Rosenberger

High-Voltage and Low-Voltage Products

Connector Systems for E-Mobility

AUTOMOTIVE

Rosenberger Automotive – a Synonym for Quality and Innovation

On the following pages we present the high-quality Rosenberger high-voltage connector systems developed in our automotive business area. They fulfill the tough requirements of the automotive industry.

Contents

The Rosenberger online catalog contains the current power connector systems for e-mobility with specific details, including data sheets, assembly instructions and panel piercings.

www.rosenberger.com/ok/hv

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.

Rosenberger Automotive Data Connector Systems

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

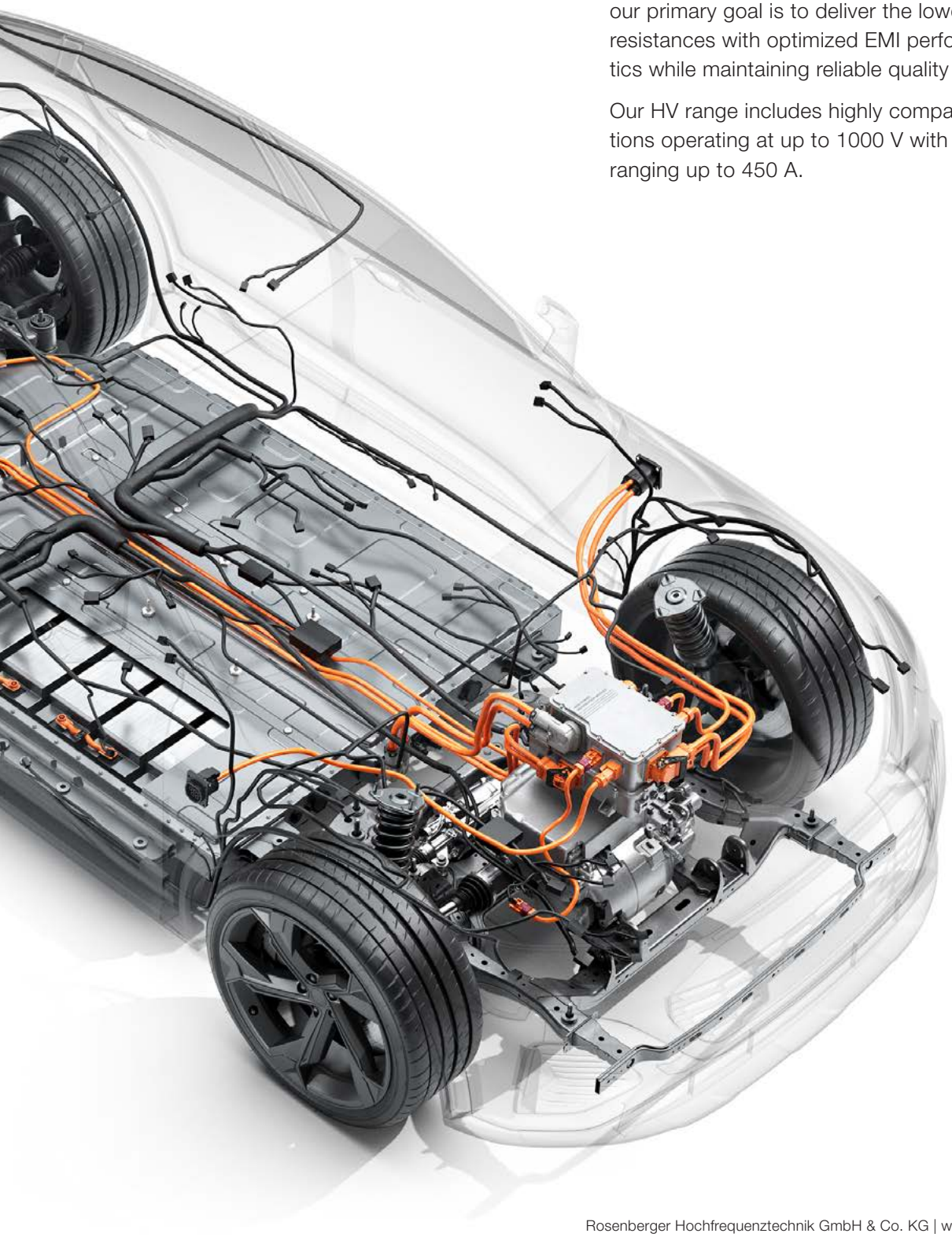
- Autonomous driving
- Driver assistance systems
- Navigation
- Infotainment
- Rear entertainment
- Internet and mobile communication
- “WiGig” (Wireless Gigabit)

Rosenberger Power Connector Systems for E-Mobility

The ongoing shift from combustion engines towards hybrid and electric motors in vehicles calls for continuous innovation in connector technology.

Electrical components must not only be robust and as space-saving as possible, but also capable of safe operation at high voltages and extreme currents. Therefore, our primary goal is to deliver the lowest possible contact resistances with optimized EMI performance characteristics while maintaining reliable quality standards.

Our HV range includes highly compact connection solutions operating at up to 1000 V with continuous currents ranging up to 450 A.



Rosenberger Connector Systems for E-Mobility

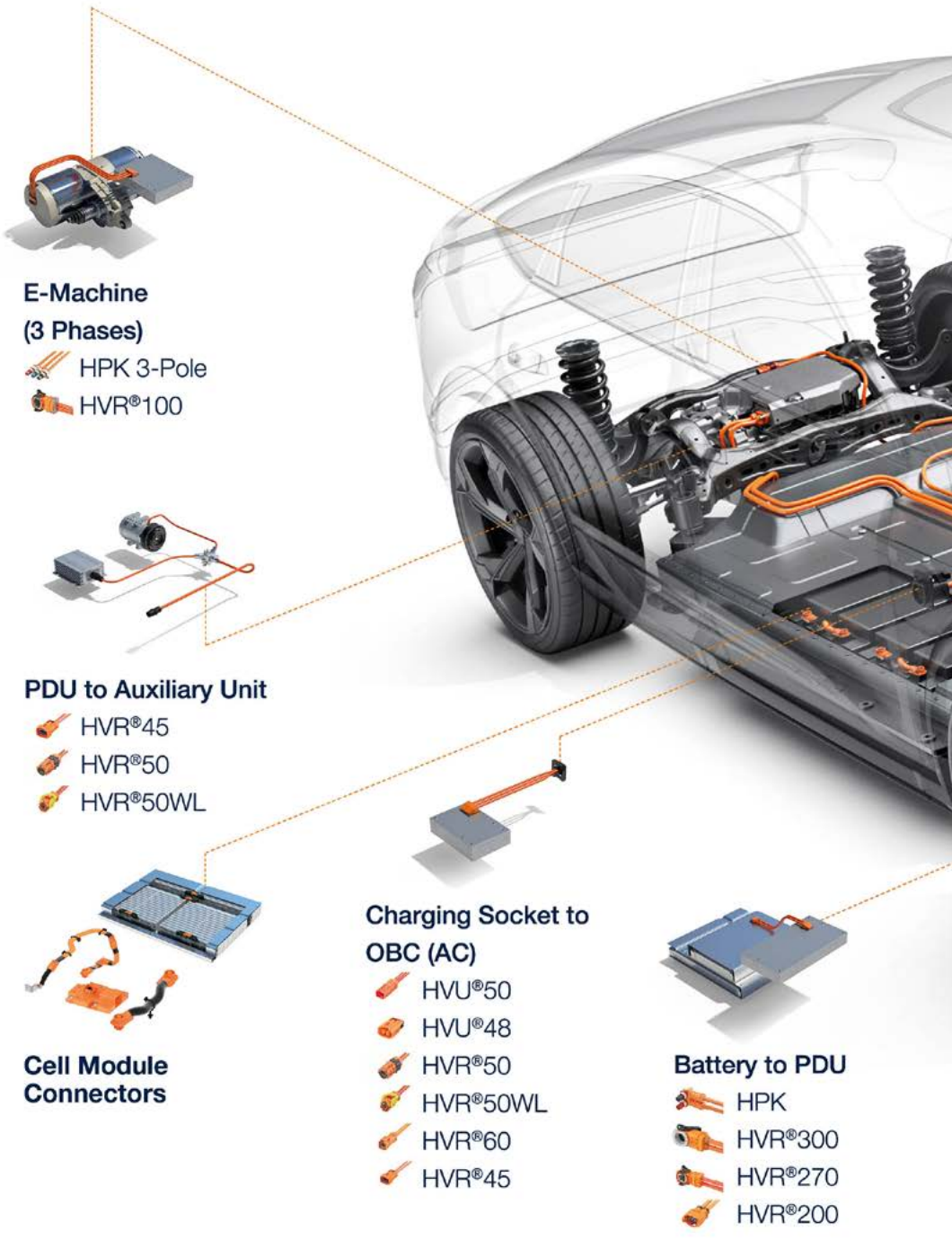
Developed especially for optimized power transmission in electric and hybrid vehicles, the extensive portfolio of Rosenberger power connectors is designed to meet customer requirements for maximum quality, reliability, performance, at best costs.

Maximum currents ranging from 50 A to 450 A and cable cross sections from 3 mm^2 to 120 mm^2 are covered, as well as power distribution units for customer-specific assemblies.

When electrical power transmission performance really counts Rosenberger has the perfect connection.

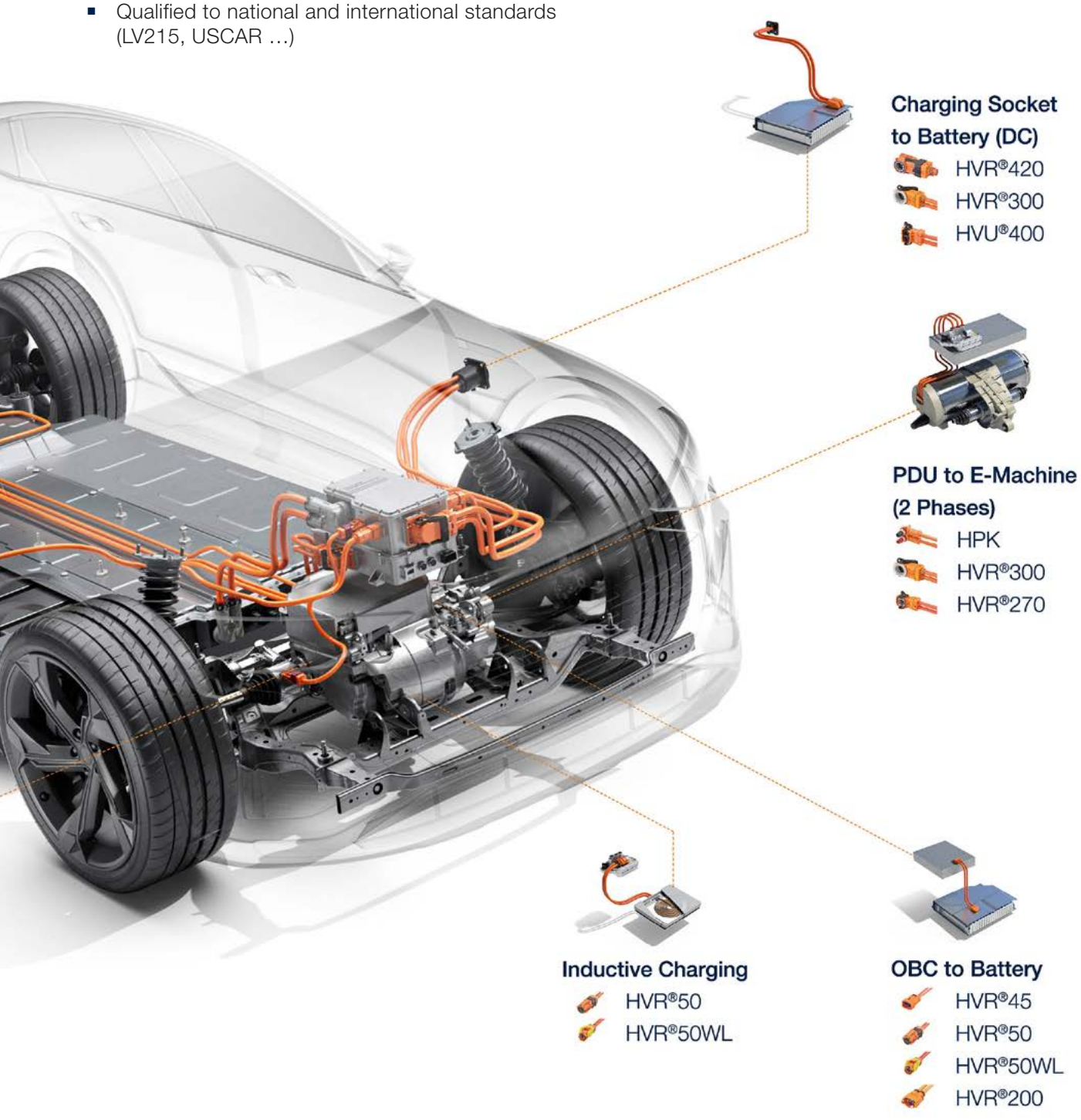
Product Portfolio

- High-voltage connectors shielded (HVR series)
- High-voltage connectors unshielded (HVU series)
- High-power connectors (HPK series)
- HV components (power distribution units, splitter, cell module connectors)
- Low-voltage connectors
- LEV connectors



Features and Benefits

- High current performance
- Minimum installation space
- Highest vibration classes
- In-house thermal simulation
- Contact system and connecting technology
- Assembly
- Best EMI performance after aging due to silver plated contacts and special screw technology
- Detailed assembly instruction for cable-side and device-side
- Qualified to national and international standards (LV215, USCAR …)



Rosenberger Number Code

HV Connectors

H2	K	1	01-	W	2	A	035	B1	-A
									Coding
								Plating	
							Cable size specified in mm^2		
						Cable group			
					Number of center contacts				
				Backend type					
				0 screw version outer and center contact					
				1 crimped outer and center contact					
				2 mated outer contact – screwed center contact					
				5 press-fitted outer contact – crimped center contact					
				9 special types					
				V crimped outer contact – crimp-welded center contact					
				W crimped outer contact – welded center contact					
			Successive number						
		Configuration							
		1 straight							
		2 right angle							
	Gender								
	K jack								
	S plug								
Connector series									

HV Device Socket (Header)

HV	L	1	02-	5	B-	002	B1	-A
								Coding
							Plating	
						Successive number		
					Cable dimension			
					0 no cable			
					A 2.5 mm^2			
					B 4 mm^2			
					C 6 mm^2			
					D 16 mm^2			
					E 25 mm^2			
					F 35 mm^2			
					G 50 mm^2			
					H 70 mm^2			
					J 90 mm^2			
				Backend type				
			Successive number					
		Configuration						
		1 straight						
		2 right angle						
	L/S Header plug							
Connector series								

HVR® High-Voltage Shielded Connectors

Rosenberger's extensive portfolio of shielded high-voltage connectors has been developed especially for optimized power transmission in electric vehicles.

