HUBER+SUHNER – Excellence in Connectivity Solutions

HUBER+SUHNER is a leading global supplier of components and systems for electrical and optical connectivity in communications, industrial and trans portation markets. HUBER+SUHNER can draw on core competences in the areas of high frequency technology, fibre optics, cables and polymers. Working in close collaboration with our customers around the globe, we strive for excellence in the development and manufacturing of high quality products.

HUBER+SUHNER is certified according to ISO 9001 and ISO 14001.

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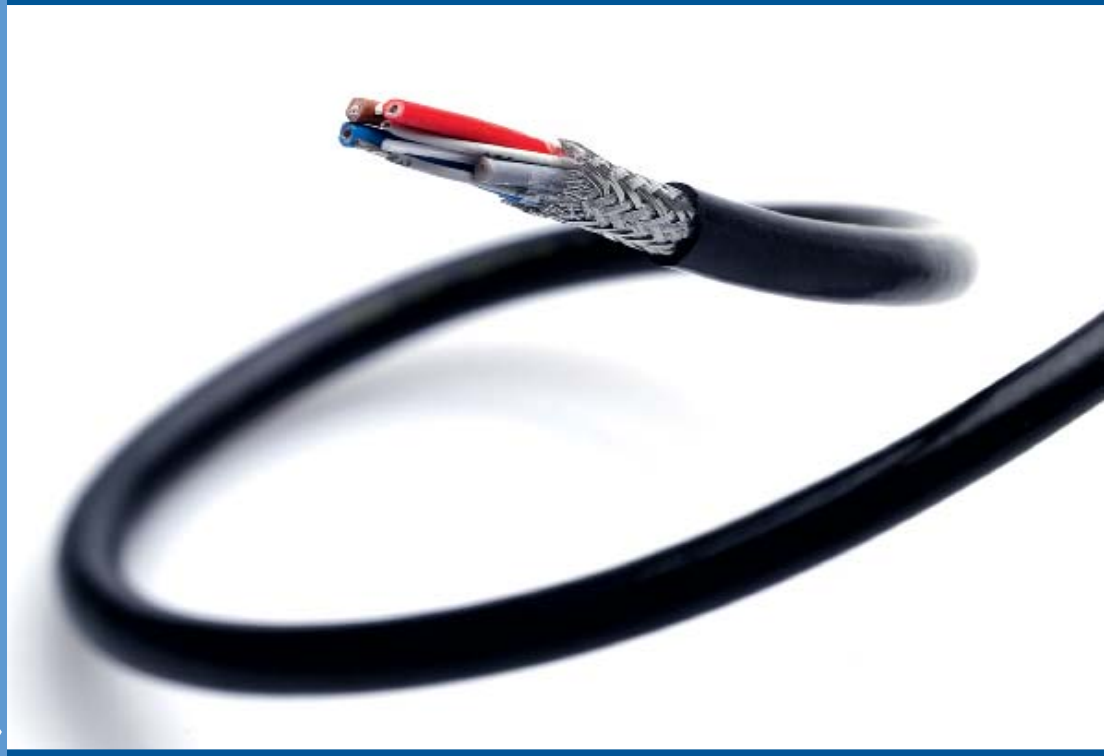
WIRES AND CABLES FOR INDUSTRIAL APPLICATIONS

WIRES AND CABLES FOR INDUSTRIAL APPLICATIONS

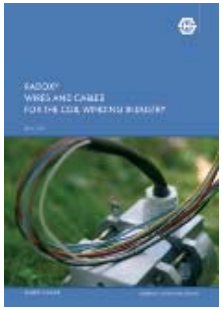
Edition 2008



HUBER+SUHNER

Excellence in Connectivity Solutions

FURTHER CATALOGUES



RADOX® wires and cables
for the coil winding industry
Item Nr. 84022718

RADOX® solar system solutions
for photovoltaic installations
Item Nr. 84017606

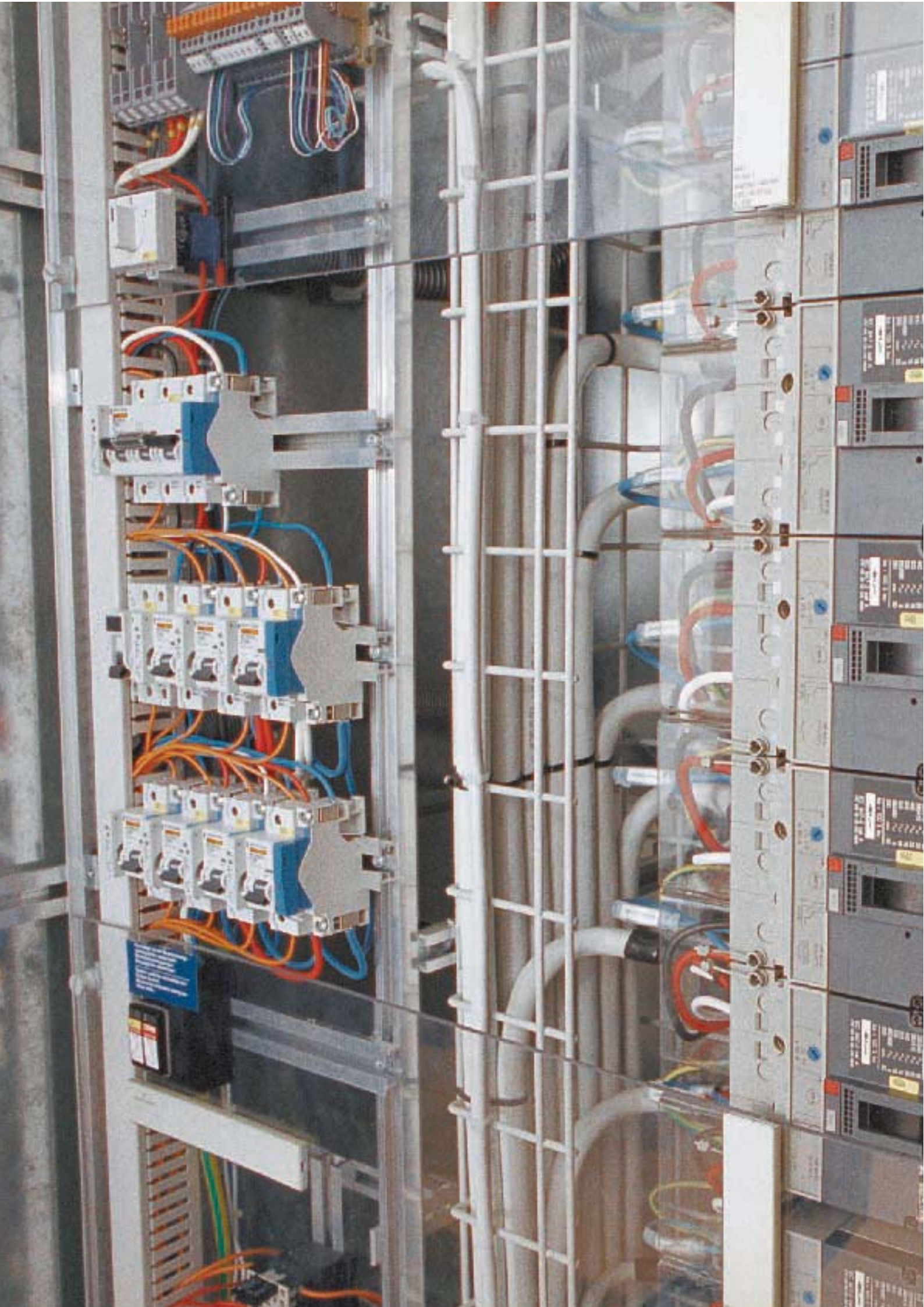
Wires and cables for industrial applications

RADOX® by HUBER+SUHNER - for the toughest conditions

RADOX® is the brand name for a HUBER+SUHNER electron beam crosslinked plastic compound based on polyolefin copolymers. It's high temperature resistance, flame retardance, reduced wall thickness and easy processability make it the ideal insulating material for wires and cables in the coil winding industry.

We can also provide customer specific solutions.

All our cables fully comply with the European directives 76/769/EWG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2002/95/EG (RoHS).



Single core/multi core cables for power and signal transmission in industrial applications

Electronic control systems automatically control processes, transmit data and govern motions such as swivelling and conveying etc. The reliability and uptime of such highly automated, complex technical systems is necessary to ensure the efficiency of state-of-the-art production processes. Trouble-free power supply must also be assured at all times. Our cables and system solutions are therefore applied precisely in areas where dependability is a top priority and outstanding heat resistance, high power handling capacity, ruggedness and compact design are a must.

Multi core cables, single core cables and system solutions

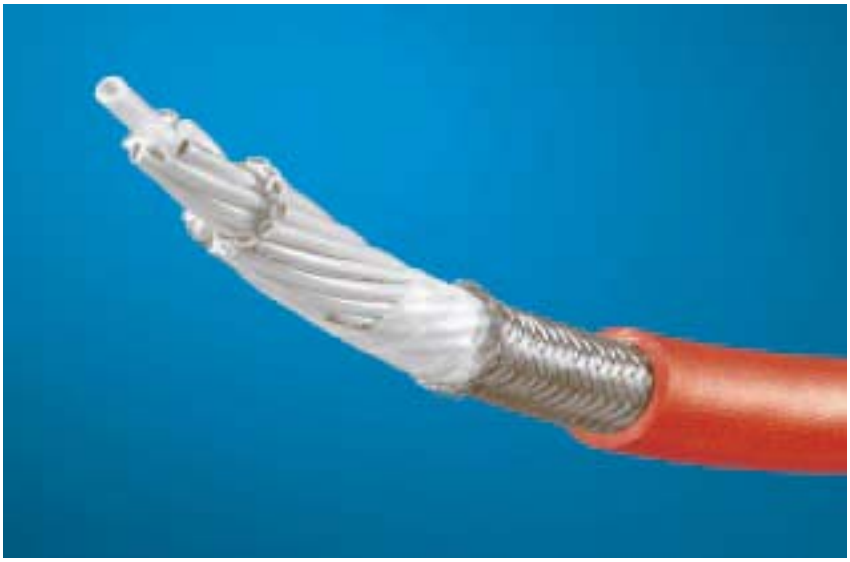
- RADOX® multi core and single core cables
- RADOX® eco-F single core cables
- RADOX® UL cables

RADOX® multi core and single core cables have a high power handling capacity and heat resistance. They have been specifically designed for the construction of high-performance, compact and light-weight equipment.

- outstanding heat resistance
- high power handling capacity
- ruggedness and compact design
- high flexibility
- easy processing

Stabag Apparatebau AG, Balzers

Single core/multi core cables for power and signal transmission in automation applications



The field of industrial automation has extremely rigorous demands on the performance and quality of the cables used. A cable will achieve top performance only if it offers absolute flexibility and a long service life. In addition, these products must satisfy highly specific customer requirements. Our modular system is the ideal solution for responding to such needs.

Top quality cables for industrial automation applications with a long service life

- RADOX® multi core and single core cables
- hybrid cables

Our single core and multi core cables are distinguished by their thin insulation walls and their tight bending radius. The hybrid cables offer a multi functional solution in a single cable.

- thin insulation walls
- tight bending radii
- high flexibility
- abrasion resistance
- high power handling capacity
- long service life

Single core/multi core cables for power and signal transmission in coil winding applications

RADOX® eco-F and RADOX® 155 are flexible single core and multi core cables offering excellent resistance to heat, hot pressure and aging. The electronically crosslinked insulation offers high mechanical ruggedness. It will not melt and is resistant to most media as well as insulating varnishes and impregnating resins. Brief exposure to heat up to +280 °C will not have any lasting effect.

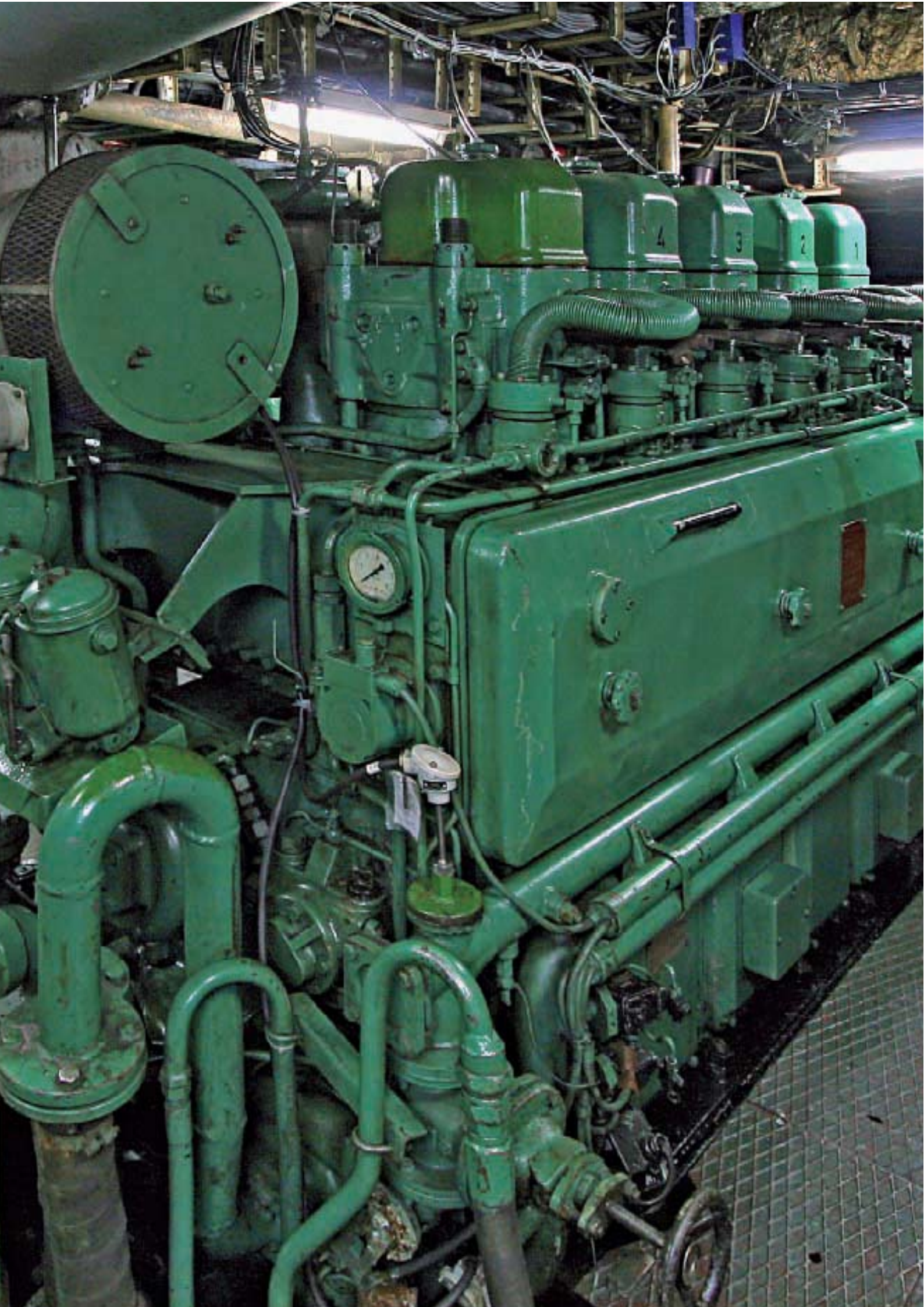
The insulation of RADOX® eco-F is halogen free and will not release any corrosive gases in case of a fire. It generates minimum smoke, and its flame retarding properties prevent fires from spreading.

You will find more detailed information and the description of additional products for the coil winding products industry in the "RADOX® wires and cables for the coil winding industry" catalogue, item no. 84022718.

Flexible single core cables and wires for coil winding products

- RADOX® 155, wires and flexible cables
- RADOX® eco-F
- RADOX UL and KDJ cables

These transmission lines offer high power handling capacity and heat resistance. They require little space and therefore allow the construction of high performance yet compact and light weight equipment.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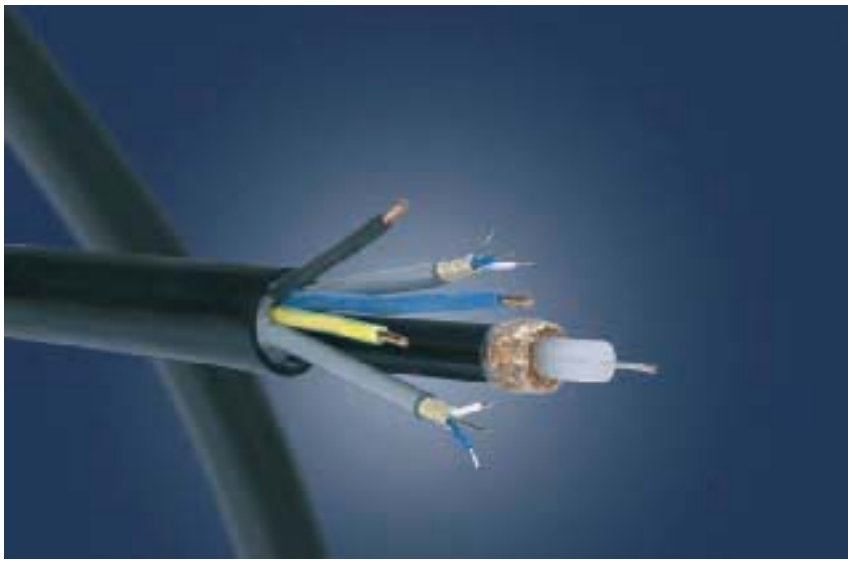
Single core and multi core cables for power and signal transmission in marine applications



Our RADOX® insulation material for cables was developed with special applications in mind which require high reliability even under adverse environmental conditions. It offers excellent resistance to heat and chemicals as well as to electrical and mechanical stressing. Our single-core and multi-core cable solutions for marine applications are suitable for stationary as well as mobile uses. They have small diameters, standardised dimensions and require only a short time to install.

Marine cables with GL, DNV and BV approvals

- RADOX® 125
- RADOX® 125 IEC marine transmission line
- RADOX® MFH control, data and power transmission lines for marine applications

These cable types are particularly distinguished by their resistance to fuels and lubricants, alkalis and acids.

- light weight, space saving hybrid solutions meeting the most rigorous demands
- highly abrasion resistant single cores for corrugated copper cables
- customised, multifunctional system cables
- versatile cable and element combinations
- high temperature data bus for marine applications

Single core and multi core cables for power and signal transmission in solar applications

RADOX® solar cables are extremely rugged and abrasion-resistant and are capable of withstanding extreme mechanical stressing. Their high temperature and excellent weatherproof ensure a long service life of the cable. Thanks to the technology and high precision of RADOX® products, these outstanding characteristics are achieved also with small diameters.

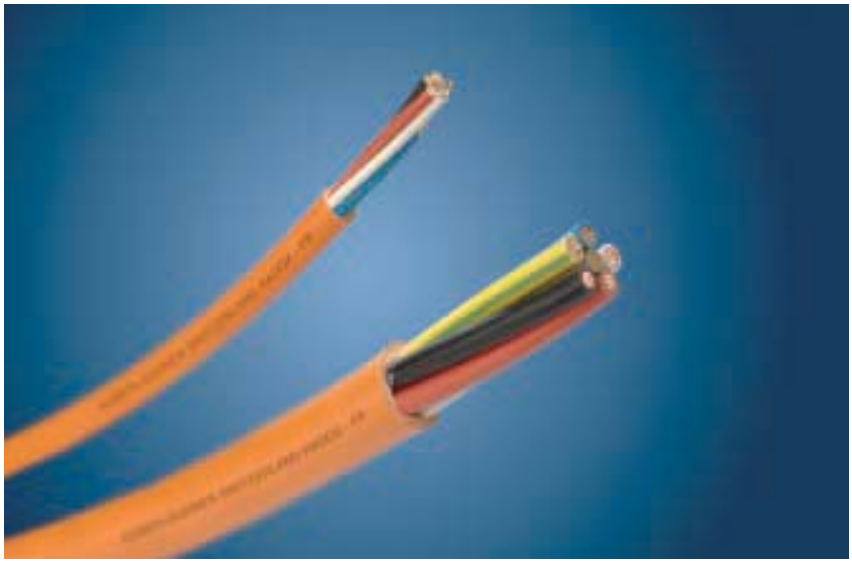
Solar cables with TÜV and UL approval

- RADOX® solar cable single and multiple core/screened
- RADOX® SMART
- RADOX® SolarLink

RADOX® solar cables are flexible single core and multi core cables that have been specially designed for the wiring of solar systems.

- range of application –40 °C to +120 °C
- short circuit strength up to +280 °C
- RADOX® electronic cross linked materials will neither melt nor flow even when exposed to high temperatures
- high UV, ozone and hydrolysis resistance
- excellent mechanical ruggedness and resistance to water, oils and chemicals
- proven of many years of field application worldwide
- TÜV and UL approvals
- connectors and connection boxes available

Single core and multi core cables for power and signal transmission in safety applications



Installations in buildings and systems with a high person density or high property value – computer centres, hospitals, high-rise buildings, airports, railway stations, public buildings, museums, railway and road tunnels – require high grade cables designed to the necessary standards.
These cable families are distinguished by their precisely defined characteristics and the fact that they will maintain their functions in case of fires. They have been approved by the major international standardisation bodies (IEC/CENELEC/BS/AS).

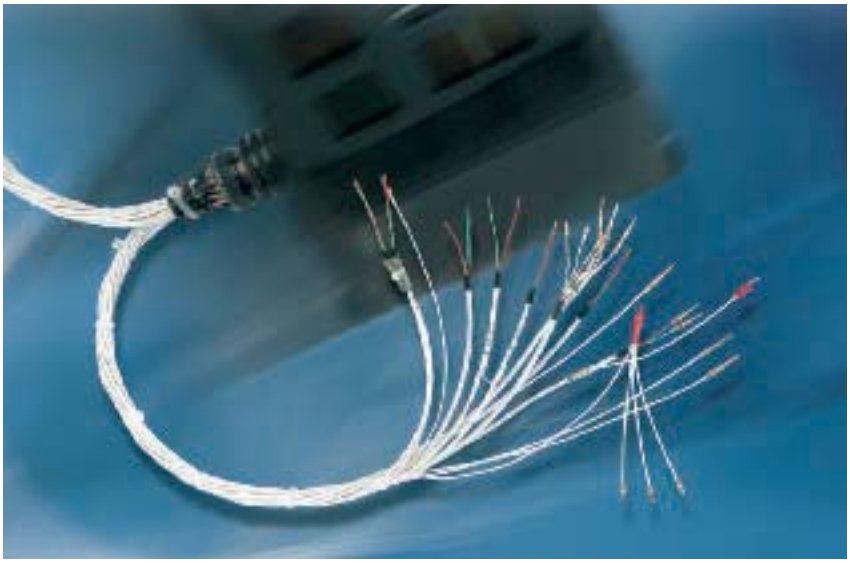
High grade cables fulfilling various international fire protection regulations

- PURGI
- RADOX® FR AUS
- RADOX® MFH

Our safety cables have been designed for service in adverse and humid environments.

- maintenance of functions in case of fire
- application in rough and humid environments
- high flexibility
- approved by major international standardisation bodies
- customised cables

Single core/multi core cables for power and signal transmission in defence applications



HUBER+SUHNER develops and produces high grade solutions that are suitable for the most extreme environmental conditions. They can be installed in very tight spaces and will satisfy even the most stringent demands.
HUBER+SUHNER is the professional partner in the development and production of system solutions which incorporate all our knowledge and engineering expertise.

Unpredictabel conditions, fulfilment of extreme environmental and operating requirements while meeting top quality standards.

- RADOX® single core and multi core cables
- VG transmission lines
- Hybrid cables

RADOX® single core and multi core cables have been developed and are produced for high grade defence solutions.

- wide temperature range
- stationary as well as mobile applications
- small overall diameter
- flexible and rugged
- light weight and space saving solutions
- chemical and mechanical resistance

Preferred fields of application

Cable type	Industry	Automation
RADOX® 125 flexible single core	page 22	
RADOX® 125 RW, reduced wall thickness	page 24	
RADOX® 125 IEC marine single core		
RADOX® 125 solid wire	page 28	
RADOX® eco-F	page 30	
RADOX® 155 flexible single core	page 32	
RADOX® 155 S high resistance to oil	page 34	
RADOX® 155 S RW, reduced wall thickness	page 36	
RADOX® 155 solid wire	page 38	
KDJ 11, flexible single core	page 40	
RADOX® 125 multi core cables, screened and unscreened	page 42	
RADOX® 155 multi core cables, screened and unscreened	page 46	
RADOX® UL/CSA flexible single core	page 52	
RADOX® UL/CSA solid wire	page 60	
RADOX® UL/CSA multi core cables, screened and unscreened	page 62	
System cables	page 78	page 78
MIL and VG 95218 div. types		page 100
RADOX® MFH-S	page 110	
Hybrid cables	page 112	page 112
RADOX® Solar single core cables		
RADOX® Solar multi core cables, screened and unscreened		
RADOX® FR		

	Coil winding (catalogue no. 84022718)	Marine	Solar (catalogue no. 84017606)	Safety	Defence
		page 22		page 22	
		page 26			
				page 28	
	page 30				
	page 32				
				page 38	
				page 42	
	page 52				
					page 78
					page 100
		page 110			page 110
				page 112	page 112
			page 116		
			page 122		
				page 126	

RADOX® 125, RADOX® 155, KDJ–11

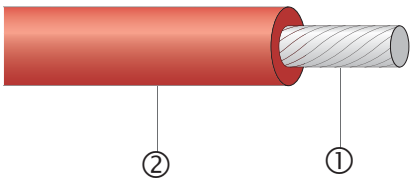
Flexible single cores, multi core cables and wires

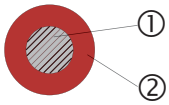
All our cables fully comply with the European directives 76/769/EWG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2002/95/EG (RoHS).

- halogen free, flame retardant
- excellent high and low temperature resistance, robust
- very good chemical and mechanical properties
- flexible, easy to strip, soldering resistant
- wide temperature range
- no melting and flowing at high temperatures due to electron beam crosslinked insulation material – RADOX®
- complies with IEC 60332-3-24 C
- suitable for outdoor applications

RADOX® 125

Flexible single core





- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- flexible, easy to strip and process
- flame retardant
- high resistance to thermal pressure
- high abrasion resistance
- oil-resistant

Application
Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, white goods and lighting fixtures.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 125 extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating U_o/U	≤ 0.50 mm^2	450 / 750 V AC
Test voltage	≤ 0.50 mm^2	2500 V AC
Voltage rating Uo/U	≥ 0.50 mm^2	600 / 1000 V AC
Test voltage	≥ 0.50 mm^2	3500 V AC
Temperature range		-40 °C up to +125 °C

Fire tests

Content of halogen acid gas	IEC 60754-1, EN 50267-2-1	0 mg/g
Corrosivity of combustion gases	IEC 60754-2, EN 50267-2-3	
Smoke density	IEC 61034-2, EN 50268-2	

RADOX® 125

Flexible single core

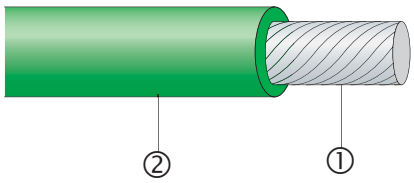
Extract from our delivery programme

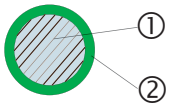
Cross section	Conductor			Core	Weight	Bending radius
nom. mm^2	Construction nom. n x mm Ø	Ø max. mm	R_{20} IEC 60228 max. Ω/km	Ø mm	nom. kg/100m	min.
0.25	19 x 0.13	0.6	85.9	1.45 ± 0.05	0.4	3 x Ø
0.34	19 x 0.16	0.8	52.1	1.60 ± 0.10	0.5	3 x Ø
0.50	19 x 0.18	0.9	40.1	1.70 ± 0.10	0.7	3 x Ø
0.75	24 x 0.20	1.15	26.7	2.20 ± 0.10	1.1	3 x Ø
1.0	32 x 0.20	1.3	20.0	2.60 ± 0.10	1.5	3 x Ø
1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	1.9	3 x Ø
2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	3.0	3 x Ø
4.0	56 x 0.30	2.6	5.09	4.15 ± 0.15	4.6	3 x Ø
6.0	81 x 0.30	3.4	3.39	4.95 ± 0.15	6.5	3 x Ø
10	78 x 0.40	4.4	1.95	6.15 ± 0.15	11	3 x Ø
16	119 x 0.40	5.4	1.24	7.35 ± 0.15	16.5	3 x Ø
25	182 x 0.40	6.7	0.795	8.9 ± 0.2	25	3 x Ø
35	266 x 0.40	7.9	0.565	10.3 ± 0.2	34.5	3 x Ø
50	378 x 0.40	9.4	0.393	12.1 ± 0.25	50	4 x Ø
70	348 x 0.50	11.5	0.277	14.4 ± 0.25	68	4 x Ø
95	444 x 0.50	12.9	0.210	16.0 ± 0.3	89	4 x Ø
120	551 x 0.50	14.8	0.164	18.1 ± 0.3	110	4 x Ø
150	722 x 0.50	17.0	0.132	20.5 ± 0.3	142	4 x Ø
185	874 x 0.50	18.5	0.108	22.2 ± 0.3	171	4 x Ø
240	1147 x 0.50	21.3	0.0817	25.4 ± 0.3	225	4 x Ø

Other cross sections on request.

RADOX® 125 RW

Flexible single core – reduced wall thickness





- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- flexible, easy to strip and process
- flame retardant
- high resistance to heat pressure
- high abrasion resistance
- reduced wall thickness
- soldering resistant

Application
Protected and fixed installation inside electrical equipment.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 125 extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating U_o/U		300 / 500 V AC
Test voltage		2500 V AC
Temperature range	(UL rating)	–40 °C up to +125 °C
Min. bending radius		3 x core-Ø

RADOX® 125 RW

Flexible single core – reduced wall thickness

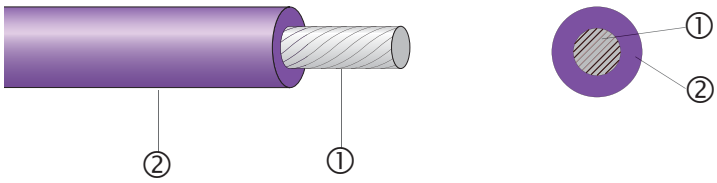
Extract from our delivery programme

Cross section	Conductor			Core	Weight
nom.	Construction nom.	Ø max.	R_{20} IEC 60228	Ø	nom.
mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
0.35	19 x 0.16	0.77	53.1	1.25 + 0.05	0.41
0.50	19 x 0.18	0.9	40.1	1.40 + 0.05	0.56
0.75	19 x 0.23	1.1	26.7	1.65 + 0.05	0.83
1.0	9 x 0.25	1.25	21.5	1.75 + 0.05	1.00

Other cross sections on request.

RADOX® 125 IEC

Marine single core



- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- flame retardant
- high abrasion resistance
- soldering resistant
- low smoke
- easy to strip and process
- flexible
- electron beam crosslinked insulation

Application
Protected and fixed installation inside electrical equipment, especially suitable for the connection of general power devices, lighting and switchboards.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 125 extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating U_o/U		600 / 1000 V AC
Test voltage		3500 V AC
Temperature range		–40 up to +120 °C
Temperature range IEC 60092		+85 °C
Short circuit temperature		+280 °C
Short circuit temperature IEC 60092		+250 °C
Min. bending radius	Ø < 12 mm	3 x core-Ø
	Ø > 12 mm	4 x core-Ø

Approvals
DET NORSKE VERITAS (DNV)
Classification of ships and mobile offshore units, IEC 60092-353, IEC 60332-3 cat. A, IEC 61034-2, IEC 60754-2 (cross section 1.5 – 300 mm^2)

BUREAU VERITAS (BV)
Classification of steel ships, IEC 60092-353, IEC 60332-3 cat. A, IEC 61034-2, IEC 60754-2 (cross section 1.5 – 300 mm^2)

RADOX® 125 IEC

Marine single core

Fire tests

Flame propagation:		
Verical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cables	EN 50266-2-2, IEC 60332-3-22	Category A
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	

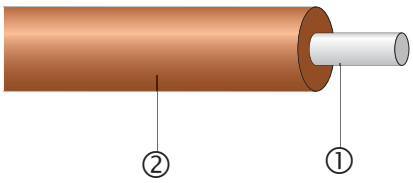
Extract from our delivery programme

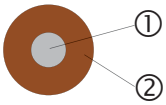
Cross section	Conductor			Core	Weight
nom.	nom.	Ø max.	R_{20} IEC 60228	Ø	nom.
mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
0.5	19 x 0.18	0.95	40.1	2.45 ± 0.10	1.1
0.75	24 x 0.20	1.2	26.7	2.65 ± 0.10	1.3
1.0	32 x 0.20	1.3	20.0	2.80 ± 0.10	1.6
1.5	30 x 0.25	1.6	13.7	3.10 ± 0.10	2.2
2.5	50 x 0.25	2.1	8.21	3.55 ± 0.10	3.1
4.0	56 x 0.30	2.6	5.09	4.25 ± 0.15	4.8
6.0	81 x 0.30	3.4	3.39	4.95 ± 0.15	6.5
10	78 x 0.40	4.4	1.95	5.95 ± 0.15	11.0
16	119 x 0.40	5.4	1.24	6.95 ± 0.15	16.3
25	182 x 0.40	6.7	0.795	8.70 ± 0.20	24.4
35	266 x 0.40	7.9	0.565	9.90 ± 0.20	34.3
50	378 x 0.40	9.4	0.393	11.6 ± 0.20	50.2
70	348 x 0.50	11.5	0.277	14.0 ± 0.25	68.8
95	444 x 0.50	12.9	0.210	15.4 ± 0.25	87.9
120	551 x 0.50	14.8	0.164	17.5 ± 0.30	109
150	722 x 0.50	17.0	0.132	20.1 ± 0.30	140
185	874 x 0.50	18.5	0.108	22.0 ± 0.30	170
240	1147 x 0.50	21.3	0.0817	25.0 ± 0.30	226
300	1443 x 0.50	23.9	0.0654	27.8 ± 0.30	276

Other cross sections on request.

RADOX® 125

Solid wire





- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- flame retardant
- high resistance to heat pressure
- high abrasion resistance
- easy to process
- soldering resistant

Application
Protected and fixed installation inside electrical equipment, especially suitable for the connection of switchboards, magnets and transformers.

Composition of the cable

① Conductor	stranded bare or tin plated copper, acc. to IEC 60228, class 1
② Insulation	RADOX® 125 extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating U_o/U	≤ 0.50 mm^2	450 / 750 V AC
Test voltage	≤ 0.50 mm^2	2500 V AC
Voltage rating U_o/U	≥ 0.50 mm^2	600/1000 V AC
Test voltage	≥ 0.50 mm^2	3500 V AC
Temperature range		–40 °C up to +125 °C
Min. bending radius		3 x wire-Ø

RADOX® 125

Solid wire

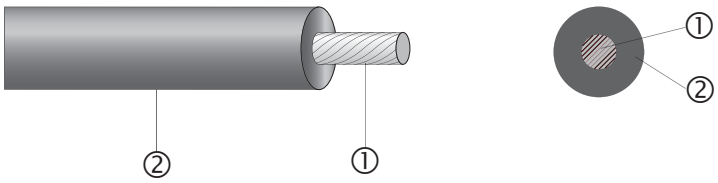
Extract from our delivery programme

Cross section	Conductor		Core	Weight
nom	Ø max.	R_{20} IEC 60228	Ø	nom.
mm^2	mm	max. Ω/km	mm	kg/100 m
0.25	0.6	61.3	1.40 ± 0.10	0.4
0.50	0.8	36.7	1.90 ± 0.10	0.8
0.75	1.0	24.8	2.10 ± 0.10	1.0
1.0	1.15	18.2	2.35 ± 0.10	1.4
1.5	1.4	12.2	2.60 ± 0.10	1.9
2.5	1.8	7.56	3.10 ± 0.10	3.0

Other cross sections on request.

RADOX® eco–F

Flexible single core



- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- easy to process
- flame retardant
- soldering resistant
- flexible
- resistant to impregnation resins and varnishes

Application
Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, white goods, lighting fixtures, etc.

