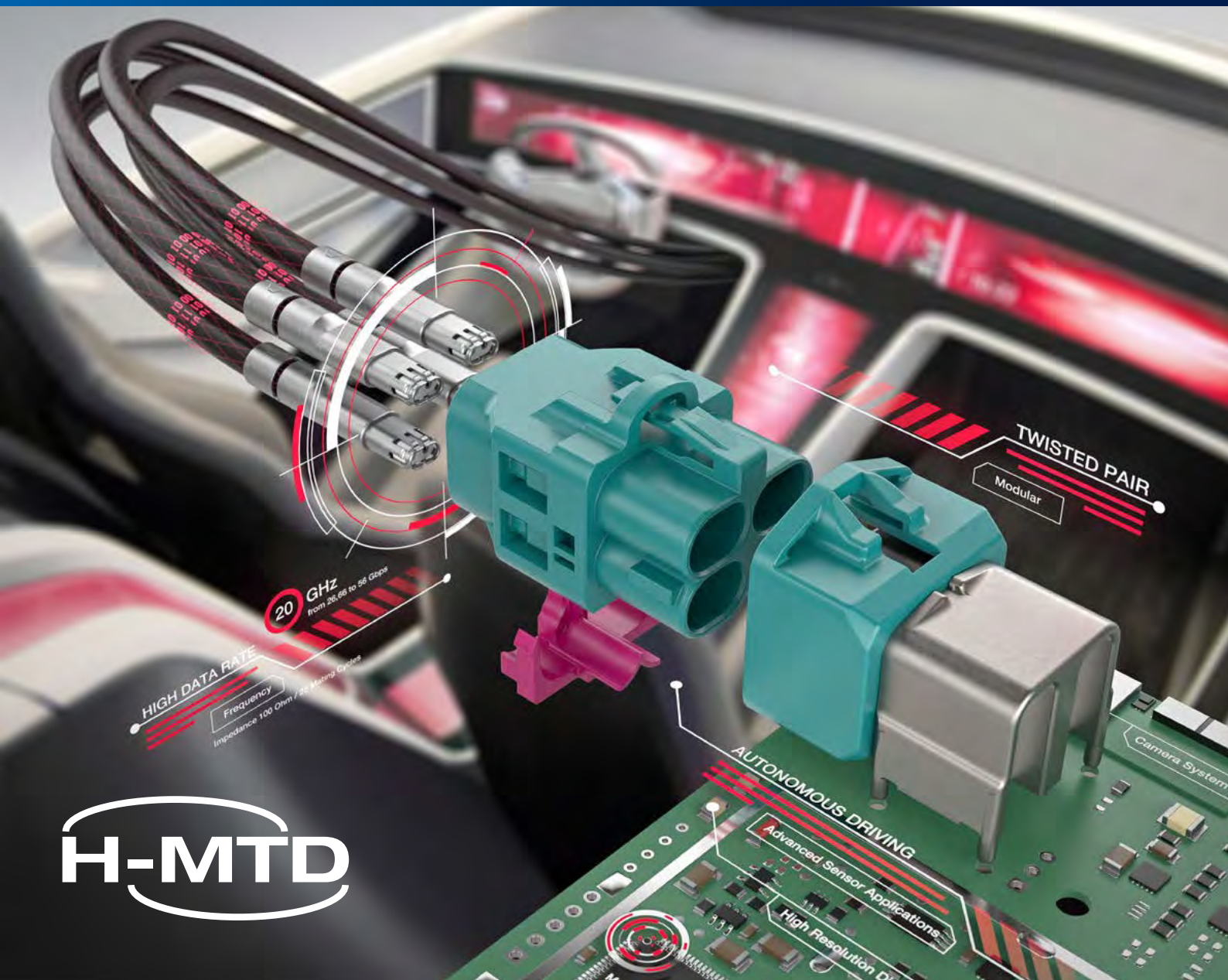
Rosenberger

System for Frequencies up to 20 GHz and Data Transmission up to 56 Gbps

H-MTD® Products
High-Speed Modular Twisted-Pair Data

AUTOMOTIVE



Rosenberger Automotive – A Synonym for Quality and Innovation

On the following pages we present the high-quality Rosenberger H-MTD® connectors developed in our Automotive Business Area to fulfill the tough requirements of the automotive industry.

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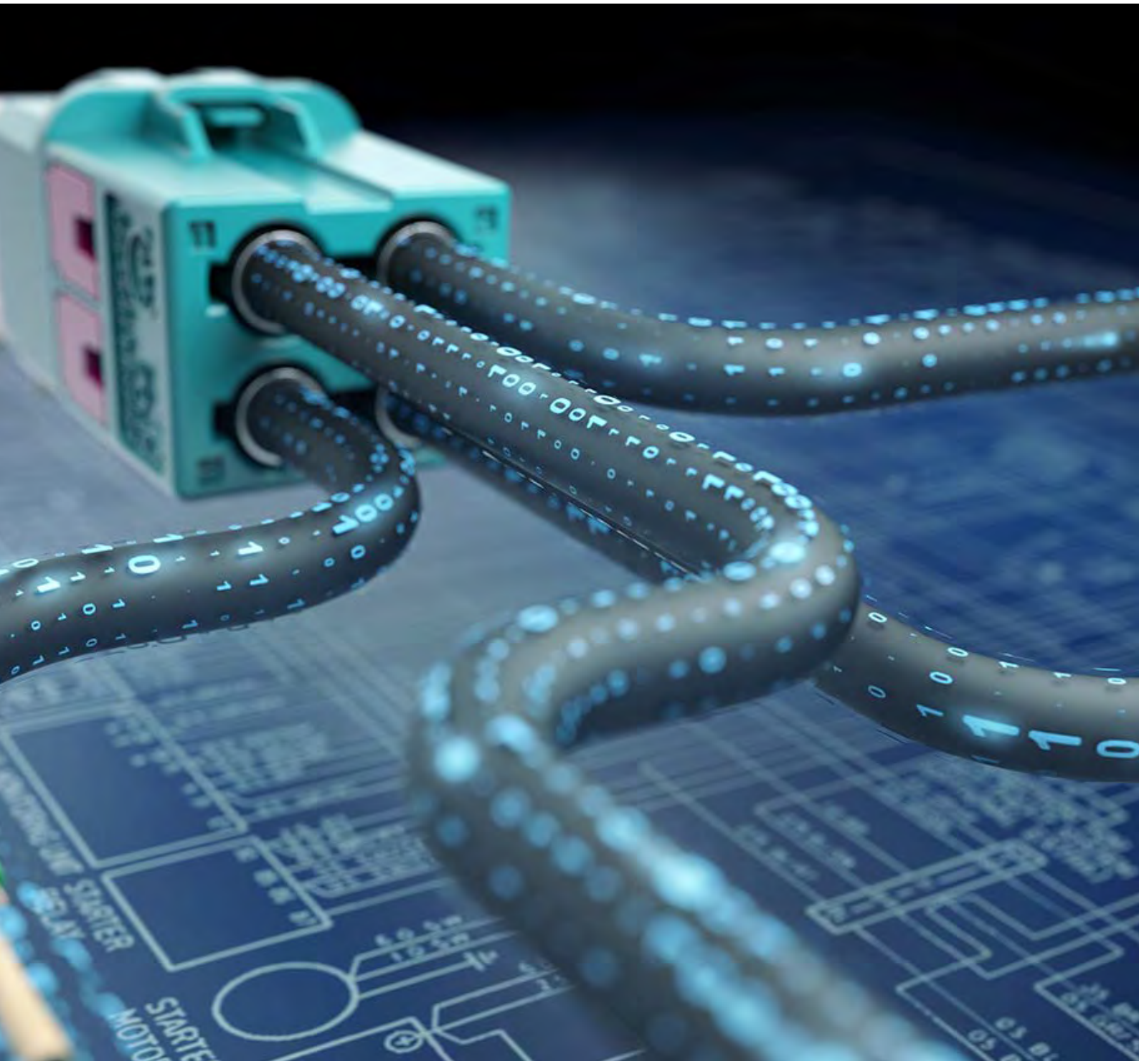
The Rosenberger online catalog contains the current Rosenberger H-MTD® product range with specific details, including data sheets, assembly instructions, and panel piercings.

www.rosenberger.com/ok/h-mtd

Rosenberger Automotive

At Rosenberger, we firmly believe in developing technology for the future. We are currently working on products and solutions that will shape our lives in the future.

