	
	Male	Straight, DC - 26.5 GHz		11K	
	Male	Straight, DC - 26.5 GHz	Venting Holes	1KV	
	Male	Straight, DC - 18.0 GHz	Factory Phase Adjustable,	11L	
	Male	Straight, DC - 26.5 GHz	Factory Phase Adjustable,	11K	
	Male	Straight	Short Connector	11S	
	Male	Straight	Venting Holes	11V	
Male	Straight	Stainless 1.4404 + water prot.	11Y		
Male	Straight	Stainless Steel 1.4404	11Z		
Male	Straight, using Cable C. Conductor		12		
SMA reverse sex	Female	Straight		20R	Stainless Steel gold plated
	Male	Straight		10R	
	Male	Straight		11R	Stainless Steel passivated
SMB	Male	Right Angle, Mitred		15R	
	Female	Right Angle, Mitred		RB	Brass Gold Plated
SMC	Female	Straight, Push-On		FB	
	Male	Straight		MB	
	Male	Mitred Right Angle		CW	Brass Gold Plated
SMP	Male	Straight		MC	
	Female	Straight		FC	
	Female	Bulkhead Feedthrough		SPU	BeCu2 Gold Plated
	Female	Float Mount		SPV	
	Female	Mitred Right Angle		MPR	
	Female	Mitred Right Angle		SPQ	
	Female	Mitred Right Angle	EMI Gasket, Anti Rock Ring	SPA	
	Female	Push-On, Right Angle, Mitred		SPR	
	Female	Straight	EMI-Gasket	SPG	
	Female	Straight		SPT	
	Female	Straight, DC - 18.0 GHz	Test Connector	TMP	Stainless Steel Passivated
	Female	Straight, DC - 18.0 GHz	Test Connector	TJ	
	Female	Straight, DC - 18.0 GHz	Test Connector Limited Det.	TJL	
	Female	Straight, DC - 18.0 GHz	Test Connector Full Detent	TJF	
	Female	Straight, DC - 18.0 GHz	Factory Phase Adjustable	SPF	
	Female	Straight, DC - 18.0 GHz	Test Connector for Locking	SPL	
	Female	Mitred Right Angle	Test Connector for Locking	SPN	
	Female	Straight, DC - 26.5 GHz		SPE	
	Female	Straight, DC - 40.0 GHz		PF	BeCu2 Gold Plated
	Male	Bulkhead Feedthrough	Smooth Bore	STS	Stainless Steel Passivated
	Male	Bulkhead Feedthrough	Limited Detent	STL	
	Male	Bulkhead Feedthrough	Full Detent	STF	
	Male	Bulkhead Feedthrough R.A.	Catcher's Mitt Right Angle	STB	
	Male	Straight	Test Connector Commercial	TMJ	
	Male	Straight	Smooth Bore	SPW	
	Male	Straight	Limited Detent	SRL	
	Male	Straight, 2-Hole Flange	Full Detent	SRF	
	Male	Straight Panel Mount	Smooth Bore	SPS	
Female	Straight		SZF	BeCu2 Gold Plated	
Female	Right Angle		SZR	BeCu2 Gold Plated/Stainl.S	
Male	Straight		SZM	Stainless Steel Passivated	



Type	Sex	Description	Details	Code	Finish
SPM	Female	Bulkhead Feedthrough		PGF	Stainless Steel Passivated
	Female	Straight	2- Hole Flange	PG2	
	Female	Straight	4- Hole Flange	PG4	
	Female	Straight		PJ	
	Male	Straight	High Power	PMH	
	Male	Straight		PM	
SMPM	Female	Straight		SSF	Stainless Steel Passivated
	Male	Straight Smooth Bore		SSM	
	Male	Straight Limited Detent		SSD	
TNC	Male	Straight Full Detent		SSC	Stainless Steel 1.4305 Passivated
	Female	135° Angle, Bulkhead Feedthrough		42	
	Female	Bulkhead Feedthrough	High Power	43H	
	Female	Bulkhead Feedthrough	Pressure Tight	43P	
	Female	Bulkhead Feedthrough		43	
	Female	Mitred Right Angle	4-Hole Flange	48	
	Female	Mitred Right Angle	4-Hole Flange High Power	48H	
	Female	Radius Right Angle	4- Hole Flange	46	
	Female	Radius Right Angle	4- Hole Flange	47	
	Female	Straight		40	
	Female	Straight		41	
	Female	Straight	High Power	41H	
	Female	Straight	High Power Bead	41U	
	Female	Straight	High Power, 4-Hole Flange	45H	
	Female	Straight	Interchangeable Connector	E41	
	Female	Straight	Quick Lock	Q41	
	Female	Straight	Reverse Sex	R41	
	Female	Straight	Venting Holes	41V	
	Female	Straight, 4-Hole Flange		44	
	Female	Straight, 4-Hole Flange		45	
	Female	Straight		40	
	Male	135° Angle		36R	
	Male	135° Angle, 18.0 GHz		36	
	Male	Mitred Right Angle	Phase Adj. C. .280°@18GHz	35B	
	Male	Mitred Right Angle	Phase Adj. C. .240°@18GHz	35C	
	Male	Mitred Right Angle	Phase Adj. C. .100°@18GHz	35A	
	Male	Mitred Right Angle	High Power	35H	
	Male	Mitred Right Angle	High Power, Factory Phase Adj.	35L	
	Male	Mitred Right Angle	Long Neck	35M	
	Male	Mitred Right Angle	Very Long Neck	35N	
	Male	Mitred Right Angle		35	
	Male	Mitred Right Angle	Quick Lock Connector	Q35	
	Male	Radius Right Angle		35R	
	Male	Mitred Right Angle	Reverse Sex	R35	
	Male	Straight	90° Radius at Cable	31B	
	Male	Straight	High Power	31H	
	Male	Straight	High Power, Factory Phase Adj.	31L	
	Male	Straight		31	
	Male	Straight	Interchangeable Connector	E31	
	Male	Straight	Quick Lock Connector	Q31	
	Male	Straight	Reverse Sex	R31	
	Male	Straight, Self Locking	Phase Adj. C. .280°@18GHz	31B	
	Male	Straight, Self Locking	Phase Adj. C. .240°@18GHz	31C	
	Male	Straight, Self Locking	Phase Adj. C. .100°@18GHz	31A	
	Male	Straight	Phase Adjustable Connector	31D	
	Male	Straight	Venting Holes (S=Space)	31S	
	Male	Straight	Venting Holes	31V	
	Male	Straight	Waterprotected	31W	
Male	Straight, Push-On	Full Locking	TS		
Male	Straight	Stainless Steel 1.4404	31Z		
Male	Straight	Stainless 1.4404; Water Protect	31Y		
TNX	Female	Straight		49	Stainless Steel Passivated
	Male	Straight		39	



Type	Sex	Description	Details	Code	Finish
Size 16	Female	Straight		F16	BeCu2 gold plated
	Male	Straight		M16	

Type	WG Designation	Groove and Gasket at the Flange	Square, or Double Ridge	Top- or End-Launched	Flange Type	Code	Material & Finish
WG with direct cable attach- ment	WR-137	No	Square	End Launched		137	Aluminum Surtech 650
	WR-284	No	Square	End Launched		284	
	WRD250-D30	No	Double Ridge	End Launched		D25	
	WRD500-D36	No	Double Ridge	End Launched		D50	
	WRD650-D28	No	Double Ridge	EndLaunched		D65	
	WRD650-D28	Yes	Double Ridge	End Launched		X65	
	WRD750-D24	No	Double Ridge	End Launched		D75	

CONNECTOR SPECIFICATION

MATERIALS

STEEL corrosion resistant 1.4305 per DIN EN 10088-3 or ASTM A 582.

ALUMINUM AlMg4.5Mn, AlMgSi0.5, AlMgSi1 per DIN EN 573-3 or SAE AMS QQ-A-225/8.

BRASS CuZn39Pb3 per DIN EN 12163/12164 or CW614N or ASTM B 16

COPPER BERYLLIUM 33-25 CuBe2PbH per ASTM B196

TFE Fluorocarbon per ASTM D 1710

SILICONE RUBBER per A A 59588

BORRIUM NITRITE Dielectric for high power applications per in house specification.

FINISH

CENTER CONTACTS shall be gold plated to a minimum thickness of .00005 inch (1.27 µm) in accordance with ASTM B 488 Type 2, Code C, Class 1.25.

STAINLESS STEEL shall be passivated per ASTM-A967.

ALUMINUM:Conductive Parts shall have an iridited finish per MIL-DTL-5541, Other parts, such as Coupling Nuts and Back Bodies shall be anodized per MIL-A-8625.

BRASS: .00003 inch (0.8 µm) min. gold plating per ASTM B 488 Type 2, Code C, Class 0.75, or nickel plating per SAE AMS-QQ-N-290, as specified.

VARIOUS: Imoloy .0001 inch (2.5 µm) min. plating, consisting of 55% Copper / 20% Zinc / 25% Tin (on special request).

ELECTRICAL

Please refer to the appropriate connector specification.

MECHANICAL

Please refer to the appropriate connector specification.

ENVIRONMENTAL

Corrosion (Salt Spray): Specification MIL-STD-202, Method 101, Test Condition B. The salt solution shall be 5%.

Vibration: Specification MIL-STD-202, Method 204, Test Condition D.

Shock: Specification MIL-STD-202, Method 213, Test Condition I.

Moisture Resistance: Specification MIL-STD-202, Method 106. Step 7b (vibration) shall be omitted. Insulation resistance shall be 200 Megohms min. within 5 minutes of removal from humidity.

Corona Level: The connecor shall not exhibit breakdown (corona) when the applied voltage is 375 volts rms and the altitude is 70,000 feet.



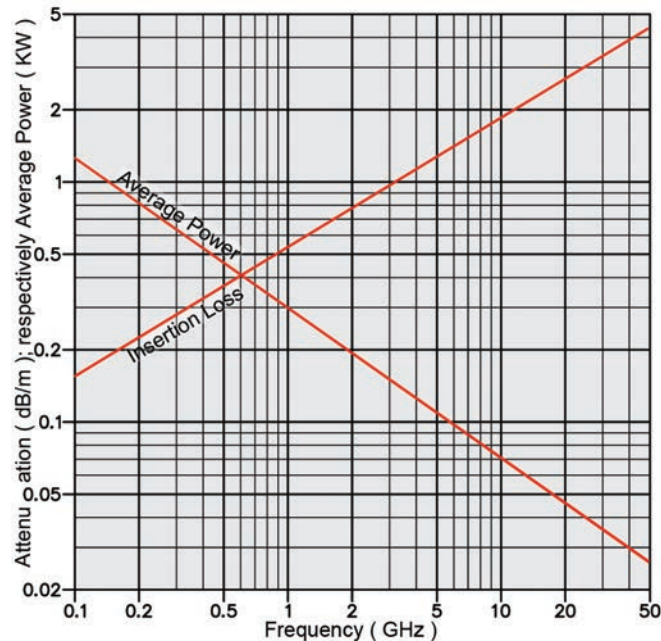
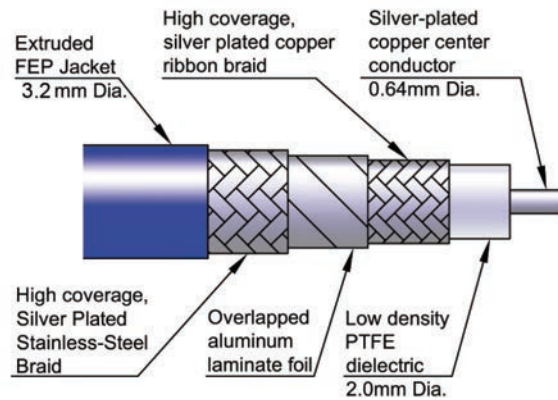
Cable - Type 11

