

HUBER+SUHNER

TL-8A Assembly Family

Test Leads Assemblies

RF Assemblies

May 2013 | RF Assemblies | M. De Cet



- **Product Description**
- **Applications**
- **Features / Benefits**
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- **Connectors**
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RF Assemblies

May 2013 | RF Assemblies | M. De Cet

Product description

TL-A8

Test Lead with **Armouring** for testing equipment's or components up to **8 GHz**

- Developed for applications where optimum VSWR and Attenuation are required
- Factory-made cable assemblies
- Produced under stringent manufacturing quality standards.



Applications

The TL-8A product line is designed to be used in:

- Test labs for testing equipment's or components with Vector Network Analyser (VNA)
- Operations for continues measuring Return Loss and Attenuation



Features / Benefits

- Excellent RF performance by optimize design of cable and connectors
- Long Lifetime
- High flexibility
- Connectors with Quick-Lock nuts
- High Mechanical Endurance
- Excellence Resistance to Wear
- Free of Halogen
- Economical Prices
- Short Lead Time



Cable

- **TL-8A assemblies are made with a HUBER+SUHRNER cable using PE Foam dielectric and a double screened cable braid**
- **TPU - Armouring (blue colour) which is well know from our SUCOFLEX assemblies**
- **Moulded Cable Entry protection**



Connectors

- **TL-8A assemblies are in general terminated with N male connectors which offer excellent characteristics guaranteed and proven by HUBER+SUHNER's high stand of quality in design and production technology.**

Connectors available only in straight version.

**Connectors for other series on request.
(SMA, TNC)**



Standard Product (TL-8A-...-51)

- 100% Tested for Return Loss and Attenuation
 → each assembly included with a test report and protection on connectors

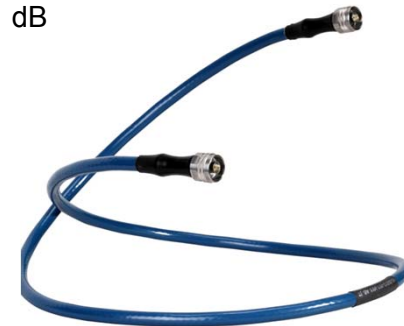
- Available in Predetermined Lengths

H+S Mat.No.:	H+S Product Description:	Length:
84236770	TL-8A-11N-11N-00600-51	0.6 m
84236772	TL-8A-11N-11N-01000-51	1.0 m
85006682	TL-8A-11N-11N-01500-51	1.5 m
84236774	TL-8A-11N-11N-02000-51	2.0 m



- Key Values

Frequency:	optimized up to: 8 GHz				
Return Loss:	1 GHz	2 GHz	4 GHz	6 GHz	8 GHz
up to 1.8 m:	≤ -32 dB	≤ -29 dB	≤ -26 dB	≤ -25 dB	≤ -22 dB
≥ 2.0 m:	≤ -31 dB	≤ -27 dB	≤ -25 dB	≤ -24 dB	≤ -21 dB
Attenuation:	1.24 dB/m @ 8 GHz (typical)				
Waterproof:	no gasket on interface				
Temperature range:	- 5°C...+85°C				
Durability (Matings)	>3000 cycles				
Assembly Length:	min. 300 mm // max. 2000 mm				



