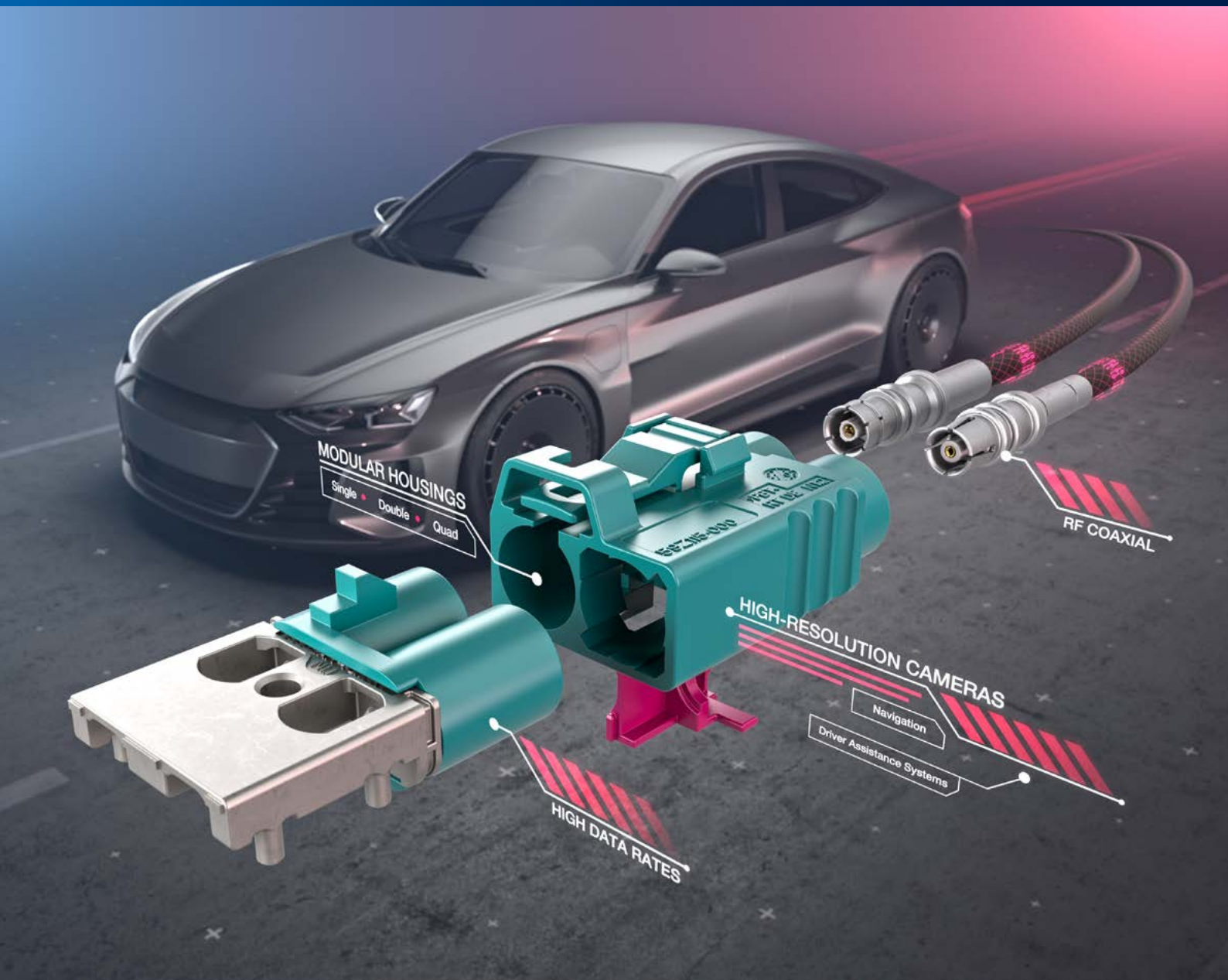
Rosenberger

Automotive Cable & PCB Connector System

FAKRA Products

AUTOMOTIVE



Rosenberger Automotive – a Synonym for Quality and Innovation

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

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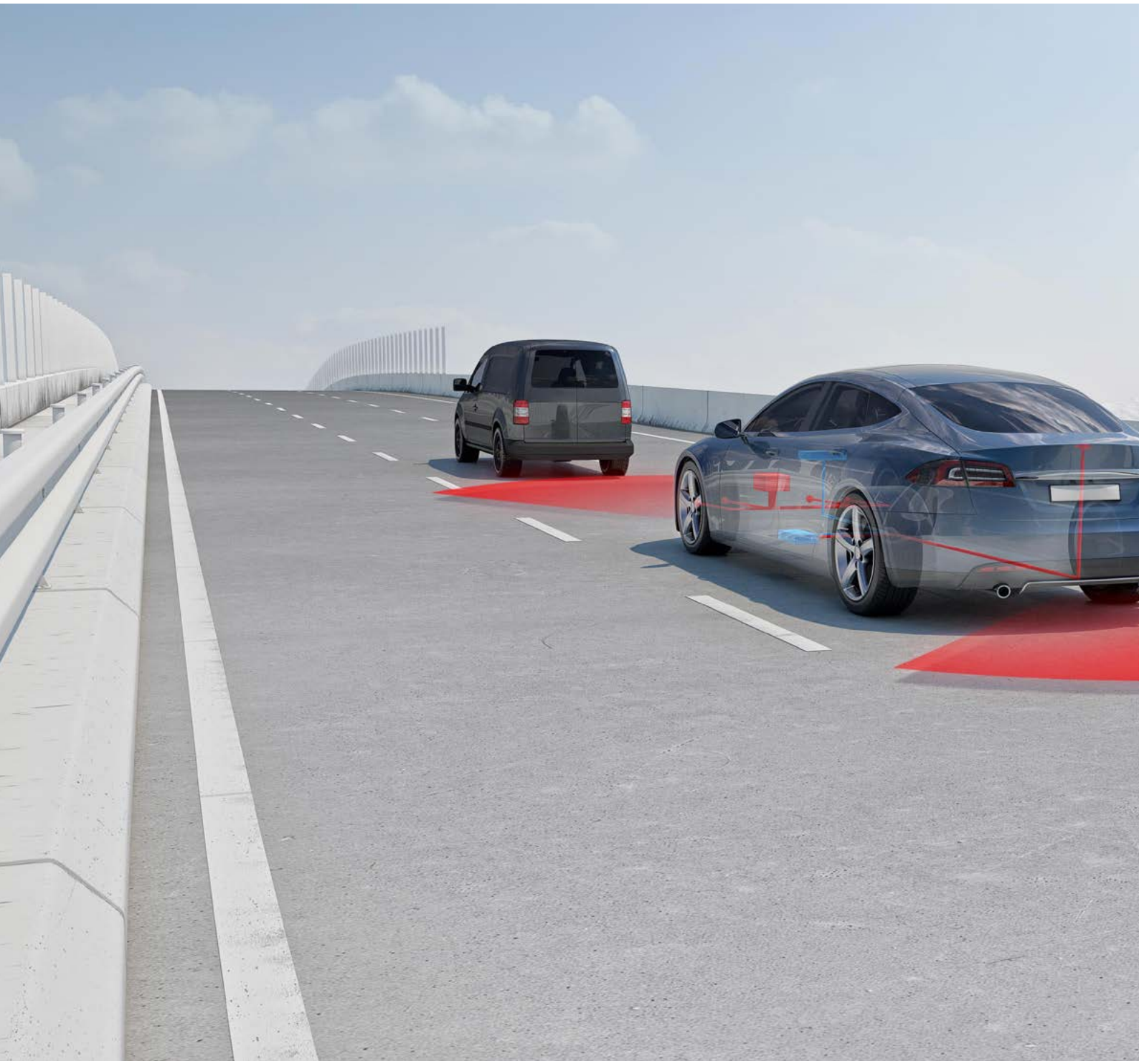
The Rosenberger online catalog contains the current Rosenberger standard FAKRA product range with specific details, including data sheets, assembly instructions, and panel piercings.

www.rosenberger.com/ok/fakra

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. Car driver assistance systems, connected car technology, electromobility, 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.