DC - 50.0 GHz

SPECIFICATION		Type 11
Cable Code	Standard	11
	Armored	11x
	X: Please find Armor & Ruggedizing Options in Section S.	
Frequency Range	DC to 50.0 GHz	
Outer Diameter in mm	3.2	
Impedance in Ohms at Sea Level and +25°C	50 ± 2	
Velocity in %, ± 2%	74	
Capacitance in pF/m	90	
Dielectric Strength (60 Hz) in KV rms	5.0	
Max. Operating Voltage at Sea Level, in KV rms, 60 Hz	0.5	
Insertion Loss in dB/m vs. Frequency	0.5 GHz	0.37
	2.0 GHz	0.76
	5.0 GHz	1.24
	10.0 GHz	1.80
	18.0 GHz	2.53
	26.5 GHz	2.98
	40.0 GHz	3.90
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	0.5 GHz	470
	2.0 GHz	190
	5.0 GHz	107
	10.0 GHz	65
	18.0 GHz	48
	26.5 GHz	38
	40.0 GHz	30
50.0 GHz	26	
RF - Leakage at 18.0 GHz	- 90 dBC	
Operating Temperature Range	-54°C to +150°C	
Outer Conductor Construction	Silver Plated Copper Braid, Overlapping Aluminum Film, Silver Plated Copper Braid	
Outer Jacket	FEP	
Dielectric Diameter in mm	2.0	
Dielectric Material	Low Density PTFE	
Dielectric Constant	1.8	
Center Conductor Material	Copper, Silver Plated	
Center Conductor Dia. in mm	0.64	
Weight in Grams/Meter	26.2	
Connector Retention Force (N)	130	
Minimum Bend Radius, Inside, Static (mm)	12.7	
Minimum Bend Radius, Inside, Dynamic (mm)	31.7	

Characteristics:

- * Low Loss Performance to 50.0 GHz
- * Small Diameter
- * Rugged Construction
- * Procurement for completely terminated assemblies, fully tested. The test documentation for VSWR and Insertion Loss will be supplied with the cable assembly.
- * Available connectors: 2.4mm, 2.92mm 3.5mm, 7mm, N, SMA, SBX, SBY, BQ-, CQ-, IQ-, RQ-, SQ- TQ-Series and TNC. For Connector Outline Drawings please refer to Section Q.
- * For Connector Code details please refer to Section S.
- * For information on armor please refer to Section S as well.
- * For ordering information please refer to Section A.



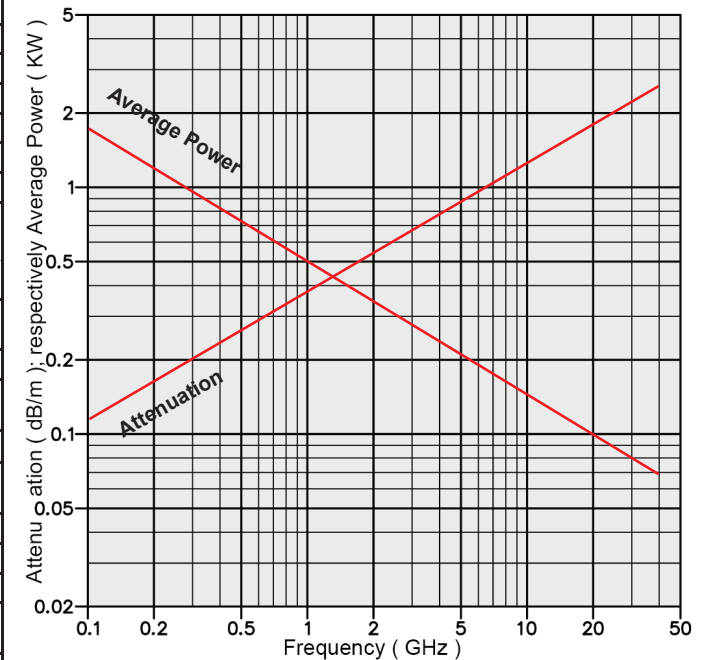
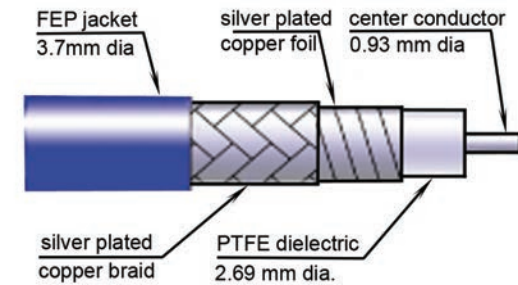
Cable - Type 39

Ultimate Performance DC - 45.0 GHz

SPECIFICATION		Type 39
Cable Code	Standard	39
	Armored	39x
	X: Please find Armor & Ruggedizing Options in Section S.	
Frequency Range	DC to 45.0 GHz	
Outer Diameter in mm	Standard	3.7
Impedance in Ohms at Sea Level and +25°C	50 ± 2	
Velocity in %, ± 2%	84	
Capacitance in pF/m	79	
Dielectric Strength (60 Hz) in KV rms	2.0	
Max. Operating Voltage at Sea Level, in KV rms, 60 Hz	1.3	
Nominal Insertion Loss in dB/m vs. Frequency	1.0 GHz	0.36
	4.0 GHz	0.73
	8.0 GHz	1.04
	12.0 GHz	1.29
	18.0 GHz	1.60
	26.0 GHz	1.94
	40.0 GHz	2.46
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	1.0 GHz	500
	4.0 GHz	260
	8.0 GHz	180
	12.0 GHz	150
	18.0 GHz	120
	26.0 GHz	100
	40.0 GHz	75
RF - Leakage at 18.0 GHz	- 100 dBC	
Operating Temperature Range	-65°C to +200°C	
Outer Conductor Construction	Silver-Plated Copper Foil, Silver-Plated Copper Braid	
Outer Jacket	FEP	
Dielectric Diameter in mm	2.64	
Dielectric Material	Low Density PTFE	
Dielectric Constant	1.6	
Center Conductor Material	Copper, Silver Plated	
Center Conductor Dia. in mm	0.92	
Weight in Grams/Meter	33	
Connector Retention Force (N)	140	
Minimum Bend Radius, Inside, Static (mm)	19	
Minimum Bend Radius, Inside, Dynamic (mm)	75	

Characteristics:

- * Excellent Performance DC to 45 GHz.
- * Small diameter
- * Excellent Flexibility
- * Meeting the very highest Quality Standards.
- * Procurement for completely terminated assemblies, fully tested. The test documentation for VSWR and Insertion Loss will be supplied with the cable assembly.
- * Available connectors: 2.4mm, 2.92mm 3.5mm, 7mm, N, SMA, SBX, SBY, BQ-, CQ-, IQ-, RQ-, SQ- TQ-Series and TNC.. For Connector Outline Drawings please refer to Section Q.
- * For Connector Code details please refer to Section S.
- * For information on armor please refer to Section S as well.
- * For ordering information please refer to Section A.





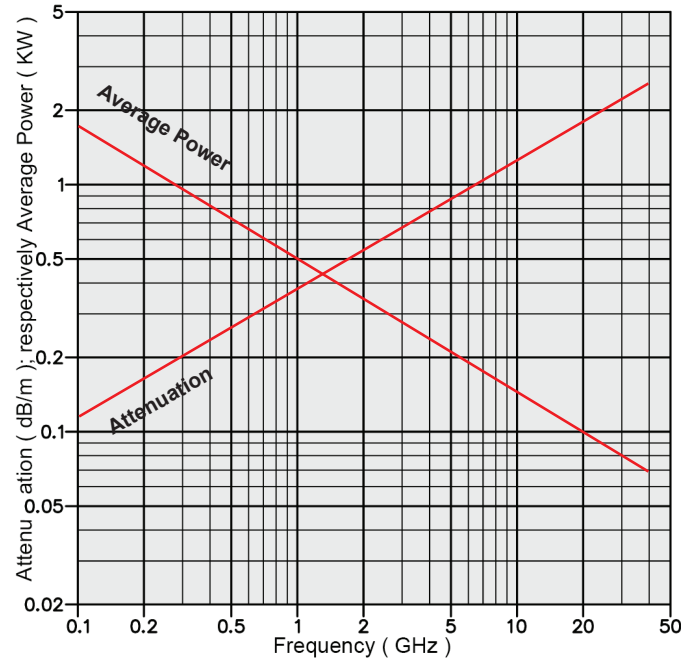
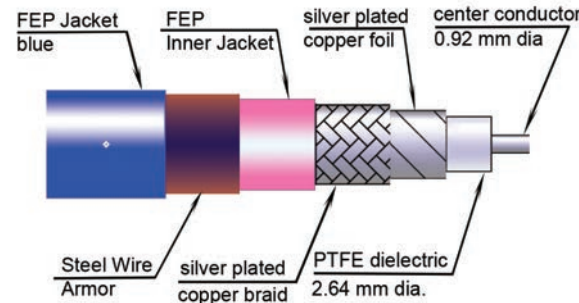
Cable -Type 39S

Ultimate Performance

DC - 45.0 GHz

SPECIFICATION		Type 39C
Cable Code	Standard	39S
	Armored	39Sx
	X: Please find Armor & Ruggedizing Options in Section S.	
Frequency Range	DC to 45.0 GHz	
Outer Diameter in mm	Standard	4.9
Impedance in Ohms at Sea Level and +25°C	50 ± 2	
Velocity in %, ± 2%	84	
Capacitance in pF/m	79	
Dielectric Strength (60 Hz) in KV rms	2.0	
Max. Operating Voltage at Sea Level, in KV rms, 60 Hz	1.3	
Nominal Insertion Loss in dB/m vs. Frequency	1.0 GHz	0.36
	4.0 GHz	0.73
	8.0 GHz	1.04
	12.0 GHz	1.29
	18.0 GHz	1.60
	26.0 GHz	1.94
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	1.0 GHz	500
	4.0 GHz	260
	8.0 GHz	180
	12.0 GHz	150
	18.0 GHz	120
26.0 GHz	100	
40.0 GHz	75	
RF - Leakage at 18.0 GHz	- 100 dBC	
Operating Temperature Range	-65°C to +200°C	
Outer Conductor Construction	Silver-Plated Copper Foil, Silver-Plated Copper Braid	
Outer Jacket	FEP	
Dielectric Diameter in mm	2.64	
Dielectric Material	Low Density PTFE	
Dielectric Constant	1.6	
Center Conductor Material	Copper, Silver Plated	
Center Conductor Dia. in mm	0.92	
Weight in Grams/Meter	70	
Connector Retention Force (N)	140	
Minimum Bend Radius, Inside, Static (mm)	19	
Minimum Bend Radius, Inside, Dynamic (mm)	75	

- Excellent Performance DC to 45 GHz.
- * Steel wire armor under outer jacket
 - * Small diameter
 - * Excellent Flexibility
 - * Meeting the very highest Quality Standards.
 - * Procurement for completely terminated assemblies, fully tested. The test documentation for VSWR and Insertion Loss will be supplied with the cable assembly.
 - * Available connectors: 2.4mm, 2.92mm 3.5mm, 7mm, N, SMA, SBX, SBY, BQ-, CQ-, IQ-, RQ-, SQ- TQ-Series and TNC.. For Connector Outline Drawings please refer to Section Q.
 - * For Connector Code details please refer to Section S.
 - * For information on armor please refer to Section S as well.
 - * For ordering information please refer to Section A.