For Rosenberger, the product development goal is clear: minimum contact resistance plus high power density coupled with excellent EMC performance properties.

They meet customer requirements in terms of quality, reliability, performance and price. The shielded HV product line includes extremely compact connection solutions up to 1000 V with continuous currents up to 450 A, that can be operated over entire product lifetimes.

HVR®45

Rosenberger HVR®45 – our smallest shielded connector series enables a maximum current capacity of 54 A at cable cross section of 6 mm² and a working voltage of 1000 V DC. HVR®45 cable connectors are available in straight and inline variants as well as headers. HVR®45 connectors are mainly used for PDU to auxiliary units, charging sockets to OBC (AC) and OBC to batteries.

Product Portfolio

- Cable connectors
- Inline connectors
- Headers
- Cable assemblies

Benefits

- Small dimensions
- For shielded cables
- For inline or header applications

Features

- Shielded
- Current capacity (6 mm²) 54 A at 85 °C
- Working voltage 1000 V DC
- Creepage ≥ 3.18 mm
- Clearance ≥ 1.39 mm
- Cross section 6 mm²
- Engine vibration SG2 according to LV similar to V1 according to USCAR
- Locking mechanism with CPA (Connector Position Assurance)

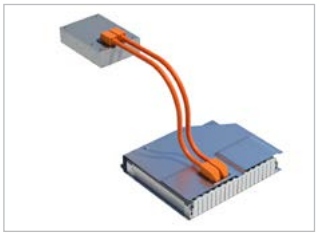
Applicable Standards

- Rosenberger series code HMA
- Interface according to RN_157-01
- RoHS compliant

Applications

PDU to auxiliary units

Charging socket to OBC (AC)



OBC to batteries

Products

HVR®45 Cable Jack

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HMAK106-520006T1-Y	Straight jack Shielded	2×6 mm²	MA_HV0235	
HMAK115-520000XX-Y	Straight jack dummy Shielded			

HVR®45 Inline Plug

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HMAS107-520006T1-Y	Straight plug Shielded	2×6 mm²	MA_HV0180	

HVR®45 Header Plug

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Panel Piercing	Product
HMAL105-320006T1-Y	Straight plug 4-hole flange Shielded	2×6 mm²	MA_HV0170	MB_803	

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvr45

HVR®50

Rosenberger HVR®50, our small and handy shielded connector series, enables a maximum current capacity of 50 A at 85 °C for cable cross sections of 6 mm² and a working voltage of 900 V DC. The slide locking mechanism prevents accidental disconnection. HVR®50 connectors are mainly used in auxiliary units such as electrical heating systems, air-conditioning units, DC/DC converters and for charging batteries.

Product Portfolio

- Cable connectors (right angle and straight)
- Headers with HVIL (high-voltage interlock)
- For multi core and single core cables
- Cable assemblies

Features

- Shielded
- Current capacity (6 mm²) 50 A at 85 °C
- Working voltage 900 V DC
- Test voltage 2700 V DC
- Creepage cable connector ≥ 4.68 mm
- Creepage header ≥ 4.75 mm
- Clearance cable connector ≥ 4.68 mm
- Clearance header ≥ 4.75 mm
- Temperature range -40 °C to +140 °C
- Engine vibration SG2 according to LV similar to V1 according to USCAR
- Mating cycles ≥ 50
- Cross sections 4 mm², 6 mm²
- Locking mechanism with slider

Benefits

- Minimal dimensions
- Excellent shielding
- With HVIL (high-voltage interlock)

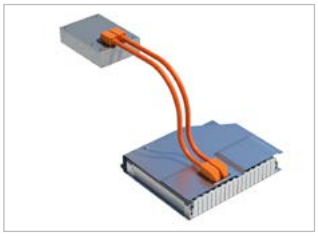
Applicable Standards

- Rosenberger series code H6
- Interface according to RN_111-01
- RoHS compliant

Applications

PDU to auxiliary units

Charging socket to OBC (AC)



OBC to batteries

Inductive charging

Products

HVR®50 Cable Jack

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
H6K106-12A004B1-Y	Straight jack 2-pole Waterproof Multi core cable Shielded	4 mm²	MA_HV0078	
H6K106-12A006B1-Y		6 mm²		
H6K105-12A006B-Y	Straight jack 2-pole dummy Shielded			
H6K206-12A004B1-Y	Right angle jack 2-pole Waterproof Multi core cable Shielded	4 mm²	MA_HV0077	
H6K206-12A006B1-Y		6 mm²		
H6K211-12A004B1-Y	Right angle jack 2-pole Waterproof 2 × single core cable Shielded	4 mm²	On request	
H6K211-12A006B1-Y		6 mm²		
H6K205-12A006B-Y	Right angle jack 2-pole dummy Shielded			

HVR®50 Header Plug

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Panel Piercing	Product
H6L106-5B-001B1-Y	Straight plug 2-pole 4-hole flange Shielded	4 mm²	MA_HV0080	MB_647	
H6L106-5C-001B1-Y		6 mm²			

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvr50

HVR®50WL

Rosenberger HVR®50WL connector system is characterized by a current capacity of 75 A at 85 °C and a working voltage of 1000 V DC at a cable cross section of 10 mm². The HVR®50WL connectors offer an excellent dimension/performance ratio while keeping dimensions to a minimum. HVR®50WL connectors are mainly used for PDU to auxiliary units and OBC to batteries. The locking mechanism with lever and CPA (Connector Position Assurance) prevents accidental unmating.

The HVR®50WL connector system is not compatible to HVR®50!

Product Portfolio

- Cable connectors (straight and right angle)
- Headers
- Cable assemblies

Benefits

- Small dimensions
- For shielded cables
- With HVIL (high-voltage interlock)

Features

- Shielded single core cable
- Current capacity (10 mm²) 75 A at 85 °C
- Working voltage 1000 V DC
- Creepage ≥ 5 mm
- Clearance ≥ 2.22 mm
- Cross sections 4 mm², 6 mm², 10 mm²
- Engine vibration V1 according to B21 7050, higher vibration levels optional
- Temperature class T2
- Reduced mating forces 30 N
- Locking mechanism with lever and CPA (Connector Position Assurance)

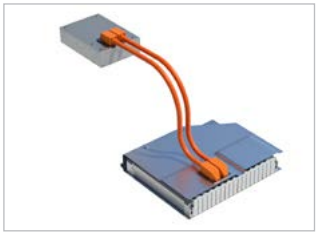
Applicable Standards

- Rosenberger series code HW
- Interface according to RN_182-01
- RoHS compliant

Applications

PDU to auxiliary units

Charging socket to OBC (AC)



OBC to batteries

Inductive charging

Products

HVR®50WL Cable Jack

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HWK122-12A004B1-Y	Straight jack 2-pole Shielded	2×4 mm²	MA_HV0165	
HWK122-12A006B1-Y		2×6 mm²		
HWK122-12A010B1-Y		2×10 mm²		
HWK222-12A004B1-Y	Right angle jack 2-pole Shielded	2×4 mm²	MA_HV0154	
HWK222-12A006B1-Y		2×6 mm²		
HWK222-12A010B1-Y		2×10 mm²		

HVR®50WL Header Plug

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Panel Piercing	Product
HWL121-5B-001B1-Y	Straight plug 2-pole 4-hole flange Shielded	2×4 mm²	MA_HV0164	MB_859	
HWL121-5C-001B1-Y		2×6 mm²			
HWL121-5X-001B1-Y		2×10 mm²			

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvr50wl

HVR®60

Rosenberger HVR®60 is a shielded connector system in small dimensions for cable cross sections of 4×6 mm² (multi core) and 2×16 mm² (single core). It offers a maximum current capacity of 60 A and a working voltage of 1000 V DC at a cable cross section of 6 mm². HVR®60 cable connectors are available in straight connector variants as well as right angled headers. HVR®60 connectors are mainly used for charging sockets to OBC (AC).

Product Portfolio

- Cable connectors straight
- Headers
- Cable assemblies

Features

- Shielded
- Current capacity (6 mm²) 60 A at 85 °C
- Current capacity (16 mm²) 130 A at 85 °C
- Working voltage 1000 V DC
- Creepage ≥ 5 mm
- Clearance ≥ 4 mm
- Cross sections 6 mm², 16 mm²
- Engine vibration SG2 according to LV similar to V1 according to USCAR
- Contact element of HVR®50
- Locking mechanism with CPA (Connector Position Assurance)

Applications

Charging socket to OBC (AC)

Benefits

- Small dimensions
- Contact element of HVR®50

Applicable Standards

- Rosenberger series code HE
- Interface according to RN_168-01
- RoHS compliant

Products

HVR®60 Cable Jack

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HEK105-140006B1-Y	Straight jack 4-pole Multi core cable Shielded	4×6 mm²	MA_HV0138	
HEK105-W40016B1-Y	Straight jack 4-pole Single core cable Shielded	2×16 mm²	MA_HV0151	

HVR®60 Header Plug

Rosenberger No.	Description	Cable Cross Section	Panel Piercing	Product
HEL201-5C-000-Y	Right angle plug 4-pole 4-hole flange Shielded	4×6 mm²	MB_784	

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvr60

HVR®100

The Rosenberger HVR®100 connector system enables a maximum current capacity of 110 A at 85 °C and a working voltage of 1000 V at a cable cross section of 16 mm². The HVR®100 connectors take up minimal space. It features an angled connector for three shielded cables along with the corresponding header. The unique locking mechanism with special lever and CPA (Connector Position Assurance) allows locking only when mated and prevents accidental unmating. HVR®100 connectors are mainly used for 3-phases e-machine applications.

Product Portfolio

- Cable connectors right angle 3 phases
- Headers
- Cable assemblies

Features

- Shielded
- Current capacity (16 mm²) 110 A at 85 °C
- Working voltage 1000 V DC
- Creepage ≥ 11.1 mm
- Clearance ≥ 4.63 mm
- Cross section 16 mm²
- Engine vibration SG2 according to LV similar to V1 according to USCAR
- Unique locking mechanism with special lever and CPA (Connector Position Assurance)

Applications

E-machine (3 phases)

Benefits

- Optimum dimension performance ratio
- 3 phases

Applicable Standards

- Rosenberger series code HMB
- Interface according to RN_196-01
- RoHS compliant

Products

HVR®100 Cable Jack

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HMBK216-130016B1-Y	Right angle jack Shielded	3×16 mm²	MA_HV0197	

HVR®100 Header Plug

Rosenberger No.	Description	Assembly Instruction	Panel Piercing	Product
HMBS119-230016T-Y	Straight plug 4-hole flange Shielded	MA_HV0198	MB_933	

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvr100

HVR®200

Rosenberger HVR®200 connectors offer an excellent dimension/performance ratio, combining high current capacity of 200 A (35 mm²) at 85 °C while keeping dimensions to a minimum. These two-pin connectors are ideal for connecting elements between a battery and an inverter or for installation in power distribution units (PDU). To suit the relevant installation or usage requirements, the portfolio includes headers as well as a straight cable connector.

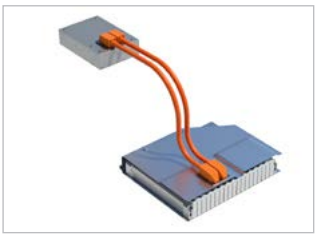
Product Portfolio

- Cable connectors
- Header optional with HVIL (high-voltage interlock)
- Cable assemblies

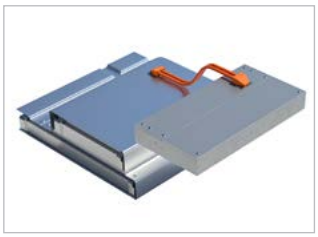
Features

- Shielded
- Current capacity (35 mm²) 200 A at 85 °C
- Working voltage 1000 V DC
- Test voltage 2700 V DC
- Creepage ≥ 5 mm
- Clearance ≥ 2.19 mm
- Temperature range -40 °C to +140 °C
- IP class mated according to IP6K9K / IPXXD / IPX8
- IP class unmated according to IPXXB
- Engine vibration SG2 according to LV similar to V1 according to USCAR
- Mating cycles ≥ 50
- Cross sections 16 mm², 25 mm², 35 mm²

Applications



OBC to batteries



Battery to PDU

Benefits

- Superior dimension performance ratio
- Optional with HVIL (high-voltage interlock)

Applicable Standards

- Rosenberger series code H2
- Interface according to RN_081-01
- RoHS compliant

Products

HVR®200 Cable Jack

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
H2K105W2A016B1-Y	Straight jack 2-pole Waterproof Shielded	2×16 mm²	MA_HV0167	
H2K105W2A025B1-Y		2×25 mm²		
H2K105-W2A035B1-Y		2×35 mm²		
170-099-00005	Protection cap for HVR®200 straight jack			

HVR®200 Header Plug

Rosenberger No.	Description	Assembly Instruction	Panel Piercing	Product
H2L105-00-004B1-Y	Straight plug 2-pole Waterproof Plastic housing Shielded	MA_HV0015	MB_741	
H2L112-00-000B1-Y	Straight plug 2-pole Waterproof Aluminum housing Shielded	MA_HV0017	MB_448	
H2L219-00-000B1-Y	Right angle plug 2-pole Waterproof Aluminum housing Shielded	MA_HV0122	MB_775	

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvr200

HVR®270

Rosenberger HVR®270 connector system is characterized by a current capacity of 270 A (50 mm²) at 85 °C and a working voltage of 1000 V DC at a cable cross section of 50 mm². The HVR®270 connectors offer an excellent dimension/performance ratio while keeping dimensions to a minimum. HVR®270 connectors are mainly used for PDU to e-machines and battery to PDU applications. The unique locking mechanism with special lever and CPA (Connector Position Assurance) allows locking only when mated and prevents accidental unmating.

