Automotive
Power distribution

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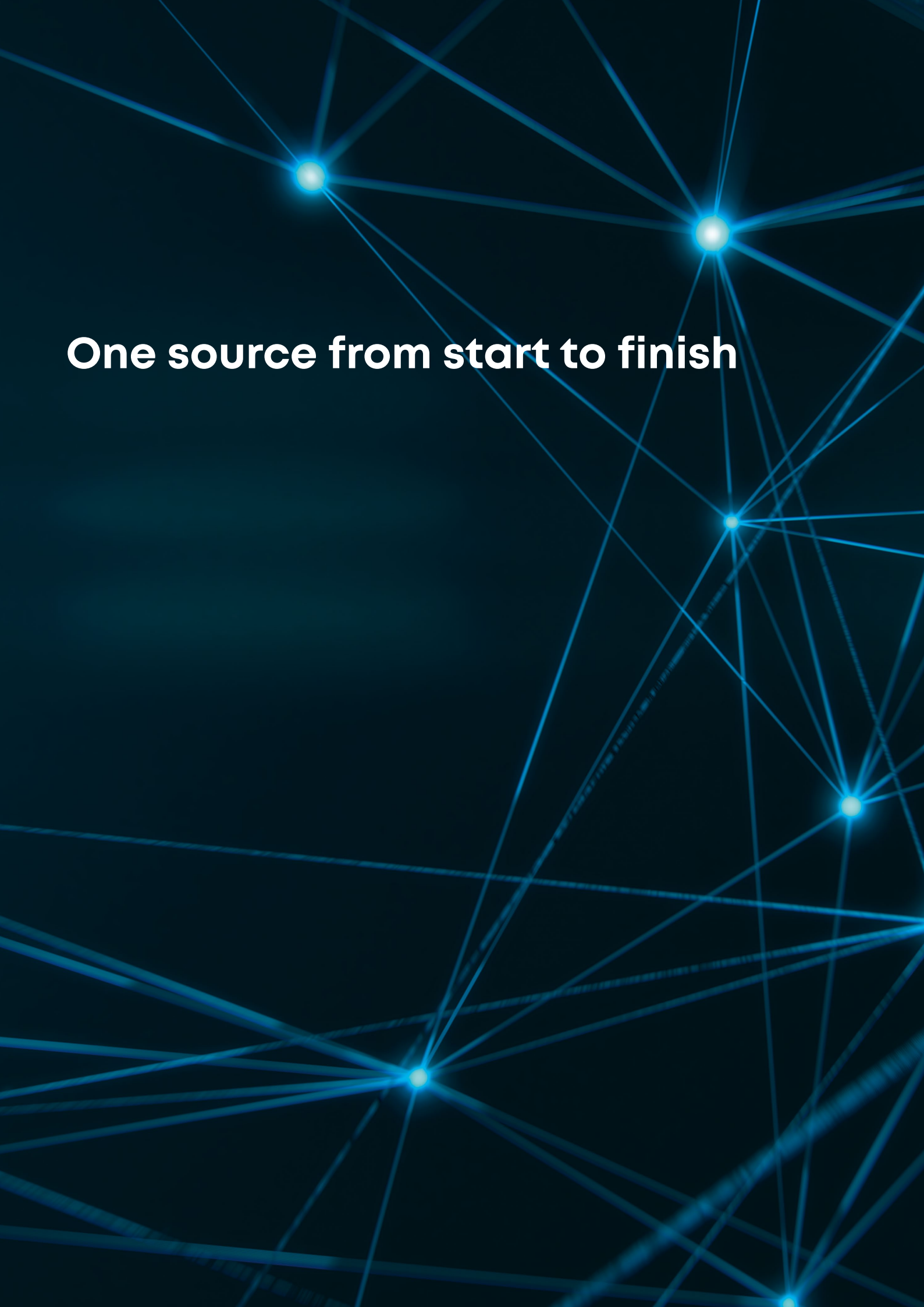
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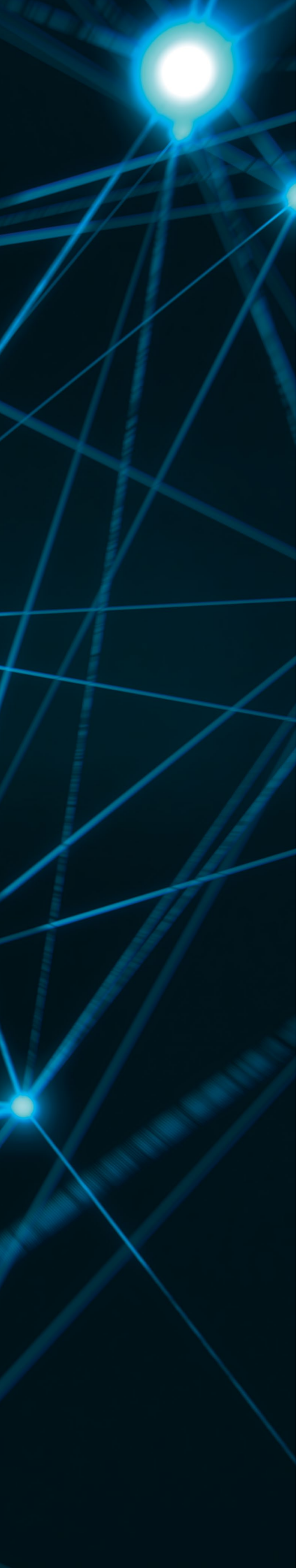


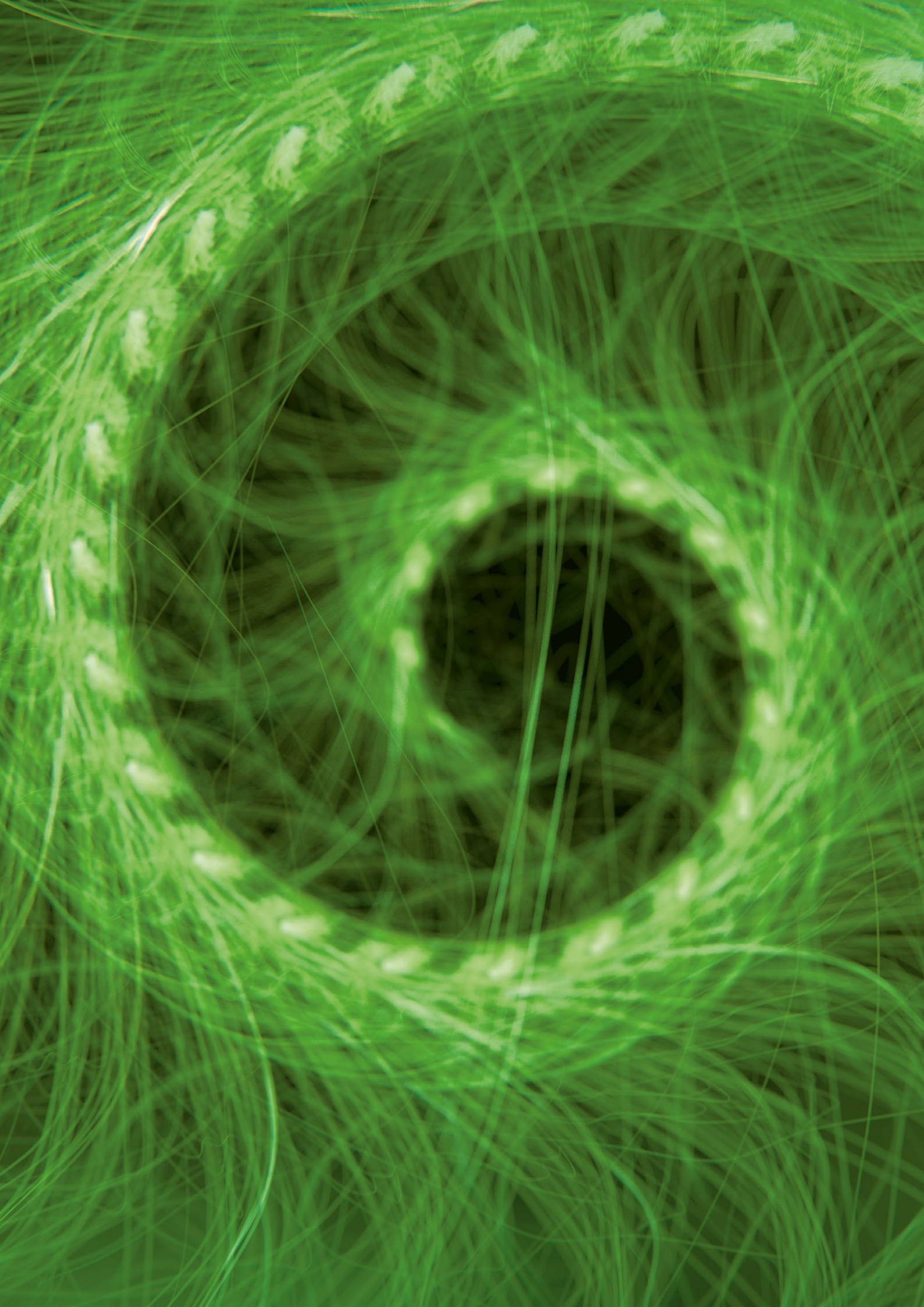
Innovation to achieve the goal

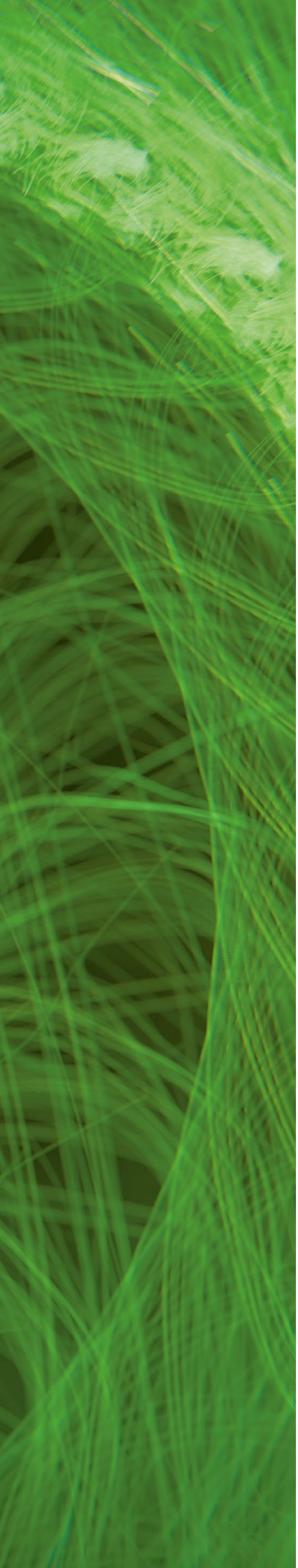
HUBER+SUHNER is a global company with headquarters in Switzerland which develops and manufactures components and system solutions for electrical and optical connec tivity. With cables, connectors and systems developed from the three core technologies of radio frequency, fiber optics and low frequency the company serves customers in the communication, transportation and industrial sectors.

The products deliver high performance, quality, reliability and long service life even under the toughest of conditions. The company's global production network, combined with group companies and agencies, ensures that HUBER+SUHNER maintains a close relationship with its customers in over 80 countries.

At HUBER+SUHNER, we are dedicated to furthering the evolution of the automotive sector through our cutting edge capabilities in high-speed data transmission and our vast experience in automotive energy power distribution.

All our products fully comply with the European Directive 2002/95/EC (RoHS).





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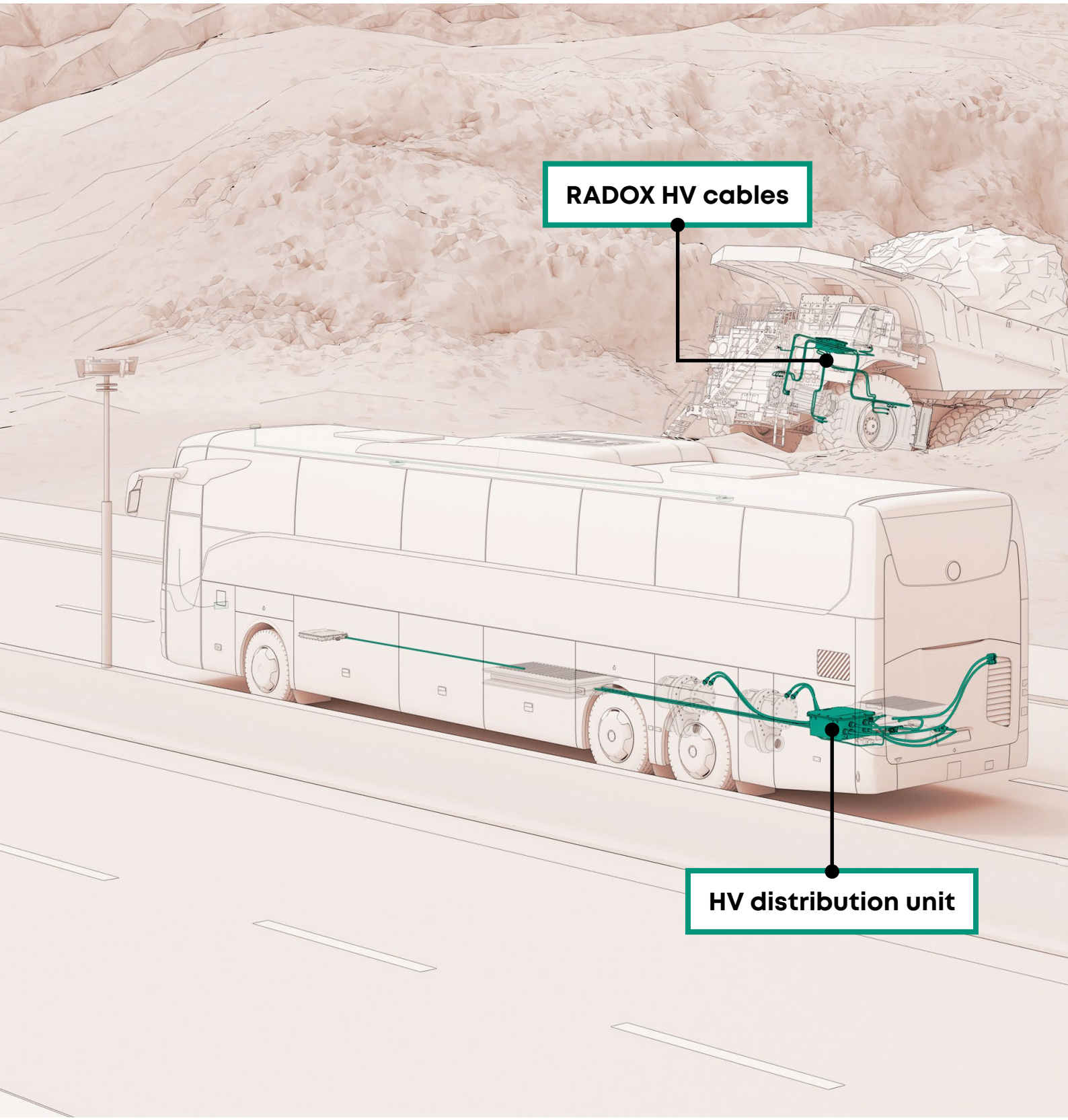
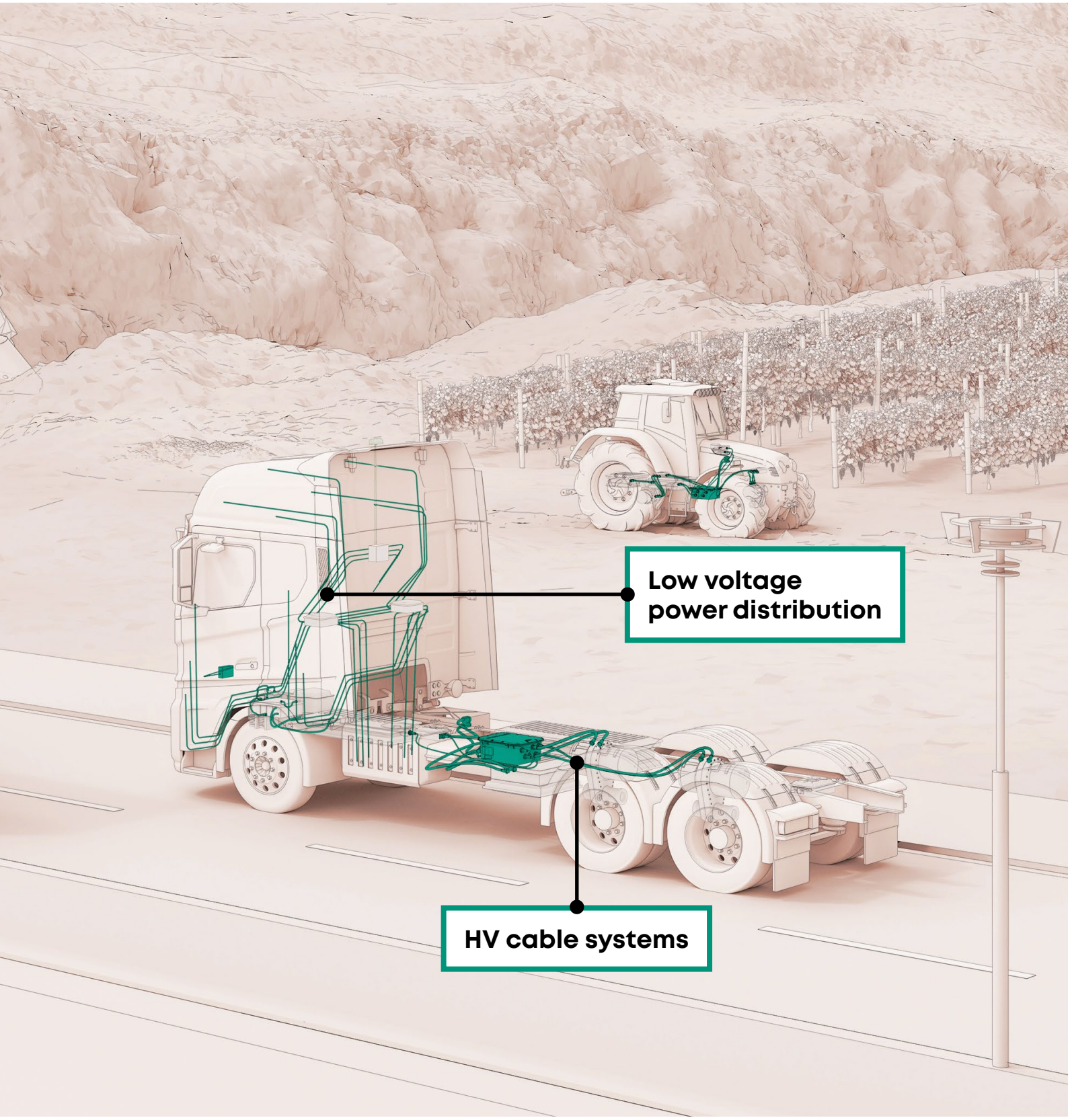
Automotive wires and cables