We want to get faster and smarter in what we do and how we do it. Advanced driver assistance systems, connected car technology, electric mobility, infotainment systems – Rosenberger is extremely committed to designing innovative connector systems for future automotive electronics.



In 2000, Rosenberger started working in the automotive sector, designing and producing customized and standard products for these specific markets.

Rosenberger Automotive is a specialist development partner when it comes to integrating connector designs and customer-specific solutions with the highest quality and best performance – while continuing to meet customer price targets.

The contact systems have been specially designed to fulfill the tough requirements of the automotive industry. From the beginning, Rosenberger has developed a close and open relationship with its customers.

The priority in the most automotive applications, such as autonomous driving and driver assistance systems, is to ensure safety. It is necessary to determine exact positions, continuously calculate routes, and detect and classify objects. High data volumes from several cameras, various sensors, and navigation sources must be combined and transported for this purpose – in real time.

Application Areas

- Autonomous driving
- Driver assistance systems
- Navigation
- Infotainment
- Rear-entertainment
- Internet & mobile communication
- "WiGig" (Wireless Gigabit)

H-MTD® Product Overview

Rosenberger H-MTD® is a differential connector system for high-speed data transmission of up to 20 GHz or 56 Gbps, contained in a compact yet robust automotive grade housing.

Apart from ensuring high-bitrate data transmission and savings on installation space and weight, a further major advantage of this connector system is its modularity, providing the flexibility to support a wide range of Ethernet applications and industry protocols.

The application field of the Rosenberger H-MTD® is countless as it can be used with a variety of different cables including Shielded Twisted Pair, Unshielded Twisted Pair and new High-Performance cables. With H-MTD® the customer can count on an interface that accommodates future vehicle networks, applications and protocols.

Product Range

Cable and PCB connectors, modular housings, cable assemblies, waterproof types:

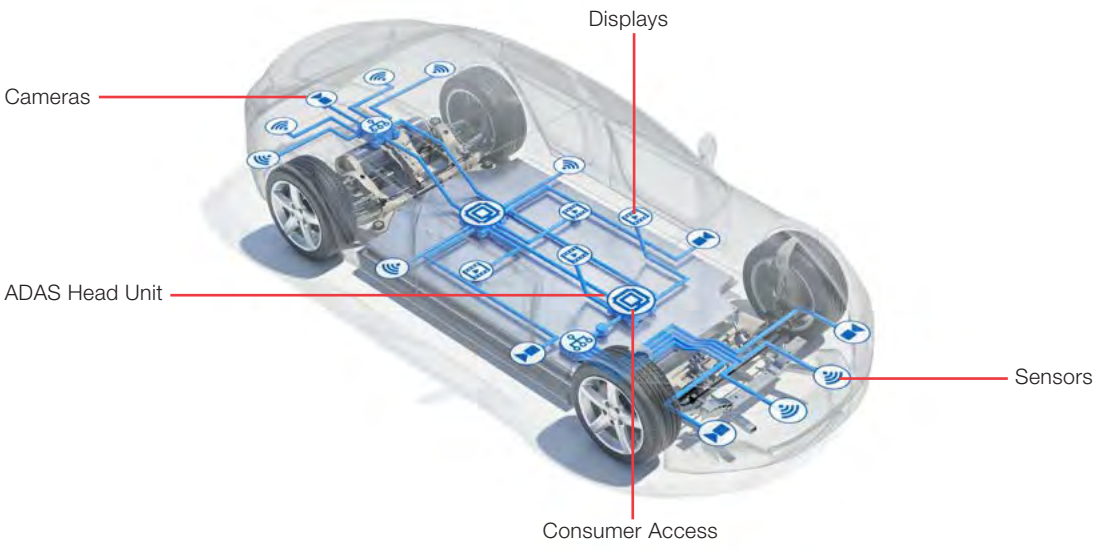
- Rosenberger H-MTD® single
- Rosenberger H-MTD® double
- Rosenberger H-MTD® quad
- Rosenberger H-MTD® six
- Rosenberger H-MTD®+6 Power pins
- Rosenberger H-MTD®e

Mechanical Properties

- Primary and secondary lock
- Crimp connection
- High cable retention force
- High coding efficiency (different codings on plastic housings to avoid misconnections)
- No contact pin damage possible
- Scoop proof
- Optional Connector Position Assurance (CPA)

Applications

- Camera systems 4k and higher
- Driver assistance systems
- Autonomous driving
- High resolution displays
- Rear seat entertainment
- Open to all protocols (e.g.)
  - Ethernet
    - 100 Mbps
    - 1 Gbps
    - Multi-Gigabit
  - LVDS
  - APIX 3
  - PCIe Gen3
  - FPD4



H-MTD® Connectors

The Rosenberger H-MTD® connection system meets all electrical and mechanical automotive requirements. It features mechanical keying, latching, color code options, further locking features and a minimum size combined with pleasing ergonomics.

H-MTD®+6 Connectors

Rosenberger H-MTD®+6 power pin connectors – further variants with additional pins (MQS contacts) for power supply purposes.

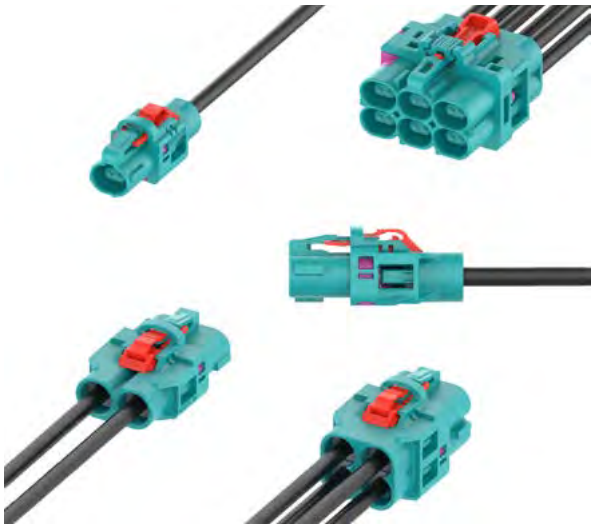
H-MTD®e Unshielded Connectors

Rosenberger H-MTD®e connectors can be used in a variety of high-speed data connection applications. including unshielded Automotive Ethernet TC2 and TC9. Highly cost-effective, they fulfill the exacting requirements of the automotive industry and are fully compatible with standard Rosenberger H-MTD® connectors.

Connector Position Assurance – CPA prevents Unintentional Disengagement

High-speed data connectors are increasingly required in safety applications such as autonomous driving and driver assistance systems. In response, Rosenberger has developed an optional CPA (Connector Position Assurance) solution which improves connection reliability.

The CPA cannot be activated if the connector has not been completely mated. When aligned correctly the CPA can be closed. Additional products are available on request.



H-MTD® Number Codes

E6	K	1	0A –	1	xx	Z5 –	y
							Coding
							A Jet black / Graphite black
							B Cream white
							C Signal blue / Light blue
							D Claret violet
							E Leaf green / May green
							F Nut brown
							Z Water blue (neutral coding for coding A – F)
							G Blue grey
							H Heather violet
							J Beige
							K Curry
							L Yellow green
							M Pastel orange
							N Pastel green
							O Light green (neutral coding for coding G – R)
							P Camine Red
							R Signal Blue
							y Placeholder for required coding
						Plating	
					01-Z9 Cable group		
					00 Blank		
					0M Surface mount device		
					xx Blank cable group		
				1 Crimp			
				4 PCB mounting			
			Successive number				
		1 Straight connector					
		2 Right angle connector					
	K Female jack						
	S Male plug						
	W Tools						
	Z Plastic housings and accessories						
Connector series							
E6 Rosenberger H-MTD®							
E9 Rosenberger H-MTD®e							
99 Special products power pin (Rosenberger H-MTD®+6)							

H-MTD® Shielded Cable Groups

Cable Group	Impedance	Cable Type
CA	100 Ω	GG 2Speed® 251
BZ	100 Ω	LEONI Dacar® 647-4

H-MTD®e Unshielded Cable Groups

Cable Group	Impedance	Cable Type
AQ	100 Ω	e.g. GG 2Speed® 132, LEONI Dacar® 676

H-MTD® Plating Code

Outer Contact

Code	Plating	Symbol	Layer thickness	Magnetic properties
S	Stainless Steel			
T	Tin/Lead loadfree	Sn	min. 1.50 µm	non magnetic
X	Placeholder, no outer contact			
Z	Special Plating			

Center Contact

Code	Plating	Symbol	Layer thickness	Magnetic properties
5	Gold	Au	min. 0.12 µm	non magnetic

The used platings of outer and center contacts as well as the cable group of Rosenberger connectors can be identified by each part number.