Composition of cable

①	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
②	Insulation	RADOX® eco–F, extruded and electron beam crosslinked polyolefin
	Core colours	various, on request

Technical data

Voltage rating U_o/U		450 / 750 V AC
Test voltage		2500 V AC
Min. operating temperature		–40 °C
Max. continuous conductor temperature		+155 °C
Max. continuous conductor temperature		
at short circuit (max. 5s)	fixed	+250 °C
	flexing	+200 °C
Min. bending radius		3 x core–Ø

Fire tests

Content of halogen acid gas	EN 50267–2–1, IEC 60754–1	0 mg/g
Corrosivity of combustion gases	EN 50267–2–2, IEC 60754–2	
Smoke density	EN 50268–2, IEC 61034–2	

RADOX® eco–F

Flexible single core

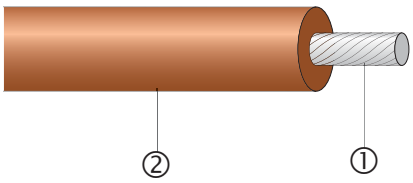
Extract from our delivery programme

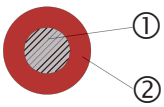
Cross section	Conductor			Core	Weight
nom.	Construction nom.	Ø max.	R_{20} IEC 60228	Ø	nom.
mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
0.25	19 x 0.13	0.6	85.9	1.35 ± 0.05	0.4
0.34	19 x 0.16	0.8	52.1	1.60 ± 0.10	0.6
0.50	19 x 0.18	0.9	40.1	1.71 ± 0.10	0.7
0.75	19 x 0.23	1.1	26.7	1.90 ± 0.10	1.0
1.0	19 x 0.26	1.2	20.0	2.15 ± 0.10	1.2
1.5	30 x 0.25	1.5	13.7	2.45 ± 0.10	1.8
2.5	50 x 0.25	2.1	8.21	3.05 ± 0.10	2.8
4.0	56 x 0.30	2.6	5.09	3.65 ± 0.15	4.7

Other cross sections on request.

RADOX® 155

Flexible single core





- excellent high and low temperature and ozone resistance
- weatherproof
- easy to process
- flame retardant
- high resistance to heat pressure
- high abrasion resistance
- soldering resistant
- flexible
- resistant to impregnation resins and varnishes

Application
Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, magnets and transformers.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 155 extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating U_o/U	≤ 0.50 mm^2	450 / 750 V AC
Test voltage	≤ 0.50 mm^2	2500 V AC
Voltage rating U_o/U	≥ 0.50 mm^2	600 / 1000 V AC
Test voltage	≥ 0.50 mm^2	3500 V AC
Temperature range		–55 °C up to +155 °C

RADOX® 155

Flexible single core

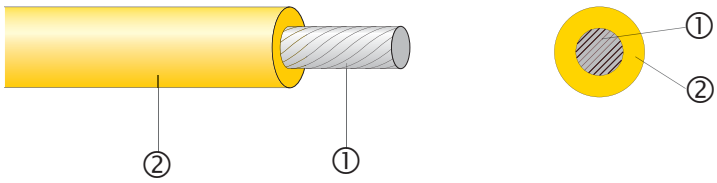
Extract from our delivery programme

Cross section	Conuctor			Core	Weight	Bending radius
nom.	Construction nom.	Ø max.	R_{20} IEC 60228	Ø	nom.	min.
mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100m	
0.25	19 x 0.13	0.6	85.9	1.45 ± 0.05	0.4	3 x Ø
0.34	19 x 0.16	0.8	52.1	1.60 ± 0.10	0.5	3 x Ø
0.50	19 x 0.18	0.9	40.1	1.70 ± 0.10	0.7	3 x Ø
0.75	24 x 0.20	1.15	26.7	2.20 ± 0.10	1.1	3 x Ø
1.0	32 x 0.20	1.3	20.0	2.60 ± 0.10	1.5	3 x Ø
1.5	30 x 0.25	1.55	13.7	2.70 ± 0.10	1.9	3 x Ø
2.5	50 x 0.25	2.05	8.21	3.35 ± 0.10	3.0	3 x Ø
4.0	56 x 0.30	2.6	5.09	4.05 ± 0.15	4.6	3 x Ø
6.0	81 x 0.30	3.4	3.39	5.2 ± 0.15	6.5	3 x Ø
10	78 x 0.40	4.4	1.95	6.4 ± 0.15	11	3 x Ø
16	119 x 0.40	5.4	1.24	7.6 ± 0.15	16.5	3 x Ø
25	182 x 0.40	6.7	0.795	9.2 ± 0.2	25	3 x Ø
35	266 x 0.40	7.9	0.565	10.6 ± 0.2	34.5	3 x Ø
50	378 x 0.40	9.4	0.393	12.3 ± 0.25	50	4 x Ø
70	348 x 0.50	11.5	0.277	14.6 ± 0.25	68	4 x Ø
95	444 x 0.50	12.9	0.210	16.3 ± 0.3	89	4 x Ø
120	551 x 0.50	14.8	0.164	18.4 ± 0.3	110	4 x Ø
150	722 x 0.50	17.0	0.132	20.8 ± 0.3	142	4 x Ø
185	874 x 0.50	18.5	0.108	22.5 ± 0.3	171	4 x Ø
240	1147 x 0.50	21.3	0.0817	25.7 ± 0.3	225	4 x Ø

Other cross sections on request.

RADOX® 155 S

Flexible single core – high oil resistance



- excellent high and low temperature and ozone resistance
- weatherproof
- high resistance to heat pressure
- high abrasion resistance
- easy to strip and process
- resistant to hydrolysis, oil and fuels
- resistant to impregnation resins and varnishes

Application
Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, magnets and transformers.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 155S extruded electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating U_o/U	≤ 0.50 mm^2	450 / 750 V AC
Test voltage	≤ 0.50 mm^2	2500 V AC
Voltage rating U_o/U	≥ 0.50 mm^2	600 / 1000 V AC
Test voltage	≥ 0.50 mm^2	3500 V AC
Temperature range		–55 °C up to +155 °C
Min. bending radius		3 x core-Ø

RADOX® 155 S

Flexible single core – high oil resistance

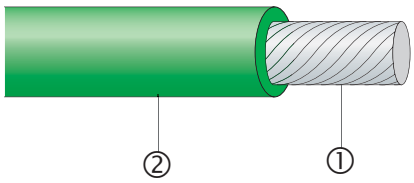
Extract from our delivery programme

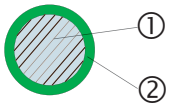
Cross section	Conductor			Core	Weight
nom.	Construction nom.	Ø max.	R_{20} IEC 60228	Ø	nom.
mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100m
0.50	19 x 0.18	0.9	40.1	1.70 ± 0.10	0.7
0.75	24 x 0.20	1.15	26.7	2.20 ± 0.10	1.1
1.0	32 x 0.20	1.3	20.0	2.60 ± 0.10	1.5
1.5	30 x 0.25	1.55	13.7	2.70 ± 0.10	1.9
2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	3.0

Other cross sections on request.

RADOX® 155 S RW

Flexible single core – reduced wall thickness





- reduced wall thickness
- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- high resistance to heat pressure
- high abrasion resistance
- easy to strip and process
- resistant to hydrolysis, oil and fuels
- resistant to impregnation resins and varnishes

Applications
Protected and fixed installation inside equipment, especially suitable for the connection of motor windings, switchboards, magnets and transformers where space is rare.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 155S extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating U_o/U	300 / 500 V AC
Test voltage	2000 V AC
Temperature range	–40 °C up to +155 °C
Min. bending radius	3 x core-Ø

RADOX® 155 S RW

Flexible single core – reduced wall thickness

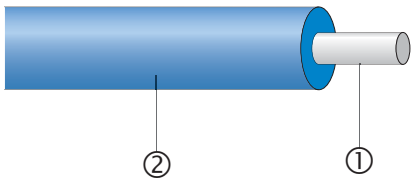
Extract from our delivery programme

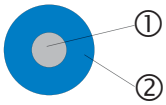
Cross section	Conductor			Core	Weight
nom.	Construction nom.	Ø max.	R_{20} IEC 60228	Ø	nom.
mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
0.14	19 x 0.10	0.51	135.5	0.95 ± 0.05	0.3
0.25	19 x 0.13	0.61	86.0	1.10 ± 0.05	0.3
0.35	19 x 0.15	0.80	54.5	1.25 ± 0.05	0.4
0.50	19 x 0.18	0.91	38.2	1.40 ± 0.05	0.6
0.75	19 x 0.22	1.12	25.4	1.65 ± 0.05	0.8
1.0	19 x 0.26	1.26	19.1	1.75 ± 0.05	1.0
1.5	30 x 0.26	1.7	13.0	2.30 ± 0.1	1.6
2.5	50 x 0.26	2.2	7.8	2.85 ± 0.15	2.6
4.0	56 x 0.31	2.75	4.8	3.55 ± 0.15	4.2

Other cross sections on request.

RADOX® 155

Solid wire





- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- high resistance to heat pressure
- high abrasion resistance
- soldering resistant
- easy to process
- resistant to impregnation resins and varnishes

Applications
Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, magnets and transformers.

Composition of cable

① Conductor	stranded bare or tin plated copper, acc. to IEC 60228, class 1
② Insulation	RADOX® 155 extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating U_o/U	≤ 0.50 mm^2	450 / 750 V AC
Test voltage	≤ 0.50 mm^2	2500 V AC
Voltage rating U_o/U	≥ 0.50 mm^2	600 / 1000 V AC
Test voltage	≥ 0.50 mm^2	3500 V AC
Temperature range		–55 °C up to +155 °C
Min. bending radius		3 x wire-Ø

RADOX® 155

Solid wire

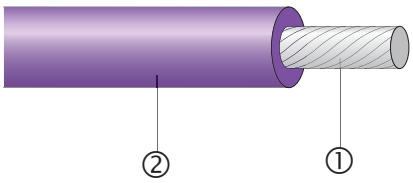
Extract from our delivery programme

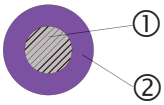
Cross section	Conductor		Core	Weight
nom	Ø max.	R_{20} IEC 60228	Ø	nom.
mm^2	mm	max. Ω/km	mm	kg/100 m
0.25	0.6	61.3	1.40 ± 0.10	0.4
0.50	0.8	36.7	1.90 ± 0.10	0.8
0.75	1.0	24.8	2.10 ± 0.10	1.0
1.0	1.15	18.2	2.35 ± 0.10	1.4
1.5	1.4	12.2	2.60 ± 0.10	1.9
2.5	1.8	7.56	3.10 ± 0.10	3.0

Other cross sections on request.

RADOX® KDJ–11

Flexible single core





- resistant to solvents, oils, fuels, alkaline solutions, acids and hydrolysis
- weatherproof
- impermeable to vapour
- compact design
- mechanical robustness in agressive environment at high and low temperatures

Application

- Wiring of equipment for heating and refrigeration units, chemical plants, wet or humid rooms and rooms with high ambient temperatures.
- Compatible to moudling compounds.
- Transformer in oil, class H motors.

Composition of cable

①	Conductor	stranded bare copper, acc. to IEC 60228, class 5
②	Insulation	FEP
	Core colours	various, on request

Technical data

Voltage rating U_o/U	0.50 and 1.0 mm^2	300 / 500 V AC
	1.50 up to 25 mm^2	450 / 750 V AC
Test voltage		2500 V AC
Max. conductor temperature	(continuous)	+180 °C
Short circuit temperature	(max. 5s)	+250 °C
Max. operating temperature	flexing	–55 °C
	fixed	–100 °C
Min. bending radius	flexing	5 x core–Ø
	fixed	3 x core–Ø

RADOX® KDJ–11

Flexible single core

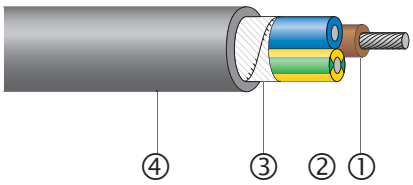
Extract from our delivery programme

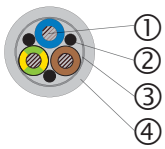
Cross section	Conductor			Core	Weight
nom.	Construction nom.	Ø max.	R_{20} IEC 60228	Ø	nom.
mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
0.50	19 x 0.18	0.91	37.1	1.85	0.8
0.75	24 x 0.20	1.16	24.7	2.10	1.2
1.0	32 x 0.20	1.33	18.5	2.30	1.4
1.5	19 x 0.32	1.63	12.6	2.60	2.0
2.5	50 x 0.25	1.98	7.58	3.20	3.0
4.0	56 x 0.30	2.50	4.70	3.80	4.3
6.0	84 x 0.30	2.98	3.14	4.90	6.8
10	80 x 0.40	3.94	1.87	5.50	11.1
16	126 x 0.40	5.60	1.19	7.50	17.0

Other cross sections on request.

RADOX® 125

Multi core cable





- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- flame retardant
- soldering resistant
- flexible
- in case of fire no corrosive gases and low smoke emission
- easy to strip

Application
Permanent installation indoor and outdoor for the connection of fixed and loose parts.

Composition of cable

①	Core:	
	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
	Insulation	RADOX® 125 extruded and electron beam crosslinked polyolefin copolymer
	Core colours	2 up to 5 core acc. to CENELEC HD 308 (see page 155) 6 core and more: black numbered with yellow/green earthing
②	Fillers (optional)	RADOX® 125
③	Separator	glass fabric tape
④	Sheath	RADOX® 125M: extruded and electron beam crosslinked polyolefin copolymer
	Colour	black

Technical data

Voltage rating U_o/U	≤ 16 x 0.50 mm^2	450 / 750 V AC
Test voltage	≤ 16 x 0.50 mm^2	2500 V AC
Voltage rating U_o/U	≥ 16 x 0.50 mm^2	600 / 1000 V AC
Test voltage	≥ 16 x 0.50 mm^2	3500 V AC
Temperature range	fixed	-40 °C up to +125 °C
Min. operating temperature	flexing	-25 °C
Max. conductor temperature	at short circuit (max. 5s)	+280 °C
Min. bending radius	fixed	3 x cable-Ø
	flexing	5 x cable-Ø

Fire tests

Flame propagation:		
Verical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cables	EN 50266-2-4, IEC 60332-3-24	Category C
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	

RADOX® 125

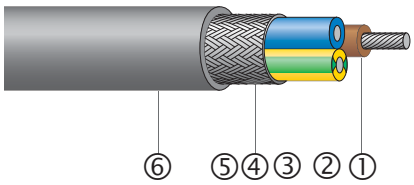
Multi core cable

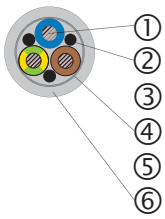
Extract from our delivery programme (Other cross sections on request)

Cross section	Conductor			Core	Cable	Weight
n x mm²	Construction nom. n x mm Ø	Ø max. mm	R_{20} IEC 60228 max. Ω/km	Ø mm	Ø mm	nom. kg/100 m
4 x 0.25	19 x 0.12	0.61	88.5	1.45 ± 0.05	5.4 ± 0.3	4.0
8 x 0.25	19 x 0.12	0.61	88.5	1.45 ± 0.05	7.75 ± 0.3	8.0
12 x 0.25	19 x 0.12	0.61	88.5	1.45 ± 0.05	8.5 ± 0.3	9.5
16 x 0.25	19 x 0.12	0.61	88.5	1.45 ± 0.05	9.45 ± 0.3	11.9
28 x 0.25	19 x 0.12	0.61	88.5	1.45 ± 0.05	12.4 ± 0.4	19.7
2 x 0.5	19 x 0.18	0.9	40.1	1.7 ± 0.10	5.5 ± 0.3	5.1
4 x 0.5	19 x 0.18	0.9	40.1	1.7 ± 0.10	6.1 ± 0.3	6.5
16 x 0.5	19 x 0.18	0.9	40.1	1.7 ± 0.10	11.0 ± 0.4	17.9
2 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	6.6 ± 0.3	6.3
3 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	7.3 ± 0.3	7.9
4 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	7.7 ± 0.3	8.8
5 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	8.6 ± 0.3	10.9
7 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	10.2 ± 0.4	15.1
10 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	11.7 ± 0.4	19.6
12 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	12.0 ± 0.4	21.4
16 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	13.5 ± 0.4	27.5
40 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	20.3 ± 0.5	61.6
2 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	7.5 ± 0.3	7.4
3 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	7.9 ± 0.3	9.1
4 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	8.8 ± 0.3	11.2
5 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	9.6 ± 0.3	13.6
7 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	11.4 ± 0.4	–
2 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	7.8 ± 0.3	8.6
3 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	8.3 ± 0.3	11.0
4 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	9.2 ± 0.3	13.6
5 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	10.4 ± 0.4	16.8
7 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	12.3 ± 0.4	23.6
10 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	14.0 ± 0.4	31.1
12 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	14.4 ± 0.4	34.3
16 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	16.3 ± 0.5	44.9
21 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	18.7 ± 0.5	56.7
27 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	20.8 ± 0.5	69.8
2 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	9.1 ± 0.3	13.0
3 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	10.1 ± 0.4	16.6
4 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	11.3 ± 0.4	20.9
5 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	12.4 ± 0.4	24.9
7 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	15.3 ± 0.5	37.9
2 x 4.0	56 x 0.30	2.6	5.09	4.15 ± 0.15	11.0 ± 0.4	18.7
4 x 4.0	56 x 0.30	2.6	5.09	4.15 ± 0.15	13.0 ± 0.4	29.8
5 x 4.0	56 x 0.30	2.6	5.09	4.15 ± 0.15	14.6 ± 0.4	36.7
4 x 6.0	81 x 0.30	3.4	3.39	4.95 ± 0.15	15.6 ± 0.5	41.8
2 x 10	78 x 0.40	4.4	1.95	6.15 ± 0.15	15.8 ± 0.5	–
3 x 10	78 x 0.40	4.4	1.95	6.15 ± 0.15	17.0 ± 0.5	–
4 x 10	78 x 0.40	4.4	1.95	6.15 ± 0.15	19.0 ± 0.5	–
5 x 10	78 x 0.40	4.4	1.95	6.15 ± 0.15	21.4 ± 0.5	–
4 x 16	119 x 0.40	5.4	1.24	7.35 ± 0.15	22.5 ± 0.5	–
5 x 16	119 x 0.40	5.4	1.24	7.35 ± 0.15	24.8 ± 0.5	–
4 x 25	182 x 0.40	6.7	0.795	8.9 ± 0.2	26.5 ± 0.6	–
5 x 25	182 x 0.40	6.7	0.795	8.9 ± 0.2	30.0 ± 0.6	–
4 x 35	266 x 0.40	7.9	0.565	10.3 ± 0.2	30.7 ± 0.6	–
5 x 35	266 x 0.40	7.9	0.565	10.3 ± 0.2	34.2 ± 0.6	–
4 x 50	378 x 0.40	9.4	0.393	12.1 ± 0.25	35.8 ± 0.7	–

RADOX® 125

Multi core cable – screened





- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- flame retardant
- soldering resistant
- flexible
- in case of fire no corrosive gases and low smoke emission
- easy to strip

Application
Permanent installation indoor and outdoor for the connection of fixed and loose parts.

Composition of cable

①	Core:	
	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
	Insulation	RADOX® 125 extruded and electron beam crosslinked polyolefin copolymer
	Core colours	2 up to 5 core acc. to CENELEC HD 308 (see page 155) 6 core and more: black numbered with yellow/green earthing other colours on request
②	Fillers (optional)	RADOX® 125
③	Separator (optional)	plastic tape
④	Screen	copper braid, optical coverage: ≥ 85 %
⑤	Separator (optional)	plastic tape
⑥	Sheath	RADOX® 125M extruded and electron beam crosslinked polyolefin copolymer
	Colour	black

Technical data

Voltage rating U_o/U	≤ 16 x 0.50 mm²	450 / 750 V AC
Test voltage	≤ 16 x 0.50 mm²	2500 V AC
Voltage rating U_o/U	≥ 16 x 0.50 mm²	600 / 1000 V AC
Test voltage	≥ 16 x 0.50 mm²	3500 V AC
Temperature range	fixed	-40 °C up to +125 °C
Min. operating temperature	flexing	-25 °C
Max. conductor temperature	at short circuit (max. 5s)	+280 °C
Min. bending radius	fixed	4 x cable-Ø
	flexing	5 x cable-Ø

Fire tests

Flame propagation:		
Verical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cables	EN 50266-2-4, IEC 60332-3-24	Category C
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	

RADOX® 125

Multi core cable – screened

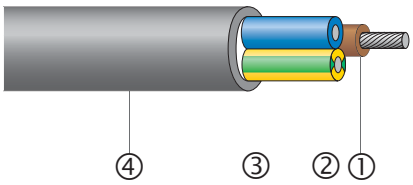
Extract from our delivery programme

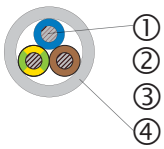
Cross section	Conductor			Core	Screen	Cable	Weight
	Construction nom.	Ø max.	R_{20} IEC 60228	Ø	Ø	Ø	nom.
n x mm²	n x mm Ø	mm	max. Ω/km	mm	mm	mm	kg/100 m
4 x 0.25	19 x 0.13	0.6	85.9	1.45 ± 0.05	4.1	5.9 ± 0.3	5.2
12 x 0.25	19 x 0.13	0.6	85.9	1.45 ± 0.05	6.9	9.0 ± 0.3	12.4
28 x 0.25	19 x 0.13	0.6	85.9	1.45 ± 0.05	10.4	13.0 ± 0.3	24.9
2 x 0.5	19 x 0.18	0.9	40.1	1.7 ± 0.10	4.0	5.9 ± 0.3	5.7
4 x 0.5	19 x 0.18	0.9	40.1	1.7 ± 0.10	4.8	6.8 ± 0.3	8.0
16 x 0.5	19 x 0.18	0.9	40.1	1.7 ± 0.10	9.0	11.6 ± 0.4	21.5
2 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	4.9	6.9 ± 0.3	7.4
3 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	5.5	7.6 ± 0.3	9.7
4 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	6.2	8.4 ± 0.3	11.7
5 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	6.8	9.3 ± 0.3	14.1
7 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	8.3	10.7 ± 0.4	18.7
25 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	15.6	19.2 ± 0.5	57.3
2 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	5.9	7.9 ± 0.3	10.6
3 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	6.3	8.7 ± 0.3	12.7
4 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	7.0	9.3 ± 0.3	14.4
7 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	9.4	12.1 ± 0.4	23.9
12 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	11.7	14.6 ± 0.4	33.5
2 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	6.3	8.4 ± 0.3	11.8
3 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	6.5	8.7 ± 0.3	13.2
4 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	7.6	10.0 ± 0.4	17.5
5 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	8.7	11.5 ± 0.4	22.8
7 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	10.4	13.1 ± 0.4	29.6
8 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	11.4	14.2 ± 0.4	34.3
12 x 1.5	30 x 0.25	1.55	13.7	2.73 ± 0.10	12.3	15.4 ± 0.5	41.0
2 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	7.7	10.2 ± 0.4	17.5
3 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	8.3	10.8 ± 0.4	20.6
4 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	9.8	12.4 ± 0.4	26.8
5 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	10.4	13.1 ± 0.4	30.9
7 x 2.5	50 x 0.25	2.05	8.21	3.50 ± 0.10	13.2	16.3 ± 0.5	45.9
2 x 4.0	56 x 0.30	2.6	5.09	4.15 ± 0.15	9.2	11.9 ± 0.4	24.4
4 x 4.0	56 x 0.30	2.6	5.09	4.15 ± 0.15	11.2	14.1 ± 0.4	37.1
3 x 6.0	81 x 0.30	3.4	3.39	4.95 ± 0.15	11.6	14.5 ± 0.4	38.8
4 x 6.0	81 x 0.30	3.4	3.39	4.95 ± 0.15	13.3	16.5 ± 0.5	51.7
4 x 10	78 x 0.40	4.4	1.91	6.15 ± 0.15	16.2	19.8 ± 0.5	77.5
4 x 35	266x0.40	7.9	0.565	10.3 ± 0.2	27.2	32.2 ± 0.6	2.17

Other cross sections on request.

RADOX® 155

Multi core cable





- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- soldering resistant
- flexible
- easy to strip

Application
Permanent installation indoor and outdoor for the connection of fixed and loose parts.

Composition of cable

①	Core:	
	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
	Insulation	RADOX® 155 extruded and electron beam crosslinked polyolefin copolymer
	Core colours	2 up to 5 core acc. to CENELEC HD 308 (see page 155) 6 core and more: black numbered with yellow/green earthing other colours on request
②	Fillers (optional)	RADOX® 125
③	Separator (optional)	plastic tape
④	Sheath	RADOX® 155 extruded and electron beam crosslinked polyolefin copolymer
	Colour	black

Technical data

Voltage rating U_o/U	≤ 16 x 0.50 mm^2	450 / 750 V AC
Test voltage	≤ 16 x 0.50 mm^2	2500 V AC
Voltage rating U_o/U	≥ 16 x 0.50 mm^2	600 / 1000 V AC
Test voltage	≥ 16 x 0.50 mm^2	3500 V AC
Temperature range	fixed	-55 °C up to +155 °C
Min. operating temperature	flexible	-40 °C
Max. conductor temperature	at short circuit (max. 5s)	+280 °C
Min. bending radius	fixed	3 x cable-Ø
	flexible	5 x cable-Ø

RADOX® 155

Multi core cable

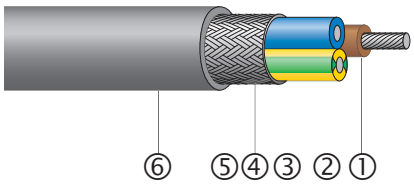
Extract from our delivery programme

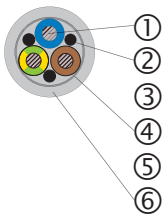
Cross section	Conductor			Core	Cable	Weight
	Construction nom.	Ø max.	R_{20} IEC 60228	Ø	Ø	
n x mm²	n x mm Ø	mm	max. Ω/km	mm	mm	nom.
4 x 0.25	19 x 0.13	0.6	85.9	1.45 ± 0.05	5.4 ± 0.3	3.3
3 x 0.34	19 x 0.15	0.75	57.2	1.55 ± 0.10	5.1 ± 0.3	–
2 x 0.50	19 x 0.18	0.9	40.1	1.7 ± 0.10	5.2 ± 0.3	–
3 x 0.50	19 x 0.18	0.9	40.1	1.7 ± 0.10	5.6 ± 0.3	4.0
8 x 0.50	19 x 0.18	0.9	40.1	1.7 ± 0.10	8.75 ± 0.3	–
16 x 0.50	19 x 0.18	0.9	40.1	1.7 ± 0.10	10.4 ± 0.4	–
3 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	6.7 ± 0.3	5.9
4 x 0.75	24 x 0.20	1.15	26.7	2.2 ± 0.10	7.5 ± 0.3	–
2 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	7.0 ± 0.3	6.1
3 x 1.0	32 x 0.20	1.3	20.0	2.6 ± 0.10	7.6 ± 0.3	7.7
2 x 1.5	30 x 0.25	1.55	13.7	2.7 ± 0.10	7.5 ± 0.3	6.6
3 x 1.5	30 x 0.25	1.55	13.7	2.7 ± 0.10	7.9 ± 0.3	9.2
4 x 1.5	30 x 0.25	1.55	13.7	2.7 ± 0.10	8.8 ± 0.3	11.7
5 x 1.5	30 x 0.25	1.55	13.7	2.7 ± 0.10	10.1 ± 0.4	15.0
3 x 2.5	50 x 0.25	2.05	8.21	3.35 ± 0.10	9.9 ± 0.3	14.6
4 x 2.5	50 x 0.25	2.05	8.21	3.35 ± 0.10	11.0 ± 0.4	18.6
5 x 2.5	50 x 0.25	2.05	8.21	3.35 ± 0.10	11.9 ± 0.4	22.3

Other cross sections on request.

RADOX® 155

Multi core cable – screened





- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- soldering resistant
- flexible
- easy to strip

Application

Permanent installation indoor and outdoor for the connection of fixed and loose parts.

Composition of cable

①	Core:	
	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
	Insulation	RADOX® 155 extruded and electron beam crosslinked polyolefin copolymer
	Core colours	2 up to 5 core acc. to CENELEC HD 308 (see page 155) 6 core and more: black numbered with yellow/green earthing other colours on request
②	Fillers (optional)	RADOX® 125
③	Separator (optional)	plastic tape
④	Screen	copper braid, optical coverage: ≥ 85 %
⑤	Separator (optional)	plastic tape
⑥	Sheath	RADOX® 155 extruded and electron beam crosslinked polyolefin copolymer
	Colour	black

Technical data

Voltage rating U_o/U	≤ 16 x 0.50 mm^2	450/750 V AC
Test voltage	≤ 16 x 0.50 mm^2	2500 V AC
Voltage rating U_o/U	≥ 16 x 0.50 mm^2	600/1000 V AC
Test voltage	≥ 16 x 0.50 mm^2	3500 V AC
Temperature range	fixed	-55 °C up to +155 °C
Min. operating temperature	flexible	-40 °C
Max. conductor temperature	at short circuit (max. 5s)	+280 °C
Min. bending radius	fixed	4 x cable-Ø
	flexible	5 x cable-Ø

Fire tests

Flame propagation:		
Verical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cables	DIN EN 50266-2-5	Category D

RADOX® 155

Multi core cable – screened

Extract from our delivery programme

Cross section	Conductor			Core	Screen	Cable	Weight
	Construction nom.	Ø max.	R_{20} IEC 60228	Ø	Ø	Ø	nom.
n x mm^2	n x mm Ø	mm	max. Ω/km	mm	mm	mm	kg/100m
2 x 0.25	19 x 0.12	0.61	88.5	1.45 ± 0.05	3.35	5.1 ± 0.3	3.43
6 x 0.25	19 x 0.12	0.61	88.5	1.45 ± 0.05	5.07	6.95 ± 0.15	6.71
4x2x0.25	19 x 0.12	0.61	88.5	1.45 ± 0.05	11.2	14.0 ± 0.4	27.7
4 x 0.5	19 x 0.18	0.9	40.1	1.71 ± 0.10	5.55	7.6 ± 0.15	7.62
16 x 0.5	19 x 0.18	0.9	40.1	1.71 ± 0.10	9.0	11.6 ± 0.4	20.3
3 G 1.5	30 x 0.25	1.61	13.3	2.73 ± 0.10	6.6	8.7 ± 0.3	11.6
10 G 1.5	30 x 0.25	1.61	13.3	2.73 ± 0.10	11.9	14.7 ± 0.4	33.2
26 G 1.5	30 x 0.25	1.61	13.3	2.73 ± 0.10	18.0	22.0 ± 0.5	74.1
8 G 2.5	50 x 0.25	2.06	8.6	3.5 ± 0.10	14.5	17.9 ± 0.5	49.8
9 G 2.5	50 x 0.25	2.06	8.6	3.5 ± 0.10	15.1	18.6 ± 0.5	51.8

Other cross sections on request.

RADOX® UL/CSA

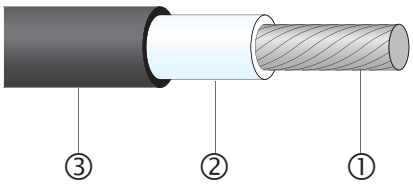
Flexible single cores, multi core cables and wires UL recognised

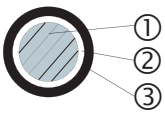
All our cables fully comply with the European directives 76/769/EWG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2002/95/EG (RoHS).

- halogen free, flame retardant
- high temperature resistance
- high mechanical resistance
- flexible, easy to strip, soldering resistant
- temperature range –55 °C up to +150 °C
- voltage rating 300/600 V AC
- flame tests VW–1 and FT1

RADOX® UL1385 / CSA AWM I A/B

Flexible single core





- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- high resistance to heat pressure
- high abration reistance
- highly resistant to hydrolysis
- resistant to impregnation resins and varnishes
- easy to process
- soldering resistant insulation
- flexible

Application
Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, magnets and transformers.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation 1	electron beam crosslinked polyalcen
③ Insulation 2	electron beam crosslinked polyvinilydenfluorid (PVDF)
Core colours	various, on request

Technical data

Voltage rating		600 V AC
Operating temperature	(UL temperature rating)	+125 °C
Min. temperature		-65 °C
Min. bending radius		3 x core-Ø

Approvals

UL AWM 1385	125 °C, no voltage rating
CSA AWM I A/B	125 °C, 300 V, FT1, FT2

RADOX® UL1385 / CSA AWM I A/B

Flexible single core

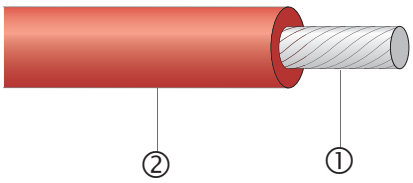
Extract from our delivery programme

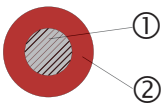
Cross section		Conductor			Core	Weight
nom.		Construction nom.	Ø max.	R_{20} MIL-W-81044/12	Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
28	0.09	7 x 0.13	040	239	0.77 ± 0.05	0.13
26	0.15	19 x 0.10	0.51	150	0.87 ± 0.05	0.19
24	0.25	19 x 0.13	0.61	94.2	1.02 ± 0.05	0.30
22	0.38	19 x 0.16	0.77	59.4	1.18 ± 0.05	0.43
20	0.60	19 x 0.20	0.99	36.7	1.40 ± 0.05	0.65
18	0.93	19 x 0.25	1.23	23.2	1.66 ± 0.05	0.95
16	1.25	19 x 0.29	1.40	15.8	1.83 ± 0.05	1.30

Other cross sections on request.

RADOX® UL 3266 / CSA AWM I A/B

Flexible single core





- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- high abrasion reistance
- resistant to impregnation resins and varnishes
- easy to process
- soldering resistant
- flexible

Application

Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, magnets and transformers.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 125 extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating U_o / U		300 V AC
Test voltage		2000 V AC
Operating temperature	(UL temperature rating)	+125 °C
Min. temperature		-40 °C
Min. bending radius		3 x core-Ø

Approvals

UL	Underwriters Laboratories	File No. E63322
CSA	Canadian Standards Association	Report No. 69581, 39507

RADOX® UL 3266 / CSA AWM I A/B

Flexible single core

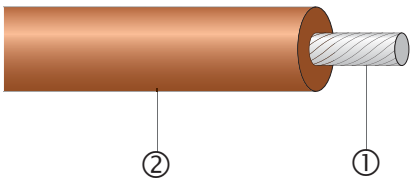
Extract from our delivery programme

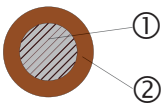
Cross section		Conductor		Core	Weight
nom.		Construction	Ø max.	Ø	nom.
AWG	mm^2	n x mm Ø	mm	mm	kg/100 m
26	0.128	19 x 0.10	0.51	1.32 ± 0.05	0.32
24	0.205	19 x 0.13	0.61	1.45 ± 0.05	0.41
22	0.324	19 x 0.16	0.79	1.65 ± 0.10	0.53
20	0.519	19 x 0.20	0.99	1.85 ± 0.10	0.83
18	0.823	19 x 0.25	1.23	2.10 ± 0.10	1.13
(16)	1.50	19 x 0.31	1.55	2.41 ± 0.10	1.65
14	2.08	19 x 0.37	1.86	2.72 ± 0.10	2.33
12	3.31	37 x 0.34	2.35	3.21 ± 0.10	3.53
10	5.26	37 x 0.43	3.02	3.88 ± 0.10	5.61

Other cross sections on request.

RADOX® UL 3271 / CSA AWM I A/B

Flexible single core





- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- flame retardant
- high resistance to heat pressure
- high abrasion reistance
- easy to process
- soldering resistant
- flexible

Application

Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, magnets and transformers.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 125S extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating		600 V AC
Test voltage		2500 V AC
Operating temperature	(UL/CSA temperature rating)	+125 °C
Max. conductor temperature	at short circuit (max. 5s)	+280 °C
Min. operating temperature		-65 °C
	flexing	-25 °C
	fixed	-40 °C

Standards

Applicance wiring material	CSA C22.2 no. 210.2	AWM I A/B 125°C 600 V FT2
Applicance wiring material	UL 758	Style 3271

Approvals

CSA Certificate	1418425
UL File	E63322

RADOX® UL 3271 / CSA AWM I A/B

Flexible single core

Fire tests

Flame propagation:		
Vertical of a single cable	CSA C22.2 no. 0.3 cl. 4.11.1	FT1 > 16 mm^2 only
Horizontal of a single cable	CSA C22.2 no. 0.3 cl. 4.11.2	FT2
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	> 16 mm^2 only
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	
Flame propagation:		
Horizontal of a single cable	UL 1581 sec. 1090	
Vertical of a single cable	UL 1581 sec. 1080	VW-1 > 16 mm^2 only

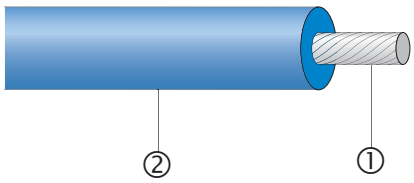
Extract from our delivery programme

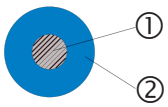
Cross section		Conductor			Core	Weight	Bending radius
nom.		Construction nom.	Ø max.	R_{20} IEC 60228	Ø	nom.	min.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m	
24	(0.241)	19 x 0.13	0.61	85.6	2.22 ± 0.10	0.72	3 x Ø
22	(0.382)	19 x 0.16	0.79	53.2	2.40 ± 0.10	0.92	3 x Ø
20	(0.616)	19 x 0.20	0.99	32.4	2.60 ± 0.10	1.2	3 x Ø
18	(0.963)	19 x 0.25	1.23	20.4	2.85 ± 0.10	1.6	3 x Ø
(16)	1.50	19 x 0.31	1.55	13.0	3.20 ± 0.10	2.1	3 x Ø
14	(2.08)	19 x 0.37	1.86	9.15	3.50 ± 0.10	2.9	3 x Ø
12	(3.31)	37 x 0.34	2.35	5.75	4.0 ± 0.15	4.2	3 x Ø
10	(5.26)	37 x 0.43	3.02	3.62	4.7 ± 0.15	6.4	3 x Ø
(8)	10	80 x 0.40	3.94	1.95	6.4 ± 0.15	12.1	3 x Ø
(6)	16	119 x 0.40	5.4	1.21	8.6 ± 0.2	18.8	3 x Ø
(4)	25	182 x 0.40	6.7	0.795	9.9 ± 0.2	26.8	3 x Ø
(2)	35	266 x 0.40	7.9	0.565	11.1 ± 0.2	36.4	3 x Ø
(1)	50	378 x 0.40	9.4	0.393	13.7 ± 0.25	54.3	4 x Ø
(2/0)	70	348 x 0.50	11.5	0.277	15.8 ± 0.25	72.3	4 x Ø
(3/0)	95	444 x 0.50	12.9	0.210	17.4 ± 0.3	95.5	4 x Ø
(4/0)	120	551 x 0.50	14.8	0.164	19.3 ± 0.3	116	4 x Ø
	150	722 x 0.50	17.0	0.132	22.2 ± 0.3	150	4 x Ø

Other cross sections on request.