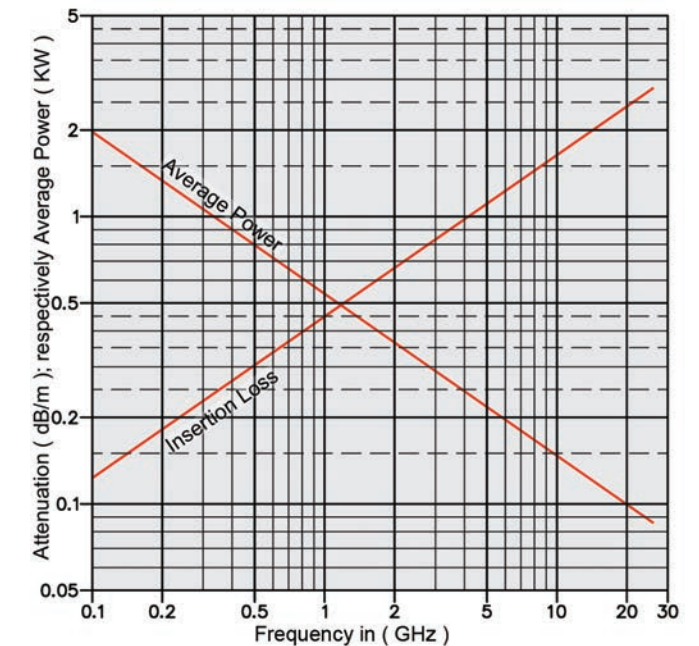
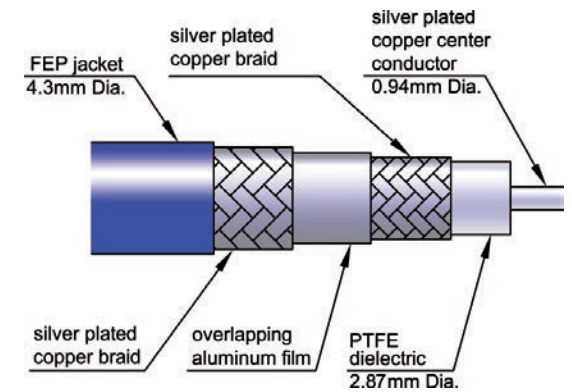
Cable - Type 43

DC - 26.5 GHz

SPECIFICATION		Type 43
Cable Code	Standard	43
	Armored	43x
	X: Please find Armor & Ruggedizing Options in Section S.	
Frequency Range	DC to 26.5 GHz	
Outer Diameter in mm	Standard	4.3
Impedance in Ohms at Sea Level and +25°C	50 ± 2	
Velocity in %, ± 2%	72	
Capacitance in pF/m	93.5	
Dielectric Strength (60 Hz) in KV rms	5.0	
Max. Operating Voltage at Sea Level, in KV rms, 60 Hz	0.7	
Nominal Insertion Loss in dB/m vs. Frequency	0.5 GHz	0.30
	2.0 GHz	0.63
	4.0 GHz	0.93
	8.0 GHz	1.36
	12.4 GHz	1.69
	18.0 GHz	2.12
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	0.5 GHz	785
	2.0 GHz	344
	4.0 GHz	227
	8.0 GHz	150
	12.4 GHz	118
	18.0 GHz	93
26.5 GHz	75	
RF - Leakage at 18.0 GHz	-90 dBC	
Operating Temperature Range	-54°C to +125°C	
Outer Conductor Construction	Silver Plated Copper braid, Aluminum Film, Silver Plated Copper braid	
Outer Jacket	FEP	
Dielectric Diameter in mm	2.87	
Dielectric Material	Low Density PTFE	
Dielectric Constant	1.9	
Center Conductor Material	Copper, Silver Plated	
Center Conductor Dia. in mm	0.94	
Weight in Grams/Meter	45	
Connector Retention Force (N)	140	
Minimum Bend Radius, Inside, Static (mm)	26	
Minimum Bend Radius, Inside, Dynamic (mm)	55	

Characteristics:

- * Excellent Performance to 26.5 GHz.
- * Meeting the very highest Quality Standard
- * Procurement for completely terminated assemblies, fully tested. The test documentation for VSWR and Insertion Loss will be supplied with the cable assembly.
- * Available connectors: 2.4mm, 2.92mm 3.5mm, 7mm, N, SMA, SBX, SBY, BQ-, CQ-, IQ-, RQ-, SQ- TQ-Series and TNC.. For Connector Outline Drawings please refer to Section Q.
- * For Connector Code details please refer to Section S.
- * For information on armor please refer to Section S as well.
- * For ordering information please refer to Section A.

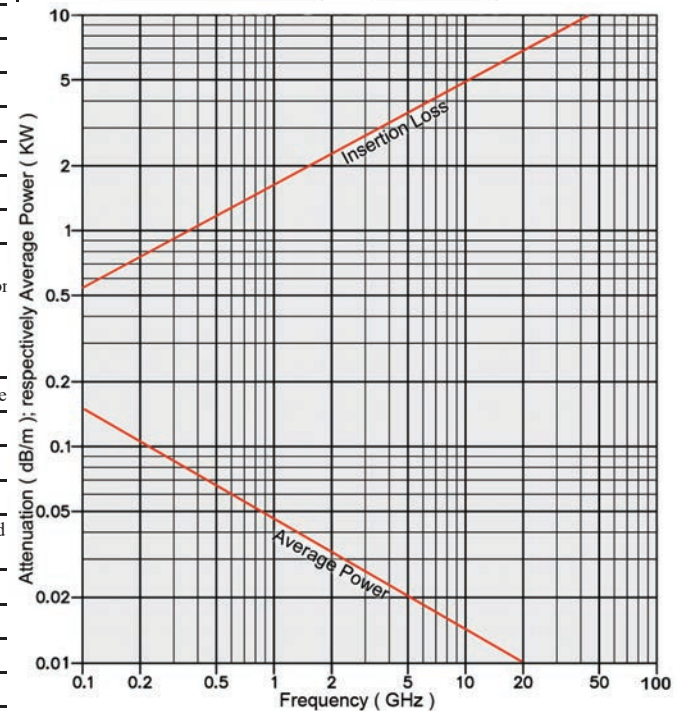
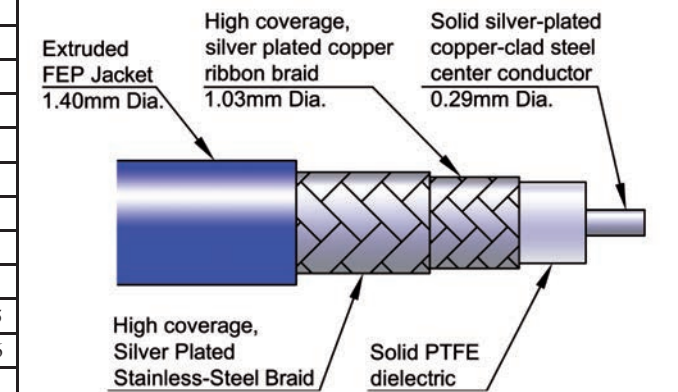


Cable - Type 47F

DC - 65.0 GHz

SPECIFICATION	SpectrumFlex 47F	
Cable Code	47F	
Frequency Range	DC - 65.0 GHz	
Outer Diameter in mm	1.40	
Impedance in Ohms at Sea Level and +25°C	50 ± 2	
Velocity in %	70.5	
Delay (ns/m) (nominal)	4.75	
Power Handling Avg. in Watts at 1.0 GHz	50	
Capacitance nominal pF/m	94.8	
Operating Temperature Range	-54°C to +125°C	
Nominal Insertion Loss in dB/m vs. Frequency	1.0 GHz	1,35
	2.5 GHz	2,15
	10.0 GHz	4,5
	18.0 GHz	6,2
	26.5 GHz	7,6
	40.0 GHz	9,7
	50.0 GHz	11,35
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	1.0 GHz	46
	2.5 GHz	28
	10.0 GHz	14
	18.0 GHz	10
	26.5 GHz	7
	40.0 GHz	6
Outer Conductor Construction	1.0 GHz	46
	2.5 GHz	28
	10.0 GHz	14
	18.0 GHz	10
	26.5 GHz	7
	40.0 GHz	6
	50.0 GHz	5
65.0 GHz	3	
Outer Jacket	Extruded FEP jacket	
Dielectric Diameter in mm	0.91	
Dielectric Material	Solid PTFE	
Dielectric Constant	2.0	
Center Conductor Material	Solid silver-plated copper-clad steel	
Center Conductor Dia. in mm	0.29	
Connector retention (N)	45	
Weight in Grams/Meter	6	
Minimum Bend Radius (mm)	dynamic	15.25
	static	2.54

- Characteristics:**
- Performance to 65.0 GHz.
 - Solid PTFE dielectric featuring Ultra-high strength, multilayer outer braid:
 - High compression resistance and greater durability
 - Eliminates cable breakage associated with repeated bending and handling
 - Flexible alternative to 0.047" Semi Rigid
 - Eliminates costs associated with time-consuming cable layout
 - Increased phase stability versus temperature and bending
 - SpectrumFlex cables can be configured to solve tough packaging challenges

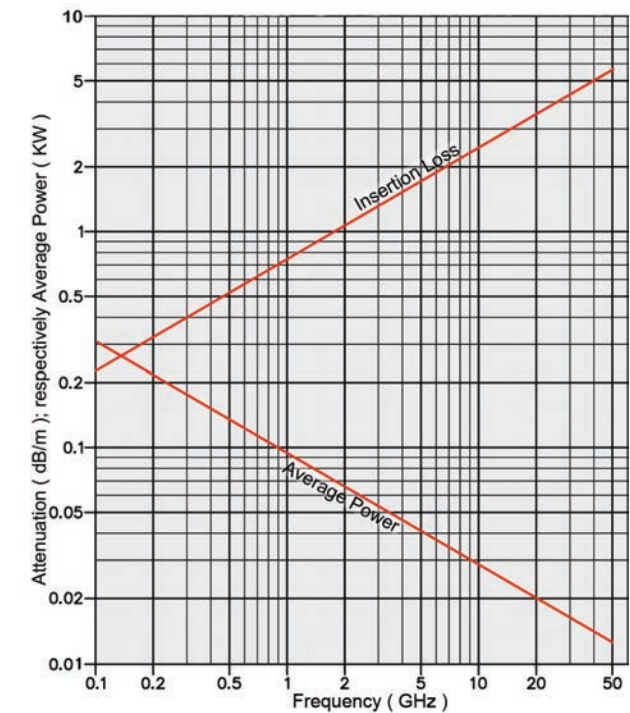
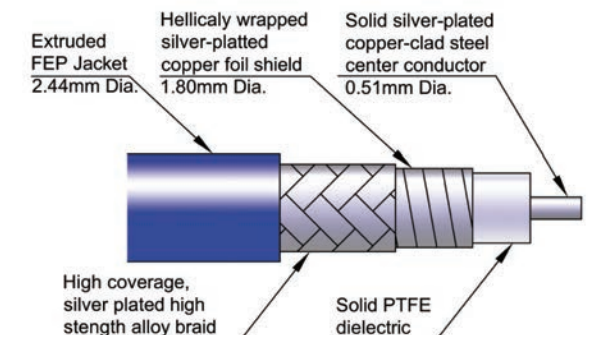