H-MTD® Technical Data

Technical Data Rosenberger H-MTD® (Code E6)

Applicable Standards

Interface according to	Rosenberger H-MTD® RN_121-00 Rosenberger H-MTD® RN_121-01 Rosenberger H-MTD® RN_121-02 Rosenberger H-MTD® RN_121-04 Rosenberger H-MTD® RN_121-06 Rosenberger H-MTD® RN_121-16 Rosenberger H-MTD® RN_121-26 Rosenberger H-MTD® RN_128-01 Rosenberger H-MTD® RN_128-02 Rosenberger H-MTD® RN_128-04

Electrical Data

Impedance	100 Ω
Frequency range depending on cable type	0.01 GHz to 20 GHz
Return loss	≥ 30 dB, 0.01 GHz to 3 GHz ≥ 25 dB, 3 GHz to 6 GHz ≥ 20 dB, 6 GHz to 10 GHz ≥ 15 dB, 10 GHz to 15 GHz ≥ 12 dB, 15 GHz to 20 GHz
Near end crosstalk	≥ 60 dB, 0.01 GHz to 7.5 GHz ≥ 45 dB, 7.5 GHz to 20 GHz
Far end crosstalk	≥ 60 dB, 0.01 GHz to 7.5 GHz ≥ 45 dB, 7.5 GHz to 20 GHz
Insulation resistance	≥ 1 x 10^2 MΩ
Signal contact resistance	≤ 10 mΩ
Outer contact resistance	≤ 7.5 mΩ
Test voltage	250 V DC
Working voltage	60 V DC
Contact current depending on cable type	≤ 1.5 A DC @ 85 °C ambient temperature

* Electrical requirements are mandatory up to the maximum frequency specified by cable testing (according to data sheet). Data is for informational purposes only when the maximum frequency is surpassed.

Mechanical Data

Mating cycles (standard, non waterproof)	≥ 25
Mating cycles (waterproof)	≥ 5
Engagement force	≤ 45 N*
Engagement force waterproof	≤ 45 N*
Retention force latch	≥ 110 N
Retention force primary lock	≥ 80 N
Retention force secondary lock	≥ 120 N
Polarization feature effectiveness	≥ 150 N*

* depends on connector

Environmental Data

Temperature range	-40 °C to +105 °C
Thermal shock	DIN EN 60068-2-14
Humidity	DIN EN 60068-2-30 @ +40 °C
Dry heat	DIN EN 60068-2-2 @ +105 °C
Vibration	DIN EN 60068-2-64
Mechanical shock	DIN EN 60068-2-27
RoHS	compliant

Materials

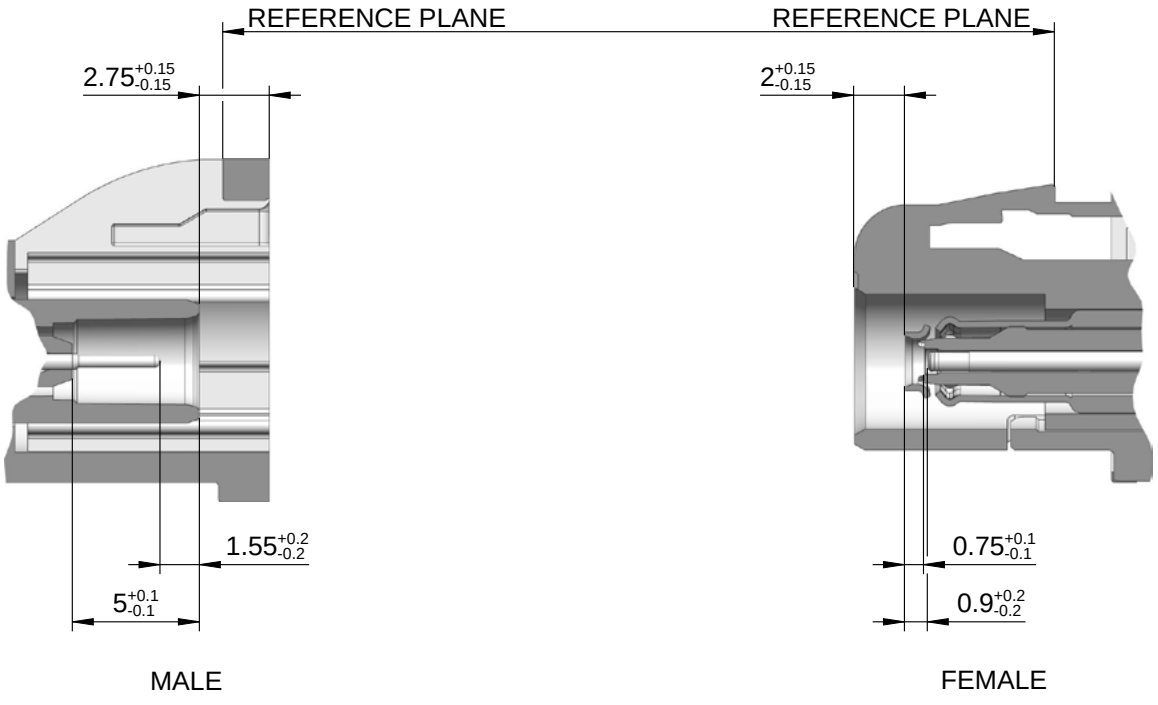
Outer contact	CuZn, CuSn (Brass, Bronze), Zinc Alloy, or equivalent Test Adaptors Stainless Steel
Signal contacts	CuZn, CuSn (Brass, Bronze), or equivalent
Dielectric	PA, LCP, or equivalent
Gasket	Silicone, Rubber, or equivalent
Crimping ferrule	CrNi (Steel), or equivalent
Plastic housings and secondary lock	PA, PBT, or equivalent

Platings

Outer contact	Tin, Special Plating
Signal contact	Gold

Rosenberger connectors fulfill in principle the indicated data of the Technical Data. Individual values of connectors may deviate depending upon application, design, type of cable, assembly method and execution. Specific data sheets for particular products can be provided on request by your Rosenberger sales partner.

Interface Dimensions



H-MTD® Connectors

PCB Connectors – Pin-in-Paste

Straight Plug, Single

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S10A-40MT5-y	pin-in-paste 2 signal pins	MB 821	see coding table	160 tape & reel	

Straight Plug, Six

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S10F-40MT5-y	pin-in-paste 6x2 signal pins	MB 689	see coding table	100 tape & reel	

y: Please fill-in required coding, availability of the specific coding on request

Right Angle Plug, Single

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S20A-40MT5-y	pin-in-paste 2 signal pins	MB 633	see coding table	225 tape & reel	
E6S22A-40MT5-y	Cable up pin-in-paste 2 signal pins	MB 633	see coding table	320 tape & reel	
E6S218-40MT5-y	Cable up Edge mount pin-in-paste 2 signal pins	MB 693	see coding table	260 tape & reel	

Right Angle Plug, Double

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S20B-40MT5-y	pin-in-paste 2x2 signal pins	MB 666	see coding table	155 tape & reel	

Right Angle Plug, Quad

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S20D-40MT5-y	pin-in-paste 4x2 signal pins	MB 869	see coding table	95 tape & reel	

Right Angle Plug, Six

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S20F-40MT5-y	pin-in-paste 6x2 signal pins	MB 653	see coding table	on request	

y: Please fill-in required coding, availability of the specific coding on request

Cable Connectors

Straight Plug, Single

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E6S10A-1xxZ5-y	2 signal pins	CA, BZ	MA E6V004 MA E6V008	see coding table	on request	
E6S10C-1xxZ5-y	2 signal pins with slot for positioning clip	CA, BZ	MA E6V004 MA E6V008	see coding table	on request	

xx: Please fill-in required cable group, y: Please fill-in required coding, availability of the specific coding on request

Straight Jack, Single

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E6K10A-1xxZ5-y	2 signal pins	CA, BZ	MA E6V003 MA E6V007	see coding table	on request	