HUBER+SUHNER designs and manufactures durable and reliable solutions, highly resistant to harsh environmental conditions, and based on our in-house RADOX® cable technology. RADOX achieves significant performance within the thermal, mechanical, and chemical properties of the cable insulation material.

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HV cable systems

Low voltage power distribution

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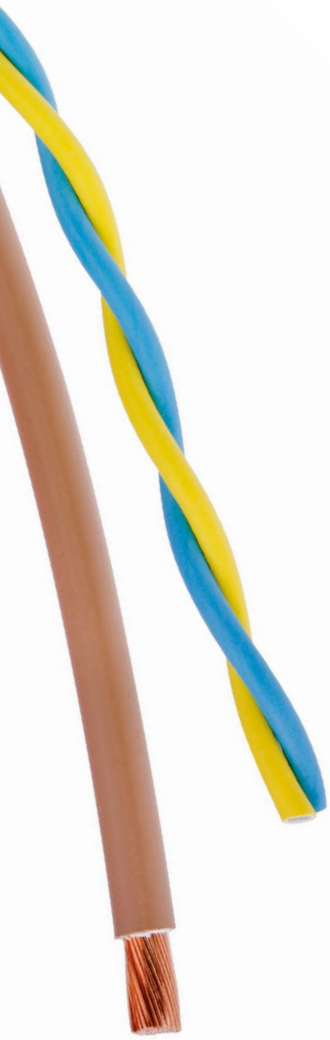


Low voltage cable for road vehicles, class D and F according to ISO 6722 and ISO 19642, temperature rating – 40 to +150 °C/200 °C

A growing demand of sensors, higher operating temperatures and restricted space are typical in today's motor compartments. These cables have been developed with these specific requirements in mind.

These cables are class D temperature range cables with reduced outer diameter. They have superb resistanceto motor oils, fluids and hydrolysis. Thanks to their electron beam cross-linked RADOX insulation, these cables have excellent resistance to extremes of temperature and abrasion even with reduced outer diameter. Furthermore these RADOX cables have outstanding electrical characteristics.

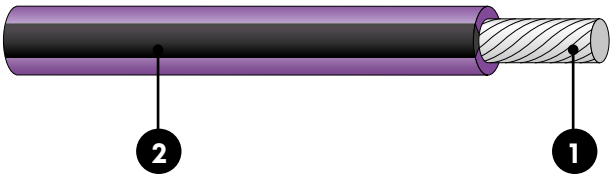
The characteristics of these RADOX cables make them ideal for use in a wide range of applications, where space is at a premium and where cables are subjected to high temperatures. Even high humidity levels and motor vehicle fluids do not negatively affect the lifetime of the cables.

General features

- Operating temperature range – 55 to + 200 °C
- Reduced outer diameter
- Resistant to motor fluids, fuels
- Hydrolysis resistant
- Resistant to pressure at high temperatures
- High abrasion resistance
- Excellent electrical characteristics

RADOX

155S FLR (FLR91X and FHLR91X)



Product Name	**RADOX 155S FLR (FLR91X and FHLR91X)**
Number of conductors	1
Cross section	0.35 to 6 mm²
Voltage rating	60/1500 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Composition of cable

1. Conductor stranded tinned or bare copper
2. Insulation RADOX 155S, extruded irradiation cross-linked polyolefin, various colours

Characteristics and specialities

- High and low temperature resistance
- Ozone and weathering resistance
- Resistant to pressure at high temperature
- Resistant to motor oils, fuels and hydrolysis
- Flame retardant
- High abrasion resistance
- Easy to strip and process

Application

Low voltage cable for use in road vehicle applications, such as motor wiring, fan motor or sensor applications.

Standards

Conductor	General
ISO 6722, ISO 19642-3 and -5	ISO 6722, ISO 19642-3 and -5, class D, thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	

Customer approvals

- GMW 15626
- VW 60306-1
- Ford ES-AU5T-1A348-AA
- BMW GS 95007
- FCA MS.90034
- JLR TPJLR.18.007
- Scania TB1914
- Volvo STD 525-001
- Bosch N34A AE011D S007

For further technical details please refer to our data sheet STD 548776.

RADOX

155S FLR (FLR91X and FHLR91X)

Extract from our delivery programme

Dimensions according to ISO 6722-1/ISO 19642, structure A

Cross section	**Conductor**					**Core**	
Nominal mm²	Number of individual wires	Diameter of individual wires max. mm	Diameter max. mm	Resistance at 20 °C max. Ω/km		Wall thickness min. mm	Diameter mm
				tinnel	bare		
0.35	7	0.26	0.8	55.5	54.4	0.20	1.25 ± 0.05
0.5	19	0.19	1.0	38.2	37.1	0.22	1.5 ± 0.1
0.75	19	0.23	1.2	25.4	24.7	0.24	1.8 ± 0.1
1	19	0.26	1.3	19.1	18.5	0.24	2.0 ± 0.1
1.5	19	0.32	1.7	13.0	12.7	0.24	2.3 ± 0.1
2.5	19	0.41	2.2	7.82	7.60	0.28	2.85 ± 0.15
2.5	37	0.29	2.2	7.82	7.60	0.28	2.85 ± 0.15
4	37	0.38	2.6	4.85	4.71	0.32	3.55 ± 0.15
6	37	0.45	3.1	3.23	3.14	0.32	4.15 ± 0.15

Datasheet STD 548776

Dimensions according to ISO 6722-1/ISO 19642, structure B

Cross section	**Conductor**					**Core**	
Nominal mm²	Number of individual wires	Diameter of individual wires max. mm	Diameter max. mm	Resistance at 20 °C max. Ω/km		Wall thickness min. mm	Diameter mm
				tinnel	bare		
0.75	24	0.21	1.2	25.4	24.7	0.24	1.8 ± 0.1
1	32	0.21	1.3	19.1	18.5	0.24	2.0 ± 0.1
1.5	30	0.26	1.7	13.0	12.7	0.24	2.3 ± 0.1
2.5	50	0.26	2.2	7.82	7.60	0.28	2.85 ± 0.15
4	56	0.31	2.6	4.85	4.71	0.32	3.55 ± 0.15
6	84	0.31	3.1	3.23	3.14	0.32	4.15 ± 0.15

Datasheet STD 548776

RADOX

155S RW (FLU91X)

Product Name	**RADOX 155S RW (FLU91X)**
Number of conductors	1
Cross section	0.14 to 1 mm²
Voltage rating	60 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Composition of cable

1. Conductor stranded, tin plated
2. Insulation RADOX 155S, extruded irradiation cross-linked polyolefin, various colours

Characteristics and specialities

- High and low temperature resistance
- Ozone and weathering resistance
- Resistant to pressure at high temperature
- Resistant to motor oils, fuels and hydrolysis
- Flame retardant
- High abrasion resistance
- Easy to strip and process

Application

Low voltage cable for use in road vehicle applications, such as motor wiring, fan motor or sensor applications.

Standards

Conductor	**General**
ISO 6722, ISO 19642-3 and -5	ISO 6722, ISO 19642-3 and -5, class D, ultra thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	

Extract from our delivery programme

Cross section	**Conductor**				**Core**		
Nominal mm²	**Number of individual wires**	**Diameter of individual wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km, bare**	**Wall thickness min. mm**	**Diameter mm**	**Weight nominal kg/100 m**
0.35	7	0.26	0.80	52.0	0.20	1.25 ± 0.05	0.4
0.5	19	0.19	1.00	37.1	0.20	1.40 ± 0.05	0.6
0.75	19	0.23	1.20	24.7	0.21	1.65 ± 0.05	0.8
1.0	19	0.26	1.35	18.5	0.22	1.80 ± 0.05	1.0
1.25	19	0.29	1.40	15.5	0.23	2.00 ± 0.05	1.3
1.5	19	0.32	1.70	12.7	0.23	2.10 ± 0.05	1.5

Datasheet STD 583960

For further technical details please refer to our data sheets STD 548401 and STD 583960.

ETFE
(FLR7Y and FLU7Y)

Product Name	**ETFE (FLR7Y and FLU7Y)**
Number of conductors	1
Cross section	0.14 to 6 mm^2
Voltage rating	60/600 V DC
Temperature range	–55 to +200 °C (3000 h)
Min. bending radius	3 × cable dia.

Composition of cable

1. Conductor stranded bare copper
2. Insulation ETFE, extruded fluoropolymer, various colours

Characteristics and specialities

- High and low temperature resistance
- Ozone and weathering resistance
- Resistant to pressure at high temperature
- Resistant to hot motor oils, fuels and hydrolysis
- Flame retardant
- High abrasion resistance
- Easy to strip and process

Application

Low voltage cable for use in road vehicle applications, where constant hot oil immersion is required.

Standards

Conductor	**General**
ISO 6722, ISO 19642-3 and -5	ISO 6722, ISO 19642-3 and -5, class D, thin-wall and ultra thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	

For further technical details please refer to our data sheets STD 378562 (FLR7Y) and STD 585353 (FLU7Y).

ETFE
(FLR7Y and FLU7Y)

Extract from our delivery programme

Dimensions according to ISO 6722-1/ISO 19642

Cross section	Conductor					Core		
Nominal mm²	Number of individual wires guide value	Diameter of individual wires max. mm	Diameter max. mm	Resistance at 20 °C max. Ω/km		Wall thickness min. mm	Weight nom. kg/100 m	Cable-diameter mm
				tinned	bare			
0.35	7	0.26	0.8	–	52.0	0.20	0.4	1.25 ± 0.05
1.00	19	0.26	1.35	–	18.5	0.24	1.2	2.00 ± 0.10

Datasheet STD 378562 (FLR7Y)

Dimensions according to ISO 6722-1/ISO 19642

Cross section	Conductor					Core		
Nominal mm²	Number of individual wires guide value	Diameter of individual wires max. mm	Diameter max. mm	Resistance at 20 °C max. Ω/km		Wall thickness min. mm	Weight nom. kg/100 m	Cable-diameter mm
				tinned	bare			
0.25	19	0.13	0.61	86.0	–	0.19	0.33	1.10 ± 0.05
0.35	7	0.26	0.79	–	50.2	0.16	0.45	1.20 ± 0.05
0.50	19	0.19	0.90	–	36.4	0.16	0.58	1.30 ± 0.05
0.75	19	0.23	1.12	–	24.5	0.16	0.84	1.50 ± 0.05
1.0	19	0.26	1.26	–	18.3	0.16	1.06	1.65 ± 0.07
1.5	19	0.32	1.52	–	12.6	0.16	1.55	2.00 ± 0.10
2.5	50	0.26	2.00	–	7.52	0.20	2.59	2.55 ± 0.10
4	56	0.31	2.50	–	4.66	0.24	3.98	3.15 ± 0.10
6	84	0.31	2.98	–	3.11	0.24	5.92	3.65 ± 0.10
10	78	0.41	4.30	–	1.82	0.24	9.89	5.00 ± 0.15

Datasheet STD 585353 (FLU7Y)

RADOX anticapillary
single insulation

Product Name	**RADOX anticapillary (single insulation)**
Number of conductors	1
Cross section	0.35 10 mm²
Voltage rating	60/1500 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Recommended max. Fluid Temperature see data sheets

Composition of cable

1. Conductor stranded tinned or bare copper, special coating
2. Insulation RADOX 155S, extruded irradiation cross-linked polyolefin (FLR91X), various colours

Characteristics and specialities

- Barrier sealed, avoids penetration of fluids along conductor (fluids such as water and AdBlue)
- High and low temperature resistance
- Ozone and weathering resistance
- Resistant to pressure at high temperature
- Resistant to motor oils, fuels, hydrolysis and AdBlue
- Flame retardant
- High abrasion resistance
- Easy to strip and process

Application

Low voltage cable with anticapillary properties for use in road vehicle applications.

Standards

Conductor	**General**
ISO 6722, ISO 19642-3 and -5	ISO 6722, ISO 19642-3 and -5, class D, thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	

Customer approvals

- Daimler DR 15863
- BMW 9 338 777.9 – 796.9
- JLR
- Bosch N34_AE011D_S014
- Ford ES-AU5T-1A348-AA

For further technical details please refer to our data sheets STD 582554D, STD 412701 (filled with fluorinated grease), STD 582272 (filled with silicon grease).