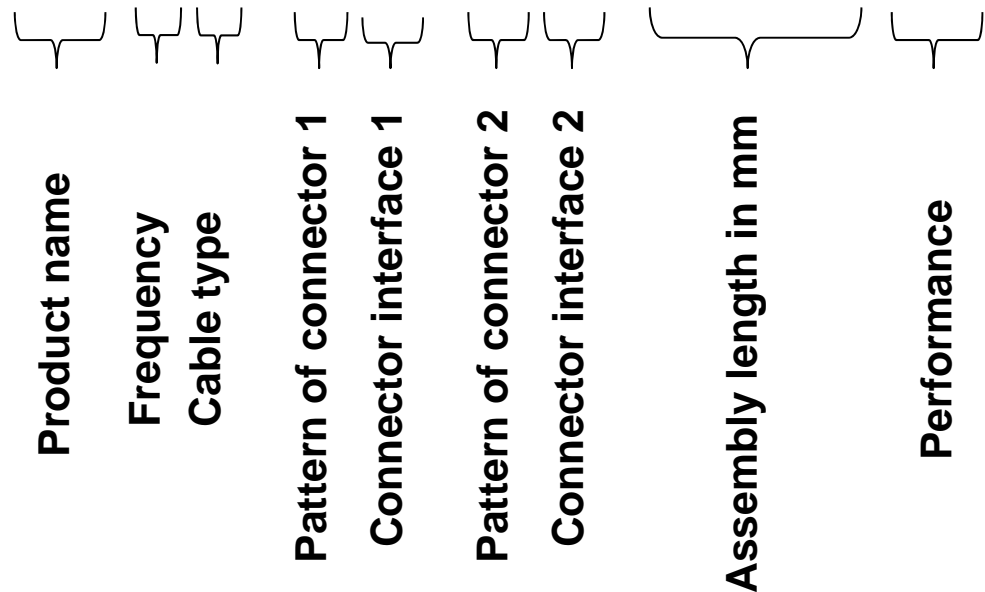
- Options: (TL-8A...-01, customer specific assembly)

Waterproof:	IP 67	→ with gasket on interface
Temperature range:	- 40°C...+85°C	→ with gasket on interface and shrinking sleeve over moulding
Assembly length:	over 2 m only after approval of responsible PM	

Ordering information

Ordering Example

TL-8A-11N-11N-01500-51



Product Name:	Test Lead	TL
Frequency:	up to GHz	8
Cable:	with Armor	A
Connector Pattern:		11
Connector Interface:		N SMA TNC
Assembly length:		min. 300 mm max. 2000 mm (Ref. Interface to Ref. interface)
Performance Code:	(Standard)	51



Product Positioning

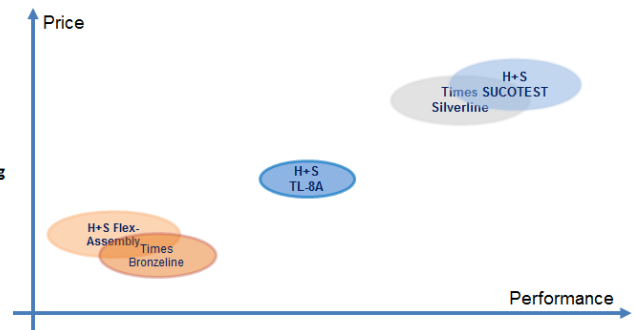
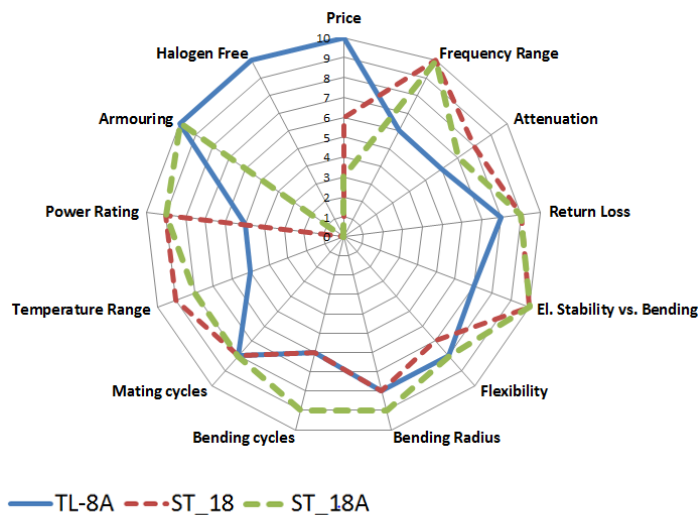
Overview Product Positioning TL-8A-XXX