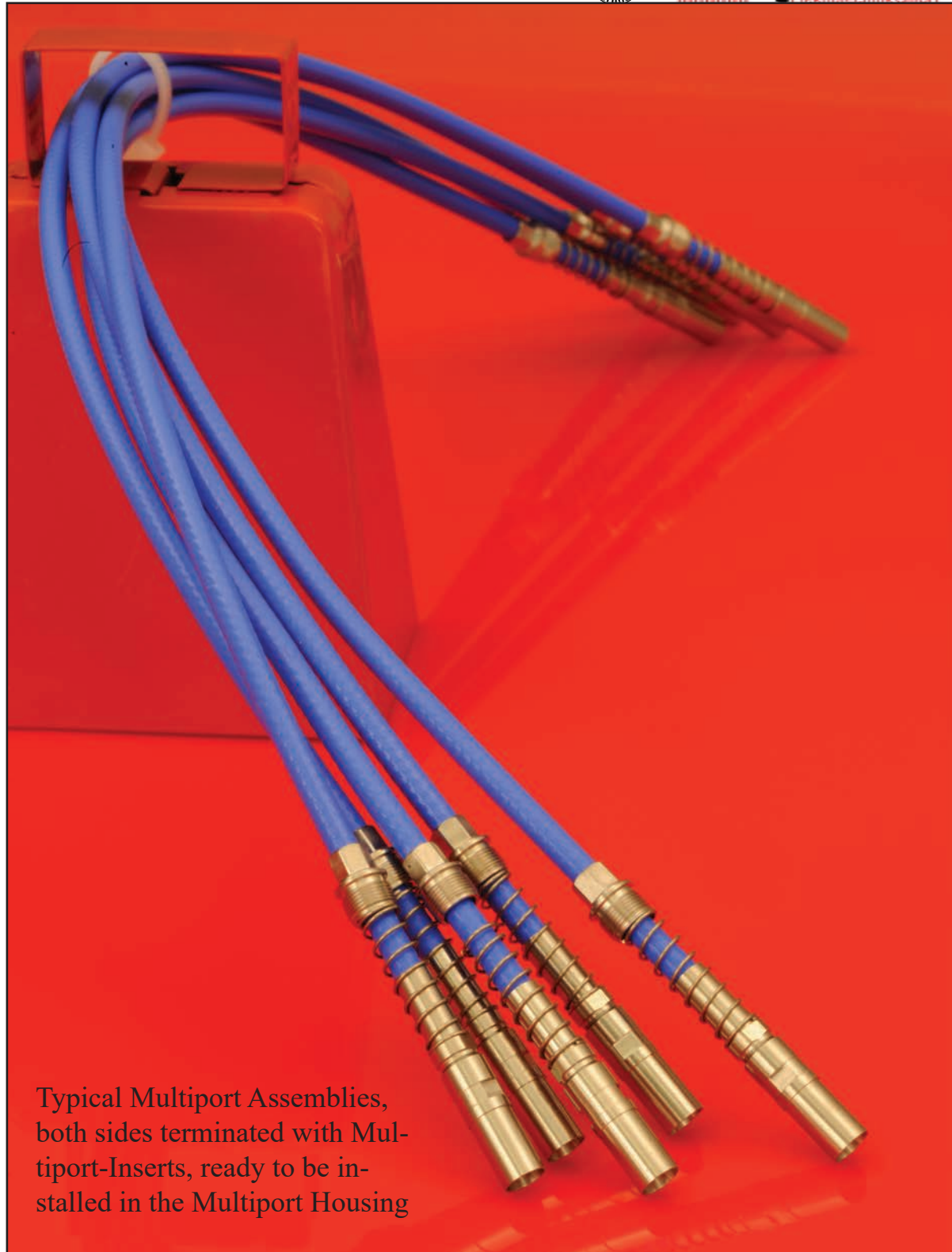
Cable - Type 89F

DC - 50.0 GHz

SPECIFICATION	SpectrumFlex 89F	
Cable Code	89F	
Frequency Range	DC - 50.0 GHz	
Outer Diameter in mm	2.44	
Impedance in Ohms at Sea Level and +25°C	50 ± 2	
Velocity in %	70.5	
Delay (ns/m) (nominal)	4.72	
Power Handling Avg. in Watts at 1.0 GHz	100	
Capacitance nominal pF/m	95.1	
Operating Temperature Range	-54°C to +125°C	
Nominal Insertion Loss in dB/m vs. Frequency	1.0 GHz	0,64
	2.5 GHz	1,05
	10.0 GHz	2,20
	18.0 GHz	3,10
	26.0 GHz	3,90
	40.0 GHz	5,00
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	1 GHz	96
	2.5 GHz	58
	10.0 GHz	28
	18.0 GHz	21
	26.0 GHz	17
	40.0 GHz	13
Outer Conductor Construction	Helically wrapped silver-plated copper foil shield, High coverage, silver-plated high strength alloy braid	
Outer Jacket	Extruded FEP jacket	
Dielectric Diameter in mm	1.65	
Dielectric Material	Solid PTFE	
Dielectric Constant	2.0	
Center Conductor Material	Solid silver-plated copper-clad steel	
Center Conductor Dia. in mm	0,51	
Connector retention in Newtons min.	65	
Weight in Grams/Meter	18	
Minimum Bend Radius (mm)	dynamic	24.4
	static	4.75

- Characteristics:**
- Performance to 50.0 GHz
 - Solid PTFE dielectric featuring Ultra-high strength, multilayer outer braid:
 - High compression resistance and greater durability
 - Eliminates cable breakage associated with repeated bending and handling
 - Flexible alternative to 0.085" Semi Rigid
 - Eliminates costs associated with time-consuming cable layout
 - Increased phase stability versus temperature and bending
 - SpectrumFlex cables can be configured to solve tough packaging challenges





Typical Multiport Assemblies, both sides terminated with Multiport-Inserts, ready to be installed in the Multiport Housing

Cable - Type 100

Low Loss, Low Cost

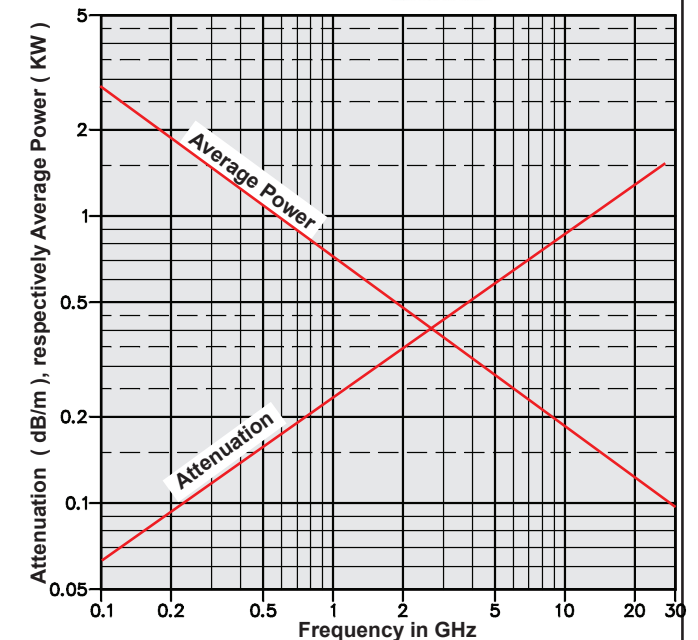
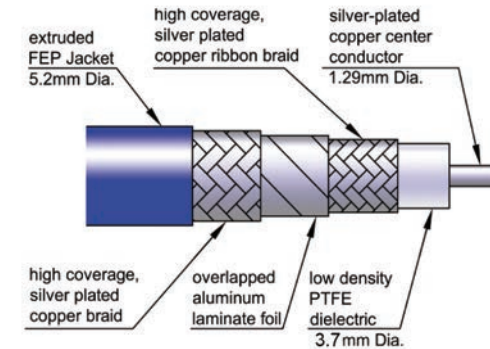
High Performance

DC - 26.5 GHz

SPECIFICATION		Type 100
Cable Code	Standard	100
	Armored	100x
	X: Please find Armor & Ruggedizing Options in Section S.	
Frequency Range	DC to 26.5 GHz	
Outer Diameter in mm	Standard	5.2
Impedance in Ohms at Sea Level and +25°C	50 ± 2	
Velocity in %, ± 2%	75	
Capacitance in pF/m	89	
Dielectric Strength (60 Hz) in KV rms	6.0	
Max. Operating Voltage at Sea Level, in KV rms, 60 Hz	1.5	
Nominal Insertion Loss in dB/m vs. Frequency	0.5 GHz	0.16
	2.0 GHz	0.35
	5.0 GHz	0.58
	10.0 GHz	0.86
	18.0 GHz	1.20
	26.5 GHz	1.48
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	0.5 GHz	1133
	1.0 GHz	750
	2.0 GHz	496
	5.0 GHz	288
	10.0 GHz	190
	18.0 GHz	134
26.5 GHz	108	
RF - Leakage at 18.0 GHz	- 90 dBC	
Operating Temperature Range	-54°C to +150°C	
Outer Conductor Construction	Copper Ribbon Braid, Overlapping Aluminum Film, Silver Plated Copper Braid	
Outer Jacket	FEP	
Dielectric Diameter in mm	3.7	
Dielectric Material	Low Density PTFE	
Dielectric Constant	1.6	
Center Conductor Material	Copper, Silver Plated	
Center Conductor Dia. in mm	1.29	
Weight in Grams/Meter	66	
Connector Retention Force (N)	140	
Minimum Bend Radius, Inside, Static (mm)	26	
Minimum Bend Radius, Inside, Dynamic (mm)	54	

Characteristics:

- * Performance to 26.5 GHz, when terminated with 2.92mm or 3.5mm connectors (mating with SMA), or Spectrum's High Performance SMA (Code 11K)
- * Meeting the very highest Quality Standard, as needed for crucial applications in harsh environment
- * Procurement for completely terminated assemblies, fully tested. The test documentation for VSWR and Insertion Loss will be supplied with the cable assembly.
- * Available connectors: 2.4mm, 3.5mm, 7mm, 7/16, HN, 2.92mm, N, SBX, SBY, SC, SMA, SPM, TNC, and Push-On Type Connectors or Series N, TNC and SMA. For Connector Outline Drawings please refer to Section Q.
- * For Connector Code details please refer to Section S.
- * For information on armor please refer to Section S as well.
- * For ordering information please refer to Section A.





Cable -Type 141

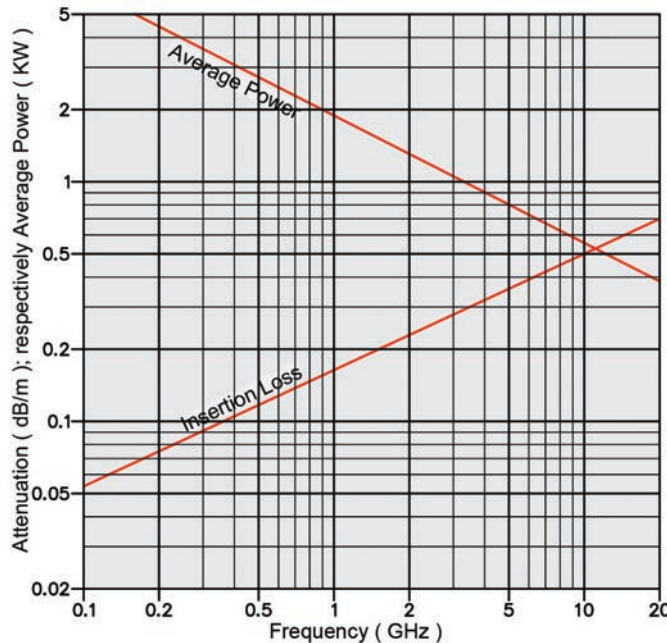
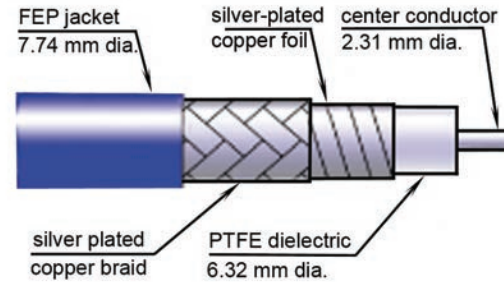
Ultra Low Loss to 19.5 GHz

Cables of Types 141 and 143 are identical with the exception of the shielding and O.D.