RADOX anticapillary
single insulation

Extract from our delivery programme

Dimensions according to ISO 6722-1/ISO 19642 structure A

Cross section	Conductor					Core	
Nominal mm²	**Number of individual wires**	**Diameter of individual wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**		**Wall thickness min. mm**	**Diameter mm**
				tinnel	bare		
0.35	7	0.26	0.8	54.5	52.0	0.20	1.25 ± 0.05
0.5	19	0.19	1.0	38.2	37.1	0.22	1.5 ± 0.1
0.75	19	0.23	1.2	25.4	24.7	0.24	1.8 ± 0.1
1.0	19	0.26	1.35	19.1	18.5	0.24	2.0 ± 0.1
1.5	19	0.32	1.7	13.0	12.7	0.24	2.3 ± 0.1

Datasheet STD 582554

Dimensions according to ISO 6722-1/ISO 19642

Cross section	Conductor					Core	
Nominal mm²	**Number of individual wires**	**Diameter of individual wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**		**Wall thickness min. mm**	**Diameter mm**
				tinnel	bare		
2	19	0.38	1.86	9.69	9.42	0.28	2.65 ± 0.15
2.5	19	0.42	2.2	7.82	7.60	0.28	2.85 ± 0.15
4	19	0.55	2.75	4.85	4.71	0.32	3.55 ± 0.15
6	19	0.67	3.3	3.23	3.14	0.32	4.15 ± 0.15
10	37	0.61	3.9	1.85	1.82	0.73	5.75 ± 0.20

Datasheet STD 412701

RADOX anticapillary
double insulation

Product Name	**RADOX anticapillary (double insulation)**
Number of conductors	1
Cross section	0.35 to 6 mm²
Voltage rating	60/1500 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Recommended max. Fluid Temperature see data sheets

Composition of cable

1. Conductor stranded tinned or bare copper, special coating
2. Insulation RADOX 155S, extruded irradiation cross-linked polyolfin
3. Insulation extruded irradiation crosslinked fluoropolymer (PVDF-X) for hot oil applications

Characteristics and specialities

- Barrier sealed, avoids penetration of fluids along conductor (fluids such as water, AdBlue and hot oils)
- High and low temperature resistance
- Ozone and weathering resistance
- Resistant to pressure at high temperature
- Resistant to motor oils, fuels and hydrolysis
- Flame retardant
- High abrasion resistance
- Easy to strip and process

Application

Low voltage cable with anticapillary properties for use in road vehicle applications.

Standards

Conductor	**General**
DIN 72551 part 6	ISO 6722 class D, thin-wall
ISO 6722	DIN 72551 part 5 (1993)
DIN EN 13602, Cu-ETP1-A (CW003A)	LV 112

Customer approvals

- Bosch N34A AEO11D_S015

For further technical details please refer to our data sheets STD 470829 (filled with fluorinated grease), STD 759203 (filled with silicon grease).

RADOX anticapillary
double insulation

Extract from our delivery programme

Dimensions according to ISO 6722/ISO 19642 structure B

Cross section	Conductor					Core	
Nominal mm²	**Number of individual wires**	**Diameter of individual wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**		**Wall thickness min. mm**	**Diameter mm**
				tinned	bare		
0.5	19	0.19	1.0	38.2	37.1	0.22	1.5 ± 0.1
0.75	19	0.23	1.2	25.4	24.7	0.24	1.8 ± 0.1
1	19	0.26	1.3	19.1	18.5	0.24	2.0 ± 0.1
1.5	19	0.32	1.7	13.0	12.7	0.24	2.3 ± 0.1
2	19	0.38	1.8	9.69	9.42	0.28	2.65 ± 0.15
4	19	0.55	2.5	4.85	4.71	0.32	3.55 ± 0.15

Datasheet STD 470829

Dimensions according to ISO 6722/ISO 19642

Cross section	Conductor					Core	
Nominal mm²	**Number of individual wires**	**Diameter of individual wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**		**Wall thickness min. mm**	**Diameter mm**
				tinned	bare		
0.5	19	0.19	1.0	38.2	37.1	0.22	1.5 ± 0.1
0.75	19	0.23	1.2	25.4	24.7	0.24	1.8 ± 0.1
1	19	0.26	1.35	19.1	18.5	0.24	2.0 ± 0.1
1.5	19	0.32	1.7	13.0	12.7	0.24	2.3 ± 0.1
2.5	19	0.42	2.2	7.82	7.60	0.28	2.85 ± 0.15

Datasheet STD 759203

RADOX battery cables
thin-wall, flexible

RADOX 155 battery cable	21
RADOX Elastomer S (REMS) battery cable	24
RADOX screened battery cable	30
RADOX screened multi core cable	34

Power cables for road vehicles, class D according to ISO 19642, operating temperature –40 to +150 °C

RADOX battery cables are high temperature resistant products with a reduced outer diameter. The cable is highly resistant to temperature, ozone, weathering, hydrolysis and has excellent resistance to battery acid and cooling agents. It is also resistant against oils, fuels and other fluids used inside and outside of the motor compartment.

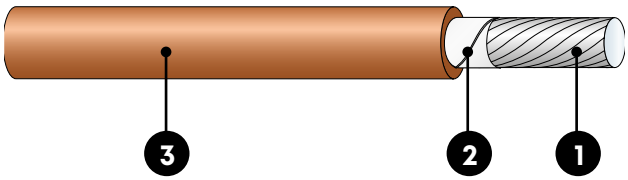
Thanks to its electron beam cross-linked RADOX insulation, the cable has, despite the reduced outer diameter, excellent resistance to heat pressure and abrasion. In addition, the RADOX battery cable has outstanding dielectric properties. The flame retardant insulation does not melt or flow at high temperatures and is easy to strip.

General features

- Operating temperature –55 to +150 °C
- Outstanding flexibility
- Reduced outer diameter
- Resistant to motor oils, battery acid and fuels
- High resistance to heat pressure
- Excellent abrasion resistance

RADOX

155 battery cable



Product Name	**RADOX 155 battery cable, aluminium (FLR4G or FHLR4G)**
Number of conductors	1
Cross section	10 to 120 mm²
Voltage rating	1000 V AC/1500 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Composition of cable

1. Conductor stranded aluminium
2. Plastic tape optional
3. Insulation RADOX 155, extruded irradiation cross-linked polyolefin, various colours

Characteristics and specialities

- Excellent high and low temperature resistance
- Ozone, weathering and hydrolysis resistance
- Outstanding resistance against battery acids, humidity, petrol, brake fluids, engine coolant, window washer, fluids, diesel and various oils
- Flame retardant
- Easy to strip and process

Application

ADR approved battery or power cable for use in road vehicle applications.

Standards

Conductor	General
ISO 6722-2, ISO 19642-6	ISO 6722-2, ISO 19642-6, class D, thin-wall
ISO 6892-1	
ASTM B231	
EN 573-1	

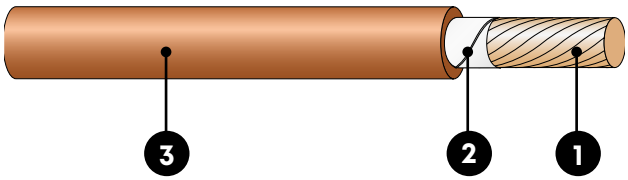
Extract from our delivery programme

Cross section	Conductor				Core		
Nominal mm²	Number of individual wires guide value	Diameter of individual wires max. mm	Diameter max. mm	Resistance at 20 °C max. Ω/km	Wall thickness min. mm	Weight nom. kg/100 m	Cable-diameter mm
16	80	0.52	5.40	1.93	0.52	8.7	6.75 ± 0.20
25	122	0.52	6.70	1.24	0.52	12.8	8.40 ± 0.20
35	172	0.52	7.90	0.878	0.64	18.3	10.05 ± 0.25
50	247	0.52	9.40	0.368	0.72	21.3	11.50 ± 0.25
60	289	0.52	10.50	0.613	0.80	28.1	12.85 ± 0.25
70	351	0.52	10.60	0.432	0.80	34.1	13.85 ± 0.25
95	472	0.52	13.50	0.327	1.09	49.2	16.20 ± 0.30
120	305	0.72	15.10	0.255	1.28	68.0	18.00 ± 0.30

Datasheet STD 776028

For further technical details please refer to our data sheet STD 776028.

RADOX
155 battery cable



Product Name	**RADOX 155 battery cable, flexible (FLR4G and FHLR4G)**
Number of conductors	1
Cross section	10 to 150 mm²
Voltage rating	1000 V AC/1500 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Composition of cable

1. Conductor stranded bare copper
2. Plastic tape optional
3. Insulation RADOX 155, extruded irradiation cross-linked polyolefin, various colours

Characteristics and specialities

- Excellent high and low temperature resistance
- Ozone, weathering and hydrolysis resistance
- Outstanding resistance against battery acids, humidity, petrol, brake fluids, engine coolant, window washer, fluids, diesel and various oils
- Flame retardant
- Easy to strip and process

Application

ADR approved battery or power cable for use in road vehicle applications.

Standards

Conductor	General
ISO 6722-1, ISO 19642-5	ISO 6722, ISO 19642-5, class D, thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	ADR approved

Customer approvals

- GMW 15626
- VW 60306-1
- Ford ES-AU5T-1A348-AA
- BMW GS 95007
- FCA MS.90034
- JLR TPJLR.18.007
- Scania TB1914
- Volvo STD 525-001
- Bosch N34A AE011D S007
- VW 75210-1

For further technical details please refer to our data sheet STD 718404.

RADOX

155 battery cable

Extract from our delivery programme

Cross section	Conductor				Core		
Nominal mm²	**Number of individual wires guide value**	**Diameter of individual wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**	**Wall thickness min. mm**	**Weight nom. kg/100 m**	**Cable-diameter mm**
8	60	0.41	3.8	2.38	0.40	8.0	5.05 ± 0.15
10	78	0.41	4.3	1.82	0.50	10.5	5.75 ± 0.20
12	92	0.41	4.7	1.52	0.50	12.0	6.10 ± 0.20
16	126	0.41	5.4	1.16	0.52	16.5	6.90 ± 0.20
20	154	0.41	6.2	0.955	0.52	20.0	7.60 ± 0.20
25	189	0.41	6.7	0.743	0.55	24.2	8.20 ± 0.20
30	224	0.41	7.4	0.647	0.64	29.0	9.10 ± 0.25
35	273	0.41	7.9	0.527	0.65	35.0	9.70 ± 0.25
40	301	0.41	8.5	0.473	0.73	38.7	10.40 ± 0.25
50	385	0.41	9.4	0.368	0.80	49.2	11.50 ± 0.25
60	294	0.51	10.6	0.315	0.80	57.8	12.60 ± 0.25
70	360	0.51	11.6	0.259	0.80	69.7	13.70 ± 0.25
95	480	0.51	13.5	0.196	0.90	93.8	16.20 ± 0.30
120	589	0.51	15.1	0.153	0.90	114.7	18.00 ± 0.30
150	741	0.51	17.0	0.122	1.00	143.4	20.00 ± 0.30

Datasheet STD 718404

RADOX

Elastomer S (REMS) battery cable

Product Name	**RADOX Elastomer S (REMS) battery cable, flexible (FLR13X)**
Number of conductors	1
Cross section	10 to 150 mm²
Voltage rating	600 V AC/900 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Composition of cable

1. Conductor — stranded bare copper
2. Plastic tape — optional
3. Insulation — RADOX Elastomer S (REMS), extruded irradiation cross-linked copolymer, various colours

Characteristics and specialities

- Excellent high and low temperature resistance
- Very flexible
- Ozone and weathering resistance
- Outstanding resistance against battery acids, diesel, various oils, engine coolant and window washer fluids
- Resistance against humidity, petrol and brake fluids
- Flame retardant
- Easy to strip and process

Application

Flexible battery or power cable for use in road vehicle applications.

Standards

Conductor	General
ISO 6722 -1, ISO 19642-5	ISO 6722, ISO 19642-5 class D, thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	

For further technical details please refer to our data sheet STD 565167

RADOX

Elastomer S (REMS) battery cable

Extract from our delivery programme

Cross section	Conductor				Cable		
Nominal mm²	**Number of individual wires guide value**	**Diameter of individual wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**	**Wall thickness min. mm**	**Weight nom. kg/100 m**	**Cable-diameter mm**
10	78	0.41	4.3	1.82	0.50	10.7	5.75 ± 0.15
12	92	0.41	4.65	1.52	0.50	12.1	6.05 ± 0.15
16	126	0.41	5.4	1.16	0.52	16.7	6.90 ± 0.20
20	154	0.41	6.2	0.955	0.52	20.2	7.60 ± 0.20
25	189	0.41	6.7	0.743	0.55	24.5	8.20 ± 0.20
30	224	0.41	7.4	0.647	0.64	29.9	9.10 ± 0.25
35	273	0.41	7.9	0.527	0.65	35.4	9.70 ± 0.25
50	385	0.41	9.4	0.368	0.80	49.8	11.50 ± 0.25
70	360	0.51	11.6	0.259	0.80	70.4	13.70 ± 0.25
95	480	0.51	13.5	0.196	0.90	95.0	16.25 ± 0.30
120	589	0.51	15.1	0.153	0.90	115.9	18.00 ± 0.30

Datasheet STD 565167

RADOX

Elastomer S (REMS) battery cable

Product Name	**RADOX Elastomer S (REMS) battery cable, high flexible (FLR13X)**
Number of conductors	1
Cross section	10 to 150 mm²
Voltage rating	600 V AC/900 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Composition of cable

1. Conductor — stranded bare copper
2. Plastic tape — optional
3. Insulation — RADOX Elastomer S (REMS), extruded irradiation cross-linked copolymer, various colours

Characteristics and specialities

- Excellent high and low temperature resistance
- Very flexible
- Ozone and weathering resistance
- Outstanding resistance against battery acids, diesel, various oils, engine coolant and window washer fluids
- Resistance against humidity, petrol and brake fluids
- Flame retardant
- Easy to strip and process

Application

High flexible battery or power cable for use in road vehicle applications.

Standards

Conductor	General
ISO 6722 -1, ISO 19142-5	ISO 6722, ISO 19642-5 class D, thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	

For further technical details please refer to our data sheet STD 451483.

RADOX

Elastomer S (REMS) battery cable

Extract from our delivery programme

Cross section	Conductor				Cable		
Nominal mm²	**Number of individual wires guide value**	**Diameter of individual wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**	**Wall thickness min. mm**	**Weight nom. kg/100 m**	**Cable-diameter mm**
16	490	0.21	5.4	1.16	0.52	16.7	6.80 ± 0.20
25	760	0.21	7.0	0.743	0.52	25.0	8.45 ± 0.25
35	1'064	0.21	8.3	0.527	0.64	35.5	10.15 ± 0.25
50	1'520	0.21	9.9	0.368	0.71	50.3	11.95 ± 0.25
70	2'146	0.21	11.8	0.259	0.80	69.6	14.10 ± 0.30
95	2'849	0.21	13.3	0.196	0.90	93.5	16.40 ± 0.30
120	3'538	0.21	15.3	0.153	1.28	120.1	19.40 ± 0.30

Datasheet STD 451483

RADOX

Elastomer S (REMS) battery cable

Product Name	**RADOX Elastomer S (REMS) battery cable, flexible, thick-wall (FL13X)**
Number of conductors	1
Cross section	10 to 150 mm^2
Voltage rating	600 V AC/900 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Composition of cable

1. Conductor — stranded bare copper
2. Plastic tape — optional
3. Insulation — RADOX Elastomer S (REMS), extruded radiation cross-linked copolymer, various colours

Characteristics and specialities

- Excellent high and low temperature resistance
- Very flexible
- Ozone and weathering resistance
- Outstanding resistance against battery acids, diesel, various oils, engine coolant and window washer fluids
- Resistance against humidity, petrol and brake fluids
- Flame retardant
- Easy to strip and process

Application

ADR approved, thick-wall battery or power cable for use in road vehicle applications.

Standards

Conductor	General
ISO 6722 -1, ISO 19642-5	ISO 6722, ISO 19642-5 class D, thick-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	ADR approved

For further technical details please refer to our data sheets STD 711923 and STD 412055.

RADOX

Elastomer S (REMS) battery cable

Extract from our delivery programme

Cross section	Conductor				Cable		
Nominal mm²	**Number of individual wires guide value**	**Diameter of individual wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**	**Wall thickness min. mm**	**Weight nom. kg/100 m**	**Cable-diameter mm**
10	78	0.41	4.3	1.82	0.80	11.4	6.30 ± 0.20
16	126	0.41	5.4	1.16	1.10	18.6	8.10 ± 0.20
25	189	0.41	6.7	0.743	1.40	28.3	10.15 ± 0.25
35	273	0.41	7.9	0.527	1.40	39.1	11.35 ± 0.25
50	385	0.41	9.4	0.368	1.60	54.4	13.25 ± 0.25
70	360	0.51	11.6	0.259	1.45	75.0	15.20 ± 0.30
95	480	0.51	13.5	0.196	1.70	100.2	17.70 ± 0.30
120	589	0.51	15.1	0.153	1.35	117.8	18.50 ± 0.30

Datasheet TD 711923

RADOX

screened single core cable

Product Name	**RADOX screened single core cable (FHLR91XC13X and FHLR4GC13X)**
Number of conductors	1
Cross section	2.5 to 150 mm²
Voltage rating	1000 V AC/1500 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	4 × cable dia.