RADOX® UL 3289/CSA CL 1503

Flexible single core





- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- high resistance to heat pressure
- high abrasion resistance
- easy to process
- soldering resistant
- flexible
- resistant to impregnation resins and varnishes

Application

Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, magnets and transformers.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 155 extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating		600 V AC
Test voltage		2500 V AC
Operating temperature	(UL temperature rating)	+150 °C
Min. temperature		–55 °C

RADOX® UL 3289/CSA CL 1503

Flexible single core

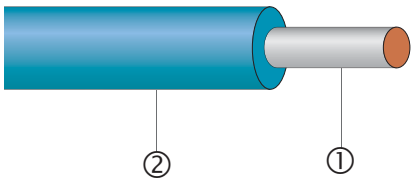
Extract from our delivery programme

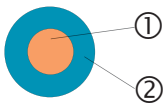
Cross section		Conductor		Core	Weight	Bending radius
nom.		Construction nom.	Ø max.	Ø	nom.	min.
AWG	mm^2	n x mm Ø	mm	mm	kg/100 m	
26	0.149	19 x 0.10	0.51	2.13 ± 0.10	0.55	3 x Ø
24	0.205	19 x 0.13	0.61	2.27 ± 0.10	0.66	3 x Ø
22	0.324	19 x 0.16	0.79	2.40 ± 0.10	0.79	3 x Ø
20	0.519	19 x 0.20	0.99	2.61 ± 0.10	1.1	3 x Ø
18	0.823	19 x 0.25	1.23	2.85 ± 0.10	1.5	3 x Ø
(16)	1.50	19 x 0.31	1.55	3.20 ± 0.10	2.1	3 x Ø
14	2.08	19 x 0.37	1.86	3.50 ± 0.10	2.7	3 x Ø
12	3.31	37 x 0.34	2.35	4.00 ± 0.15	4.0	3 x Ø
10	5.26	37 x 0.43	3.02	4.68 ± 0.15	6.1	3 x Ø
(8)	10	80 x 0.40	3.94	6.40 ± 0.15	11.7	3 x Ø
(6)	16	119 x 0.40	5.4	8.90 ± 0.2	18.4	3 x Ø
(4)	25	182 x 0.40	6.7	10.2 ± 0.2	25.8	3 x Ø
(2)	35	266 x 0.40	7.9	11.4 ± 0.2	36.5	3 x Ø
(1)	50	378 x 0.40	9.4	14.0± 0.25	54.3	4 x Ø
(2/0)	70	348 x 0.50	11.5	16.1± 0.3	71.3	4 x Ø
(3/0)	95	444 x 0.50	12.9	17.6± 0.3	93.6	4 x Ø
(4/0)	120	551 x 0.50	14.8	19.3 ± 0.3	113	4 x Ø

Other cross sections on request.

RADOX® UL 3289 / CSA CL 1503

Single core solid wire





- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- high resistance to heat pressure
- high abrasion resistance
- easy to process
- soldering resistant
- resistant to impregnation resins and varnishes

Application

Protected and fixed installation inside electrical equipment, especially suitable for the connection of motor windings, switchboards, magnets and transformers.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 1
② Insulation	RADOX® 155 extruded and electron beam crosslinked polyolefin copolymer
Core colours	various, on request

Technical data

Voltage rating		600 V AC
Operating temperature	(UL temperature rating)	+150 °C
Min. temperature		-55 °C

RADOX® UL 3289 / CSA CL 1503

Single core solid wire

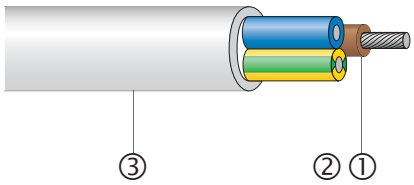
Extract from our delivery programme

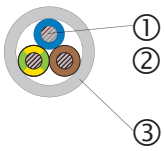
Cross section		Conductor	Core	Weight	Bending radius
nom.		Ø max.	Ø	nom.	min.
AWG	mm^2	mm	mm	kg/100 m	
24	0.205	0.55	2.15 ± 0.10	0.7	3 x Ø
22	0.324	0.7	2.30 ± 0.10	0.8	3 x Ø
20	0.517	0.8	2.45 ± 0.10	1.0	3 x Ø
18	0.821	1.1	2.70 ± 0.10	1.4	3 x Ø
16	1.31	1.4	3.05 ± 0.10	2.1	3 x Ø
14	2.08	1.8	3.45 ± 0.10	3.1	3 x Ø
12	3.31	2.2	3.80 ± 0.10	4.2	3 x Ø

Other cross sections on request.

RADOX® UL4486 / CSA AWM I/II A/B

Multi core cable – halogen free – 300 V





- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- easy to strip and process
- flame retardant
- in case of fire no corrosive gases and low smoke emission
- flexible

Application

Permanent installation indoor and outdoor for the connection of fixed and loose parts.

Composition of cable

① Cores:	
Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
Insulation	RADOX® 125
Core colours	various, on request
② Fillers (optional)	RADOX®
③ Sheath	RADOX® 125M
Colour	grey

Technical data

Voltage rating		300 V AC
Test voltage		2000 V AC
Operating temperature	(UL temperature rating)	+125 °C
Max. conductor temperature	at short circuit (max. 5s)	+280 °C
Min. operating temperature	flexing	-25 °C
	fixed	-40 °C
Min. bending radius		5 x cable-Ø

RADOX® UL4486 / CSA AWM I/II A/B

Multi core cable – halogen free – 300 V

Standards

Applicance wiring material	CSA C22.2 no. 210.2	AWM I/II A/B 125°C 300 V FT1
Applicance wiring material	UL 758	Style 4486

Fire tests

Flame propagation:		
Vertical of a single cable	CSA C22.2 no. 0.3 cl. 4.11.1	FT1
Horizontal flame propagation	CSA C22.2 no. 0.3 cl. 4.11.2	FT2
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cables	EN 50266-2-4, IEC 60332-3-24	Category C
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	
Flame propagation:		
Horizontal flame propagation of an applicance wire	UL 1581 sec. 1090	
Vertical of a single cable	UL 1581 sec. 1061	
Vertical of a single cable	UL 1581 sec. 1080	VW-1

Approvals

CSA Certificate	1241318
UL File	E63322

RADOX® UL4486 / CSA AWM I/II A/B

Multi core cable – halogen free – 300 V

Extract from our delivery programme (Other cross sections on request.)

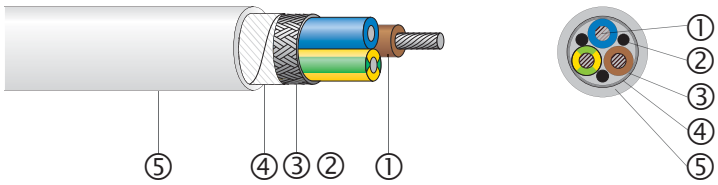
Cross section	Conductor		Core		Cable	Item no.
nom.	Construction nom.	R_{20} IEC 60228	Ø nom.	Colours*	Ø nom.	
n x(G) AWG	n x mm Ø	max. Ω/km	mm		mm	
2 x 26	19 x 0.10	136	1.37	BU,BN	4.6 ± 0.3	12564229
2 x 24	19 x 0.12	88.5	1.45	BU,BN	4.7 ± 0.3	12567437
2 x 20	19 x 0.20	32.6	1.85	BU,BN	5.5 ± 0.3	12563922
2 x 18	19 x 0.25	21.3	2.10	BU,BN	6.0 ± 0.3	12563923
2 x 16	19 x 0.31	13.7	2.41	BU,BN	6.7 ± 0.3	12563924
2 x 14	19 x 0.37	9.02	2.72	BU,BN	7.3 ± 0.3	12563925
2 x 12	37 x 0.34	5.67	3.21	BU,BN	8.3 ± 0.3	12563926
3 x 26	19 x 0.10	136	1.37	BN,BK,GY	4.8 ± 0.3	12568483
3 x 24	19 x 0.12	88.5	1.45	BN,BK,GY	4.95 ± 0.3	12568485
3 x 20	19 x 0.20	32.6	1.85	BU,BN,BK	5.8 ± 0.3	12563927
3 G 20	19 x 0.20	32.6	1.85	BU,BN,GNYE	5.8 ± 0.3	12564097
3 x 18	19 x 0.25	21.3	2.10	BU,BN,BK	6.4 ± 0.3	12563928
3 G 18	19 x 0.25	21.3	2.10	BU,BN,GNYE	6.4 ± 0.3	12564098
3 x 16	19 x 0.31	13.7	2.41	BU,BN,BK	7.0 ± 0.3	12563929
3 G 16	19 x 0.31	13.7	2.41	BU,BN,GNYE	7.0 ± 0.3	12564099
3 x 14	19 x 0.37	9.02	2.72	BU,BN,BK	7.7 ± 0.3	12563930
3 G 14	19 x 0.37	9.02	2.72	BU,BN,GNYE	7.7 ± 0.3	12564100
3 x 12	37 x 0.34	5.67	3.21	BU,BN,BK	8.8 ± 0.3	12563931
3 G 12	37 x 0.34	5.67	3.21	BU,BN,GNYE	8.8 ± 0.3	12564101
3 x 10	37 x 0.43	3.43	3.88	BU,BN,BK	10.3 ± 0.4	12564198
3 G 10	37 x 0.43	3.43	3.88	BU,BN,GNYE	10.3 ± 0.4	12564199
4 x 26	19 x 0.10	136	1.37	BU, BN,BK,GY	5.25 ± 0.3	12568484
4 x 24	19 x 0.12	88.5	1.45	BU,BN,BK,GY	5.4 ± 0.3	12568486
4 x 18	19 x 0.25	21.3	2.10	BU,BN,BK,GY	7.0 ± 0.3	12563932
4 G 18	19 x 0.25	21.3	2.10	BU,BN,BK,GNYE	7.0 ± 0.3	12564102
4 x 16	19 x 0.31	13.7	2.41	BU,BN,BK,GY	7.8 ± 0.3	12563933
4 G 16	19 x 0.31	13.7	2.41	BU,BN,BK,GNYE	7.8 ± 0.3	12564103
4 x 14	19 x 0.37	9.02	2.72	BU,BN,BK,GY	8.5 ± 0.3	12563934
4 G 14	19 x 0.37	9.02	2.72	BU,BN,BK,GNYE	8.5 ± 0.3	12564104
4 x 12	37 x 0.34	5.67	3.21	BU,BN,BK,GY	9.9 ± 0.3	12563935
4 G 12	37 x 0.34	5.67	3.21	BU,BN,BK,GNYE	9.9 ± 0.3	12564105
4 x 10	37 x 0.43	3.43	3.88	BU,BN,BK,GY	11.5 ± 0.4	12563936
4 G 10	37 x 0.43	3.43	3.88	BU,BN,BK,GNYE	11.5 ± 0.4	12564106
5 x 14	19 x 0.37	9.02	2.72	BU,BN,BK,GY,BK	8.7 ± 0.3	12563937
5 G 14	19 x 0.37	9.02	2.72	BU,BN,BK,GY,GNYE	8.7 ± 0.3	12564107
5 x 12	37 x 0.34	5.67	3.21	BU,BN,BK,GY,BK	10.8 ± 0.4	12563938
5 G 12	37 x 0.34	5.67	3.21	BU,BN,BK,GY,GNYE	10.8 ± 0.4	12564108
5 x 10	37 x 0.43	3.43	3.88	BU,BN,BK,GY,BK	12.6 ± 0.4	12563939
5 G 10	37 x 0.34	3.43	3.88	BU,BN,BK,GY,GNYE	12.6 ± 0.4	12564109
6 x 20	19 x 0.20	32.6	1.85	BK, YE num.	7.5 ± 0.3	12568487
18 x 18	19 x 0.25	21.3	2.10	BK, YE num.	12.6 ± 0.4	12568185

* abbreviations for core colours see page 154

Notes

RADOX® UL4486 / CSA AWM I/II A/B

Multi core cable – screened – halogen free – 300 V



- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- easy to strip and process
- flame retardant
- in case of fire no corrosive gases and low smoke emission
- flexible

Application
Permanent installation indoor and outdoor for the connection of fixed and loose parts.

Composition of cable

① Cores:	
Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
Insulation	RADOX® 125
Core colours	various, on request
② Fillers (optional)	RADOX®
③ Screen	tin plated copper braid
④ Separator	plastic tape
⑤ Sheath	RADOX® 125M
Colour	grey

Technical data

Voltage rating		300 V AC
Test voltage		2000 V AC
Operating temperature	UL temperature rating	+125 °C
Max. conductor temperature	at short circuit (max. 5s)	+280 °C
Min. operating temperature	flexing	-25 °C
	fixed	-40 °C
Min. bending radius		5 x cable-Ø

RADOX® UL4486 / CSA AWM I/II A/B

Multi core cable – screened – halogen free – 300 V

Standards

Applicance wiring material	CSA C22.2 no. 210.2	AWM I/II A/B 125°C 300 V FT1
Applicance wiring material	UL 758	Style 4486

Fire tests

Flame propagation:		
Vertical of a single cable	CSA C22.2 no. 0.3 cl. 4.11.1	FT1
Horizontal of a single cable	CSA C22.2 no. 0.3 cl. 4.11.2	FT2
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cables	EN 50266-2-4, IEC 60332-3-24	Category C
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	
Flame propagation:		
Horizontal flame propagation of an applicance wire	UL 1581 sec. 1090	
Vertical of a single cable	UL 1581 sec. 1061	
Vertical of a single cable	UL 1581 sec. 1080	VW-1

Approvals

CSA Certificate	1241318
UL File	E63322

RADOX® UL4486 / CSA AWM I/II A/B

Multi core cable – screened – halogen free – 300 V

Extract from our delivery programme (Other cross sections on request.)

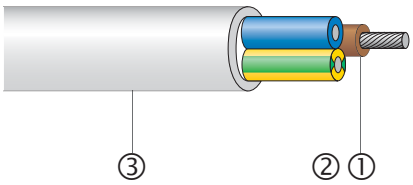
Cross section	Conductor		Core		Screen	Cable	Item no.
nom. n x(G) AWG	Construc. nom. n x mm Ø	R_{20} IEC 60228 max. Ω/km	Ø nom. mm	Colours*	Ø nom. mm	Ø nom. mm	
2 x 20	19 x 0.20	32.6	1.85	BU,BN	4.0	5.9 ± 0.3	12563940
2 x 18	19 x 0.25	21.3	2.10	BU,BN	4.6	6.6 ± 0.3	12563941
2 x 16	19 x 0.31	13.7	2.41	BU,BN	5.3	7.2 ± 0.3	12563942
2 x 14	19 x 0.37	9.02	2.72	BU,BN	6.0	7.9 ± 0.3	12563943
2 x 12	37 x 0.34	5.67	3.21	BU,BN	7.0	8.9 ± 0.3	12563944
3 x 24	19 x 0.12	88.2	1.45	BU,BN,BK	3.7	5.6 ± 0.3	12565389
3 x 20	19 x 0.20	32.6	1.85	BU,BN,BK	4.5	6.4 ± 0.3	12563945
3 G 20	19 x 0.20	32.6	1.85	BU,BN,GNYE	4.5	6.4 ± 0.3	12564110
3 x 18	19 x 0.25	21.3	2.10	BU,BN,BK	5.0	6.9 ± 0.3	12563946
3 G 18	19 x 0.25	21.3	2.10	BU,BN,GNYE	5.0	6.9 ± 0.3	12564111
3 x 16	19 x 0.31	13.7	2.41	BU, BN,BK	5.7	7.6 ± 0.3	12563947
3 G 16	19 x 0.31	13.7	2.41	BU,BN,GNYE	5.7	7.6 ± 0.3	12564112
3 x 14	19 x 0.37	9.02	2.72	BU, BN,BK	6.5	8.3 ± 0.3	12563948
3 G 14	19 x 0.37	9.02	2.72	BU,BN,GNYE	6.5	8.3 ± 0.3	12564113
3 x 12	37 x 0.34	5.67	3.21	BU,BN,BK	7.7	9.6 ± 0.3	12563949
3 G 12	37 x 0.34	5.67	3.21	BU,BN,GNYE	7.7	9.6 ± 0.3	12564114
4 x 24	19 x 0.12	88.2	1.45	WH num.	4.2	6.1 ± 0.3	12565575
4 x 20	19 x 0.20	32.6	1.85	BU,BN,BK,GY	5.2	7.1 ± 0.3	12564504
4 x 18	19 x 0.25	21.3	2.10	BU,BN,BK,GY	5.7	7.6 ± 0.3	12563950
4 G 18	19 x 0.25	21.3	2.10	BU,BN,BK,GNYE	5.7	7.6 ± 0.3	12564115
4 x 16	19 x 0.31	13.7	2.41	BU, BN,BK,GY	6.5	8.4 ± 0.3	12563951
4 G 16	19 x 0.31	13.7	2.41	BU,BN,BK,GNYE	6.5	8.4 ± 0.3	12564116
4 x 14	19 x 0.37	9.02	2.72	BU,BN,BK,GY	7.4	9.3 ± 0.3	12563952
4 G 14	19 x 0.37	9.02	2.72	BU,BN,BK,GNYE	7.4	9.3 ± 0.3	12564117
4 x 12	37 x 0.34	5.67	3.21	BU,BN,BK,GY	8.8	10.7 ± 0.4	12563953
4 G 12	37 x 0.34	5.67	3.21	BU,BN,BK,GNYE	8.8	10.7 ± 0.4	12564118
5 x 14	19 x 0.37	9.02	2.72	BU,BN,BK,GY,BK	8.4	10.4 ± 0.4	12563954
5 G 14	19 x 0.37	9.02	2.72	BU,BN,BK,GY,GNYE	8.4	10.4 ± 0.4	12564119
5 x 12	37 x 0.34	5.67	3.21	BU,BN,BK,GY,BK	9.7	11.6 ± 0.4	12563955
5 G 12	37 x 0.34	5.67	3.21	BU,BN,BK,GY,GNYE	9.7	11.6 ± 0.4	12564120
6 x 28	7 x 0.12	232	1.20	BK,bn,rt,BU,GY,WH	4.4	6.3 ± 0.3	12566635
6 x 20	19 x 0.20	32.6	1.85	BK num.	6.3	8.2 ± 0.3	12564505
6 G 20	19 x 0.20	32.6	1.85	BK num.,GNYE	6.3	8.2 ± 0.3	12564597
8 x 20	19 x 0.20	32.6	1.85	BK num.	7.4	9.3 ± 0.3	12564506
8 G 20	19 x 0.20	32.6	1.85	BK num.,GNYE	7.4	9.3 ± 0.3	12564598
8 x 18	19 x 0.25	21.3	2.10	BK num.	8.5	10.5 ± 0.4	12564507
8 x 16	19 x 0.31	13.7	2.41	BK num.	10.0	12.0 ± 0.4	12564599
3 G 18 + 3 x 2 x 24	19 x 0.25 19 x 0.12	21.3 88.2	2.1 1.45	BU,RD,GNYE,BN, WH,VT,OG,YE,GN	8.7	10.6 ± 0.4	12581568

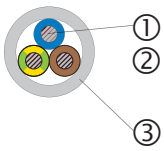
* abbreviations for core colours see page 154

Notes

RADOX® UL4486 / CSA AWM I/II A/B

Multi core cable – halogen free – 600 V





- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- easy to strip and process
- flame retardant
- in case of fire no corrosive gases and low smoke emission
- flexible

Application

Permanent installation indoor and outdoor for the connection of fixed and loose parts.

Composition of cable

①	Cores:	
	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
	Insulation	RADOX® 125
	Core colours	diverse, on request
②	Fillers (optional)	RADOX®
③	Sheath	RADOX® 125M
	Colour	grey

Technical data

Voltage rating		600 V AC
Test voltage		2500 V AC
Max. conductor temperature	in continuous operation	+125 °C
	10'000 h	+130 °C
	3'000 h	+145 °C
	at short circuit (max. 5s)	+ 280 °C
Min. operating temperature	flexing	-25 °C
	fixed	-40 °C
Min. bending radius		5 x cable-Ø

RADOX® UL4486 / CSA AWM I/II A/B

Multi core cable – halogen free – 600 V

Standards

Applicance wiring material	CSA C22.2 no. 210.2	AWM I/II A/B 125°C 300 V FT1
Applicance wiring material	UL 758	Style 4486

Fire tests

Flame propagation:		
Vertical of a single cable	CSA C22.2 no. 0.3 cl. 4.11.1	FT1
Horizontal of a single cable	CSA C22.2 no. 0.3 cl. 4.11.2	FT2
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cables	EN 50266-2-4, IEC 60332-3-24	Category C
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	
Flame propagation:		
Horizontal flame propagation of an applicance wire	UL 1581 sec. 1090	
Vertical of a single cable	UL 1581 sec. 1061	
Vertical of a single cable	UL 1581 sec. 1080	VW-1

Approvals

CSA Certificate	1241318
UL File	E63322

RADOX® UL4486 / CSA AWM I/II A/B

Multi core cable – halogen free – 600 V

Extract from our delivery programme (Other cross sections on request)

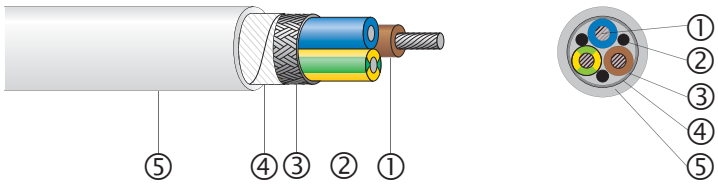
Cross section	Conductor		Core		Cable	Item no.
nom.	Construction nom.	R_{20} IEC 60228	Ø nom.	Colours*	Ø nom.	
n x (G) AWG	n x mm Ø	max. Ω/km	mm		mm	
1 x 2*	266 x 0.40	0.554	11.1	BK	12.9 ± 0.25	12564516
1 G 2*	266 x 0.40	0.554	11.1	GNYE	12.9 ± 0.25	12564515
1 x 1	378 x 0.40	0.385	13.7	BK	16.5 ± 0.3	12564518
1 G 1	378 x 0.40	0.385	13.7	GNYE	16.5 ± 0.3	12564517
1 x 2/0	348 x 0.50	0.271	15.8	BK	18.6 ± 0.3	12564519
1 x 3/0	444 x 0.50	0.206	17.3	BK	20.1 ± 0.3	12564520
2 x 20	19 x 0.20	32.6	2.60	BU,BN	7.0 ± 0.3	12563956
2 x 18	19 x 0.25	21.3	2.85	BU,BN	7.5 ± 0.3	12563957
2 x 16	19 x 0.31	13.7	3.20	BU,BN	8.2 ± 0.3	12563958
2 x 14	19 x 0.37	9.02	3.50	BU,BN	8.8 ± 0.3	12563959
2 x 12	37 x 0.34	5.67	4.00	BU,BN	9.8 ± 0.3	12563960
3 x 20	19 x 0.20	32.6	2.60	BU,BN,BK	7.45 ± 0.3	12563961
3 G 20	19 x 0.20	32.6	2.60	BU,BN,GNYE	7.45 ± 0.3	12564121
3 x 18	19 x 0.25	21.3	2.85	BU,BN,BK	8.0 ± 0.3	12563962
3 G 18	19 x 0.25	21.3	2.85	BU,BN,GNYE	8.0 ± 0.3	12564122
3 x 16	19 x 0.31	13.7	3.20	BU,BN,BK	8.75 ± 0.3	12563963
3 G 16	19 x 0.31	13.7	3.20	BU,BN,GNYE	8.75 ± 0.3	12564123
3 x 14	19 x 0.37	9.02	3.50	BU,BN,BK	9.4 ± 0.3	12563964
3 G 14	19 x 0.37	9.02	3.50	BU,BN,GNYE	9.4 ± 0.3	12564124
3 x 12	37 x 0.34	5.67	4.00	BU,BN,BK	10.6 ± 0.4	12563965
3 G 12	37 x 0.34	5.67	4.00	BU,BN,GNYE	10.6 ± 0.4	12564125
3 G 8	80 x 0.40	1.91	6.40	BK,RD,GNYE	17.0 ± 0.5	12567713
4 G 20	19 x 0.20	33.4	2.60	BU,BK,RD,GNYE	8.3 ± 0.3	12566928
4 x 18	19 x 0.25	21.3	2.85	BU,BN,BK,GY	8.9 ± 0.3	12563966
4 G 18	19 x 0.25	21.3	2.85	BU,BN,BK,GNYE	8.9 ± 0.3	12564126
4 x 16	19 x 0.31	13.7	3.20	BU,BN,BK,GY	9.8 ± 0.3	12563967
4 G 16	19 x 0.31	13.7	3.20	BU,BN,BK,GNYE	9.8 ± 0.3	12564127
4 x 14	19 x 0.37	9.02	3.50	BU,BN,BK,GY	10.5 ± 0.4	12563968
4 G 14	19 x 0.37	9.02	3.50	BU,BN,BK,GNYE	10.5 ± 0.4	12564128
4 x 12	37 x 0.34	5.67	4.00	BU,BN,BK,GY	11.7 ± 0.4	12563969
4 G 12	37 x 0.34	5.67	4.00	BU,BN,BK,GNYE	11.7 ± 0.4	12564129
4 x 10	37 x 0.43	3.43	4.70	BU,BN,BK,GY	13.6 ± 0.4	12563970
4 G 10	37 x 0.43	3.43	4.70	BU,BN,BK,GNYE	13.6 ± 0.4	12564130
4 x 6	119 x 0.40	1.25	8.60	BU,BN,BK,GY	25.9 ± 0.6	12564514
4 G 6	119 x 0.40	1.25	8.60	BU,BN,BK,GNYE	25.9 ± 0.6	12564600
5 x 24	19 x 0.12	88.5	2.22	WH,GN,YE,GY,BN	8.1 ± 0.3	12565927
5 x 16	19 x 0.31	13.7	3.20	BU,BN,BK,GY,BK	10.8 ± 0.4	12564508
5 G 16	19 x 0.31	13.7	3.20	BU,BN,BK,GY,GNYE	10.8 ± 0.4	12564601
5 x 14	19 x 0.37	9.02	3.50	BU,BN,BK,GY,BK	11.7 ± 0.4	12563971
5 G 14	19 x 0.37	9.02	3.50	BU,BN,BK,GY,GNYE	11.7 ± 0.4	12564131
5 x 12	37 x 0.34	5.67	4.00	BU,BN,BK,GY,BK	13.1 ± 0.4	12563972
5 G 12	37 x 0.34	5.67	4.00	BU,BN,BK,GY,GNYE	13.1 ± 0.4	12564132
5 x 10	37 x 0.43	3.43	4.70	BU,BN,BK,GY,BK	16.0 ± 0.5	12563973
5 G 10	37 x 0.34	3.43	4.70	BU,BN,BK,GY,GNYE	16.0 ± 0.5	12564133
6 G 20	19 x 0.20	33.4	2.60	BN,BU,BK,GNYE,WH	9.8 ± 0.3	12566929
7 x 24	19 x 0.12	88.5	2.22	BK,YE num.	9.4 ± 0.3	12581967
9 x 20	19 x 0.20	33.4	2.60	BK,YE num.	12.7 ± 0.4	12567514
10 x 18	19 x 0.25	21.3	2.85	BK,YE num.	13.3 ± 0.4	12565173
8 x 2 x 20	19 x 0.20	33.4	2.60	BK,YE num.	20.7 ± 0.5	12565135
27 G 18	19 x 0.25	21.3	2.85	BK,YE num., GNYE	20.6 ± 0.5	12565136
15 x 2 x 20	19 x 0.20	33.4	2.60	BK,YE num.	26.7 ± 0.6	12568954

* abbreviations for core colours see page 154

Notes

RADOX® UL 4486/CSA AWM I/II A/B

Multi core cable – screened – halogen free – 600 V



- excellent high and low temperature and ozone resistance
- weatherproof
- halogen free
- easy to strip and process
- flame retardant
- in case of fire no corrosive gases and low smoke emission
- flexible

Application

Permanent installation indoor and outdoor for the connection of fixed and loose parts.

Composition of cable

①	Cores:	
	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
	Insulation	RADOX® 125
	Core colours	various, on request
②	Fillers (optional)	RADOX®
③	Screen	tin plated copper braid
④	Separator	plastic tape
⑤	Sheath	RADOX® 125M
	Colour	grey

Technical data

Voltage rating		600 V AC
Test voltage		2500 V AC
Operating temperature	(UL temperature rating)	+125 °C
Max. conductor temperature	at short circuit (max. 5s)	+280 °C
Min. operating temperature	flexing	-25 °C
	fixed	-40 °C
Min. bending radius		5 x cable-Ø

RADOX® UL 4486/CSA AWM I/II A/B

Multi core cable – screened – halogen free – 600 V

Standards

Applicance wiring material	CSA C22.2 no. 210.2	AWM I/II A/B 125°C 300 V FT1
Applicance wiring material	UL 758	Style 4486

Fire tests

Flame propagation:		
Vertical of a single cable	CSA C22.2 no. 0.3 cl. 4.11.1	FT1
Horizontal of a single cable	CSA C22.2 no. 0.3 cl. 4.11.2	FT2
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cables	EN 50266-2-4, IEC 60332-3-24	Category C
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	
Flame propagation:		
Horizontal flame propagation of an applicance wire	UL 1581 sec. 1090	
Vertical of a single cable	UL 1581 sec. 1061	
Vertical of a single cable	UL 1581 sec. 1080	VW-1

Approvals

CSA Certificate	1241318
UL File	E63322

RADOX® UL 4486/CSA AWM I/II A/B

Multi core cable – screened – halogen free – 600 V

Extract from our delivery programme

Cross section	Conductor		Core		Screen	Cable	Item no.
nom.	Construct. nom.	R_{20} IEC 60228	Ø nom.	Colours*	Ø nom.	Ø	
n x (G) AWG	n x mm Ø	max. Ω/km	mm		mm	mm	
1 x 2*	266 x 0.40	0.554	11.1	BK	12.2	14.1 ± 0.3	12565208
1 G 2*	266 x 0.40	0.554	11.1	GNYE	12.2	14.1 ± 0.3	12565207
1 x 1	378 x 0.40	0.385	13.7	BK	14.8	17.7 ± 0.3	12564525
1 G 1	378 x 0.40	0.385	13.7	GNYE	14.8	17.7 ± 0.3	12564524
1 x 2/0	348 x 0.50	0.271	15.8	BK	16.9	19.8 ± 0.3	12565210
1 x 3/0	444 x 0.50	0.206	17.3	BK	18.4	22.8 ± 0.3	12564526
1 x 4/0	551 x 0.50	0.164	19.2	BK	20.5	25.0 ± 0.3	12564527
2 x 22	19 x 0.16	54.7	2.4	WH num.	5.4	7.3 ± 0.3	12565572
2 x 20	19 x 0.20	32.6	2.60	BU, BN	5.7	7.6 ± 0.3	12563974
2 x 18	19 x 0.25	21.3	2.85	BU, BN	6.3	8.2 ± 0.3	12563975
2 x 16	19 x 0.31	13.7	3.10	BU, BN	7.0	8.9 ± 0.3	12563976
2 x 14	19 x 0.37	9.02	3.50	BU, BN	7.7	9.6 ± 0.3	12563977
2 x 12	37 x 0.34	5.67	4.00	BU, BN	8.7	10.7 ± 0.4	12563978
2 x 8	80 x 0.40	1.96	6.40	BU, BN	13.8	16.8 ± 0.5	12568351
3 x 20	19 x 0.20	32.6	2.60	BU, BN, BK	6.2	8.1 ± 0.3	12563979
3 G 20	19 x 0.20	32.6	2.60	BU, BN, GNYE	6.2	8.1 ± 0.3	12564134
3 x 18	19 x 0.25	21.3	2.85	BU, BN, BK	6.7	8.6 ± 0.3	12563980
3 x 18	19 x 0.25	21.3	2.85	BK, YE num.	6.7	8.6 ± 0.3	12565248
3 G 18	19 x 0.25	21.3	2.85	BU, BN, GNYE	6.7	8.6 ± 0.3	12564135
3 x 16	19 x 0.31	13.7	3.10	BU, BN, BK	7.5	9.4 ± 0.3	12563981
3 G 16	19 x 0.31	13.7	3.10	BU, BN, GNYE	7.5	9.4 ± 0.3	12564136
3 x 14	19 x 0.37	9.02	3.50	BU, BN, BK	8.3	10.3 ± 0.4	12563982
3 G 14	19 x 0.37	9.02	3.50	BU, BN, GNYE	8.3	10.3 ± 0.4	12564137
3 x 12	37 x 0.34	5.67	4.00	BU, BN, BK	9.4	11.3 ± 0.4	12563983
3 G 12	37 x 0.34	5.67	4.00	BU, BN, GNYE	9.4	11.3 ± 0.4	12564138
3 x 8	80 x 0.40	1.96	6.40	BK, YE num.	15.1	18.2 ± 0.5	12565822
3 G 8	80 x 0.40	1.96	6.40	BU, BN, GNYE	15.1	18.2 ± 0.5	12581865

* abbreviations for core colours see page 154

Other cross sections on request.