Applications

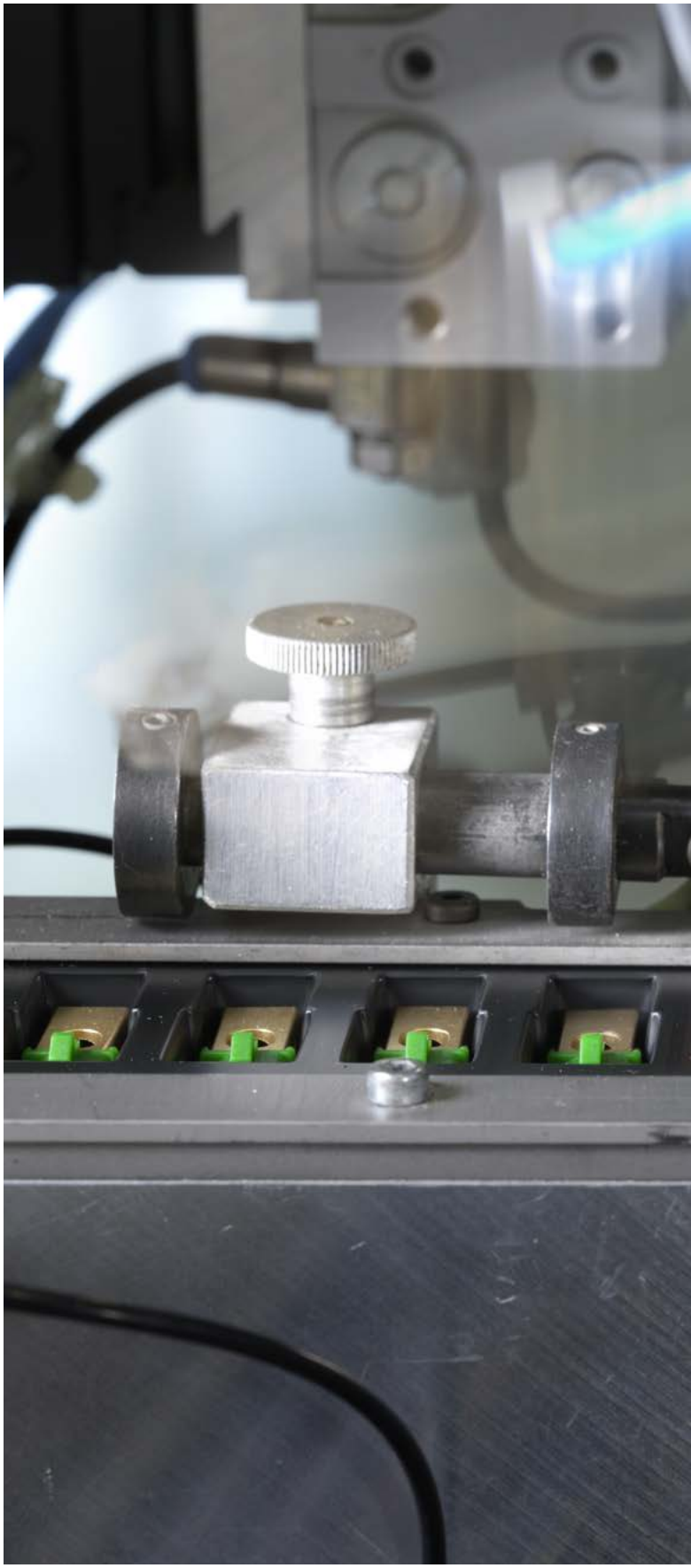
- Cameras
- Sensors for detection, evaluation and reaction
- High Performance Computing
- Radio antenna
- GPS telematics or navigation
- Infotainment & television
- Mobile communication
- RF bluetooth / WLAN applications
- Radio frequency remote control for keyless entry
- Vehicle auxiliary heating

FAKRA
Product Overview

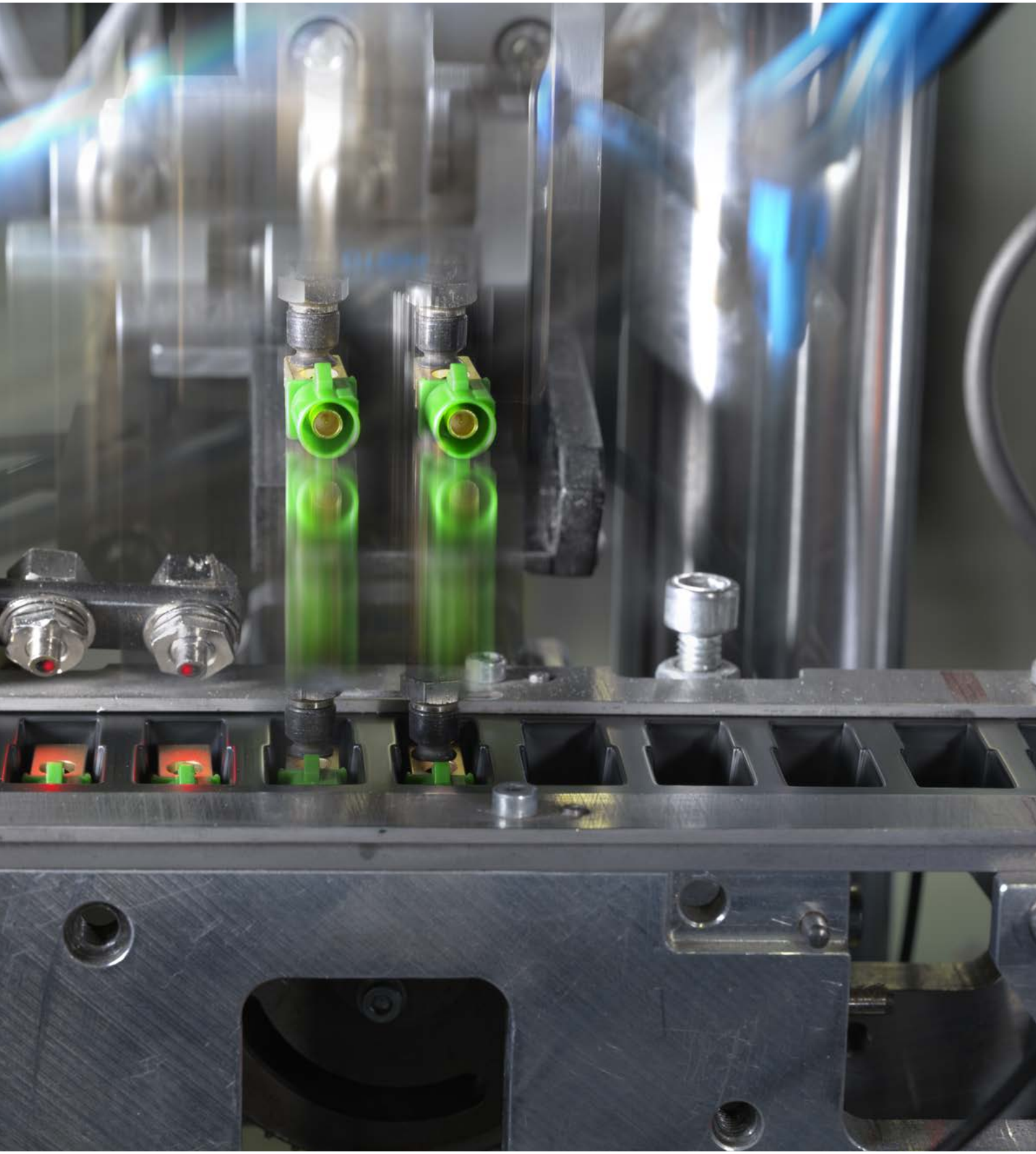
Rosenberger FAKRA* industry standard compatible connectors are designed to fulfill the rigorous mechanical and environmental requirements of the automotive industry. Ensuring maximum electrical and mechanical performance, these high quality FAKRA connectors feature specific color coded plastic housings in accordance with the FAKRA coding industry standard. Thirteen distinct mechanical and color codes enable easy identification and unique keying to avoid mismating and additional one neutral coding.

Combining Rosenberger's turned part production expertise and FAKRA SF** stamped and formed technology these precision manufactured products are ideally suited for process-safe and fully automated assembly by harness makers – leading to a significant reduction in production costs.

Rosenberger FAKRA connectors are used as standard interfaces for high-frequency telematic applications in vehicles where the number one priority is to ensure safety. For example, in autonomous driving and driver assistance systems where it is necessary to determine exact positioning, continuously calculate routes, and detect and classify objects. High data volumes from several cameras, various sensors and navigation sources must therefore be combined and transmitted in real time.



* FAKRA = FAchKReisAutomobil (Automobile Expert Group)
** FAKRA SF = FAKRA Stamped and Formed