Composition of cable

1. Conductor	stranded bare copper ISO Structure B
2. Tape	plastic
3. Insulation	RADOX 155S (91X) for 1.5, 2.5, 4.0, 6.0 mm²; RADOX 155 (4G) for > 6 mm²
4. EMC screen	tin plated copper braid optimised
5. Tape	plastic (PEC)
6. Sheath	RADOX Elastomer S (13X), colour: orange

Characteristics and specialities

- Excellent high and low temperature resistance
- Ozone and weathering resistance
- Outstanding resistance against battery acid, diesel, various oils, engine coolant and window washer fluids
- Resistance against humidity, petrol and brake fluids
- Flame retardant
- Soldering iron resistant
- Easy to strip and process
- ADR, ECE R118 and DNV approved

Application

Screened power cable for use in hybrid and electrical vehicles.

Standards

Conductor	General
ISO 6722 -1, ISO 19642-9	ISO 6722, ISO 19642-9 class D, thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	

For further technical details please refer to our data sheet STD 806104.

RADOX

screened single core cable

Extract from our delivery programme

Cross section	Conductor				Cable				
Nominal mm²	**Number of ind. wires guide value**	**Dia. of ind. wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**	**Diameter of insulation nom. mm**	**Diameter of screen max. mm**	**Overall-diameter nom. mm**	**ZT at 30 MHz nom. mΩ/m**	**Weight nom. kg/100m**
2.5	50	0.26	2.0	7.60	2.85	3.3	5.0 ± 0.2	100	4.9
4	56	0.31	2.5	4.71	3.55	4.0	5.8 ± 0.2	110	7.0
6	84	0.31	3.0	3.14	4.15	4.7	6.6 ± 0.3	70	9.8
8	60	0.41	3.8	2.38	5.05	5.6	7.6 ± 0.3	40	12.5
10	78	0.41	4.3	1.82	5.75	6.3	8.4 ± 0.3	30	15.8
12	92	0.41	4.7	1.52	6.10	6.7	8.9 ± 0.3	30	17.9
16	126	0.41	5.4	1.16	6.90	7.5	9.7 ± 0.3	40	23.0
20	154	0.41	6.2	0.955	7.60	8.3	10.6 ± 0.3	30	28.2
25	189	0.41	6.7	0.743	8.20	8.9	11.2 ± 0.3	40	32.8
30	224	0.41	7.4	0.647	9.10	9.8	12.1 ± 0.3	30	38.5
35	273	0.41	7.9	0.527	9.70	10.4	12.7 ± 0.3	60	44.7
40	301	0.41	8.5	0.473	10.40	11.3	13.6 ± 0.3	20	51.3
50	385	0.41	9.4	0.368	11.50	12.6	14.9 ± 0.3	30	64.2
60	294	0.51	10.6	0.315	12.60	13.5	15.9 ± 0.3	30	73.1
70	360	0.51	11.6	0.259	13.70	14.6	17.0 ± 0.3	30	85.8
95	480	0.51	13.5	0.196	16.20	17.3	19.9 ± 0.4	20	115.3
120	589	0.51	15.1	0.153	18.00	19.1	22.6 ± 0.4	20	145.5
150	741	0.51	17.0	0.122	20.00	21.3	24.9 ± 0.5	30	177.4

Datasheet TD 806104

RADOX

screened FLEX single core cable

Product Name	**RADOX screened FLEX single core cable (FHLR4GC13X)**
Number of conductors	• 1
Cross section	16 to 120 mm^2
Voltage rating	1000 V AC/1500 V DC
Temperature range	–55 to +150 °C (3000 h)
Min. bending radius	3 × cable dia.

Composition of cable

1. Conductor — stranded bare copper ISO structure C (flexible)
2. Tape — plastic
3. Insulation — RADOX 155 (4G)
4. EMC screen — tin plated copper braid optimized
5. Tape — plastic (PEC)
6. Sheath — RADOX Elastomer S (13X), colour: orange

Characteristics and specialities

- Excellent high and low temperature resistance
- Enhanced cable flexibility
- Easy and low-effort cable routing
- Ozone and weathering resistance
- Outstanding resistance against battery acid, diesel, various oils, engine coolant and window washer fluids
- Resistance against humidity, petrol and brake fluids
- Flame retardant
- Soldering iron resistant
- Easy to strip and process
- ECE R118 approved

Application

Screened cable for power transmission in hybrid and electrical vehicles.

Standards

Conductor	General
ISO 6722-1, ISO 19642-9 (ISO structure C)	ISO 6722-1, ISO 19642-9 class D, thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	

For further technical details please refer to our data sheet STD 859519.

RADOX

screened FLEX single core cable

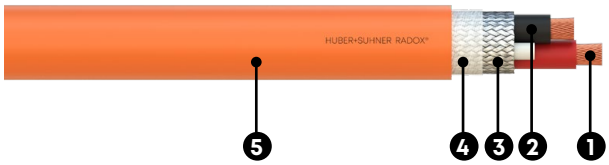
Extract from our delivery programme

Cross section	Conductor				Cable				
Nominal mm²	**Number of ind. wires guide value**	**Dia. of ind. wires max. mm**	**Diameter max. mm**	**Resistance at 20 °C max. Ω/km**	**Diameter of insulation nom. mm**	**Diameter of screen max. mm**	**Overall-diameter nom. mm**	**ZT at 30 MHz nom. mΩ/m**	**Weight nom. kg/100m**
16	490	0.21	5.4	1.16	6.85	8.0	9.3 ± 0.3	60	22.8
25	760	0.21	7.1	0.743	8.35	9.5	11.0 ± 0.3	50	32.2
35	1064	0.21	8.2	0.527	9.90	11.2	12.9 ± 0.3	40	46.1
50	1520	0.21	9.9	0.368	11.70	13.0	14.9 ± 0.3	30	63.1
70	1427	0.26	11.6	0.259	14.00	15.2	17.0 ± 0.4	30	85.2
95	1936	0.26	13.3	0.196	16.20	17.7	19.5 ± 0.4	20	113.7
120	2450	0.26	15.1	0.153	19.10	20.7	22.6 ± 0.4	20	143.5
150	2960	0.26	17.2	0.122	21.10	22.6	25.0 ± 0.5	20	175.9
185	3660	0.26	18.5	0.099	22.5	23.9	26.6 ± 0.5	20	211.3

Datasheet STD 859519

RADOX

screened multi core cable



Product Name	**RADOX screened multi core cable (FHLR91XC13X and FHLR4GC13X)**
Number of conductors	2 to 5
Cross section	1.5 to 70 mm^2
Voltage rating	1000 V AC/1500 V DC
Temperature range	−55 to +150 °C (3000 h)
Min. bending radius	4 × cable dia.

Composition of cable

1. Conductor	stranded bare copper
2. Insulation	RADOX 155S (91X) or RADOX 155 (4G)
3. EMC screen	tin plated copper braid optimised
4. Tape	plastic or aluminium screen (optional)
5. Sheath	RADOX Elastomer S (13X), colour: orange

Characteristics and specialities

- Excellent high and low temperature resistance
- Ozone and weathering resistance
- Outstanding resistance against battery acid, diesel, various oils, engine coolant and window washer fluids
- Resistance against humidity, petrol and brake fluids
- Flame retardant
- Soldering iron resistant
- Easy to strip and process
- ADR, ECE R118 and DNV approved

Application

Screened power cable for use in hybrid and electrical vehicles.

Standards

Conductor	General
ISO 6722, ISO 19642-5	ISO 6722, ISO 19642-9 class D, thin-wall
DIN EN 13602, Cu-ETP1-A (CW003A)	

For further technical details please refer to our data sheet STD 806686.

RADOX

screened multi core cable

Extract from our delivery programme

Cable type	Conductor			Cores	Cable				
Nominal n × mm²	**Number of ind. wires guide value**	**Dia. of ind. wires max. mm**	**Conductor diameter max. mm**	**Diameter of cores nom. mm**	**Resistance at 20 °C max. Ω/km**	**Diameter of screen max. mm**	**Overall diameter nom. mm**	**ZT at 30 MHz nom. mΩ/m**	**Weight nom. kg/100m**
2 × 2.5	50	0.26	2.2	2.85	7.98	6.3	8.4 ± 0.3	50	12.0
2 × 4	56	0.31	2.6	3.55	4.95	7.8	10.2 ± 0.3	30	18.2
2 × 6	84	0.31	3.1	4.15	3.30	9.0	11.0 ± 0.35	50	22.5
2 × 8	60	0.41	3.8	5.05	2.50	11.0	12.8 ± 0.4	40	31.1
2 × 10	78	0.41	4.3	5.75	1.91	12.4	14.4 ± 0.4	40	40.5
3 × 2.5	50	0.26	2.2	2.85	7.98	6.8	8.4 ± 0.3	70	14.4
3 × 4	56	0.31	2.6	3.55	4.95	8.4	10.1 ± 0.4	80	21.0
3 × 6	84	0.31	3.1	4.15	3.30	10.0	12.4 ± 0.4	70	32.2
3 × 10	78	0.41	4.3	5.75	1.91	13.4	15.8 ± 0.5	30	49.6
3 × 16	126	0.41	5.4	6.90	1.21	16.0	18.5 ± 0.5	30	75.1
3 × 35	273	0.41	7.9	9.70	0.554	22.5	24.9 ± 0.5	140	148.8
4 × 2.5	50	0.26	2.2	2.85	7.98	7.6	9.2 ± 0.3	40	18.1
4 × 4	56	0.31	2.6	3.55	4.95	9.3	11.3 ± 0.4	50	26.5
4 × 6	84	0.31	3.1	4.15	3.30	11.0	12.9 ± 0.4	50	37.6
4 × 10	78	0.41	4.3	5.75	1.91	15.0	17.1 ± 0.5	40	64.7
5 × 4	56	0.31	2.6	3.55	4.95	10.8	13.3 ± 0..4	70	36.2
5 × 6	84	0.31	3.1	4.15	3.30	12.4	14.4 ± 0.4	30	47.0

Datasheet TD 806686

RADOX sensor cables

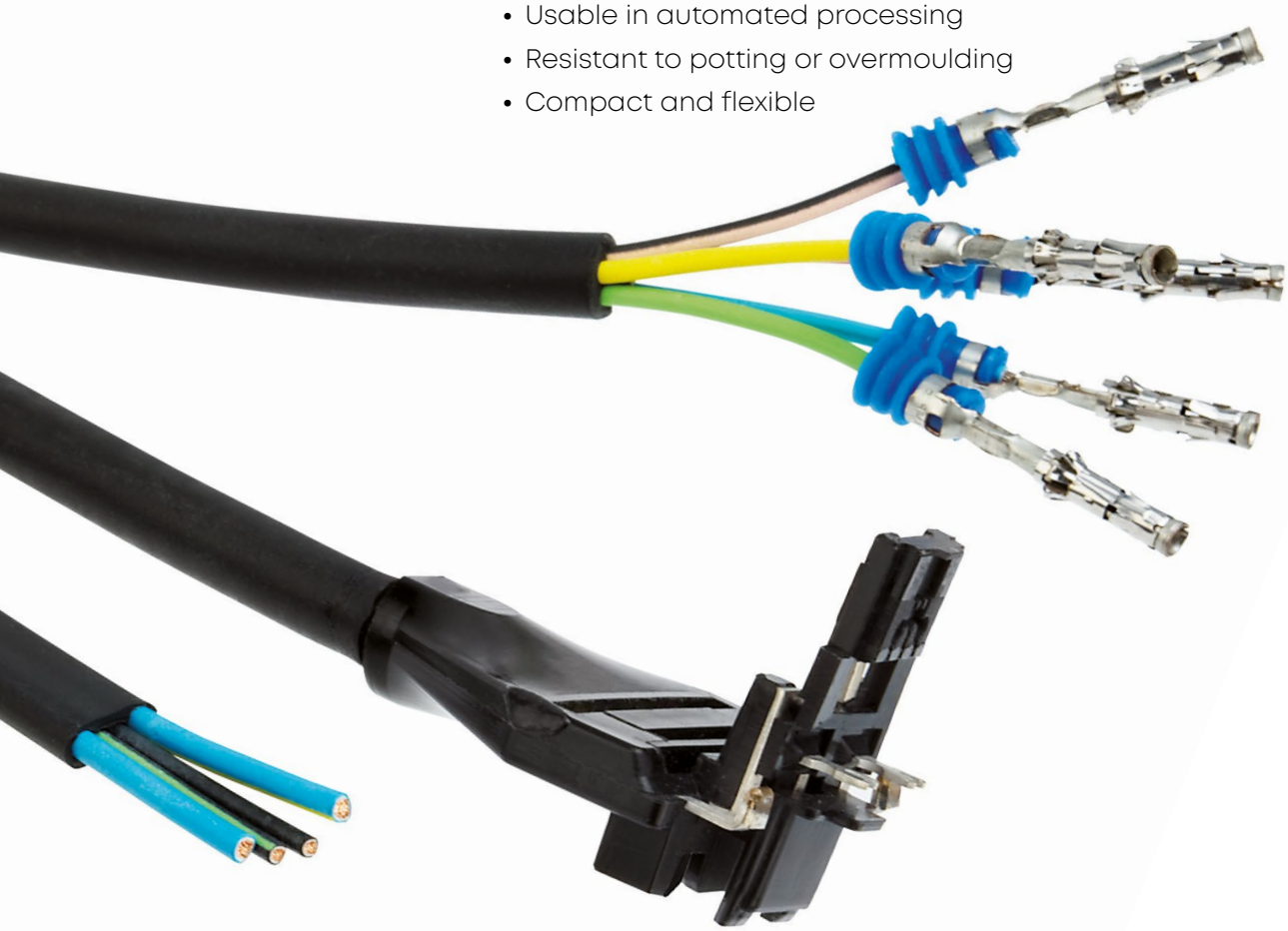
Sensor cables for road vehicles: Resistant to low and high temperatures, flame retardant, flexible and media resistant, customer specific designs.

Pressure, knock and temperature sensors are standard today, and sensors for seatbelt tighteners, automatic transmissions, diesel pumps, ABS/EPS systems, speed monitoring plus other applications are an in-creasing demand. It must be ensured that critical electrical circuits will perform faultlessly under the most adverse conditions.

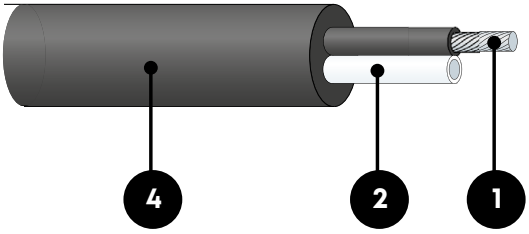
Electrical systems for fan motors, water pumps, power steering, brakes and accelerators are in-creasingly replacing V-belts, various hydraulic motors and mechanical actuators. Sensor cables serve for controlling the electronics and supplying power to the electric motors.

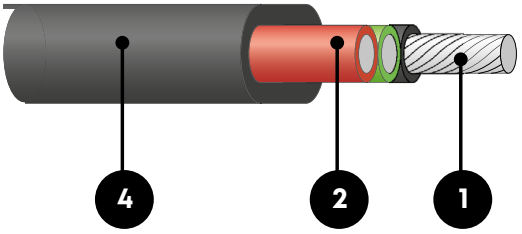
General features

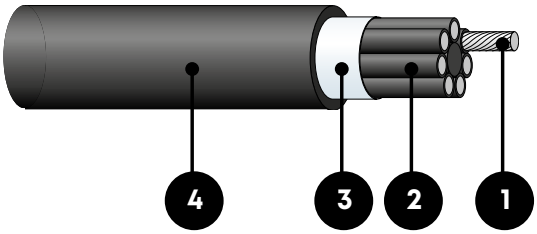
- Temperature range –55 to +150 °C
- Resistant to motor oils, fuels, hydrolysis
- Electron beam cross-linked RADOX insulation does not melt or flow at high temperatures
- Usable in automated processing
- Resistant to potting or overmoulding
- Compact and flexible



RADOX
sensor cables







Product Name	**RADOX sensor cables**
Number of conductors	1 to 50
Cross section	0.14 to 6 mm²
Voltage rating	60 to 600 V DC
Temperature range	–55 to +150 °C (3000h)

Composition of cable

1. Conductor — stranded tinned or bare copper
2. Insulation — various RADOX, fluoropolymers
3. EMC screen — copper braiding or aluminium tape
4. Jacket — various RADOX, TPU or fluoropolymers

Characteristics and specialities

- High and low temperature resistance
- Ozone and weathering resistance
- Resistant to pressure at high temperature
- Resistant to motor oils, fuels and hydrolysis
- Flame retardant
- High abrasion resistance
- Easy to strip and process

Application

Sensor cables for use in road vehicle applications.