RADOX® UL 4486/CSA AWM I/II A/B

Multi core cable – screened – halogen free – 600 V

Extract from our delivery programme – continuation

Cross section	Conductor		Core		Screen	Cable	Item no.
nom.	Construct. nom.	R_{20} IEC 60228	Ø nom.	colours*	Ø nom.	Ø	
n x (G) AWG	n x mm Ø	max. Ω/km	mm		mm	mm	
4 x 22	19 x 0.16	54.7	2.4	WH num.	6.6	8.5 ± 0.3	12565574
4 x 18	19 x 0.25	21.3	2.85	BU, BN, BK, GY	7.8	9.7 ± 0.3	12563984
4 x 18	19 x 0.25	21.3	2.85	BK, YE num.	7.8	9.7 ± 0.3	12565247
4 G 18	19 x 0.25	21.3	2.85	BU, BN, BK, GNYE	7.8	9.7 ± 0.3	12564139
4 x 16	19 x 0.31	13.7	3.10	BU, BN, BK, GY	8.7	10.7 ± 0.4	12563985
4 G 16	19 x 0.31	13.7	3.10	BU, BN, BK, GNYE	8.7	10.7 ± 0.4	12564140
4 x 14	19 x 0.37	9.02	3.50	BU, BN, BK, GY	9.3	11.3 ± 0.4	12563986
4 G 14	19 x 0.37	9.02	3.50	BU, BN, BK, GNYE	9.3	11.3 ± 0.4	12564141
4 G 14	19 x 0.37	9.02	3.50	BK, YE num. GNYE	9.3	11.3 ± 0.4	12565206
4 x 12	37 x 0.34	5.67	4.00	BU, BN, BK, GY	10.7	12.7 ± 0.4	12563987
4 G 12	37 x 0.34	5.67	4.00	BU, BN, BK, GNYE	10.7	12.7 ± 0.4	12564142
4 G 12	37 x 0.34	5.67	4.00	BK, YE num. GNYE	10.7	12.7 ± 0.4	12565246
4 G 10	37 x 0.43	3.43	4.70	BK, YE num., GNYE	12.8	15.9 ± 0.5	12565245
4 G 8	80 x 0.40	1.96	6.40	BK, YE num., GNYE	17.1	20.2 ± 0.5	12565244
4 x 6	119 x 0.40	1.25	8.60	BU, BN, BK, GY	22.5	27.3 ± 0.6	12565176
4 G 6	119 x 0.40	1.25	8.60	BK, YE num., GNYE	22.5	27.3 ± 0.6	12565204
4 x 4	182 x 0.40	0.798	9.90	BU, BN, BK, GY	25.6	30.4 ± 0.6	12564523
4 G 4	182 x 0.40	0.798	9.90	BU, BN, BK, GNYE	25.6	30.4 ± 0.6	12564602
4 G 4	182 x 0.40	0.798	9.90	BK, YE num., GNYE	25.6	30.4 ± 0.6	12565241
5 x 18	19 x 0.25	21.3	2.85	BU, BN, BK, GY, BK	8.7	10.7 ± 0.4	12565175
5 x 18	19 x 0.25	21.3	2.85	BK, YE num.	8.7	10.7 ± 0.4	12565202
5 x 14	19 x 0.37	9.02	3.50	BU, BN, BK, GY, BK	10.7	12.7 ± 0.4	12563988
5 G 14	19 x 0.37	9.02	3.50	BU, BN, BK, GY, GNYE	10.7	12.7 ± 0.4	12564143
5 x 12	37 x 0.34	5.67	4.00	BU, BN, BK, GY, BK	12.1	14.0 ± 0.4	12563989
5 G 12	37 x 0.34	5.67	4.00	BU, BN, BK, GY, GNYE	12.1	14.0 ± 0.4	12564144
6 x 14	19 x 0.37	9.02	3.50	BK, YE num.	11.5	13.4 ± 0.4	12581542
4 x 18+ 2 x 22	19 x 0.25 19 x 0.16	21.3 54.7	2.85 2.4	WH num.	9.2	11.2 ± 0.4	12565573
12 G 16	19 x 0.31	13.7	3.10	BK, YE num., GNYE	14.0	17.1 ± 0.5	12568520
12 G 14	19 x 0.37	9.02	3.50	BK, YE num., GNYE	15.7	18.8 ± 0.5	12568522
25 G 16	19 x 0.31	13.7	3.10	BK, YE num., GNYE	20.2	24.8 ± 0.5	12568521
25 G 14	19 x 0.37	9.02	3.50	BK, YE num., GNYE	22.9	27.6 ± 0.6	12568523
30 G 14	19 x 0.37	9.02	3.50	BK, YE num., GNYE	23.9	28.7 ± 0.6	12568524

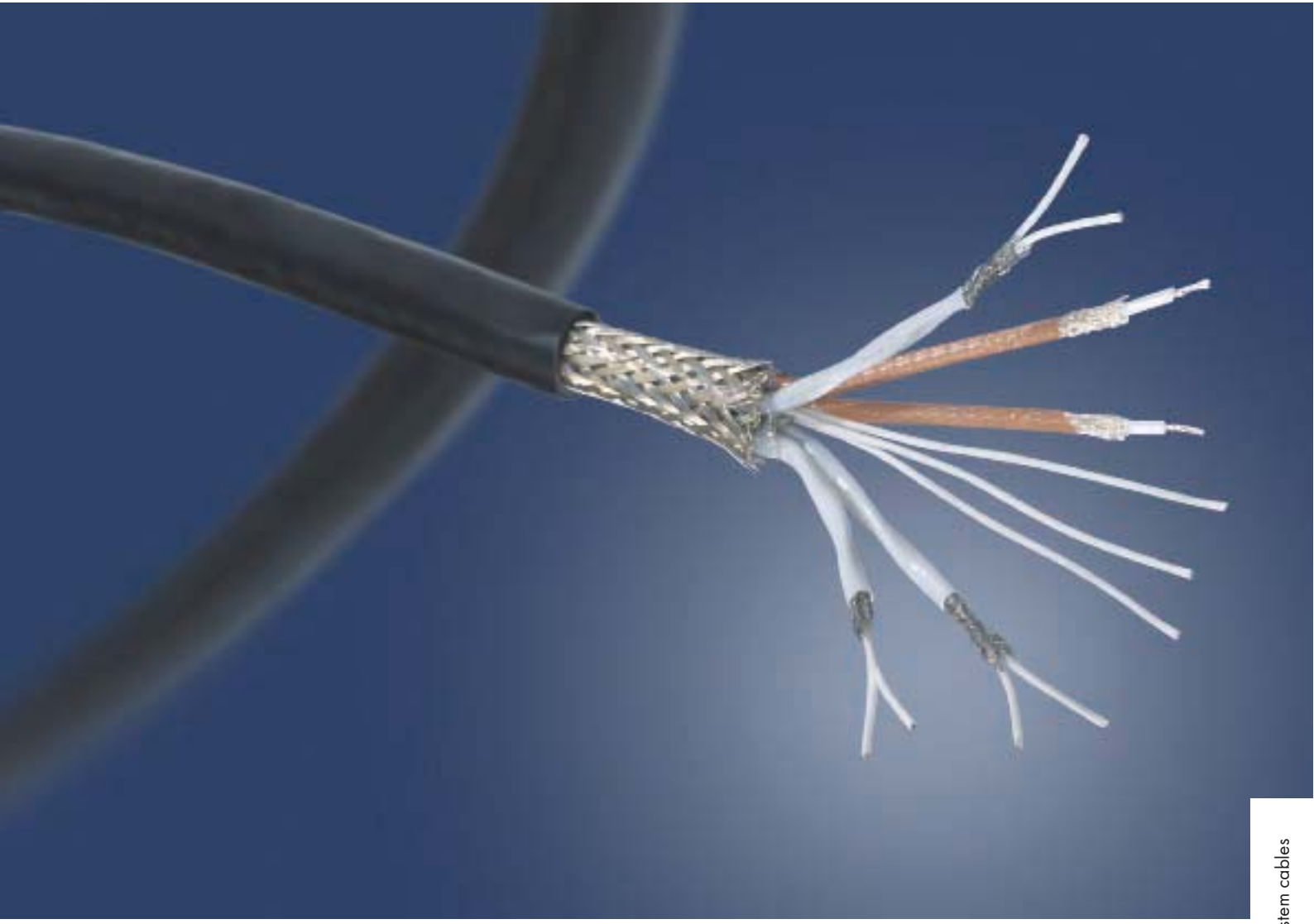
* abbreviations for core colours see page 154.

Other cross sections on request.

RADOX® System cables

Single cores, single core cables, multi core cables and wires

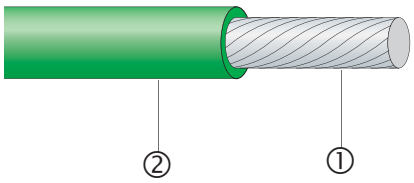
All our cables fully comply with the European directives 76/769/EWG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2002/95/EG (RoHS).

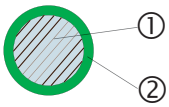


- halogen free, flame retardant
- excellent chemical and mechanical resistance
- flexible, easy to process, soldering resistant
- temperature range –40 °C bis +120 °C
- voltage rating 600 V AC
- dimensions according to MIL–W–81044/12
- easy to strip, easy to process

MA 12 A1

System element





- halogen free
- easy to process
- high media and abrasion resistance
- excellent resistance to high and low temperatures
- flame retardant
- high resistance to heat pressure

Application
Dry and protected, flexible and fixed installation inside electrical equipment, elements of control and supply cables and system cables.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	Multi A-12 polyester, extruded polyster
Colours	various, on request

Technical data

Voltage rating U_o/U		600 V AC
Test voltage		3000 V AC
Temperature range		-40 °C up to +120 °C
Min. bending radius		3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MA 12 A1

System element

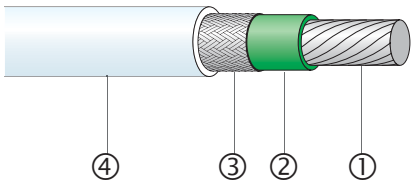
Extract from our delivery programme

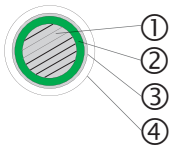
Cross section		Conductor			Core	Weight
nom.		Construction nom.	Ø max.	R_{20} MIL-W-81044/12	Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
28	0.09	7 x 0.13	0.40	225.0	0.76 ± 0.05	0.10
26	0.15	19 x 0.10	0.51	135.5	0.87 ± 0.05	0.17
24	0.25	19 x 0.13	0.61	85.96	1.02 ± 0.05	0.30
22	0.38	19 x 0.16	0.79	53.15	1.19 ± 0.05	0.43
20	0.60	19 x 0.20	0.99	32.42	1.40 ± 0.05	0.65
18	0.93	19 x 0.25	1.23	20.44	1.66 ± 0.05	0.95
16	1.25	19 x 0.29	1.40	15.78	1.83 ± 0.05	1.30
14	1.93	19 x 0.35	1.64	10.04	2.27 ± 0.08	1.86
12	2.97	37 x 0.32	2.24	6.63	2.75 ± 0.08	2.87
10	4.74	37 x 0.40	2.77	4.14	3.53 ± 0.1	4.76
--	0,5	19 x 0.18	0.91	40.1	1.29 ± 0.05	0.52
--	1,5	37 x 0.22	1.57	13.7	2.10 ± 0.05	1.52
--	2,5	37 x 0.29	1.97	8.21	2.55 ± 0.08	2.37
--	4,0	56 x 0.30	2.50	5.09	3.10 ± 0.15	3.80
--	6,0	84 x 0.30	2.98	3.39	3.65 ± 0.15	5.90

Other cross sections on request.

MA 12 E1

Single core – screened





- halogen free
- easy to process
- high media and abrasion resistance
- excellent resistance to high and low temperatures
- flame retardant
- high resistance to heat pressure
- constructions and dimensions acc. to NEMA WC 27500

Application
Dry and protected, flexible and fixed installation inside electrical equipment, elements of control and supply cables and system cables.

Composition of cable

①	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
②	Insulation	Multi A-12 polyester, extruded polyster
	Core colours	white or blue
③	EMV screen	optimised
④	Sheath	Multi A-12 polyester
	Colour	white

Technical data

Voltage rating U_o/U	600 V AC
Test voltage	2500 V AC
Temperature range	-40 °C up to +120 °C
Transfer impedance up to 30 MHz	250 m Ω/m
Min. bending radius	3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MA 12 E1

Single core – screened

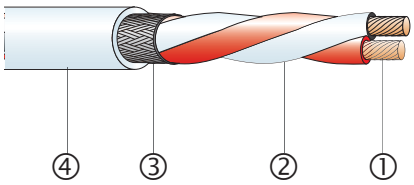
Extract from our delivery programme

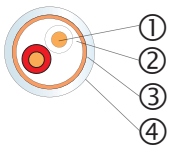
Cross section		Conductor			Core		Gewicht
nom.		Construction nom.	max. Ø	R_{20} IEC 60228	Ø	Outer-Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	mm	kg/100 m
26	0.15	19 x 0.10	0.51	135.5	0.87 ± 0.05	1.65 ± 0.1	0.17
24	0.25	19 x 0.13	0.61	85.96	1.02 ± 0.05	1.90 ± 0.1	0.30
22	0.38	19 x 0.16	0.79	53.15	1.19 ± 0.05	2.05 ± 0.1	0.43
20	0.60	19 x 0.20	0.99	32.42	1.40 ± 0.05	2.30 ± 0.1	0.65
18	0.93	19 x 0.25	1.23	20.44	1.66 ± 0.05	2.50 ± 0.1	0.95
16	1.25	19 x 0.29	1.40	15.78	1.83 ± 0.05	2.70 ± 0.1	1.30
14	1.93	37 x 0.26	1.80	10.04	2.27 ± 0.08	3.15 ± 0.1	1.97
12	2.97	37 x 0.32	2.24	6.63	2.75 ± 0.08	3.60 ± 0.1	2.87

Other cross sections on request.

MA 12 E2

Screend pair





- halogen free
- easy to process
- high media and abrasion resistance
- excellent resistance to high and low temperatures
- flame retardant
- high resistance to heat pressure
- constructions and dimensions acc. to NEMA WC 27500

Application
Dry and protected, flexible and fixed installation inside electrical equipment, elements of control and supply cables and system cables.

Composition of cable

①	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
②	Insulation	Multi A-12 polyester, extruded polyester
	Core colours	white/blue, white/red, white/black, white/green
		two cores twisted
③	EMV screen	optimised
④	Sheath	Multi A-12 polyester
	Colour	white

Technical data

Voltage rating U_o/U	600 V AC
Test voltage	2500 V AC
Temperature range	-40 °C up to +120 °C
Transfer impedance up to 30 MHz	250 m Ω/m
Min. bending radius	3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MA 12 E2

Screend pair

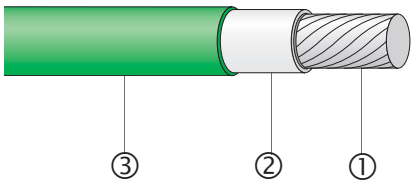
Extract from our delivery programme

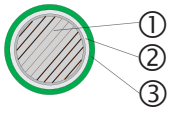
Cross section		Conductor			Core		Weight
nom.		Construction nom.	Ø max.	R_{20} IEC 60228	Ø	Outer-Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	mm	kg/100 m
2x26	0.15	19 x 0.10	0.51	138.5	0.87 ± 0.05	2.60 ± 0.1	0.94
2x24	0.25	19 x 0.13	0.61	87.9	1.02 ± 0.05	2.85 ± 0.1	1.33
2x22	0.38	19 x 0.16	0.79	54.4	1.19 ± 0.05	3.15 ± 0.1	1.71
2x20	0.60	19 x 0.20	0.99	33.2	1.40 ± 0.05	3.60 ± 0.1	2.14
2x18	0.93	19 x 0.25	1.23	20.9	1.66 ± 0.05	4.30 ± 0.1	3.38

Other cross sections on request.

MA 14 A1

Single core





- halogen free
- easy to process
- high media and abrasion resistance
- excellent resistance to high and low temperatures
- flame retardant
- high resistance to heat pressure
- constructions and dimensions acc. to MIL-W-81044

Application
Protected, flexible and fixed installation inside electrical equipment, elements of control and supply cables and system cables.

Composition of cable

①	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
②	Insulation 1	high tech polymer
③	Insulation 2	aromatic polymer
	Colours	various, on request

Technical data

Voltage rating U_o/U		600 V AC
Test voltage		2500 V AC
Temperature range		-40 °C up to +140 °C
Min. bending radius		3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MA 14 A1

Single core

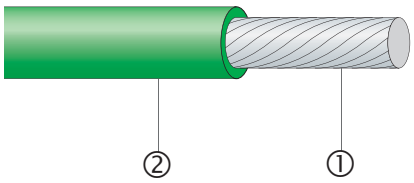
Extract from our delivery programme

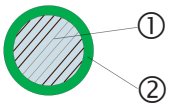
Cross section		Conductor			Core	Weight
nom.		Construction nom.	Ø max.	R_{20} MIL-W-81044/12	Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
26	(0.15)	19 x 0.10	0.51	135.5	0.87 ± 0.02	0.18
24	(0.25)	19 x 0.13	0.61	85.96	1.02 ± 0.02	0.30
22	(0.38)	19 x 0.16	0.77	53.15	1.18 ± 0.02	0.43
20	(0.60)	19 x 0.20	0.99	32.42	1.39 ± 0.02	0.65
18	(0.93)	19 x 0.25	1.23	20.44	1.67 ± 0.03	0.95
16	(1.25)	19 x 0.29	1.40	15.78	1.83 ± 0.03	1.30
14	(1.96)	37 x 0.26	1.74	10.8	2.29 ± 0.04	1.97
12	(2.97)	37 x 0.32	2.22	6.63	2.78 ± 0.04	2.87
--	0.50	19 x 0.18	0.91	40.1	1.30 ± 0.02	0.53
--	0.75	19 x 0.22	1.12	26.7	1.52 ± 0.03	0.79
--	1.00	19 x 0.25	1.23	20.0	1.67 ± 0.03	0.94
--	1.50	37 x 0.22	1.57	13.7	2.04 ± 0.04	1.48
--	2.50	37 x 0.29	1.97	8.21	2.54 ± 0.04	2.36

Other cross sections on request.

MIL 5932 A1

Single core





- easy to process
- resistant to oils, fuels, lubricants, alkaline solutions and acids
- notch and abrasion resistant
- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- high resistance to heat pressure
- high media and abrasion resistance
- constructions and dimensions acc. to MIL-W-22759

Application
Protected, flexible and fixed installation inside electrical equipment, elements of control and supply cables and system cables.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	ETFE-X, extruded fluorcarbon, electron beam crosslinked
Colours	various, on request

Technical data

Voltage rating U_o/U		600 V AC
Test voltage		2500 V AC
Temperature range		-65 °C up to +150 °C
Min. bending radius		3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MIL 5932 A1

Single core

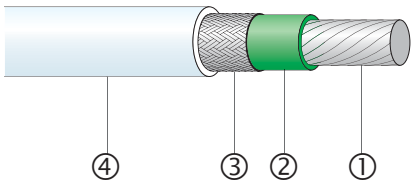
Extract from our delivery programme

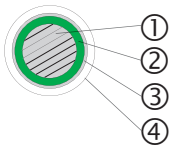
Cross section		Conductor			Core	Weight
nom.		Construction nom.	Ø max.	R_{20} MIL-W-81044/12	Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
26	0.15	19 x 0.10	0.51	135.5	0.81 ± 0.05	0.21
24	0.25	19 x 0.13	0.61	85.96	0.94 ± 0.05	0.30
22	0.38	19 x 0.16	0.77	53.15	1.09 ± 0.05	0.42
20	0.60	19 x 0.20	0.99	32.42	1.27 ± 0.05	0.64
18	0.93	19 x 0.25	1.23	20.44	1.52 ± 0.05	0.97
16	1.25	19 x 0.28	1.40	15.78	1.73 ± 0.05	1.25
14	1.93	19 x 0.35	1.68	10.04	2.16 ± 0.08	1.95
12	2.97	37 x 0.32	2.22	6.63	2.62 ± 0.08	2.95

Other cross sections on request.

MIL 5932 E1

Single core – screened





- easy to process
- resistant to oils, fuels, lubricants, alkaline solutions and acids
- notch and abrasion resistant
- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- high resistance to heat pressure
- high media and abrasion resistance
- constructions and dimensions acc. to MIL-W-22759

Application
Protected, flexible and fixed installation inside electrical equipment, elements of control and supply cables and system cables.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	ETFE-X, extruded fluorcarbon, electron beam crosslinked
Core colours	various, on request
③ EMV screen	optimised
④ Sheath	ETFE-X, extruded fluorcarbon, electron beam crosslinked
Colour	white

Technical data

Voltage rating U_o/U	600 V AC
Test voltage	2500 V AC
Temperature range	-55 °C up to +150 °C
Min. bending radius	3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MIL 5932 E1

Single core – screened

Extract from our delivery programme

Cross section		Conductor			Core		Weight
nom.		nom.	Ø max.	R_{20} IEC 60228	Ø	Outer-Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	mm	kg/100 m
26	0.15	19 x 0.10	0.50	135.5	0.81 ± 0.05	1.64 ± 0.12	0.17
24	0.25	19 x 0.13	0.60	85.96	0.94 ± 0.05	1.76 ± 0.12	0.30
22	0.38	19 x 0.16	0.76	53.15	1.09 ± 0.05	1.90 ± 0.12	0.43
20	0.60	19 x 0.20	0.96	32.42	1.27 ± 0.05	2.09 ± 0.15	0.65
18	0.93	19 x 0.25	1.20	20.44	1.52 ± 0.05	2.35 ± 0.15	0.95
16	1.25	19 x 0.28	1.36	15.78	1.73 ± 0.05	2.55 ± 0.15	1.30

Other cross sections on request.

MIL 5932/34 E2, E3, E4

Screened system element

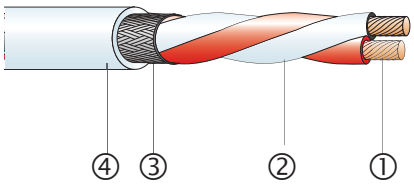
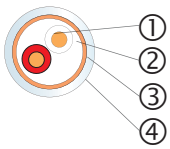


Figure shows MIL 5932 E2



- easy to process
- resistant to oils, fuels, lubricants, alkaline solutions and acids
- notch and abrasion resistant
- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- high resistance to heat pressure

Application
For applications inside electrical equipment and for control and supply cables.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	ETFE-X, extruded fluorcarbon, electron beam crosslinked
Core colours	various, on request
	two cores twisted
③ EMV screen	optimised
④ Sheath	ETFE-X, extruded fluorcarbon, electron beam crosslinked
Colour	white

Technical data

Voltage rating U_o/U	600 V AC
Test voltage	2500 V AC
Temperature range	-55 °C up to +150 °C
Min. bending radius	3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MIL 5932/34 E2, E3, E4

Screened system element

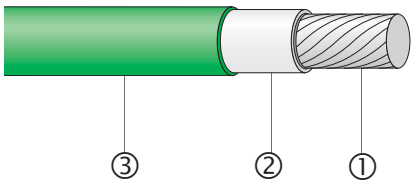
Extract from our delivery programme

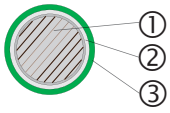
Cross section		Conductor			Core		Weight
nom.		Construction nom.	Ø max.	R_{20} IEC 60228	Ø	Outer-Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	mm	kg/100 m
26	0.15	19 x 0.10	0.51	140.0	0.81 ± 0.05	2.45 ± 0.12	1.1
24	0.25	19 x 0.12	0.61	88.5	0.94 ± 0.05	2.70 ± 0.12	1.3
22	0.38	19 x 0.16	0.77	54.7	1.09 ± 0.05	2.98 ± 0.12	1.7
20	0.60	19 x 0.20	0.99	33.4	1.27 ± 0.05	3.36 ± 0.12	2.2
18	0.96	19 x 0.25	1.23	21.1	1.52 ± 0.05	3.87 ± 0.12	3.0
16	1.2	19 x 0.29	1.40	14.9	1.73 ± 0.05	4.34 ± 0.13	3.7
14	1.94	19 x 0.36	1.68	10.3	2.15 ± 0.05	5.20 ± 0.13	5.4

Other cross sections on request.

MIL 4412 A1

Single core





- flame retardant
- easy to process
- high media and abrasion resistance
- excellent high and low temperature and ozone resistance
- weatherproof
- constructions and dimensions acc. to MIL-W-81044

Application
For protected installations inside electrical equipment, elements of control and supply cables and system cables.

Composition of cable

① Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation 1	polyalken, extruded polyalken, electron beam crosslinked
③ Insulation 2	XLPVDF, extruded polyvinylidenfluorid, electron beam crosslinked
Core colours	various, on request

Technical data

Voltage rating U_o/U		600 V AC
Test voltage		2500 V AC
Temperature range		-65 °C up to +150 °C
Min. bending radius		3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MIL 4412 A1

Single core

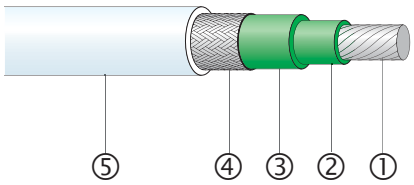
Extract from our delivery programme

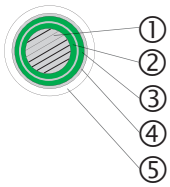
Cross section		Conductor			Core	Weight
nom.		Construction nom.	Ø max.	R_{20} MIL-W-81044/12	Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	kg/100 m
28	0.09	7 x 0.13	0.40	225.1	0.76 ± 0.05	0.13
26	0.15	19 x 0.10	0.51	135.5	0.87 ± 0.05	0.19
24	0.25	19 x 0.13	0.61	85.96	1.02 ± 0.05	0.30
22	0.38	19 x 0.16	0.77	53.15	1.18 ± 0.05	0.43
20	0.60	19 x 0.20	0.99	32.42	1.40 ± 0.05	0.65
18	0.93	19 x 0.25	1.23	20.44	1.66 ± 0.05	0.95
16	1.25	19 x 0.29	1.40	15.78	1.83 ± 0.05	1.30
14	1.93	19 x 0.36	1.68	10.04	2.27 ± 0.08	1.97
12	2.97	37 x 0.32	2.22	6.63	2.75 ± 0.08	2.87

Other cross sections on request.

MIL 4412 E1

Single core – screened





- flame retardant
- easy to process
- high media and abrasion resistance
- excellent high and low temperature and ozone resistance
- weatherproof
- constructions and dimensions acc. to NEMA WC 27500

Application
For protected installations inside electrical equipment, elements of control and supply cables and system cables.

Composition of cable

①	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
②	Insulation 1	polyalken, extruded polyalken, electron beam crosslinked
③	Insulation 2	XLPVDF, extruded polyvinylidenfluorid, electron beam crosslinked
	Core colours	various, on request
④	EMV screen	optimised
⑤	Sheath	XLPVDF, electron beam crosslinked
	Colour	white

Technical data

Voltage rating U_o/U	600 V AC
Test voltage	2500 V AC
Temperature range	–55 °C up to +150 °C
Transfer impedance up to 30 MHz	250 mΩ/m
Min. bending radius	3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MIL 4412 E1

Single core – screened

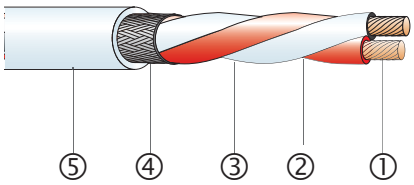
Extract from our delivery programme

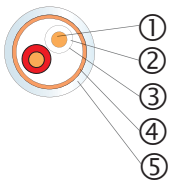
Cross section		Conductor			Core		Weight
nom.		Construction nom.	Ø max.	R_{20} IEC 60228	Ø	Outer-Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	mm	kg/100 m
26	0.15	19 x 0.10	0.51	135.5	0.87 ± 0.05	1.65 ± 0.1	0.17
24	0.25	19 x 0.13	0.61	85.96	1.02 ± 0.05	1.90 ± 0.1	0.30
22	0.38	19 x 0.16	0.79	53.15	1.19 ± 0.05	2.05 ± 0.1	0.43
20	0.60	19 x 0.20	0.99	32.42	1.40 ± 0.05	2.30 ± 0.1	0.65
18	0.93	19 x 0.25	1.23	20.44	1.66 ± 0.05	2.50 ± 0.1	0.95
16	1.25	19 x 0.29	1.40	15.78	1.83 ± 0.05	2.70 ± 0.1	1.30
14	1.93	19 x 0.36	1.80	10.04	2.27 ± 0.08	3.15 ± 0.1	1.97
12	2.97	37 x 0.32	2.24	6.63	2.75 ± 0.08	3.60 ± 0.1	2.87

Other cross sections on request.

MIL 4412 E2

Screened pair





- easy to process
- high resistance to heat pressure
- high chemical and abrasion resistance
- excellent high and low temperature and ozone resistance
- weatherproof
- flame retardant
- constructions and dimensions acc. to NEMA WC 27500

Application
For protected installation inside electrical equipment, elements of control and supply cables and system cables.

Composition of cable

①	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
②	Insulation 1	polyalken, extruded polyalken, electron beam crosslinked
③	Insulation 2	XLPVDF, extruded polyvinylidenfluorid, electron beam crosslinked
	Core colours	various, on request
		two cores twisted
④	EMVscreen	optimised
⑤	Sheath	XLPVDF, electron beam crosslinked
	Colour	white

Technical data

Voltage rating U_o/U	600 V AC
Test voltage	2500 V AC
Temperature range	–55 °C up to +150 °C
Transfer impedance up to 30 MHz	200 mΩ/m
Min. bending radius	3 x core-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g

MIL 4412 E2

Screened pair

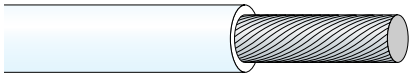
Extract from our delivery programme

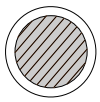
Cross section		Conductor			Core		Weight
nom.		Construction nom.	Ø max.	R_{20} IEC 60228	Ø	Outer-Ø	nom.
AWG	mm^2	n x mm Ø	mm	max. Ω/km	mm	mm	kg/100 m
2 x 26	0.15	19 x 0.10	0.51	138.5	0.87 ± 0.05	2.60 ± 0.1	0.94
2 x 24	0.25	19 x 0.13	0.61	87.9	1.02 ± 0.05	2.85 ± 0.1	1.33
2 x 22	0.38	19 x 0.16	0.79	54.4	1.19 ± 0.05	3.15 ± 0.1	1.71
2 x 20	0.60	19 x 0.20	0.99	33.2	1.40 ± 0.05	3.60 ± 0.1	2.14
2 x 18	0.93	19 x 0.25	1.23	20.9	1.66 ± 0.05	4.30 ± 0.1	3.38

Other cross sections on request.

VG 95218 T020

Type A and type G





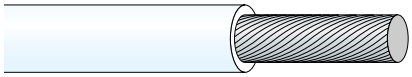
- temperature range
  –55 °C up to +150 °C
- resistant to oils, fuels, lubricants, alkaline solutions and acids
- notch and abrasion resistant
- small outer diameter, low weight
- flame retardant, self-extinguishing
- easy to strip
- easy to process
- soldering resistant

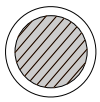
Application
Wiring of electrical/electronic systems, for system cables in defence, aircraft, sensor systems, instrumentation, motors, transformers and industrial automation.

Cross section from to	type A	0.25 – 16 mm^2
	type G	1.5 – 95 mm^2
Insulation material	type A	ETFE
	type G	polyolefin–X
Voltage rating U_o/U	600 V AC	
Number of conductors	1	
Conductor class	VG 95218/BWB specification	
Jacket	–	

VG 95218 T020

Type E and type F





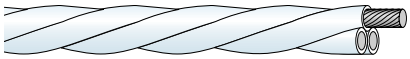
- temperature range
  –55 °C up to +105 °C
- resistant to oils, fuels, lubricants, alkaline solutions and acids
- notch and abrasion resistant
- small outer diameter, low weight
- flame retardant, self-extinguishing
- easy to strip
- easy to process
- soldering resistant

Application
Wiring of electrical/electronic systems, for system cables in defence, aircraft, sensor systems, instrumentation, motors, transformers and industrial automation.

Cross section from to	type E	0.15 – 3 mm^2
	type F	0.15 – 95 mm^2
Insulation material	type E	high tech polymer/aromatic p.
	type F	polyolefin–X
Voltage rating U_o/U	600 V AC	
Number of conductors	1	
Conductor class	VG 95218/BWB specification	
Jacket	–	

VG 95218 T021

Type C and type E



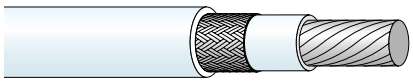
- type C acc. to T020 type E
- type E acc. to T020 type A

Application
Wiring of electrical/electronic systems, for system cables in defence, aircraft, sensor systems, instrumentation, motors, transformers and industrial automation.

Cross section from to		0.25 – 3 mm^2
Insulation material	type C	high tech polymer/aromatic p.
	type G	Polyolefin-X
Voltage rating U_o/U	600 V AC	
Number of conductors	2 – 4	
Conductor class	VG 95218/BWB specification	
Jacket	–	

VG 95218 T022

Type C screened



- temperature range
  –55 °C up to +150 °C
- resistant to oils, fuels, lubricants, alkaline solutions and acids
- notch and abrasion resistant
- small outer diameter, low weight
- flame retardant, self-extinguishing
- easy to strip
- easy to process
- soldering resistant

Application
Wiring of electrical/electronic systems, for system cables in defence, aircraft, sensor systems, instrumentation, motors, transformers and industrial automation.

Cross section from to	0.25 – 2.5 mm^2
Insulation material	ETFE
Voltage rating U_o/U	600 V AC
Number of conductors	1
Conductor class	VG 95218/BWB specification
Separator	EMV screening
Jacket	ETFE

VG 95218 T023

Type F, multi core screened

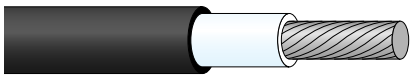
- temperature range –55 °C up to +150 °C
- resistant to oils, fuels, lubricants, alkaline solutions and acids
- notch and abrasion resistant
- small outer diameter, low weight
- flame retardant, self-extinguishing
- easy to strip
- easy to process
- soldering resistant

Application
Wiring of electrical/electronic systems, for system cables in defence, aircraft, sensor systems, instrumentation, motors, transformers and industrial automation.

Cross section from to	0.25 – 3.0 mm^2
Insulation material	ETFE
Voltage rating U_o/U	600 V AC
Number of conductors	2 – 7
Conductor class	VG 95218/BWB specification
Separator	EMV screening
Jacket	ETFE

VG 95218 T024

Type K



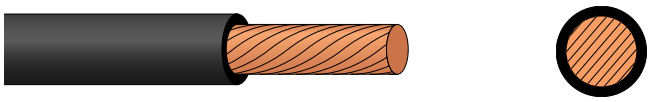
- temperature range –40 °C up to +150 °C
- weatherproof
- resistant to mineral oils and fuels
- high abrasion resistance
- flame resistant, self-extinguishing
- non-melting
- flexible
- system compatibility with heat shrink parts according to VG 95343 part 14

Application
System cables in defence, aircraft, sensor systems and instrumentation.

Cross section from to	1.5 – 95 mm^2
Insulation material	RADOX®
Voltage rating U_0/U	600 V AC
Number of conductors	1
Conductor class	VG 95218/BWB specification
Separator	–
Jacket	RADOX® elastomer S

VG 95218 T025

Type G, high flexible



- temperature range
  –40 °C up to +150 °C
- weatherproof
- resistant to mineral oils and fuels
- high abrasion resistance
- flame resistant, self-extinguishing
- non-melting
- flexible
- system compatibility with heat shrink parts according to VG 95343 part 14

Application
System cables in defence, sensor systems, instrumentation and ground wires.

Cross section from to	10 – 240 mm^2
Insulation material	RADOX® elastomer S
Voltage rating U_o/U	600 V AC
Number of conductors	1
Conductor class	VG 95218/BWB specification, plain

VG 95218 T027

Type B, multi core

- temperature range –40 °C up to +150 °C
- weatherproof
- resistant to mineral oils and fuels
- high abrasion resistance
- flame resistant, self-extinguishing
- non-melting
- flexible
- system compatibility with heat shrink parts according to VG 95343 part 14

Application
Control and supply cables in fixed and moving systems of defence and sensor systems.

Cross section from to	0.4 – 35 mm^2
Insulation material	ETFE
Voltage rating U_o/U	600 V AC
Number of conductors	2 – 61
Conductor class	VG 95218/BWB specification
Separator	–
Jacket	RADOX® elastomer S

VG 95218 T028

Type D and type A, multi core, screened

- temperature range –40 °C up to +150 °C
- weatherproof
- resistant to mineral oils and fuels
- high abrasion resistance
- flame resistant, self-extinguishing
- non-melting
- flexible
- system compatibility with heat shrink parts according to VG 95343 part 14

Application
Control and supply cables in fixed and moving systems of defence and sensor systems.

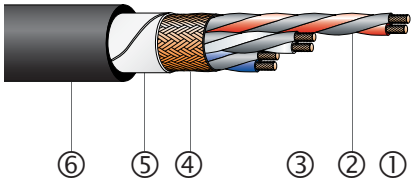
Cross section from to	0.25 – 10 mm^2
Insulation material	ETFE
Voltage rating U_o/U	600 V AC
Number of conductors	2 – 104
Conductor class	VG 95218/BWB specification
Separator	EMV screening (type A double screen)
Jacket	RADOX® elastomer S

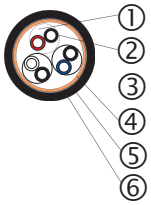
Notes

RADOX® MFH

MFH–S Signal cable screened and unscreened

MFH–P Power cable





- ozone, hydrolysis, chemical resistant
- weatherproof
- easy to process
- leight weight
- wide operating temperature range
- halogen free
- flame retardant

Application
For fixed installations in dry, damp or wet locations, inside and outside of ships, industrial equipment, defence equipment, buses, other vehicles and railway rolling stock.

Composition of cable

① Centre (if necessary)	RADOX® filler
② Cores 2 x 0.75 mm^2	
Conductor	stranded tin plated copper, acc. to IEC 60228, class 5 type Multi A 14 A2–0.75
Dual wall insulation	high tech polymer
Core colours	see table two cores twisted
③ Fillers (optional)	RADOX®
④ EMV screening	optimised tin plated copper braid, optical coverage: ≥85 %
⑤ Separator	textile yarn
⑥ Sheath	RADOX® elastomer S FH
Colour	black

Technical data

Voltage rating U_o/U		600 / 1000 V AC
Test voltage		3500 V AC
Temperature range		–25 °C up to +120 °C
Min. bending radius	fixed ≤12 mm	3 x cable-Ø
	≥12 mm	4 x cable-Ø
	flexing ≤12 mm	5 x cable-Ø
	≥12 mm	6 x cable-Ø

Fire tests

Flame propagation:		
Vertial of a single cable	EN 50265–2–1, IEC 60332–1	
Content of halogen acid gas	EN 50267–2–1, IEC 60754–1	0 mg/g

RADOX® MFH

MFH–S Signal cable screened and unscreened

MFH–P Power cable

Approvals

GERMANISCHER LLOYD Certificate no. 43159–02 HH

IEC 60092–359:1999 IEC 60332–1:1999 IEC 60332–3 cat. A: 1992

IEC 60754–1:1994 IEC 60754–2:1997 IEC61034–2:1997

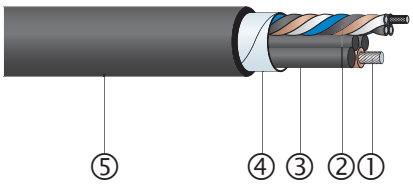
Extract from our delivery programme

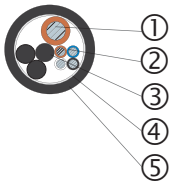
Cross section	Stranded	R_{20} IEC 60228	Z_T max.**	Screen	Cable	Core colours	Weight	Item Nr.
n x mm²	Ø mm	max. Ω/km	max. mΩ/m	Ø mm	Ø mm		nom. kg/100 m	
5 x 2 x 0.5	6.7	40.1	80	7.4	9.6 ± 0.3	WH num.	14.5	12566769
21 x 2 x 0.5	13.3	40.1	55	14.4	17.7 ± 0.5	WH num.	48.7	12566772
4 x 2 x 0.75	6.9	26.7	80	7.6	10.0 ± 0.3	WH num.	16.4	12568842

Other cross sections on request.