Product Portfolio

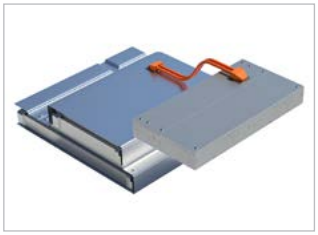
- Cable connectors (right angle)
- Headers
- For single core cables
- Cable assemblies

Features

- Shielded
- Current capacity (50 mm²) 270 A at 85 °C
- Working voltage 1000 V DC
- Creepage ≥ 6.76 mm
- Clearance ≥ 1.70 mm
- Cross sections 16 mm², 25 mm², 35 mm², 50 mm²
- Engine vibration SG2 according to LV similar to V1 according to USCAR
- Unique locking mechanism with special lever and CPA (Connector Position Assurance)

Applications

PDU to E-machine
(2 phases)



Battery to PDU

Benefits

- For shielded cables
- Excellent dimension/performance ratio

Applicable Standards

- Rosenberger series code H7
- Interface according to RN_176-01
- RoHS compliant

Products

HVR®270 Cable Jack

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
H7K225-W20016B1-Y	Right angle jack 2-pole Shielded	2×16 mm²	MA_HV0175	
H7K225-W20025B1-Y		2×25 mm²		
H7K225-W20035B1-Y		2×35 mm²		
H7K225-W20050B1-Y		2×50 mm²		

HVR®270 Header Plug

Rosenberger No.	Description	Assembly Instruction	Panel Piercing	Product
H7S157-22-000/90-Y	Straight plug 4-hole flange Shielded Contact to aluminum material	MA_HV0147	MB_777-Y	
H7S125-22-000B1-A	Straight plug 4-hole flange Shielded Contact to metal sheet Coding A	MA_HV0196	MB_861	
H7S126-22-000B1-B	Straight plug 4-hole flange Shielded Contact to metal sheet Coding B			
H7Z024-000/91	Backing Plate for H7S125-22-000B1-A and H7S126-22-000B1-B Plastic			

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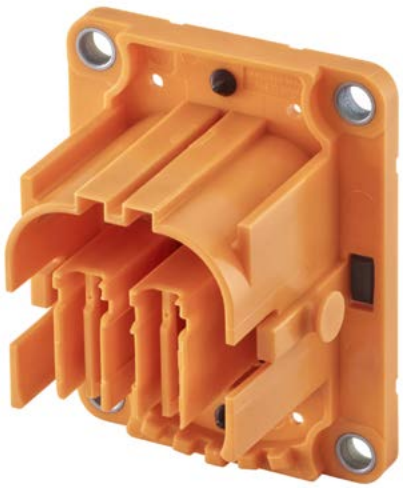


For more information
refer to our website:

www.rosenberger.com/hvr270

HVR®300

The Rosenberger HVR®300 connector system enables a maximum current capacity of 380 A (95 mm²) at 85 °C. Working voltage is 1000 V DC. The HVR®300 connector system takes up minimal space. It features a 2-pole angled connector for shielded cables along with the corresponding header. The locking mechanism with lever and CPA (Connector Position Assurance) prevents accidental unmating.

Product Portfolio

- Right angle cable connector
- Header
- Cable assemblies

Features

- Shielded
- Current capacity (50 mm²) 265 A at 85 °C
- Current capacity (70 mm²) 320 A at 85 °C
- Current capacity (95 mm²) 380 A at 85 °C
- Working voltage 1000 V DC
- Test voltage 4800 V DC
- Creepage ≥ 5.92 mm
- Clearance ≥ 5.92 mm
- Temperature range -40 °C to +85 °C
- IP class mated according to IP6K9K / IP6K6K / IP6K7
- Engine vibration Vib D + M05 according to LV 124
- Mating cycles ≥ 50
- Cross sections 50 mm², 70 mm², 95 mm²
- Locking mechanism with lever and CPA (Connector Position Assurance)

Benefits

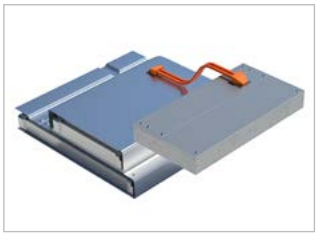
- Effective dimension/performance ratio
- With HVIL (high-voltage interlock)

Applicable Standards

- Rosenberger series code HK
- Interface according to RN_140-02
- RoHS compliant

Applications

PDU to E-machine
(2 phases)



Battery to PDU

Charging socket
to battery (DC)

Products

HVR®300 Cable Jack

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HKK207-W20050B1-Y	Right angle jack 2-pole Shielded	2×50 mm²	MA_HV0140	
HKK206-W20070B1-Y		2×70 mm²		
HKK204-W20095B1-Y		2×95 mm²		

HVR®300 Header Plug

Rosenberger No.	Description	Panel Piercing	Product
HKL116-23-001B1-Y	Straight plug 2-pole Outgoing busbar straight 4-hole flange Shielded	MB_753	
HKS123-22-000B1-Y	Straight plug 2-pole Outgoing busbar right angle, right 4-hole flange Shielded	MB_721	
HKS120-22-000B1-Y	Straight plug 2-pole Outgoing busbar right angle, left 4-hole flange Shielded	MB_753	

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvr300

HVR®420

The Rosenberger HVR®420 compact connector system enables a maximum current capacity of 405 A at cable cross section 95 mm² and a working voltage of 1000 V DC. Furthermore, the slide locking mechanism prevents accidental disconnection. Typical applications include charging socket to vehicle batteries (DC).

Product Portfolio

- Right angle cable connector
- Header
- Cable assemblies

Features

- Shielded
- Current capacity (95 mm²) 405 A at 85 °C
- Working voltage 1000 V DC
- Test voltage 2500 V DC
- Creepage ≥ 7.25 mm
- Clearance ≥ 5 mm
- IP class mated according to IP6K9K / IPX8
- IP class unmated according to IPXXB
- Engine vibration Vib D + M05 according to LV 124
- Mating cycles ≥ 50
- Cross sections 70 mm², 95 mm²
- Locking mechanism with slider

Applications

Charging socket to battery (DC)

Benefits

- Highest performance up to 405 A
- With HVIL (high-voltage interlock)

Applicable Standards

- Rosenberger series code HA
- Interface according to RN_113-01
- RoHS compliant

Products

HVR®420 Cable Jack

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HAK203-W10070B1-Y	Right angle jack Shielded	70 mm²	MA_HV0076	
HAK203-W10095B1-Y	Right angle jack Shielded	95 mm²	MA_HV0076	

HVR®420 Header Plug

Rosenberger No.	Description	Assembly Instruction	Panel Piercing	Product
HAS105-21-000B1-Y	Straight plug Outgoing busbar straight 4-hole flange Shielded	MA_HV0061	MB_569	
HAS103-21-000B1-Y	Straight plug Outgoing busbar right angle 4-hole flange Shielded	MA_HV0061	MB_569	

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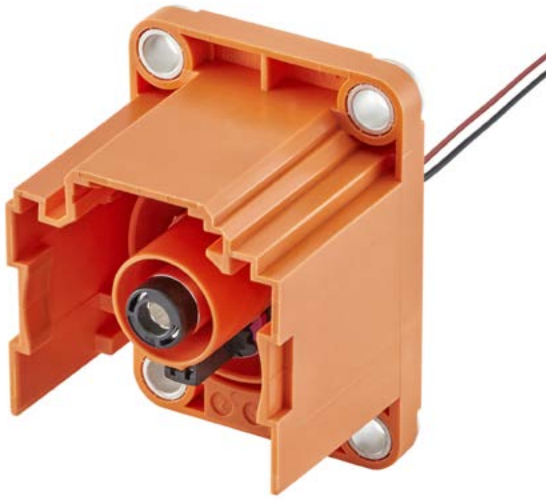


For more information
refer to our website:

www.rosenberger.com/hvr420

HPK

The Rosenberger HPK system can achieve 280 A at 85 °C up to 1000 V. With their excellent vibration and current capacity performance the HPK connectors are well-suited to typical high-voltage electric vehicle applications such as the connection between battery, inverter and PDU as well as to e-machine.

The range includes 1-, 2- or 3-pole connectors which for maximum flexibility can be used with copper or aluminum cables in different cable cross sections. Straight and angled cable connectors as well as corresponding headers are available, optional with HVIL (high-voltage interlock).

Product Portfolio

- Cable connectors 1-pole, 2-pole (3-pole on request)
- Header optional with HVIL (high-voltage interlock)
- Cable assemblies

Features

- Shielded
- Current capacity (straight 50 mm^2) 280 A at 85 °C
- Working voltage 1000 V DC
- Test voltage 3200 V DC
- Temperature range -40 °C to +140 °C
- IP class mated according to IP6K9K / IPX8 / IPXXD
- IP class unmated according to IPXXB
- Creepage (straight) ≥ 5.02 mm
- Creepage (right angle) ≥ 8.9 mm
- Clearance (straight) ≥ 4.91 mm
- Clearance (right angle) ≥ 9 mm
- Engine vibration SG2 according to LV, similar to V1 according to USCAR
- Mating cycles ≥ 50
- Cross sections 16 mm^2, 25 mm^2, 35 mm^2, 50 mm^2
- Different axis possible for the connection of the header

Benefits

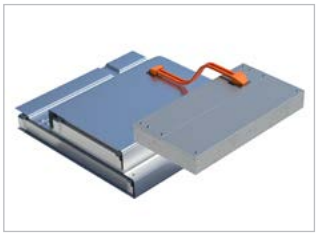
- Versatile product range
- High temperature and vibration performance
- Design makes this series easier to assemble, creating faster processes and higher quality
- Optional with HVIL (high-voltage interlock)
- Cable connectors with or without SVS (screw locking feature)
- New versions with stamped outer contact element and material PBT

Applicable Standards

- Interface according to Rosenberger RN_084-01
- Rosenberger RN_087-01
- Rosenberger RN_087-04
- Rosenberger series code H4
- RoHS compliant

Applications

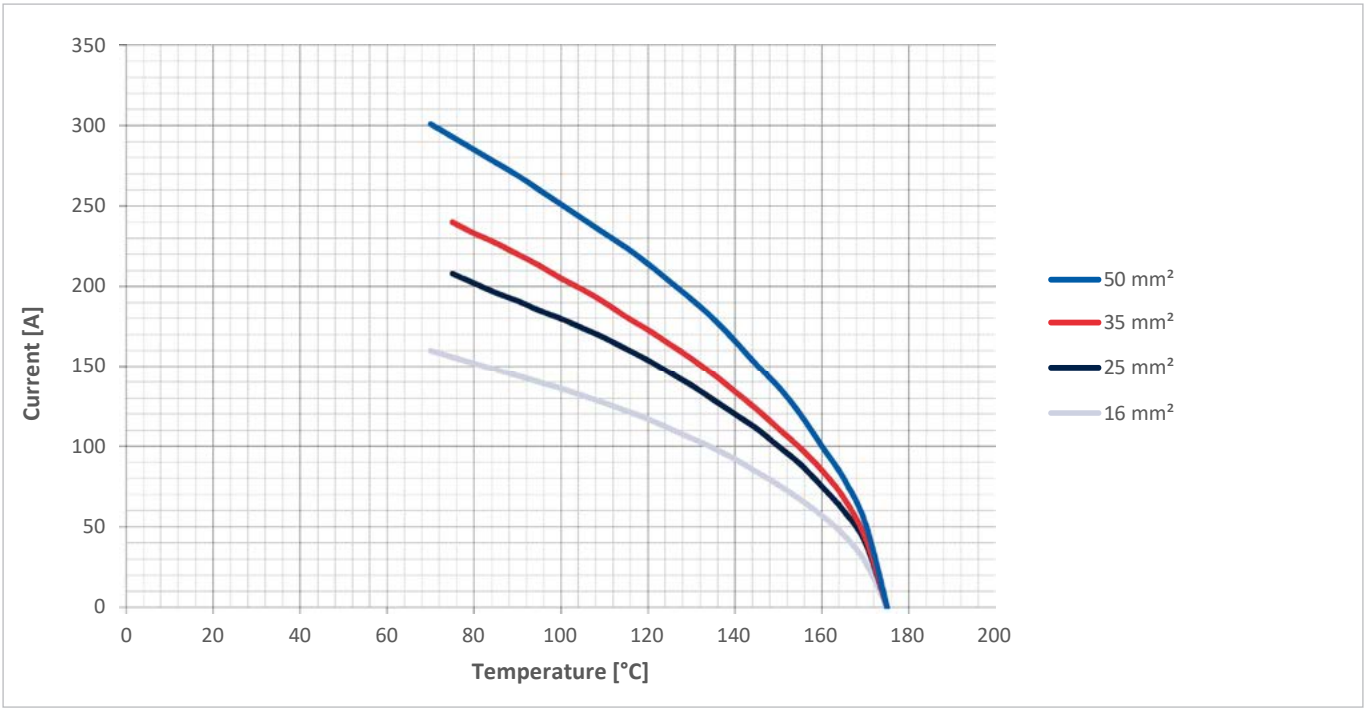
E-Machine (3 phases)



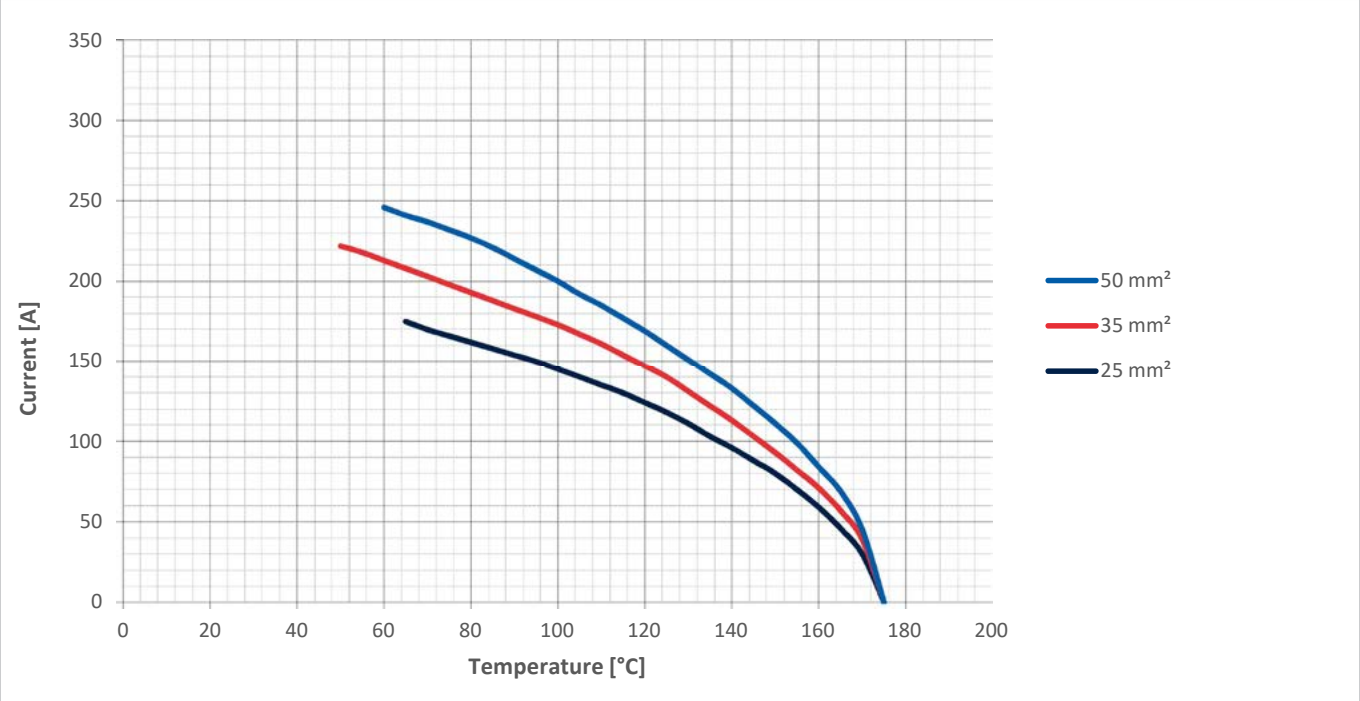
Battery to PDU

PDU to E-machine (2 phases)