Standards

Conductor	**General**
ISO 6722	ISO 19642
DIN EN 13602, Cu-ETP1-A (CW003A)	ADR approved

For further technical details please refer to our data sheet.

RADOX
sensor cables

Customised cables to your requirements

- Round or flat cable?
- EMC shielding necessary?
- What degree of flexibility is required?
- Special temperature requirements?
- Special requirements for voltage rating, impedance, attenuation?
- Special chemical or environmental concerns?
- Potting or overmoulding?
- Special requirements on processing (crimping, welding, ultrasonic welding, etc.)?
- Approvals?

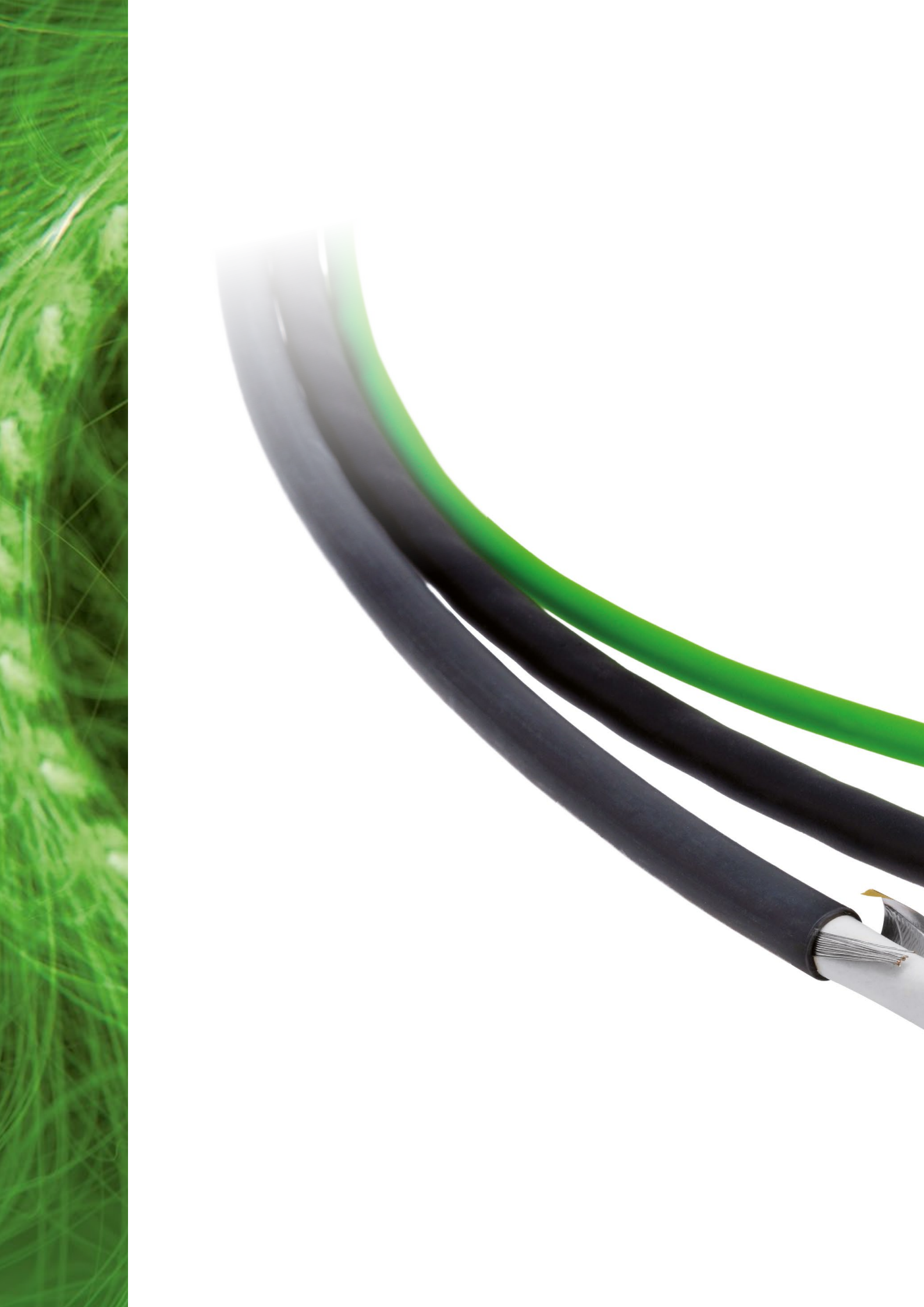
Our leads

single-coloured or two-coloured

Lead type	Temperature range	Cross section	Designation
	3000 h	mm²	
RADOX 155S RW	–55 to +150 °C	0.14 to 1	Following "ultra thin-wall" according to ISO 6722, excellent media resistance, for applications where a small diameter is required
RADOX 155S FLR	–55 to +150 °C	0.35 to 6	"Thin-wall" according to ISO 6722, excellent media resistance, for standard applications
PE-X	–40 to +125 °C	0.35 to 1	Databus cable with 110/120 Ω impedance
ETFE FLR	–55 to +200 °C	0.35 to 6	"Thin-wall" according to ISO 6722, excellent media resistance, such as hot oil

Our jacket materials

Jacket material	Temperature range	Electron beam cross-linked	Mechanical resistance	Flexibility	Media resistance
	3000 h				
RADOX Elastomer S	–70 to +150 °C	yes	very good	excellent	excellent
RADOX 155	–55 to +150 °C	yes	good	good	good
TPU	–40 to +125 °C	no	very good	excellent	good



RADOX databus cables

Optimum protection of sensitive data with RADOX

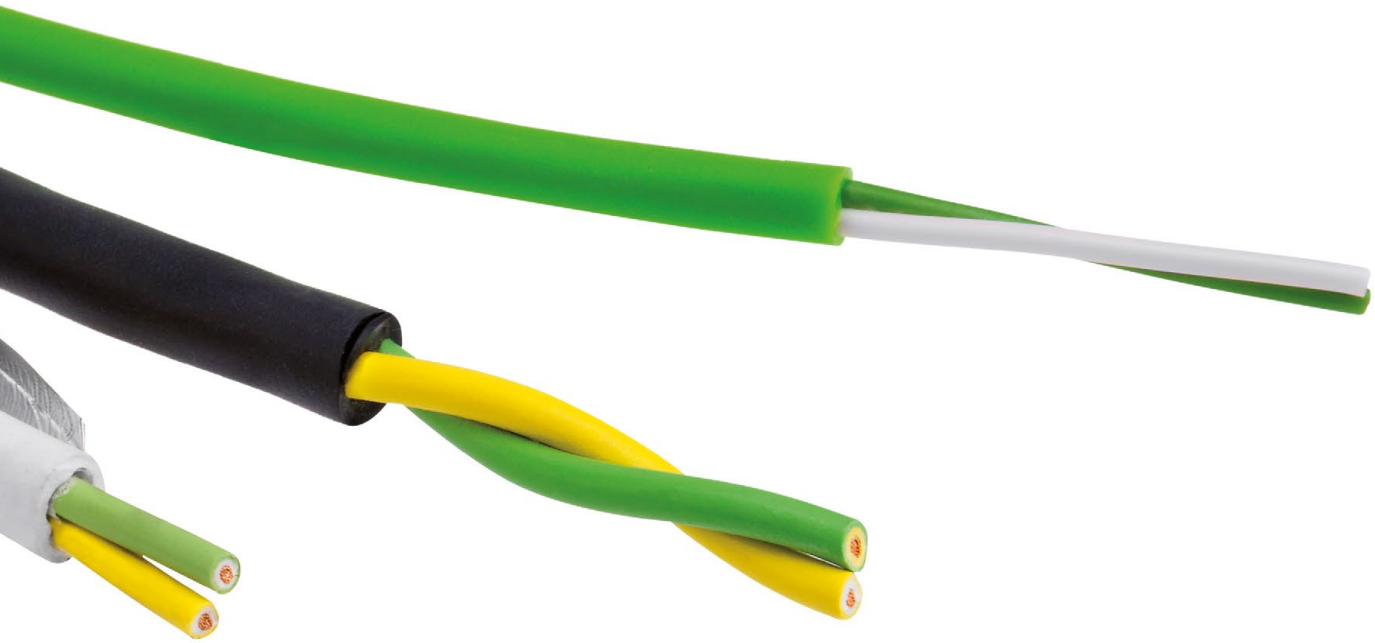
The continuous growth in the application of electronic systems in road vehicles requires reliable databus cables for transmitting information at high frequencies. CAN, LIN, MOST, FlexRay and Ethernet applications have become part of the modern on-board network structures inside vehicles.

HUBER+SUHNER combines its know-how in data communications with electron beam cross-linked materials technology to offer cables meeting specifications such as SAE J1939-11, -15, ISO 11898-2 (CAN), ISO 19642-12.

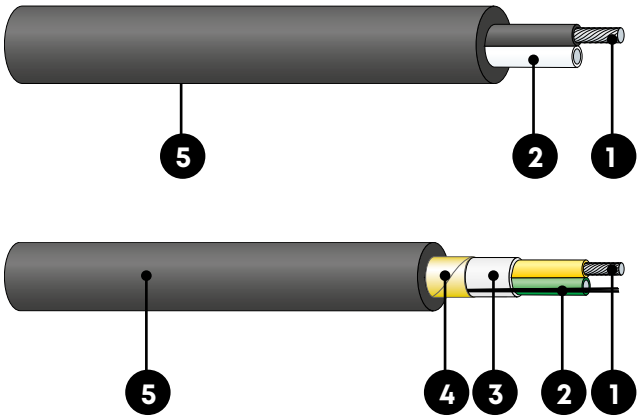
Using their electron beam cross-linked RADOX insulation, the cables offer high thermal pressure resistance, resistance to fluids and good abrasion resistance, and they can be applied across a wide temperature range.

General features

- Excellent dielectric performance
- Flame retardant insulation, neither melting nor flowing when exposed to high temperatures
- Operating temperature – 55 to +150 °C
- Outstanding data transmission performance
- Optimal protection using RADOX insulation
- Application is possible in engine compartments



RADOX
databus cables



Product Name	**RADOX databus cables**
Number of conductors	2 to 4
Cross section	0.35 to 0.75 mm²
Voltage rating	60 V DC
Temperature range	−55 to +125 °C/+150 °C (3000 h)
Min. bending radius	4 × cable dia

Composition of cable

1. Conductor — stranded tinned or bare copper
2. Insulation — various RADOX insulation materials or PE-X
3. Sheath — various RADOX jacket materials
4. Screen — plastic laminated aluminium tape and drain wire
5. Sheath — various RADOX jacket materials or TPU

Characteristics and specialities

- Excellent dielectric performance
- Outstanding data transmission performance
- Possible application in engine compartments
- High and low temperature resistance
- Flame retardant

Application

Databus cable for transmitting information at high frequencies in road vehicles.

Standards

Conductor	**General**
ISO 6722	ISO 6722, ISO 14642 class C and D, ISO 19642-12, ISO 11898-2 (CAN)
DIN EN 13602, Cu-ETP1-A (CW003A)	SAE J1939-11/-15

For further technical details please refer to our data sheet.

RADOX
databus cables

Extract from our delivery programme

Cable types

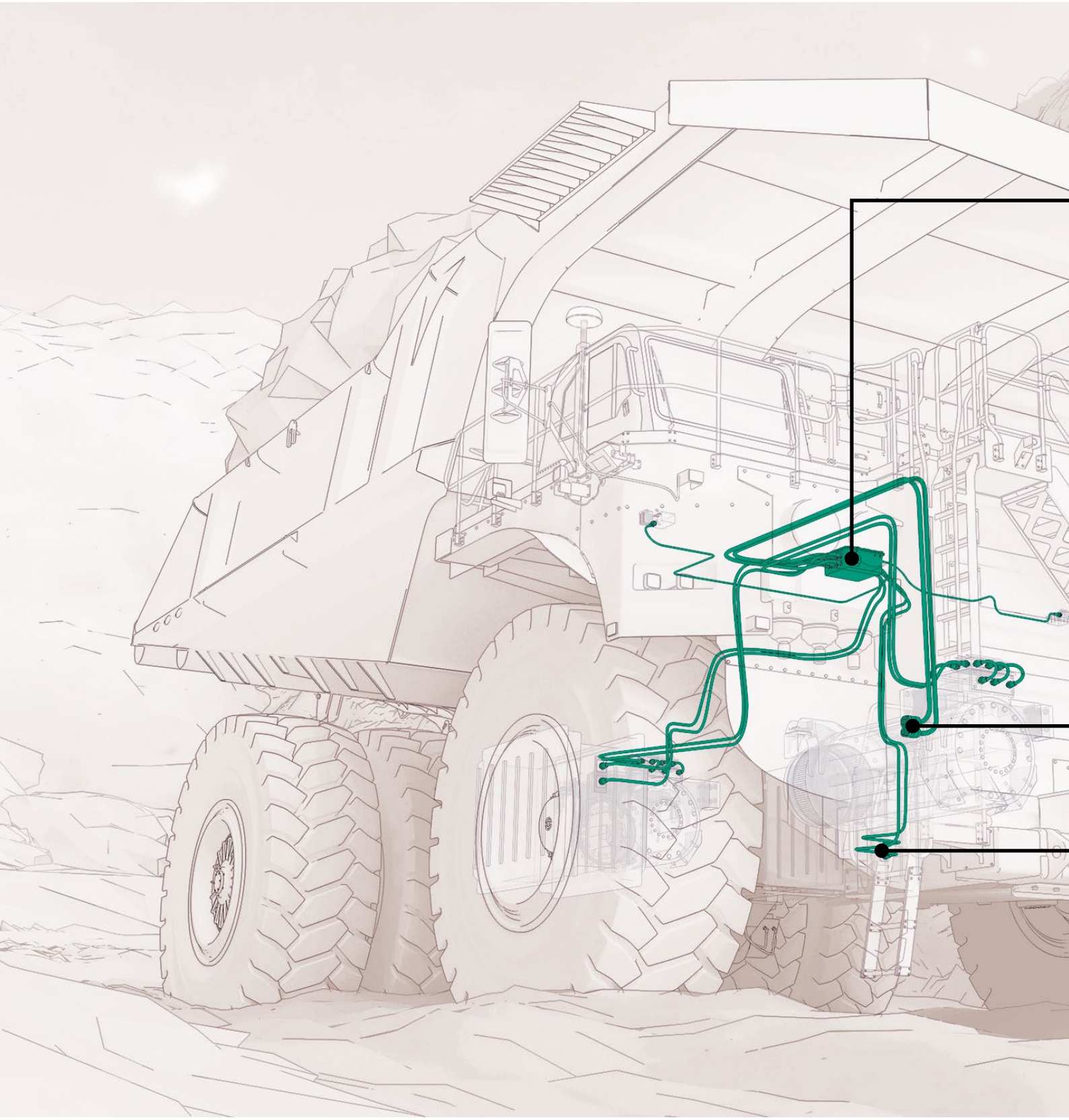
Cross section	Conductor			Core		Screen	Outside diameter
mm²	Construction* n × mm	Diameter. max. mm	Resistance at 20 °C max. Ω/km	Wall thickness min. mm	Diameter mm	Aluminium tape	mm
2 × 0.14	7 × 0.16	0.5	140	0.54	0.88	no	3.1
2 × 0.35	7 × 0.26	0.77	52.0	0.66	2.1	no	5.6
2 × 0.50	19 × 0.18	0.89	37.1	0.80	2.5	no	6.2
2 × 0.75	19 × 0.22	1.10	24.7	0.95	3.0	no	7.2
2 × 0.35	7 × 0.26	0.77	52.0	0.66	2.1	yes	8.0
2 × 0.50	19 × 0.18	0.89	37.1	0.80	2.5	yes	8.3
2 × 0.75	19 × 0.22	1.10	24.7	0.95	3.0	yes	10.7

Jacket materials

Jacket material	Temperature range	Electron beam cross-linked	Flexibility	Media resistance
	3000 h			
RADOX Elastomer S	–70 to +150 °C	yes	excellent	excellent
RADOX 155	–55 to +150 °C	yes	good	good
TPU	–40 to +125 °C	no	excellent	good

High-voltage power distribution

HUBER+SUHNER designs and manufactures complete high voltage solutions for the highest power levels. With their robust and reliable performance, they assure safe and efficient power distribution between high-voltage components.