SPECIFICATION		Type 141
Cable Code	Standard	141
	Armored	141x
	X: Please find Armor & Ruggedizing Options in Section S.	
Frequency Range	DC to 19.5 GHz	
Outer Diameter in mm	Standard	7.74
Impedance in Ohms at Sea Level and +25°C	50 ± 2	
Velocity in %, ± 2%	84	
Capacitance in pF/m	79	
Dielectric Strength (60 Hz) in KV rms	6.0	
Max. Operating Voltage at Sea Level, in KV rms, 60 Hz	1.5	
Nominal Insertion Loss in dB/m vs. Frequency	1.0 GHz	0.16
	2.0 GHz	0.23
	4.0 GHz	0.32
	8.0 GHz	0.45
	12.4 GHz	0.54
	18.0 GHz	0.66
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	1 GHz	1900
	2.0 GHz	1306
	4.0 GHz	900
	8.0 GHz	618
	12.4 GHz	496
	18.0 GHz	400
RF - Leakage at 18.0 GHz	-90 dBC	
Operating Temperature Range	-65°C to +200°C	
Outer Conductor Construction	Silver Plated Copper Foil, Silver Plated Copper Braid	
Outer Jacket	FEP	
Dielectric Diameter in mm	6.32	
Dielectric Material	Low Density EPTFE	
Dielectric Constant	1.4	
Center Conductor Material	Copper, Silver Plated	
Center Conductor Dia. in mm	2.31	
Weight in Grams/Meter	116	
Connector Retention Force (N)	200	
Minimum Bend Radius, Inside, Static (mm)	44	
Minimum Bend Radius, Inside, Dynamic (mm)	400	

Characteristics:

- * Excellent Performance to 19.5 GHz.
- * Very Rugged Construction.
- * Meets the very highest Quality Standard, as needed for crucial applications in harsh environment
- * Procurement for completely terminated assemblies, fully tested. The test documentation for VSWR and Insertion Loss will be supplied with the cable assembly.
- * Available connectors: 7mm, N, SMA, SBX, SBY, BQ-, CQ-, IQ-, RQ-, SQ- TQ-Series and TNC.. For Connector Outline Drawings please refer to Section Q.
- * For Connector Code details please refer to Section S.
- * For information on armor please refer to Section S as well.
- * For ordering information please refer to Section A.



Cable - Type 677

Small Diameter

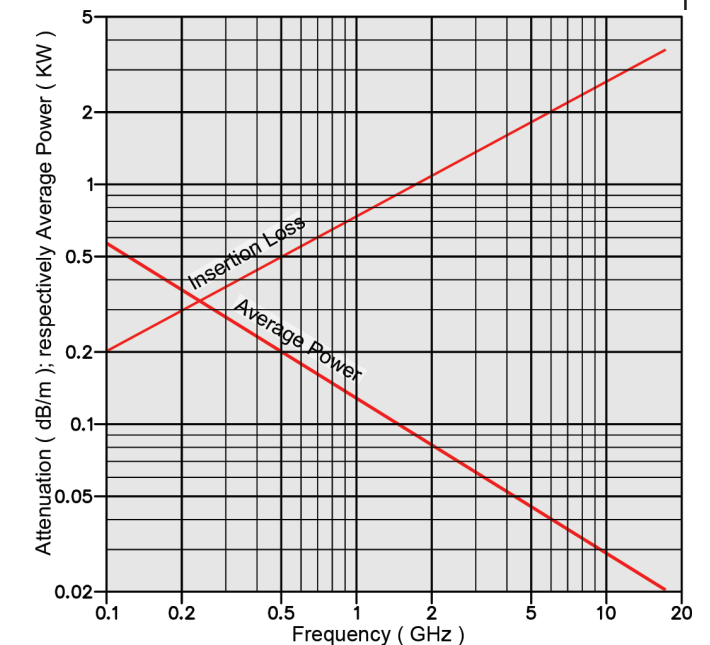
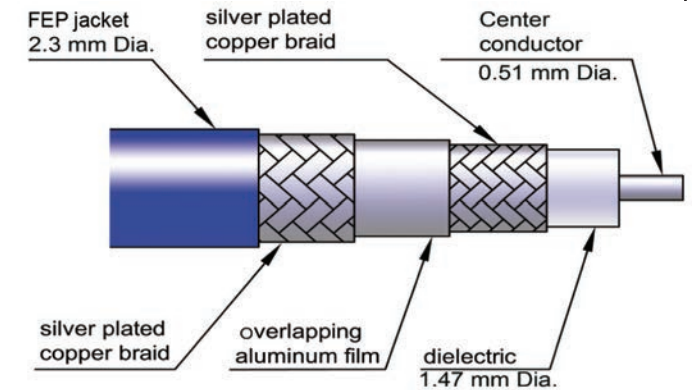
Good Performance

DC - 18.0 GHz

SPECIFICATION		Type 677
Cable Code	677	
Frequency Range	DC to 18 GHz	
Outer Diameter in mm	2.3	
Impedance in Ohms at Sea Level and +25°C	50 ± 2	
Velocity in %, ± 2%	78	
Capacitance in pF/m	87	
Dielectric Strength (60 Hz) in KV rms	2.0	
Max. Operating Voltage at Sea Level, in KV rms, 60 Hz	0.6	
Nominal Insertion Loss in dB/m vs. Frequency	0.5 GHz	0.50
	2.0 GHz	1.05
	4.0 GHz	1.51
	8.0 GHz	2.23
	12.4 GHz	2.80
	18.0 GHz	3.46
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	0.5 GHz	200
	2.0 GHz	75
	4.0 GHz	45
	8.0 GHz	28
	12.4 GHz	20
	18.0 GHz	10
RF - Leakage at 9.5 GHz	- 90 dBC	
Operating Temperature Range	-54°C to +150°C	
Outer Conductor Construction	Ribbon Braid Aluminum Foil round braid	
Outer Jacket	PTFE	
Dielectric Diameter in mm	1.47	
Dielectric Material	Low Density PTFE	
Dielectric Constant	1.6	
Center Conductor Material	Copper, Silver Plated	
Center Conductor Dia. in mm	0.51	
Weight in Grams/Meter	13	
Connector Retention Force (N)	65	
Minimum Bend Radius, Inside, Static (mm)	11.5	
Minimum Bend Radius, Inside, Dynamic (mm)	23	

Characteristics:

- * Performance to 18 GHz.
- * Meeting the very highest Quality Standard, as needed for crucial applications in harsh environment
- * Procurement for completely terminated assemblies, fully tested. The test documentation for VSWR and Insertion Loss will be supplied with the cable assembly.
- * Available connectors: 2.4mm, 2.92mm, 3.5mm, SMP and SMPM.
- For Connector Outline Drawings please refer to Section Q.
- * For Connector Code details please refer to Section S.
- * For information on armor please refer to Section S as well.
- * For ordering information please refer to Section A.



Cable - Type 31

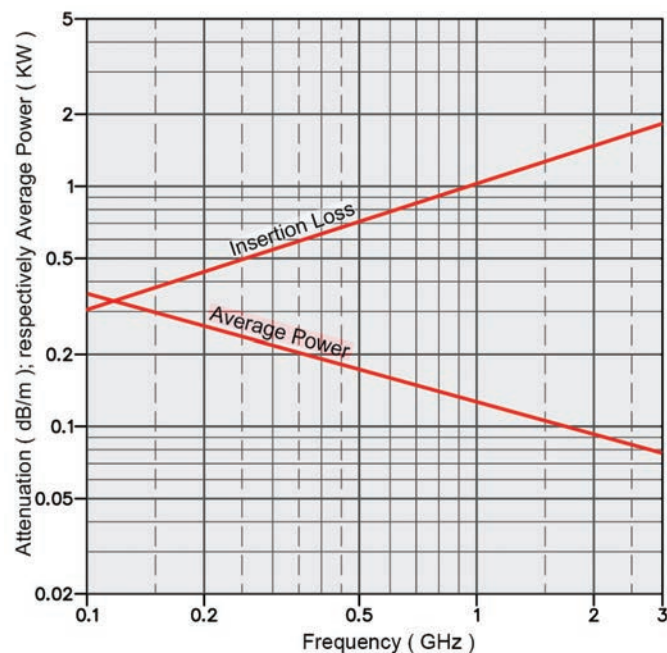
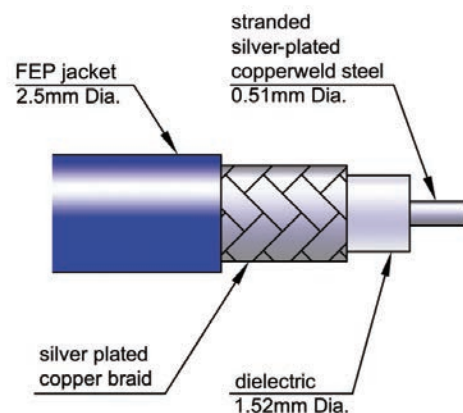
RG - 316/U

DC - 3.0 GHz

Characteristics:

- * Performance to 3.0 GHz
- * Usage in Commercial Systems for low frequency applications.
- * Low Price.
- * Procurement for the raw cable only, or completely terminated assemblies, 100% tested in VSWR and Insertion Loss.
- * Available connectors: 1.8/5.6, SMA, SMP, N, TNC and Multiport Inserts
- For Connector Outline Drawings please refer to Section Q.
- * For Connector Code details please refer to Section S.
- * For information on armor please refer to Section S as well.
- * For ordering information please refer to Section A.

