



# SERIES QN, COAXIAL CONNECTORS

## DESCRIPTION

HUBER+SUHNER QN coaxial connectors are available with 50 Ω impedance. The frequency range extends to 11 GHz, depending on the connector and cable type, however most of the QN connectors are Return Loss optimised for frequencies up to 6 GHz. The interface is based on the inner dimensions of the N connector, but, instead of a threaded coupling mechanism, a new snap-lock mechanism is used.

The QN interface has a very similar performance to the N, but in addition it offers an easier, faster and safer coupling operation, helping the customers to save significantly time during production of their systems.

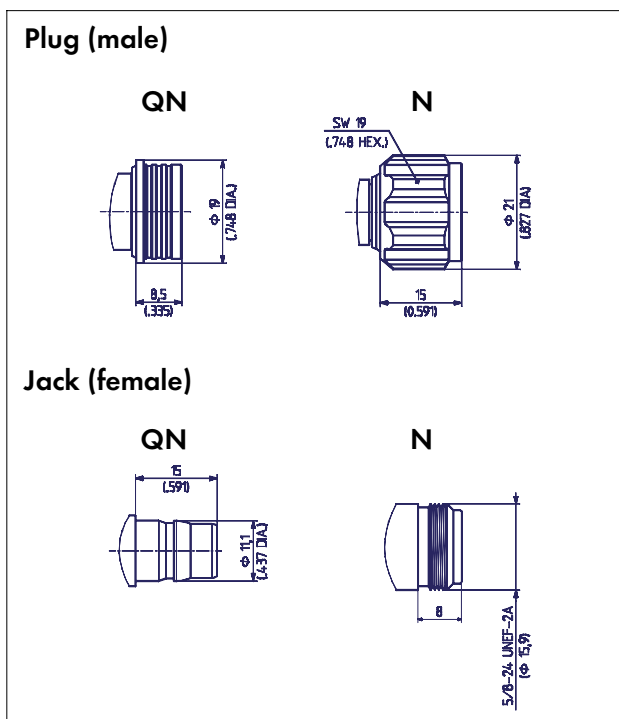
The packaging density of QN increased compared to N thanks to the fact that no torque spanner is required to fasten the coupling nut. Additionally the outer dimensions of QN are smaller than N, leading to the advantage that TNC-size flanges can be used at QN connectors.

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## INTERFACE DIMENSIONS (COMPARED TO N)



## FEATURES OF QN CONNECTORS

- > Cycle time improvement for making RF connections (10 times faster to mount than threaded connectors)
- > No torque required
- > Higher packaging density
- > Free-rotating connection when mated
- > Eliminates loosening problems associated with threaded connectors
- > Same performance as N
- > Best intermodulation performance thanks to the unique interface design

**HUBER+SUHNER QN - the cost effective solution for advanced RF interconnections !**

**IP rating (interface, mated) IP68**

## TECHNICAL DATA

ELECTRICAL DATA	REQUIREMENTS
Impedance	50 $\Omega$
Frequency range	DC to 6 GHz (optimized)                      DC to 11 GHz (working range)
Dielectric withstanding voltage (at sea level, in V rms, 50 Hz)	2500
Working voltage (at sea level, in V rms, 50 Hz)	$\leq 1000$
Insulation resistance	$\geq 5 \cdot 10^3 \text{ M}\Omega$
Contact resistance - centre contact - outer contact	$\leq 1.5 \text{ m}\Omega$ $\leq 1.5 \text{ m}\Omega$
RF-leakage	100 MHz to 3 GHz $\geq -90 \text{ dB}$
Return loss (typical)	DC - 3 GHz $\geq 32 \text{ dB}$ ; 3 to 6 GHz $\geq 25 \text{ dB}$ ; 6 to 11 GHz $\geq 20 \text{ dB}$
Intermodulation	better -155 dBc (2 x 43 dBm carrier)

MECHANICAL DATA	REQUIREMENTS
Durability (matings)	$\geq 100$
Engagement force (typical)	30 N
Disengagement force (typical)	30 N
Retention force for interface	$\geq 450 \text{ N}$
Bending moment admissible (interface)	$\leq 10 \text{ Nm}$
Contact captivation	$\geq 28 \text{ N}$

1) Value considers maximum load of the cables without irreversible variations of specifications.