vs. H+S SUCOTEST 18 / H+S SUCOTEST 18 A

For Internal Use

Position		TL-8A	ST-18	ST-18A
Price (per pce /MOQ: 10 pce)	11N-11N / L = 1.5 m	> 60 CHF	> 120 CHF	> 200 CHF
Frequency Range	Max. defined performance	8 GHz	18 GHz	18 GHz
Attenuation (typical, at 20°C / m)	Cable at:			
	2 GHz	0.42 dB	0.41 dB	0.43 dB
	4 GHz	0.64 dB	0.61 dB	0.65 dB
	6 GHz	0.88 dB	0.75 dB	0.84 dB
	8 GHz	1.20 dB	0.86 dB	0.97 dB
Return Loss	Assembly at:			
	2 GHz	> 29 dB	> 30 dB	> 30 dB
	4 GHz	> 26 dB	> 28 dB	> 28 dB
	6 GHz	> 25 dB	> 25 dB	> 25 dB
	8 GHz	> 22 dB	> 21 dB	> 21 dB
EI. Stability vs. Bending (Insertion Loss stability)	Assembly at:			
	2 GHz	> 0.03 dB	> 0.03 dB	> 0.03 dB
	4 GHz	> 0.05 dB	> 0.04 dB	> 0.04 dB
	6 GHz	> 0.08 dB	> 0.04 dB	> 0.04 dB
	8 GHz	> 0.10 dB	> 0.05 dB	> 0.05 dB
Flexibility	Insertion Loss stability	high flex	flex	high flex
Bending Radius	Cable / dynamic bending	55	35	50
Bending cycles	Flex life	30'000	30'000	100'000
Mating cycles	Connector interface	> 3000	> 3000	> 3000
Temperature Range	Assembly	-5°C to +85°C	-55°C to +105°C	-55°C to +85°C
Power Rating (CW, at 25°C, sea level)	Assembly at:			
	2 GHz	105 W	391 W	380 W
	4 GHz	75 W	310 W	260 W
	6 GHz	62 W	225 W	215 W
	8 GHz	50 W	216 W	184 W
Armouring	Cable protection	Yes	No	Yes
Halogen Free		Yes	No	No
Cable construction	Centre conductor	copper wire	copper wire	copper strand
	Isolation	foamed PE	PTFE	PTFE
	Outer conductor	copper braid	copper foil/braid	copper foil/braid
Connector cable entry	Centre contact	plugged	plugged	plugged
	Outer contact	crimped	soldered	soldered

Summary Positioning TL-8A vs. ST-18/ST-18A:



HUBER+SUHNER® DATA SHEET RF ASSEMBLIES

Test Lead: TL-8A



Rev.: A

Description

Test Lead assembly for indoor applications (Test and Measurement) consisting of a high flexible PE foamed cable with armouring protection and 2x N male straight connectors for frequency up to 8 GHz.

ID (Material/Item No.) 84236772
Description (Product) TL-8A-11N-11N-01000-51



Product Configuration

Cable type 50Ω +/-1Ω, PE Foam double screen
 Armour Steel wire spring, steel braid, TPU blue, max. dia. 10.4 mm
 Length of Assembly 1000 mm +/- 12 mm
 Connector A N Straight male, knurl / hex. 19 mm, *Quick-Lock*
 Nut: steel; body: brass/SUCOPLATE®; Center Contact: Cu-Be/Gold
 Connector B N Straight male, knurl / hex. 19 mm, *Quick-Lock*
 Nut: steel; body: brass/SUCOPLATE®; Center Contact: Cu-Be/Gold
 Cable entry protection PA, black

Technical Data

Mechanical Data

Mating cycle *)	> 3000	Bending Radius repeated (min.)	55 mm (preferred: 100 mm)
Tensile Force (max.)	200 N	Connector interface	IEC 61169-16 / MIL-STD-348A/304
Recom. mating torque **)	1.0 Nm	Weight	0.225 kg

Environmental Data

Operating Temperature - 5°C to + 85°C
 Storage Temperature - 40°C to + 85°C
 RoHS, REACH compliant
 Water protection***) N-Connector without gasket on Interface