Derating Graph according to DIN EN 60512-5-2



HPK Straight Copper Cables



HPK Straight Aluminum Cables

Products

HPK Cable Jack with HVIL

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
H4K134-W10016B1-YY	Straight jack 1-pole With SVS With HVIL Shielded	16 mm²	MA_HV0104	
H4K134-W10025B1-YY		25 mm²		
H4K134-W10035B1-YY		35 mm²		
H4K134-W10050B1-YY		50 mm²		
H4K136-W10016B1-YY	Straight jack 1-pole Without SVS With HVIL Shielded	16 mm²	MA_HV0104	
H4K136-W10025B1-YY		25 mm²		
H4K136-W10035B1-YY		35 mm²		
H4K136-W10050B1-YY		50 mm²		
H4K280-W10016B1-YY	Right angle jack 1-pole, cable down With SVS With HVIL Shielded	16 mm²	MA_HV0121	
H4K280-W10025B1-YY		25 mm²		
H4K280-W10035B1-YY		35 mm²		
H4K280-W10050B1-YY		50 mm²		
H4K282-W10016B1-YY	Right angle jack 1-pole, cable down Without SVS With HVIL Shielded	16 mm²	MA_HV0121	
H4K282-W10025B1-YY		25 mm²		
H4K282-W10035B1-YY		35 mm²		
H4K282-W10050B1-YY		50 mm²		
170-101-00000	Protection cap for jack With and without HVIL			

HPK Header Plug with HVIL

Rosenberger No.	Description	Product
H4S115-91-H00B-Y	Header 1-pole Outgoing busbar straight With HVIL Shielded	

-Y/-YY: please fill-in requested coding

Products

HPK Cable Jack with HVIL

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
H4K180-W20016B1-YYY	Straight jack 2-pole With SVS With HVIL Shielded	16 mm²	MA_HV0128	
H4K180-W20025B1-YYY		25 mm²		
H4K180-W20035B1-YYY		35 mm²		
H4K180-W20050B1-YYY		50 mm²		
H4K182-W20016B1-YYY	Straight jack 2-pole Without SVS With HVIL Shielded	16 mm²	MA_HV0128	
H4K182-W20025B1-YYY		25 mm²		
H4K182-W20035B1-YYY		35 mm²		
H4K182-W20050B1-YYY		50 mm²		
H4K280-W20016B1-YYY	Right angle jack 2-pole, cable down With SVS With HVIL Shielded	16 mm²	MA_HV0205	
H4K280-W20025B1-YYY		25 mm²		
H4K280-W20035B1-YYY		35 mm²		
H4K280-W20050B1-YYY		50 mm²		
H4K290-W20016B1-YYY	Right angle jack 2-pole, cable up With SVS With HVIL Shielded	16 mm²	MA_HV0205	
H4K290-W20025B1-YYY		25 mm²		
H4K290-W20035B1-YYY		35 mm²		
H4K290-W20050B1-YYY		50 mm²		
H4K282-W20016B1-YYY	Right angle jack 2-pole, cable down Without SVS With HVIL Shielded	16 mm²	MA_HV0205	
H4K282-W20025B1-YYY		25 mm²		
H4K282-W20035B1-YYY		35 mm²		
H4K282-W20050B1-YYY		50 mm²		
H4K292-W20016B1-YYY	Right angle jack 2-pole, cable up Without SVS With HVIL Shielded	16 mm²	MA_HV0205	
H4K292-W20025B1-YYY		25 mm²		
H4K292-W20035B1-YYY		35 mm²		
H4K292-W20050B1-YYY		50 mm²		
170-101-00000	Protection cap for jack With and without HVIL			

HPK Header Plug with HVIL

Rosenberger No.	Description	Product
H4S115-92-H00B-YY	Header 2-pole Outgoing busbar straight With HVIL Shielded	
H4L108-00-001B-YY	Header 2-pole Outgoing busbar right angle With HVIL Shielded	

-YY/-YYY: please fill-in requested coding

Products

HPK Cable Jack without HVIL

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
H4K135-W10016B1-YY	Straight jack 1-pole With SVS Without HVIL Shielded	16 mm²	MA_HV0104	
H4K135-W10025B1-YY		25 mm²		
H4K135-W10035B1-YY		35 mm²		
H4K135-W10050B1-YY		50 mm²		
H4K137-W10016B1-YY	Straight jack 1-pole Without SVS Without HVIL Shielded	16 mm²	MA_HV0104	
H4K137-W10025B1-YY		25 mm²		
H4K137-W10035B1-YY		35 mm²		
H4K137-W10050B1-YY		50 mm²		
H4K281-W10016B1-YY	Right angle jack 1-pole, cable down With SVS Without HVIL Shielded	16 mm²	MA_HV0121	
H4K281-W10025B1-YY		25 mm²		
H4K281-W10035B1-YY		35 mm²		
H4K281-W10050B1-YY		50 mm²		
H4K283-W10016B1-YY	Right angle jack 1-pole, cable down Without SVS Without HVIL Shielded	16 mm²	MA_HV0121	
H4K283-W10025B1-YY		25 mm²		
H4K283-W10035B1-YY		35 mm²		
H4K283-W10050B1-YY		50 mm²		
170-101-00000	Protection cap for jack With and without HVIL			

HPK Header Plug without HVIL

Rosenberger No.	Description	Product
H4S115-91-000B-Y	Header 1-pole Outgoing busbar straight Without HVIL Shielded	

-Y/-YY: please fill-in requested coding

For more information
refer to our website:

www.rosenberger.com/hpk

Products

HPK Cable Jack without HVIL

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
H4K181-W20016B1-YYY	Straight jack 2-pole With SVS Without HVIL Shielded	16 mm²	MA_HV0128	
H4K181-W20025B1-YYY		25 mm²		
H4K181-W20035B1-YYY		35 mm²		
H4K181-W20050B1-YYY		50 mm²		
H4K183-W20016B1-YYY	Straight jack 2-pole Without SVS Without HVIL Shielded	16 mm²	MA_HV0128	
H4K183-W20025B1-YYY		25 mm²		
H4K183-W20035B1-YYY		35 mm²		
H4K183-W20050B1-YYY		50 mm²		
H4K281-W20016B1-YYY	Right angle jack 2-pole, cable down With SVS Without HVIL Shielded	16 mm²	MA_HV0205	
H4K281-W20025B1-YYY		25 mm²		
H4K281-W20035B1-YYY		35 mm²		
H4K281-W20050B1-YYY		50 mm²		
H4K291-W20016B1-YYY	Right angle jack 2-pole, cable up With SVS Without HVIL Shielded	16 mm²	MA_HV0205	
H4K291-W20025B1-YYY		25 mm²		
H4K291-W20035B1-YYY		35 mm²		
H4K291-W20050B1-YYY		50 mm²		
H4K283-W20016B1-YYY	Right angle jack 2-pole, cable down Without SVS Without HVIL Shielded	16 mm²	MA_HV0205	
H4K283-W20025B1-YYY		25 mm²		
H4K283-W20035B1-YYY		35 mm²		
H4K283-W20050B1-YYY		50 mm²		
H4K293-W20016B1-YYY	Right angle jack 2-pole, cable up Without SVS Without HVIL Shielded	16 mm²	MA_HV0205	
H4K293-W20025B1-YYY		25 mm²		
H4K293-W20035B1-YYY		35 mm²		
H4K293-W20050B1-YYY		50 mm²		
170-101-00000	Protection cap for jack With and without HVIL			

HPK Header Plug without HVIL

Rosenberger No.	Description	Product
H4S115-92-000B-YY	Header 2-pole Outgoing busbar straight Without HVIL Shielded	

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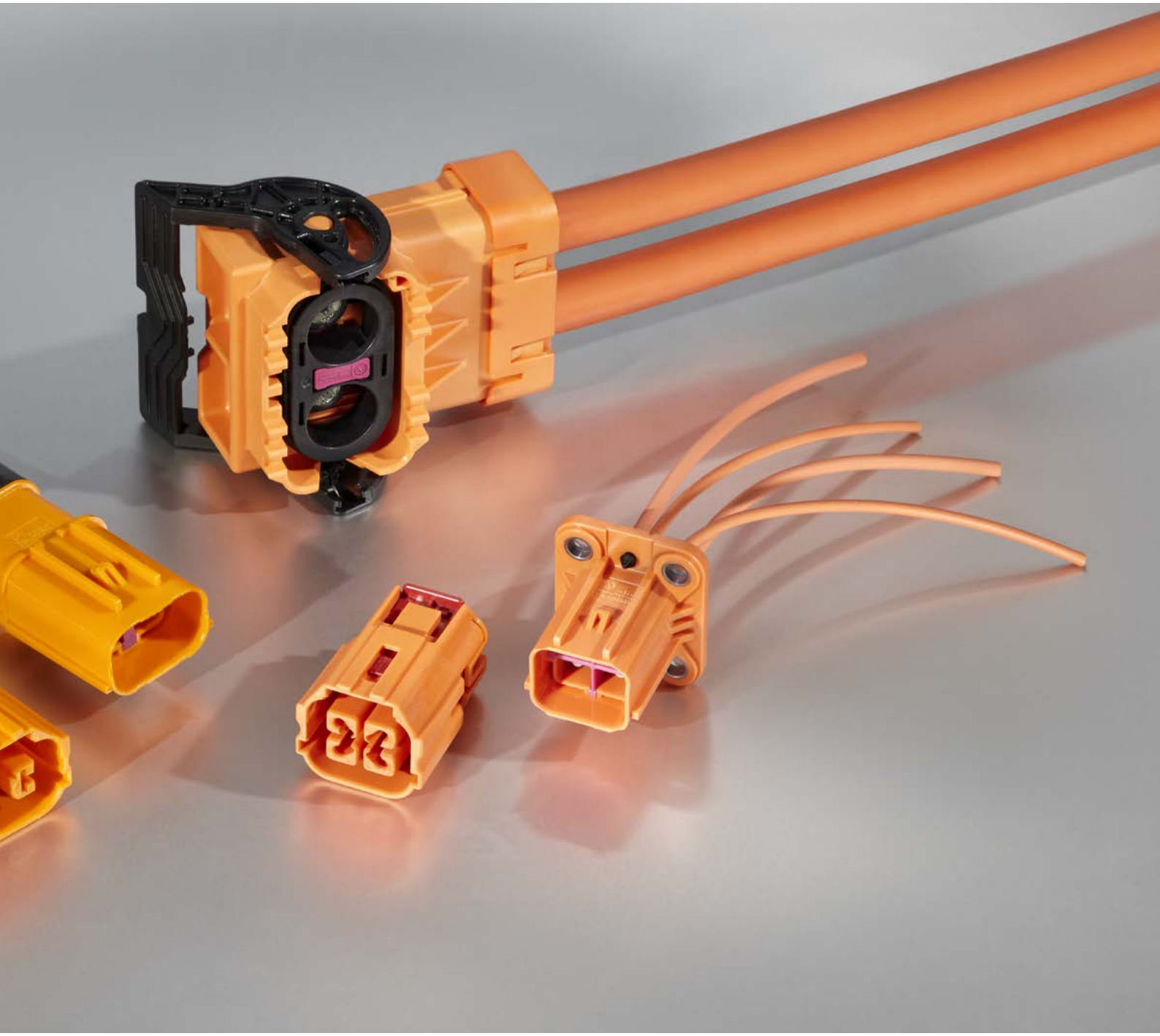
HVU® High-Voltage Unshielded Connectors

New and additional to the shielded product portfolio, Rosenberger develops and offers several unshielded high-voltage product series (HVU®) e.g. HVU®48, HVU®50, HVU®400.

Cost-effective and tailored to the usecase, these connectors are reduced to the purpose of transmitting power while maintaining high voltage safety.

Current capacity ranges from 60 A, 87.5 A up to 340 A at a working voltage of 1000 V DC.



HVU®48

Unshielded Rosenberger HVU®48 connector series in small dimensions for cable cross sections of 6 mm^2, 10 mm^2, 16 mm^2 are available in straight and inline variants as well as headers. They are characterized by a maximum current capacity of 87.5 A and a working voltage of 1000 V DC at a cable cross section of 16 mm^2. HVU®48 connectors are mainly used for charging sockets to OBC (AC).

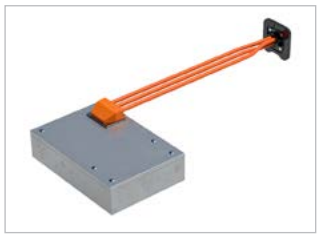
Product Portfolio

- Cable connectors
- Inline connectors
- Header
- Cable assemblies

Features

- Unshielded
- Current capacity (16 mm^2) 87.5 A at 85 °C
- Working voltage 1000 V DC
- Creepage ≥ 17.68 mm
- Clearance ≥ 11.4 mm
- Cross sections 6 mm^2, 10 mm^2, 16 mm^2
- Engine vibration SG2 according to LV similar to V1 according to USCAR
- Locking mechanism with CPA (Connector Position Assurance)

Applications



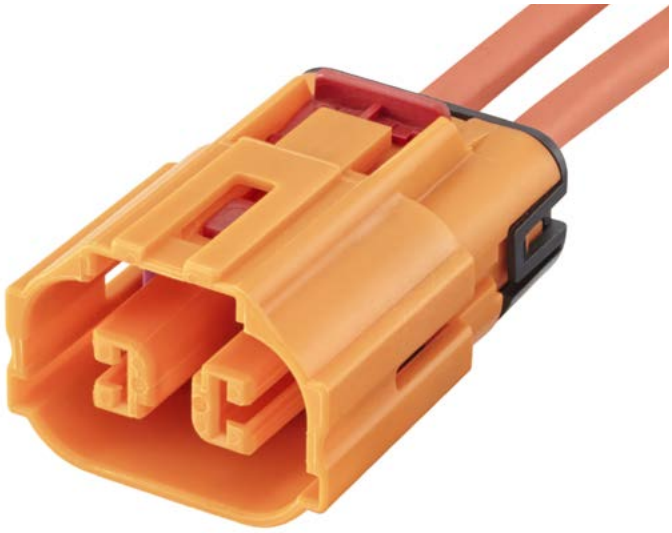
Charging socket to OBC (AC)

Benefits

- Small dimensions
- For unshielded copper cables
- For inline or header application
- Ultrasonic welding

Applicable Standards

- Rosenberger series code HUB
- Interface according to Rosenberger RN_163-02
- RoHS compliant



Products

HVU®48 Cable Jack Unshielded

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HUBK102-920006X1-Y	Straight jack 2-pole Unshielded	2×6 mm²	MA_HV0142	
HUBK102-920010X1-Y		2×10 mm²		
HUBK102-920016X1-Y		2×16 mm²		

HVU®48 Inline Plug Unshielded

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HUBS102-920006X1-Y	Straight plug 2-pole Unshielded	2×6 mm²	MA_HV0172	
HUBS102-920010X1-Y		2×10 mm²		
HUBS102-920016X1-Y		2×16 mm²		

HVU®48 Header Plug Unshielded

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Panel Piercing	Product
HUBL102-920006X1-Y	Straight plug 2-pole 4-hole flange Unshielded	2×6 mm²	MA_HV0149	MB_806	
HUBL102-920010X1-Y		2×10 mm²			
HUBL102-920016X1-Y		2×16 mm²			

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvu48

HVU®50

Unshielded Rosenberger HVU®50 connector series in small dimensions enables a maximum current capacity of 60 A at a cable cross section of 6 mm^2 and a working voltage of 1000 V DC. HVU®50 cable connectors for cable cross sections of 3 mm^2, 5 mm^2, 6 mm^2 are available in straight and inline variants as well as headers. HVU®50 connectors are mainly used for charging sockets to OBC (AC).