ENVIRONMENTAL DATA	TEST CONDITIONS
Temperature range	- 40°C ... + 125°C / - 40 °F ... + 257 °F
Climatic category	40 / 125 / 21 (IEC 60169_1 16.2)
Moisture resistance	MIL-STD-202 F, Method 106 F
Corrosion	Saltspray test acc. to MIL-STD-202 F, Method 101 D, Condition B
Vibration	IEC-1169-1 paragraph 9.3.3. (10-500 Hz; 5g)
Shock	MIL-STD-202 F, Method 213, Condition I
Rapid change of temperature	IEC 60169-1 16.4 ( -40° C ... + 125° C / - 40 °F ... + 257 °F )

MATERIAL DATA		
CONNECTOR PART	MATERIAL	PLATING
Bodies	brass	SUCOPLATE®
Pin contacts	brass	SUCOPRO
Socket contacts	spring bronze	SUCOPRO
Insulators	typ.: PTFE or PFA	
Contact washer	spring bronze or copper beryllium	SUCOPRO

Some connectors may have a specification that differs from the above mentioned data.

**The products are designed and guaranteed to pass the above mentioned test procedures. Any additional or different requirement arising from specific applications or environmental conditions which is not covered by these test procedures is subject to request.**

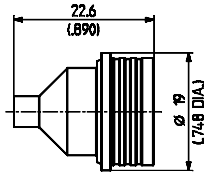
## CABLE CONNECTORS

### Straight cable plugs (male)

> for semi-rigid cables, SUCOFORM and MULTIFLEX cables

> cable entry soldered

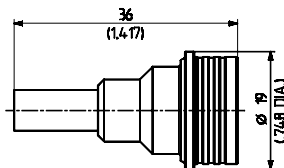
> centre contact plugged-in



HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction	Notes
11_QN-50-3-3/113_NE	23033393	Y5, Y12 (SM 141)	single	27502	

> for flexible cables

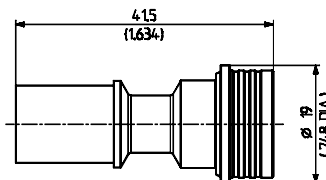
> HUBER+SUHNER® full crimp



HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction	Crimp insert
11_QN-50-3-1/133_NE	23033391	U9 (EF 142)	single	27500	2B
11_QN-50-3-2/133_NE	23033392	U7 (RG 58 C/U)	single	27501	2B

> for flexible cables

> HUBER+SUHNER® full crimp



HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction	Crimp insert
11_QN-50-7-1/133_NE	23033394	U32 (RG 214/U)	single	27503	3D
11_QN-50-7-2/133_NE	23033395	U33 (EF 393)	single	27504	2.5D
11_QN-50-7-3/133_NE	23033396	U29 (RG 213/U)	single	27505	3D

Cable groups see page 28

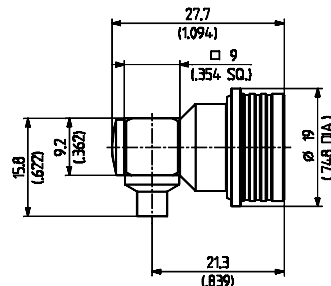
Assembly tools see page 385

Mounting holes see page 412

## Right angle cable plugs (male)

> for semi-rigid cables, SUCOFORM and MULTIFLEX cables

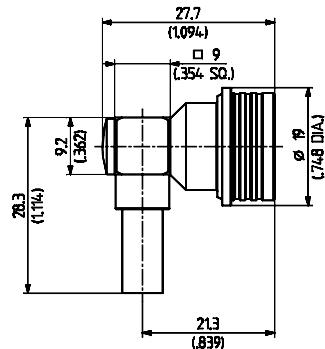
- > cable entry soldered
- > centre contact soldered



HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction	Notes
16_QN-50-3-3/13_NE	23033268	Y5, Y12 (SM 141)	single	27508	

> for flexible cables

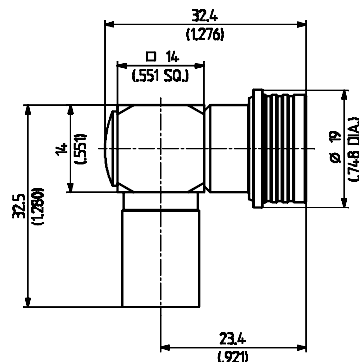
- > cable entry crimp
- > centre contact soldered



HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction	Crimp insert
16_QN-50-3-1/133_NE	23033267	U11 (EF 400)	single	27506	B
16_QN-50-3-2/133_NE	23033398	U7 (RG 58 C/U)	single	27507	B
16_QN-50-4-1/133_NE	23033078	S16 (S 04262 D)	single	27509	C

> for flexible cables

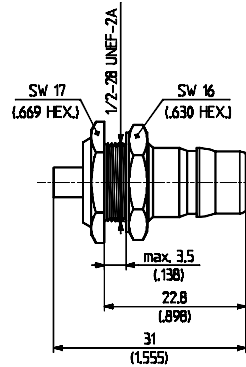
- > cable entry crimp
- > centre contact soldered



HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction	Crimp insert
16_QN-50-7-1/133_NE	23032410	U32,U33 (EF 393)	single	27510	D
16_QN-50-7-2/133_NE	23033399	U29 (RG 213/U)	single	27511	D