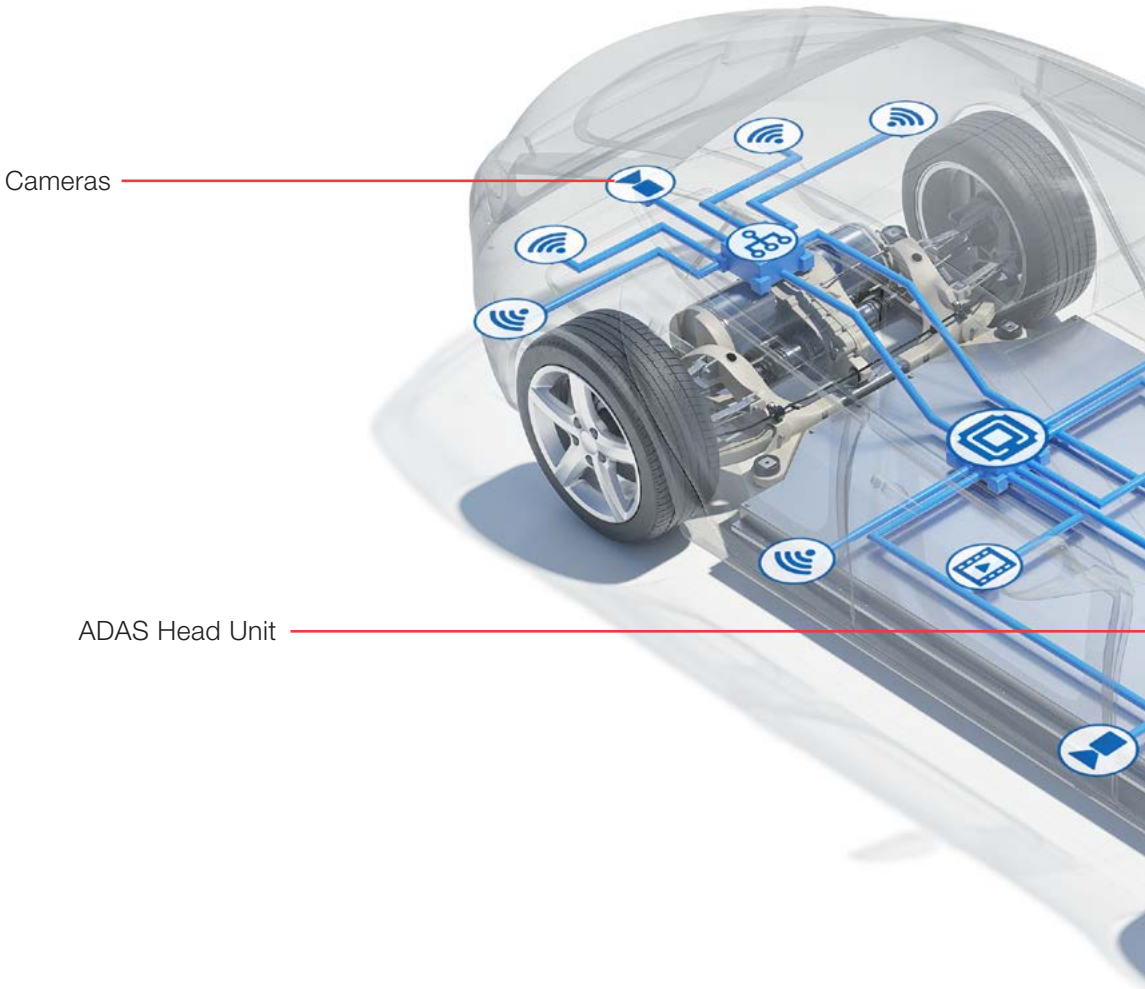


Benefits

- Fulfill the tough requirements of the automotive industry
- No misuse due to secure coding system
- Primary and secondary locking systems lead to high assembling security
- Reliable and durable
- Multiple housings for space savings and for quick plug-in operations
- FAKRA-SF products allow process-safe and fully automated assembly for significant cost reduction
- Separate housings available

Product Portfolio

- Cable connectors (straight, right angle)
- PCB connectors (pin-in-paste soldering, SMD)
- Panel connectors
- Standardized housings (single, double, triple, quad)
- Cable assemblies
- Customized solutions
- Calibration kits
- Measurement equipment & accessories
- Tools
- Waterproof versions



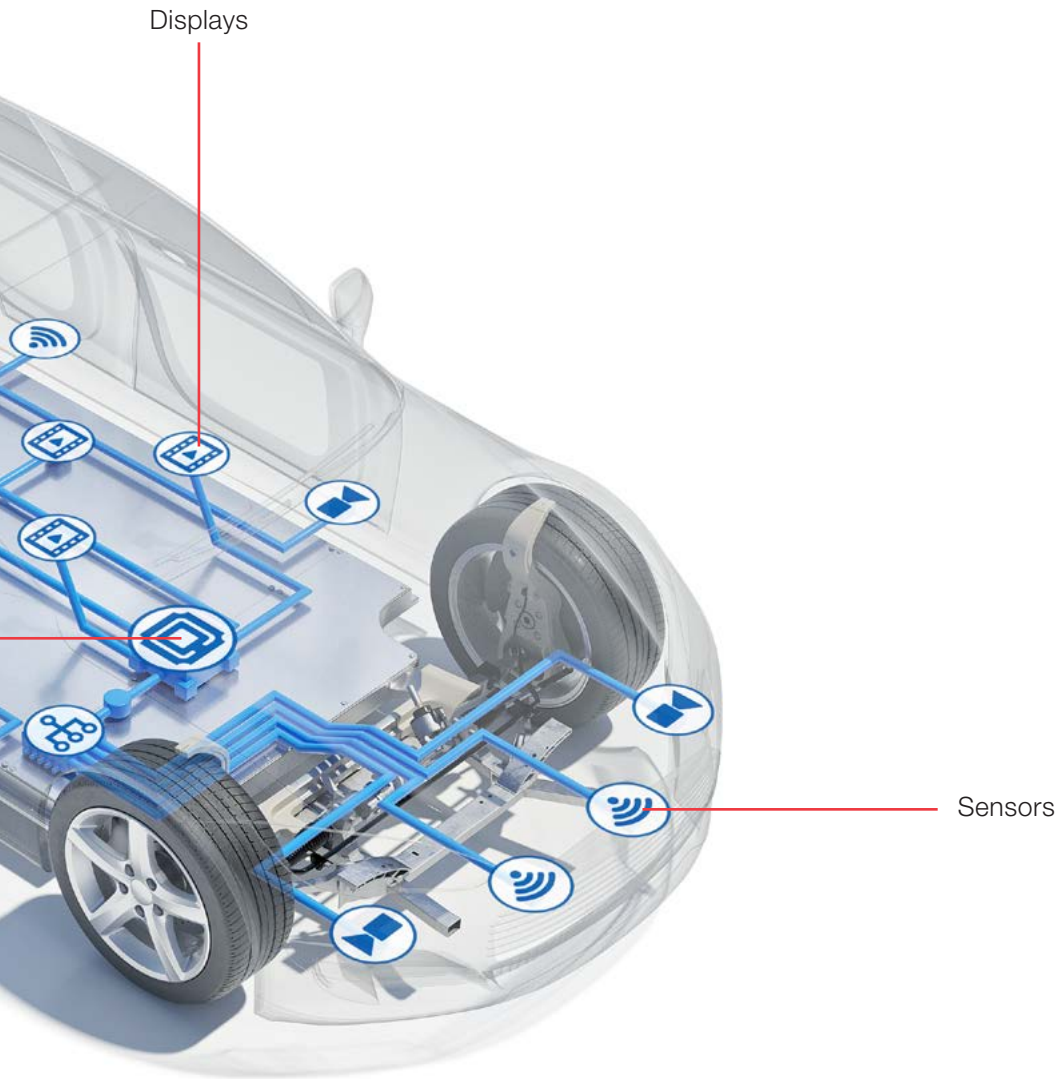
Wiring Harness Topologies

Features

- Impedance 50 Ω
- Frequency range DC up to 6 GHz
- High data rates up to 8 Gbps
- Return loss ≥ 18 dB
- Temperature range from -40 °C to +105 °C
- Mating cycles ≥ 25
- 13 mechanical and colored codings and one neutral coding
- Primary and secondary lock
- Stamped parts on separate coils (center contact, support sleeve, connector head plug)
- RoHS, WEEE, ELV Conformity

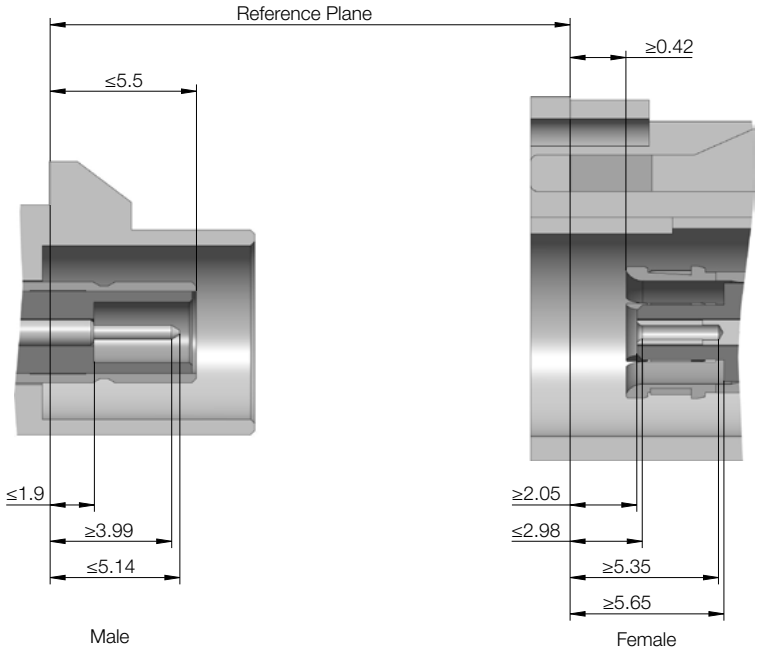
Applications

- Radio antenna
- GPS telematics or navigation
- Infotainment & television
- Mobile communication
- RF bluetooth / WLAN applications
- Radio frequency remote control for keyless entry
- Vehicle auxiliary heating
- Sensors for detection, evaluation and reaction



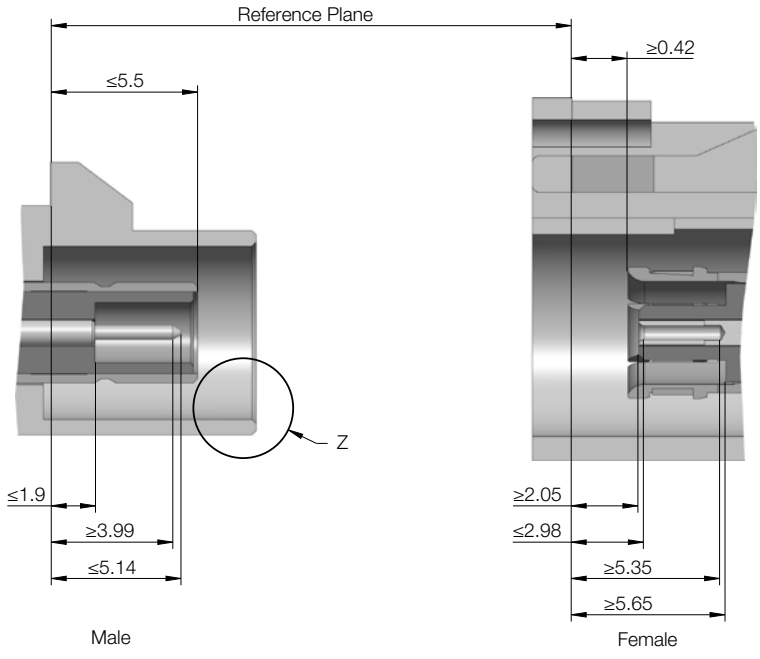
FAKRA Interface Dimensions

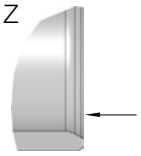
Standard Interface



Dimensions in mm

Waterproof Interface





For waterproof applications, a lead in is mandatory, according to USCAR 18 Rev. 4.