Hybrid cables

2 x 2 x 0.25 mm^2 + 1KO MA14 / REMS FH BK (example out of our product range)





- customised solutions
- physical and chemical characteristics according to specifications
- power and data transmission
- installation of one cable only
- small dimensions
- low weight
- multifunctional

Application
Control cable, CCTV for example in tunnels, buildings, airports

Composition of cable

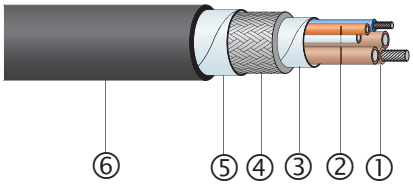
① coaxial cable 75Ω	type RG_179-B/U	
Inner conductor	steel, copper and silver plated	Ø: 0.30 mm
Insulation	PTFE	Ø: 1.53 mm
Screening	silver plated copper braid	Ø: 2.00mm
Sheath	FEP, colour: brown	Ø: 2.54 mm
② 2 pairs of 2 x 0.25 mm^2	type Multi A-14 A2-0.25	
Conductor	tin plated copper	Ø: 19 x 0.12 mm
Dual wall	high tech polymer	Ø: 1.02 mm
Colours	blue/brown, black/grey	Ø: 2.04 mm
③ 3 x fillers	RADOX®	
④ Separator	plastic tape	
⑤ Sheath	RADOX® elastomer S FH	
Colour	black	Ø: 7.1 ± 0.3 mm

Technical data

Conductor resistance at 20 °C		<86.0 Ω/km
Voltage rating		600 V AC
Test voltage		2500 V
Max. conductor temperature		+120 °C
Min. operating temperature		-25 °C
Min. bending radius		10 x cable-Ø
Coaxial cable RG_179-B/U:		
Impedance		75 Ω
Capacitance		63 pF/m
Velocity of signal propagation		69 % of the speed of light
Attenuation at 20 °C (typ. value)	f = 1 MHz	3.0 dB/100m
	f = 10 MHz	9.5 dB/100m
.	f = 100 MHz	30 dB/100m

Hybrid cables

3 x 24 AWG + 3 x KO 2253D–02 (example out of our product range)



- customised solutions
- physical and chemical characteristics according to specifications
- power and data transmission
- installation of one cable only
- small dimensions
- low weight
- multifunctional

Application
Control cable, CCTV for example in tunnels, buildings, airports

Composition of cable

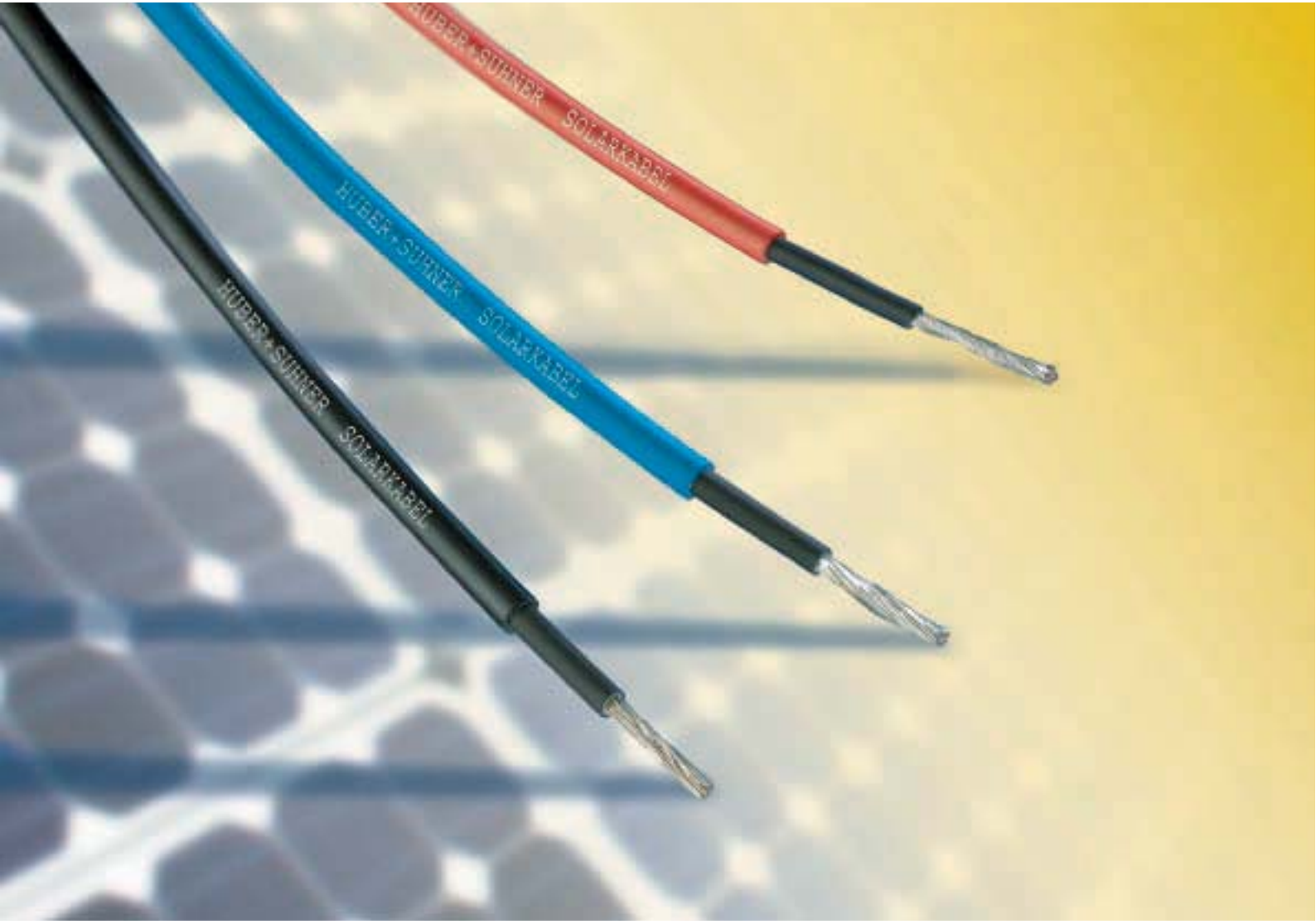
① 3 coaxial cables 75 Ω	type K 02253 D–02	
Inner conductor	steel, copper and silver plated	Ø: 0.30 mm
Insulation	PTFE	Ø: 1.53 mm
Screening 1	silver plated copper braid	Ø: 2.00 mm
Screening 2	silver plated copper braid	Ø: 2.50 mm
Sheath	FEP, colour: brown	Ø: 3.00 mm
② 3 cores 24 AWG	type 22759–32A1–24	
Conductor	tin plated copper	Ø: 19 x 0.13 mm
Insulation	XETFE	Ø: 0.94 mm
Colours	white, blue, orange	
③ Separator	plastic tape	
④ EMV screening	tin plated copper braid	Ø: 7.3 mm
⑤ Separator	plastic tape	
⑥ Sheath	RADOX® elastomer S	
Colour	black	Ø: 9.3 ± 0.3 mm

Technical data

Conductor resistance at 20 °C		<90.5 Ω/km
Voltage rating		600 V
Test voltage		1500 V
Transfer impedance	f ≤ 30 MHz	80 mΩ/m
Temperature range	(cores)	–50 up to +150 °C
Temperature range	(sheath)	–40 up to +150 °C
Coaxial cable K 02253D–02:		
Impedance		75 Ω
Capacitance		63 pF/m
Velocity of signal propagation		69 % of the speed of light
Attenuation at 20 °C (typ. value)	f = 1 MHz	30 dB/100m
	f = 10 MHz	9.5 dB/100m
	f = 100 MHz	30 dB/100m
Temperature range		–40 up to +150 °C

RADOX® solar cables

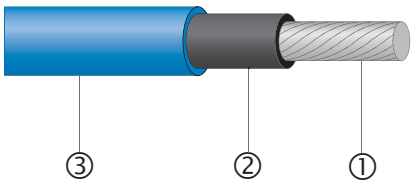
All our cables fully comply with the European directives 76/769/EWG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2002/95/EG (RoHS).

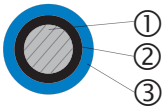


- operating temperature range -40°C up to +120°C
- short circuit strength up to +280°C
- RADOX® electron-beam crosslinked materials do not melt or flow, even at high temperatures
- high resistance against UV, ozone and hydrolysis
- very high mechanical robustness and resistance against water, oil and chemicals
- compact and flexible
- years of approved applications worldwide
- TÜV an UL approval
- RADOX® solar connectors, junction boxes and accessories for photovoltaic installations
  (see catalogue item no. 84017606)

RADOX® solar cable

Single core cable





- nominal cross sections with TÜV approval
- space saving outer diameter
- long service life, extremly robust
- electron beam, crosslinked insulation and sheath
- high resistance against heat, cold, oil, abrasion, ozone, UV and weather
- improved characteristics in case of fire
- halogen free, flame retardant
- flexible, easy to strip

Application

Specifically designed for connecting photovoltaic system components inside and outside of buildings and equipment with high mechanical requirements and extreme weather conditions. For permanent installations.

Composition of cable

① Conductor	stranded tin plated copper, fine wired, acc. to IEC 60228, class 5
② Insulation	RADOX® black
③ Sheat	RADOX®
Colours	see table

Technical data

Conductor resistance at 20 °C			see table
TüV:	Voltage rating line to ground	U_o	600 V AC
	Voltage rating line to line	U	1000 V AC
	maximum voltage line to ground		660 V AC
	maximum voltage line to line	U_m	1100 V AC
	maximum voltage line to ground	V_o	1000 V DC
	maximum voltage line to line		1650 V DC
	test voltage AC		3.5 kV
	test voltage DC		8.4 kV
	lower ambient temperature		-40°C
	upper ambient temperature		+85°C
	max. conductor temperature		+110°C
Min. bending radius	D < 8 mm	4 x cable-Ø	
	D ≥ 8 mm	6 x cable-Ø	

RADOX® solar cable

Single core cable

Fire tests

Flame propagation::		
Vertical of a single cable	IEC 60332-1, EN 50265-2-1	
Content of halogen acid gas	IEC 670754-1, EN 50267-2-1	0mg/g
Corrosivity of combustion gases	IEC 60754-2, EN 50267-2-3	
Smoke density	IEC 61034-2, EN 50268-2	

Approvals (2.5 – 6.0 mm^2)

Wires for photovoltaic-systems	RADOX® solar cable	TÜV Rheinland 2 Pfg 1169 certificate R02210086

Extract from our delivery programme

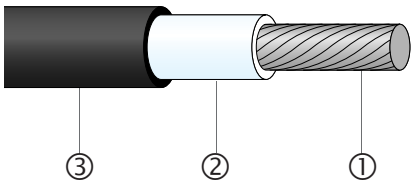
Cross section	Conductor		Cable	Weight	Colour	Item no.
	Construction nom.	R_{20} IEC 60228	Ø nom.	nom.		
mm^2	n x mm	max. Ω/km	mm	kg/100m		
1.5	30 x 0.25	1.52 ± 0.05	4.3 ± 0.15	3.2	black	12558072
2.5*	48 x 0.25	2.01 ± 0.05	5.2 ± 0.15	4.6	red	12529712
2.5*	48 x 0.25	2.01 ± 0.05	5.2 ± 0.15	4.6	blue	12529713
2.5*	48 x 0.25	2.01 ± 0.05	5.2 ± 0.15	4.6	black	12529714
4.0*	56 x 0.30	2.54 ± 0.05	5.8 ± 0.15	6.6	red	12545801
4.0*	56 x 0.30	2.54 ± 0.05	5.8 ± 0.15	6.6	blue	12537896
4.0*	56 x 0.30	2.54 ± 0.05	5.8 ± 0.15	6.6	black	12545802
6.0*	81 x 0.30	3.30 ± 0.10	6.9 ± 0.20	9.2	red	12568182
6.0*	81 x 0.30	3.30 ± 0.10	6.9 ± 0.20	9.2	blue	12568183
6.0*	81 x 0.30	3.30 ± 0.10	6.9 ± 0.20	9.2	black	12552756
10	78 x 0.40	4.30 ± 0.10	8.1 ± 0.15	14.4	black	12537897
16	119 x 0.40	5.30 ± 0.10	9.5 ± 0.20	21.0	black	12567377
25	182 x 0.40	6.60 ± 0.10	11.1 ± 0.20	29.6	black	12567378
35	266 x 0.40	7.80 ± 0.10	12.8 ± 0.25	41.7	black	12567379
50	378 x 0.40	9.30 ± 0.10	15.0 ± 0.25	60.2	black	12567380
70	348 x 0.50	11.40 ± 0.10	17.5 ± 0.30	80.8	black	12567381
95	444 x 0.50	12.80 ± 0.10	19.3 ± 0.30	103.1	black	12567382
120	551 x 0.50	14.60 ± 0.10	21.8 ± 0.30	126.0	black	12567383
150	722 x 0.50	16.80 ± 0.10	24.4 ± 0.30	161.7	black	12567384

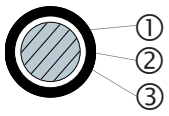
*Approvals: TÜV Rheinland design-tested, certificate R 02210086

Other cross sections and colours on request.

RADOX® SMART

Single core cable





- for all climate zones
- for reliable and durable connections
- with UL and TÜV approvals
- halogen free, flame retardant
- lean, powerful and flexible
- of proven RADOX® quality

Composition of cable

①	Conductor	stranded tin plated copper, fine wired, acc. to IEC 60228, class 5
②	Inner insulation	RADOX® FI
③	Outer insulation	RADOX® FS
	Colour	black

Technical data

UL:	voltage rating		600 V AC
	test voltage		3.0 kV AC
	temperature rating		90 °C wet or dry, sunlight resistant
TÜV:	Voltage rating line to ground	U_o	600 V AC
	Voltage rating line to line	U	1000 V AC
	maximum voltage line to ground	V_o	1000 V DC
	maximum voltage line to line		1650 V DC
	test voltage AC		3.5 kV AC
	test voltage DC		8.4 kV DC
	lower ambient temperature		–40 °C
	upper ambient temperature		+85 °C
	maximum conductor temperature		+110 °C
Minimum bending radius			4 x cable–Ø

Application

- Type PV: Suitable for interconnection wiring of grounded and ungrounded photovoltaic power systems as descriebed in section 690.31 (A) and other parts of the National Electrical Code (NEC), NFPA 70. For single conductor, double–insulated wires installation without using a conduit is permitted according to section 690.35 (D) of the NEC.
- Type RHH oder RHW–2: Suitable for any of the wiring methods recognised in chapter 3 and as specified in their respective tables or as permitted elsewhere in the NEC.

Europe:

- Suitable for the installation methods reference no. 2, 3A, 4A, 5A, 11, 11A, 12, 13, 14, 15, 16, 21, 22A, 23A, 24A, 25, 31A, 32A, 33A, 41, 43, 51, 72, 73, 75 in table 52H of HD 384.5.52 (CH: SEV 1000 section 5.2; DE: DIN VDE 0100–520).

RADOX® SMART

Single core cable

Fire tests

flame propagation:		
Vertical FT1	UL 1581 # 1060	L ≤ 250 mm, T ≤ 60 s
Vertical	EN 60332-1-2	
	IEC 60332-1-2	50 < L ≤ 540 mm
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	HCl + HBr ≤ 0.5%
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	pH ≥ 4.3, σ ≤ 10 µS/mm

Approvals

UL	Photovoltaic Wire	Type PV, UL subject 4703, UL listed E305787
UL	Thermoset-insulated Wires and Cables	Type RHH kand RHW-2, UL 44, listed E310273
TÜV Rheinland	Wires for photovoltaic-systems	2 Pfg 1169, certificate R60017683

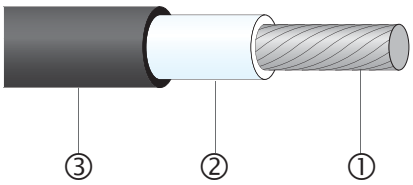
Extract from our delivery programme

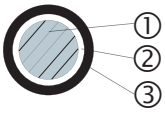
Cross section		Conductor			Cable	Weight	Item no.
nom.		Constr. nom.	Ø nom.	R_{20} IEC 60228	Ø	nom.	
AWG	mm2	n x mm	nom. mm	max. Ω/km	mm	kg/100 m	
14	2.5	48 x 0.26	2.0	8.21	5.3 5± 0.10	5.1	12583222
12	4.0	56 x 0.30	2.5	5.09	6.05 ± 0.10	7.1	12583780
10	6.0	82 x 0.30	3.2	3.39	7.15 ± 0.15	9.9	12583781

Other cross sections and colours on request.

RADOX® SolarLink

Single core cable





- UL and TÜV approval
- double insulated construction allows for installation without a conduit
- smaller outer diameter
- of proven RADOX® quality
- very flexible

Composition of cable

①	Conductor	stranded tin plated copper, fine wired, acc. to IEC 60228, class 5
②	Inner insulation	RADOX® 155
③	Outer insulation	RADOX® 155
	Colour	black

Technical data

UL:	voltage rating			600 V AC
	test voltage AC			3.0 kV AC
	temperature rating			90 °C wet or dry, sunlight resistant
TÜV:	Voltage rating line to ground		U_o	600 V AC
	Voltage rating line to line		U	1000 V AC
	maximum voltage line to ground		V_o	1000 V DC
	maximum voltage line to line			1650 V DC
	test voltage AC			3.5 kV AC
	test voltage DC			8.4 kV DC
	lower ambient temperature			-40 °C
	upper ambient temperature			+85 °C
	maximum conductor temperature			+110 °C
Min. bending radius				4 x cable-Ø

Application

United States:

- Type PV: suitable for interconnection wiring of grounded and ungrounded photovoltaic power systems as described in section 690.31 (A) and other parts of the National Electrical Code (NEC), NFPA 70.
  For single conductor, double insulated wires installation without using a conduit is permitted according to section 690.35 (D) of the NEC.
- Type RHH or RHW-2: suitable for use in any of the wiring methods recognized in chapter 3 and as specified in their respective tables or as permitted elsewhere in the NEC.

Europe:

- suitable for the installation mehods reference no. 2, 3A, 4A, 5A, 11, 11A, 12, 13, 14, 15, 16, 21, 22A, 23A, 24A, 25, 31A, 32A, 33A, 41, 43, 51, 72, 73, 75 given in table 52H of HD 384.5.52 (CH: SEV 1000 cl. 5.2; DE: DIN VDE 0100-520).

RADOX® SolarLink

Single core cable

Fire tests

Flame propagation:		
Vertical FT1	UL 1581 # 1060	L ≤ 250 mm, T ≤ 60 s
Vertical	EN 60332-1-2, IEC 60332-1-2	50 < L ≤ 540 mm

Approvals

UL	Photovoltaic Wire	Type PV, UL subject 4703, UL listed E305787
UL	Thermoset-insulated Wires and Cables	Type RHH kand RHW-2, UL 44, listed E310273
TÜV Rheinland	Wires for photovoltaic-systems	2 Pfg 1169, certificate R60017683

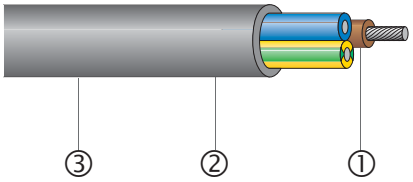
Extract from our delivery programme

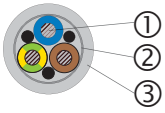
Cross section		Conductor			Cable	Weight	Item no..
nom.		Constr. nom.	Ø max.	R_{20} IEC 60228	Ø	nom.	
AWG	mm^2	n x mm	nom. mm	max. Ω/km	mm	kg/100 m	
14	2.5	48 x 0.26	2.0	8.21	5.35 ± 0.10	5.1	12582664
12	4.0	56 x 0.30	2.5	5.09	6.05 ± 0.10	7.1	12582665
10	6.0	82 x 0.30	3.2	3.39	7.15 ± 0.15	9.9	12583784

Other cross sections and colours on request.

RADOX® solar cable

Multi core cable





- high resistance against heat, ozone and weatherproof
- extremely mechanically robust, very long lifetime
- halogen free
- space saving, easy to install
- flame retardant
- no corrosive gases and low smoke occurrence in case of fire
- soldering resistant
- flexible, easy to strip

Application

Connecting photovoltaic system components inside and outside of buildings and equipment with high mechanical requirements and extreme weather influences. For permanent installations.

Composition of cable

① Conductor	stranded tin plated copper, fine wired, acc. to IEC 60228, class 5
② Insulation	RADOX® 125
Colour	2 – 5 cores acc. to CENELEC, HD 308 S2 (see page 155) as of 6 cores black-numbered with earth conductor yellow-green (other colours on request)
③ Sheat	RADOX® 125
Colour	black

Technical data

Voltage rating		1000V DC or 600 / 1000V AC
Test voltage		3500 V AC
Temperature range	fixed	–40 up to +125 °C
Min. operating temperature	flexing	–25 °C
Max. conductor temperature	(short circuit at max. 5s)	+ 280 °C
Min. bending radius	fixed	3 x cable-Ø
	flexing	5 x cable-Ø

RADOX® solar cable

Multi core cable

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cable	EN 50266-2-4, IEC 60332-3-24	Category C
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0 mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	

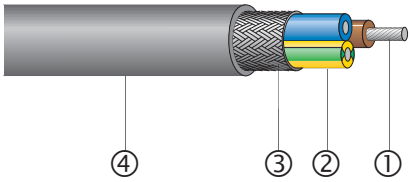
Extract from our delivery programme

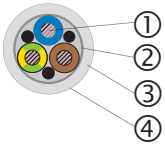
Cross section	Conductor		Core	Cable	Weight
mm^2	Construction nom. n x mm	Ø nom. mm	Ø nom. mm	Ø nom. mm	nom. kg/100 m
2 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	9.1 ± 0.3	13.0
3 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	10.1 ± 0.4	16.6
4 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	11.4 ± 0.4	20.9
5 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	12.4 ± 0.4	24.9
7 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	15.3 ± 0.5	37.9
2 x 4.0	56 x 0.30	2.60	4.15 ± 0.15	11.0 ± 0.4	18.7
4 x 4.0	56 x 0.30	2.60	4.15 ± 0.15	13.0 ± 0.4	29.8
5 x 4.0	56 x 0.30	2.60	4.15 ± 0.15	14.6 ± 0.4	36.7
4 x 6.0	81 x 0.30	3.40	4.95 ± 0.15	15.6 ± 0.5	41.8
2 x 10.0	78 x 0.40	4.40	6.15 ± 0.15	15.8 ± 0.5	50.4
3 x 10.0	78 x 0.40	4.40	6.15 ± 0.15	17.0 ± 0.5	62.0
4 x 10.0	78 x 0.40	4.40	6.15 ± 0.15	18.9 ± 0.5	77.5
5 x 10.0	78 x 0.40	4.40	6.15 ± 0.15	21.4 ± 0.5	98.3

Other cross sections and colours on request.

RADOX® solar cable

Multi core cable – screened





- high resistance against heat, ozone and weatherproof
- extremely mechanically robust, very long lifetime
- halogen free
- space saving, easy to install

Application

For connecting photovoltaic system components inside and outside of buildings and equipment with high mechanical requirements and extreme weather conditions. For permanent installations.

Composition of cable

① Conductor	stranded tin plated copper, fine wired, acc. to IEC 60228, class 5
② Insulation	RADOX® 125
Colour	2 – 5 cores acc. to CENELEC, HD 308 S2 (see page 155) as of 6 cores black-numbered with earth conductor yellow-green (other colours on request)
③ Screening	tin plated copper braid
④ Sheat	RADOX® 125
Colour	black

Technical data

Voltage rating		1000V DC or 600 / 1000V AC
Test voltage		3500V AC
Temperature range	fixed	–40 up to +125 °C
Min. operating temperature	flexing	–25 °C
Max. conductor temperature	(short circuit at max. 5s)	+280 °C
Min. bending radius	fixed	3 x cable-Ø
	flexing	5 x cable-Ø

RADOX® solar cable

Multi core cable – screened

Fire tests

Flame propagation:		
Vertical of a single cable	EN 50265-2-1, IEC 60332-1	
Vertical of bunched cables	EN 50266-2-4, IEC 60332-3-24	Category C
Content of halogen acid gas	EN 50267-2-1, IEC 60754-1	0mg/g
Corrosivity of combustion gases	EN 50267-2-2, IEC 60754-2	
Smoke density	EN 50268-2, IEC 61034-2	

Extract from our delivery programme

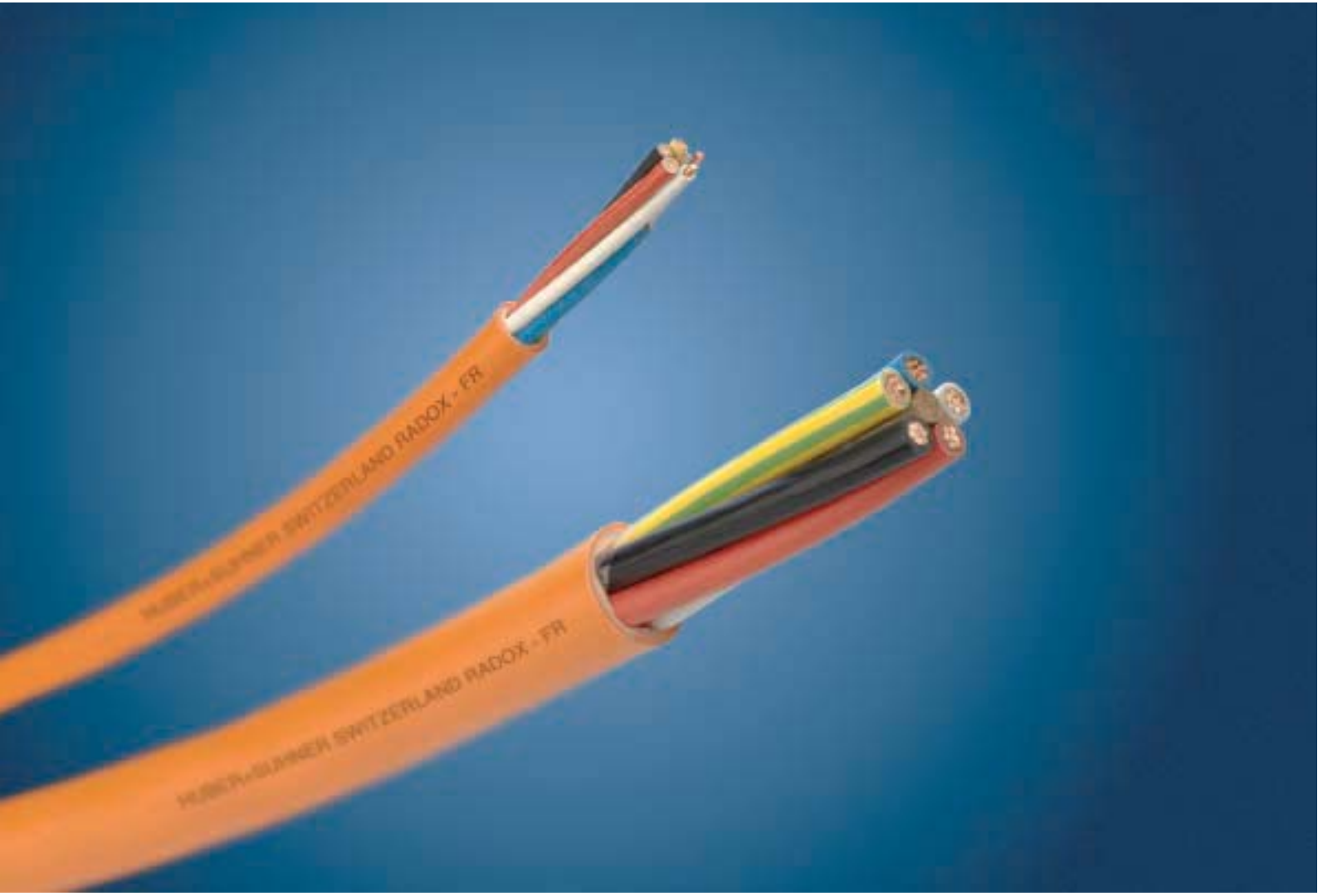
Cross section	Conductor		Core	Screening	Cable	Weight
mm^2	Construction nom. n x mm	Ø nom. mm	Ø nom. mm	Ø nom. mm	Ø nom. mm	nom. kg/100 m
2 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	7.7	10.2 ± 0.4	17.5
3 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	8.3	10.8 ± 0.4	20.6
4 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	9.8	12.0 ± 0.4	26.8
5 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	10.4	13.1 ± 0.4	30.9
7 x 2.5	48 x 0.25	2.05	3.50 ± 0.10	13.2	16.3 ± 0.5	45.9
2 x 4.0	56 x 0.30	2.60	4.15 ± 0.15	9.2	11.9 ± 0.4	24.4
4 x 4.0	56 x 0.30	2.60	4.15 ± 0.15	11.2	14.1 ± 0.4	37.1
3 x 6.0	81 x 0.30	3.40	4.95 ± 0.15	11.6	14.5 ± 0.4	38.8
4 x 6.0	81 x 0.30	3.40	4.95 ± 0.15	13.3	16.5 ± 0.5	51.7

Other cross sections and colours on request.

RADOX® FR

Safety cables with circuit integrity in case of fire

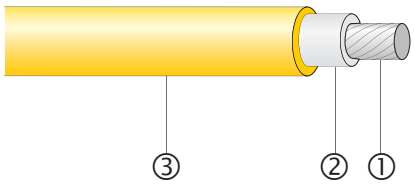
All our cables fully comply with the European directives 76/769/EWG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2002/95/EG (RoHS).

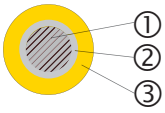


- circuit integrity in case of fire
- highly flame retardant
- low smoke emissions
- low toxicity of fire gases
- electro magnetic compatibility

PURGI

Single core cable





- resistant to oils, alkaline solutions, acids, grease and fuel
- long service life time
- halogen free
- microbe and weatherproof
- high chemical and mechanical robustness
- high abrasion resistance

Application
Installation on construction sites, machine industry, agriculture and horticulture, chemical industry and workshops as well as for connecting electric equipment in humid and wet environment.

Composition of cable

① Core	stranded tin plated copper, acc. to IEC 60228, class 5
② Insulation	RADOX® 125 C extruded and electron beam crosslinked pololefin
Colour	black
③ Sheath	TPU
Colour	yellow RAL 1028

Technical data

Voltage rating	450 / 750 V AC
Test rating	2500 V AC
Temperature range	-40 °C up to +90 °C
Min. bending radius	6 x cable-Ø

PURGI

Single core cable

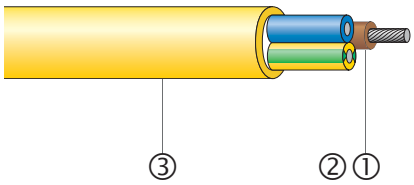
Extract from our delivery programme

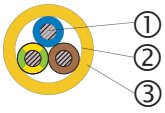
Cross section	No. of wires	Conductor		Cable	Weight	Item no.
nom mm^2	Ø max. mm	Ø nom. mm	R_{20} IEC 60228 max. Ω/km	Ø mm	nom. kg / 100 m	
16	119 x 0.41	5.30 ± 0.10	1.22	9.4 ± 0.15	19.1	12560556
25	182 x 0.41	6.70 ± 0.10	0.779	11.2 ± 0.20	28.4	12560557
35	259 x 0.41	7.80 ± 0.10	0.554	12.7 ± 0.20	38.9	12560558
50	378 x 0.41	9.30 ± 0.10	0.385	14.85 ± 0.25	50.9	12560559
95	444 x 0.51	12.80 ± 0.10	0.210	19.0 ± 0.30	95.8	12560560
150	722 x 0.51	16.80 ± 0.20	0.132	24.2 ± 0.30	154.2	12560561
185	874 x 0.51	18.30 ± 0.20	0.108	26.1 ± 0.30	184.7	12560562
240	1147 x 0.51	21.10 ± 0.20	0.0817	29.7 ± 0.30	240.8	12560563
300	1443 x 0.51	23.70 ± 0.20	0.0654	32.9 ± 0.30	298.6	12560564

Other cross sections on request.

PURGI

Multi core cable





- resistant to oils, alkaline solutions, acids, grease and fuel
- long service life time
- halogen free
- microbe and weatherinproof
- high chemical and mechanical robustness
- high abrasion resistance

Application
Installation on construction sites, machine industry, agriculture and horticulture, chemical industry and workshops as well as for connecting electric equipment in humid and wet environment.

Composition of cable

①	Core	stranded tin plated copper, acc. to IEC 60228, class 5
	Insulation	RADOX® 125 C extruded and electron beam crosslinked pololefin
	Core colours	acc. to table HD 308 on page 159
②	Fillers (optional)	RADOX®
③	Sheath	TPU
	Colour	yellow RAL 1028

Technical data

Voltage rating	450 / 750 V
Test voltage	2500 V
Temperature range	-40 °C up to +90 °C
Min. bending radius	6 x cable-Ø

PURGI

Multi core cable

Extract from our delivery programme

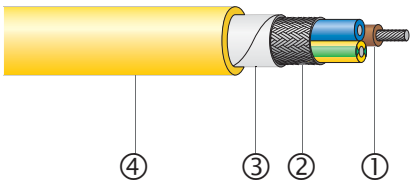
Cross section	Conductor			Core	Cable	Weight	Core colours*	Item no.
n x mm²	Constr. nom. n x mm	Ø nom. mm	R_{20} IEC 60228 max. Ω/km	Ø nom. mm	Ø nom. mm	nom. kg/100 m		
3 x 0.75	24 x 0.20	1.10	26.7	2.40	7.3 ± 0.3	6.5	GNYE,BU,BN	12509248
2 x 1	32 x 0.20	1.30	20.0	2.60	7.3 ± 0.3	6.3	BU,BN	12509249
3 x 1	32 x 0.20	1.30	20.0	2.60	7.7 ± 0.3	7.6	GNYE,BU,BN	12509250
4 x 1	32 x 0.20	1.30	20.0	2.60	8.6 ± 0.3	9.7	GNYE,BN,BK,GY	12509251
5 x 1	32 x 0.20	1.30	20.0	2.60	9.4 ± 0.3	11.7	GNYE,BU,BN, BK,GY	12516532
2 x 1.5	30 x 0.25	1.56	13.7	3.25	8.8 ± 0.3	9.1	BU,BN	12509252
3 x 1.5	30 x 0.25	1.56	13.7	3.25	9.3 ± 0.3	11.0	GNYE,BU,BN	12509253
4 x 1.5	30 x 0.25	1.56	13.7	3.25	10.6 ± 0.4	14.3	GNYE,BN,BK,GY	12509254
5 x 1.5	30 x 0.25	1.56	13.7	3.25	11.9 ± 0.4	18.0	GNYE,BU,BN, BK,GY	12509255
7 x 1.5	30 x 0.25	1.56	13.7	3.25	13.8 ± 0.4	23.8	GNYE,BU, 5 x BK	12510854
10 x 1.5	30 x 0.25	1.56	13.7	3.25	16.5 ± 0.5	31.1	GNYE,BU,8 x BK	12510855
3 x 2.5	50 x 0.25	2.01	8.21	3.90	11.0 ± 0.4	16.0	GNYE,BU,BN	12509256
4 x 2.5	50 x 0.25	2.01	8.21	3.90	12.4 ± 0.4	21.0	GNYE,BN,BK,GY	12509257
5 x 2.5	50 x 0.25	2.01	8.21	3.90	13.8 ± 0.4	25.3	GNYE,BU,BN, BK,GY	12509258
7 x 2.5	50 x 0.25	2.01	8.21	3.90	17.1 ± 0.5	37.8	GNYE,BU,5 x BK	12510859
4 x 4	53 x 0.30	2.54	5.09	4.70	15.0 ± 0.4	29.3	GNYE,BN,BK,GY	12510860
5 x 4	53 x 0.30	2.54	5.09	4.70	16.6 ± 0.5	36.3	GNYE,BU,BN, BK,GY	12510861
4 x 6	81 x 0.30	3.30	3.39	5.50	17.7 ± 0.5	41.2	GNYE,BN,BK,GY	12510862
5 x 6	81 x 0.30	3.30	3.39	5.50	19.6 ± 0.5	50.1	GNYE,BU,BN, BK,GY	12510863
4 x 10	78 x 0.40	4.30	1.95	6.15	18.9 ± 0.5	57.8	GNYE,BN,BK,GY	12513763
5 x 10	78 x 0.40	4.30	1.95	6.15	21.3 ± 0.5	73.2	GNYE,BU,BN, BK,GY	12510864
5 x 16	119 x 0.40	5.30	1.24	7.35	25.5 ± 0.6	107	GNYE,BU,BN, BK,GY	12509794
5 x 25	182 x 0.40	6.60	0.795	9.00	29.6 ± 0.6	156	GNYE,BU,BN, BK,GY	12516534

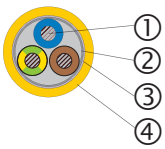
* Description for core colours see page 154

Other cross sections on request.