Straight Jack, Double

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E6K10B-1xxZ5-y	2x2 signal pins	CA, BZ	MA E6V003 MA E6V007	see coding table	on request	

Straight Jack, Quad

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E6K10D-1xxZ5-y	4x2 signal pins	CA, BZ	MA E6V003 MA E6V007	see coding table	on request	

Straight Jack, Six

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E6K10F-1xxZ5-y	6x2 signal pins	CA, BZ	MA E6V003 MA E6V007	see coding table	on request	

xx: Please fill-in required cable group, y: Please fill-in required coding, availability of the specific coding on request

H-MTD® Connectors – Waterproof

PCB Connectors – Pin-in-Paste

Straight Plug, Single, Waterproof

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S14A-40MT5-y	waterproof pin-in-paste 2 signal pins	MB 821	see coding table	on request	

Straight Plug, Double, Waterproof

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S14B-40MT5-y	waterproof pin-in-paste 2x2 signal pins	MB 797	see coding table	on request	

Right Angle Plug, Single, Waterproof

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S24A-40MT5-y	waterproof pin-in-paste 2 signal pins	MB 780	see coding table	on request	

Right Angle Plug, Double, Waterproof

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S24B-40MT5-y	waterproof pin-in-paste 2x2 signal pins	MB 782	see coding table	on request	

Right Angle Plug, Quad, Waterproof

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
E6S24D-40MT5-y	waterproof pin-in-paste 4x2 signal pins	MB 725	see coding table	on request	

y: Please fill-in required coding, availability of the specific coding on request

Cable Connectors

Straight Plug, Single, Waterproof

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E6S14E-1xxZ5-y	waterproof 2 signal pins with slot for positioning clip	CA, BZ	on request	see coding table	on request	

Straight Jack, Single, Waterproof

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E6K14A-1xxZ5-y	waterproof 2 signal pins	CA, BZ	on request	see coding table	on request	

Straight Jack, Double, Waterproof

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E6K14B-1xxZ5-y	waterproof 2x2 signal pins	CA, BZ	MA_E6V005	see coding table	on request	

Straight Jack, Quad, Waterproof

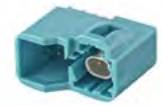
Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E6K14D-1xxZ5-y	waterproof 4x2 signal pins	CA, BZ	on request	see coding table	on request	

xx: Please fill-in required cable group, y: Please fill-in required coding, availability of the specific coding on request

H-MTD®+6 Power Pin Connectors

PCB Connectors – Pin-in-Paste

Straight Plug, Single +6

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
99S1HC-40MT5-y	pin-in-paste 2 signal pins 6 power pins	MB 815	see coding table	125 tape & reel	

Straight Plug, Double +6

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
99S1HG-40MT5-y	pin-in-paste 2x2 signal pins 6 power pins	MB 798	see coding table	110 tape & reel	

Right Angle Plug, Single +6

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
99S2HC-40MT5-y	pin-in-paste 2 signal pins 6 power pins	MB 756	see coding table	135 tape & reel	

Right Angle Plug, Double +6

Rosenberger No.	Remarks	Panel Piercing / PCB Layout	Coding H-MTD®	Packing Unit	Product
99S2HG-40MT5-y	pin-in-paste 2x2 signal pins 6 power pins	MB 757	see coding table	120 tape & reel	

y: Please fill-in required coding, availability of the specific coding on request

Cable Connectors

Straight Jack, Single +6

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
99K1HC-1xxZ5-y	2 signal pins 6 power pins	CA, BZ	MA 99V062	see coding table	on request	

Straight Jack, Double +6

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
99K1HG-1xxZ5-y	2x2 signal pins 6 power pins	CA, BZ	MA 99V062	see coding table	on request	

xx: Please fill-in required cable group, y: Please fill-in required coding, availability of the specific coding on request

H-MTD®e Technical Data

Technical Data H-MTD®e (Code E9)

Applicable Standards

Interface according to	Rosenberger H-MTD® RN_121-00 Rosenberger H-MTD® RN_121-01 Rosenberger H-MTD® RN_121-02 Rosenberger H-MTD® RN_121-04 Rosenberger H-MTD® RN_121-06 Rosenberger H-MTD® RN_121-16 Rosenberger H-MTD® RN_121-26 Rosenberger H-MTD® RN_128-01 Rosenberger H-MTD® RN_128-02 Rosenberger H-MTD® RN_128-04

Electrical Data

Impedance	100 Ω
Frequency range depending on cable type	DC to 1 GHz
Return loss	$\geq \begin{pmatrix} 38 & 1 \leq f < 75 \\ 20 - 20\log\left(f/600\right) & 75 \leq f \leq 600 \end{pmatrix} dB^*$
Insertion loss	$\leq \left(0.01\sqrt{f}\right) dB^*$
Mode conversion loss	$\geq \begin{pmatrix} 55 & 10 \leq f \leq 80 \\ 77 - 11.51\log(f) & 80 < f \leq 600 \end{pmatrix} dB^*$
Skew (between signal contacts) straight connectors Skew (between signal contacts) right angle connectors	≤ 5 ps ≤ 25 ps
Near end crosstalk	≤ -30 dB, DC to 100 MHz
Far end crosstalk	≤ -35 dB, DC to 100 MHz
Insulation resistance	≥ 1 x 10^2 MΩ
Signal contact resistance	≤ 10 mΩ
Test voltage	250 V DC
Working voltage	60 V DC
Contact current depending on cable type	≤ 1.5 A DC @ 85 °C ambient temperature

* f in MHz

Mechanical Data

Mating cycles (standard, non waterproof)	≥ 25
Mating cycles (waterproof)	≥ 5
Engagement force	≤ 45 N*
Engagement force waterproof	≤ 45 N*
Retention force latch	≥ 110 N
Retention force primary lock	≥ 80 N
Retention force secondary lock	≥ 120 N
Polarization feature effectiveness	≥ 150 N

* depends on connector

Environmental Data

Temperature range	-40 °C to +105 °C
Thermal shock	DIN EN 60068-2-14
Humidity	DIN EN 60068-2-30 @ +40 °C
Dry heat	DIN EN 60068-2-2 @ +105 °C
Vibration	DIN EN 60068-2-64
Mechanical shock	DIN EN 60068-2-27
RoHS	compliant

Materials

Signal contacts	CuZn, CuSn (Brass, Bronze), or equivalent
Dielectric	PA, LCP, or equivalent
Gasket	Silicone, Rubber, or equivalent
Crimping ferrule	CrNi (Steel), or equivalent
Plastic housings and secondary lock	PA, PBT, or equivalent

Platings

Signal contacts	Gold

Rosenberger connectors fulfill in principle the indicated data of the Technical Data. Individual values of connectors may deviate depending upon application, design, type of cable, assembly method and execution. Specific data sheets for particular products can be provided on request by your Rosenberger sales partner.

H-MTD®e Connectors

H-MTD®e Unshielded Connectors

Rosenberger H-MTD®e connectors can be used in a variety of high-speed data connection applications, including unshielded Automotive Ethernet TC2 and TC9. Highly cost-effective, they fulfill the exacting requirements of the automotive industry and are fully compatible with standard Rosenberger H-MTD® connectors.