Dimensions in mm

FAKRA Technical Data (Code 59)

Applicable Standards

Interface according to	ISO 20860-1, SAE/USCAR-18

Electrical Data

Impedance	50 Ω
Frequency range (depends on cable), connector, assembling, testing	DC up to 6 GHz
Return loss	≥ 18 dB
Insertion loss	≤ 0.1 x $\sqrt{f(GHz)}$ dB
Insulation resistance	≥ 1 x 1 GΩ
Center contact resistance	≤ 5 mΩ
Outer contact resistance	≤ 5 mΩ
Test voltage	750 V DC
Working voltage	60 V DC
Contact current (depending on cable size, connector and housing)	≤ 4 A DC
RF-leakage	≥ 65 dB

Mechanical Data

Mating cycles (standard)	≥ 25
Mating cycles (waterproof)	≥ 5
Engagement force (single, standard)	≤ 25 N
Engagement force (waterproof)	≤ 45 N
Disengagement force	≥ 2 N
Retention force latch	≥ 110 N
Retention force primary lock	≥ 80 N
Retention force secondary lock	≥ 60 N

Environmental Data

Temperature range	-40 °C – +105 °C
Vibration	DIN EN 60068-2-64
Mechanical shock	DIN EN 60068-2-27
Thermal shock	DIN EN 60068-2-14 Na
Temperature humidity cycling	DIN EN 60068-2-30 variante 2
High temperature exposure	DIN EN 60068-2-2

Materials

Outer contact	CuZn, CuSn, Zn, Stainless steel
Center contact	CuZn, CuBe, CuSn
Dielectric	PTFE, PA, LCP, PBT
Gasket	Silicone, Rubber
Crimping ferrule	CuZn, CuSn
Plastic housings	PBT, PA, PPE, POM
Secondary lock	PBT, PA, PPE

Platings

Outer contact	Au, Ni, Sn, Stainless steel
Center contact	Au

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 from your Rosenberger sales partner.

FAKRA Cable Connectors

Cable Connectors & Housings, Straight

Straight Jack, Stamped & Formed Center Contact

Rosenberger No.	Cable	Assy Inst.	Crimping Tool Center Contact	Crimp Insert Outer Contact	Product
59K13o-102A4	RG 174, RG 316	MA 59 V 059	11W161-800	11W150-302	
59K13o-103A4	RG 179 B/U-d, 1.5DS	MA 59 V 059	11W161-800	11W15B-503	
59K13o-106A4	RG 58	MA 59 V 059	11W161-806	11W150-108	
59K13o-1BFA4	e.g.: Shikoku 2DS-PPFW	MA 59 V 109	11W161-8M4	11W15W-5BA	
59K13o-1E4A4	RG 58-LL	MA 59 V 059	11W161-8E4	11W150-108	
59K13o-1E7A4	B-61-1.87-2.9	MA 59 V 059	11W161-800	11W150-302	
59K13o-1M4A4	RTK 031	MA 59 V 059	11W161-8M4	11W150-104	

works with all housings at page 12 and 13

Straight Jack, Stamped & Formed Outer and Center Contact

Rosenberger No.	Cable	Assy Inst.	Crimping Tools for FAKRA SF	Product
59K16B-102T4	RG 174, RG 316	MA 59 V 047	11WS013, 11WB054, 11WR047	
59K16B-106T4	RG 58	MA 59 V 044	11WR014, 11WB009, 11WR083	
59K16B-1E4T4	RG 58-LL	MA 59 V 044	11WR014, 11WB007, 11WR083	
59K16B-1M4T4	RTK 031	MA 59 V 047	11WS014, 11WB009, 11WR039	

works with all housings at page 12 and 13

Straight Jack

Rosenberger No.	Cable	Assy Inst.	Crimping Tool Center Contact	Crimp Insert Outer Contact	Product
59K17F-102A4	RG 179	MA 59 V 002	11W15A-502	11W15A-502	
59K17F-1D6A4	e.g. Dacar 077	MA 59 V 002	11W15A-508	11W15A-508	
59K17F-1D8A4	B-75-1.7-2.7	MA 59 V 002	11W15A-502	11W15A-502	

works with all housings at page 12 and 13

Housing Jack, Quad

Rosenberger No.	Description	Product
59Z076-001-y	Works with connector 59S20Z-40MT5-y -y: please fill-in requested coding	

works with all connectors at page 12

Housing Jack, Single

Rosenberger No.	Description	Product
59Z063-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	
59Z113-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	
59Z117-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	
59Z117-C01-y	With secondary locking With slot for positioning clip -y: please fill-in requested coding	

works with all connectors at page 12

Housing Jack, Double 8 mm

Rosenberger No.	Description	Product
59Z115-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	
59Z119-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	
59Z119-C01-y	With secondary locking With slot for positioning clip -y: please fill-in requested coding	

works with all connectors at page 12

Housing Jack, Double 12.7 mm

Rosenberger No.	Description	Product
59Z017-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	

works with all connectors at page 12

Cable Connectors & Housings, Straight

Straight Plug, Stamped & Formed Center Contact

Rosenberger No.	Cable	Assy Inst.	Crimping Tool Center Contact	Crimp Insert Outer Contact	Product
59S10o-101A4	RG 178, RG 196	MA 59 V 086	S951-050833	11W150-101	
59S10o-102A4	RG 174, RG 316	MA 59 V 058	11W161-800	11W150-302	
59S10o-103A4	RG 179 B/U-d, 1.5DS	MA 59 V 058	11W161-800	11W15B-503	
59S10o-106A4	RG 58	MA 59 V 058	11W161-806	11W150-108	
59S10o-1E4A4	RG 58-LL	MA 59 V 058	11W161-8E4	11W150-108	
59S10o-1E7A4	B-61-1.87-2.9	MA 59 V 058	11W161-800	11W150-302	
59S10o-1M4A4	RTK 031	MA 59 V 058	11W161-8M4	11W150-104	

works with all housings at page 15

Straight Plug

Rosenberger No.	Cable	Assy Inst.	Crimping Tool Center Contact	Crimp Insert Outer Contact	Product
59S17E-1D8A4	B-75-1.7-2.7	MA 59 V 010	11W15A-502	11W15A-502	

works with all housings at page 15

Straight Plug, Stamped & Formed Outer and Center Contact

Rosenberger No.	Cable	Assy Inst.	Crimping Tools for FAKRA SF	Product
59S16A-102T4	RG 174, RG 316	MA 59 V 046	11WS013, 11WB054, 11WR048	
59S16A-106T4	RG 58	MA 59 V 043	11WR014, 11WB009, 11WR082	
59S16A-1E4T4	RG 58-LL	MA 59 V 043	11WR014, 11WB007, 11WR082	
59S16A-1M4T4	RTK 031	MA 59 V 046	11WS014, 11WB009, 11WR040	

works with all housings at page 15

Housing Plug, Single

Rosenberger No.	Description	Product
59Z064-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	
59Z114-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	
59Z118-C00-y	With secondary locking With slot for positioning clip -y: please fill-in requested coding	

works with all connectors at page 14

Housing Plug, Double 8 mm

Rosenberger No.	Description	Product
59Z116-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	
59Z120-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	
59Z120-C00-y	With secondary locking With slot for positioning clip -y: please fill-in requested coding	

works with all connectors at page 14

Housing Plug, Double 12.7 mm

Rosenberger No.	Description	Product
59Z016-000-y	With secondary locking Without slot for positioning clip -y: please fill-in requested coding	

works with all connectors at page 14

Cable Connectors & Housings, Right Angle

Right Angle Jack

Rosenberger No.	Cable	Assy Inst.	Crimping Tool Center Contact	Crimp Insert Outer Contact	Product
59K28H-102A4	RG 174, RG 316	MA 59 V 042	11W150-402	11W150-402	
59K28H-106A4	RG 58	MA 59 V 042	11W150-506	11W150-506	
59K28H-1E7A4	B-61-1.87-2.9	MA 59 V 042	11W150-402	11W150-402	
59K28H-1M4A4	RTK 031	MA 59 V 042	11W150-504	11W150-504	

works with all housings at this page

Housing Jack, Single

Rosenberger No.	Description	Product
59Z066-000-y	Cable down With secondary locking -y: please fill-in requested coding	
59Z066-L00-y	Cable left With secondary locking -y: please fill-in requested coding	
59Z066-R00-y	Cable right With secondary locking -y: please fill-in requested coding	

Housing Jack, Double 8 mm

Rosenberger No.	Description	Product
59Z027-001-y	Cable down With secondary locking -y: please fill-in requested coding	