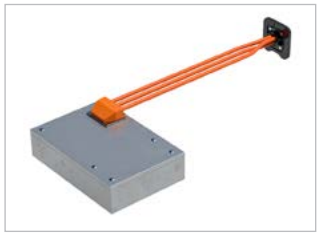
Product Portfolio

- Cable connectors
- Inline connectors
- Header
- Cable assemblies

Features

- Unshielded
- Current capacity (6 mm^2) 60 A at 85 °C
- Working voltage 1000 V DC
- Creepage ≥ 12.58 mm
- Clearance ≥ 12.45 mm
- Cross sections 3 mm^2, 5 mm^2, 6 mm^2
- Engine vibration SG2 according to LV similar to V1 according to USCAR
- Locking mechanism with CPA (Connector Position Assurance)

Applications



Charging socket to OBC (AC)

Benefits

- Small dimensions
- For unshielded cables
- For inline or header applications

Applicable Standards

- Rosenberger series code HUD
- Interface according to Rosenberger RN_201-01
- RoHS compliant

Products

HVU®50 Straight Jack Unshielded

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HUDK103-940005X1-Y	Straight jack 4-pole Unshielded	4×5 mm²/4×6 mm²	MA_HV0217	
HUDK113-940005X1-Y		2×5 mm²/2×6 mm² 2×3 mm²		
HUDK123-940005X1-Y		2×5 mm²/2×6 mm² 2×blind		

HVU®50 Inline Plug Unshielded

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HUDS102-940005X1-Y	Straight plug 4-pole Unshielded	4×5 mm²/4×6 mm²	MA_HV0218	
HUDS112-940005X1-Y		2×5 mm²/2×6 mm² 2×3 mm²		
HUDS122-940005X1-Y		2×5 mm²/2×6 mm² 2×blind		

HVU®50 Header Plug Unshielded

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Panel Piercing	Product
HUDL102-940005X1-Y	Straight plug 4-pole 4-hole flange Unshielded	4×5 mm²/4×6 mm²	MA_HV0219	MB_806	
HUDL112-940005X1-Y		2×5 mm²/2×6 mm² 2×3 mm²			
HUDL122-940005X1-Y		2×5 mm²/2×6 mm² 2×blind			

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvu50

HVU®400

Rosenberger HVU®400 unshielded connector series enables a maximum current capacity of 340 A at a cable cross section of 95 mm² and a working voltage of 1000 V DC. HVU®400 cable connectors for cable cross sections of 70 mm² and 95 mm² are available in right angle variants. HVU®400 connectors are mainly used for charging sockets to battery (DC). The unique locking mechanism with special lever and CPA (Connector Position Assurance) allows locking only when mated and prevents accidental unmating.

Product Portfolio

- Cable connectors right angle 2 phases
- Headers
- Cable assemblies

Features

- Unshielded
- Current capacity (95 mm²) 340 A at 85 °C
- Working voltage 1000 VDC
- Creepage ≥ 13.51 mm
- Clearance ≥ 3.46 mm
- Cross sections 70 mm², 95 mm²
- Engine vibration SG2 according to LV similar to V1 according to USCAR
- Unique locking mechanism with special lever and CPA (Connector Position Assurance)

Applications

Charging socket to battery (DC)

Benefits

- For unshielded cables
- Excellent dimension/performance ratio
- Easy to handle

Applicable Standards

- Rosenberger series code HUC
- Interface according to Rosenberger RN_164
- RoHS compliant

Products

HVU®400 Cable Jack Unshielded

Rosenberger No.	Description	Cable Cross Section	Assembly Instruction	Product
HUCK206-920070X1-Y	Right angle jack 2-pole Unshielded	2×70 mm²	MA_HV0179	
HUCK206-920095X1-Y		2×95 mm²		

HVU®400 Header Plug Unshielded

Rosenberger No.	Description	Assembly Instruction	Panel Piercing	Product
HUCS106-92-000X1-Y	Straight plug 2-pole 4-hole flange Unshielded	MA_HV0190	MB_807	

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/hvu400

HV Components

Complementing its standard connector portfolio, Rosenberger develops and manufactures customer-specific high-voltage components for electric and hybrid vehicles. These enable the lowest possible transition resistances, ensuring long-term low-loss performance and reliability in critical electrical systems such as battery charging, cell management, heating, and air conditioning.

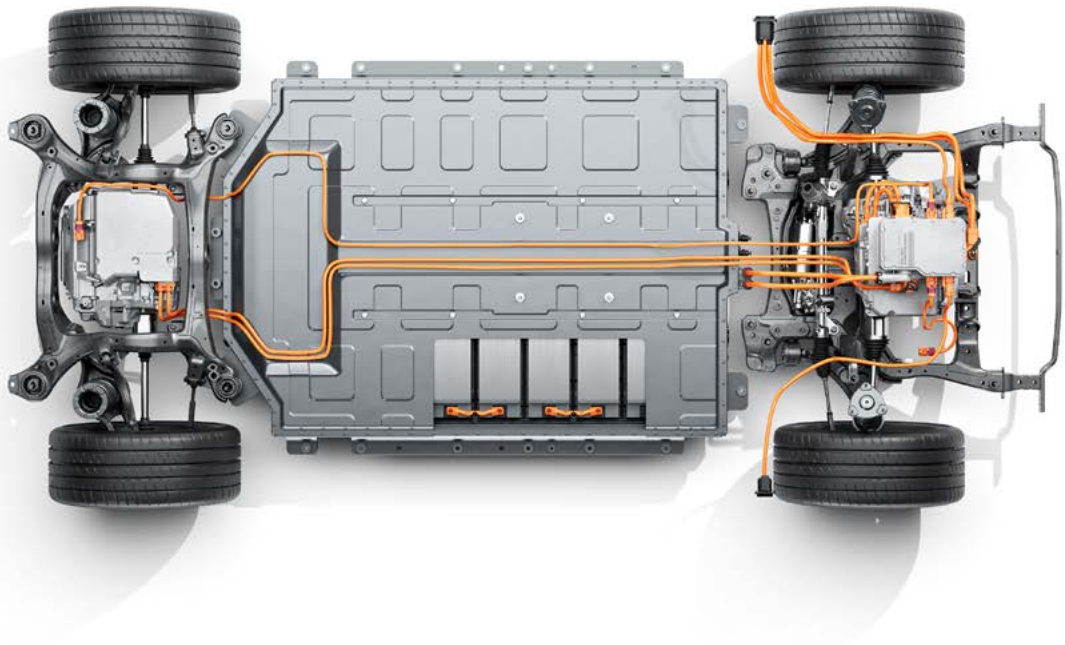
From concept to final delivery, Rosenberger high-voltage custom components are the perfect fit every time. Using its component toolkit, including PDUs, Y-splitter, busbars and cell module connectors, Rosenberger can develop and manufacture a wide array of tailor-made solutions. These are designed and configured precisely to the relevant vehicle architecture, allowing ideal combinations of various fuses, relays and other passive and active components required.

Product Portfolio

- Cell module connectors and busbars
- Power distribution units
- Y-splitter (aluminum housing)
- Contact systems
- Insulation material

Properties

- Insulation
- LV and HV interfaces
- AC and DC currents



Power Distribution Units (PDU)

Power distribution units for vehicles have multiple power inputs and outputs and use all kinds of connectors, fuses, and relays. In these cases, the PDU generally forms the central link between the vehicle power electronics and batteries, electric motors, and other ancillary units.

Y-Splitter

Y-splitter are used to distribute the power from one cable harness to two or more units, e.g. between a DC/DC converter and an electric air-conditioning unit. Rosenberger can design Y-splitter for applications with or without shielding for cable cross sections from 4 mm^2 to 95 mm^2 in collaboration with the customer.

Cell Module Connectors

The Rosenberger HV portfolio also includes busbars or cell module connectors according to customer-specific requirements. These connectors are required to link battery modules within a battery pack. For typical battery applications, multiple custom-designed battery connection points are required.

Based on the robust butted contact system, Rosenberger offers cell module connectors with integrated flexible tolerance compensation. Systems from 100 to 350 A are available.

Different assembly directions, coding variants as well as cross sections can be implemented according to customer-specific requirements.

Features

- Current capacity (95 mm^2) 270 A at 85 °C
- Working voltage 1000 V DC
- Cross sections 70 mm^2 to 95 mm^2
- Engine vibration 2 according to LV 215 (GS95031), M-04 profile D according to LV124 (GS95024)
- IPXXB protected center screw
- For unshielded copper cables (round, flat)

Benefits

- High-flex cables (round)
- Robust pressure contact system
- Ensures proper electrical connectivity
- Lower size and weight
- Rigid or flexible variants
- Safe and quick replacement
- Reduces electrical loss at connection points
- Different assembly directions, coding variants as well as cross sections
- Customized designs

For more information
refer to our website:

**www.rosenberger.com/
hv-components**

Low-Voltage Connectors

Compact and lightweight, low-voltage Rosenberger connectors are ideal for a wide range of applications.

From high power applications like electric superchargers all the way down to use cases like mobile coolers or trickle-charging, we have built a wide range of solutions.

Rosenberger develops and offers several low-voltage product series e.g. LVR®120 and MagCode®.

LVR®120

Compact and lightweight, low-voltage Rosenberger LVR®120 connectors are ideal for applications such as electrical superchargers. Achieving their current capacity up to 120 A at 85 °C with a cable cross section of just 16 mm² they are certified to Vibration Severity Level 4. Furthermore, the additional slide locking mechanism (CPA – Connector Position Assurance) prevents accidental unmating.

Product Portfolio

- Cable connectors
- Header (jack)

Features

- Current capacity (16 mm²) 120 A at 85 °C
- Working voltage 48 V DC
- Temperature range from -40 °C to +150 °C
- IP class mated according to IP6K9K/IPX8/IPXXD
- Vibration class according to LV 215 PG17-IV
- Mating cycles ≥ 50
- Cross sections 16 mm²

Benefits

- Low weight
- Small dimensions

Applications

- Electrical supercharger

Products

LVR®120 Cable Plug

Rosenberger No.	Description	Max. Current at 85 °C	Cable Cross Section	Assembly Instruction	Product
H5S102-920016X1-Y	Straight plug Waterproof Available on request	120 A	16 mm²	On request	

LVR®120 Header Jack

Rosenberger No.	Description	Assembly Instruction	Product
H5K203-92-000X1-Y	Right angle jack Header Available on request	On request	

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/lvr120

MagCode®

Rosenberger MagCode® systems provide short-circuit-proof, self-finding magnetic connections for 12 V and 24 V applications. They are used for trickle charging of batteries in vehicles with longer standing times, such as in cars, vans, motor homes as well as motorcycles and boats – and especially in emergency vehicles. They are also used to supply power to mobile devices, such as external coolers or headlights.

MagCode® PowerSystem

The MagCode® Magnetic Power System is a magnetic connector system for 12 V and 24 V.

Magnets in the PowerPort and PowerClip ensure contact is made between the two parts of the connector while also providing a switching function. The flat contacts only carry power when the moveable plate in the port is magnetized by the magnets in the clip. Totally short-circuit-proof, the MagCode® Power System is designed to avoid other metal objects or permanent magnets inadvertently energizing the contacts.

MagCode® PowerSystemPro

The MagCode® Magnetic Power System Pro is a magnetic connector system for 12 V and 24 V with mechanical twist lock. Important are higher separation forces, higher current load and no arcing problem.

In addition, the twist lock function guarantees switching will not occur before the outside contact has been closed – therefore eliminating potential arcing problems.

Product Portfolio

- Power System and Power System Pro
- PowerPort
- PowerClip
- Accessories e.g. protecting cap

Features

- High-tech design
- Minimal mounting depth (port)
- Up to 15 A (12 V) and 25 A (24 V) current load
- Short-circuit-proof
- Waterproof (installed port)
- Voltage 12 V and 24 V
- Mismating of 12 V and 24 V is not possible, due to the different magnetic codings
- Power Pro only with additional twist-lock and up to 25 A current load

Benefits

- Stable connection
- Easy clean
- No arcing

Applications

- Maintenance charging of batteries for cars, trucks, vans, campers, motorcycles and boats
- Power supply for devices such as external coolers and headlights

Products

MagCode® Magnetic Power System

Rosenberger No.	Description	Voltage	Assembly Instruction	Panel Piercing	Product
M2K211-1AE	PowerClip	12 V	MA_M2V001		
M2K212-1AE		24 V			
M2S111-3XX	PowerPort	12 V	MA_M2V001	MB_612	
M2S112-3XX		24 V			

MagCode® Magnetic Power System Pro

Rosenberger No.	Description	Voltage	Assembly Instruction	Panel Piercing	Product
M2K203-1AE	PowerClip-Pro	12 V	MA_M2V002		
M2K204-1AE		24 V			
M2S103-3XX	PowerPort-Pro	12 V	MA_M2V002	MB_378	
M2S104-3XX		24 V			

Accessories

Rosenberger No.	Description	Product
M2Z101-3XX	Protection Cap	

For more information
refer to our website:

www.rosenberger.com/magcode

Connectors for Light Electric Vehicles (LEVs)

For sustainable, climate-friendly transport and less noise, small light electric vehicles (LEVs) are on the rise, especially in urban areas. These expand and complement progressive forms of mobility.

To allow economic operation of these vehicles, they must be charged quickly, easily and safely when connecting to the power grid. Connection solutions from Rosenberger are purpose-designed to ensure this.

Rosenberger develops and offers several LEV connector series e.g. RoPD® and RoPO that can transfer power and data with one single connection.

RoPD®

RoPD® – Rosenberger Power Data Connectors with magnetic self-mating mechanism are designed for Light Electric Vehicles (LEV) including e-bikes and e-scooters as well as UGVs and drones. Providing fast and reliable magnetic connection, these are particularly suited for data communication and power transmission of voltages up to 60 V and current loads up to 40 A. The magnetic locking and precise self-mating capability prevents any accidental or forced disconnection and therefore possible damage to the connector or the LEV. Furthermore, the high tolerance pin and socket design allows many mating cycles.

The RoPD® connection system is ideal for many LEV connection applications – including battery changing and charging – where frequent connection and disconnection is required. Versions of the RoPD® system are also available for EnergyBus applications.