PURGI

Multi core cable – screened





- resistant to oils, alkaline solutions, acids, grease and fuel
- long service life time
- halogen free
- microbe and weatherproof
- high chemical and mechanical robustness
- high abrasion resistance

Application

Installation on construction sites, machine industry, agriculture and horticulture, chemical industry and workshops as well as for connecting electric equipment in humid and wet environment.

Composition of cable

①	Cores R 125 C	
	Conductor	stranded tin plated copper, acc. to IEC 60228, class 5
	Insulation	RADOX® 125 C extruded and electron beam crosslinked pololefin
	Core colours	blue, brown, green/yellow
②	Screening	tin plated copper braid, optical coverage: ≥ 85 %
③	Separator	plastic tape
④	Sheath	TPU
	Colour	yellow RAL 1028

Technical data

Voltage rating	450 / 750 V
Test voltage	2500 V
Temperature range	-40 °C up to +90 °C
Min. bending radius	6 x cable-Ø

PURGI

Multi core cable – screened

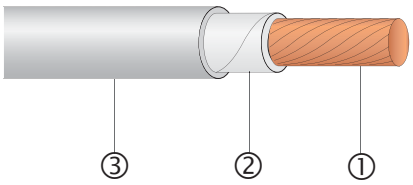
Extract from our delivery programme

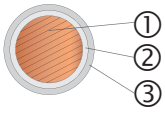
Cross section	Conductor			Core	Cable	Weight	Item Nr.
	Construction nom.	Ø nom.	R_{20} IEC 60228	Ø nom.	Ø nom.	nom.	
n x mm^2	n x mm	mm	max. Ω/km	mm	mm	kg / 100 m	
3 x 1.5	30 x 0.25	1.56	13.0	3.25 ± 0.10	10.1 ± 0.30	14.5	12560567
3 x 2.5	50 x 0.25	2.01	7.80	3.90 ± 0.10	11.8 ± 0.40	20.2	12560569
5 x 1.5	30 x 0.25	1.56	13.0	3.25 ± 0.10	12.9 ± 0.40	22.8	12560568
5 x 2.5	50 x 0.25	2.01	7.80	3.90 ± 0.10	14.8 ± 0.40	31.5	12560570

Other cross sections on request..

RADOX® FR AUS

Single core cable with circuit integrity in case of fire





- halogen free
- flame retardant
- in case of fire no corrosive gases and low smoke
- circuit integrity in case of fire
- excellent high and low temperature, and ozone resistance
- weatherproof
- easy to strip

Application

For emergency support systems: emergency lighting, smoke spill fans, fire alarms and sprinklers, emergency evacuation intercommunication systems, etc.

Composition of cable

① Core	stranded copper bare acc. to IEC 60228, class 2
② Flame barrier	
③ Insulation	RADOX® 125

Technical data

Voltage rating		600 / 1000 V
Test voltage		3500 V AC
Max. conductor temperature		+110 °C
Max. conductor temperature	(short circuit max. 5s)	+280 °C
Min. operating temperature	flexing	-25 °C
Min. conductor temperature	fixed	-40 °C
Min. bending radius	fixed	6 x cable-Ø
	flexing	10 x cable-Ø

Fire tests

Content of halogen acid gas	IEC 60754-1, EN 50267-2-1	0 mg/g
Corrosivity of combustion gases	IEC 60754-2, EN 50267-2-3	
Smoke density	IEC 61034-2, EN 50268-2	
Circuit integrity 180 Min.	IEC 60331-21	
Circuit integrity	AS/NZS 3013, WS5	

RADOX® FR AUS

Single core cable with circuit integrity in case of fire

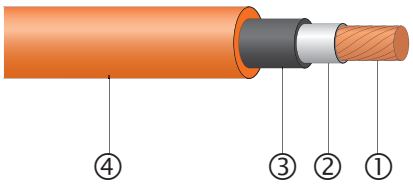
Extract from our delivery programme

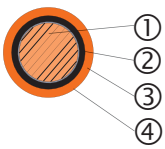
Cross section	Conductor			Core				Item no.
	Construction nom.	Ø nom.	R_{20} IEC 60228	Ø nom.	Colour	Weight nom.	Fire load	
mm^2	n x mm	mm	max. Ω/km	mm		kg/100 m	kj/m	
1.5	7 x 0.54	1.62	11.50	3.50	black	2.5	180	12538125
2.5	7 x 0.69	2.07	7.56	4.10	black	3.7	266	12542736

Other cross sections on request.

RADOX® FR AUS

Single core cable with circuit integrity in case of fire





- halogen free
- flame retardant
- in case of fire no corrosive gases and low smoke
- circuit integrity in case of fire
- excellent high and low temperature, and ozone resistance
- weatherproof
- easy to strip

Application

For emergency support systems: emergency lighting, smoke spill fans, fire alarms and sprinklers, emergency evacuation intercommunication systems, etc.

Composition of cable

① Core	stranded copper bare acc. to IEC 60228, class 5
② Flame barrier	
③ Insulation	RADOX® 125 (for colours see table)
④ Sheath	RADOX® 125 (for colours see table)

Technical data

Voltage rating		600 / 1000 V
Test voltage		3500 V AC
Max. conductor temperature		+110 °C
Max. conductor temperature	(short circuit max. 5s)	+280 °C
Min. operating temperature	flexing	-25 °C
Min. conductor temperature	fixed	-40 °C
Min. bending radius	fixed	6 x cable-Ø
	flexing	10 x cable-Ø

Fire tests

Flame propagation:		
Vertical of a single cable	IEC 60332-1, EN 50265-2-1	
Vertical of bunched cables	IEC 60332-3-24, EN 50266-2-4	category C
Content of halogen acid gas	IEC 60754-1, EN 50267-2-1	0 mg/g
Corrosivity of combustion gases	IEC 60754-2, EN 50267-2-3	
Smoke density	IEC 61034-2, EN 50268-2	
Circuit integrity 180 Min.	IEC 60331-21	
Circuit integrity	AS/NZS 3013, WS5	

RADOX® FR AUS

Single core cable with circuit integrity in case of fire

Extract from our delivery programme

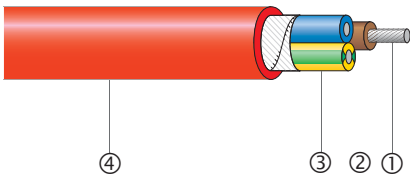
Cross section	Conductor			Core		Cable				Item no.
	Construction	Ø	R_{20} IEC 60228	Ø	Colour	Ø nom.	Colour	Weight nom.	Fire load	
mm^2	n x mm Ø	mm	max. Ω/km	mm		mm		kg/100 m	kJ/m	
1 x 1.5	7 x 0.54	1.62	11.5	3.5	black white	5.05	orange orange	4.0		12536417 12536419
1 x 2.5	7 x 0.69	2.07	7.56	4.1	black white	5.80	orange orange	5.6	467	12536421 12536422
1 x 4.0	7 x 0.88	2.64	4.70	4.8	black white	6.50	orange orange	7.8	571	12536424 12536425
1 x 6.0	7 x 1.07	3.21	3.11	5.4	black white	7.30	orange orange	10.5	693	12537402 12537403
1 x 10	7 x 1.36	4.08	1.83	6.9	black white	9.90	orange orange	18.5	1381	12537405 12537408
1 x 16.0	7 x 1.70	4.85	1.15	7.7	black white	10.70	orange orange	24.8	1529	12537410 12537413
1 x 25	7 x 2.15	6.10	0.734	9.4	black white	12.50	orange orange	36.4	2049	12537415 12537418
1 x 35	7 x 2.53	7.20	0.524	10.5	black white	13.6	orange orange	46.8	2252	12537420 12537423

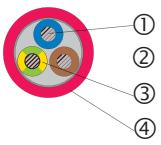
* Description for core colours see page 154

Other cross sections on request.

RADOX® FR AUS – 0.75 bis 2.5 mm²

Multi core cable with circuit integrity in case of fire – LSFH





- halogen free
- flame retardant
- in case of fire no corrosive gases and low smoke
- circuit integrity in case of fire
- excellent high and low temperature, and ozone resistance
- weatherproof
- easy to strip

Application

For emergency support systems: emergency lighting, smoke spill fans, fire alarms and sprinklers, emergency evacuation intercommunication systems, etc.

Composition of cable

① Cores	
Conductor	stranded tin plated copper acc, to IEC 60228, class 5
Flame barrier	
Insulation	RADOX® 125
Colours	see table
② Fillers (optional)	RADOX®
③ Cores	
Conductor	stranded tin plated copper acc, to IEC 60228, class 5
Insulation	RADOX® 125
Colour	yellow-green
④ Sheath	LSFH
Colour	see table

Technical data

Voltage rating	0.75 and 1.0	300 / 500 V
	1.5 and 2.5	600 / 1000 V
Test voltage		3500 V
Temperature range	fixed	-40 °C up to +90 °C
Min. bending radius		10 x cable-Ø

Fire tests

Flame propagation::		
Vertical of a single cable	IEC 60332-1, EN 50265-2-1	
Vertical of bunched cables	IEC 60332-3-24, EN 50266-2-4	category C
Content of halogen acid gas	IEC 60754-1, EN 50267-2-1	0 mg/g
Corrosivity of combustion gases	IEC 60754-2, EN 50267-2-3	
Smoke density	IEC 61034-2, EN 50268-2	
Circuit integrity 180 Min.	IEC 60331-21	
Circuit integrity	AS/NZS 3013, WS5	

RADOX® FR AUS – 0.75 bis 2.5 mm²

Multi core cable with circuit integrity in case of fire – LSFH

Extract from our delivery programme

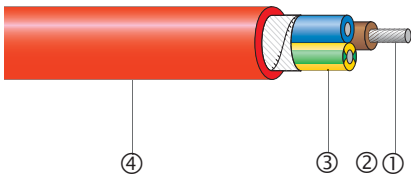
Cross section	Conductor			Core colours*		Cable				Item no.
	Construction nom.	Ø	R_{20} IEC 60228	Ø	Colour	Ø	Weight nom.	Fire load	Colour	
mm²	n x mm	mm	max. Ω/km	mm		mm	kg/100 m	kJ / m		
2x0.75	7 x 0.37	1.11	24.8	2.5	WH,RD	7.8	8.1	955	RD	12536429
3x0.75	7 x 0.37	1.11	24.8	2.5	WH,RD,BU	8.4	9.6	1055	RD	12536460
4x0.75	7 x 0.37	1.11	24.8	2.5	WH,RD,BK,BU	9.3	11.8	1250	RD	12537006
10x0.75	7 x 0.37	1.11	24.8	2.5	WH numb.	14.5	25.5	2474	RD	12537192
20x0.75	7 x 0.37	1.11	24.8	2.5	WH numb.	19.2	46.6	4274	RD	12548139
2x1.0	7 x 0.43	1.29	18.2	3.1	WH,RD	8.5	9.8	1131	RD	12536434
3x1.0	7 x 0.43	1.29	18.2	3.1	WH,RD,BU	9.1	11.7	1248	RD	12536467
4x1.0	7 x 0.43	1.29	18.2	3.1	WH,RD,BK,BU	10.3	14.8	1519	RD	12537012
2x1.5	7 x 0.53	1.59	12.2	3.4	WH,RD	9.2	12.1	1305	RD	12536444
3x1.5	7 x 0.53	1.59	12.2	3.4	WH,RD,BU	9.9	14.5	1446	RD	12536474
3G1.5					RD,BK,GNYE				RD	12536472
4x1.5	7 x 0.53	1.59	12.2	3.4	WH,RD,BK,BU	10.9	18.2	1724	RD	12537021
4G1.5					WH,RD,BK,GNYE				RD	12537024
5G1.5	7 x 0.53	1.59	12.2	3.4	WH,RD,BK,BU,GNYE	12.1	22.8	2125	RD	12537054
7x1.5	7 x 0.53	1.59	12.2	3.4	WH numb.	13.1	27.4	2363	RD	12537092
7G1.5				3.4	BK numb, GNYE				RD	12548140
10x1.5	7 x 0.53	1.59	12.2	3.4	WH numb.	17.4	40.4	3464	RD	12537212
12G1.5	7 x 0.53	1.59	12.2	3.4	WH numb.,GNYE	17.9	44.9	3756	RD	12537232
16x1.5	7 x 0.53	1.59	12.2	3.4	WH numb.	20.3	59.2	4824	RD	12537259
21G1.5	7 x 0.53	1.59	12.2	3.4	WH numb,GNYE	22.6	73.9	5875	RD	12537284
41G1.5	7 x 0.53	1.59	12.2	3.4	WH numb.,GNYE	32.3	144.5	11150	RD	12539462
56G1.5	7 x 0.53	1.59	12.2	3.4	BK numb.,BU,GNYE	36.3			OG	12537326
2x2.5	7 x 0.67	2.01	7.56	3.9	WH,RD	10.6	16.7	1715	RD	12536454
3x2.5	7 x 0.67	2.01	7.56	3.9	WH,RD,BU	11.3	20.1	1858	RD	12536486
3G2.5					RD,BK,GNYE				RD	12536487
4x2.5	7 x 0.67	2.01	7.56	3.9	WH,RD,BK,BU	12.6	25.3	1341	RD	12537039
4G2.5					WH, RD,BU,GNYE				RD	12547477
5G2.5	7 x 0.67	2.01	7.56	3.9	WH,RD,BK,BU,GNYE	14.0	31.7	2525	RD	12537059
7G2.5	7 x 0.67	2.01	7.56	3.9	WH numb.GNYE	15.4	39.6	3231	RD	12537099
11G2.5	7 x 0.67	2.01	7.56	3.9	WH numb.GNYE	20.8	60.5	4828	RD	12537225
12G2.5	7 x 0.67	2.01	7.56	3.9	WH numb.GNYE	20.8	64.6	5188	RD	12567690
21G2.5	7 x 0.67	2.01	7.56	3.9	WH numb.GNYE	26.3	106	7759	RD	12537289
50x2.5	7 x 0.67	2.01	7.56	3.9	WH numb.	40.8	244	17928	RD	12568873

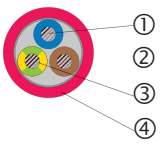
* Description for core colours see page 154

Other cross sections on request.

RADOX® FR AUS – 4.0 – 35 mm²

Multi core cable with circuit integrity in case of fire – RADOX® 125





- halogen free
- flame retardant
- in case of fire no corrosive gases and low smoke
- circuit integrity in case of fire
- excellent high and low temperature, and ozone resistance
- weatherproof
- easy to strip

Application

For emergency support systems: emergency lighting, smoke spill fans, fire alarms and sprinklers, emergency evacuation intercommunication systems, etc.

Aufbau

①	Cores	
	Conductor	stranded tin plated copper, 4 and 6 mm²
		stranded copper bare, 10 up to 120 mm²
	Flame barrier	
	Insulation	RADOX® 125, colours see table
②	Fillers (optional)	RADOX®
③	Cores	
	Conductor	stranded tin plated copper, 4 and 6 mm²
		stranded copper bare, 10 up to 120 mm²
	Insulation	RADOX® 125
	Colours	yellow-green
④	Sheath	RADOX® 125
	Colour	see table

Technical data

Voltage rating		600 / 1000 V
Test voltage		3500 V AC
Max. conductor temperature		+110 °C
Max. conductor temperature	(short circuit max. 5s)	+280 °C
Min. operating temperature	flexing	-25 °C
Min. conductor temperature	fixed	-40 °C
Min. bending radius	fixed	6 x cable-Ø
	flexing	10 x cable-Ø

Fire tests

Flame propagation::		
Vertical of a single cable	IEC 60332-1, EN 50265-2-1	
Vertical of bunched cables	IEC 60332-3-24, EN 50266-2-4	category C
Content of halogen acid gas	IEC 60754-1, EN 50267-2-1	0 mg/g
Corrosivity of combustion gases	IEC 60754-2, EN 50267-2-3	
Smoke density	IEC 61034-2, EN 50268-2	
Circuit integrity 180 Min.	IEC 60331-21	
Circuit integrity	AS/NZS 3013, WS5	

RADOX® FR AUS – 4.0 – 35 mm²

Multi core cable with circuit integrity in case of fire – RADOX® 125

Extract from our delivery programme

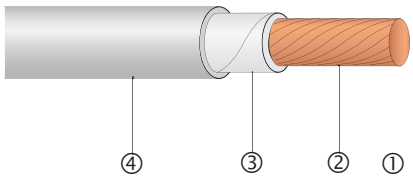
Cross section	Conductor			Core		Cable				Item no.
	Construction nom.	Ø	R_{20} IEC 60228	Ø	Colour*	Ø	Weight nom.	Fire load	Colour	
mm²	n x mm.	mm	max. Ω/km	mm		mm	kg/100 m	kJ / m		
2x4	7 x 0.86	2.58	4.70	4.4	BK,RD	12.1	23.0	2313	OG	12536456
2x4					WH,RD				RD	12536459
3x4	7 x 0.86	2.58	4.70	4.4	WH,RD,BU	12.9	28.1	2468	RD	12536494
3G4					RD,BK,GNYE				red	12536496
4x4	7 x 0.86	2.58	4.70	4.4	WH,RD,BK,BU	14.6	36.4	3047	RD	12537048
4G4					WH,RD,BU,GNYE				RD	12537047
5G4					WH,RD,BK,BU,GNYE	16.2	44.9		RD	12537062
2x6	7 x 1.07	3.21	3.11	5.0	WH,RD	13.6	30.5	2892	RD	12537478
3G6	7 x 1.07	3.21	3.11	5.0	RD,BK,GNYE	14.5	37.0	2996	RD	12537996
4G6	7 x 1.07	3.21	3.11	5.0	WH,RD,BU,GNYE	16.4	48.8	1430	RD	12537708
5G6	7 x 1.07	3.21	3.11	5.0	WH,RD,BK,BU,GNYE	18.1	59.8	3778	RD	12537654
2x10	7 x 1.36	4.08	1.83	6.6	BK,RD	17.9	53.8	4378	OG	12537481
3x10	7 x 1.36	4.08	1.83	6.6	WH,RD,	19.0	63.6		OG	12537490
3G10					BURD,BK,GNYE				OG	12537491
4x10	7 x 1.36	4.08	1.83	6.6	WH,RD,BK,BU	21.1	78.3	6144	OG	12537709
4G10					WH,RD,BU, GNYE				OG	12537713
5G10	7 x 1.36	4.08	1.83	6.6	WH,RD,BK,BU,GNYE	22.9	96.1	7132	OG	12537756
3x16	7 x 1.36	4.08	1.83	6.6	WH,RD,BU	20.7	84.5		OG	12537492
4x16	7 x 1.36	4.08	1.83	6.6	WH,RD,BK,BU	23.1	108.3		OG	12537714
4G16	7 x 1.70	4.85	1.15	7.5	WH,RD,BU,GNYE	23.1	75.1		OG	12537718
5G16	7 x 1.70	4.85	1.15	7.5	WH,RD,BK,BU,GNYE	25.2	127.4	7683	OG	12537758
3x25	7 x 2.15	6.10	0.734	9.2	WH,RD,BU	24.4	126.3		OG	12537493
4x25	7 x 2.15	6.10	0.734	9.2	WH,RD,BK,BU	27.0	157.4	1054	OG	12537726
4G25					WH,RD,BU,GNYE				OG	12537730
5G25	7 x 2.15	6.10	0.734		WH,RD,BK,BU,GNYE	30.3	197.5	1176 1	OG	12537759
3x35	7 x 2.53	7.2	0.524	10.3	WH,RD,BU	26.9	160.6		OG	12537494
4x35	7 x 2.53	7.2	0.524	10.3	WH,RD,BK,BU	29.7	203.6	1130 4	OG	12537731
4G35					WH,RD,BU,GNYE				OG	12537735
5G35	7 x 2.53	7.2	0.524	10.3	WH,RD,BK,BU,GNYE	33.6	257.6	1391 2	OG	12537838

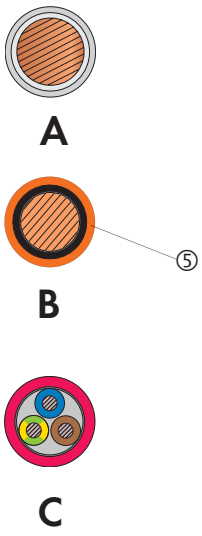
* Description for core colours see page 154

Other cross sections on request.

RADOX® FR INTERNATIONAL

Single core, single core or multi core cable with circuit integrity in case of fire





- halogen free
- flame retardant
- in case of fire no corrosive gases and low smoke
- circuit integrity in case of fire
- excellent high and low temperature, and ozone resistance
- weatherproof
- easy to strip

Application
For emergency support systems: emergency lighting, smoke spill fans, fire alarms and sprinklers, emergency evacuation intercommunication systems, etc.

Composition of cable

① Filler (optional)	RADOX®
② Cores <1.5 mm^2	conductor: stranded tin plated copper OF copper, class 2
2.5 and 4.0 mm^2	conductor: stranded copper bare OF copper, class 2
>4.0 mm^2	conductor: copper bare ETP copper class 2
③ Flame barrier	
④ Insulation	RADOX® 125 crosslinked
Colour	HD 308 S2 (see page 155)
⑤ Sheath	RADOX® 125 crosslinked
Colour	orange

Technical data

Voltage rating U_o/U	≤ 1.0 mm^2	470 / 750 V
Test voltage	≤ 1.0 mm^2	2500 V AC
Voltage rating U_o/U	≤ 1.5 mm^2	600 / 1000 V
Test voltage	≤ 1.5 mm^2	3500 V AC
Max. conductor temperature		+110 °C
Max. conductor temperature	(short circuit max. 5s)	+280 °C
Min. operating temperature	flexing	-25 °C
Min. conductor temperature	fixed	-40 °C
Min. bending radius		10 x cable-Ø

RADOX® FR INTERNATIONAL

Single core, single core or multi core cable with circuit integrity in case of fire

Fire tests

Flame propagation::		
Vertical of a single cable	IEC 60332-1, EN 50265-2-1	
Vertical of bunched cables	IEC 60332-3-24, EN 50266-2-4	category C
Content of halogen acid gas	IEC 60754-1, EN 50267-2-1	0 mg/g
Corrosivity of combustion gases	IEC 60754-2, EN 50267-2-3	
Smoke density	IEC 61034-2, EN 50268-2	
Circuit integrity 180 Min.	IEC 60331-21	
Circuit integrity	AS/NZS 3013, WS5	

Core (drawing A)

A

Extract from our delivery programme

Cross section	Conductor			Core		Cable		Item no.
nom. mm^2	Constr. nom. n x mm	Ø nom. mm	R_{20} IEC60228 max. Ω/km	Ø nom. mm	Colour*	Ø nom. mm	Weight nom. kg/100m	
0.75	7 x 0.38	1.18	23.8	2.6	BK	--	1.32	12582541
1.0	7 x 0.45	1.37	17.5	2.9	BK	--	1.70	12581260
1.0	7 x 0.45	1.37	17.5	2.9	WH	--	1.70	12581261
1.5	7 x 0.54	1.66	11.7	3.5	BK	--	2.49	12581262
1.5	7 x 0.54	1.66	11.7	3.5	BU	--	2.49	12581263
1.5	7 x 0.54	1.66	11.7	3.5	RD	--	2.49	12581264
2.5	7 x 0.69	2.12	7.11	3.95	BK	--	3.61	12581265
2.5	7 x 0.69	2.12	7.11	3.95	RD	--	3.61	12581266
4.0	7 x 0.88	2.67	4.43	4.55	BK	--	5.31	12581835
6.0	7 x 1.07	3.24	2.96	5.1	BK	--	7.31	12581836
10	7 x 1.36	4.13	1.79	6.0	BK	--	10.9	12581837
16	7 x 1.70	4.90	1.13	6.8	BK	--	16.9	12581838
25	7 x 2.15	6.15	0.712	8.5	BK	--	26.6	12581668
35	7 x 2.53	7.25	0.514	9.6	BK	--	36.0	12581669

* Description for core colours see page 154

Other cross sections on request.

RADOX® FR INTERNATIONAL

Single core, single core or multi core cable with circuit integrity in case of fire

Single core cable (drawing B)

B

Extract from our delivery programme

Cross section	Conductor			Cores		Cable		Item no.
nom.	Construction nom.	Ø nom.	R_{20} IEC60228	Ø nom.	Colour*	Ø nom.	Weight nom.	
mm^2	n x mm	mm	max. Ω/km	mm		mm	kg/100 m	
1 x 1.5	7 x 0.54	1.66	11.7	3.5	BN	5.05	4.08	12581843
1 x 2.5	7 x 0.69	2.12	7.11	3.95	BN	5.6	5.49	12581844
1 x 4.0	7 x 0.88	2.67	4.43	4.55	BN	6.3	7.57	12581845
1 x 6.0	7 x 1.07	3.24	2.96	5.1	BN	6.85	9.83	12581846
1 x 10	7 x 1.36	4.13	1.79	6.0	BN	9.0	16.3	12581275
1 x 16	7 x 1.70	4.90	1.13	6.8	BN	9.8	22.8	12581276
1 x 25	7 x 2.15	6.15	0.712	8.5	BN	11.5	33.8	12581419
1 x 35	7 x 2.53	7.25	0.514	9.6	BN	12.7	44.2	12581847

* Description for core colours see page 154

Other cross sections on request.

RADOX® FR INTERNATIONAL

Single core, single core or multi core cable with circuit integrity in case of fire

Multi core cable (drawing C)

C

Extract from our delivery programme

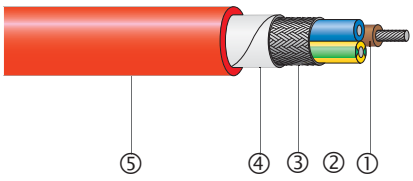
Cross section	Conductor			Cores		Cable		Item no.	Note
nom. mm^2	Construction nom. n x mm Ø	Ø nom. mm	R_{20} IEC 60228 max. Ω/km	Ø nom. mm	Colour*	Ø nom. mm	Weight nom. kg/100m		
2 x 0.75	7 x 0.38	1.18	24.8	2.6	BN,BU	7.1	7.05	12581417	
2 x 1.0	7 x 0.45	1.37	18.2	2.9	BN,BU	7.8	5.43	12582190	
2 x 1.5	7 x 0.54	1.66	12.2	3.5	BN,BU	7.0	5.01	12581269	without sheath
2 x 1.5	7 x 0.54	1.66	12.2	3.5	BN,BU	9.2	12.2	12581270	
2 x 2.5	7 x 0.69	2.12	7.41	3.95	BN,BU	7.9	7.25	12581874	without sheath
2 x 2.5	7 x 0.69	2.12	7.41	3.95	BN,BU	10.3	16.2	12581748	
3 x 0.75	7 x 0.38	1.18	24.8	2.6	BN,BK,GY	7.6	8.75	12581418	
3 G 1.5	7 x 0.54	1.66	12.2	3.5	BN,BU,GNYE	9.9	14.8	12581271	
3 x 2.5	7 x 0.69	2.12	7.41	3.95	BN,BK,GY	10.9	19.4	12581272	
3 G 2.5	7 x 0.69	2.12	7.41	3.95	BN,BU,GNYE	10.9	19.4	12581273	
3 x 6.0	7 x 1.07	3.24	3.08	5.1	BN,BK,GY	13.8	35.3	12581925	
3 x 16	7 x 1.70	4.90	1.15	6.8	BN,BK,GY	18.8	76.0	12581926	
4 G 1.5	7 x 0.54	1.66	12.2	3.5	BN,BK,GY,GNYE	11.0	18.5	12581274	
4 G 4.0	7 x 0.88	2.67	4.614.55	bn,	BK,GY,GNYE	13.9	34.3	12581422	
4 G 6.0	7 x 1.07	3.24	3.08	5.1	BN,BK,GY,GNYE	15.6	45.7	12581423	
4 x 10	7 x 1.36	4.13	1.83	6.0	BN,BK,GY,BU	18.9	68.9	12581424	
4 x 16	7 x 1.70	4.90	1.15	6.8	BN,BK,GY,BU	20.7	96.2	12581425	
4 x 25	7 x 2.15	6.15	0.727	8.5	BN,BK,GY,BU	25.2	148	12581426	
4 x 35	7 x 2.53	7.25	0.524	9.6	BN,BK,GY,BU	28.1	194	12581427	
5 G 1.5	7 x 0.54	1.66	12.2	3.5	BU,BN,BK,GY,GNYE	12.1	22.4	12581284	
5 G 2.5	7 x 0.69	2.12	7.41	3.95	BU,BN,BK,GY,GNYE	13.5	30.3	12581285	
5 G 6.0	7 x 1.07	3.24	3.08	5.1	BU,BN,BK,GY,GNYE	17.5	57.6	12581286	
5 G 10	7 x 1.36	4.13	1.83	6.0	BU,BN,BK,GY,GNYE	20.6	83.2	12581718	
5 G 16	7 x 1.70	4.90	1.15	6.8	BU,BN,BK,GY,GNYE	22.7	118	12581287	
10 x 1.5	7 x 0.54	1.66	12.2	3.5	BK,YE num..	17.4	40.9	12582613	
10 x 1.5	7 x 0.54	1.66	12.2	3.5	BK,YE num..	20.5	59.4	12582614	
4 x 25 + 1 G 16	7 x 2.15 7 x 1.70	6.15 4.90	0.727 1.15	8.5 6.8	BU,BN,BK,GY,GNYE	27.7	171	12581283	

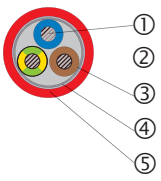
* Description for core colours see page 154

Other cross sections on request.

RADOX® FR INTERNATIONAL ALU

Communication cable with circuit integrity in case of fire





- halogen free
- flame retardant
- in case of fire no corrosive gases and low smoke
- circuit integrity in case of fire
- excellent high and low temperature, and ozone resistance
- weatherproof
- easy to strip

Anwendung
For emergency support systems: emergency lighting, smoke spill fans, fire alarms and sprinklers, emergency evacuation intercommunication systems, etc.

Composition of cable

①	Cores <1.5 mm^2	
	Conductor	stranded tin plated copper OF copper, class 2
	Flame barrier	
	Insulation	RADOX® 125 vernetzt
	Colours	white, black numbered
②	Fillers (optional)	RADOX®
	Filler	stranded tin plated copper OF copper, class 2
③	Screening	aluminium tape, plastic coated
④	Separator (optional)	plastic tape
⑤	Sheath	RADOX® 125 crosslinked
	Colour	red

Technical data

Voltage rating Uo/U	300 / 500 V
Test voltage, 50 Hz, 1 Min.	2000 V
Temperature range	-40 °C up to +110 °C
Min. bending radius	10 x cable-Ø

Fire tests

Flame propagation::		
Vertical of a single cable	IEC 60332-1, EN 50265-2-1	
Vertical of bunched cables	IEC 60332-3-24, EN 50266-2-4	category C
Content of halogen acid gas	IEC 60754-1, EN 50267-2-1	0 mg/g
Corrosivity of combustion gases	IEC 60754-2, EN 50267-2-3	
Smoke density	IEC 61034-2, EN 50268-2	
Circuit integrity 180 Min.	IEC 60331-21	
Circuit integrity	AS/NZS 3013, WS5	

RADOX® FR INTERNATIONAL ALU

Communication cable with circuit integrity in case of fire

Extract from our delivery programme

Cross section	Conductor			Cores		Filler	Cable		Item no.
nom.	Construction nom.	Ø nom.	R_{20} IEC 60228	Ø nom.	Core numbers	Ø nom.	Ø nom.	Weight nom.	
mm2	n x mm Ø	mm	max. Ω/km	mm		mm2	mm	kg/100m	
1 x 2 x 0.5	7 x 0.31	0.97	36.7	2.4	1 + 2	0.97	6.8	6.1	12581936
2 x 2 x 0.5	7 x 0.31	0.97	36.7	2.4	1/2 - 3/4	0.97	11.2	14.2	12581937
3 x 2 x 0.5	7 x 0.31	0.97	36.7	2.4	1/2 - 5/6	0.97	12.1	16.9	12581938
5 x 2 x 0.5	7 x 0.31	0.97	36.7	2.4	1/2 - 9/10	0.97	15.6	25.5	12581939
7 x 2 x 0.5	7 x 0.31	0.97	36.7	2.4	1/2 - 13/14	0.97	16.0	28.6	12581940
10 x 2 x 0.5	7 x 0.31	0.97	36.7	2.4	1/2 - 19/20	0.97	20.0	40.2	12581941
1 x 2 x 0.75	7 x 0.38	1.18	24.8	2.6	1 + 2	1.18	7.3	7.4	12581942
2 x 2 x 0.75	7 x 0.38	1.18	24.8	2.6	1/2 - 3/4	1.18	12.2	17.4	12581943
3 x 2 x 0.75	7 x 0.38	1.18	24.8	2.6	1/2 - 5/6	1.18	12.9	19.9	12581944
5 x 2 x 0.75	7 x 0.38	1.18	24.8	2.6	1/2 - 9/10	1.18	17.2	31.6	12581945
7 x 2 x 0.75	7 x 0.38	1.18	24.8	2.6	1/2 - 13/14	1.18	17.3	35.0	12581946
10 x 2 x 0.75	7 x 0.38	1.18	24.8	2.6	1/2 - 19/20	1.18	21.6	49.0	12581947
1 x 2 x 1.0	7 x 0.44	1.37	18.2	2.9	1 + 2	1.37	7.9	9.0	12581948
2 x 2 x 1.0	7 x 0.44	1.37	18.2	2.9	1/2 - 3/4	1.37	13.5	21.6	12581949
3 x 2 x 1.0	7 x 0.44	1.37	18.2	2.9	1/2 -- 5/6	1.37	14.3	24.8	12581950
5 x 2 x 1.0	7 x 0.44	1.37	18.2	2.9	1/2 - 9/10	1.37	19.1	39.4	12581951
7 x 2 x 1.0	7 x 0.44	1.37	18.2	2.9	1/2 - 13/14	1.37	19.1	43.4	12581952
10 x 2 x 1.0	7 x 0.44	1.37	18.2	2.9	1/2 - 19/20	1.37	24.1	62.2	12581953
1 x 3 x 1.0	7 x 0.44	1.37	18.2	2.9	1 - 3	1.37	8.5	11.3	12581954
1 x 4 x 1.0	7 x 0.44	1.37	18.2	2.9	1 - 4	1.37	9.4	13.8	12581955
1 x 2 x 1.5	7 x 0.54	1.66	12.2	3.5	1 + 2	1.66	9.3	12.5	12581956
2 x 2 x 1.5	7 x 0.54	1.66	12.2	3.5	1/2 - 3/4	1.66	16.0	30.0	12581957

* Description for core colours see page 154

Other cross sections on request.

General technical information

Electrical formulas

Formulas

Required conductor cross section for electric cables

given	Direct current	Single phase alternating current	Three phase alternating current
Voltage drop, current	$\frac{200 \cdot L \cdot I}{\gamma \cdot u_0 \cdot U}$	$\frac{200 \cdot L \cdot I \cdot \cos\varphi}{\gamma \cdot u_0 \cdot U}$	$\frac{173 \cdot L \cdot I \cdot \cos\varphi}{\gamma \cdot u_0 \cdot U}$
Voltage drop, power	$\frac{200 \cdot L \cdot P}{\gamma \cdot u_0 \cdot U^2}$	$\frac{200 \cdot L \cdot P}{\gamma \cdot u_0 \cdot U^2}$	$\frac{100 \cdot L \cdot P}{\gamma \cdot u_0 \cdot U^2}$
Voltage drop, current	$\frac{200 \cdot L \cdot I^2}{\gamma \cdot p_0 \cdot P}$	$\frac{200 \cdot L \cdot I^2}{\gamma \cdot p_0 \cdot P}$	$\frac{300 \cdot L \cdot I^2}{\gamma \cdot p_0 \cdot P}$
Voltage drop, voltage	$\frac{200 \cdot L \cdot P}{\gamma \cdot p_0 \cdot U^2}$	$\frac{200 \cdot L \cdot P}{\gamma \cdot p_0 \cdot U^2 \cdot \cos^2\varphi}$	$\frac{100 \cdot L \cdot P}{\gamma \cdot p_0 \cdot U^2 \cdot \cos^2\varphi}$

Key:

I	=	Current in ampère	A	=	Conductor cross section in mm²
γ	=	Conductivity (copper 56, aluminium 34)	u_o	=	Voltage drop in % of the operating voltage
L	=	Conductor lengths (single) in meters	U	=	Operating voltage in volts
P	=	Transmission power in watts	cos φ	=	Power factor (usually assumed to be 0.8)
p_o	=	Power loss in % of the transmission power			

The formulas stated for alternating and three-phase current do not give any consideration to the inductive resistance. This resistance is a function of the distance of the individual conductors between one another.
Determination of the current if the power is known.