Straight Jack, Single

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E9K10A-1xxX5-y	1x2 signal pins	AQ	MA_E9V001	see coding table	on request	

Straight Jack, Double

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E9K10B-1xxX5-y	2x2 signal pins	AQ	MA_E9V001	see coding table	on request	

Straight Jack, Quad

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E9K10D-1xxX5-y	4x2 signal pins	AQ	MA_E9V001	see coding table	on request	

Straight Jack, Six

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E9K10F-1xxX5-y	6x2 signal pins	AQ	MA_E9V001	see coding table	on request	

xx: Please fill-in required cable group, y: Please fill-in required coding, availability of the specific coding on request

H-MTD®e Connectors – Waterproof

Straight Jack, Single, Waterproof

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E9K14A-1xxX5-y	1x2 signal pins	AQ	MA_E9V001	see coding table	on request	

Straight Jack, Double, Waterproof

Rosenberger No.	Remarks	Cable Group	Assy Inst.	Coding H-MTD®	Packing Unit	Product
E9K14B-1xxX5-y	2x2 signal pins	AQ	on request	see coding table	on request	

H-MTD® Test PC-Boards

Testboard H-MTD®

Rosenberger No.	Remarks	Connectors	Packing Unit	Product
PCB-T2003-SB-01	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S10A-40MT5-y; 4x RPC-2.92 female 02K721-40MS3	1	
PCB-T3503-SB-01	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S10F-40MT5-y; 4x RPC-2.92 female 02K721-40MS3	1	
PCB-S3401-SB-01	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S20A-40MT5-y; 4x RPC-2.92 female 02K721-40MS3	1	
PCB-T0601-SB-01	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S20B-40MT5-y; 6x RPC-2.92 female 02K721-40MS3	1	
PCB-T0602-SB-01	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S20D-40MT5-y; 10x RPC-2.92 female 02K721-40MS3	1	
PCB-T0704-SB-02	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S20F-40MT5-y; 12x RPC-2.92 female 02K721-40MS3	1	

Testboard H-MTD®, Waterproof

Rosenberger No.	Remarks	Connectors	Packing Unit	Product
PCB-T2003-SB-02	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S14A-40MT5-y waterproof; 4x RPC-2.92 female 02K721-40MS3	1	
PCB-S3401-SB-02	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S24A-40MT5-y waterproof; 4x RPC-2.92 female 02K721-40MS3	1	
PCB-T0601-SB-02	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S24B-40MT5-y waterproof; 6x RPC-2.92 female 02K721-40MS3	1	
PCB-T0602-SB-02	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD® male E6S24D-40MT5-y waterproof; 10x RPC-2.92 female 02K721-40MS3	1	

Testboard H-MTD® +6 Power Pin

Rosenberger No.	Remarks	Connectors	Packing Unit	Product
PCB-T2003-SB-03	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD®+6 male 99S1HC-40MT5-y; 6x SMA female 32K101-400L5; 4x RPC-2.92 female 02K721-40MS3	1	
PCB-T2003-SB-04	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD®+6 male 99S1HG-40MT5-y; 6x SMA female 32K101-400L5; 6x RPC-2.92 female 02K721-40MS3	1	
PCB-T1401-SB-01	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD®+6 male 99S2HC-40MT5-y; 6x SMA female 32K101-400L5; 4x RPC-2.92 female 02K721-40MS3	1	
PCB-T1401-SB-02	Impedance 100 Ω Frequency range DC to 10 GHz	1x H-MTD®+6 male 99S2HG-40MT5-y; 6x SMA female 32K101-400L5; 6x RPC-2.92 female 02K721-40MS3	1	

H-MTD® Test Adaptors

Precision Adaptors with H-MTD® Housing

Rosenberger No.	Remarks	Connectors	Packing Unit	Product
02K3E6-K00S5	Y-Adaptor with H-MTD® housing single	RPC-2.92 female H-MTD® female	1	
02S3E6-K00S5	Y-Adaptor with H-MTD® housing single	RPC-2.92 male H-MTD® female	1	
02K3E6-S00S5	Y-Adaptor with H-MTD® housing single	RPC-2.92 female H-MTD® male	1	
02S3E6-S00S5	Y-Adaptor with H-MTD® housing single	RPC-2.92 male H-MTD® male	1	

Precision Adaptors without H-MTD® Housing for Universal Use

Rosenberger No.	Remarks	Connectors	Packing Unit	Product
02K3E6-K01S5	Y-Adaptor w/o H-MTD® housing	RPC-2.92 female H-MTD® female	1	
02S3E6-K01S5	Y-Adaptor w/o H-MTD® housing	RPC-2.92 male H-MTD® female	1	
02K3E6-S01S5	Y-Adaptor w/o H-MTD® housing	RPC-2.92 female H-MTD® male	1	
02S3E6-S01S5	Y-Adaptor w/o H-MTD® housing	RPC-2.92 male H-MTD® male	1	

H-MTD® Cable Assemblies

Rosenberger offers a comprehensive range of standard cable assemblies as well as customized solutions for high speed data transmissions.

Cable variants with 0.14 mm^2 center contact sections are available. There are fully shielded cable variants for Rosenberger H-MTD®. Additional unshielded cables for the cost-optimized Rosenberger H-MTD®e are available.

Custom specific versions on request, please feel free to contact us.

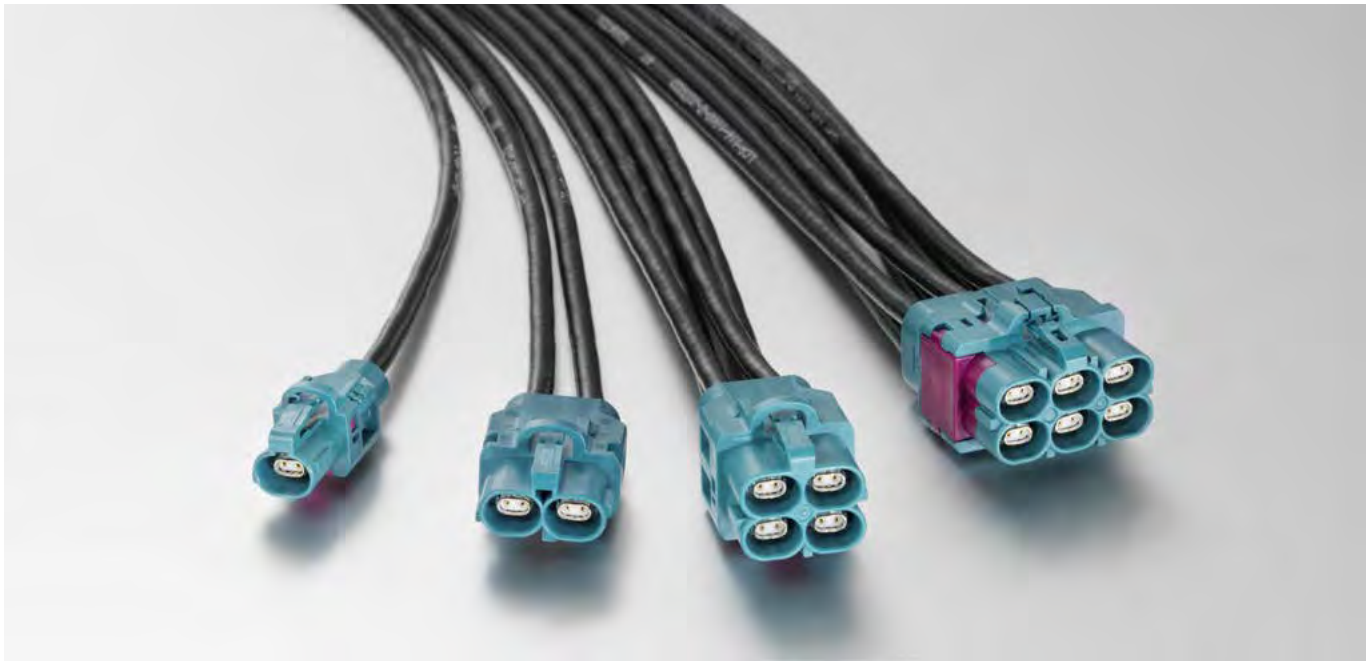
Rosenberger Number Code – Cable Assemblies Rosenberger H-MTD®/H-MTD®e

L	xx-	101-	xxxx-	-y-y	(_flex)
					add. if flexible cable
				Coding Side A and B	
				A Jet Black / Graphite Black	
				B Cream White	
				C Signal Blue / Light Blue	
				D Claret Violet	
				E Leaf Green / May Green	
				F Nut Brown	
				Z Water Blue (Neutral Coding)	
				G Blue Grey	
				H Heather Violet	
				J Beige	
				K Curry	
				L Yellow Green	
				M Pastel Orange	
				O Light Green (Neutral Coding for special use)	
				y Placeholder for required coding	
			Length in mm		
		Successive number,			
		Include assembled connectors,			
		for details please see data sheet			
	Cable group				
	AQ				
	BZ				
	CA				
Cable assembly					