Electrical Data

Impedance	50 Ω +/-1 Ω	Operating Frequency	up to 8 GHz
Velocity of propagation	82 %	Insulation resistance	> 5 x 10 ³ MΩ
Capacitance	82 pF / m	Time delay	4.3 ns / m
Dielectric withstand voltage	500 V rms		

	Frequency	1 GHz	2 GHz	3 GHz	4 GHz	6 GHz	8 GHz
Return Loss	equal or better	- 32 dB	- 29 dB	- 26 dB	- 26 dB	- 25 dB	- 22 dB
Attenuation (assembly)	typically, at 25°C	0.35 dB	0.53 dB	0.67 dB	0.81 dB	1.07 dB	1.30 dB
Power handling	sea level, at 40°C	150 W	105 W	80 W	75 W	62 W	55 W
Screening effectiveness		> 80 dB	> 76 dB	> 70 dB	> 65 dB	> 60 dB	> 55 dB
Insertion Loss stability ****)		< 0.02 dB	< 0.03 dB	< 0.04 dB	< 0.06 dB	< 0.08 dB	< 0.10 dB
Phase stability ****)		+/- 1.5° el.	+/- 2.5° el.	+/- 4° el.	+/- 5° el.	+/- 8° el.	+/- 10° el.

General Information

*) Number of Mating With use of torque wrench at recommended value, clean interface after each 20 matings, mated with connector according IEC or MIL standard
 **) H+S torque wrench H+S description: 74_Z-0-0-321 // material/item number: 22651994
 ***) Waterproof with gasket: IP 67
 ****) Stability test One, 180° revers bends, 75 mm radius mandrel

HUBER+SUHNER is certified according to ISO 9001 and ISO 14001

WAIVER!
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HUBER+SUHNER® DATA SHEET RF ASSEMBLIES

Test Lead: TL-8A



Rev.: A

Description

Test Lead assembly for indoor applications (Test and Measurement) consisting of a high flexible PE foamed cable with armouring protection and 2x N male straight connectors for frequency up to 8 GHz.

ID (Material/Item No.) **84236770**
Description (Product) **TL-8A-11N-11N-00600-51**



Product Configuration

Cable type 50Ω +/-1Ω, PE Foam double screen
 Armour Steel wire spring, steel braid, TPU blue, max. dia. 10.4 mm
 Length of Assembly 600 mm +/- 10 mm
 Connector A N Straight male, knurl / hex. 19 mm, *Quick-Lock*
 Nut: steel; body: brass/SUCOPLATE®; Center Contact: Cu-Be/Gold
 Connector B N Straight male, knurl / hex. 19 mm, *Quick-Lock*
 Nut: steel; body: brass/SUCOPLATE®; Center Contact: Cu-Be/Gold
 Cable entry protection PA, black

Technical Data

Mechanical Data

Mating cycle *)	> 3000	Bending Radius repeated (min.)	55 mm (preferred: 100 mm)
Tensile Force (max.)	200 N	Connector interface	IEC 61169-16 / MIL-STD-348A/304
Recom. mating torque **)	1.0 Nm	Weight	0.165 kg

Environmental Data

Operating Temperature - 5°C to + 85°C
 Storage Temperature - 40°C to + 85°C
 RoHS, REACH compliant
 Water protection***) N-Connector without gasket on Interface

Electrical Data

Impedance	50 Ω +/-1 Ω	Operating Frequency	up to 8 GHz
Velocity of propagation	82 %	Insulation resistance	> 5 x 10 ³ MΩ
Capacitance	82 pF / m	Time delay	4.3 ns / m
Dielectric withstand voltage	500 V rms		

	Frequency	1 GHz	2 GHz	3 GHz	4 GHz	6 GHz	8 GHz
Return Loss	equal or better	- 32 dB	- 29 dB	- 26 dB	- 26 dB	- 25 dB	- 22 dB
Attenuation (assembly)	typically, at 25°C	0.22 dB	0.33 dB	0.41 dB	0.49 dB	0.64 dB	0.78 dB
Power handling	sea level, at 40°C	150 W	105 W	80 W	75 W	62 W	50 W
Screening effectiveness		> 80 dB	> 76 dB	> 70 dB	> 65 dB	> 60 dB	> 55 dB
Insertion Loss stability ****)		< 0.02 dB	< 0.03 dB	< 0.04 dB	< 0.06 dB	< 0.08 dB	< 0.10 dB
Phase stability ****)		+/- 1.5° el.	+/- 2.5° el.	+/- 4° el.	+/- 5° el.	+/- 8° el.	+/- 10° el.