SPECIFICATION		Type 31
Cable Code		31
Frequency Range		DC to 3.0 GHz
Outer Diameter in mm		2.5
Impedance in Ohms at Sea Level and +25°C		50 ± 2
Velocity in %, ± 2%		69.5
Capacitance in pF/m		105
Dielectric Strength (60 Hz) in KV rms		2.0
Max. Operating Voltage at Sea Level, in KV rms, 60 Hz		0.9
Nominal Insertion Loss in dB/m vs. Frequency	0.5 GHz	0.70
	1.0 GHz	1.10
	2.0 GHz	1.57
	3.0 GHz	1.85
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	0.5 GHz	170
	1.0 GHz	130
	2.0 GHz	91
	3.0 GHz	75
RF - Leakage at 3.0 GHz		-80 dBC
Operating Temperature Range		-55°C to +200°C
Outer Conductor Construction		1x Silver-Plated Copper Braid
Outer Jacket		FEP
Dielectric Diameter in mm		1.52
Dielectric Material		FEP
Dielectric Constant		2.0
Center Conductor Material		Stranded Silver-Plated Copperweld Steel
Center Conductor Dia. in mm		0.51
Weight in Grams/Meter		18
Minimum Bend Radius, Inside, Static (mm)		24
Minimum Bend Radius, Inside, Dynamic (mm)		60



Cable - Type 78

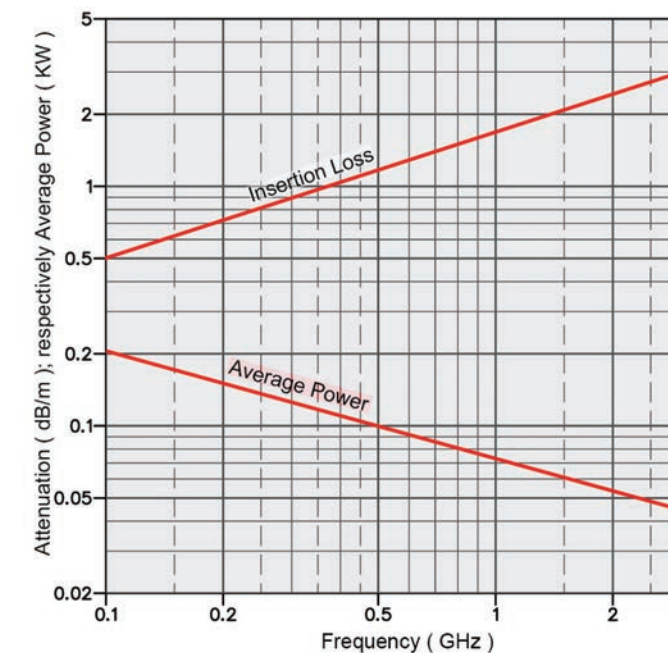
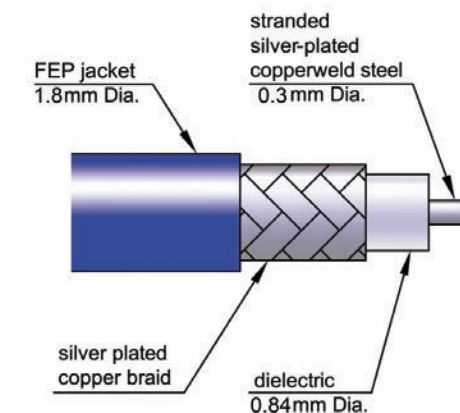
RG - 178/U

DC - 3.0 GHz

Characteristics:

- * Performance to 3.0 GHz
- * Usage in Commercial Systems for low frequency applications.
- * Low Price.
- * Procurement for the raw cable only, or completely terminated assemblies, 100% tested in VSWR and Insertion Loss.
- * Available connectors: SMA, Multiport Inserts.
- For Connector Outline Drawings please refer to Section Q.
- * For Connector Code details please refer to Section S.
- * For information on armor please refer to Section S as well.
- * For ordering information please refer to Section A.

SPECIFICATION		Type 78
Cable Code		78
Frequency Range		DC to 3.0 GHz
Outer Diameter in mm		1.8
Impedance in Ohms at Sea Level and +25°C		50 ± 3
Velocity in %, ± 2%		69.5
Capacitance in pF/m		94
Dielectric Strength (60 Hz) in KV rms		1.2
Max. Operating Voltage at Sea Level, in KV rms, 60 Hz		0.5
Nominal Insertion Loss in dB/m vs. Frequency	0.5 GHz	1,21
	1.0 GHz	1.70
	2.0 GHz	1.57
	3.0 GHz	3,10
Nominal CW-Power in Watts, vs. Frequency, at Sea Level and + 20°C	0.5 GHz	102
	1.0 GHz	78
	2.0 GHz	55
	3.0 GHz	45
RF - Leakage at 3.0 GHz		-60 dBC
Operating Temperature Range		-55°C to +200°C
Outer Conductor Construction		7x 0.12mm Silver-Plated Copper Braid
Outer Jacket		FEP
Dielectric Diameter in mm		0.84
Dielectric Material		FEP
Dielectric Constant		2.0
Center Conductor Material		Stranded Silver-Plated Copperweld Steel
Center Conductor Dia. in mm		0.3
Weight in Grams/Meter		10
Minimum Bend Radius, Inside, Static (mm)		24
Minimum Bend Radius, Inside, Dynamic (mm)		60



RF Measurement Chart



VSWR = (1+r)/(1-r)	Reflection Coefficient "r"	Return Loss (dB)	Relative to Unity Reference			
			X dB Below Reference	Ref + x (dB)	Ref - x (dB)	Ref ± x Pk to Pk Ripple (dB)
∞	1.00	0	0	-6.00	∞	∞
17.40	0.891	1	1	-5.53	19.28	24.81
8.72	0.794	2	2	-5.08	13.74	18.81
5.85	0.708	3	3	-4.65	10.69	15.34
4.42	0.631	4	4	-4.25	8.66	12.91
3.57	0.562	5	5	-3.87	7.18	11.05
3.01	0.501	6	6	-3.53	6.22	9.75
2.61	0.477	7	7	-3.21	5.14	8.35
2.32	0.398	8	8	-2.91	4.41	7.32
2.10	0.355	9	9	-2.64	3.81	6.45
1.92	0.316	10	10	-2.39	3.30	5.69
1.78	0.282	11	11	-2.16	2.88	5.03
1.67	0.251	12	12	-1.95	2.51	4.46
1.58	0.224	13	13	-1.76	2.20	3.96
1.50	0.200	14	14	-1.58	1.93	3.51
1.43	0.178	15	15	-1.42	1.70	3.12
1.38	0.159	16	16	-1.28	1.50	2.78
1.33	0.141	17	17	-1.15	1.32	2.47
1.29	0.126	18	18	-1.03	1.17	2.20
1.25	0.112	19	19	-0.92	1.03	1.96
1.22	0.100	20	20	-0.83	0.92	1.74
1.196	0.0891	21	21	-0.741	0.811	1.552
1.172	0.0794	22	22	-0.644	0.719	1.382
1.152	0.0708	23	23	-0.594	0.638	1.232
1.134	0.0631	24	24	-0.531	0.566	1.098
1.119	0.0562	25	25	-0.475	0.502	0.977
1.107	0.0501	26	26	-0.434	0.466	0.880
1.096	0.0447	27	27	-0.380	0.397	0.777
1.083	0.0398	28	28	-0.338	0.353	0.691
1.074	0.0355	29	29	-0.303	0.314	0.556
1.065	0.0316	30	30	-0.270	0.279	0.549
1.058	0.0282	31	31	-0.242	0.248	0.490
1.052	0.0251	32	32	-0.215	0.221	0.436
1.046	0.0224	33	33	-0.192	0.197	0.389
1.041	0.0200	34	34	-0.172	0.174	0.347
1.036	0.0178	35	35	-0.153	0.156	0.309
1.032	0.0159	36	36	-0.137	0.138	0.275
1.029	0.0141	37	37	-0.122	0.123	0.245
1.026	0.0126	38	38	-0.109	0.110	0.219
1.023	0.0112	39	39	-0.098	0.098	0.196
1.020	0.0100	40	40	-0.086	0.087	0.173
1.0112	0.0056	45	45	-0.049	0.049	0.097
1.0064	0.0032	50	50	-0.028	0.028	0.056
1.0036	0.0018	55	55	-0.016	0.016	0.031
1.0020	0.0010	60	60	-0.008	0.0086	0.0172



Our other Products

Coaxial Connectors and Adapters
DC-71 GHz



Multiport Assemblies
DC to 40 GHz



Coaxial Delay Lines
DC to 40 GHz



Cable Assemblies
DC to 71 GHz



Waveguide to Coax Adapters



Phase-Adjusters
DC to 63 GHz



Gain Amplitude Equalizers



TAKE
OFF
WITH
OUR
PRODUCTS



when quality is needed

Telephone: +49-89-3548-040
Fax: +49-89-3548-0490
Email: Sales@Spectrum-et.com
www.spectrum-et.com



Are you still Threading?
Torquing? Untorquing?
Unthreading?

Never ever heard of
Push-Ons?
Slide On!
Pull Off!
Done!



Push - On Connectors do fit all
standard SMA, N, TNC, 7/16

Spectrum when Quality is needed
Elektrotechnik GmbH

80905 Munich, Germany
Telephone: +49-89-3548-040
WWW.SPECTRUM-ET.COM

P.O. Box 450533
Facsimile: +49-89-3548-0490
Email: sales@spectrum-et.com



Procedure for how to use the N, TNC and 7/16 Push-On male. Push-On Connectors mate with any standard female connector of the same connector style.



1. Convert your standard Assembly into a Push-On Assembly using the Nf to Nm Push-On Adapter



2. Put your fingers firmly onto the knurls of the "Lock Nut"



3. Push "Lock Nut" forward and engage the Push-On end of the Adapter with the mating female. Back nut must be released.



4. The Connection has been completed, easy and fast. The connector has been locked on safely.



5. To unlock (when "Back Nut" is in unlocked mode) push the "Lock Nut" forward and stop reverse movement by setting your fingers onto the "Back Nut".



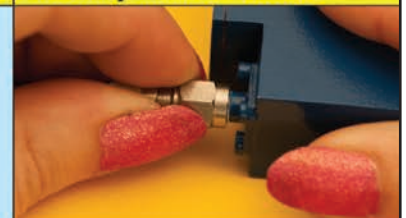
6. Keep fingers on "Back Nut" to ensure that "Lock Nut" cannot slide back and pull the connector off.



1. Convert your standard cable assembly into a Push-On Assembly by threading the standard female side of the adapter onto the male connector of the assembly.



2. Your standard SMA male cable assembly is converted into an SMA male Push-On Assembly.

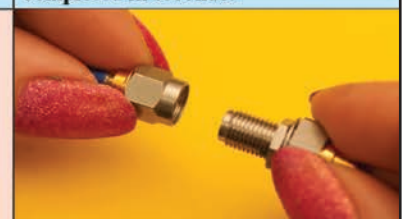


3. Just slide the Push-On SMA male Connector onto any standard SMA female. The connection is securely completed in seconds.

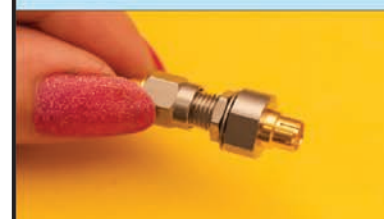


4. To disconnect, just pull the connector off.

Procedure for how to use the SMA male and female Push-On connectors. SMA Push-On Connectors mate with any standard connector of the same but opposite connector style.



1. Convert your standard cable assembly into a Push-On Assembly by threading the standard female side of the adapter onto the male connector of the assembly.



2. Your standard SMA male cable assembly is converted to a Push-On SMA female Cable Assembly.



3. Just slide the Push-On SMA female Connector onto any standard SMA male. The connection is securely connected in seconds.



4. To disconnect, just pull the connector off.

Phase Adjusters



360° @ 1 GHz

330° @ 1 GHz
230° @ 12 GHz
350° @ 18 GHz
500° @ 26 GHz
590° @ 40 GHz
400° @ 50 GHz
600° @ 63 GHz

85° @ 2 GHz
520° @ 12 GHz
770° @ 18 GHz

Spectrum
 Elektrotechnik GmbH
 when Quality is needed

80905 Munich, Germany P.O. Box 450533
 Telephone: +49-89-3548-040 Facsimile: +49-89-3548-0490
 www.spectrum-et.com * Email: sales@spectrum-et.com

PhaseI-63E6IMS

WG-Coax Adapters



Spectrum
 Elektrotechnik GmbH

End-Launched

We supply Components in the frequency range of DC to 71.00 GHz. Please visit us at: www.spectrum-et.com

Almost any Waveguide to almost any Coax Connector.
 WG Materials : Aluminum, Copper, Brass
 Connectors : 1.85 mm...SMA...
 TNC...N...7/16....