Cable Assemblies H-MTD®

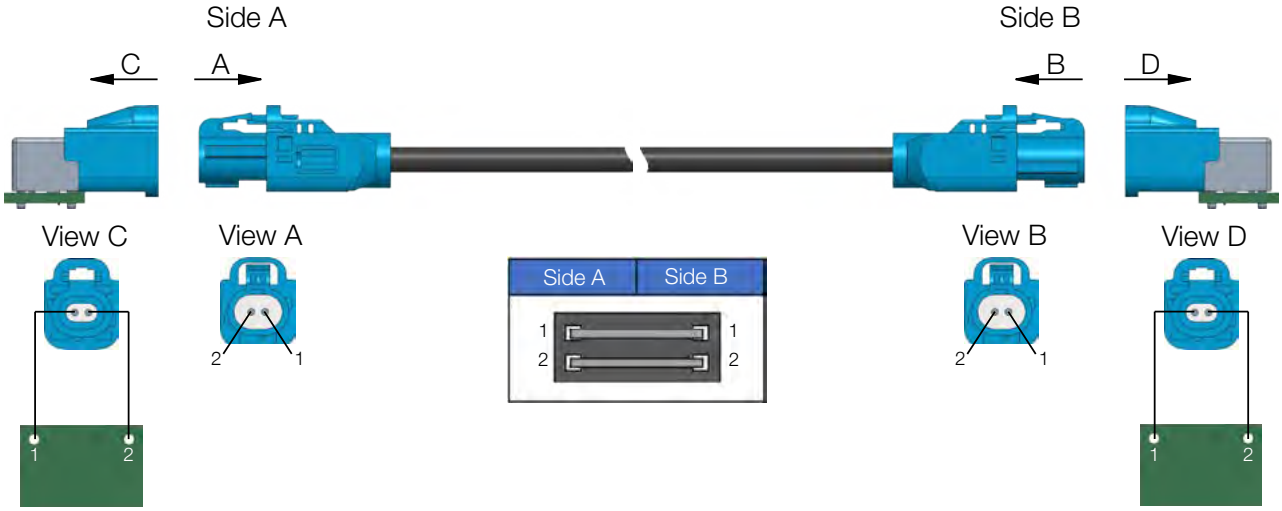
Rosenberger No.	Remarks	Cable Group	Side A	Side B	Product
LCA-101-xxxx-y-y	xxxx: length in mm y-y: coding side A/B (see table)	CA	E6K10A-1CA Jack, straight	E6K10A-1CA Jack, straight	
LCA-102-xxxx-y-y	xxxx: length in mm y-y: coding side A/B (see table)	CA	E6K10A-1CA Jack, straight	E6S10A-1CA Plug, straight	
LCA-103-xxxx-y-y	xxxx: length in mm y-y: coding side A/B (see table)	CA	E6S10A-1CA Plug, straight	E6K10A-1CA Jack, straight	
LCA-104-xxxx-y-y	xxxx: length in mm y-y: coding side A/B (see table)	CA	E6S10A-1CA Plug, straight	E6S10A-1CA Plug, straight	

xxxx: length in mm
-y: coding side A/B see table

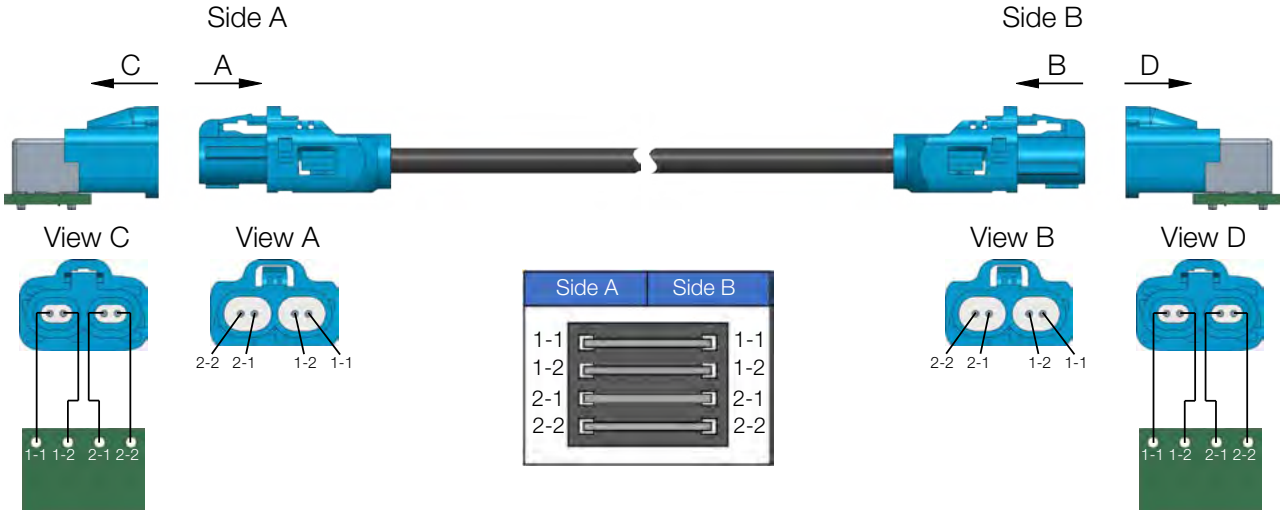


H-MTD® Pinnings

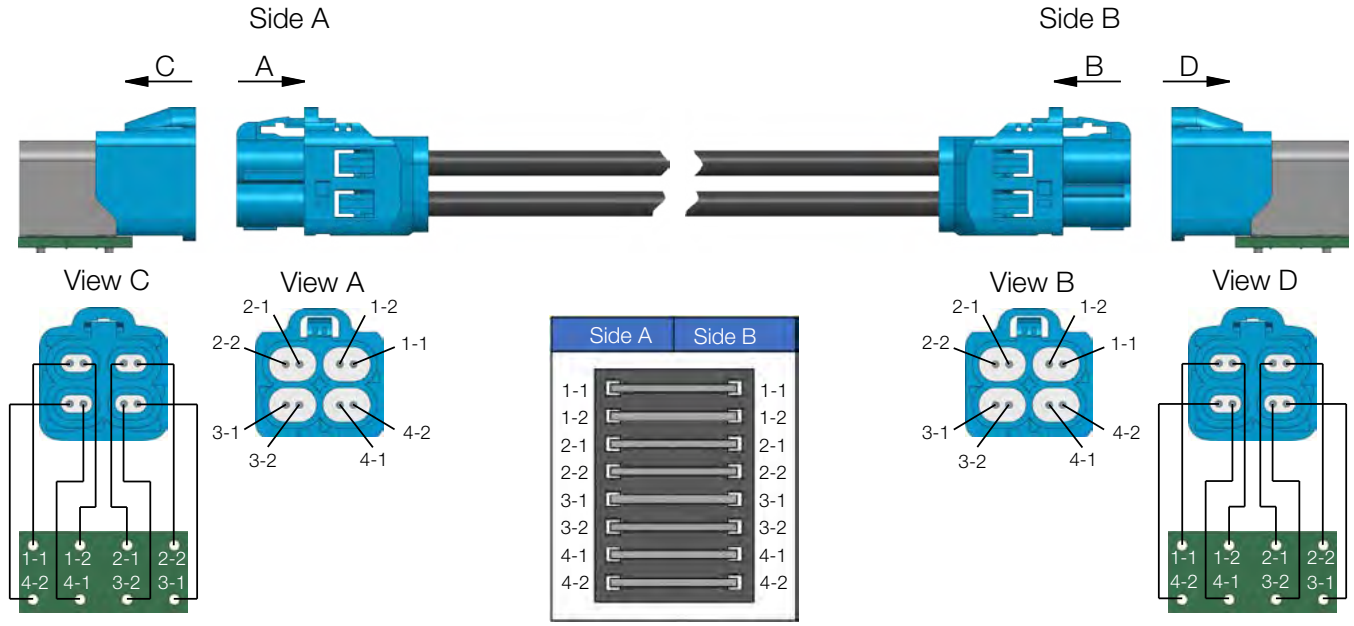
The standard pinning of the Rosenberger H-MTD® is defined in the Rosenberger norm RN_143-XX (XX defining the port quantity)



