

# **E2000<sup>®</sup> / APC / ST Duplex Jumper**



**Artikel: O0920.x**

**Stecker: E2000<sup>®</sup> HRL grün, ST**

**Ferrule: APC 8° (E2000<sup>®</sup>)**

**Kabel: I-VH 2E9/125µm gelb**

**Klasse: OS1 G.652D**

# Technical Data Sheet



R&M Connector E-2000™

About this data sheet

This document has been drafted with utmost care and reflects the products engineering level at the time of publication. Amendments or corrections to this document will be included in each new edition. Subject to technical change without notice.

Edition 3.  
Februa2008

1. Specifications E-2000™ SM Connector, Patch Cable/Pigtail

	Standard	Load	Requirement	Result	
	acc. to IEC 61753-1-1 Category U			LSH PC	LSH APC
<b>Optical properties</b>					
Insertion loss (IL) [dB] against reference	IEC 61300-3-4		<= 0.4	< 0.3 Type: 0.2	< 0.3 Type: 0.2
Insertion loss (IL) [dB] Random mated	IEC 61300-3-34		Grad Q <sup>1)</sup>	pass Type: 0.18	pass Type: 0.18
Return loss (RL) [dB] against air patch cable/pigtail	IEC 61300-3-6		>=55		
Return loss (RL) [dB] coupled patch cable	IEC 61300-3-6		>=60 (APC) >=40 (PC)	>45 Type: >50	>60 Type 85 <sup>1)</sup>
Return loss (RL) [dB] coupled pigtail	IEC 61300-3-6			>45 Type: > 50	>60 Type 86
<b>Mechanical properties</b>					
Mating durability	CECC 86 275-802 IEC 61300-2-2	(500) 1000	delta IL <0.2 dB	pass	pass
Cable retention	IEC 61300-2-4	100 N, 120 sec	delta IL <0.2 dB	pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
Fiber retention	IEC 61300-2-4	5 N, 60 sec	delta IL <0.2 dB	pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
Vibration	IEC 61300-2-1	10 – 55 Hz, 1 octave per min, 3 axis of 15 cycles, 0.5 h/axis, amplitude 0.75 mm	delta IL <0.2 dB	pass Type: delta 0.01 dB	pass Type: delta 0.01 dB
Repeated bending patch cable	IEC 60794-1-E6	200 cycles –90°, 0°, +90°, 5 N	delta IL <0.2 dB	pass Type: delta 0.02 dB	pass Type: delta 0.02 dB
Repeated bending pigtail	IEC 60794-1-E6	200 cycles –90°, 0°, +90°, 0.2 N	delta IL <0.2 dB	pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
Drop	IEC 61300-2-12	1.5 m, 5 x	delta IL <0.2 dB	pass	pass
Static side load pigtail	IEC 61300-2-42	0.2 N, 5 min	delta IL <0.2 dB	pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
<b>Climatic class</b>					
Cold	IEC 61300-2-17	–25 °C, 96 h	delta IL <0.2 dB	pass	pass
Dry heat	IEC 61300-2-18	+70 °C, 96 h	delta IL <0.2 dB	pass	pass
Change of temperature	IEC 61300-2-22	–25/+70 °C 12 cycles	delta IL <0.2 dB	pass Type: delta 0.2 dB	pass Type: delta 0.2 dB
<b>Long-term endurance</b>					
Heat resistance	IEC 61300-2-18	+70 °C, 1000 h	delta IL <0.2 dB	pass	pass
Damp heat	IEC 61300-2-19	+40 °C at 93 %, 96 h	delta IL <0.2 dB	pass	pass

Grade Q = mean value < 0.3 dB and 99 % of all insertions < 0.6 dB.

In case of standard deviations requirements are given in brackets. Compatibility strongly depends on the quality of the purchase

<sup>1)</sup> Tested under laboratory conditions.

Measured on wavelengths 1310 and 1550 nm.