Top Launched

80905 Munich, Germany P.O. Box 450533
 Telephone: +49-89-3548-040 Facsimile: +49-89-3548-0490
WWW.SPECTRUM-ET.COM Email: Sales@spectrum-et.com



*Innovation in
Microwave
Engineering*

Hermetically Sealed Adapters



**1.85mm, 2.4mm, 2.92mm,
TNC and N BFJ & 4-H-Flg.**
with & without venting holes, as used at Test Chambers

80905 Munich, Germany

Telephone: +49-89-3548-040

WWW.SPECTRUM-ET.COM

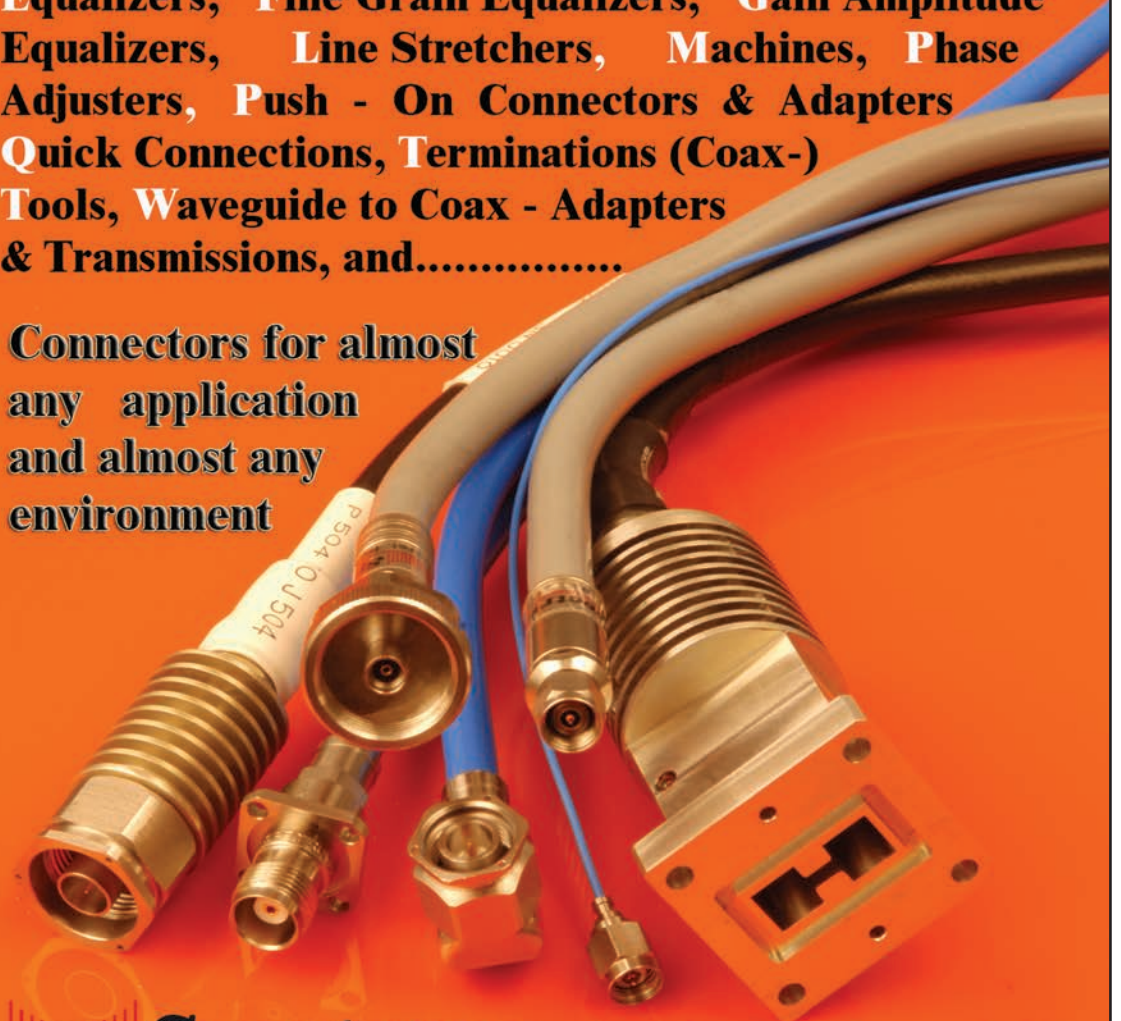
P.O. Box 450533

Facsimile: +49-89-3548-0490

Email: sales@spectrum-et.com

Adapters, Attenuators, Blind Mate Connectors, Cable Assemblies, Connectors, Delay Lines, Duplexers Equalizers, Fine Grain Equalizers, Gain Amplitude Equalizers, Line Stretchers, Machines, Phase Adjusters, Push - On Connectors & Adapters Quick Connections, Terminations (Coax-) Tools, Waveguide to Coax - Adapters & Transmissions, and.....

Connectors for almost any application and almost any environment



Spectrum when Quality is needed
Elektrotechnik GmbH

80905 Munich, Germany

Telephone: +49-89-3548-040

WWW.SPECTRUM-ET.COM

P.O. Box 450533

Facsimile: +49-89-3548-0490

Email: sales@spectrum-et.com

CableAssiesE



Europe	
<p>Czech Republic</p> <p>Abditus Sp. z o.o. ul. Gubinska 8/62 54-434 Wroclaw - Poland</p> <p>Contact: Mr. Thomas Luszpinski Phone: +48 71-75-034-64 Fax: +48 71-72-313-45 E-mail: info@abditus.pl Web Page: www.abditus.pl</p>	<p>Italy</p> <p>Selint S.r.l. Via del Fontanile Anagnino 50/52 00118 Roma (Rome) - Italy</p> <p>Contact: Mr. Roberto Mazza Phone: +39-679-841-028 / 679-841-418 Fax: +39-679-845-609 Email: info@selint.it Web Page: www.selint.it</p>
<p>France</p> <p>Elhyte 8-10 Rue du Bois Sauvage Bat Q 91000 Evry - France</p> <p>Contact: Mr. David Duval Phone: Tel: +33 (0) 171 63 14 30 Fax: +33-01-690-150-75 E-mail: commercial@elhyte.fr Web Page: www.elhyte.fr</p>	<p>Poland</p> <p>Abditus Sp. z o.o. ul. Gubinska 8/62 54-434 Wroclaw - Poland</p> <p>Contact: Mr. Thomas Luszpinski Phone: +48 71-75-034-64 Fax: +48 71-72-313-45 E-mail: info@abditus.pl Web Page: www.abditus.pl</p>
<p>Hungary</p> <p>Abditus Sp. z o.o. ul. Gubinska 8/62 54-434 Wroclaw - Poland</p> <p>Contact: Mr. Thomas Luszpinski Phone: +48 71-75-034-64 Fax: +48 71-72-313-45 E-mail: info@abditus.pl Web Page: www.abditus.pl</p>	<p>Slovakia</p> <p>Abditus Sp. z o.o. ul. Gubinska 8/62 54-434 Wroclaw Poland</p> <p>Contact: Tomasz Luszpinski Phone: +48 71 750 3464 Fax: +48 71 723 1345 E-mail: info@abditus.pl</p>
<p>Israel</p> <p>IMC Microwave industries Ltd. LEADING RF & MICROWAVE OEM</p> <p>6 Nahshon st. Petach-Tikva, 4927795 Israel Contact: Mr. Eshel Ayalon General Manager Tel: 972-3-9300464 Fax: 972-3-9342056 Email: eshel@imc-mw.co.il URL: www.imc-mw.com</p>	<p>Spain</p> <p>ERCOMS Solutions S.L. Calle Luis Barahona de Soto 6-Bloque 3, 2-B 29004 Malaga, SPAIN</p> <p>Contact: Mrs. Estefania Ruiz Phone: +34 (0)655 - 256 776 eMail: estefania@ercoms.es URL: www.ercoms.es</p>

Dimensions shown are Inches over Millimeters or vice versa. Standard units have stainless finish (last 2 digits of the P/N are -02). Interfaces are per DIN 47 223, DIN 47 226, IEC 169-4, IEC 169-7, IEC 169-8, IEC 457-2, IEC 60169-5, IEEE 287, MIL-PRF-39012, MIL DTL-24044, MIL DTL-3643, MIL-STD-348B, where applicable

Europe	
<p>UK</p> <p>Microtek Components Ltd Unit 25 Kingfisher Court Hambridge Road Newbury, Berkshire, RG14 5SJ</p> <p>Contact: Mr. Abdreu Sanders; Mr. Rob Valentine Phone: +44 (0)1635 522292 Fax: +44 (0)1635 524174 Email: rob@microtekcomps.co.uk Web: www.microtekcomps.co.uk</p>	



We are looking for additional Reps & Distributors in Europe and world-wide.

Can you help ?

Dimensions shown are Inches over Millimeters or vice versa. Standard units have stainless finish (last 2 digits of the P/N are -02). Interfaces are per DIN 47 223, DIN 47 226, IEC 169-4, IEC 169-7, IEC 169-8, IEC 457-2, IEC 60169-5, IEEE 287, MIL-PRF-39012, MIL DTL-24044, MIL DTL-3643, MIL-STD-348B, where applicable



United States of America

Centre frequency Technical Marketing

PO Box 229
125 South Pennsylvania Ave.
Centre Hall, PA 16828, USA
Representative for all Spectrum products in the following mentioned cities/territories in the United States:
- Pennsylvania
- Southern New Jersey
- Delaware
Contact: Richard P. Whitman
Phone: +1 814 - 364 9867
eMail: rwhitman@cf-tm.com

WILSON CO.

PO Box 466
Towaco, NJ 07082, USA
Representative all Spectrum products in the following mentioned cities/territories in the United States:
- New York
- Northern New Jersey
- Connecticut
Contact: George Wilson
Phone: +1 973 - 335 3550
Fax: +1 973 - 335 3980
eMail: gwwilsonco@aol.com

We are looking for additional Representatives in the USA



Dimensions shown are Inches over Millimeters or vice versa. Standard units have stainless finish (last 2 digits of the P/N are -02). Interfaces are per DIN 47 223, DIN 47 226, IEC 169-4, IEC 169-7, IEC 169-8, IEC 457-2, IEC 60169-5, IEEE 287, MIL-PRF-39012, MIL DTL-24044, MIL DTL-3643, MIL-STD-348B, where applicable



Asia

Shanghai Fintest Technology Development Co., Ltd.
Room A1216, Tomson Centre
No.188 Zhang Yang Road
201318 Shanghai, CHINA

Representative and Distributor for all Spectrum products in the following mentioned cities/territories in China:
- Shanghai
- Nanjing (province of Jiangsu)
- Chengdu (province of Sichuan)
- Kanton (province of Guangdong)

Contact: Mr. Henry Yu, Mr. Benson Liu
Phone: +86 (0)21 - 6838 0250
Fax: +86 (0)21 - 6838 0251
eMail: sales@fin-test.com
URL: http://www.fin-test.com/EN/

Shenzen Hanlunda Industrial Co., Ltd.
Rm USTV, 11/F., Block A, Fortune Plaza
No.7002 Shennan Road, Futian District
518040 Shenzen, CHINA

Representative and Distributor for all Spectrum products in the following mentioned cities/territories in China:
- Province Anhui
- Beijing
- Province Hebei

Contact: Mr. John Yu
Phone: +86 (0)755 - 8302 1316, 8302 1690, 8287 9200
Fax: +86 (0)755 - 8302 1987
eMail: john@hanlunda.com
URL: http://www.hanlunda.com

CHINA

Shenzhen Unibetter Electronics Co. Ltd.
Room 2008-2015, Fu Ji Park Building
No. 1008, Bu Ji Road, Luo Hu District
518003 Shenzhen, Guangdong, CHINA

Representative and Distributor for all Spectrum products, but only in cities and territories not mentioned at the other Chinese reps.