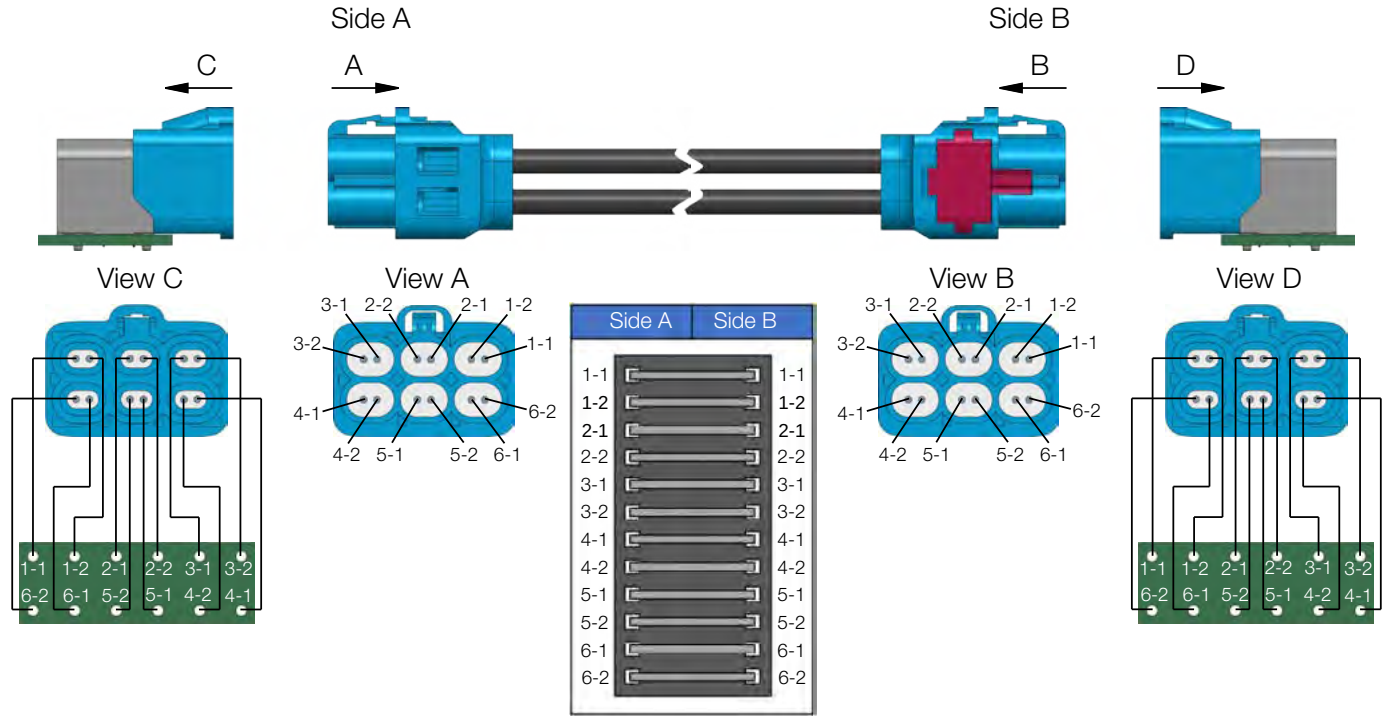
Pinning according Rosenberger norm RN_143-01



Pinning according Rosenberger norm RN_143-02



Pinning according Rosenberger norm RN_143-04



Pinning according Rosenberger norm RN_143-06

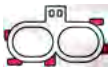
H-MTD® Codings

Coding H-MTD® Single, H-MTD®+6 Single

Coding	Jack	Plug	Color / RAL-No. (similar)
A			Jet Black / 9005
B			Pure White / 9010
C			Light Blue / 5012
D			Claret Violet / 4004
E			May Green / 6017
F			Nut Brown / 8011
G			Platinum Gray / 7036
H			Light Pink / 3015
J			Beige / 1001
K			Curry / 1027
L			Yellow Green / 6018
M			Pastel Orange / 2003
O (neutral coding for coding G – M)			Light Green / 6027
Z (neutral coding for coding A – F)			Water Blue / 5021

Availability of specific codings upon request. Color of the plastic housing defined in accordance to the listed RAL colors. Minor color differences due to manufacturing possible.

Coding H-MTD® Double, H-MTD®+6 Double

Coding	Jack	Plug	Color / RAL-No. (similar)
A			Jet Black / 9005
B			Pure White / 9010
C			Light Blue / 5012
D			Claret Violet / 4004
E			May Green / 6017
F			Nut Brown / 8011
G			Platinum Gray / 7036
H			Light Pink / 3015
J			Beige / 1001
K			Curry / 1027
L			Yellow Green / 6018
M			Pastel Orange / 2003
O (neutral coding for coding G – M)			Light Green / 6027
Z (neutral coding for coding A – F)			Water Blue / 5021

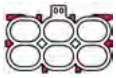
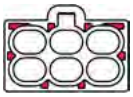
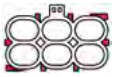
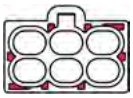
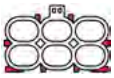
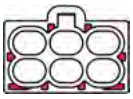
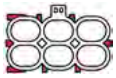
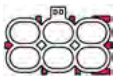
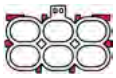
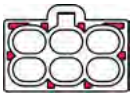
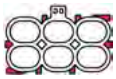
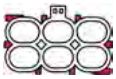
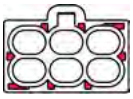
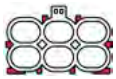
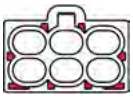
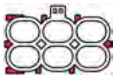
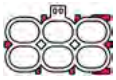
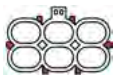
Availability of specific codings upon request. Color of the plastic housing defined in accordance to the listed RAL colors. Minor color differences due to manufacturing possible.

Coding H-MTD® Quad

Coding	Jack	Plug	Color / RAL-No. (similar)
A			Jet Black / 9005
B			Pure White / 9010
C			Light Blue / 5012
D			Claret Violet / 4004
E			May Green / 6017
F			Nut Brown / 8011
G			Platinum Gray / 7036
H			Light Pink / 3015
J			Beige / 1001
K			Curry / 1027
L			Yellow Green / 6018
M			Pastel Orange / 2003
O (neutral coding for coding G – M)			Light Green / 6027
Z (neutral coding for coding A – F)			Water Blue / 5021

Availability of specific codings upon request. Color of the plastic housing defined in accordance to the listed RAL colors. Minor color differences due to manufacturing possible.

Coding H-MTD® Six

Coding	Jack	Plug	Color / RAL-No. (similar)
A			Jet Black / 9005
B			Pure White / 9010
C			Light Blue / 5012
D			Claret Violet / 4004
E			May Green / 6017
F			Nut Brown / 8011
G			Platinum Gray / 7036
H			Light Pink / 3015
J			Beige / 1001
K			Curry / 1027
L			Yellow Green / 6018
M			Pastel Orange / 2003
O (neutral coding for coding G – M)			Light Green / 6027
Z (neutral coding for coding A – F)			Water Blue / 5021

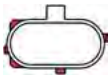
Availability of specific codings upon request. Color of the plastic housing defined in accordance to the listed RAL colors. Minor color differences due to manufacturing possible.

Coding H-MTD® Single Waterproof

Coding	Jack	Plug	Color / RAL-No. (similar)
A			Jet Black / 9005
B			Pure White / 9010
C			Light Blue / 5012
D			Claret Violet / 4004
E			May Green / 6017
F			Nut Brown / 8011
G			Platinum Gray / 7036
H			Light Pink / 3015
J			Beige / 1001
K			Curry / 1027
L			Yellow Green / 6018
M			Pastel Orange / 2003
O (neutral coding for coding G – M)			Light Green / 6027
Z (neutral coding for coding A – F)			Water Blue / 5021

Availability of specific codings upon request. Color of the plastic housing defined in accordance to the listed RAL colors. Minor color differences due to manufacturing possible.

Coding H-MTD® Double Waterproof

Coding	Jack	Plug	Color / RAL-No. (similar)
A			Jet Black / 9005
B			Pure White / 9010
C			Light Blue / 5012
D			Claret Violet / 4004
E			May Green / 6017
F			Nut Brown / 8011
G			Platinum Gray / 7036
H			Light Pink / 3015
J			Beige / 1001
K			Curry / 1027
L			Yellow Green / 6018
M			Pastel Orange / 2003
O (neutral coding for coding G – M)			Light Green / 6027
Z (neutral coding for coding A – F)			Water Blue / 5021

Availability of specific codings upon request. Color of the plastic housing defined in accordance to the listed RAL colors. Minor color differences due to manufacturing possible.