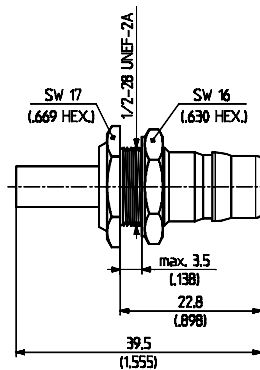
## Straight bulkhead cable jacks (female)

- > for semi-rigid cables, SUCOFORM and MULTIFLEX cables
- > cable entry soldered
- > centre contact plugged-in



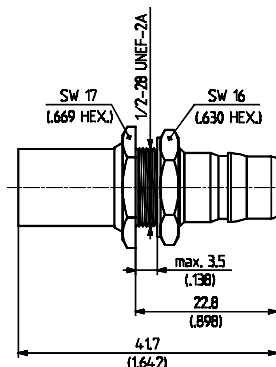
HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction	Mounting hole
24_QN-50-3-3/13_NE	23033423	Y5, Y12 (SM 141)	single	27514	ML 112

- > for flexible cables
- > HUBER+SUHNER® full crimp



HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction/ Mounting hole	Crimp insert
24_QN-50-3-1/133_NE	23033400	U9 (EF 142)	single	27512 / ML 112	2B
24_QN-50-3-2/133_NE	23033402	U7 (RG 58 C/U)	single	27513 / ML 112	2B

- > for flexible cables
- > HUBER+SUHNER® full crimp

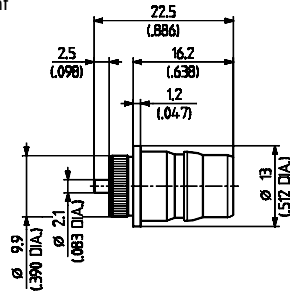


HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction/ Mounting hole	Crimp insert
24_QN-50-7-1/133_NE	23033403	U33 (EF 393)	single	27515 / ML 112	2.5D
24_QN-50-7-2/133_NE	23033404	U32 (RG 214/U)	single	27516 / ML 112	3D
24_QN-50-7-3/133_NE	23033405	U29 (RG 213/U)	single	27517 / ML 112	3D

## RECEPTACLES WITH SOLDER END

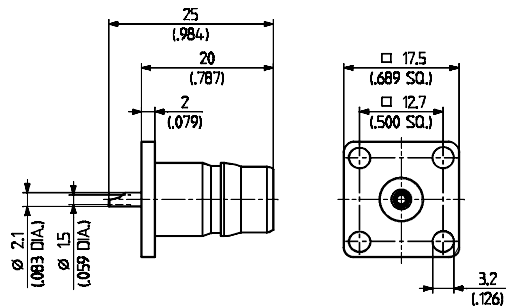
### Receptacles, jacks (female)

- > bulkhead mounted
- > press-in chassis mount



HUBER+SUHNER type	Item no.	Packaging	Notes
22_QN-50-0-1/133_NE	23033237	single	press-in
22_QN-50-0-1/133_NY	23033904	bulk 100 pcs.	press-in

- > panel mounted




HUBER+SUHNER type	Item no.	Packaging	Notes
23_QN-50-0-1/133_NE	23033251	single	flange with same dimensions as TNC
23_QN-50-0-1/133_NY	23033252	bulk 100 pcs.	flange with same dimensions as TNC

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## QN-CALIBRATION WITH ADAPTOR SWAPPING METHOD

For return Loss/VSWR measurement of QN connectors, HUBER+SUHNER recommends the following calibration method:


**1. Calibration with PC7 to PC7 calibration adaptors (PC7 calibration)**  
 Adaptors: 32\_PC7-U50-0-1/1\_NE (Item no. 23032719) and  
 33\_PC7-U50-0-1/1\_NE (Item no. 23032721)



**Calibration Kit for PC7**

to NWA                      calibration adaptor                      calibration adaptor                      to NWA


**Alternative calibration with N to PC7 calibration adaptors (N calibration)**  
 Adaptors: 32\_N-PC7-50-6/1\_NE (Item no. 23032917) see page 373 or  
 33\_PC7-N-50-6/1\_NE (Item no. 23032916) see page 374



**Calibration Kit for N**

to NWA                      calibration adaptor                      calibration adaptor                      to NWA

**2. Exchanging of the calibration adaptors with the required QN adaptors**  
 32\_PC7-QN-50-1/1\_NE (Item no. 23032720) see page 377 or  
 33\_PC7-QN-50-1/1\_NE (Item no. 23032722) see page 377



**DUT**

Thanks to the same electrical length and the same return loss behaviour of all these adaptors, the adaptor swapping method can be used (same dimensions of all electrical relevant piece parts in these adaptors).