Contact: Mrs. Cissie Liu
Phone: +86 (0)755 2542-9125, Exit:606
Fax: +86 (0)755 - 2542 9135
eMail: sales@unibetter-ic.com
URL: http://www.unibetter-ic.com

ShangHai HangOu Mechanical And Electrical Equipment Co. Ltd
Room 905, Building No.1, Guoson Centre
Lane 388, Zhongjiang Road
200062 Shanghai, CHINA

Distributor only for Spectrum Tools

Contact: Mrs. Lisa Zou
Phone: +86 (0)21 - 5108 5161, +86 (0)21 - 5239 1901
Fax: +86 (0)21 - 5187 0910, +86 (0)21 - 5239 1837
eMail: sales@shhangou.com, sales@shhangou.com.cn
URL: http://www.shhangou.com, http://www.shhangou.com.cn

INDIA Technical Support

Deltronic Marketing Corporation

DMC Centre
49 Entrenchment Road
Secunderabad 500 026, INDIA

Contact: Mr. Dev Kushlani
Phone: +91 (0)40 - 2773 1530, 2773 2993
Fax: +91 (0)40 - 2773 2864, 2773 1248
eMail: dk@deltronic.in
URL: http://www.dmcindia.in

JAPAN

AmTechs Corporation

5-20-16, Kyodo, Setagaya-ku
Tokyo 156-0052, JAPAN

Contact: Mr. Ken Satoh
Phone: +81 (0)3 - 5450 5311
Fax: +81 (0)3 - 5450 5312
eMail: rf@amtechs.co.jp
URL: http://www.amtechs.co.jp

Dimensions shown are Inches over Millimeters or vice versa. Standard units have stainless finish (last 2 digits of the P/N are -02). Interfaces are per DIN 47 223, DIN 47 226, IEC 169-4, IEC 169-7, IEC 169-8, IEC 457-2, IEC 60169-5, IEEE 287, MIL-PRF-39012, MIL DTL-24044, MIL DTL-3643, MIL-STD-348B, where applicable



Asia

RUSSIA

NKT ZAO

Dolgorukovskaya 40, Building S
127006, Moskow, RUSSIA

Contact: Mr. Alexey Gavrilov
Phone: +7 (495) - 787 05 50
Fax: +7 (495) - 787 77 82
eMail: info@nkt-rf.ru
URL: <http://www.nkt-rf.ru>

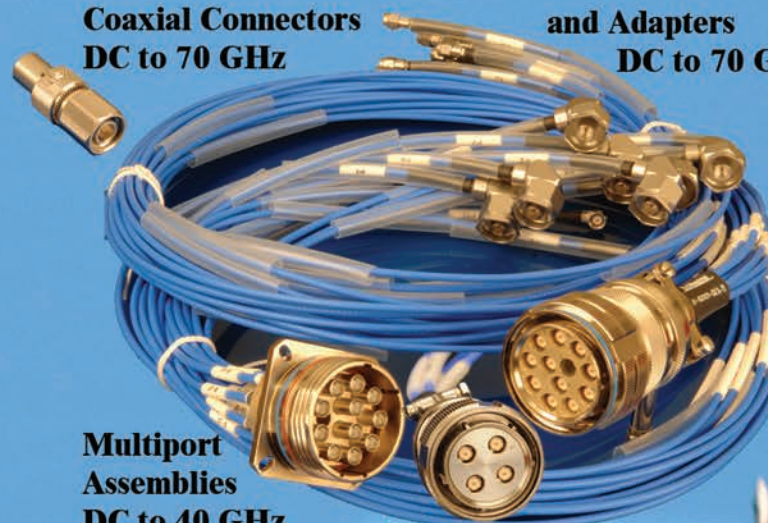
SOUTH KOREA

UNI WAVES

Suite 16-231 International Distribute Complex
555-9, Hokeydong Anyang
431 080 KOREA,

Contact: Mr. J.C. Kim
Phone: +82 (31) - 427 82 69
Fax: +82 (31) - 427 82 68
eMail: jckim@uniwaves.co.kr

Coaxial Connectors and Adapters
DC to 70 GHz



Multiport Assemblies
DC to 40 GHz



Adapters
DC to 70 GHz

Coaxial Delay Lines
DC to 40 GHz



Waveguide to Coax Adapters



Gain Amplitude Equalizers

Phase-Adjusters
DC to 63 GHz



Telephone: +49-89-3548-040
Fax: +49-89-3548-0490
Email: Sales@Spectrum-et.com

www.spectrum-et.com

TAKE OFF WITH OUR PRODUCTS

RELIABLE DESIGNS YOU CAN TRUST

Ordering

Please include both, Spectrum Elektrotechnik GmbH part number, and a description of the item(s) ordered. If special features are required, describe them as completely as possible and include an engineering sketch. Orders may be placed directly with the factory in Munich or with any authorized Spectrum Elektrotechnik GmbH Representative. Minimum Factory Order is 150 Euro.

Acceptance of Orders

All orders are subject to acceptance at the discretion of the factory and with an Order Acknowledgment from Spectrum Elektrotechnik GmbH.

Terms

Upon approval of credit, payment is due Net 30 days from date of invoice. Late payments are subject to a 1.5 % monthly charge on past due balances.

Shipments

Spectrum Elektrotechnik GmbH ships via the most expedient reliable carrier. Shipment F.C.A. or F.O.B., Spectrum Elektrotechnik GmbH plant, will be sent freight prepaid and billed unless other prior arrangements are made. Spectrum Elektrotechnik GmbH will use any acceptable method of delivery specifically requested by customer.

Damaged Materials/Shortages

All orders should be inspected upon receipt for both completeness and to insure receipt of materials in proper condition. All claims for shortages must be made within thirty (30) days after date of shipment of material from Spectrum Elektrotechnik GmbH plant. Title to goods passes to the Buyer upon delivery to the carrier and risk of loss or damage shall thereafter rest with the Buyer. Claims for damage or loss while material is in transit must be made against the carrier by the Buyer.

Warranty

Spectrum Elektrotechnik GmbH warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery of the original owner and after prepaid return by the original owner, any Spectrum Elektrotechnik GmbH product is found to be defective, Spectrum Elektrotechnik GmbH shall, at its option, repair or replace said defective item. This warranty does not apply to products which have been disassembled, modified or subjected to conditions exceeding the applicable specifications or ratings.

Cancellation

Cancellation of, or changes to an order acknowledged by Spectrum Elektrotechnik GmbH are accepted only upon terms that protect Spectrum Elektrotechnik GmbH against loss.

Returns

Excess or unused material cannot be returned for credit without factory authorization. Such material is subject to a handling charge of not less than 15 % upon return and inspection of material at the factory. In no case will Spectrum Elektrotechnik GmbH authorize return of material beyond ninety (90) days after shipment from the factory. Credit for returned material is issued by Spectrum Elektrotechnik GmbH only to the original purchaser. Freight charges for returned material is the responsibility of the Buyer.

Defective Material

Claims for defective material or workmanship are subject to verification by Spectrum Elektrotechnik GmbH Quality Control, and must have prior factory authorization. Upon verification, Spectrum Elektrotechnik GmbH reserves the right to repair or replace, as deemed necessary.

Prices / Specifications

Unless otherwise specified, prices quoted are F. O. B. Spectrum Elektrotechnik GmbH plant. Both prices and specifications are subject to modification without prior notice.

Patent and Trademark Indemnity

Buyer agrees at Buyer's expense to protect and defend Seller against any and all claims of patent or trademark infringement arising from Seller's compliance with Buyer's designs or specifications or instruction and to hold Seller harmless from all losses, damages, costs and expenses attributable to any such claim or claims. Seller shall have the right to approve or disapprove counsel designated by Buyer to defend such claims.

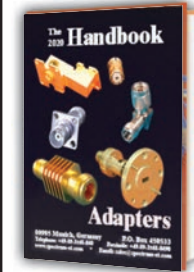
Spectrum Elektrotechnik GmbH reserves the right to make design changes without notice on any of its products and without any obligation to make same or similar changes to items previously purchased. In no event does Spectrum Elektrotechnik GmbH assume liability for installation labor or for consequential damages. This warranty is the extent of the obligation or liability assumed by Spectrum Elektrotechnik GmbH with respect to its products, and no other warranty or guarantee is either expressed or implied.

Spectrum Elektrotechnik GmbH is a leading manufacturer of RF and Microwave Components in the Frequency Range of DC to 71.0 GHz. The products are published in seven individual catalogs and one Product Portfolio, showing detailed information and comprehensive data.



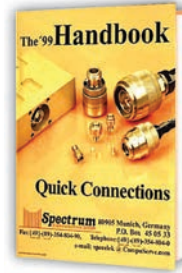
Multiports

DC to 65 GHz
Circular Connectors,
SQ-, TQ-, IQ-, BQ-, CQ-Series
Rectangular Connectors,
RQ-Series



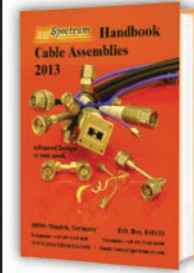
Adapters,

DC - 70 GHz, 50 Ohms
Coaxial Adapters (In Series and
Between Series)
Hermetically Sealed Adapters
High Power Adapters
Push-On Adapters
Waveguide to Coax Adapters



Quick Connections,

DC to 65 GHz, 50 Ohms
Blind Mate Connectors
Multi Coax Connections,
SQ-, TQ-, IQ-, BQ-, CQ-, and
RQ-Series,
Push - On Adapters, Connectors,
and Push-On Cable Assemblies



Cable Assemblies,

DC - 70 GHz, 50 Ohms
ANA Test Cables
Flexible Cable Assemblies
Low Loss Cable Assemblies
Phase Stable Cable Assemblies
Semi Rigid Cable Assemblies
(Dia. 0.34" to 1")



Test Necessities and Accessories,

DC - 71 GHz, 50 Ohms
LRL, TRL Calibration and
Verification Kits
ANA Cable Assemblies
Torque Wrenches
Interface Gauges
Calibration Kits
Terminations



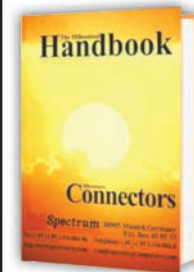
Circulators and Isolators

Connectorized Isolators and
Circulators
Drop In Isolators and Circulators
Lumped Design Isolators



Adjusting Phase

DC - 63 GHz, 50 Ohms
Phase Adjustable Connectors
Phase Adjustable Adapters



Connectors,

DC - 70 GHz, 50 Ohms
Blind Mate Connectors
Coaxial Connectors
High Power Connectors
Multi Pin Connectors
Push-On Connectors



Product Portfolio

Coaxial Connectors and Adapters
Multiport Assemblies
Coaxial Delay Lines
Waveguide to Coax-Adapters
Phase Adjusters
Gain Amplitude Equalizers
Cable Assemblies etc.

**Never heard of Multiports,
connecting coaxial Cable
Assemblies in Seconds?**



 **Spectrum**
Elektrotechnik GmbH

when Quality is needed

80905 Munich, Germany

P.O. Box 450533

Telephone: +49-89-3548-040

Facsimile: +49-89-3548-0490

www.spectrum-et.com

Email: sales@spectrum-et.com