Coding H-MTD® Quad Waterproof

Coding	Jack	Plug	Color / RAL-No. (similar)
A			Jet Black / 9005
B			Pure White / 9010
C			Light Blue / 5012
D			Claret Violet / 4004
E			May Green / 6017
F			Nut Brown / 8011
G			Platinum Gray / 7036
H			Light Pink / 3015
J			Beige / 1001
K			Curry / 1027
L			Yellow Green / 6018
M			Pastel Orange / 2003
N			Pastel Green / 6019
P			Carmine Red / 3002
R			Signal Blue / 5005
Z (neutral coding for coding A – R)			Water Blue / 5021

Availability of specific codings upon request. Color of the plastic housing defined in accordance to the listed RAL colors. Minor color differences due to manufacturing possible.

Competencies & Technologies

Rosenberger's mission is to be a leader when it comes to innovation and technology within its business segments.

An ongoing focus on cost management and process optimization complements our commitment to the increasingly stringent market requirements for delivering products of the highest quality. Effective research & development, the very latest manufacturing technologies, the highest possible levels of efficiency in production processes, and continuous improvement of process automation make up Rosenberger's core competencies.

Using state-of-the-art production, Rosenberger can continue to develop and optimize key manufacturing technologies – turned parts production, stamped & formed technology, injection molding technology.

Manufacturing everything in house ensures a high degree of flexibility which combined with continuous quality controls ensures newly designed products can be produced in the required quantities. With acceptable tolerances now in the range of one hundredth of a millimeter, the production of electronic connectors requires the highest precision.

Automated Connector Mounting and Cable Assembling

At Rosenberger various machine types are used for enabling precise and extreme deformation of raw materials and fast throughput of large quantities. In addition to extensive stamping, forming and embossing operations, Rosenberger machines are used to join, laser-weld and, if required, laser-mark large quantities of pieces. This takes place directly in the processing area with minimum set-up and assembly times.

The necessary tool construction for the specially equipped stamping and forming assembly machines are designed and produced as far as possible in the company's own tool shop.

With the help of its strip stamping technology Rosenberger produces high quantities with maximum repeatability and short reaction and running times. The implementation of the production process from strip material to high-quality end product is carried out with maximum production speed, cost-efficiency and precision.

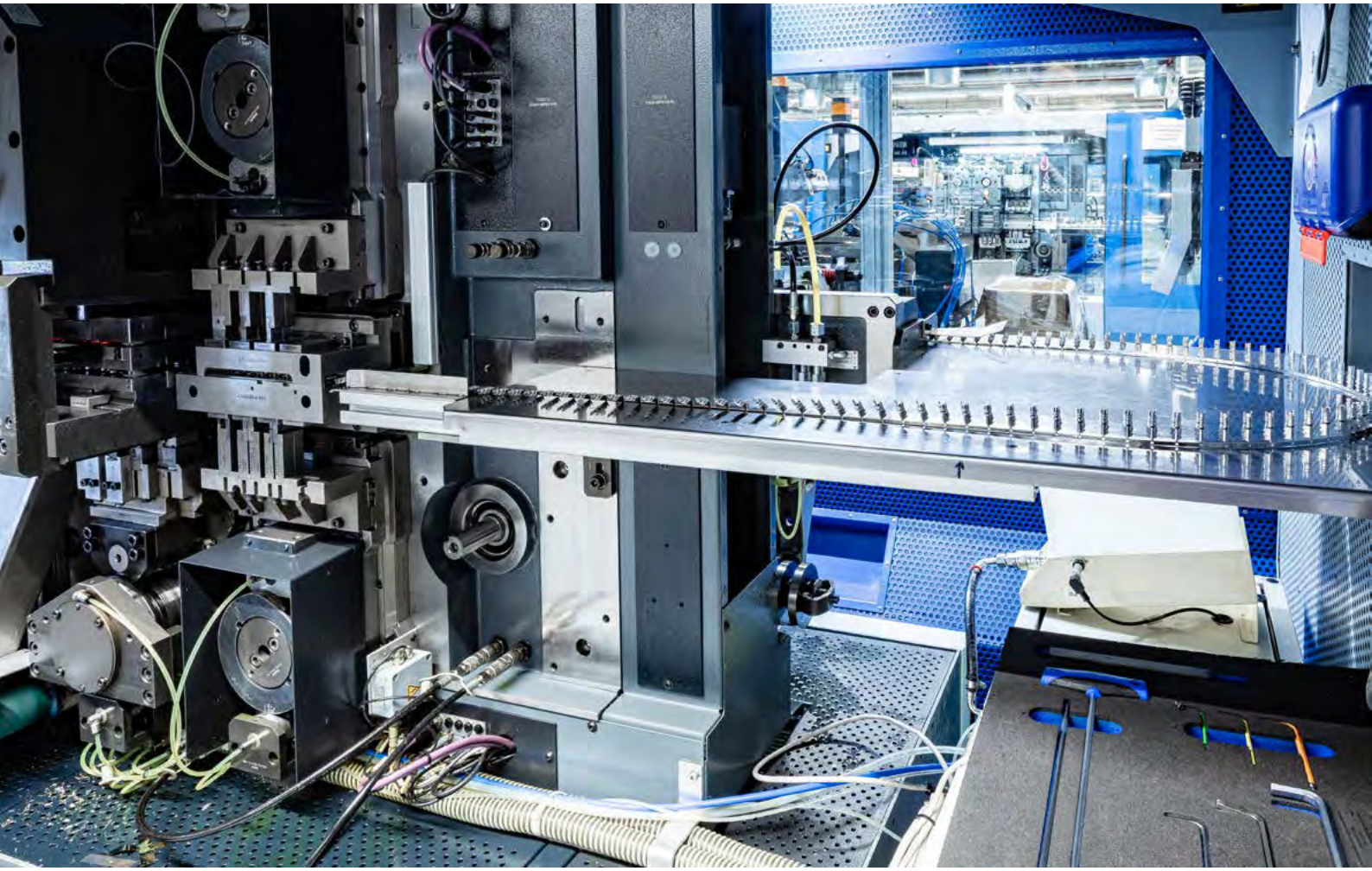
Rosenberger uses various raw materials including pure and partially tinned copper, copper-tin and stainless steel strips.

Stamping Technologies

The Rosenberger Group meets the increasing requirements with its high-quality stamping technology. Competence and experience guarantees reliable pluggability as well as highly resilient, stamped and formed (SF) connectors; especially under demanding conditions such as those found in the automotive industry. Rosenberger quality is assured by the adoption of fully automated processes with 100 % repeatability. Maximum efficiency is achieved by the involvement of the potential harness makers as early as the design phase of the respective SF connectors.

Benefits of Stamping & Forming

- Cost optimization
- Reduced use of materials
- Fast production of large quantities
- Guaranteed plug compatibility
- Process-safe manufacturing
- Precision



Belting & Packing – Tape & Reel

For high volume production, stamped and formed connector parts such as outer contacts/connector bodies, center/inner contacts or support sleeves can be delivered on reels only.

Information about high-volume production and assembly, special tools for cable assembly and ordering procedure of packing units is available on request: automotive@rosenberger.com

Stamping Technologies at Rosenberger

Quality & Environment

The quality of Rosenberger products, solutions and services is an essential part of our corporate strategy.

Ensuring the optimum quality of products and services and taking responsibility for our environment are fundamental elements of Rosenberger's corporate philosophy. Our quality philosophy does not only cover the optimization of parts and products, but also the continuous improvement of all company processes: from product development, planning, procurement, production, sales, logistics right through to environmental policy. To summarize, we want to offer maximum benefits for our customers all over the world.

We aim to act in an environmentally conscious manner, use materials economically, protect natural resources, recycle, and ensure energy efficiency.

In recognition of continuously improving processes and applying quality management systems, Rosenberger has won a number of prestigious quality and environmental excellence awards.

IMDS System

Rosenberger has been registered with the IMDS system (Internationales MaterialDatenSystem der Automobilindustrie) since 2001. Our products are fed systematically into the IMDS system.

www.mdsystem.com

Certificates

- IATF 16949
- DIN EN 9100
- ISO 9001
- ISO 14001
- ISO 50001
- DaKKs accreditation according to DIN EN ISO 17025

Rosenberger Global Network

Rosenberger is one of the world`s leading manufacturers of impedance controlled and optical connectivity solutions. It provides connectivity solutions in high-frequency, high-voltage, and fiber-optic technologies for mobile communication networks, data centers, test & measurement applications, automotive electronics, as well as high-voltage contact systems, medical electronics or aerospace applications.

A global network of R&D, manufacturing and assembly locations provides innovation, optimized cost structure and excellent customer services world-wide.

Contacts Automotive

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