2. Specifications E-2000™ MM Connector, Patch Cable/Pigtail

	Standard	Load	Requirement	Result	
	acc. to IEC 61753-1-1 Category U			LSH 50 μm	LSH 62.5 μm
<b>Optical properties</b>					
Insertion loss (IL) [dB] against reference	IEC 61300-3-4		≤0.3	<0.3 Type: 0.2	<0.3 Type: 0.2
Insertion loss (IL) [dB] Random mated	IEC 61300-3-34		Grade M	pass Type: 0.2	pass Type: 0.2
Return loss (RL) [dB] against air patch cable	IEC 61300-3-6		≥20	>20	>20
Return loss (RL) [dB] coupled	IEC 61300-3-6		≥20	>45 Type: > 50	>45 Type: > 50
<b>Mechanical properties</b>					
Mating durability	CECC 86 275-802 IEC 61300-2-2	(500) 1000	delta IL < 0.2 dB	pass	pass
Cable retention	IEC 61300-2-4	100 N, 120 sec		pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
Fiber retention	IEC 61300-2-4	5 N, 60 sec	delta IL < 0.2 dB	pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
Vibration patch cable	IEC 61300-2-1	10 – 55 Hz, 1 octave per min, 3 axes of 15 cycles, 0.5 h/axis, amplitude 0.75 mm	delta IL < 0.2 dB	pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
Repeated bending patch cable	IEC 60794-1-E6	200 cycles –90°, 0°, +90°, 5 N	delta IL < 0.2 dB	pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
Repeated bending pigtail	IEC 60794-1-E6	200 cycles –90°, 0°, +90°, 0.2 N	delta IL < 0.2 dB	pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
Drop	IEC 61300-2-12	1.5 m, 5 x	delta IL < 0.2 dB	pass Type: delta 0.1 dB	pass Type: delta 0.1 dB
Static side load patch cable	IEC 61300-2-42	1 N, 1 h	delta IL < 0.2 dB	pass Type: delta 0.05 dB	
Static side load pigtail	IEC 61300-2-42	0.2 N, 5 min	delta IL < 0.2 dB	pass Type: delta 0.05 dB	pass Type: delta 0.05 dB
<b>Climatic class</b>					
Cold	IEC 61300-2-17	–25 °C, 96 h	delta IL < 0.2 dB	pass	pass
Dry heat	IEC 61300-2-18	+70 °C, 96 h	delta IL < 0.2 dB	pass	pass
Change of temperature	IEC 61300-2-22	–25/+70 °C 12 cycles	delta IL < 2 dB	Type: delta 1.5 dB	Type: delta 1.5 dB
<b>Long-term endurance</b>					
Heat resistance	IEC 61300-2-18	+70 °C, 1000 h	delta IL < 0.2 dB	pass	pass
Damp heat	IEC 61300-2-19	+40 °C at 93 %, 96 h	delta IL < 0.2 dB	pass	pass

Grade Q = mean value < 0.35 dB and 95 % of all insertions < 0.75 dB.

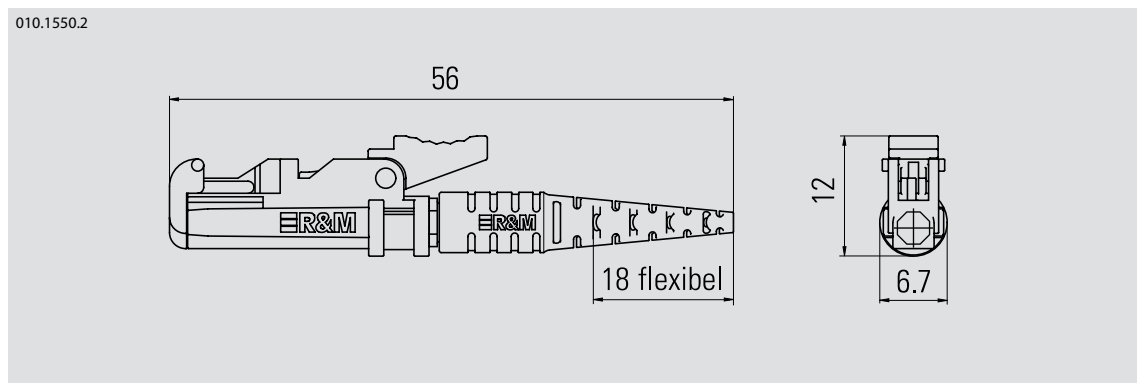
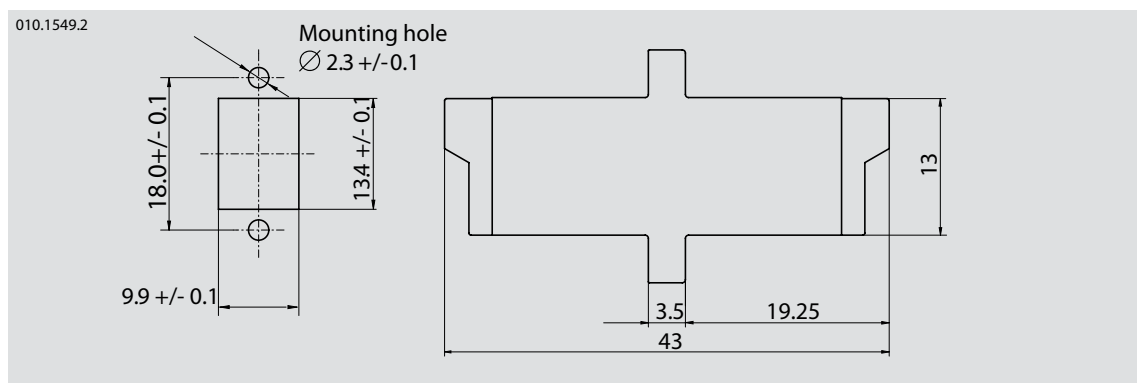
In case of standard deviation requirements are given in brackets. Compatibility strongly depends on the quality of the purchase

Measured on wavelength 1300 nm.