General Information

*) Number of Mating With use of torque wrench at recommended value, clean interface after each 20 matings, mated with connector according IEC or MIL standard
 **) H+S torque wrench H+S description: 74_Z-0-0-321 // material/item number: 22651994
 ***) Waterproof with gasket: IP 67
 ****) Stability test One, 180° revers bends, 75 mm radius mandrel

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HUBER+SUHNER® DATA SHEET RF ASSEMBLIES

Test Lead: TL-8A



Rev.: A

Description

Test Lead assembly for indoor applications (Test and Measurement) consisting of a high flexible PE foamed cable with armouring protection and 2x N male straight connectors for frequency up to 8 GHz.

ID (Material/Item No.) **85006682**
Description (Product) **TL-8A-11N-11N-01500-51**



Product Configuration

Cable type 50Ω +/-1Ω, PE Foam double screen
 Armour Steel wire spring, steel braid, TPU blue, max. dia. 10.4 mm
 Length of Assembly 1500 mm +/- 15 mm
 Connector A N Straight male, knurl / hex. 19 mm, *Quick-Lock*
 Nut: steel; body: brass/SUCOPLATE®; Center Contact: Cu-Be/Gold
 Connector B N Straight male, knurl / hex. 19 mm, *Quick-Lock*
 Nut: steel; body: brass/SUCOPLATE®; Center Contact: Cu-Be/Gold
 Cable entry protection PA, black

Technical Data

Mechanical Data

Mating cycle *)	> 3000	Bending Radius repeated (min.)	55 mm (preferred: 100 mm)
Tensile Force (max.)	200 N	Connector interface	IEC 61169-16 / MIL-STD-348A/304
Recom. mating torque **)	1.0 Nm	Weight	0.295 kg

Environmental Data

Operating Temperature - 5°C to + 85°C
 Storage Temperature - 40°C to + 85°C
 RoHS, REACH compliant
 Water protection***) N-Connector without gasket on Interface

Electrical Data

Impedance	50 Ω +/-1 Ω	Operating Frequency	up to 8 GHz
Velocity of propagation	82 %	Insulation resistance	> 5 x 10 ³ MΩ
Capacitance	82 pF / m	Time delay	4.3 ns / m
Dielectric withstand voltage	500 V rms		

	Frequency	1 GHz	2 GHz	3 GHz	4 GHz	6 GHz	8 GHz
Return Loss	equal or better	- 32 dB	- 29 dB	- 26 dB	- 26 dB	- 25 dB	- 22 dB
Attenuation (assembly)	typically, at 25°C	0.54 dB	0.80 dB	1.00 dB	1.16 dB	1.50 dB	1.84 dB
Power handling	sea level, at 40°C	150 W	105 W	80 W	75 W	62 W	50 W
Screening effectiveness		> 80 dB	> 76 dB	> 70 dB	> 65 dB	> 60 dB	> 50 dB
Insertion Loss stability ****)		< 0.02 dB	< 0.03 dB	< 0.04 dB	< 0.05 dB	< 0.08 dB	< 0.10 dB
Phase stability ****)		+/- 1.5° el.	+/- 2.5° el.	+/- 4° el.	+/- 5° el.	+/- 8° el.	+/- 10° el.

General Information

*) Number of Mating With use of torque wrench at recommended value, clean interface after each 20 matings, mated with connector according IEC or MIL standard
 **) H+S torque wrench H+S description: 74_Z-0-0-321 // material/item number: 22651994
 ***) Waterproof with gasket: IP 67
 ****) Stability test One, 180° revers bends, 75 mm radius mandrel

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