Direct current:

$I = \frac{P}{U \cdot \eta}$

P = Rated power in W
U = Voltage in V
I = Current in A
η = Efficiency

Example:
What is the current that a heating unit of 3.4 kW absorbs at 440 V ? (η = 1)

$I = \frac{3400}{440 \cdot 1}$ = 7.7 A

Alternating current:

$I = \frac{P}{U \cdot \cos\varphi \cdot \eta}$

P = Rated power in W
U = Voltage in V
I = Current in A
cos φ = Phase shift
η = Efficiency

Example:
What is the current consumption of an alternating current motor of 1.9 kW at cos φ = 0.77 and an efficiency of 79%?
The voltage is 230 V, 50 Hz.

$I = \frac{1900}{230 \cdot 0.77 \cdot 0.79}$ = 13.6 A

Three phase current:

$I = \frac{P}{1.73 \cdot \cos\varphi \cdot \eta \cdot U}$

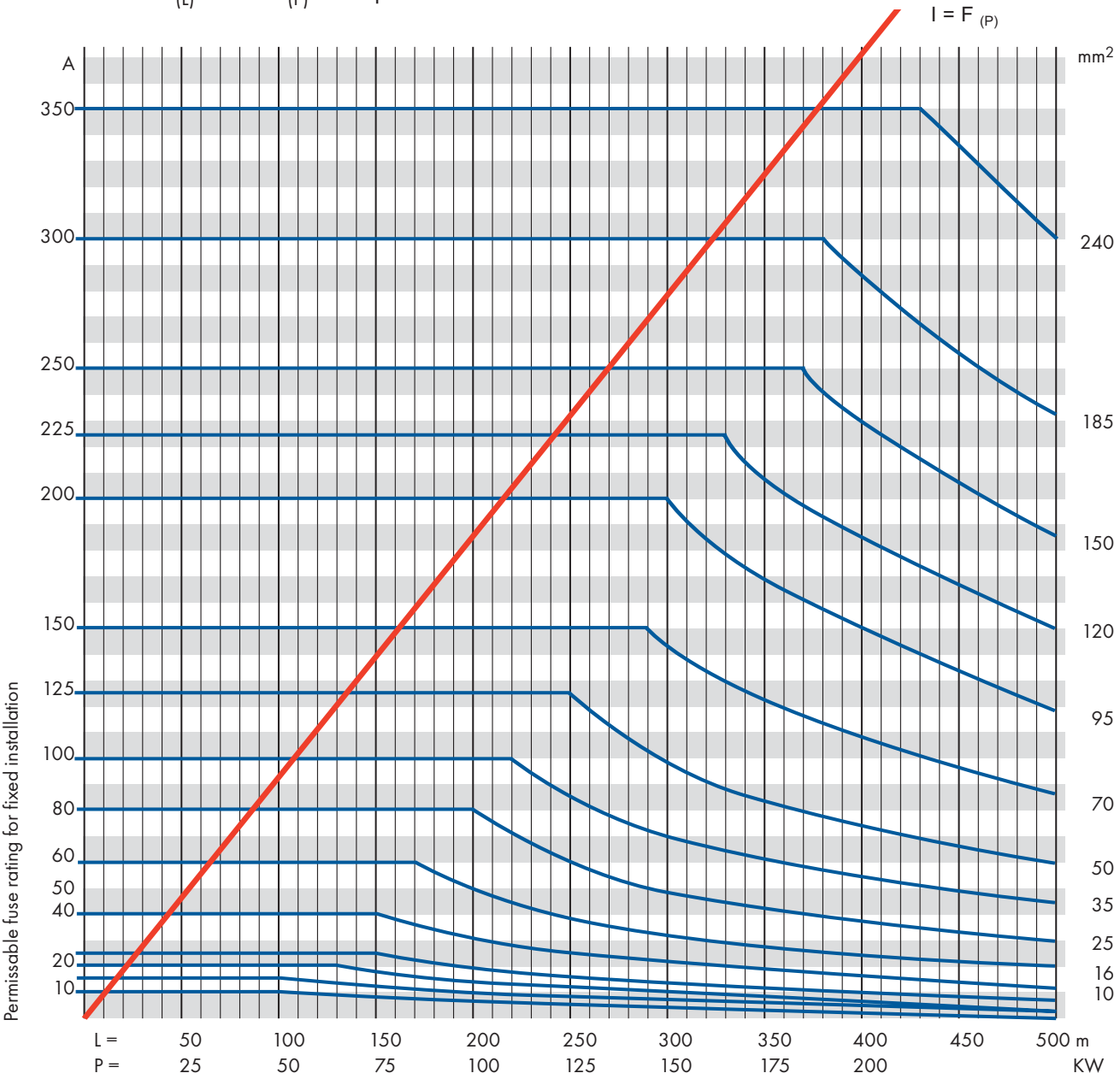
P = Nennleistung in W
U = Aussenleiterspannung in V
I = Aussenleiterstrom in A
cos φ = Phasenverschiebung
η = Wirkungsgrad

Example:
What current does a three phase motor of 22 kW consume at 400 V, 50 Hz, with cos φ = 0,89 and an efficiency of 90% ?

$I = \frac{22000}{1.73 \cdot 400 \cdot 0.89 \cdot 0.9}$ 39.7 A

Table of three phase current

Permissable three phase cable loading at 5% voltage drop
Presentation: $I = F_{(L)}$ und $I = F_{(P)}$ $\cos \varphi = 0.82$



Example:
A power of 70 kW is to be transmitted across a distance of L = 450 m. The funktion $I = F_{(P)}$ gives us 70 kW ~= 130 A (mixed users). The function $I = F_{(L)}$ provides the cable cross section of 95 mm^2.

A length of 500 metres would already require a cable of 120 mm^2 to ensure that the voltage loss and therefore also the power loss would be in an acceptable and economical range.

Representation: $I = F_{(L)}$ shows that, for example, for 95 mm^2 the permissable fuse of 200 A determines the load limit up to L = 300 m, i.e. $U_V < 5$ %.

From 300 m the cross section can no longer be fully utilized.

Characteristics of materials

Typical characteristics of various insulation and jacket materials for cables

	Insulation compounds													
	Thermoplastics							Crosslinked materials						
Abbreviations(1)	PVC	PE	PBT-FR	TPE-E	ETFE	FEP	PTFE	EPR	PE-X	RX 125	RX 155S	RX 155	PVDF-X	SIR
CENELEC type	TI1							EI6						EI2
Thermical characteristics														
Thermal resistance														
20'000 h (°C)	70	70	110	110	135	180	250	90	90	120	130	135	135	180
24 h (°C)	100	100	160	160	220	240	300	180	180	200	220	220	220	260
Short circuit (°C)	160	100	160	160	250	250	300	250	250	250	250	250	300	350
Resistance to cold, moved (°C)	-5	-55	-40	-40	-55	-55	-70	-40	-55	-40	-55	-55	-55	-55
Mechanical characteristics														
Tensile strenght (N/mm^2)	≥12.5	≥10	≥25	≥30	≥30	≥10	≥20	≥5.0	≥12.5	≥12.5	≥12.5	≥15	≥28	≥5.0
Elongation at break (%)	≥125	≥300	≥200	≥200	≥150	≥200	≥200	≥200	≥200	≥200	≥200	≥300	≥200	≥150
Abrasion resistance	satisf.	good	good	very good	very good	satisf.	satisf.	satisf.	very good	good	very good	good	very good	poor
Flexibilty (2)	satisf.	poor	poor	poor	poor	poor	poor	very good	poor	satisf.	poor	satisf.	poor	very good
Electrial characteristics														
Volume resistivity at 20 °C (Ωcm)	10^{14}	10^{16}	10^{15}	10^{15}	10^{16}	10^{18}	10^{18}	10^{15}	10^{16}	10^{14}	10^{16}	10^{16}	10^{14}	10^{15}
Dielectric constant at 1 kHz	5.0	2.3	3.7	3.8	2.6	2.2	2.0	3.0	2.4	4.2	2.6	2.8	5.7	3.0
Fire characteristics														
Flame retardant	yes	no	yes	no	yes	yes	yes	no	no	yes	yes	yes	yes	ja
Halogen free	no	yes	yes	yes	no	no	no	yes	yes	yes	no	no	no	ja
Corrosive combustion gases	yes	no	no	no	yes	yes	yes	no	no	no	yes	yes	yes	no
Smoke generation	strong	average	average	average	low	low	low	average	average	low	strong	strong	low	average
Resistance to														
Ionizing radiation (kGy)	100	1000	1000	1000	2000	100	1	2000	1000	1000	1000	1000	1000	500
Solvents (3)	satisf.	satisf.	good	good	very good	very good	very good	satisf.	satisf.	satisf.	good	satisf.	very good	satisf.
Oils and fuels (3)	satisf.	satisf.	good	good	very good	very good	very good	schlecht	satisf.	satisf.	good	satisf.	very good	satisf.
Acids and alkaline solutions (3)	good	very good	satisf.	satisf.	very good	very good	very good	very good	very good	good	good	good	very good	satisf.
Water/hydrolysis (3)	good	very good	satisf.	satisf.	very good	very good	very good	good	very good	good	very good	very good	very good	very good
Weather/UV radiation	good	schlecht	good	good	very good	very good	very good	good	satisf.	good	good	good	very good	very good

(1) RX = RADOX®, for other abbreviations see following page "Material designations"
(2) depends greatly on cable construction
(3) influenced by type, time and medium temperature

Important:
As the characteristics of compounds may vary widely according to their specific formulation, the values stated in the table must be understood as approximate values referring to typical representatives of their material class.

The data is based on laboratory investigations and practical experience. It is stated to the best of our knowledge, but without guarantee. We will gladly advise you in individual cases.

Characteristics of materials

Typical characteristics for cables

	Sheat compounds							
	Thermoplastics		Crosslinked materials					
Abbreviation (1)	LSFH	TPU	CR	RX 125A	RX 125M	RX 125TM	REMS	REMS FH
CENELEC type		TMPU	EM2					
Thermical characteristics								
Thermal resistance								
20'000 h (°C)	90	90	60	120	120	120	130	120
24 h (°C)	130	140	120	200	200	200	200	200
Short circuit (°C)	250	200	200	280	280	280	280	280
Resistance to cold, moved (°C)	-25	-55	-25	-25	-25	-25	-40	-25
Mechanical characteristics								
Tensile strenght (N/mm^2)	≥ 9.0	≥25	≥10	≥10	≥9	≥10	≥15	≥10
Elongation at break (%)	≥125	≥300	≥300	≥125	≥125	≥125	≥300	≥125
Abrasion resistance	good	very good	good	good	good	good	good	good
Flexibilty (2)	satisf.	satisf.	very good	satisf.	good	good	good	good
Electrial characteristics								
Volume resistivity at 20 °C (Ωcm)	10^{13}	10^{12}	10^{10}	10^{14}	10^{12}	10^{12}	10^{12}	10^{12}
Dielectric constant at 1 kHz	5	7	8	4.8	6	5	4.8	5.5
Fire characteristics								
Flame retardant	yes	no	yes	yes	yes	yes	yes	yes
Halogen free	yes	yes	no	yes	yes	yes	no	yes
Corrosive combustion gases	no	no	yes	no	no	no	yes	no
Smoke generation	low	average	stark	low	low	low	stark	low
Resistance to								
Ionizing radiation (kGy)	1000	5000	500	1000	1000	1000	1000	1000
Solvents (3)	schlecht	satisf.	satisf.	satisf.	satisf.	satisf.	satisf.	satisf.
Oils and fuels (3)	schlecht	good	good	satisf.	good	good	very good	very good
Acids and alkaline solutions (3)	satisf.	satisf.	very good	good	good	very good	very good	good
Water/hydrolysis (3)	satisf.	very good	good	good	good	very good	good	good
Weather/UV radiation	satisf.	good	good	good	good	good	very good	good

(1) RX = RADOX®, for other abbreviations see following page "Material designations"
(2) depends greatly on cable construction
(3) influenced by type, time and medium temperature

Important:
As the characteristics of compounds may vary widely according to their specific formulation, the values stated in the table must be understood as approximate values referring to typical representatives of their material class.

The data is based on laboratory investigations and practical experience. It is stated to the best of our knowledge, but without guarantee. We will gladly advise you in individual cases.

Colour table

• BK	=	black/schwarz	• GN	=	green/grün
• TQ	=	turquoise/türkis	• GY	=	grey/grau
• WH	=	white/weiss	• OG	=	orange/orange
• BN	=	brown/braun	• VT	=	violet/violett
• BU	=	blue/blau	• PK	=	pink/rosa
• RD	=	red/rot			
• YE	=	yellow/gelb	• GNYE	=	green-yellow/grün-gelb

Material designations

Thermoplastics

ETFE	Ethylene-tetrafluoroethylene copolymer
FEP	Tetrafluoroethylene-perfluoropropylene copolymer
LSFHTM	Halogen free, flame retardant material (low smoke free of halogen)
PBT FR	Flame retardant polybutylene terephthalate
PE	Polyethylene
PTFE	Polytetrafluoroethylene
PVC	Polyvinylchloride
TPC	Thermoplastic polyester elastomers
TPU	Thermoplastic polyurethane

Crosslinked materials

CR	Chloroprene rubber
EPR	Ethylene propylene rubber
PE-X	Crosslinked polyethylene
PVDF-X	Crosslinked polyvinylidene fluoride
RADOX® 125	Polyolefin copolymer
RADOX® 125A	Polyolefin copolymer
RADOX® 125M	Polyolefin copolymer
RADOX® 125TM	Ethylene acrylate copolymer
RADOX® 155	Polyolefin copolymer
RADOX® 155S	Polyolefin copolymer
RADOX® ELASTOMER S (REMS)	Ethylene acrylate copolymer
RADOX® ELASTOMER S FH (REMS FH)	Ethylene acrylate copolymer
SIR	Silicon rubber

Core colours HD 308 S2 vs. HD 308

Example

Core numbers:

New	Old
HD 308 S2	**HD 308**

with yellow-green grounding wire

3					
4					
5					

3					
4					
5					

Old
SEV 1101, 1102

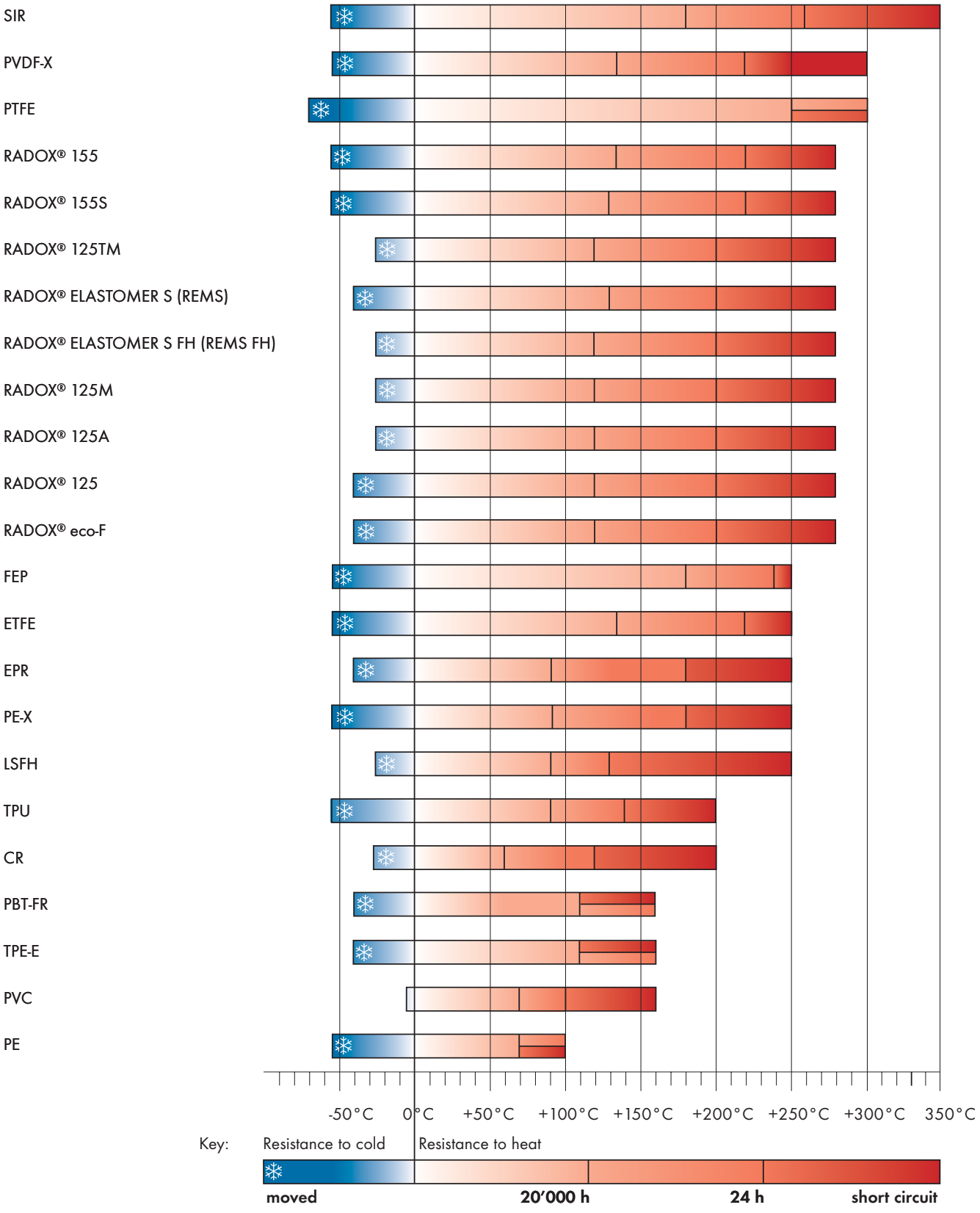
without yellow-green grounding wire

2					
3					
4					
5					

2					
3					
4					
5					

Resistance to cold and heat

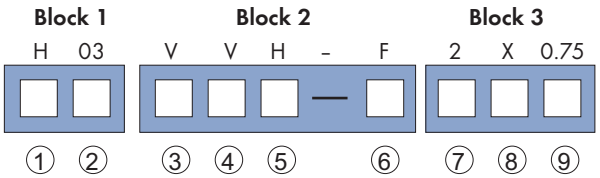
Typical operating temperature ranges of different insulations and sheaths



Standards

System for type designation of electric cables according to CENELEC HD 361

Example:
light weight PVC sheathed cable, flat



Block 1:

① Type of standard
H: Harmonised type
A: Acknowledged national type

② Voltage rating U_O/U
01: 100/100 V
03: 300/300 V
05: 300/500 V
07: 450/750 V

⑤ Construction feature
H: flat, divisible line
H2: flat, non-divisible line

⑥ Conductor type
F: stranded (class 5) with flexible cables
H: stranded (class 6) with flexible cables
K: stranded (class 5) with permanently installed cables
R: stranded (class 2)
U: solid (class 1)

Block 2:

③ Insulation material ④ Sheat material
R: Ethylen propylen rubber, 90 °C
G: Ethylen vinylacetat
N: Polychloropren rubber
Q: Polyurethane
R: Ethylen propylen rubber, 60 °C
S: Silicon rubber
V: PVC
V2: PVC, 90 °C
V3: PVC, cold resistant
V5 PVC, oil resistant
Z: Crosslinked polyolefin compound, little corrosive gases, low smoke
Z1: Thermoplastic polyolefin compound, little corrosive gases, low smoke

Block 3:

⑦ Number of cores

⑧ Protective earth conductor
X: without protecitve earth conductor (yellow-green)
G: with protecitve earth conductor (yellow-green)

⑨ Conductor cross section in mm^2

Conversion AWG

Metric wire cross section and wire diameters

= American Wire Gauge

AWG	with UL/CSA		with MIL
	Cross section mm² nom.	Diameter mm nom.	Cross section mm² nom.
36	0.013	0.13	-
34	0.020	0.16	-
32	0.032	0.20	-
30	0.051	0.25	0.057
28	0.081	0.32	0.090
26	0.13	0.40	0.15
24	0.21	0.51	0.24
22	0.32	0.64	0.38
20	0.52	0.81	0.62
18	0.82	1.0	0.96
16	1.3	1.3	1.2
14	2.1	1.6	1.9
12	3.3	2.1	3.0
10	5.3	2.6	4.7
8	8.4	3.3	8.6
6	13	4.1	14
4	21	5.2	22
3	27	5.8	-
2	34	6.5	34
1	42	7.3	41
1/0	54	8.3	53
2/0	67	9.3	67
3/0	85	10	84
4/0	107	12	107

Thermal classes of insulating materials according to IEC 60085

Thermal class	Max. limiting-temperature	Thermal class	Max. limiting-temperature	Thermal class	Max. limiting-temperature
Y	90 °C	B	130 °C	200	200 °C
A	105 °C	F	155 °C	220	220 °C
E	120 °C	H	180 °C	250	250 °C

Wire cross section

according to IEC 60228 and CENELEC HD 383

table 1

Nom. cross section	Construction: number of wires (minimum value) Strand diameter (approx.)		max. direct current at 20 °C	
	solid, class 1	stranded, class 2	bare	tinned
mm^2	n x mm	n x mm	Ω/km	Ω/km
0.5	1 x 0.80	7 x 0.30	36.0	36.7
0.75	1 x 1.00	7 x 0.37	24.5	24.8
1	1 x 1.13	7 x 0.43	18.1	18.2
1.5	1 x 1.38	7 x 0.52	12.1	12.2
2.5	1 x 1.78	7 x 0.67	7.41	7.56
4	1 x 2.25	7 x 0.85	4.61	4.70
6	1 x 2.76	7 x 1.04	3.08	3.11
10	1 x 3.57	7 x 1.35	1.83	1.84
16	1 x 4.50	7 x 1.70	1.15	1.16
25	-	7 x 2.16	0.727	0.734
35	-	7 x 2.52	0.524	0.529
50	-	19 x 1.78	0.387	0.391
70	-	19 x 2.16	0.268	0.270
95	-	19 x 2.52	0.193	0.195
120	-	37 x 2.03	0.153	0.154
150	-	37 x 2.25	0.124	0.126
185	-	37 x 2.52	0.0991	0.100
240	-	61 x 2.25	0.0754	0.0762
300	-	61 x 2.52	0.0601	0.0607
400	-	61 x 2.84	0.0470	0.0475
500	-	61 x 3.20	0.0366	0.0369
630	-	91 x 2.97	0.0283	0.0286

Terminals:
Because of the larger diameter in classes 2, 5 and 6 compared with class 1, you must select a terminal for these classes that is one nominal cross section larger.

Wire cross sections

according to IEC 60228 and Cenelec HD 383

table 2

Nom. cross section	Construction: number of wires (minimum value) Strand diameter (approx.)		max. direct current at 20 °C	
mm²	stranded, class 5 n x mm	stranded, class 6 n x mm	bare Ω/km	tinned Ω/km
0.5	19 x 0.21	25 x 0.16	39.0	40.1
0.75	24 x 0.21	38 x 0.16	26.0	26.7
1	32 x 0.21	50 x 0.16	19.5	20.0
1.5	30 x 0.26	75 x 0.16	13.3	13.7
2.5	50 x 0.26	125 x 0.16	7.98	8.21
4	56 x 0.31	200 x 0.16	4.95	5.09
6	80 x 0.31	174 x 0.21	3.30	3.39
10	77 x 0.41	290 x 0.21	1.91	1.95
16	123 x 0.41	462 x 0.21	1.21	1.24
25	190 x 0.41	722 x 0.21	0.780	0.795
35	266 x 0.41	1012 x 0.21	0.554	0.565
50	385 x 0.41	664 x 0.31	0.386	0.393
70	348 x 0.51	928 x 0.31	0.272	0.277
95	468 x 0.51	1260 x 0.31	0.206	0.210
120	589 x 0.51	1590 x 0.31	0.161	0.164
150	741 x 0.51	1990 x 0.31	0.129	0.132
185	912 x 0.51	2452 x 0.31	0.106	0.108
240	1184 x 0.51	3180 x 0.31	0.0801	0.0817
300	1480 x 0.51	3976 x 0.31	0.0641	0.0654
400	1961 x 0.51	-	0.0486	0.0495
500	1702 x 0.61	-	0.0384	0.0391
630	2146 x 0.61	-	0.0287	0.0292

Guide to installation

Smallest allowable bending radii for power and signal cables

Conductor type	Cable diameter D (mm)			
Installation method	D ≤ 8	8 < D ≤ 12	12 < D ≤ 20	D < 20
solid, class 1/stranded, class 2				
- carefully bend at connection	2D	3D	4D	4D
- normal use	4D	5D	6D	6D
stranded, class 5 (HUBER+SUHNER)				
- fixed	3D	3D	4D	4D
- flexing	4D	4D	5D	6D

Allowable tensile stress

1. For installing cables by pulling on the conductors, or by drawing sleeve, the following max. pulling force (P) is allowed::

$P = 50 \times A$ (N)
A = Sum of conductor cross section (mm^2)

2. When installing cables with high tensile armouring, the following max. pulling force (P) is allowed:

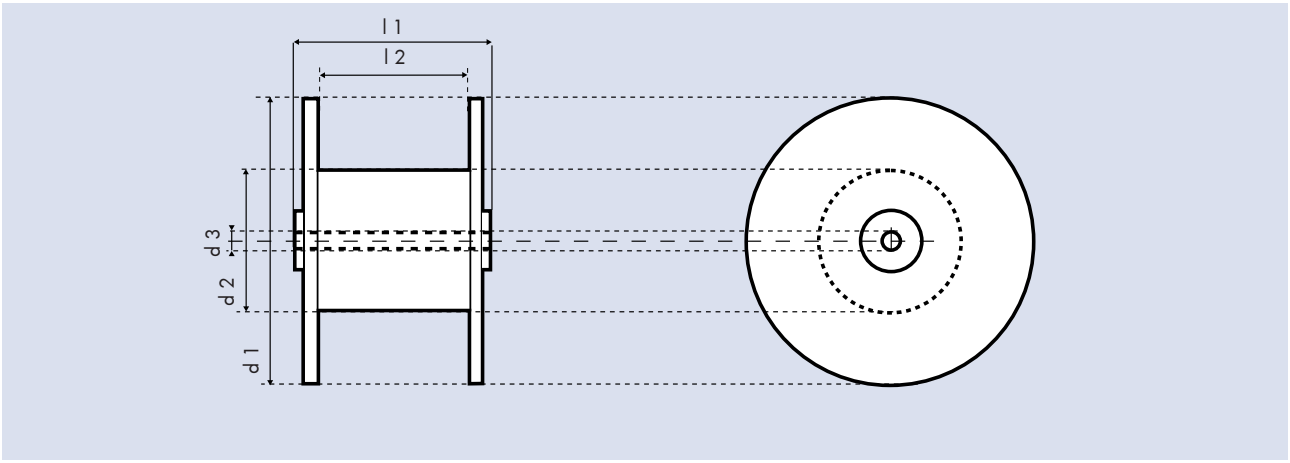
$P = 9 \times D^2$ (N)
D = cable diameter over armouring (mm)

The calculation of pulling forces necessary for installation is done using the following formulas:

Pulling force for installation of a straight section without elevation difference.			Pulling force for installation of a straight section with elevation difference	
	P =	10 x G x L x μ	P =	10 x G x (L x μ ± h)
with	P:	pulling force at the end of the stretch (N)	with h:	elevation difference (m)
	G:	weight of the cable (kg/m)	Coefficient of friction μ	
	L:	length of the section (m)	0.15 – 0.30	installation with rollers
	μ:	coefficient of friction	0.40 – 0.60	installation in cement pipes installation in plastic pipes
			0.15 – 0.25	– with special lubricating grease
			0.15 – 0.30	– with water

N.B.: Very long cable lengths with thermoplastic sheaths can only be pulled into plastic pipes with the aid of lubricants. Local heating, occurring mainly in bends, may cause the cable to melt into the pipe walls.

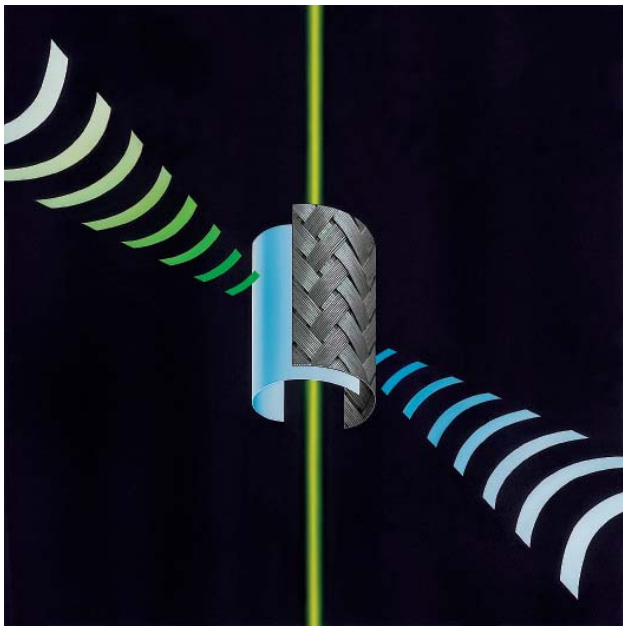
Delivery spools



	Spool type													
	One way spools													
	Nr. 5	Nr. 6	Nr. 7	DIN	L	L	L	L	LHL	LHL	LHL	LHL	LHL	LHL
				250	355	450/13	450/14	500	710	900	1050	1250	1400	1600
d 1	140	140	170	250	355	450	450	500	710	900	1050	1250	1400	1600
d 2	65	65	65	160	200	200	312	250	360	450	550	700	700	800
d 3	60	60	60	22	36	50	50	50	82	82	82	92	92	92
l 1	56	106	135	200	160	244	244	321	430	545	698	726	880	1025
l 2	50	100	130	160	150	228	228	305	400	450	600	630	760	900
Tara kg	0.08	0.10	0.15	0.71	1.54	2.48	3.02	3.16	10	36	53	74	120	174

Cable Ø mm	Cable length per delivery spool m													
1		970	2020	3710	8100									
2			500	930	2030	5820								
4					510	1450	940	2240	5880					
6					220	650	420	1000	2610	4770	8380			
8						360	230	560	1470	2680	4710			
10						230	150	360	940	1720	3010			
12								250	650	1190	2090			
14								180	480	880	1540			
16								140	370	670	1180			
18								110	290	530	930			
20									230	430	750	1060	1750	2710
22										350	620	880	1450	2240
24										300	520	740	1220	1880
26										250	450	630	1040	1610
28										220	380	540	890	1380
30										190	330	470	780	1210
32										170	290	410	680	1060
34										150	260	370	610	940
36										130	230	330	540	840
38										120	210	290	490	750
40											190	260	440	680
45											150	210	350	540
48											130	180	300	470

EMC screened cables



The screening of cables can be described by the two coupling quantities of transfer impedance Z_T and transfer admittance Y_T. Both coupling quantities are basically a function of the geometry and the environment; depending on the specific application and requirements, the coupling quantities can be optimised for a given cable.

EMI	**electromagnetic interference**
EMP	**electromagnetic pulse**
ESD	**electrostatic discharge**
LEMP	**lightning electromagnetic pulse**
NEMP	**nuclear electromagnetic pulse**
TEMPEST	**tap-proofness (eaves-dropping protection)**
NEXT	**near end crosstalk**

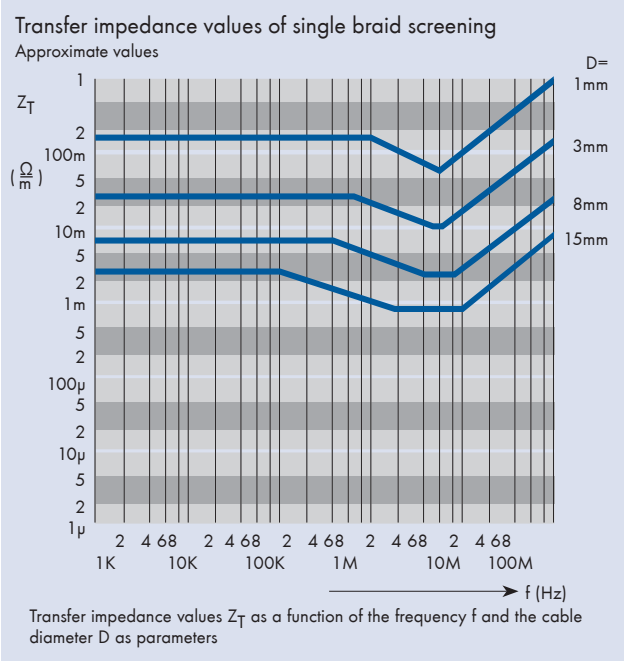
With HUBER+SUHNER, your screening problems will end.
We can ensure this thanks to the vast experience accumulated in this field responding to every kind of customer need and collaborating continuously with research institutes..

Measurement engineering at HUBER+SUHNER
Complies with the following standards:
IEC 96-1 and 46 A/DIN 47250/
VG 95373/CCITT/...

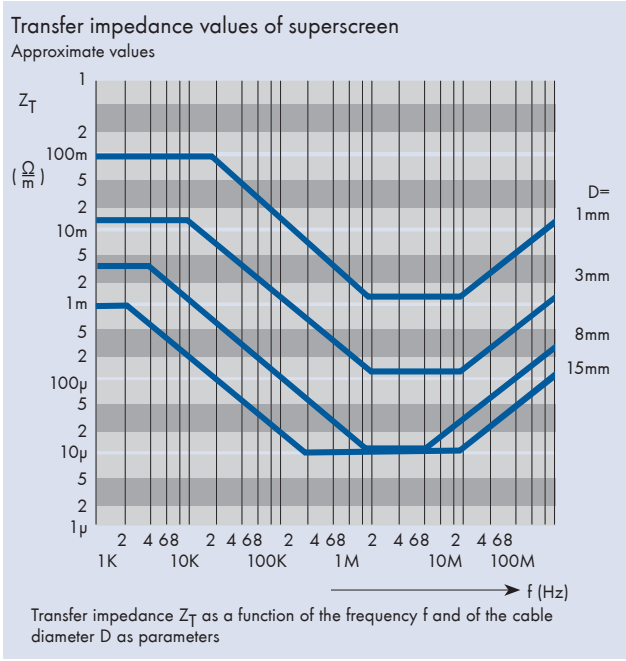
Screenings for all EMC requirements
HUBER+SUHNER designs, optimises and produces products for a wide variety of performance classes. These products are implemented using different braids, foils, high-permeability intermediate layers, microwave absorbing and semi-conducting layers, mixed screens, etc.

EMC screened cables

Screened cables from single braid to superscreen



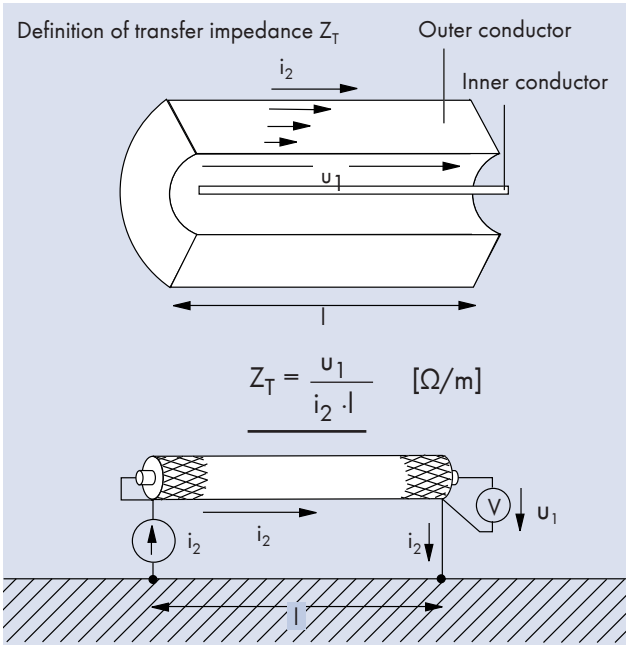
Transfer impedance values Z_T as a function of the frequency f and the cable diameter D as parameters



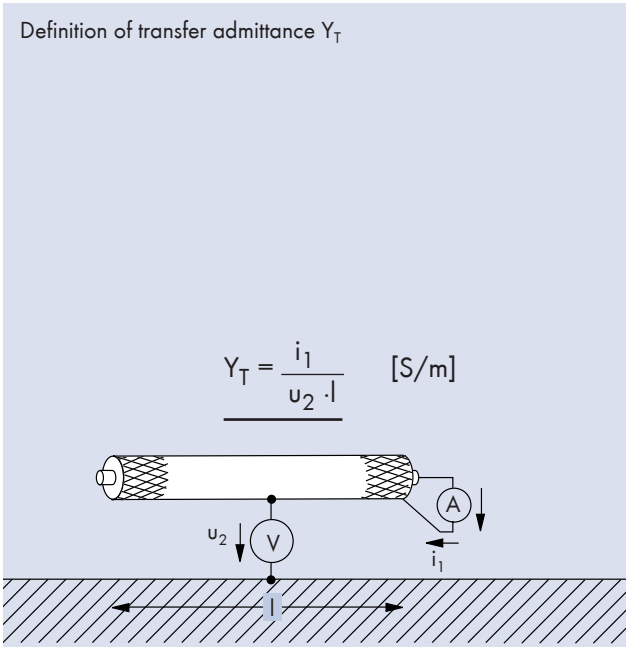
Transfer impedance Z_T as a function of the frequency f and of the cable diameter D as parameters

The transfer impedance Z_T
(also called "coupling resistance") refers to the relationship between the current in one wire and the longitudinal voltage it induces in the other wire (ohmic-inductive coupling)

The transfer admittance Y_T
refers to the relationship between the voltage in one wire and the leak current it induces in the other line (capacitive coupling).