HV distribution unit

p. 46-49

Based on well-defined interfaces and internal architectures, HUBER+SUHNER has designed a modular high voltage distribution unit which can be tailored to unique customer specifications (fuse size, inputs/outputs etc). The modular systems and components are tested and validated against various global automotive regulations and standards to ensure the highest quality solution.

Modular cable assembly

p. 50

HUBER+SUHNER has invested in building in-house assembly capabilities using EMPT technology, allowing production to meet market demand promptly and efficiently for the first prototype needs, as well as selected small serial deliveries. Short lead-times enable design teams to quickly validate the wiring concepts / market fit and consequently shorten overall vehicle time to market to bring a valuable competitive advantage.

RADOX connection system

p. 51-53

An internally developed innovative system that provides commercial EV vehicles – particularly trucks, buses, construction and special vehicles – with a safe and reliable connection suitable for the most demanding applications. These include high temperatures, current peaks, extreme mechanical loads and harsh environments.

High-voltage power distribution

modular High Voltage Distribution Unit mHVDU	46
RADOX Modular cable assembly	50
RADOX EV-C 2 Connection system	51
RADOX EV-C 2 Connection system – Single-core Standard / FLEX	52
RADOX EV-C 2 Connection system – Multi-core	53

The quality of the power distribution architecture, including the connection systems laid throughout a vehicle, plays a crucial role in the transmission and protection of high power.

The cables used in the vehicle must resist mechanical abrasion, harsh environmental conditions, moisture, temperature and aggressive fluids, all while handling high voltages. To overcome these challenges, HUBER+SUHNER have designed innovative wire and cables to best support manufacturers.

When it comes to EV connection systems in the automotive sector, the main considerations are ensuring high levels of safety, reasonable costs and the correct approvals. Our in-house engineers are well experienced in the EV sector and will never lose sight of the bigger picture. As a result, HUBER+SUHNER delivers complete high-voltage solutions that consistently meet required all automotive standards, while also optimising installation processes.

Our engineers work closely with different customers, always using the latest market demands as a starting point. A wide variety of solutions, both modular and tailored to specific applications, are found within our portfolio. With global presence and many years of high voltage experience, we support customers operating within the EV market, no matter their requirements.

Those using HUBER+SUHNER solutions will benefit from:

- Safe and reliable power distribution
- Modular solutions
- A smooth and effective integration into new or existing vehicles
- High current carrying capacity
- High Ingress Protection (IP) for both solid objects and liquids
- High voltage testing and validation services, both internal and external, to guarantee high product quality
- The possibility of joint development projects, which allow access to specialised engineering resources and the latest RADOX technology

modular High Voltage Distribution Unit (mHVDU)

The electric vehicle commercial vehicle world is evolving at an unprecedented pace. The strategic objective of HUBER+SUHNER is to help vehicle EV manufacturers found across the globe achieve their increasing, complex safety, affordability and efficiency targets.

Our storied history and proven expertise in supplying different high - voltage power distribution solutions, both customised and modular, as well as our innovative RADOX HV cables, means we can help customers keep up with the latest developments in the automotive industry.

Based on well-defined interfaces and internal architectures, HUBER+SUHNER has designed a modular High Voltage Distribution Unit (mHVDU) that can be easily tailored to customer specifications with a short lead time. Our mHVDU is helping OEMs to bring new electric vehicles to the market much faster while maintaining a high level of quality. All modular systems and components are tested and validated against various global automotive regulations and standards to ensure best-in-class performance.

The modular design from HUBER+SUHNER enables the standardization of parts, simplifying production processes. With standardized modules, we can leverage assembly line techniques which reduce the complexity of the production process and increasing output. Additionally, any issues with a module can be isolated and resolved without impacting the entire product, further speeding up the production process. Finally, modular design also ensures product consistency. As each module is standardised, products maintain a consistent quality, reducing the likelihood of defects and improving overall product reliability.

modular High Voltage Distribution Unit (mHVDU)

Features

- Modular concept to achieve flexibility
- Robust design to withstand harsh environments
- High adaptability thanks to proven design with standardized components
- Compatible with HUBER+SUHNER high-voltage portfolio (high voltage RADOX cable and connection system EV-C)
- Validation according to international Automotive Standards and Norms

Benefits

- Flexible configuration and scalability of inputs / outputs and fuses
- Commercial off-the-shelf product helping to reduce time-to-market
- Easy to adapt
- Suitable for harsh environments
- Because this is a fully validated box to Commercial Vehicle requirements, there is no need for one-time investment in engineering and/or tooling from customer side

Applications

- Heavy- Duty vehicles (trucks, buses and coaches)
- Construction vehicles (loaders, dump trucks, backhoe)
- Agricultural and forestry tractors and their trailers
- Off-road vehicles
- Special vehicles

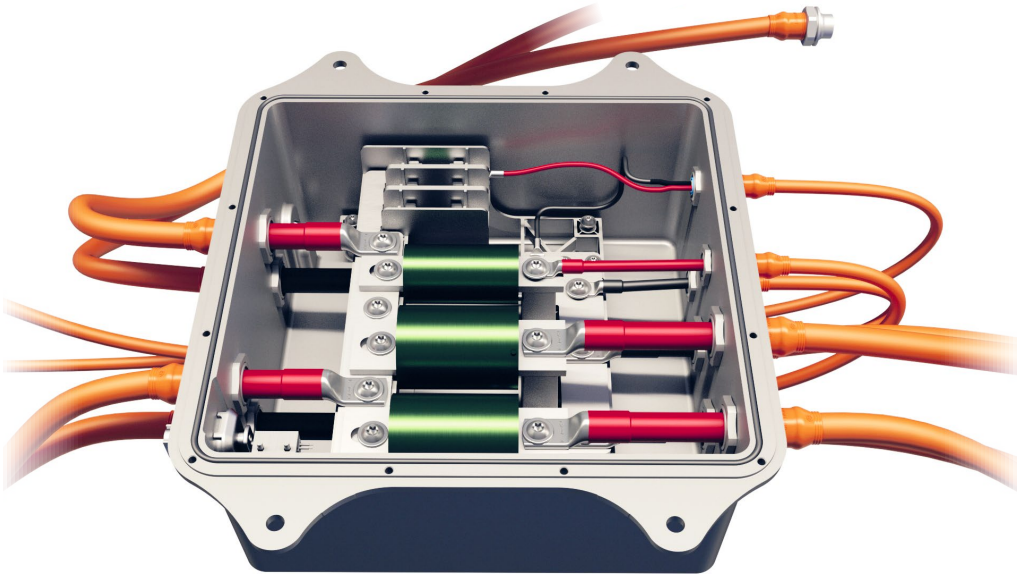
modular High Voltage Distribution Unit (mHVDU)

Technical data

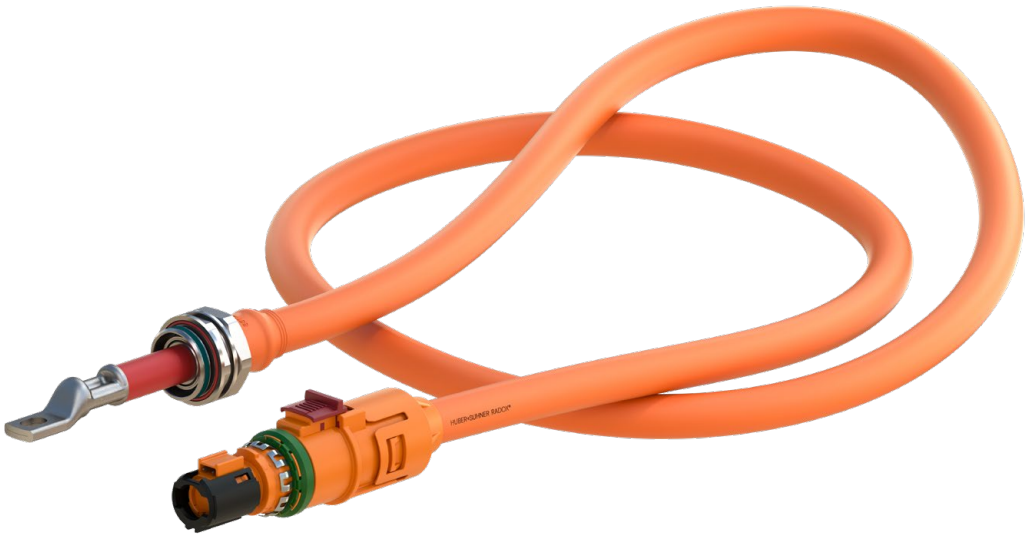
Description	Features	Standard
Voltage rating	500V DC; 800V DC	IEC 60664-1:2007
Current-carrying capacity	650 A (System)	
Screen resistance	<9 mΩ	
HVIL	(Passive) HV Interlock	LV123 # 7.15
Channels	Input 2+1, Output 6	
EMC protection	ECE R10	CISPR25-2016 6.3–5
Insulation resistance	>50MΩ	LV123–425

Description	Features	Standard
Waterproof pressure equalizing valve	YES	
Weight (without fuses)	5.63 kg	
Vibration and shock resistance	Profile VII	ISO 16750–3 4.1 / 4.2
Dimensions (length, width, height)	352mm x 325mm x 144mm	HUBER+SUHNER design
Housing material	Aluminum die-cast	
Available cable cross sections	Input: 35/50/70 mm² Output 1–2: 35/50/70 mm² Output 3: 16/25 mm² Output 4–6: 4/6 mm² Multi-core	HUBER+SUHNER design

Description	Features	Standard
Ambient Temperature	–40 °C to +85 °C	ISO 16750-4 5.1 / 5.2 / 5.3 / 5.4 / 5.6 / 5.7
Degree of protection (IP- Code)	IP6K9K / IP6K7	ISO 20653
Corrosion resistance of case and cover	Severity 5, 672h	ISO16750–4 5.5
Chemicals	BD, CA, CB, CD, DB, EE	ISO 16750–5



RADOX Modular cable assembly (mCAY)



HUBER+SUHNER has been investing in building of in-house assembly capabilities using EMPT technology as well as standard crimping. This will allow production to meet market demands promptly and efficiently for first prototype needs, as well as selected serial deliveries. HUBER+SUHNER offer a wide range of cable options, as well as access to the latest high voltage connectors, to empower vehicle design teams to quickly validate the wiring concepts / market fit, consequently shortening the vehicle's overall time to market.

The abrasion, fire, UV and environmental resistance, alongside their durability and flexibility, make our RADOX cables the perfect choice when combining various connectors suitable for harsh environments.

HUBER+SUHNER is actively looking for different assembly options with validated RADOX cables, creating modular cable assemblies that are ready for use without any additional investments.

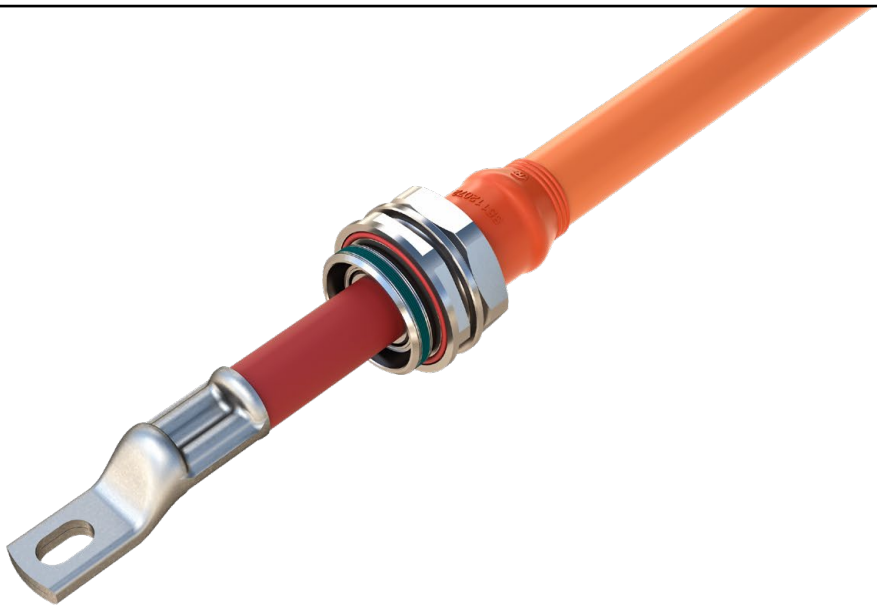
mCAY Highlights include:

- Easy and intuitive configuration
- Compatibility with RADOX technology and EV-C
- Accelerated homologation and a shortened time-to-market
- Operational longevity in harsh environments
- Easy integration into high voltage systems
- System usage without corrugated tubes
- Tested End of Line

Applications:

- Heavy- Duty vehicles (trucks, buses and coaches)
- Construction vehicles (loaders, dump trucks, backhoe)
- Agricultural and forestry tractors and their trailers
- Off-road vehicles
- Special vehicles

RADOX EV-C 2 connection system



High-Voltage cables found in fuel cell and electric vehicles transfer power to and from the battery, as well as various systems throughout a vehicle. Managing and keeping these cables in place over a vehicle's lifespan is critical, especially when considering the range of driving conditions the vehicle will encounter.

Within Automotive Power Distribution, EV-C cable glands perform several essential roles. They provide best-in-class screen performance, support repelling of external contaminants such as dirt, dust, moisture or chemicals, and will stop cables from becoming pulled or twisted during operation.

In addition, launched in 2024 EV-C 2 (Generation 2) offers superior reliability and protection from vibrations. It incorporates a precoated thread to ensure greater tightness and higher mechanical resistance, and offers a shorter installation time onto a vehicle, as well as an improved sealing concept and shorter thread run out for thin-wall applications. The materials used in the EV-C 2, have also been carefully selected to become compliant with the latest directive Restriction of Hazardous Substances in Electrical and Electronic Equipment RoHS 3.

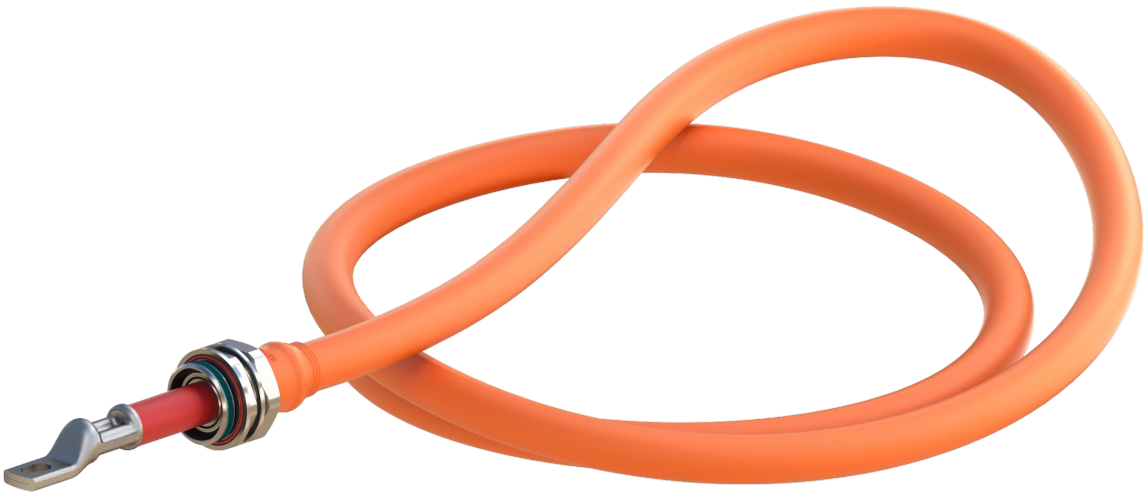
Applications:

- Heavy- Duty vehicles (trucks, buses and coaches)
- Construction vehicles (loaders, dump trucks, backhoe)
- Agricultural and forestry tractors and their trailers
- Off-road vehicles
- Special vehicles

The EV-C connection systems utilises proven RADOX technology, which uses an electron beam crosslinking process for the cables. Merging this cable technology with EV-C provides a best in class system for heavy duty applications. The connection system is offered alongside Single- core Standard and Flex cables, as well as with Multi- core cables, with wide configuration options for M20, M25 and M32 interfaces. The whole system has been validated externally by an independent Test Laboratory according to the latest Automotive standards.