3. Material Connector/Adaptor E-2000™ SM/MM

	Component	Material	Colour (RAL) LSH	LSH-APC	LSH 50 µm	LSH 62.5 µm
Connector	Sleeve	Zirconia ceramic				
	Housing	PBT/UL94 V-O	Blue (5015)	Green (6018)	Black (9005)	Black (9005)
	Dust cap	PBT/UL94 V-O	Blue (5015)	Green (6018)	Black (9005)	Black (9005)
	Tension relief	TPE/UL94 V-O	Blue (5015)	Green (6018)	Black (9005)	Black (9005)
	Lever	PBT/UL94 V-O	Blue (5015)	Weiss (9010)	Orange (2003)	Black (9005)
Adaptor	Sleeve	Zirconia ceramic				
	Housing	PBT/UL94 V-O	Blue (5015)	Green (6018)	Black (9005)	Black (9005)
	Dust cap	PBT/UL94 V-O	Blue (5015)	Green (6018)	Black (9005)	Black (9005)
	Frame	PBT/UL94 V-O	Blue (5015)	White (9010)	Orange (2003)	Black (9005)

4. Dimensions(Standard CECC 86-275-801/802)



5. Colour coding

With the E-2000™ system by R&M customers are free to determine the code colours for adaptor and connector by different colours unlatching brackets themselves, allowing them to be able to identify different lines, applications, starting points, etc. quickly and easily.

Blue	RAL 5015	Black	RAL 9005
Brown	RAL 8004	Orange	RAL 2003
Green	RAL 6018	White	RAL 9010
Red	RAL 3020	Yellow	RAL 1016

In addition the code colours of connector and adaptor housings identify ferrule polish geometry. Blue (5015) means (PC) ferrule and green (6018) angled physical contact APC (HRL) ferrule.

## 6. Mechanical Coding

The mechanical coding system by R&M separates the various services mechanically, therefore effectively preventing operation within different networks or any mixing up of interactive and distributive services. The mechanical coding system includes interconnectable adaptors plus coloured unlatching levers for connectors. For additional distinction the mechanical coding is also colour coded.

Red	RAL 3020	Orange	RAL 2003
Brown	RAL 8004	Violet	RAL 4008
Yellow	RAL 1016	White	RAL 9010

Different mechanical codings cannot be interconnected, yet a connection to a not mechanically coded adaptor is always possible. Removing the unlatching levers is an additional protection against unwanted plugging out of connections.

## 7. Specifications E-2000™ Simplex Adaptor SM/MM

### 7.1 Optical properties

Description	Requirement	Standard	Result
Insertion loss (IL) [dB]	≤ 0.2 dB	IEC/EN 61300-3-4	pass

### 7.2 Mechanical properties

Mating cycles	1000 cycles	IEC/EN 61300-2-2	pass
Pull out force	70 N	IEC/EN 61300-2-6	pass

### 7.3 Climatic class

		Category	IEC/EN	
Cold	-25 °C for 96 h	U	61300-2-17	pass
	-10 °C for 96 h	C	61300-2-17	pass
Dry heat	+70 °C for 96 h	U	61300-2-18	pass
	+60 °C for 96 h	C	61300-2-18	pass
Change of temperature	-25 °C / +70 °C; 20 cycles	U	61300-2-22	pass
	-10 °C / +60 °C; 5 cycles	C	61300-2-22	pass

### 7.4 Long-term endurance

Heat resistance	+70 °C for 1000 h	IEC	61300-2-18	pass
Damp heat	+40 °C at 93 % r.F. for 21 days	EN	61300-2-19	pass
	+40 °C at 93 % r.F. for 96 h	IEC	61300-2-19	pass

### 7.5 Material

Description	Material	Colour (RAL)	
		LSH	LSH-APC 8°
Sleeve	Zirconia ceramic		
Housing	PBT/UL94 V-O	Blue (5015)	Green (6018)
Dust cap	PBT/UL94 V-O	Blue (5015)	Green (6018)

### 7.6 Compatibility

Compatibility with other manufacturers is confirmed in conformance with CECC 86 275-801 /802 and EN 186270 Type LSH.

# ST Connector

## Technical Specification



This specification covers the requirement of the ST Connector for SM and MM applications.

### APPLICATIONS

- Long distance telecommunications
- Fibre optic active components
- Test and measure instruments
- CATV

### FEATURES

- Low insertion loss
- Environmental stable
- Easy to handle
- Easy to assembly

### MODELS

The ST connector is available for PC applications.

The boot can be chosen between the following standard colours:

SM:

- Yellow (Standard for 3 mm model)

MM:

- Black (Standard for 3 mm model)

*For MM duplex patch cords standard will be one black and one red boot for each side*



## OPTICAL CHARACTERISTICS

### Typical Insertion Loss [dB] at 1310 nm

SM	MM
0.15	0.25

### Return Loss [dB]

	PC	SPC
SM	> 40	> 45

## MECHANICAL CHARACTERISTICS

- Max tensile load of cable pulling: 120 N
- Corrosion resistant body

## ENVIRONMENTAL SPECIFICATIONS

	min	type	max
Operating Temperature [°C]	- 20	+ 25	+ 60
Storage Temperature [°C]	- 25	+ 25	+ 80