Housing Jack, Double 12.7 mm

Rosenberger No.	Description	Product
59Z026-000-y	Cable down With secondary locking -y: please fill-in requested coding	

Right Angle Jack and Housing Jack, Single

Rosenberger No.	Description	Cable	Assy Inst.	Crimping Tool Center Contact	Crimp Insert Outer Contact	Product
59K25H-102A4	360° turnable	RG 174, RG 316	MA 59 V 065	11W150-402	11W150-402	
59K25H-106A4	360° turnable	RG 58	MA 59 V 065	11W150-508	11W150-508	
59K25H-1E4A4	360° turnable	RG 58 LL	MA 59 V 065	11W15F-5E4	11W15F-5E4	
59K25H-1M4A4	360° turnable	RTK 031	MA 59 V 065	11W150-504	11W150-504	
59Z006-T00-y	360° turnable With secondary locking Housing single for 59K25H-1xx -y: please fill-in requested coding					

Right Angle Jack, Stamped & Formed Outer and Center Contact incl. Housing, Single

Rosenberger No.	Description	Cable	Assy Inst.	Crimping Tools for FAKRA SF	Product
59K27D-102Z4-y	360° turnable Without secondary locking Incl. housing single -y: please fill-in requested coding	RG 174, RG 316	MA 59 V 080	11WS013, 11WB054, 11WR037	
59K27D-1M4Z4-y	360° turnable Without secondary locking Incl. housing single -y: please fill-in requested coding	RTK 031	MA 59 V 080	11WS014, 11WB009, 11WR041	

Right Angle Jack, Stamped & Formed Outer and Center Contact and Housings Jack, Single/Double 8 mm

Rosenberger No.	Description	Cable	Assy Inst.	Crimping Tools for FAKRA SF	Product
59K26A-102Z4	360° turnable	RG174, RG 316	MA 59 V 080 MA 59 V 099	11WS013, 11WB054, 11WR038	
59K26A-1M4Z4	360° turnable	RTK 031	MA 59 V 080 MA 59 V 099	11WS014, 11WB009, 11WR042	
59Z127-000-y	Cable down With secondary locking Housing double 8 mm for 59K26A-1MZ4 -y: please fill-in requested coding				
59Z143-000-y	Cable down single for 59K26A-1M4Z4 -y: please fill-in requested coding				
59Z144-000-y	Cable down double 8 mm for 59K26A-1M4Z4 -y: please fill-in requested coding				

FAKRA Cable Connectors – Waterproof

Cable Connectors & Housings

Straight Jack, Stamped & Formed Center Contact

Rosenberger No.	Cable	Assy Inst.	Crimping Tool Center Contact	Crimp Insert Outer Contact	Product
59K13o-102A4	RG 174, RG 316	MA 59 V 059	11W161-800	11W150-302	
59K13o-106A4	RG 58	MA 59 V 059	11W161-806	11W150-108	
59K13o-1M4A4	RTK 031	MA 59 V 059	11W161-8M4	11W150-104	

Straight Jack, Stamped & Formed Outer and Center Contact

Rosenberger No.	Cable	Assy Inst.	Crimping Tools for FAKRA SF	Product
59K16B-102T4	RG 174, RG 316	MA 59 V 047	11WS013, 11WB016, 11WR047	
59K16B-1M4T4	RTK 031	MA 59 V 047	11WS014, 11WB009, 11WR039	

Housing Jack, Single

Rosenberger No.	Description	Product
59Z163-003-y	Waterproof** Works with connectors, cable seal and cap! Connectors: 59K13O-1xxA4 and 59K16B-1xxT4 Required piece parts must be ordered separately! Cable group 02: cable seal 59K14B-102/50 and cap 59Z163-000/51 Cable group M4: cable seal 59K14B-1M4/50 and cap 59Z163-000/51 -y: available codings on request	

** Watertightness can be guaranteed for a mated connection consisting of waterproof Rosenberger connectors according LV 214

Straight Jack, Stamped & Formed Center Contact incl. Housing

Rosenberger No.	Description	Cable	Assy Inst.	Crimping Tools	Product
59K14o-102Z4-y	Waterproof** Short version	RG 174	MA 59 V 119	11WR012_A01, 11WB047_A, 11WD001	
59K14o-1M4Z4-y	Waterproof** Short version	RTK 031	MA 59 V 119	11WR013_A01, 11WB048_A, 11WD002	

** Watertightness can be guaranteed for a mated connection consisting of waterproof Rosenberger connectors according LV 214

Right Angle Jack, Stamped & Formed Center Contact incl. Housing

Rosenberger No.	Description	Cable	Assy Inst.	Crimping Tools	Product
59K24K-102A4-y	Waterproof** Cable down*	RG 174, e.g. DACAR 462	MA 59 V 115	On request	
59K24K-1M4A4-y	Waterproof** Cable down*	RTK 031	MA 59 V 115	On request	
59K2RK-102A4-y	Waterproof** Cable right*	RG 174, e.g. DACAR 462	MA 59 V 115	On request	
59K2RK-1M4A4-y	Waterproof** Cable right*	RTK 031	MA 59 V 115	On request	
59K2LK-102A4-y	Waterproof** Cable left*	RG 174, e.g. DACAR 462	MA 59 V 115	On request	
59K2LK-1M4A4-y	Waterproof Cable left*	RTK 031	MA 59 V 115	On request	

* -y: please fill-in requested coding
** Watertightness can be guaranteed for a mated connection consisting of waterproof Rosenberger connectors according LV 214

Straight Plug, Stamped & Formed Center Contact

Rosenberger No.	Cable	Assy Inst.	Crimping Tool Center Contact	Crimp Insert Outer Contact	Product
59S10o-102A4	RG 174, RG 316	MA 59 V 058	11W161-800	11W150-302	
59S10o-106A4	RG 58	MA 59 V 058	11W161-806	11W150-108	
59S10o-1M4A4	RTK 031	MA 59 V 058	11W161-8M4	11W150-104	

Straight Plug, Stamped & Formed Outer and Center Contact

Rosenberger No.	Cable	Assy Inst.	Crimping Tools for FAKRA SF	Product
59S16A-102T4	RG 174, RG 316	MA 59 V 046	11WS013, 11WB016, 11WR048	
59S16A-1M4T4	RTK 031	MA 59 V 046	11WS014, 11WB009, 11WR040	

Housing Plug, Single

Rosenberger No.	Description	Product
59Z176-C01-y	Waterproof** Works with connectors, cable seal and cap! Connectors: 59S10O-1xxA4 and 59S16A-1xxT4 Required piece parts must be ordered separately! Cable group 02: cable seal 59K14B-102/50 and cap 59Z163-000/51 Cable group M4: cable seal 59K14B-1M4/50 and cap 59Z163-000/51 -y: available codings on request	

** Watertightness can be guaranteed for a mated connection consisting of waterproof Rosenberger connectors according LV 214

Additional Piece Parts, Please Order Separately

Rosenberger No.	Description	Cable Group	Product
59K14B-102/50	Cable seal	02	
59K14B-1M4/50	Cable seal	M4	
59Z163-000/51	Cap	02, M4	

FAKRA PCB Connectors

PCB Connectors Wave Soldering

Straight Plug PCB incl. Housing, Single

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S10H-400T5-y	Wave soldering Round pins Pin length 4.00 mm -y: please fill-in requested coding	MB 273	

Right Angle Plug PCB incl. Housing, Single

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S20X-400T5-y	Wave soldering Coupling nose up Pin length 2.50 mm -y: please fill-in requested coding	MB 190	

PCB Connectors SMD Pin-in-Paste

Straight Plug PCB incl. Housing, Single

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S12K-40MT5-y	Pin-in-paste Pin length 2.25 mm -y: please fill-in requested coding	MB 286	
59S10K-40MT5-y	Pin-in-paste Pin length 1.85 mm -y: please fill-in requested coding	MB 286	
59S10M-40MT5-y	Pin-in-paste Pin length 2.30 mm -y: please fill-in requested coding	MB 296	
59S1AC-40MT5-y	Pin-in-paste Pin length 2.00 mm -y: please fill-in requested coding	MB 244	

Straight Plug PCB incl. Housing, Double 8 mm

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S14K-40MT5-y	Pin-in-paste Pin length 2.25 mm -y: please fill-in requested coding	MB 506	
59S11K-40MT5-y	Pin-in-paste Pin length 1.95 mm -y: please fill-in requested coding	MB 506	

Straight Plug PCB without Housing for Camera Applications

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S13X-40MT5	Custom specific versions on request	MB 495	

Right Angle Jack PCB incl. Housing, Single

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59K23C-40MA5-y	Pin-in-paste Designed for antenna applications -y: please fill-in requested coding	MB 297	

PCB Connectors SMD Pin-in-Paste

Right Angle Plug PCB incl. Housing, Single

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S20K-40MT5-y	Pin-in-paste Coupling nose up -y: please fill-in requested coding	MB 601	
59S2UK-40MT5-y	Pin-in-paste Coupling nose down -y: please fill-in requested coding	MB 601	
59S2LK-40MT5-y	Pin-in-paste Coupling nose left -y: please fill-in requested coding	MB 601	
59S2RK-40MT5-y	Pin-in-paste Coupling nose right -y: please fill-in requested coding	MB 601	
59S22B-40MT5-y	Coupling nose up -y: please fill-in requested coding	MB 281	
59S21B-40MT5-y	Coupling nose down -y: please fill-in requested coding	MB 281	