Magnetic Self-Mating

Rosenberger has developed a locking system that offers an intelligent alternative to mechanical coupling connections. The magnetic self-mating connectors provide all common functions and are suitable for power and data transmission.

Break-Away Function

This is designed to detach the connectors should the plug or cable be subjected to an acute tensile force. It avoids the risk of injury to the user and damage to the connectors or devices. The deliberate removal of the plug is also fast and simple.

Product Portfolio

- Different interfaces RoPD® (M4), RoPD®e (M5), RoPD®s (M8)
- Accessories e.g. protection caps
- Cable assemblies (3 A, 10 A, 18 A, 25 A, 40 A) with charging, battery and PCB connectors

Interfaces

			
Characteristics	**RoPD® (M4)**	**RoPD®e (M5)**	**RoPD®s (M8)**
Power pins	2	2	2
Contact distance power pins	7 mm	8.4 mm	8.4 mm
Data pins	4	4	6
Coding	✓	–	✓

Features

- Interface according Rosenberger RoPD®
- Current capacity (6 mm^2) 40 A at 65 °C
- Current (power pins) 3 A, 10 A, 18 A, 25 A, 40 A
- Working voltage (power pins) 60 V DC
- Voltage (data pins) 12 V
- Temperature range -40 °C to +65 °C
- Waterproof (mated) IP 64/67
- UV resistant
- Mating cycles > 2500
- Also available with UL certification

Benefits

- Fast, reliable and simple magnetic self-mating, not hot-plugable
- Reliable connection even in hard-to-reach positions
- High mating cycles
- No risk of canting or similar
- Prevents damage in event of forced disconnection

Applications

- E-bikes
- E-scooters
- E-wheelchairs
- Unmanned Ground Vehicles (UGV)
- Drones
- Medical, industrial and consumer applications

Pictures show RoPD® standard interfaces

Products

Cable Assemblies*

Rosenberger No.	Interface	Maximum Current Load	Description	Product**
B001-20-XXX-Y	RoPD® (M4)	3 A	Charging connector jack straight	
C001-04-XXX-Y	RoPD® (M4)	10 A		
C003-03-XXX-Y	RoPD® (M4)	25 A		
C001-E4-XXX	RoPD®e (M5)	10 A		
C003-EE-XXX	RoPD®e (M5)	25 A		
B001-37-XXX-Y	RoPD® (M4)	3 A	Charging connector jack right angle	
C001-08-XXX-Y	RoPD® (M4)	10 A		
C003-04-XXX-Y	RoPD® (M4)	25 A		
C001-E3-XXX	RoPD®e (M5)	10 A		
C003-ED-XXX	RoPD®e (M5)	25 A		
C003-G10-XXX-Y	RoPD® (M4)	25 A	Charging connector jack right angle	
C001-10-XXX-Y	RoPD® (M4)	10 A	Battery panel jack straight 4-hole flange	
C003-BB-XXX-Y	RoPD® (M4)	25 A		
C004-BB-XXX-Y	RoPD® (M4)	30 A		
C006-BB-XXX-Y	RoPD® (M4)	40 A		
C003-E7-XXX	RoPD®e (M5)	25 A		
C004-E1-XXX	RoPD®e (M5)	30 A		
C006-E2-XXX	RoPD®e (M5)	40 A		
C003-C5-XXX-Y	RoPD®s (M8)	25 A		
B001-23-XXX-Y	RoPD® (M4)	3 A	Battery panel plug straight Round flange	
C001-21-XXX-Y	RoPD® (M4)	10 A		
C003-17-XXX-Y	RoPD® (M4)	25 A		
C006-17-XXX-Y	RoPD® (M4)	40 A		
C003-EA-XXX	RoPD®e (M5)	25 A		
C006-E3-XXX	RoPD®e (M5)	40 A		
C001-11-XXX-Y	RoPD® (M4)	10 A	Battery panel plug straight 4-hole flange	
C003-B1-XXX-Y	RoPD® (M4)	25 A		
C004-B1-XXX-Y	RoPD® (M4)	30 A		
C006-B1-XXX-Y	RoPD® (M4)	40 A		
C001-E9-XXX	RoPD®e (M5)	10 A		
C003-E1-XXX	RoPD®e (M5)	25 A		
C006-E1-XXX	RoPD®e (M5)	40 A		
C003-C4-XXX-Y	RoPD®s (M8)	25 A		

* Exemplary products, please contact us for further standard and customized variants.
** Pictures show RoPD® standard interfaces
-XXX please fill in requested length in mm, -Y please fill in requested coding

Products

RoPD® PCB Connectors

Rosenberger No.	Description	Panel Piercing, PCB Layout	Product
M4S108-400B5-Y	PCB panel plug straight 4-hole flange	MB_462	
M4S109-400B5-Y	PCB panel plug Round flange	MB 462	

-Y please fill in requested coding

Accessories

Rosenberger No.	Description	Product
M4Z003-000	Protection cap for plug connectors	
170-108-00000	Protection cap for jack connectors	

For more information
refer to our website:

www.rosenberger.com/ropd

RoPO

RoPO (Rosenberger Power Bike) connectors up to 500 V DC have been developed with a new type of secure bayonet locking for uninterrupted data and power transmission. Seamless connectivity must be ensured and the connector must be easy to plug and unplug. They meet the requirement for fast, safe and easy charging on the standard power grid.

The RoPO connection system is ideal for many LEV connection applications, e.g. battery charging for light e-scooters, e-bikes and e-rickshaws.

Product Portfolio

- Charging cable connectors right angle
- Header square flange straight
- Cable assemblies

Features

- Current capacity 80 A at 85 °C
- Working voltage 500 V DC
- Waterproof (mated) IP 65/67
- Touchproof IPXXB
- Operating temperature range -40 °C to +105 °C
- 2 power pins, 4 data pins
- Cross sections 3 mm^2, 12 mm^2
- With HVIL (high-voltage interlock)
- Mating cycles >10000

Benefits

- Secure bayonet locking
- Uninterrupted data and power transmission
- Reliable connectivity
- Easy to plug and unplug
- Fast, safe and easy charging on the standard power grid

Applications

- LEV connection and charging applications
- Battery charging
- E-scooters
- E-rickshaws

Products

RoPO Cable Assemblies

Rosenberger No.	Description	Cable Cross Section	Product
X003-A2-XXX-Y	Cable assembly With cable connector right angle	3 mm^2	
X012-A2-XXX-Y		12 mm^2	

-XXX please fill in requested length in mm
-Y please fill in requested coding

RoPO Cable Assemblies

Rosenberger No.	Description	Product
BIAL105-1L-001B1-Y	Cable assembly With header 4-hole flange	

-Y please fill in requested coding

For more information
refer to our website:

www.rosenberger.com/ropo

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 requirements for delivering products of the highest quality. Rosenberger's core competences includes effective in-house research and development, the latest manufacturing technologies, the highest levels of efficiency in production processes, and continuous improvement of process automation.

Computational Engineering

Science-based high-frequency know-how enables us to continuously improve existing products and to design innovative products and solutions whether standard or customer specific. Numerous patents are proof of Rosenberger's leadership as a creative and innovative partner.

Production

With a high level of vertical integration and using state of-the-art manufacturing technologies, Rosenberger continues to develop and optimize key manufacturing solutions for turned parts production, stamped and formed technology and injection molding technology. Manufacturing in-house ensures a high degree of flexibility, continuous quality controls, and ensures newly designed products are produced in the required quantities.

Plating Technology

Our components can be electroplated quickly and flexibly in our own electroplating facilities, regardless of whether this is to provide corrosion protection, optimized conductivity, or other technical and physical characteristics. Environmental protection is always taken into account when coating surfaces.

Assembly

Rosenberger operates manufacturing and assembly locations around the world. Our fully automated assembly centers and customer-oriented cable assembly locations offer global support and local sourcing.

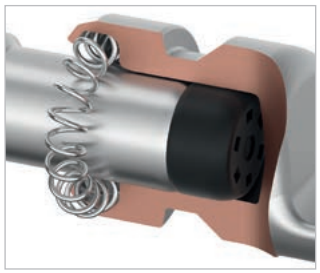
Injection Molding

We use the very latest machinery and methods, as well as special materials and components to ensure the precision and durability of our tools and products. Rosenberger can process all available high-performance plastics.

HV Contact Systems

The Rosenberger high-voltage connection and accessory portfolio is based on different contact systems.

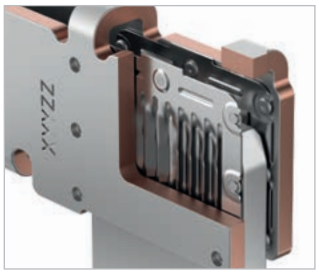
Available contact systems



Spring technology

Stamped sleeve technology

Surface contact technology



Stamped blade contact and carrier

Each technology enables multiple contact points to achieve the lowest possible contact resistances and highest current performance. Depending on the application, Rosenberger will use the most suitable contact technology to fulfill your requirements. Our contact technologies ensure constant contact forces over a wide range of use cases. Large mating tolerances and temperature changes can be accommodated without significant deviation from the initial specification.

Even after severe aging, Rosenberger silver-plated contact pins and “press-in sleeves” ensure optimum current carrying capacity and EMI performance over the product’s lifetime. Compared to alternative contact methods with nickel-plated or cast material, the Rosenberger “press-in sleeve” ensures stable shielding performance of the highest caliber. Multiple contact points on both sides of the inner and outer connection diameters allow vibration levels up to severity level 4 to be achieved.

Performance

- High current capacity
- Low contact resistance
- Low mating force

Further Product Advantages

- High number of contact points
- Controllable/adjustable contact forces
- Small diameters and cross sections available
- Minimal self-heating
- Simple assembly
- Small space requirements
- For static, sliding and rotating connections
- High tolerance range for assembled components and low production costs

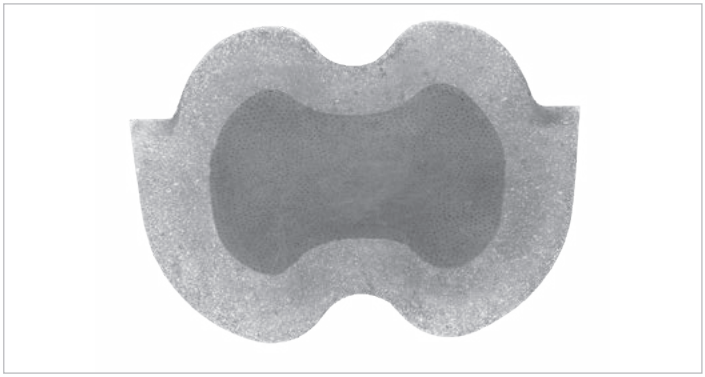
Connection Technologies

Rosenberger uses different methods to create secure electrical and mechanical connections: crimp connection and ultrasonic welding for connectors as well as resistance welding for cell module connectors. They fulfill the highest automotive quality standards. Each connection technology is standardized by automotive harness makers.

Crimp Connection

The crimping method is an important connection technique for connectors at Rosenberger. This process involves the physical compression of a contact or a contact sleeve around a stranded wire to produce a reliable and long-lasting electrical connection. With crimped contacts a second crimp is often added in the insulation area to provide strain relief.

Prefabricated conductor sleeves or insulating sleeves are crimped around a stranded wire to form a connection that is difficult to detach. This process ensures a high-quality electrical and mechanical connection which is also gas-tight.

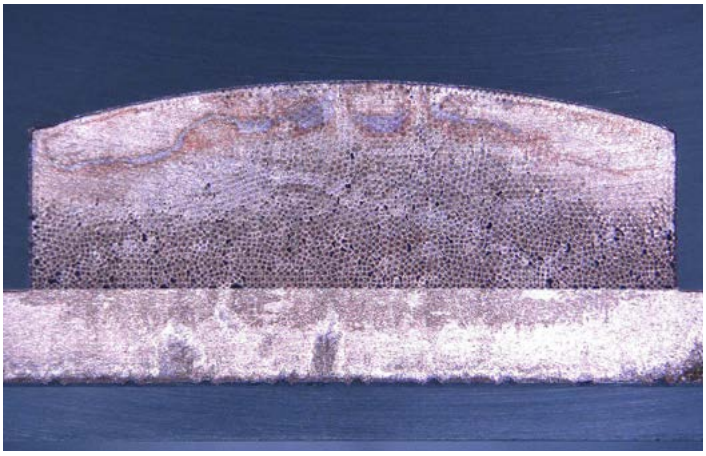


The crimping process is developed and refined in Rosenberger's own laboratories. To reduce product introduction times for customers, the relevant parameters and tools are defined as part of this process and made available in the installation instructions.

Ultrasonic Welding

Ultrasonic welding involves generating a high-frequency alternating current using a generator. This current is transferred to a converter which turns it into mechanical ultrasonic vibrations. The vibrations of the welding electrode heat up the edges of the materials being joined so that they can be fixed together permanently.

This method is characterized by very short welding times and high cost-effectiveness. Ultrasonic welding can be used to join metals such as copper and aluminum. A key focus at Rosenberger is on metal joining techniques where, for example, copper or aluminum stranded wires are welded together with an internal conductor.



The connection pairings developed by Rosenberger are carefully tested in the company's own laboratories to verify a huge range of physical variables in accordance with the relevant automotive standards or customer requirements.

Connection Technologies

Resistance Welding for Cell Module Connectors

There are various types of resistance welding technologies for connecting busbars or cell module connectors according to customer-specific requirements. We distinguish between compacting and two variants of resistance welding using brazing solder: overlap welding and welding on contact elements.

The resistance welded joints are developed at Rosenberger and validated in the company's own laboratory in accordance with the required automotive standards and customer requirements.

Compacting

Resistance welding with compacting is a welding process where stranded copper cables are connected by electric current and pressure. This allows them to be compacted at the same time.

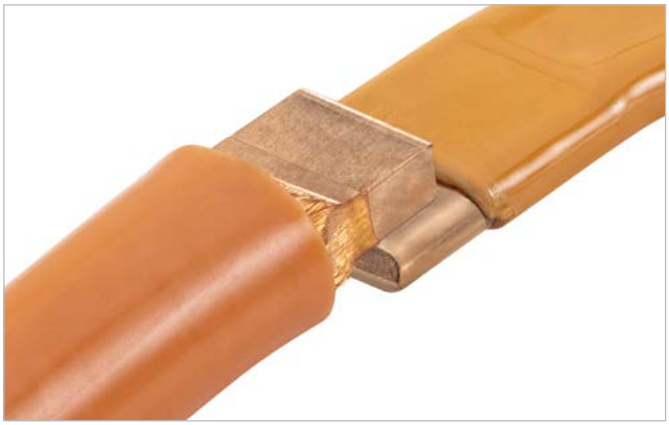
The process uses the electrical resistance on the components to generate heat. At the same time, pressure is applied causing the materials to be pressed together and compacted, resulting in a strong and dense metallurgical bond. This process is often used to produce high-strength and compact joints in the automotive industry. Compacted wire ends are used at Rosenberger for further processing such as ring soldering or lap soldering.