RADOX EV-C 2 connection system

Single-core Standard / FLEX



EV-C Single-core FLEX highlights

- High shock and vibration resistance
- High ampacity of conductor and shielding
- Compact design and small size
- Reduced bending radius for assemblies
- Easy installation onto a vehicle
- High temperature range (– 40 to 140 °C)
- IP6K9K- RoHS3 compliance
- Precoated thread
- Optimised sealing

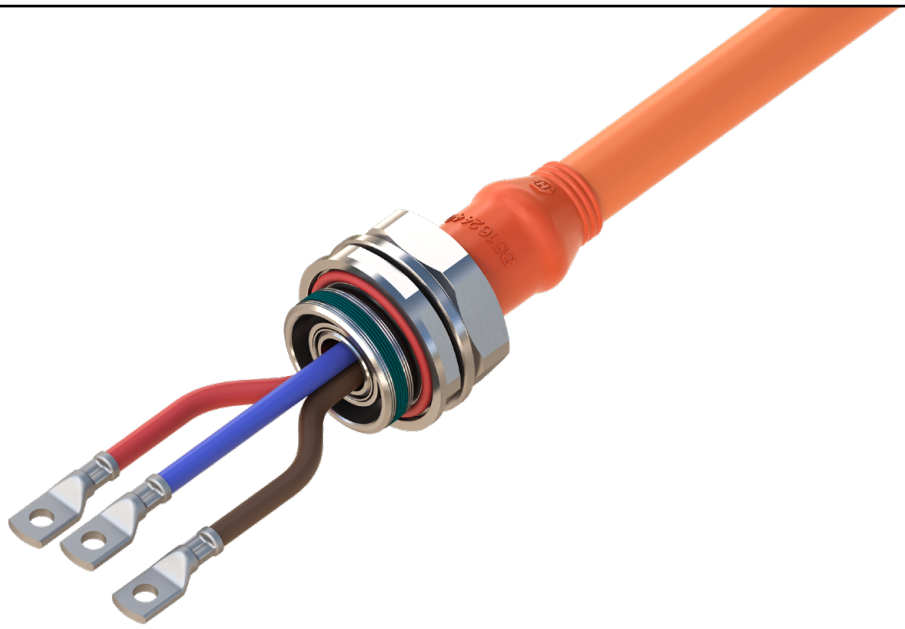
Technical data

Electrical Data	
Voltage rating	1000 V DC
Current carrying capacity	450A (95 mm²) at 85 °C
Screen resistance	< 7 mΩ

Mechanical data	
Cross section	Single-core standard 16 – 120 mm² Single-core FLEX 50 – 120 mm²

Environmental data	
Ambient temperature	–40 °C to +140 °C
IP Rating	IP6K9K / IP67

RADOX EV-C 2 connection system
Multi-core



EV-C Multi-core highlights

- The same interface as single-core version
- High shock and vibration resistance
- Compact design and small size
- Full 360° screen connection
- High temperature range (– 40 to 140 °C)
- IP6K9K
- RoHS3 compliance
- Precoated thread
- Optimised sealing

Technical data

Electrical Data	
Voltage rating	2×4 mm², 700V DC 2×6 mm², 800V DC 3×6 mm², 800 DC 4×10 mm², 850V DC
Current carrying capacity	2 × 4 / 2 × 6 / 3 × 6 / 4 × 10 mm² 44A / 52A / 50A / 57A at 85 °C (each core)
Screen resistance	< 7 mΩ

Mechanical data	
Cross section	Multi-Core: 2×4, 2×6, 3x6 and 4×10 mm²

Environmental data	
Ambient temperature	–40 °C to +140 °C
IP Rating	IP6K9K / IP67

Technical and delivery information

RADOX details and advantages	54
Temperature classes	55
Current carrying capacity	56
Delivery spools	64

RADOX – a unique technology meets wider applications

What is RADOX?

RADOX represents electron beam cross-linked insulating materials developed by HUBER+SUHNER. The RADOX insulations offer excellent resistance to thermal, chemical, electrical and mechanical loads. Thanks to reduced wall thicknesses, it also saves weight and space. RADOX materials enable solutions to be customised to specific applications.

RADOX does not melt!

Thermoplastic insulation materials are sometimes used for automotive wiring. Products such as PVC, PP, PE, PA, TPE and Fluorpolymers are used. These materials all have a melting point and at certain temperature peaks in specific applications they eventually melt with the risk of creating a short circuit. RADOX does not melt and therefore provides an extra safety margin for automotive applications.

RADOX withstands temperature peaks!

Since RADOX is not melting, it will withstand temperature peaks above the defined temperature range. A typical automotive RADOX cable is specified for applications between –40 and +150 °C based on a lifetime of 3000 h. Even at higher temperature peaks, RADOX does not melt. There is a rule of thumb that states, +10 °C temperature increase reduces lifetime by half (160 °C/1500 h, 170 °C/750 h, etc.), the converse also applies.

RADOX – a unique technology meets wider applications

RADOX extends lifetime at lower temperature!

In general automotive cables are defined with different temperature ratings based on 3000 h. This makes sense in most of the cases since 3000 h corresponds to 150 000 km lifetime for a car (at 50 km/h average speed). If any applicat ion asks for a longer lifetime, especially with trucks and buses, RADOX is the best choice. By using a 150 °C rated RADOX cable at 120 °C, this will extend lifetime to 24 000 h or 1 200 000 km.

RADOX withstands low temperatures!

Automotive specifications define clear temperature ranges. These ranges often start from –40 °C and go up to 85, 100, 125, 150, 175 °C, etc. The range is described as class B, C, D or T2, T3 and T4 and so on. RADOX can do better than that! REMS will withstand –70 °C, RADOX 155S and 155 at least –55 °C. This creates more possibilities where for example a standard PVC can not do the job.

Temperature classes for cables

Automotive specifications define clear temperature ranges. These ranges often start from – 40 °C and go up to 85, 100, 125, 150, 175 °C, etc. The range is described as class A, B, C, D, E, F, G and H or T1, T2, T3, T4, T5 and T6. These temperature classes are defined according to ISO 6722, the ratings are valid for 3000 hours.

Class rating	Temperature	Materials
H	–40 to +250 °C	fluoropolymers
G	–40 to +225 °C	fluoropolymers
F (6)	–40 to +200 °C	fluoropolymers, silicone
E (5)	–40 to +175 °C	fluoropolymers, silicone
D (4)	–40 to +150 °C	fluoropolymers, Polyesters, RADOX
C (3)	–40 to +125 °C	PE-X, TPE, PVC-X, RADOX
B (2)	–40 to +100 °C	PE-X, TPE, PVC
A (1)	–40 to +85 °C	PVC

Current carrying capacity

RADOX 155 and REMS battery cables and RADOX 155 SFLR single core cables

Standard conditions for current rating

The tabled values for the current rating were calculated according to IEC 60287 for the following standard conditions:

- Continuous operation
- Single circuit for 3-phase current, single conductor for 1-phase current
- 30 °C ambient temperature and sufficiently large and ventilated spaces, whose ambient temperature is not appreciably increased by the heat coming from the cables
- 150 °C conductor temperature
- ISO 19642: 3000 h/150 °C winding test
- Frequency from 0 Hz (DC) up to 200 Hz (AC)

Installation in air, unrestricted heat dissipation, means that the following installation conditions are observed:

- Distance of the cables from the wall, from the floor, from the ceiling ≥ cable diameter
- Distance between two adjacent power circuits ≥ 2 × cable diameter
- Vertical distance between power circuits laid one upon another for individual cables ≥ 2 × cable diameter for layers of cables > 200 mm
- Perforated tray with a perforation > 30 % of the total surface

Open trays are continuous supports with vertical sides, but without cover. A possible perforation accounts for ≤ 30 % of the total surface. Closed ducts are entirely closed. Pipes belong to this category also. The max. filling degree is 70 %.

The specified values apply to unscreened single core cable. If the values for screened cables are to be determined here, switch to the "under surface" installation type to take the shielding approximately into account.

Current carrying capacity

RADOX 155 and REMS battery cables and RADOX 155 SFLR single core cables

Lifetime expectation

If cross-linked wires are used at higher temperatures than indicated by the temperature rating in ISO 19642, the lifetime is reduced accordingly. Analogical, the lifetime will increase at lower temperature. RADOX 155 for example has a life span of 3000 h at a conductor temperature of +150 °C. When it is used at different temperature, lifetime expectations are shown as follows:

180 °C	375 h
170 °C	750 h
160 °C	1500 h
150 °C	3000 h
140 °C	6000 h
130 °C	12 000 h
120 °C	24 000 h
110 °C	48 000 h
100 °C	96 000 h

Example on basis RADOX 155, REMS and RADOX 155 SFLR

Current rating under service conditions

$I = IN \cdot f_t \cdot f_3 \cdot f_4$

I [A] current rating for continuous operation under service conditions
IN [A] current rating for continuous operation under standard conditions
f_t reduction factor for increased ambient temperature and deviated conductor temperature
f_3 reduction factor for multicore cables
f_4 reduction factor for increased frequency

Current rating under service conditions

RADOX 155 and REMS battery cables

Cross-section [mm²]	4	6	10	16	25	35	50	70	95	120	150
Current rating IN [A]	72	94	135	178	233	295	378	467	585	679	776

RADOX 155 SFLR single core cables

Cross-section [mm²]	0.5	0.75	1.0	1.5	2.5	4	6
Current rating IN [A]	18.6	23.7	28.4	37	53	72	94

Current carrying capacity

Combined reaction factor for ambient temperature and permissible conductor temperature (f_t)

f_t	Ambient temperature [°C]																								
Permissible conductor temperature [°C]	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145
40	0.41	0.35	0.29	0.20																						
45	0.46	0.41	0.35	0.29	0.20																					
50	0.50	0.46	0.41	0.35	0.29	0.20																				
55	0.54	0.50	0.46	0.41	0.35	0.29	0.20																			
60	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20																		
65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20																	
70	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20																
75	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20															
80	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20														
85	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20													
90	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20												
95	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20											
100	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20										
105	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20									
110	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20								
115	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20							
120	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20						
125	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20					
130	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20				
135	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20			
140	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20		
145	1.02	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20	
150	1.04	1.02	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29	0.20
155	1.06	1.04	1.02	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35	0.29
160	1.08	1.06	1.04	1.02	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41	0.35
165	1.10	1.08	1.06	1.04	1.02	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46	0.41
170	1.12	1.10	1.08	1.06	1.04	1.02	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50	0.46
175	1.14	1.12	1.10	1.08	1.06	1.04	1.02	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54	0.50
180	1.15	1.14	1.12	1.10	1.08	1.06	1.04	1.02	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.84	0.82	0.79	0.76	0.74	0.71	0.68	0.65	0.61	0.58	0.54

Current carrying capacity

RADOX 155 and REMS battery cables and RADOX 155 SFLR single core cables

Reduction factors for increased frequency (f_3)

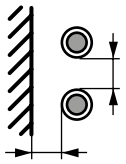
Frequency [Hz]*	400	600	800	1000	2000	3000	4000	5000	10 000
Copper conductor cross section [mm²]	**Faktor f_3**								
1.5	1	1	1	1	1	1	1	1	1
2.5	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	0.98
6	1	1	1	1	1	1	1	0.99	0.93
10	1	1	1	1	1	1	0.96	0.93	0.82
16	1	1	1	1	1	0.95	0.91	0.87	0.76
25	1	1	1	1	0.94	0.88	0.83	0.80	0.69
35	1	1	1	0.98	0.89	0.82	0.77	0.74	0.64
50	1	1	0.98	0.94	0.83	0.76	0.72	0.69	0.59
70	1	0.95	0.94	0.88	0.77	0.71	0.67	0.63	0.54
95	0.98	0.93	0.88	0.84	0.73	0.67	0.63	0.60	0.51
120	0.94	0.88	0.84	0.80	0.69	0.64	0.60	0.57	0.48
150	0.90	0.85	0.80	0.77	0.66	0.61	0.57	0.54	0.46

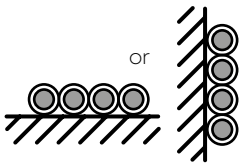
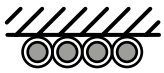
* We recommend that you use a special conductor design for frequencies >800 Hz and cross sections >25 mm² (waveguide design).

Current carrying capacity

RADOX 155 and REMS battery cables

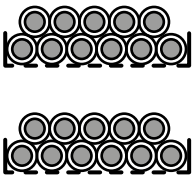
Table of cable installation (f_4)

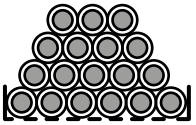
Installation method	**1. Connecting lead in free air or perforated tray**								
Number of simultaneous loaded conductors on each tray									
	1	2	3	4	6	8	10	16	20
Reduction factor f_4	**1.00**	**0.86**	**0.80**	**0.78**	**0.75**	**0.74**	**0.73**	**0.72**	**0.72**
Copper conductor cross section mm²	Current carrying capacity [A]								
4	72	62	58	56	55	54	53	52	52
6	94	81	76	73	71	70	69	68	68
10	135	115	108	105	101	100	98	97	96
16	178	153	143	139	134	132	130	128	128
25	233	200	187	182	175	173	171	168	167
35	295	253	237	230	222	218	216	213	211
50	378	323	303	294	284	279	276	272	271
70	467	400	375	364	351	346	342	337	335
95	585	501	471	456	441	433	429	422	420
120	679	581	546	529	511	503	497	489	487
150	776	665	624	605	584	575	568	560	556

Installation method	**2. On floor or wall**				**3. Fixed on a ceiling or under floor**								
Number of simultaneous loaded conductors on each tray													
	1	2	3	4	1	2	3	4	5	6	7	8	≥ 9
Reduction factor f_4	**0.96**	**0.80**	**0.75**	**0.72**	**0.92**	**0.74**	**0.68**	**0.66**	**0.63**	**0.61**	**0.61**	**0.60**	**0.59**
Copper conductor cross section mm²	**Current carrying capacity [A]**												
4	69	58	54	52	67	53	49	48	46	45	44	43	43
6	90	76	71	68	87	70	64	62	59	58	57	57	56
10	129	108	101	97	124	99	91	89	85	83	81	81	80
16	170	143	134	129	164	131	121	117	112	110	108	107	106
25	223	187	175	169	215	172	158	154	146	143	141	140	138
35	282	236	221	214	272	218	200	194	185	181	179	177	175
50	360	302	283	273	348	278	255	249	237	232	229	226	224
70	446	374	350	338	431	344	316	308	293	287	283	280	277
95	558	469	439	424	540	432	396	386	368	360	355	351	348
120	648	544	509	491	626	501	459	447	427	417	411	407	403
150	741	622	582	562	716	572	525	511	488	477	470	465	461

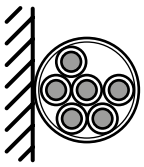
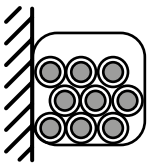
(The reduction facto are rounded to two decimal places.
To minimise the calculation error you can find the more exact calculated values in the table.)