Right Angle Plug PCB incl. Housing, Single

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S2AQ-40MT5-y_1	Pin-in-paste Coupling nose up -y: please fill-in requested coding	MB 172, MB 355	
59S2UQ-40MT5-y_1	Pin-in-paste Coupling nose down -y: please fill-in requested coding	MB 172, MB 355	
59S2LQ-40MT5-y_1	Pin-in-paste Coupling nose left -y: please fill-in requested coding	MB 172, MB 355	
59S2RQ-40MT5-y_1	Pin-in-paste Coupling nose right -y: please fill-in requested coding	MB 172, MB 355	

Right Angle Plug PCB incl. Housing, Single

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S2PL-40MT5-y	Pin-in-paste Coupling nose up -y: please fill-in requested coding	On request	
59S2UL-40MT5-y	Pin-in-paste Coupling nose down -y: please fill-in requested coding	On request	
59S2LL-40MT5-y	Pin-in-paste Coupling nose left -y: please fill-in requested coding	On request	
59S2RL-40MT5-y	Pin-in-paste Coupling nose right -y: please fill-in requested coding	On request	

Right Angle Plug PCB incl. Housing, Double 8 mm

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S2DA-40MT5-y	Pin-in-paste Coupling nose up -y: please fill-in requested coding	MB 182	
59S2DU-40MT5-y	Pin-in-paste Coupling nose down -y: please fill-in requested coding	MB 182	
59S2MU-40MT5-y	Pin-in-paste Coupling nose down -y: please fill-in requested coding	MB 447	
59S2MB-40MT5-y	Pin-in-paste Coupling nose up -y: please fill-in requested coding	MB 187	
59S20M-40MT5-y	Pin-in-paste Coupling nose up y: please fill-in requested coding	MB 602	
59S2UM-40MT5-y	Pin-in-paste Coupling nose down -y: please fill-in requested coding	MB 602	

Right Angle Plug incl. Housing, Double Stacked 12.7 mm

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S2DC-40MT5-y-y	Pin-in-paste Double stacked type -y: please fill-in requested coding	MB 269	

Right Angle Plug PCB incl. Housing, Quad, Stacked 12.7 mm

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S2QF-40MT5-y-y-y-y	Pin-in-paste Quad Stacked type -y: please fill-in requested coding	MB 696	

Right Angle Plug PCB incl. Housing, Quad

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S20Z-40MT5-y	Pin-in-paste Coupling nose down -y: please fill-in requested coding	MB 426	

Right Angle Plug, Quint

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59S2MC-40MT5	3, 4 or 5 connectors optional Available on request Only mateable with 59K2MP-40MT5	MB 563	

Right Angle Jack PCB incl. Housing, Quint

Rosenberger No.	Description	Panel Piercing / Footprint	Product
59K2MP-40MT5	5 connectors Die cast Only mateable with 59S2MC-40MA5	MB 555	

FAKRA Calibration Kits

Electrical Specifications

Calibration Standard	Frequency Range in GHz	Parameter	Specification
Opens[1] (plug and jack)	DC to ≤ 4 GHz > 4 GHz to ≤ 6 GHz	Error from Nominal phase	≤ 1.0° ≤ 1.5°
Shorts[1] (plug and jack)	DC to ≤ 4 GHz > 4 GHz to ≤ 6 GHz	Error from Nominal phase	≤ 1.0° ≤ 1.5°
Calibration loads (plug and jack)	DC to ≤ 4 GHz > 4 GHz to ≤ 6 GHz	Return loss	≥ 40 dB ≥ 35 dB
Calibration adaptors RPC-3.50 to FAKRA (plug/plug, plug/jack, jack/plug, jack/jack	DC to ≤ 1 GHz > 1 GHz to ≤ 3 GHz > 3 GHz to ≤ 6 GHz	Return loss	≥ 35 dB ≥ 26 dB ≥ 21 dB

1 The specifications for opens and shorts are given as allowed deviation from nominal model as defined in calibration certificate included with your kit.

Calibration Kit, Adaptor Version

Rosenberger No.	Description	Product
59CK070-150	Rosenberger calibration kits are delivered in stable wooden boxes including factory calibration certificate. Please use the following part numbers for ordering single components.	

Contents of Calibration Kit, Adaptor Version

Rosenberger No.	Description	Quantity
03K159-S20S3	Calibration adaptor, RPC-3.50 jack / FAKRA plug	1
03K159-K20S3	Calibration adaptor, RPC-3.50 jack / FAKRA jack	1
03S159-S20S3	Calibration adaptor, RPC-3.50 plug / FAKRA plug	1
03S159-K20S3	Calibration adaptor, RPC-3.50 plug / FAKRA jack	1
59Z114-000Z	Plastic housing plug	10
59Z113-000Z	Plastic housing jack	10

Please note: this calibration kit includes a set of adaptors only. The full functionality is only given with an additional RPC-3.50 calibration kit.

Calibration Kit, Full Version

Rosenberger No.	Description	Product
59CK010-150	Rosenberger calibration kits are delivered in stable wooden boxes including factory calibration certificate. Please use the following part numbers for ordering single components.	

Contents of Calibration Kit, Full Version

Rosenberger No.	Description	Quantity
03S12L-00FS3	Open circuit plug, RPC-3.50	1
03K12L-00FS3	Open circuit jack, RPC-3.50	1
03S12S-00FS3	Short circuit plug, RPC-3.50	1
03K12S-00FS3	Short circuit jack, RPC-3.50	1
03S150-F10S3	Calibration load plug, RPC-3.50	1
03K150-F10S3	Calibration load jack, RPC-3.50	1
03K159-S20S3	Calibration adaptor, RPC-3.50 jack / FAKRA plug	1
03K159-K20S3	Calibration adaptor, RPC-3.50 jack / FAKRA jack	1
03S159-S20S3	Calibration adaptor, RPC-3.50 plug / FAKRA plug	1
03S159-K20S3	Calibration adaptor, RPC-3.50 plug / FAKRA jack	1
03W008-000	Combi wrench	1
03W021-000	Torque wrench	1
59Z114-000Z	Plastic housing plug	10
59Z113-000Z	Plastic housing jack	10

Tools

Hand Crimping Tools for Turned Parts

Crimping Tool

Rosenberger No.	Description	Product
11W150-000	MIL-STD-22520/5 Without crimp insert Choose crimp inserts 11W150-xxx	

Crimp Inserts for Outer Contact Crimp only

for 11W150-000

Rosenberger No.	Description	Product
11W150-102	Width outer contact 3.30 mm	
11W150-104	Width outer contact 4.30 mm	
11W150-108	Width outer contact 5.50 mm	
11W150-109	Width outer contact 6.50 mm	
11W150-302	Width outer contact 3.30 mm	
11W15B-503	Width outer contact 3.30 mm	
11W15W-5BA	Width outer contact 5.35 mm	

Crimp Inserts for Outer & Center Contact Crimp

for 11W150-000

Rosenberger No.	Description	Product
11W150-402	Width outer contact 3.30 mm, center contact 0.73 mm	
11W15A-502	Width outer contact 3.30 mm, center contact 1.20 mm	
11W150-504	Width outer contact 4.30 mm, center contact 1.10 mm	
11W15A-504	Width outer contact 4.30 mm, center contact 1.10 mm	
11W150-506	Width outer contact 5.35 mm, center contact 1.10 mm	
11W150-508	Width outer contact 5.50 mm, center contact 1.10 mm	
11W15A-508	Width outer contact 5.50 mm, center contact 1.10 mm	
11W15F-5E4	Width outer contact 5.50 mm, center contact 1.30 mm	

Hand Crimping Tools for FAKRA SF – Stamped and Formed

Crimping Tool for Center Contacts only

Rosenberger No.	Description	Product
11W161-801	for RG 178, RTK 013 Crimping height 0.74 ± 0.03	
11W161-800	for RG 174 U Crimping height 0.78 ± 0.03	
11W161-8M4	for RTK 031 Crimping height 0.88 ± 0.03	
11W161-806	for RG 58 Crimping height 0.95 ± 0.03	
11W161-8E4	for RG 58 LL Crimping height 1.10 ± 0.03	
11W161-809	for RG 62	

Repair Tool for Housings

Rosenberger No.	Description	Product
59W007-000	Insert for basic tool for replacing right angle housings (59K27D-102Z4-y, 59K27D-1M4Z4-y)	
59W008-000	Insert for basic tool for replacing straight housings (59Z074-000-y, 59Z073-001-y, 59Z073-C00-y, 59Z067-C00-y)	
59W010-000	Basic tool small	
59W011-000	Basic tool large	

FAKRA Number Code

Connector or Housing only							Connector including Housing
59	K	1	30 -	1	M4	A4	-y
							Coding
							A Black
							B White
							C Blue
							D Bordeauxviolet
							E Green
							F Brown
							G Grey
							H Violet
							I Beige
							K Curry
							L Carmine red
							M Pastel orange
							N Pastel green
							Z Waterblue
							-y Placeholder for required coding
						Plating	
					01-Z9 Cable group		
					00 Blank		
					0M Surface mount device		
					xx Blank cable group		
				1 Crimp			
				3 Solder crimp			
				4 PCB mounting			
				5 Solid center contact			
			Successive number				
		1 Straight					
		2 Right angle					
		5 Panel connector with round flange					
	K Female, jack						
	S Male, plug						
	W Tool						
	Z Plastic housings and accessories						
Connector series, 59 FAKRA							

FAKRA Cable Groups

Cable Group	Impedance	Cable Type
01	50 Ω	RG 178, RG 196
02	50 Ω	RG 316/U, RG 174
02	75 Ω	RG 179
03	75 Ω	RG 179 B/U-d, 1.5DS, 1.5C
06	50 Ω	RG 58
09	75 Ω	RG 59
10	93 Ω	RG 62
BF	50 Ω	e.g. Shikoku 2DS-PPFW
BU	50 Ω	e.g. TFC 5.5
D6	120 Ω	e.g. LEONI Dacar® 077
D8	75 Ω	B-75-1.7-2.7
E3	50 Ω	RTK 008
E4	50 Ω	RG 58-LL
E7	61 Ω	B-61-1.87-2.9
H1	50 Ω	RTK 013
M4	50 Ω	RTK 031, RTK 032

Cable group overview: the assignment of concrete cables can be found in the assembly instructions of the connector.