Compacting

Use of Brazing Solder for Overlap Welding and Welding on Contact Elements

Resistance welding uses electrical resistance to generate heat and melt a brazing solder between the parts to be joined. Electric current flows through electrodes into the components, with the contact resistance generating the necessary heat.

The brazing solder, usually an alloy with a lower melting point than the base metals, melts and flows into the components, creating a solid connection. Local heat generation under pressure produces high strength with low electrical resistance.



Overlap welding

Welding on contact elements

Computational Engineering

Rosenberger leverages state-of-the-art computational engineering throughout the connector design phases of each product development. Our interdisciplinary research and development department includes experts in electromagnetic compatibility, structural simulation, dynamic simulation, thermal-electric simulation, and high-voltage systems engineering.

With extensive experience in computational engineering, Rosenberger is a well-established and reliable development partner for numerous projects with leading OEMs on a global basis. Additionally, we collaborate along the entire supply chain to support the first-time-right approach through virtual design verification and product validation, reducing the time-to-market for future high-voltage projects significantly.

Electromagnetic Compatibility

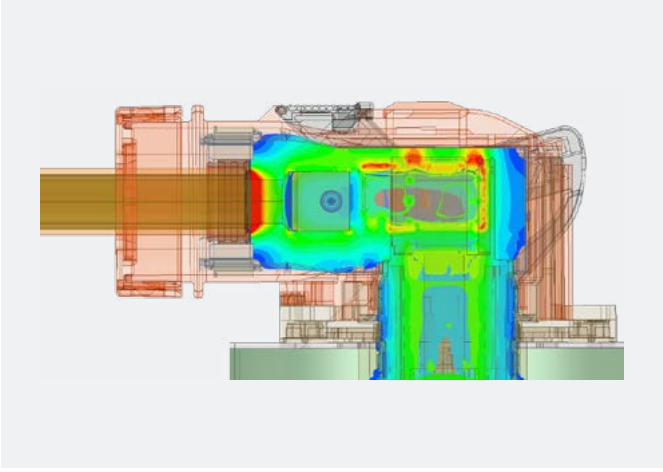
Electromagnetic compatibility (EMC) is a challenging discipline in the realm of automotive high-voltage interconnection systems. Through extensive cooperation with vehicle manufacturers and standardization committees, Rosenberger has developed a comprehensive understanding of EMC testing and EMC-compliant connector designs.

Computational engineering and component-level measurement, referring to standards, such as IEC 62153-4-x and ISO 20076 Annex A, are an integral part of our development process.

Our in-house EMC laboratory, equipped with advanced testing facilities, allows us to perform subsystem level tests, including radiated and conducted emission measurements compliant with CISPR 25 and narrowband immunity tests to ISO 11452-x. These capabilities support the development process by providing valuable insights into the correlation between subsystem performance and component requirements of single connectors as part of the HV wiring harness.

Furthermore, Rosenberger actively contributes to the standardization of EMC test procedures and is pioneering the establishment of “Virtual EMC” at both component and subsystem levels. By doing so, we are aiming at closing the gap between system and component specifications along the integration path of the V-model of engineering.

At Rosenberger, we aim to collaborate closely with our customers to derive and define product requirements at the component level, ensuring the delivery of valuable, high-quality products.



Structural Simulation

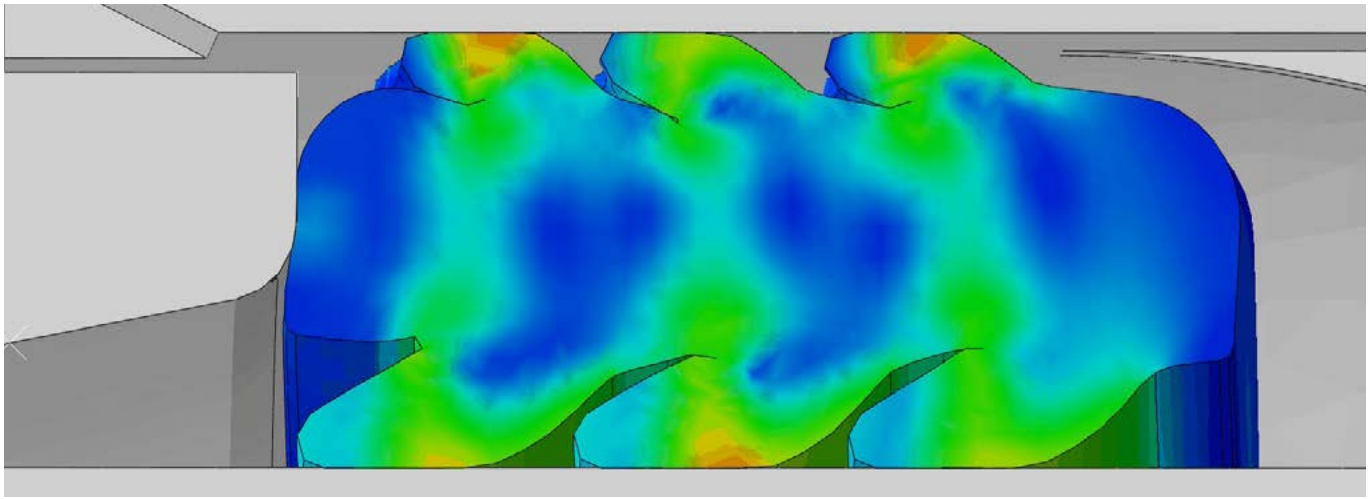
Rosenberger's structural-mechanical simulation is based on the finite element method (FEM). Our expertise enables us to create robust designs that meet even the most challenging customer demands.

Quasi-static disciplines at Rosenberger include the numerical assessment of sealings, contact systems, and the general design of plastic parts. The assembly process and operating conditions of radial and axial sealings, including temperature cycles and tolerance situations, are simulated to ensure optimal sealing behaviour. This simulation, a standard procedure at Rosenberger, leads to robust, reliable designs at an early product stage. The simulation results are verified using computer tomography (CT) and analysis of sealing mounting forces.

Moreover, we continuously examine the required contact forces, as well as the frictional behaviour and wear resistance of different contact pairings. This information allows us to develop comprehensive contact designs, including mating, contact forces, and lifespan.

Further core functions of the connection system, such as retention forces, depend on an adequate housing design. We use structural simulation methods to design housing that meets the targeted forces required by our customers and to develop an overall robust closing system.

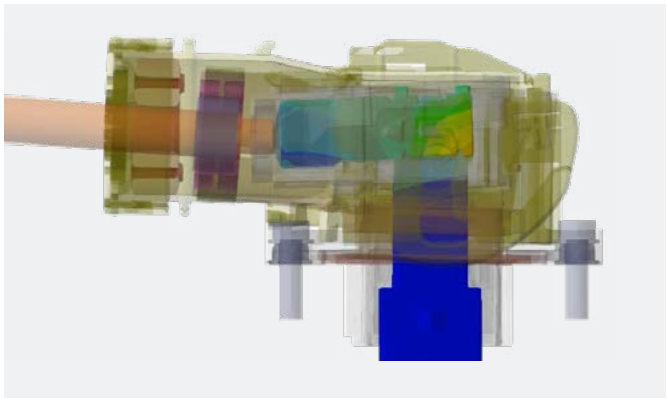
To enhance our simulation methods and confirm calculated values, results are continuously verified in our laboratories.

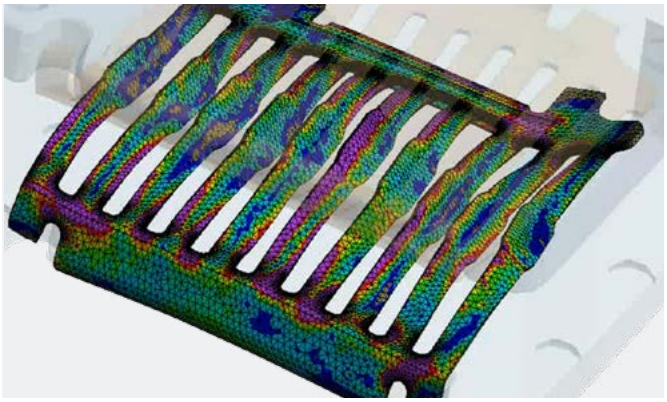


Dynamic Simulation

Rosenberger standardly subjects parts, such as conductors or plastic housings intended for ultrasonic welding to thorough dynamic simulation and optimization. This ensures not only exceptional robustness for the cable assembly process but also enables us to support and counsel customers during the implementation phase of their welding process.

Applying these highly sophisticated dynamic simulations to entire connector assemblies provides unique insights into vibration performance determined by the non-linear interaction between electrical contacts, seals, and cables. Combined with the knowledge generated in our in-house contact and surface laboratory, we can develop tailor-made solutions for any vibration-related use cases.



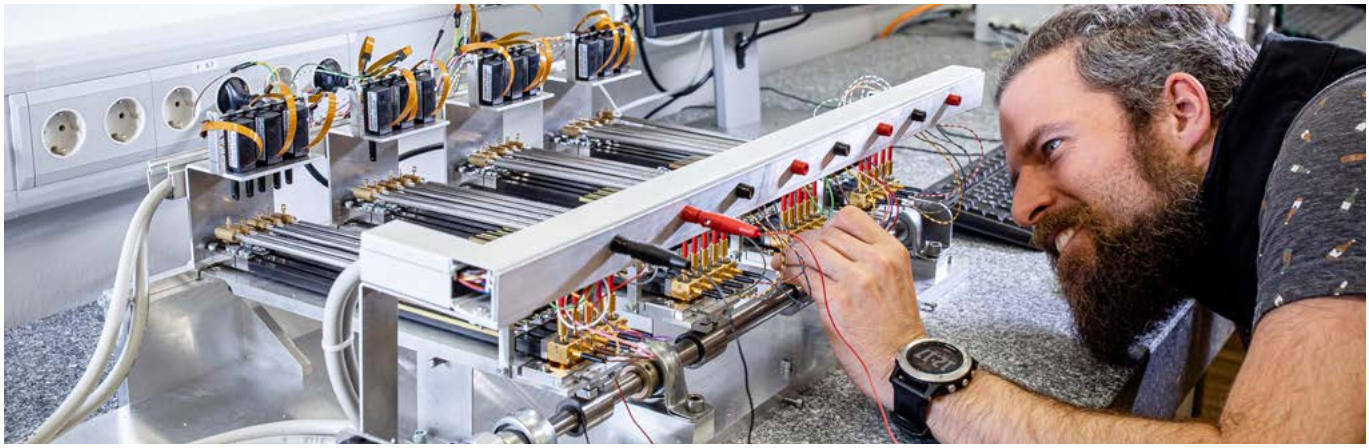


Contact Physics and Plating Characterization Laboratory

A comprehensive understanding of contact material properties is crucial for the design of efficient and reliable connectors. Rosenberger acquires this knowledge through application-specific tests conducted in our internal research and development laboratory.

Self-developed test benches, specifically tailored to represent actual stresses, are used to determine relevant contact properties with a strong focus on electrical and tribological parameters. The knowledge obtained from these experiments forms a reliable basis for product design and simulation models. Corrosion and wear resistance of electrical contact surfaces, including connector-specific phenomena such as fretting corrosion, are also investigated to ensure reliable operation of the connector over its entire lifetime.

The contact physics and plating characterization laboratory at Rosenberger additionally initiates and experimentally supports the development of new contact surface solutions, such as tribologically optimized silver platings.



Thermal-electric Simulation

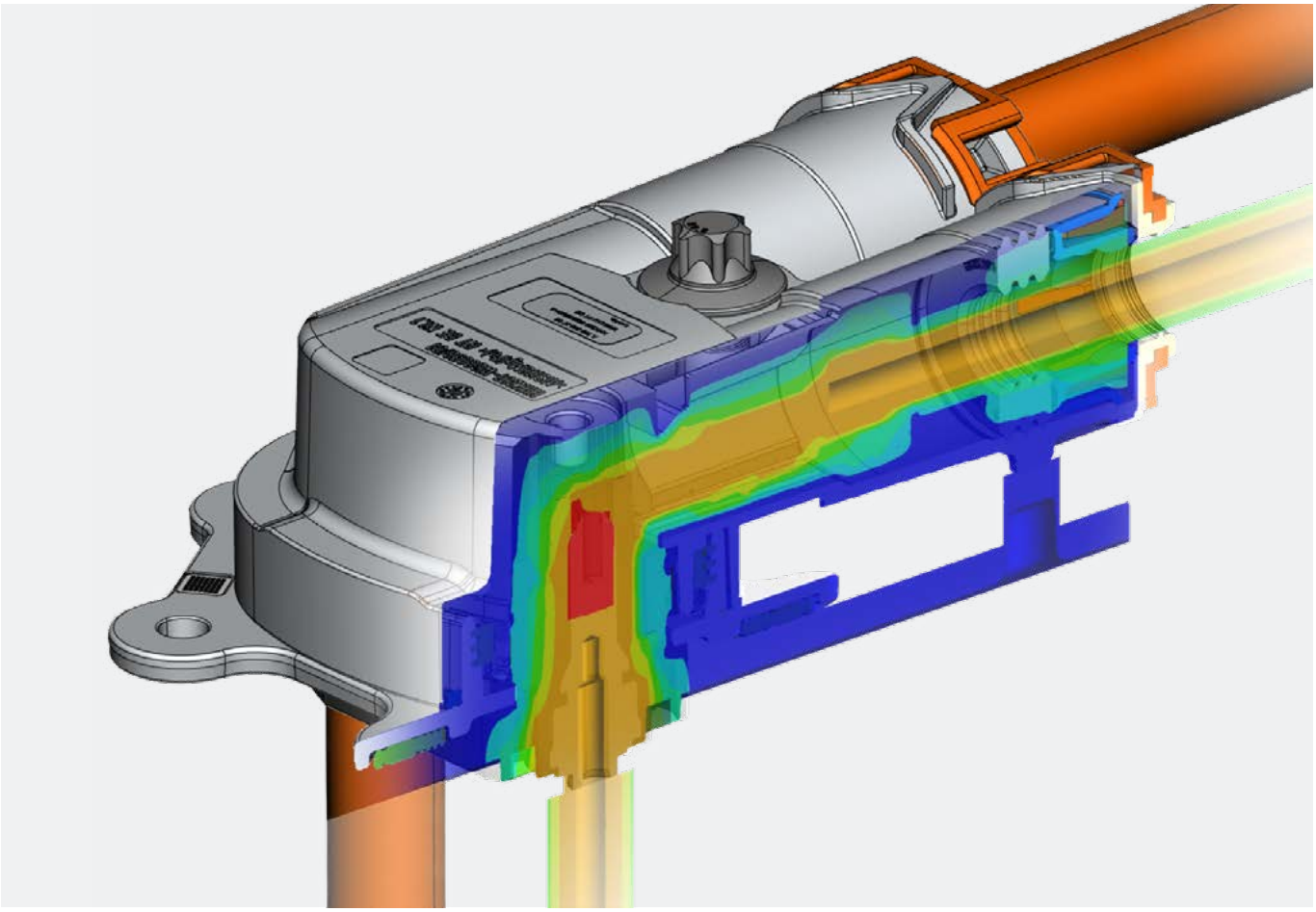
Thermal-electric simulation is used to determine the current capacity of connectors, ensuring reliable operation of our products throughout their entire service life in compliance with customer requirements. Our validation capabilities are grounded in internal laboratory measurement results and the verification of various modelling types, providing customers with a high standard of simulation quality.