Conductor temperature +150 °C, ambient temperature +30 °C





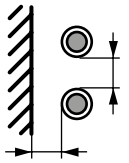
	4	6	8	10	16	20	4	6	8	10	16	20	4	6	8	10	16	20
	0.72	**0.61**	**0.56**	**0.52**	**0.48**	**0.46**	**0.67**	**0.59**	**0.54**	**0.50**	**0.45**	**0.43**	**0.72**	**0.58**	**0.51**	**0.47**	**0.41**	**0.39**
	Current carrying capacity [A]																	
	52	44	40	38	34	33	49	43	39	36	33	31	52	42	37	34	30	28
	68	58	53	49	45	43	63	56	51	47	42	41	67	55	48	45	39	37
	97	82	75	71	64	62	90	79	73	67	61	58	96	78	69	64	55	53
	128	109	99	94	85	82	119	105	96	89	80	77	127	103	91	84	73	70
	168	143	130	122	111	107	156	138	126	117	105	100	167	135	119	110	96	91
	212	181	165	155	140	136	198	174	159	148	133	127	211	171	151	139	121	115
	272	231	211	198	179	174	253	223	204	189	170	162	270	219	193	178	155	148
	336	286	261	245	222	215	313	275	252	233	210	201	334	271	239	221	192	183
	421	358	327	307	278	269	392	345	316	293	263	252	419	340	300	277	240	229
	489	415	379	356	323	312	455	401	367	339	306	292	486	394	348	321	278	265
	558	475	433	407	369	357	520	458	419	388	349	334	555	450	398	367	318	303

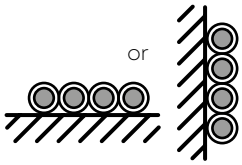
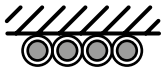
	4. In corrugated pipe														**5. In conduit**													
																												
	1	2	3	4	5	6	7	8	9	10	12	14	16	20	1	2	3	4	5	6	7	8	9	10	12	14	16	20
	0.96	**0.80**	**0.75**	**0.72**	**0.71**	**0.70**	**0.69**	**0.69**	**0.68**	**0.68**	**0.67**	**0.67**	**0.67**	**0.66**	**0.76**	**0.61**	**0.54**	**0.49**	**0.46**	**0.43**	**0.41**	**0.39**	**0.38**	**0.36**	**0.34**	**0.33**	**0.31**	**0.29**
	Current carrying capacity [A]																											
	69	58	54	52	51	51	50	50	49	49	49	48	48	48	55	44	39	35	33	31	30	28	27	26	25	24	23	21
	90	76	71	68	67	66	65	65	64	64	63	63	63	62	72	58	51	46	43	41	38	37	36	34	32	31	30	28
	129	108	101	97	95	94	93	92	92	91	90	90	90	89	103	82	72	66	61	58	55	53	51	49	46	44	42	39
	170	143	134	129	126	124	123	122	121	121	120	119	119	118	136	109	95	87	81	77	73	70	67	65	61	58	56	52
	223	187	175	169	165	163	161	160	159	158	156	156	155	154	178	142	125	114	106	100	95	91	88	85	80	76	73	68
	282	236	221	214	209	206	204	202	201	200	198	197	196	195	225	180	158	144	134	127	120	115	111	108	101	97	92	86
	360	302	283	273	267	263	261	259	257	255	253	252	251	250	289	230	202	185	172	162	154	148	142	138	130	124	118	111
	446	374	350	338	331	326	322	320	318	316	313	312	311	309	358	285	250	228	213	201	190	183	176	170	161	153	146	137
	559	469	439	424	414	408	404	401	399	396	393	391	390	387	449	357	314	286	267	251	239	229	221	213	201	192	184	171
	649	544	509	491	481	474	469	465	462	459	456	454	452	449	522	414	364	332	309	292	277	265	256	248	233	222	213	199
	742	622	582	562	549	541	536	532	528	525	521	519	517	513	600	474	416	379	354	333	316	303	293	283	267	254	243	227

Current carrying capacity

RADOX 155S-FLR single core cables

Table of cable installation (f_4)

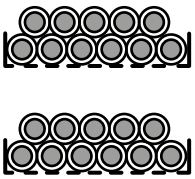
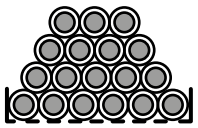
Installation method	**1. Connecting lead in free air or perforated tray**								
Number of simultaneous loaded conductors on each tray									
	1	2	3	4	6	8	10	16	20
Reduction factor f_4	**1.00**	**0.86**	**0.80**	**0.78**	**0.75**	**0.74**	**0.73**	**0.72**	**0.72**
Copper conductor cross section mm²	**Current carrying capacity [A]**								
0.5	18.6	15.9	14.9	14.5	14.0	13.7	13.6	13.4	13.3
0.75	23.7	20.3	19.1	18.5	17.9	17.6	17.4	17.1	17.0
1.0	28.4	24.3	22.8	22.1	21.4	21.0	20.8	20.5	20.4
1.5	37	31.8	29.9	28.9	28.0	27.5	27.2	26.8	26.6
2.5	53	45	43	41	40	39	39	38	38
4	72	62	58	56	55	54	53	52	52
6	94	81	76	73	71	70	69	68	68

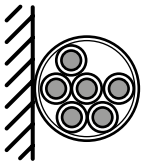
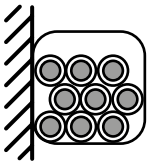
Installation method	**2. On floor or wall**				**3. Fixed on a ceiling or under floor**								
Number of simultaneous loaded conductors on each tray													
	1	2	3	4	1	2	3	4	5	6	7	8	≥ 9
Reduction factor f_4	**0.96**	**0.80**	**0.75**	**0.72**	**0.92**	**0.74**	**0.68**	**0.65**	**0.63**	**0.62**	**0.61**	**0.60**	**0.59**
Copper conductor cross section mm²	**Current carrying capacity [A]**												
0.5	17.8	14.9	13.9	13.5	16.5	13.2	12.1	11.5	11.2	11.0	10.8	10.7	10.6
0.75	23.6	19.0	17.8	17.2	21.9	17.5	16.1	15.32	14.9	14.6	14.4	14.2	14.1
1.0	27.2	22.8	21.29	20.56	26.2	21.0	19.2	18.3	17.8	17.5	17.2	17.0	16.9
1.5	37.0	29.8	27.9	26.9	34.3	27.4	25.1	24.0	23.3	22.9	22.5	22.3	22.1
2.5	53	43	40	39	49	39	36	34	33	33	32	32	32
4	69	58	54	52	67	53	49	47	45	45	44	43	43
6	90	76	71	68	87	70	64	61	59	58	57	57	56

(The reduction facto are rounded to two decimal places.
To minimise the calculation error you can find the more exact calculated values in the table.)

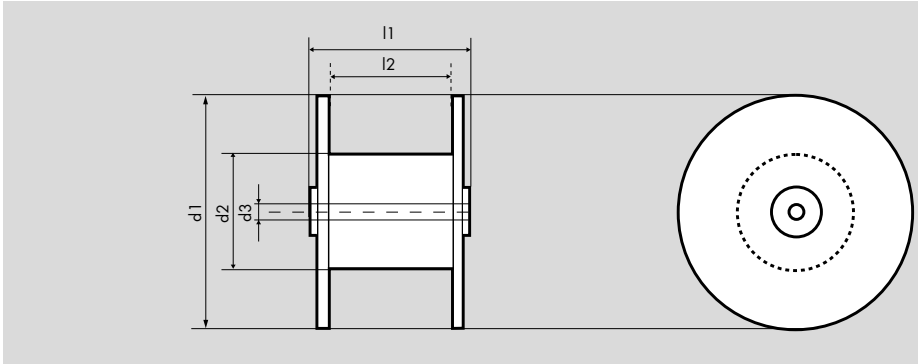
Continuous current rating

Conductor temperature +150 °C, ambient temperature +30 °C

																		
	4	6	8	10	16	20	4	6	8	10	16	20	4	6	8	10	16	20
	0.72	**0.61**	**0.56**	**0.52**	**0.48**	**0.46**	**0.67**	**0.59**	**0.54**	**0.50**	**0.45**	**0.43**	**0.72**	**0.58**	**0.51**	**0.47**	**0.41**	**0.39**
	13.4	11.4	10.4	9.7	8.9	8.5	12.4	11.0	10.0	9.3	8.4	8.0	13.3	10.8	9.5	8.8	7.6	7.3
	17.1	14.5	13.2	12.4	11.3	10.9	15.9	14.0	12.8	11.9	10.7	10.2	17.0	13.7	12.1	11.2	9.7	9.3
	20.5	17.4	15.8	14.9	13.5	13.0	19.0	16.7	15.3	14.2	12.8	12.2	20.3	16.5	14.5	13.4	11.7	11.1
	26.8	22.7	20.7	19.5	17.7	17.1	24.9	21.9	20.1	18.6	16.7	16.0	26.6	21.5	19.0	17.5	15.3	14.5
	38	33	30	28	25	24	36	31	29	27	24	23	38	31	27	25	22	21
	52	44	40	38	34	33	49	43	39	36	33	31	52	42	37	34	30	28
	68	58	53	50	45	43	63	56	51	47	42	41	67	55	48	44	39	37

	4. In corrugated pipe														**5. In conduit**													
																												
	1	2	3	4	5	6	7	8	9	10	12	14	16	20	1	2	3	4	5	6	7	8	9	10	12	14	16	20
	0.96	**0.80**	**0.75**	**0.72**	**0.71**	**0.70**	**0.69**	**0.69**	**0.68**	**0.68**	**0.67**	**0.67**	**0.67**	**0.66**	**0.76**	**0.61**	**0.54**	**0.49**	**0.46**	**0.43**	**0.41**	**0.39**	**0.38**	**0.36**	**0.34**	**0.33**	**0.31**	**0.29**
	Current carrying capacity [A]																											
	17.8	14.9	13.9	13.5	13.2	13.0	12.8	12.7	12.7	12.6	12.5	12.4	12.4	12.3	14.2	11.3	10.0	9.1	8.5	8.0	7.6	7.3	7.0	6.8	6.4	6.1	5.8	5.4
	23.6	19.0	17.8	17.2	16.8	16.6	16.4	16.3	16.2	16.1	15.9	15.9	15.8	15.7	18.8	14.5	12.7	11.6	10.8	10.2	9.7	9.3	8.9	8.6	8.1	7.8	7.5	6.9
	27.2	22.8	21.3	20.6	20.1	19.8	19.6	19.5	19.3	19.2	19.1	19.0	18.9	18.8	21.7	17.3	15.2	13.9	12.9	12.2	11.6	11.1	10.7	10.3	9.8	9.3	8.9	8.3
	37.0	29.8	27.9	26.9	26.3	25.9	25.7	25.5	25.3	25.2	25.0	24.8	24.7	24.6	29.5	22.7	19.9	18.2	16.9	15.9	15.2	14.5	14.0	13.5	12.8	12.1	11.7	10.8
	53	43	40	39	38	37	37	36	36	36	36	36	35	35	42	32	29	26	24	23	22	21	20	19	18	17	17	16
	69	58	54	52	51	51	50	50	49	49	49	48	48	48	55	44	39	35	33	31	30	28	27	26	25	24	23	21
	90	76	71	68	67	66	65	65	64	64	63	63	63	62	72	58	51	46	43	40	39	37	36	34	32	31	30	28

Delivery spools



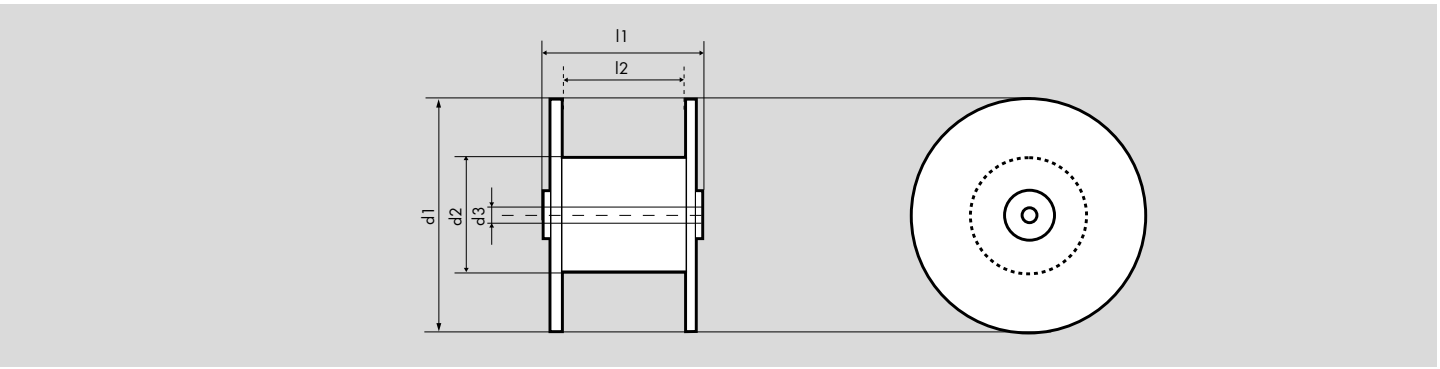
	Spool HS 150	Spool HS 151	Spool HS 200	Spool HS400	Spool HS 401	Spool HS 600
						
d 1	150	150	195	395	395	595
d 2	65	65	100	180	180	350
d 3	60	60	60	60	60	80
l 1	76	166	250	185	280	500
l 2	70	160	210	145	240	430
Tara kg	0.095	0.135	0.480	1.475	1.645	7.460

Cable Ø mm	Cable length per delivery m					
1	804	1'837	3'698	11'263	18'642	62'553
2	201	459	924	2'816	4'661	15'638
3	89	204	411	1'251	2'071	6'950
4	50	115	231	704	1'165	3'910
5	32	73	148	451	746	2'502
6	22	51	103	313	518	1'738
7	16	37	75	230	380	1'277
8	13	29	58	176	291	977
9	10	23	46	139	230	772
10	8	18	37	113	186	626
11	7	15	31	93	154	517
12	6	13	26	78	129	434
13	5	11	22	67	110	370
14	4	9	19	57	95	319
15	4	8	16	50	83	278
16	3	7	14	44	73	244
17	3	6	13	39	65	216
18	2	6	11	35	58	193
19	2	5	10	31	52	173
20		5	9	28	47	156
21		4	8	26	42	142
22		4	8	23	39	129
23		3	7	21	35	118
24		3	6	20	32	109

d1 flange diameter (mm), d2 core diameter (mm), d3 drill hole diameter (mm)

l1 external width (mm)

l2 reel width (mm)



		Spool HS 601	Spool HS 800	Spool HS 1000	Spool HS 1200	Reusable NPS coil 250 × 400 (CK2)	Reusable NPS coil 400 × 400 (CK4)
							
	d 1	595	795	1000	1190	400	400
	d 2	250	450	500	600	208 to 260	176 to 260
	d 3	80	80	80	80	80	80
	l 1	500	750	800	790	313	463
	l 2	430	620	660	650	250	400
	Tara kg	7.150	18.875	31.000	64.200	2.4	2.7

	Cable Ø mm	Cable length per delivery m				
	1	78'763	167'325	311'018	431'319	For details about length, instruction manual and accessories ask for separate documentation.
	2	19'691	41'831	77'754	107'830	
	3	8'751	18'592	34'558	47'924	
	4	4'923	10'458	19'439	26'957	
	5	3'151	6'693	12'441	17'253	
	6	2'188	4'648	8'639	11'981	
	7	1'607	3'415	6'347	8'802	
	8	1'231	2'614	4'860	6'739	
	9	972	2'066	3'840	5'325	
	10	788	1'673	3'110	4'313	
	11	651	1'383	2'570	3'565	
	12	547	1'162	2'160	2'995	
	13	466	990	1'840	2'552	
	14	402	854	1'587	2'201	
	15	350	744	1'382	1'917	
	16	308	654	1'215	1'685	
	17	273	579	1'076	1'492	
	18	243	516	960	1'331	
	19	218	464	862	1'195	
	20	197	418	778	1'078	
	21	179	379	705	978	
	22	163	346	643	891	
	23	149	316	588	815	
	24	137	290	540	749	

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HUBER+SUHNER is certified according to ISO 9001, ISO 14001, OHSAS 18001, EN(AS) 9100, IATF 16949 and ISO/TS 22163 – IRIS.