FAKRA Plating Code

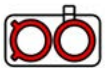
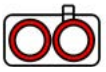
Outer Contact

Code	Plating (top layer)	Symbol	Layer Thickness	Magnetic Properties
A	Nickel	Ni	min. 3.00 µm	
L	AuroDur®	Au	min. 0.15 µm	Non-magnetic
N	White bronze (e.g. Optalloy®) Flash white bronze over silver (e.g. Optargen®)			Non-magnetic
S	Stainless steel			
T	Tin/Lead loadfree	Sn	min. 1.50-8.00 µm	Non-magnetic
Z	Special materials, see data sheet			

Center Contact

Code	Plating (top layer)	Symbol	Layer Thickness	Magnetic Properties
4	Gold	Au	min. 0.80 µm	
5	AuroDur®	Au	min. 0.15 µm	Non-magnetic

FAKRA Coding

Coding	Jack		Plug		Color / RAL-No. (Similar)
	Single	Double	Single	Double	
A					Black/ 9005
B					White/ 9001
C					Blue/ 5005
D					Bordeauxviolet/ 4004
E					Green/ 6002
F					Brown/ 8011
G					Grey/ 7031
H					Violet/ 4003
I					Beige/ 1001
K					Curry/ 1027
L					Carmine red/ 3002
M					Pastel orange/ 2003
N					Pastel green/ 6019
Z					Waterblue/ 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.

Housing Designs

Single	
Double 8 mm	
Double 12.7 mm	
Double, Stacked 12.7 mm	
Quad	
Quad, Stacked 12.7 mm	

Competencies & Technology

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.

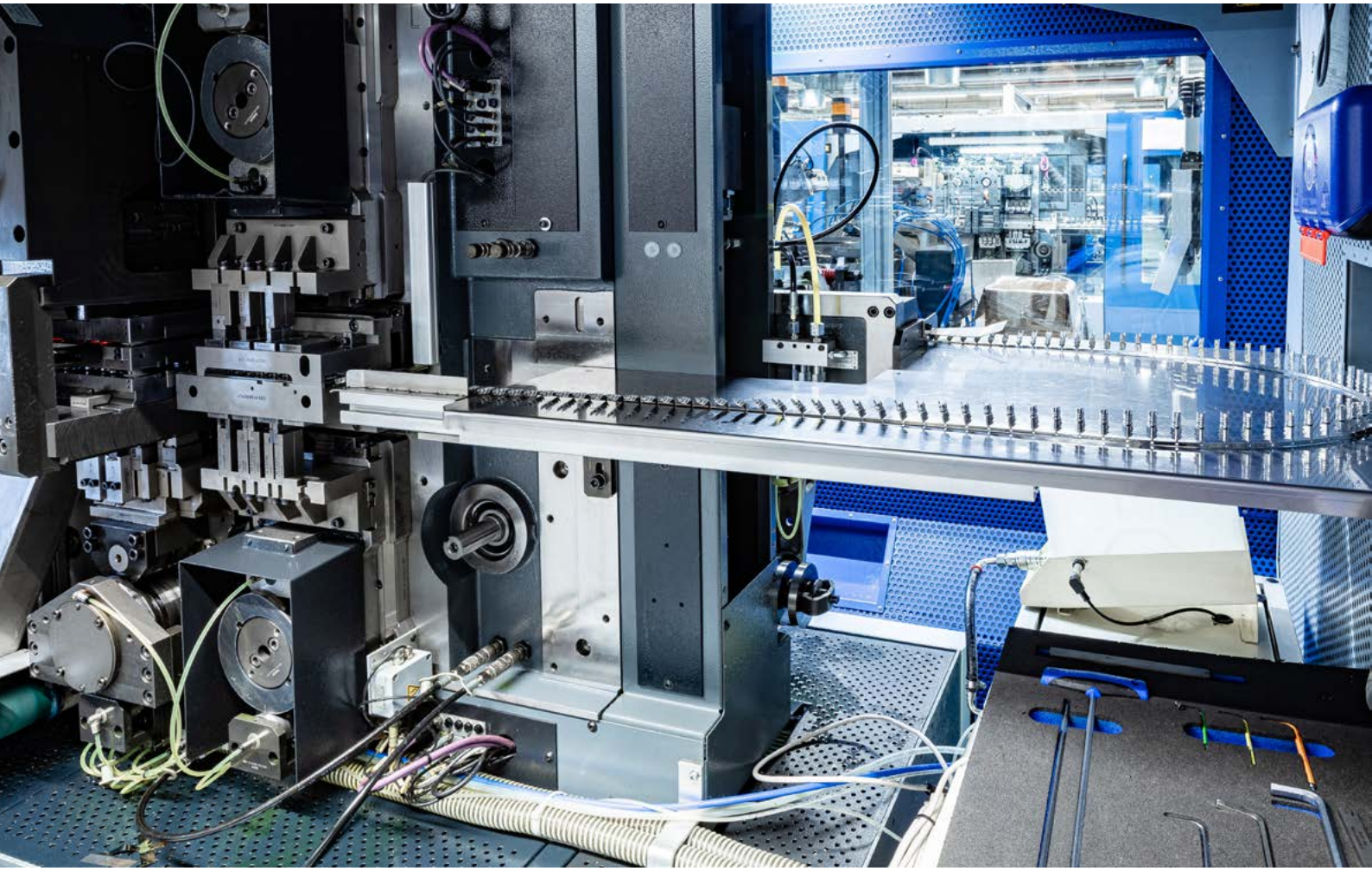
Rosenberger uses various raw materials including pure and partially tinned copper, copper-tin and stainless steel strips.

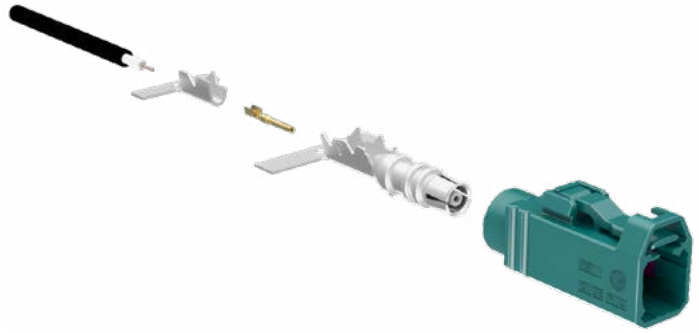
Stamping Technologies

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.

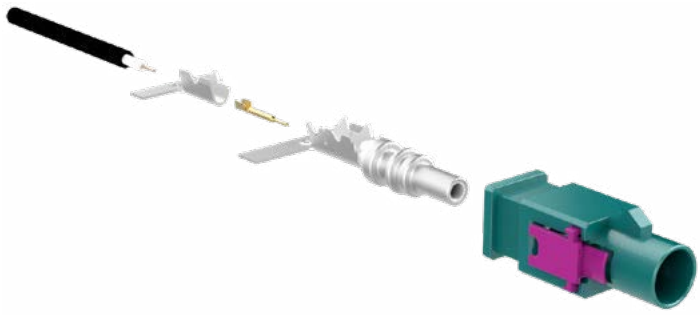
Benefits of Stamping & Forming

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





Cable SF support sleeve SF center contact SF connector body Plastic housing



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.