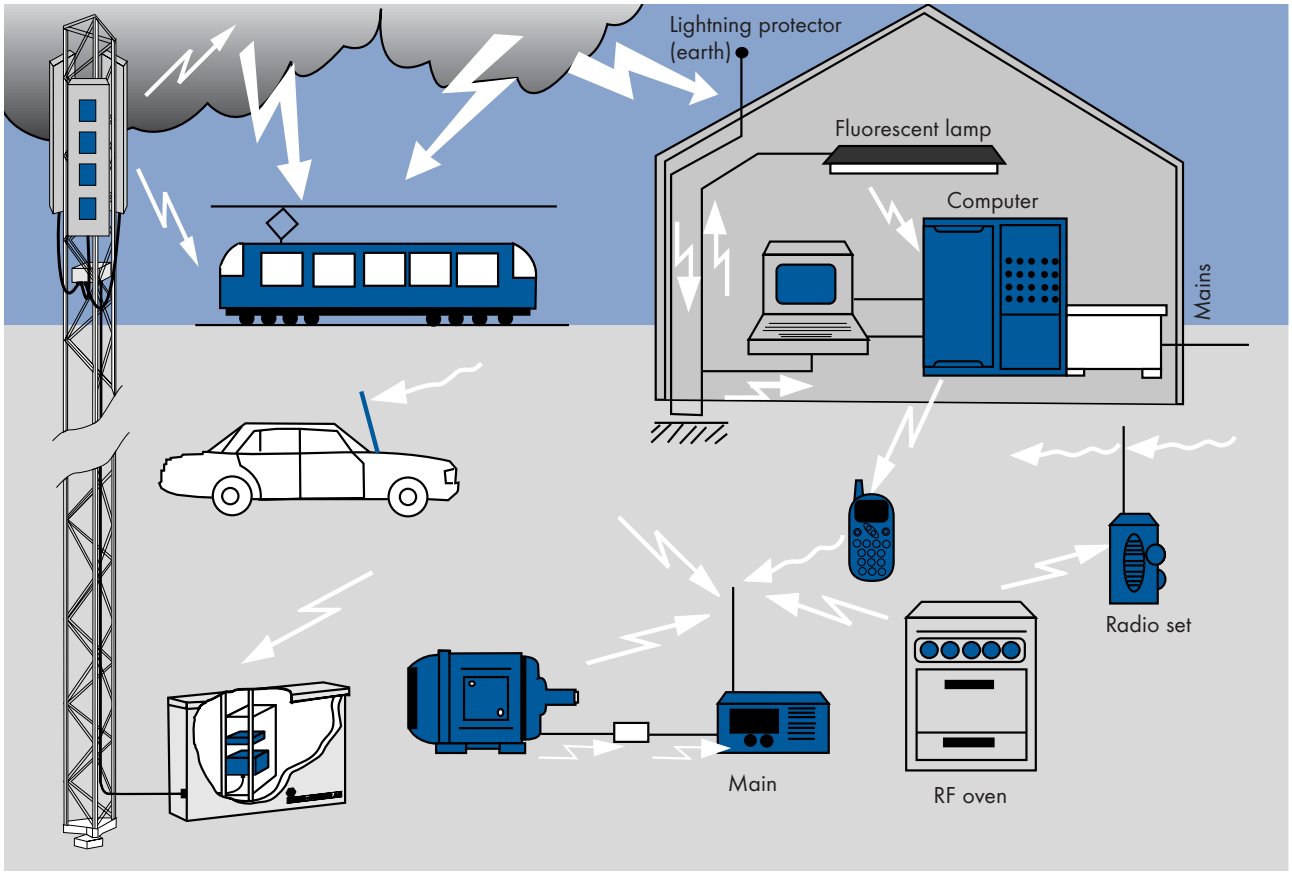


The cable together with its surroundings form a three-conductor system. It consists of two coupled conductors with one common conductor (screen).
Transfer impedance Z_T and transfer admittance Y_T are



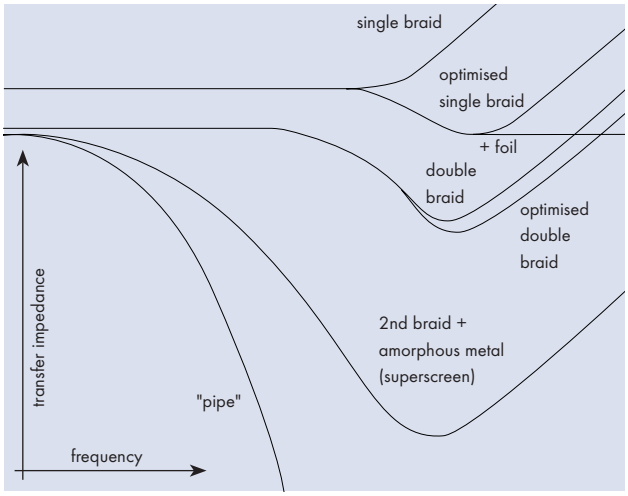
cable quantities which are always defined in conjunction with the surroundings of the cable and the construction of the cable itself.

Protect your equipment and machinery from interference and failure



The situation
Environmental pollution is a modern buzzword. But do you ever think of it as "pollution" by electromagnetic radiation, by "electrosmog"?

Your problem
Only when machinery starts to fail and plant operation is disrupted do the people in charge start thinking. But things don't have to reach that point. Non-screened cables act in the same way as antennas, attracting interference from the outside or radiating it.

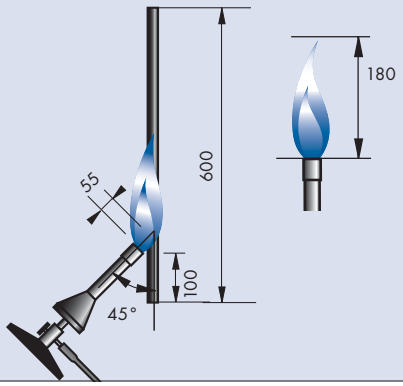
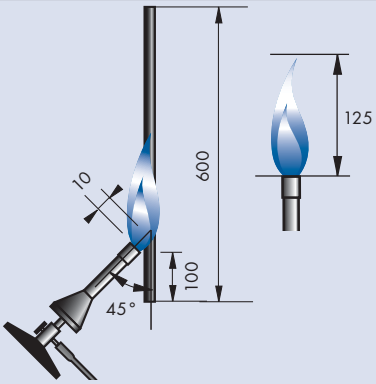


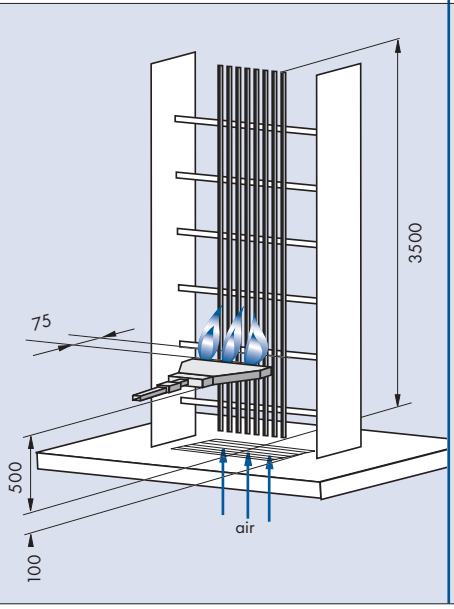
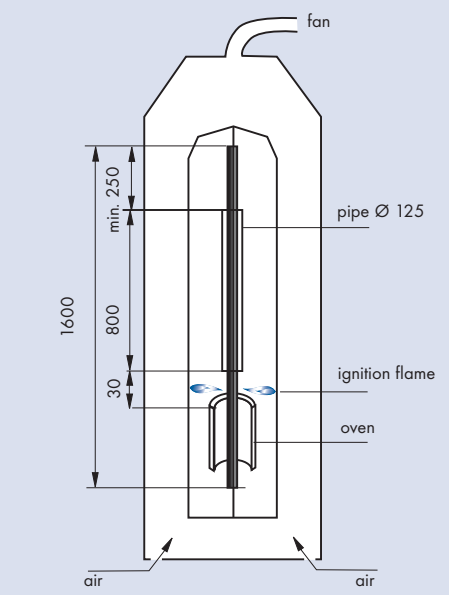
Our solution
Copper braids prevent dangerous interferences with cables. At the same time, the interference radiated by the cable is reduced. Our solution consists not only in the specification of a degree of coverage. HUBER+SUHNER also defines the effectiveness of a copper braid as a measurable quantity. This noise immunity is expressed by the transfer impedance (coupling resistance) at a given frequency (MHz) in Ω/m.

Optimized, high grade screening
Optimized screening braids enable even the most intractable screening problems to be solved. And in screening cables, we take care to ensure that performance of the screened cables will not be significantly affected in terms of flexibility, workability, weight and dimensions.

Fire test methods

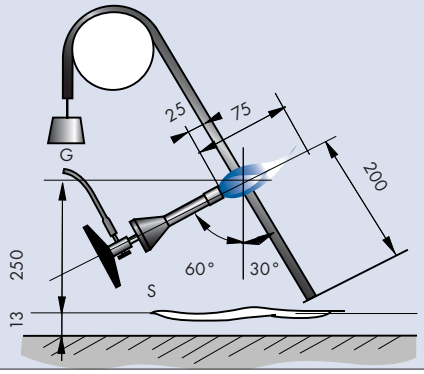
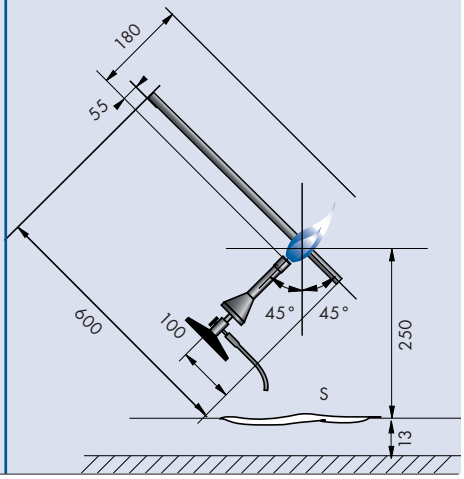
Fire test methods for electrical wires and cables

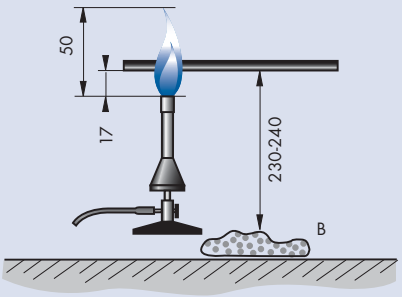
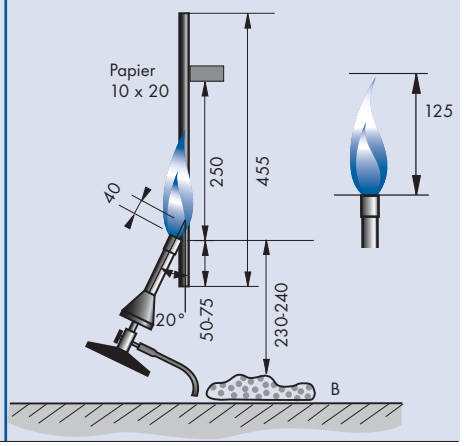
Designation	EN 50265-2-1 IEC 60332-1	EN 50265-2-2 IEC 60332-2
Flame temperature	Determined by the prescribed adjustment of the flame.	Determined by the prescribed adjustment of the flame.
Test duration	Cable Ø D ≤ 25 mm: 60 s Cable Ø 25 < D ≤ 50 mm: 120 s	20 s
Conditions	The cable shall be self extinguishing. The damage by fire shall be more than 50 mm from the top fastening clamp.	The cable shall be self extinguishing. The damage by fire shall be more than 50 mm from the top fastening clamp.
		

Designation	EN 50266-2-4 IEC 60332-3-24	NF C32-070 test 2 UIC 895 VE appendix 7
Flame temperature	Determined by the prescribed propane gas and air volumes.	830 ± 50 °C.
Test duration	Cat. A (7 l compustible material): 40 min. Cat. B (3.5 l compustible material): 40 min. Cat. C (1.5 l compustible material): 20 min.	30 min.
Conditions	The damage by fire shall be maximum 2.5 m from the lower burner end.	The cable piece projecting from the pipe shall be not damaged.
		

Fire test methods

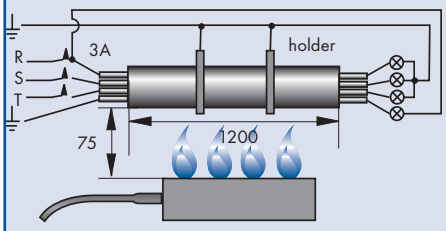
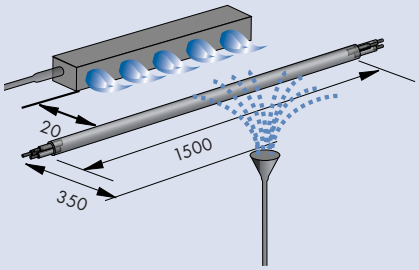
Fire test methods for electrical wires and cables

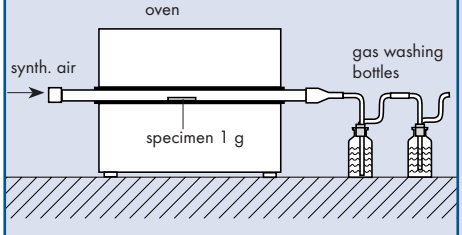
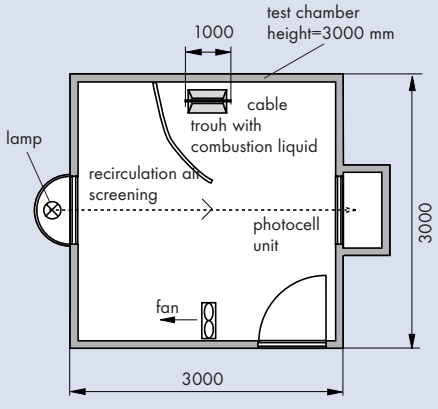
Designation	MIL-W-22759 and MIL-W-81044 VG 95218-2 procedure 4	VG 95218-2 procedure 3
Flame temperature	min. 950 °C	Determined by the prescribed adjustment of the flame.
Test duration	30 s	Cable Ø D ≤ 25 mm: 60 s Cable Ø 25 < D ≤ 50 mm: 120 s
Conditions	The specimen shall not continue to burn for more than 30 s, and damage by fire shall not exceed 76 mm. Dripping material shall not ignite the tensioned tissue paper (S).	The specimen shall not continue to burn for more than 30 s, and damage by fire shall not exceed 76 mm. Dripping material shall not ignite the tensioned tissue paper (S).
		

Designation	UL 1581 section 1090 Horizontal specimen AWM flame test	UL 1581 section 1061 UL 1581 section 1080 (VW1)
Flame temperature	Determined by the prescribed adjustment of the flame.	Determined by the prescribed adjustment of the flame.
Test duration	30 s	Sect.1061: 60s flaming,30s pause (3x) Sect.1080: 15s flaming,15s pause (5x)
Conditions	The rate of the flame propagation shall not exceed 25 mm/min. Dripping material shall not ignite the cotton wool underneath (B).	The paper shall not be burned more than 25%, and the specimen shall not continue to burn for more than 60 s. Dripping material shall not ignite the cotton wool underneath (B).
		

Fire test methods

Fire test methods for electrical wires and cables

Designation	IEC 60331-21, IEC 60331-23 DIN VDE 0472-814 BS 6387, category C	BS 6387, category W
Flame temperature	IEC, DIN VDE: min. 750 °C BS : 950 ± 40 °C.	650 ± 40 °C
Test duration	IEC: 90 min. recommended DIN VDE, BS: 180 min.	30 min.
Conditions	Zwischen den Adern wird eine Prüfspannung angelegt. IEC: power cable: U_O/U IEC, DIN VDE: data cable: 110 V DIN VDE: power cable: 230/400 V BS: all U_O/U The fuses shall not blow and the incandescent lamps shall not extinguish.	A test voltage is applied between the cores which equals the mains voltage U_O/U. After 15 min. exposure to the flame, the sprinkler is additionally switched on. The fuses shall not blow and the incandescent lamps shall not extinguish.
		

Designation	EN 50267-2-2 IEC 60754-2	EN 50268-2 IEC 61034-2
Flame temperature	min. 935 °C	Determined by the composition of the combustion liquid.
Test duration	30 min..	40 min..
Conditions	The pH value of the washing water shall be min. 4.3, its conductivity shall not exceed 10 µS/mm.	The light permeability of the resulting smoke shall be min. 60%.
		

Current carrying capacity

of RADOX® single core and multi core cables

Scope

The following tables referring to RADOX® connecting leads and multicore cables give easy and fast support for the layout of apparatus and components.
The following remarks are based on today's state of the art and practical experience as described in the standard IEC 60216, IEC 60287 and IEC 60364. The application of products will frequently vary from the theoretical values of constant ambient temperature, constant current carrying, homogeneous laying and others. That means, in practice the theoretical current carrying will differ from the real values.
For a safe layout of apparatus and components it is recommended to carry out a test with the installed connecting lead or cable under service conditions.

Definitions

Current load	current passed through the cable during operation
Continuous operation	an operation with constant current whose duration is at least long enough to allow the system to reach thermal equilibrium, but may then go on indefinitely
Current rating	maximum permissible current under determined operating
Permissible operating temperature	maximum permissible temperature on the condutor in continuous operation
Wire	insulated single core
Cable	bundle with jacket with one ore more insulated single cores
Conductor temperature	temperature of the surface of the core material

General remarks

The current rating of a cable depends on the conductor cross section, on the cable design, on the characteristics of the insulation materials, on the installation conditions and, for larger cross sections, on the frequency (skin and proximity effects). Also, additional heating effects due to higher ambient temperatures, due to heating elements and due to bunching of cables have to be taken into account.
The conductor cross section has to be selected in such a way that the actual current load does not exceed the curent rating, i.e. the conductor temperature does not exceed the permissible operating temperature. The determining factor is the appropriate, most unfavourable operating condition, encountered during operation over the whole length of the cable.

Current rating under service conditions (I [A])

$I = I_N \bullet f_1 \bullet f_2 \bullet f_3 \bullet f_4 \bullet f_5$

I [A]	Current rating for continuous operation under service conditions
I_N[A]	Current rating for continuous operation under standard conditions
f_1	Reduction factor for increased ambient temperature
f_2	Conversion factor for deviated conductor temperature acc. to. temperature index IEC 60216 (20'000 h)
f_3	Reduction factor for multicore cables
f_4	Reduction factor for increased frequency
f_5	Reduction factor for bundeled cables

Current carrying capacity

of RADOX® single core and multi core cables

Standard conditions for current rating (I_N [A])
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.
- 120 °C conductor temperature
- frequency up to 200 Hz

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 x cable diameter
- vertical distance between power circuits laid one upon another for individual cables > 2 x cable diameter and 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 60%.

Maximum permitted conductor temperature for various insulating materials according to IEC 60216 (20'000 h / 50 % elongation at break):

PCV, CR	**70 °C**
PE-X, EPR	**90 °C**
RADOX® 125	**120 °C**

Life time expectation
If crosslinked wires are used at higher temperatures than indicated by the temperature index of IEC 60216, the life time is reduced accordingly. Analogical, the life time will increase at lower temperature. RADOX® 125 for example has a life span of 20'000 h at a conductor temperature of +120 °C, which is approx. 2.5 years. If it is used at another temperature, life time expectations are as follows:

Example RADOX® 125, d.h. 120 °C / 20'000 h

160 °C	**1'250 h**
150 °C	**2'500 h**
140 °C	**5'000 h**
130 °C	**10'000 h**
120 °C	**20'000 h**
110 °C	**40'000 h**
100 °C	**80'000 h**
90 °C	**160'000 h**
80 °C	**320'000 h**

Current carrying capacity

of RADOX® single core and multi core cables

Reduction factors for increased ambient temperature (f_1)

Ambient temp. [°C]	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115
Reduction factor f_1	1	0.97	0.94	0.91	0.88	0.85	0.82	0.78	0.75	0.71	0.67	0.62	0.58	0.53	0.47	0.41	0.33	0.22

Reduction factors for different permissible conductor temperature (f_2)

Conductor temp. (°C)	135	120	110	100	90	80
Reduction factor f_2		1	0.96	0.91	0.85	0.79

Reduction factors for multicore cables (f_3)

No. of cores in cable	3	4	5	7	8	10	14	16	19	20	24	27	33	40	61
Reduction factor f_3	1.0	0.80	0.75	0.65	0.62	0.55	0.50	0.48	0.45	0.44	0.40	0.39	0.37	0.35	0.30

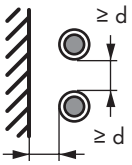
Reduction factors for increased frequency (f_4)

Frequency [Hz]*	400	600	800	1000	2000	3000	4000	5000	10000
Copper conductor cross section mm²	faktors f_4								
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	0.97	0.94	0.83	0.76	0.72	0.69	0.59
70	1	0.95	0.91	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
185	0.88	0.82	0.77	0.74	0.64	0.58	0.54	0.52	0.44
240	0.85	0.77	0.72	0.69	0.60	0.54	0.51	0.48	0.41
300	0.79	0.73	0.69	0.66	0.57	0.52	0.48	0.46	0.39
400	0.75	0.69	0.65	0.63	0.54	0.49	0.46	0.44	0.37

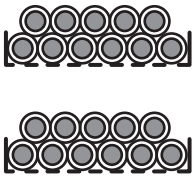
* We recommend that you use a special conductor design for frequencies > 800 Hz and cross sections > 25 mm² (waveguide design).

Current carrying capacity

of RADOX® single cores

Installation method	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	4	6
Reduction factor f_5	1	0.87	0.81	0.78	0.75	0.74	0.73	0.72	0.71	0.71	0.62
Copper conductor cross section mm^2	**Current carrying capacity in [A]**										
0.50	19	16.4	15.3	14.7	14.2	14.0	13.8	13.6	13.4	13.4	11.7
0.75	24	20.8	19.4	18.6	17.9	17.7	17.4	17.2	17.0	17.0	14.8
1.0	29	24.8	23.1	22.2	21.4	21.1	20.8	20.5	20.2	20.2	17.7
1.5	36	31	29	28	27	26	26	26	25	25	22
2.5	49	43	40	38	37	36	36	35	35	35	30
4	66	57	53	51	49	49	48	47	47	47	41
6	85	74	69	67	64	63	62	61	61	61	53
10	121	105	98	94	91	90	88	87	86	86	75
16	163	142	132	127	122	121	119	117	116	116	101
25	219	191	177	171	164	162	160	158	155	155	136
35	272	237	220	212	204	201	199	196	193	193	169
50	344	299	279	268	258	255	251	248	244	244	213
70	439	382	356	342	329	325	320	316	312	312	272
95	523	455	424	408	392	387	382	377	371	371	324
120	621	540	503	484	466	460	453	447	441	441	385
150	723	629	586	564	542	535	528	521	513	513	448
185	825	718	668	644	619	611	602	594	586	586	512
240	996	867	807	777	747	737	727	717	707	707	618
300	1150	1001	932	897	863	851	840	828	817	817	713
400	1473	1282	1194	1149	1105	1091	1076	1061	1046	1046	914

Continuous current rating
conductor temperature 120 °C, ambient temperature 30°C

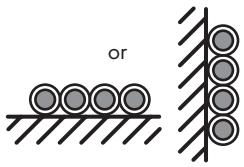


8	10	16	20	4	6	8	10	16	20	4	6	8	10	16	20
0.57	0.53	0.47	0.45	0.67	0.59	0.54	0.50	0.45	0.43	0.71	0.58	0.52	0.48	0.41	0.38

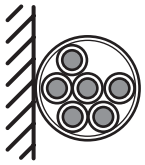
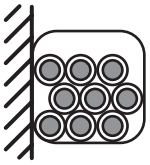
10.8	10.0	8.9	8.5	12.7	11.2	10.2	9.5	8.5	8.1	13.4	11.0	9.8	9.1	7.7	7.2
13.6	12.7	11.2	10.8	16.0	14.1	12.9	12.0	10.8	10.3	17.0	13.9	12.4	11.5	9.8	9.1
16.2	15.1	13.4	12.8	19.1	16.8	15.4	14.3	12.8	12.3	20.2	16.5	14.8	13.7	11.7	10.8
20	19	17	16	24	21	19	18	16	15	25	21	19	17	15	14
28	26	23	22	33	29	26	24	22	21	35	28	25	23	20	19
38	35	31	30	44	39	36	33	30	28	47	38	34	32	27	25
49	45	40	38	57	50	46	43	38	37	61	49	44	41	35	32
69	64	57	54	81	71	65	61	54	52	86	70	63	58	50	46
93	86	77	73	109	96	88	82	73	70	116	95	85	78	67	62
125	116	103	99	147	129	118	110	99	94	155	127	114	105	90	83
155	144	128	122	182	160	147	136	122	117	193	158	141	131	112	103
196	182	162	155	230	203	186	172	155	148	244	200	179	165	141	131
250	233	206	198	294	259	237	220	198	189	312	255	228	211	180	167
298	277	246	235	350	309	282	262	235	225	371	303	272	251	214	199
354	329	292	279	416	366	335	311	279	267	441	360	323	298	255	236
412	383	340	325	484	427	390	362	325	311	513	419	376	347	296	275
470	437	388	371	553	487	446	413	371	355	586	479	429	396	338	314
568	528	468	448	667	588	538	498	448	428	707	578	518	478	408	378
656	610	541	518	771	679	621	575	518	495	817	667	598	552	472	437
840	781	693	663	987	870	796	737	663	634	1046	855	766	708	604	560

Current carrying capacity

of RADOX® single cores

Installation method	on floor or wall				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
Reduction factor f_5	1	0.87	0.79	0.75	0.95	0.81	0.72	0.68	0.66	0.64	0.63	0.62
Copper conductor cross section mm^2	Current carrying capacity in [A]											
0.50	18	15.3	14.2	13.5	17.1	14.5	12.9	12.2	11.9	11.5	11.3	11.1
0.75	23	19.3	17.9	17.0	21.6	18.4	16.3	15.4	15.0	14.5	14.3	14.1
1.0	27	23.0	21.4	20.3	25.7	21.9	19.5	18.4	17.9	17.3	17.1	16.8
1.5	34	29	27	25	32	27	24	23	22	22	21	21
2.5	46	39	37	35	44	38	33	32	31	30	29	29
4	63	53	49	47	59	51	45	43	41	40	39	39
6	81	69	64	61	77	66	58	55	53	52	51	50
10	115	98	91	86	109	93	83	78	76	74	72	71
16	155	132	122	116	147	125	111	105	102	99	98	96
25	208	177	164	156	198	169	150	141	137	133	131	129
35	258	220	204	194	245	209	186	176	171	165	163	160
50	327	278	258	245	310	265	235	222	216	209	206	203
70	417	354	329	313	396	338	300	284	275	267	263	259
95	497	422	393	373	472	402	358	338	328	318	313	308
120	590	501	466	442	560	478	425	401	389	378	372	366
150	687	584	543	515	653	556	495	467	453	440	433	426
185	784	666	619	588	745	635	564	533	517	502	494	486
240	946	804	747	710	899	766	681	643	624	606	596	587
300	1093	929	863	819	1038	885	787	743	721	699	688	677
400	1352	1150	1069	1114	1285	1096	974	920	893	866	852	839

Continuous current rating
conductor temperature 120 °C, ambient temperature 30°C

	in conduit, in a void or in a pipe													
														
≥ 9	1	2	3	4	5	6	7	8	9	10	12	14	16	20
0.61	1	0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50	0.48	0.45	0.43	0.41	0.38

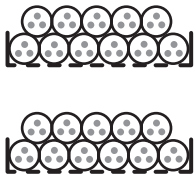
11.0	14.4	11.5	10.1	9.3	8.6	8.2	7.8	7.5	7.2	6.9	6.5	6.2	5.9	5.5
13.9	18.2	14.5	12.7	11.8	10.9	10.4	9.8	9.4	9.1	8.7	8.2	7.8	7.4	6.9
16.5	22	17.3	15.2	14.1	13.0	12.3	11.7	11.3	10.8	10.4	9.7	9.3	8.9	8.2
21	27	22	19	18	16	15	15	14	14	13	12	12	11	10
28	37	30	26	24	22	21	20	19	19	18	17	16	15	14
38	50	40	35	33	30	29	27	26	25	24	23	22	21	19
49	65	52	45	42	39	37	35	34	32	31	29	28	27	25
70	92	74	64	60	55	52	50	48	46	44	41	40	38	35
94	124	99	87	81	74	71	67	64	62	59	56	53	51	47
127	166	133	117	108	100	95	90	87	83	80	75	72	68	63
158	207	165	145	134	124	118	112	107	103	99	93	89	85	79
199	261	209	183	170	157	149	141	136	131	125	118	112	107	99
254	334	267	234	217	200	190	180	173	167	160	150	143	137	127
303	397	318	278	258	238	227	215	207	199	191	179	171	163	151
360	472	378	330	307	283	269	255	245	236	227	212	203	194	179
419	549	440	385	357	330	313	297	286	275	264	247	236	225	209
478	627	502	439	408	376	357	339	326	314	301	282	270	257	238
577	757	606	530	492	454	431	409	394	378	363	341	325	310	288
666	874	699	612	568	524	498	472	454	437	420	393	376	358	332
825	973	779	682	633	584	555	526	506	487	468	438	419	399	370

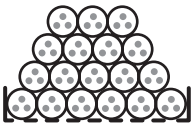
Current carrying capacity

of RADOX® multi core cables

Installation method	Multicore cables in free air or perforated trays										
Number of simultaneous loaded conductors on each tray	 ≥ 0.3 d										
	1	2	3	4	6	8	10	16	20	4	6
Reduction factor f_5	1	0.87	0.81	0.78	0.75	0.74	0.73	0.72	0.71	0.71	0.62
Copper conductor cross section mm^2	**Current carrying capacity in [A]**										
0.50	14.5	12.6	11.7	11.3	10.9	10.7	10.6	10.4	10.3	10.3	9.0
0.75	18.5	16.1	15.0	14.4	13.9	13.7	13.5	13.3	13.1	13.1	11.5
1.0	22	19.1	17.8	17.2	16.5	16.3	16.1	15.8	15.6	15.6	13.6
1.5	28	25	23	22	21	21	21	21	20	20	18
2.5	38	34	31	30	29	29	28	28	27	27	24
4	51	44	42	40	39	38	38	37	37	37	32
6	66	58	54	52	50	49	49	48	47	47	41
10	95	83	77	75	72	71	70	69	68	68	59
16	128	112	104	100	96	95	94	93	91	91	80
25	167	146	136	131	126	124	122	121	119	119	104
35	205	179	167	160	154	152	150	148	146	146	128
50	257	224	209	201	193	191	188	186	183	183	160
70	325	283	264	254	244	241	238	234	231	231	202
95	382	333	310	298	287	283	279	276	272	272	237
120	443	386	359	346	333	328	324	319	315	315	275

Continuous current rating
conductor temperature 120 °C, ambient temperature 30°C



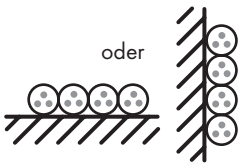
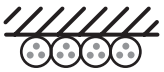


8	10	16	20	4	6	8	10	16	20	4	6	8	10	16	20
0.57	0.53	0.47	0.45	0.67	0.59	0.54	0.50	0.45	0.43	0.71	0.58	0.52	0.48	0.41	0.38

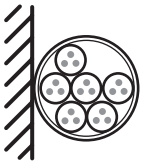
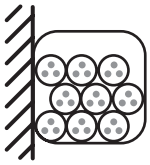
8.3	7.7	6.8	6.5	9.7	8.6	7.8	7.3	6.5	6.2	10.3	8.4	7.5	7.0	5.9	5.5
10.5	9.8	8.7	8.3	12.4	10.9	10.0	9.3	8.3	8.0	13.1	10.7	9.6	8.9	7.6	7.0
12.5	11.7	10.3	9.9	14.7	13.0	11.9	11.0	9.9	9.5	15.6	12.8	11.4	10.6	9.0	8.4
16	15	14	13	19	17	16	14	13	13	20	17	15	14	12	11
22	21	18	18	26	23	21	19	18	17	27	23	20	19	16	15
30	28	24	23	35	31	28	26	23	22	37	30	27	25	21	20
38	35	32	30	45	39	36	33	30	29	47	39	35	32	28	26
55	51	45	43	64	57	52	48	43	41	68	56	50	46	39	37
73	68	61	58	86	76	70	64	58	56	91	75	67	62	53	49
96	89	79	76	112	99	91	84	76	72	119	97	87	81	69	64
117	109	97	93	138	121	111	103	93	89	146	119	107	99	85	78
147	137	121	116	173	152	139	129	116	111	183	150	134	124	106	98
186	173	153	147	218	192	176	163	147	140	231	189	169	156	134	124
218	203	180	172	256	226	207	191	172	165	272	222	199	184	157	146
253	235	209	200	297	262	240	222	200	191	315	257	231	213	182	169

Current carrying capacity

of RADOX® multi core cables

Installation method	on floor or wall				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
Reduction factor f_5	1	0.87	0.79	0.75	0.95	0.81	0.72	0.68	0.66	0.64	0.63	0.62
Copper conductor cross section mm^2	**Current carrying capacity in [A]**											
0.50	13.5	11.5	10.7	10.1	12.8	10.9	9.7	9.2	8.9	8.6	8.5	8.4
0.75	17	14.5	13.4	12.8	16.2	13.8	12.2	11.6	11.2	10.9	10.7	10.5
1.0	20	17.0	15.8	15.0	19.0	16.2	14.4	13.6	13.2	12.8	12.6	12.4
1.5	26	23	21	20	25	22	19	18	18	17	17	17
2.5	35	30	28	27	34	29	26	24	24	23	23	22
4	48	41	38	36	46	39	35	33	32	31	31	30
6	62	53	49	47	59	51	45	43	41	40	40	39
10	88	75	70	66	84	72	64	60	59	57	56	55
16	116	99	92	87	111	94	84	79	77	75	74	72
25	154	131	122	116	147	125	111	105	102	99	98	96
35	190	162	151	143	181	154	137	130	126	122	120	118
50	239	204	189	180	228	194	173	163	158	153	151	149
70	299	255	237	225	285	243	216	204	198	192	189	186
95	351	299	278	264	334	285	253	239	232	225	222	218
120	405	345	320	304	385	329	292	276	268	260	256	252

Continuous current rating
conductor temperature 120 °C, ambient temperature 30°C

	in conduit, in a void or in a pipe													
														
≥ 9	1	2	3	4	5	6	7	8	9	10	12	14	16	20
0.61	1	0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50	0.48	0.45	0.43	0.41	0.38

8.2	10.8	8.6	7.6	7.0	6.5	6.2	5.8	5.6	5.4	5.2	4.9	4.6	4.4	4.1
10.4	13.6	10.9	9.5	8.8	8.2	7.8	7.3	7.1	6.8	6.5	6.1	5.8	5.6	5.2
12.2	15.8	12.6	11.1	10.3	9.5	9.0	8.5	8.2	7.9	7.6	7.1	6.8	6.5	6.0
16	21	17	15	14	13	12	12	11	11	11	10	10	9	8
22	28	23	20	19	17	16	16	15	14	14	13	13	12	11
30	38	31	27	25	23	22	21	20	19	19	18	17	16	15
38	48	39	34	32	29	28	26	25	24	24	22	21	20	19
54	67	54	47	44	41	39	37	35	34	33	31	29	28	26
71	89	72	63	58	54	51	49	47	45	43	41	39	37	34
94	119	96	84	78	72	68	65	62	60	58	54	52	49	46
116	147	118	103	96	89	84	80	77	74	71	67	64	61	56
146	184	148	129	120	111	105	100	96	92	89	83	80	76	70
183	234	188	164	153	141	134	127	122	117	113	106	101	96	89
215	275	220	193	179	165	157	149	143	138	132	124	119	113	105
248	338	271	237	220	203	193	183	176	169	163	153	146	139	129