Fundamentals & Simulation Methods

In current-carrying conductors, heat is dissipated by ohmic losses and distributed along the prevailing temperature gradient via the transport mechanisms of heat conduction, radiation, and convection. After a period of constant current supply, a stationary state is reached where the heat flow dissipated by the current is in equilibrium with the heat flow extracted by transport mechanisms. The current capacity is attained when the temperature limit of the restricting component is reached. Derating simulation addresses this issue by providing the current capacity in a steady state depending on the ambient temperature.

However, the transient thermal behaviour of a connector is often the key figure to determine e.g. the short-term current capacity or temperature during dynamic current profiles. Rosenberger offers a comprehensive portfolio of thermal-electric simulations, including both 1D network methods and 3D finite element methods (FEM).

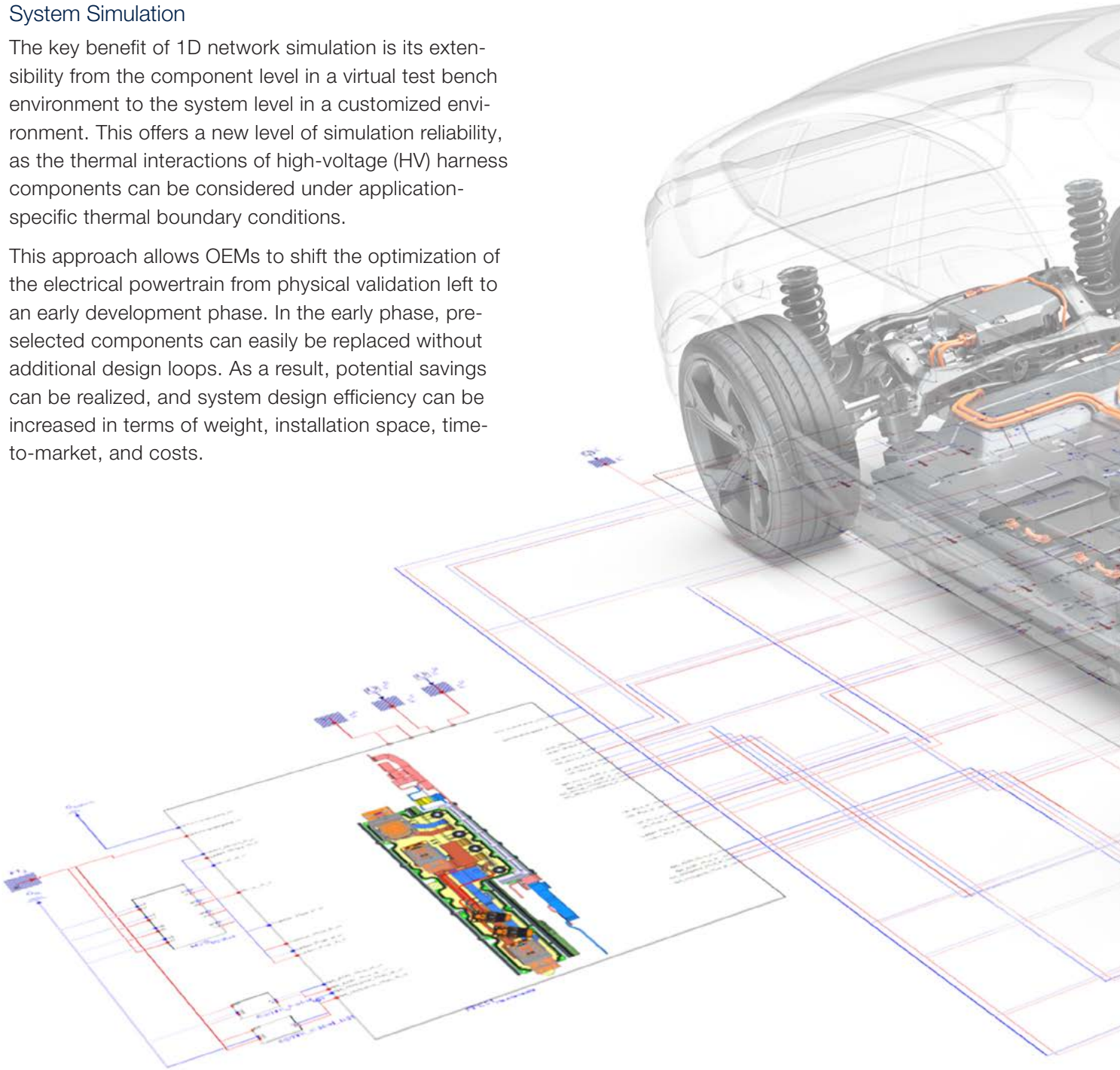
A 3D FEM simulation is required for detailed local temperature resolution and is the method of choice when maximum temperatures in poorly conducting materials, such as insulating components, are of interest. Conversely, 1D networks impress with their short computing times and the simple implementation of variants, thanks to the interchangeability of individual modules.

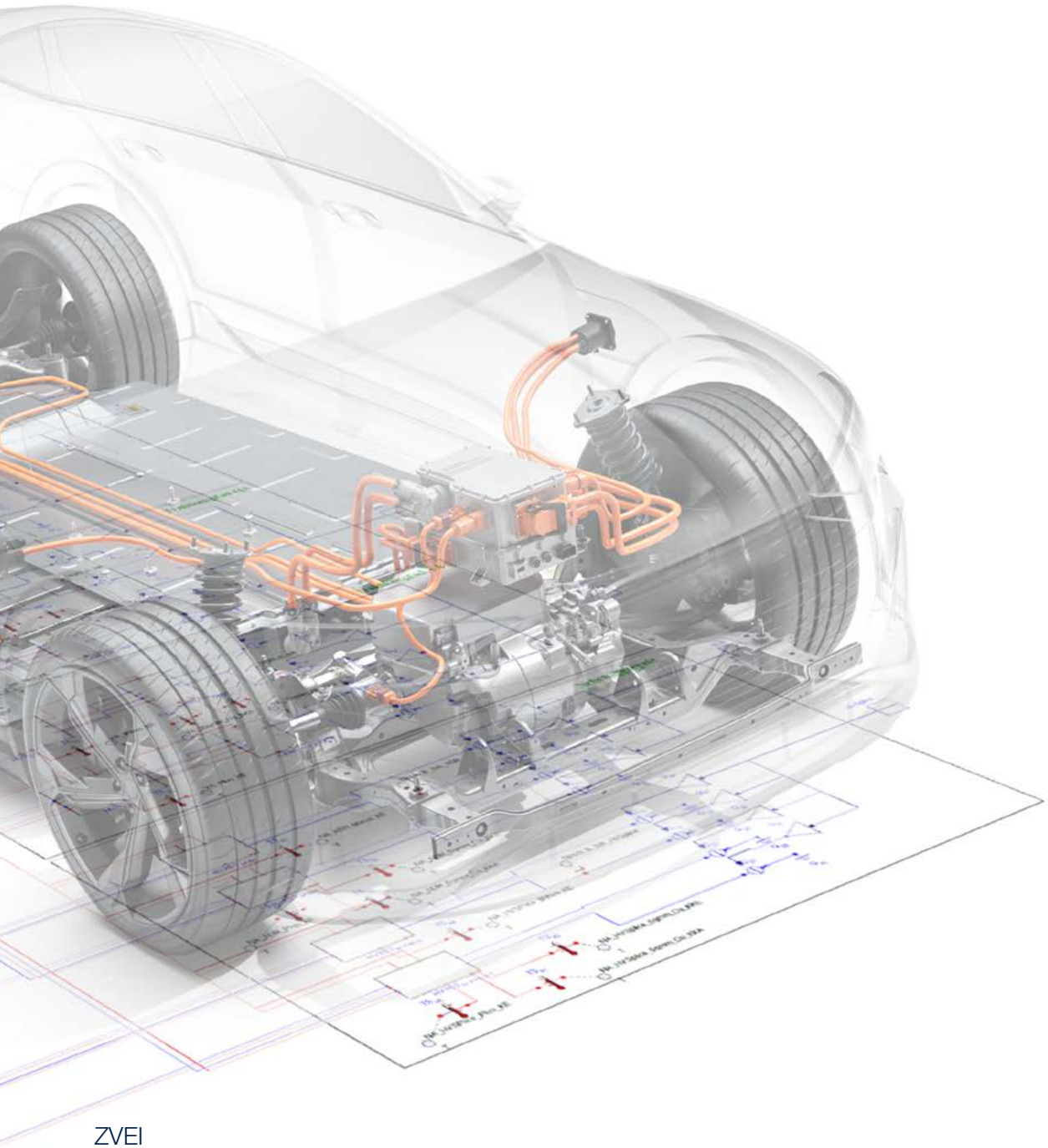


System Simulation

The key benefit of 1D network simulation is its extensibility from the component level in a virtual test bench environment to the system level in a customized environment. This offers a new level of simulation reliability, as the thermal interactions of high-voltage (HV) harness components can be considered under application-specific thermal boundary conditions.

This approach allows OEMs to shift the optimization of the electrical powertrain from physical validation left to an early development phase. In the early phase, preselected components can easily be replaced without additional design loops. As a result, potential savings can be realized, and system design efficiency can be increased in terms of weight, installation space, time-to-market, and costs.





ZVEI

System simulation requires close cooperation between OEMs and suppliers, as well as a standardized exchange format. To facilitate this, several German OEMs and suppliers, including Rosenberger, have joined forces in the “German Electrical and Electronic Manufacturers Association” (ZVEI) and developed the “Technical Guideline 0101.” This guideline provides a tool-independent standard for exchanging thermal-electric networks and defines parameter sets of modules, i.e., generic sub-models.

For exchange, the thermal network of components is simplified by combining and abstracting subcomponents using network theory methods. This ensures that manufacturers’ proprietary know-how is protected.

With vast experience in thermal-electric simulation, Rosenberger is well-established as a reliable development partner in system simulation, having participated in numerous projects with well-known OEMs.

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.

Certificates

- IATF 16949
- DIN EN 9100
- ISO 9001
- ISO 14001
- ISO 45001
- ISO 50001
- DaKKs accreditation according to DIN EN ISO 17025

Learn more about Rosenberger certifications:

www.rosenberger.com/company/certifications/

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.

For more information refer to the website:

www.mdsystem.com

Information Security – TISAX®

Information security is an integral part of our corporate culture. Rosenberger was audited at TISAX® (Trusted Information Security Assessment Exchange).

Learn more about Rosenberger information security:

www.rosenberger.com/company/information-security

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.

Contacts Automotive

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The Rosenberger online catalog contains the current power connector systems for e-mobility with specific details, including data sheets, assembly instructions and panel piercings.

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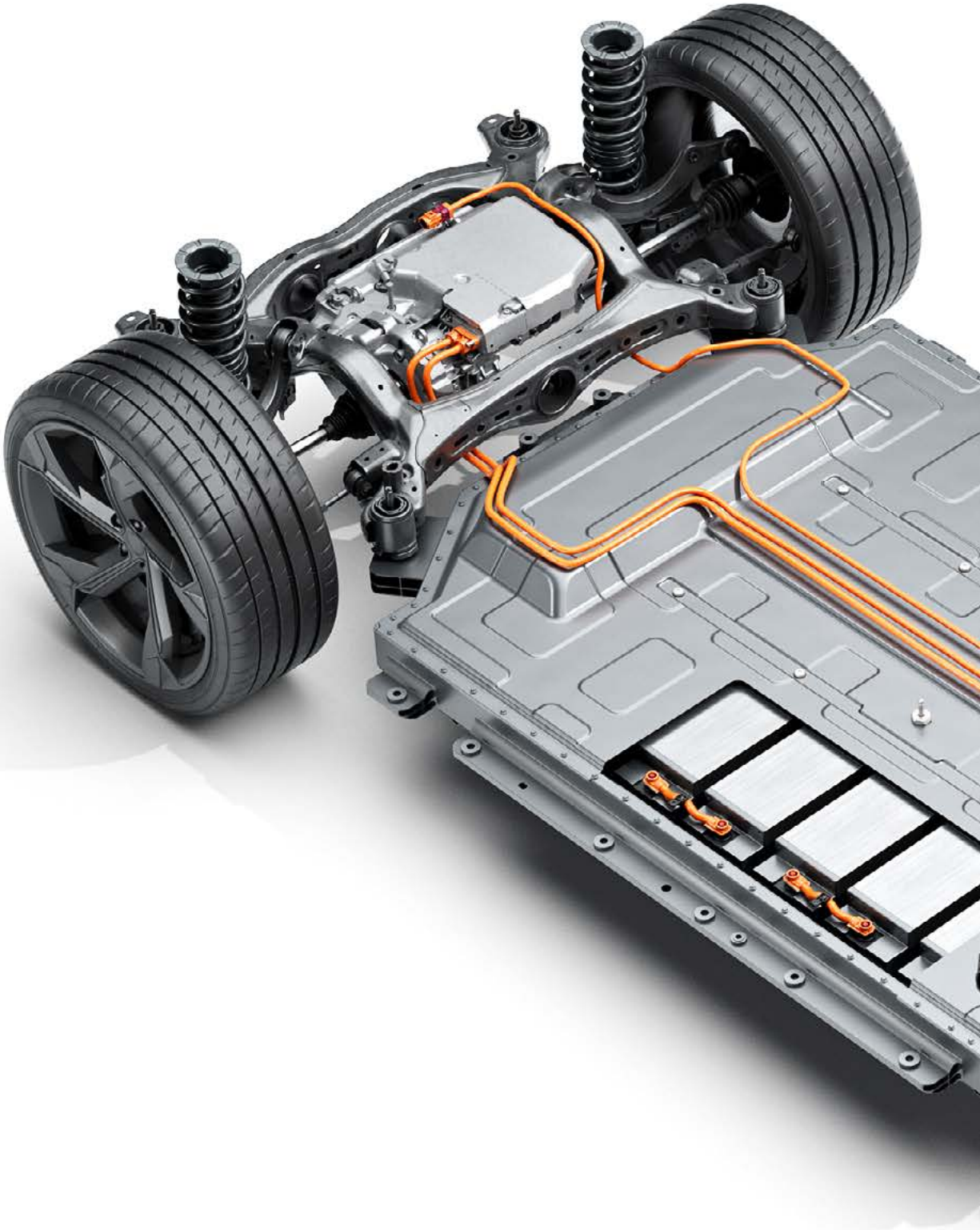

Website

For more information refer to our website:
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