Complete Control with Innovative Technology

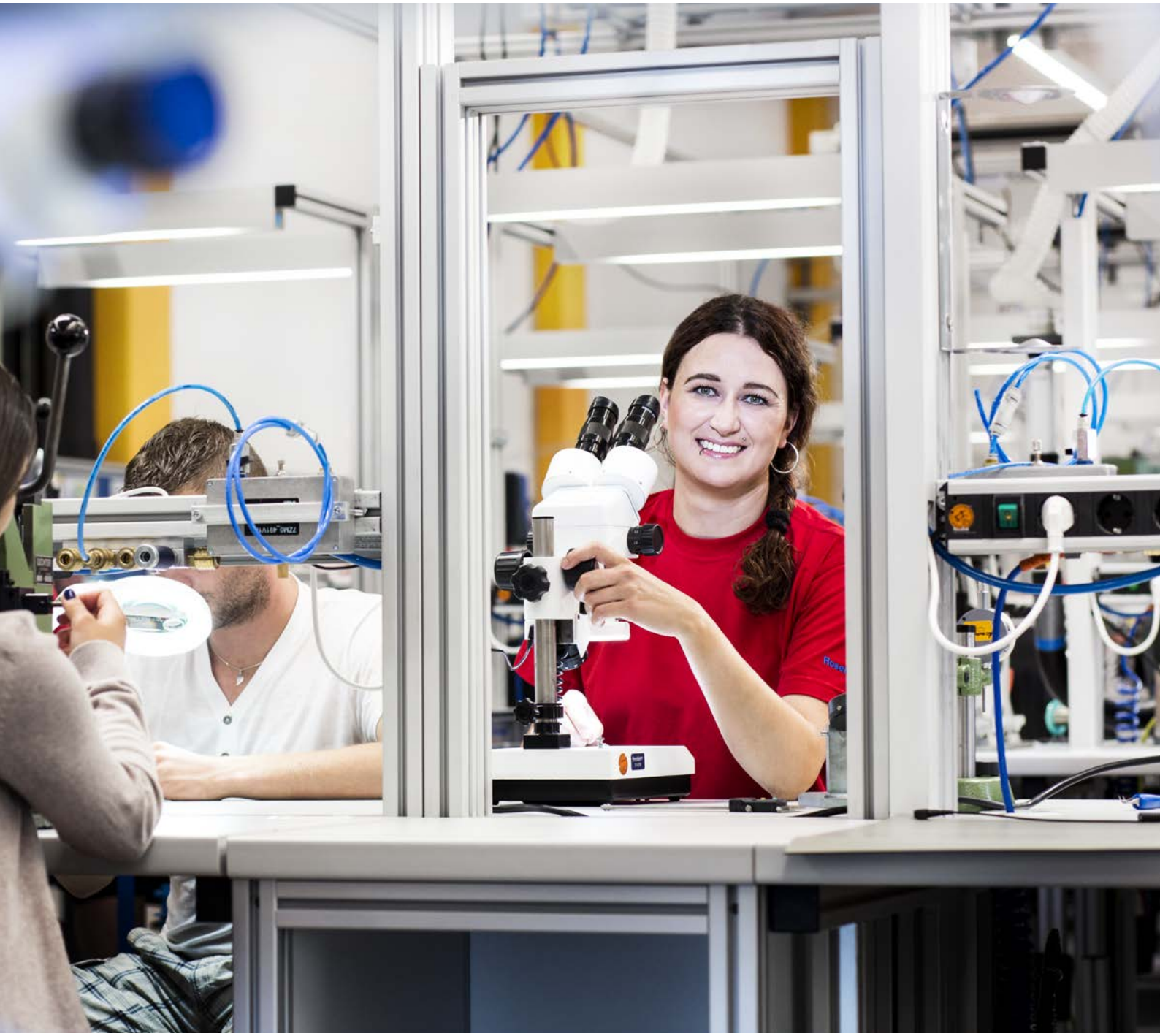
Industrial image processing guarantees fully automatic machine inspection. A combination of hardware and software ensures error-free execution of complex production. Digital sensors inside industrial cameras with special optics for image acquisition analyze and monitor all process steps. If products are in need of adjustment they are immediately scanned prior to checking for errors against the respective design data.

IMDS System

Rosenberger has been registered in the IMDS database (International Material Data System) since 2001.

IMDS reports for automotive customers are provided as a part of the PPAP documentation.

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 technology for mobile communication networks, data centers, test & measurement applications, automotive electronics, as well as high-voltage contact systems, medical electronics or aerospace engineering.

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

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contact-rin@rosenberger.com

Rosenberger No.

03K12L-00FS3 27
03K12S-00FS3 27
03K150-F10S3 27
03K159-K20S3 26, 27
03K159-S20S3 26, 27
03S12L-00FS3 27
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03W021-000 27
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11W150-508 28
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11W15A-508 28
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11W15F-5E4 28
11W15W-5BA 28
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11W161-801 29
11W161-806 29
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11W161-8M4 29
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59CK070-150 26
59K13o-102A4 12, 18
59K13o-103A4 12
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59K13o-1BFA4 12
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59K13o-1E7A4 12
59K13o-1M4A4 12, 18
59K14B-102/50 19
59K14B-1M4/50 19
59K14o-102Z4-y 18
59K14o-1M4Z4-y 18
59K16B-102T4 12, 18
59K16B-106T4 12
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59K16B-1M4T4 12, 18
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59K24K-1M4A4-y 18
59K25H-102A4 17
59K25H-106A4 17
59K25H-1E4A4 17
59K25H-1M4A4 17
59K26A-102Z4 17
59K26A-1M4Z4 17
59K27D-102Z4-y 17
59K27D-1M4Z4-y 17
59K28H-102A4 16
59K28H-106A4 16
59K28H-1E7A4 16
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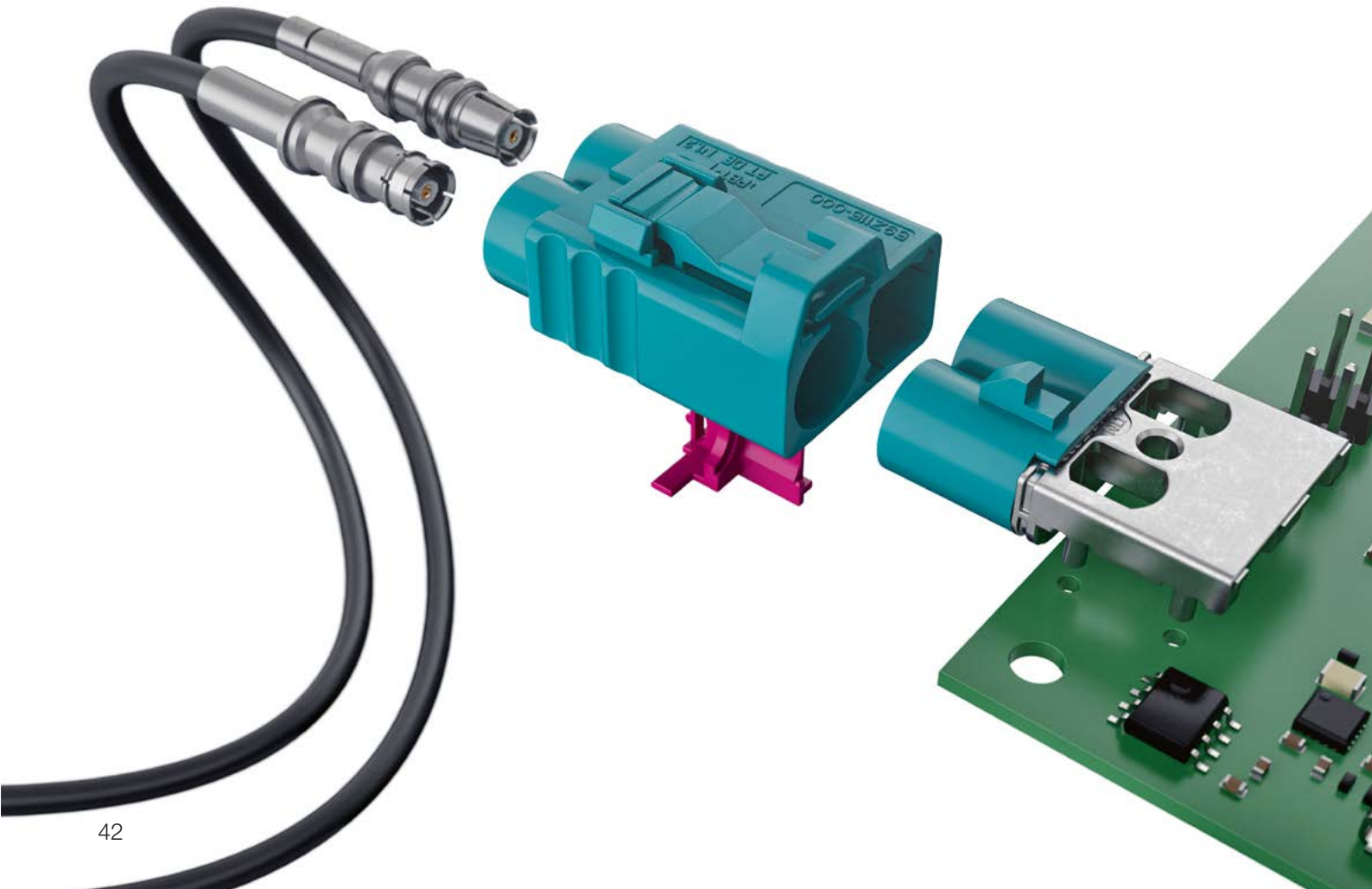
59K2LK-1M4A4-y 18
59K2MP-40MT5 25



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59S10M-40MT5-y 21
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59S12K-40MT5-y 21
59S13X-40MT5 21
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59S20Z-40MT5-y 25
59S21B-40MT5-y 22
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59S2DA-40MT5-y 24
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59S2DU-40MT5-y 24
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59S2LL-40MT5-y 23
59S2LQ-40MT5-y_1 23
59S2MB-40MT5-y 24
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59S2RK-40MT5-y 22
59S2RL-40MT5-y 23
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59S2UK-40MT5-y 22
59S2UL-40MT5-y 23
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59S2UQ-40MT5-y_1 23
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59W008-000 29
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59W011-000 29
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59Z026-000-y 16
59Z027-001-y 16
59Z063-000-y 13
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59Z066-L00-y 16
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59Z076-001-y 12
59Z113-000-y 13
59Z113-000Z 26, 27
59Z114-000-y 15
59Z114-000Z 26, 27
59Z115-000-y 13
59Z116-000-y 15
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59Z117-C01-y 13
59Z118-C00-y 15
59Z119-000-y 13
59Z119-C01-y 13
59Z120-000-y 15
59Z120-C00-y 15
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