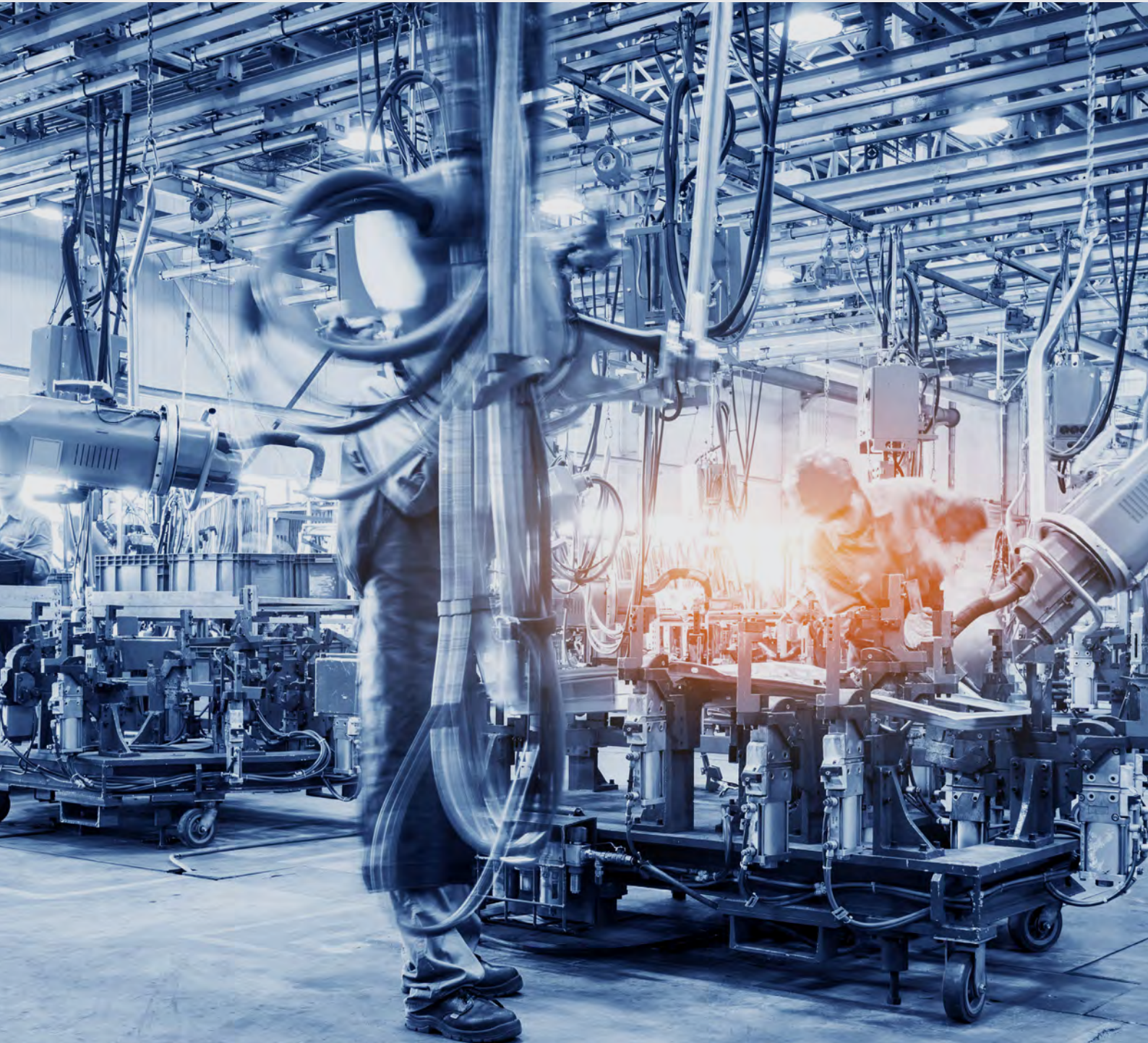


Wires and cables for industrial applications

Edition 2019/06



RADOX® – for harsh environment



Wires and cables for industrial applications

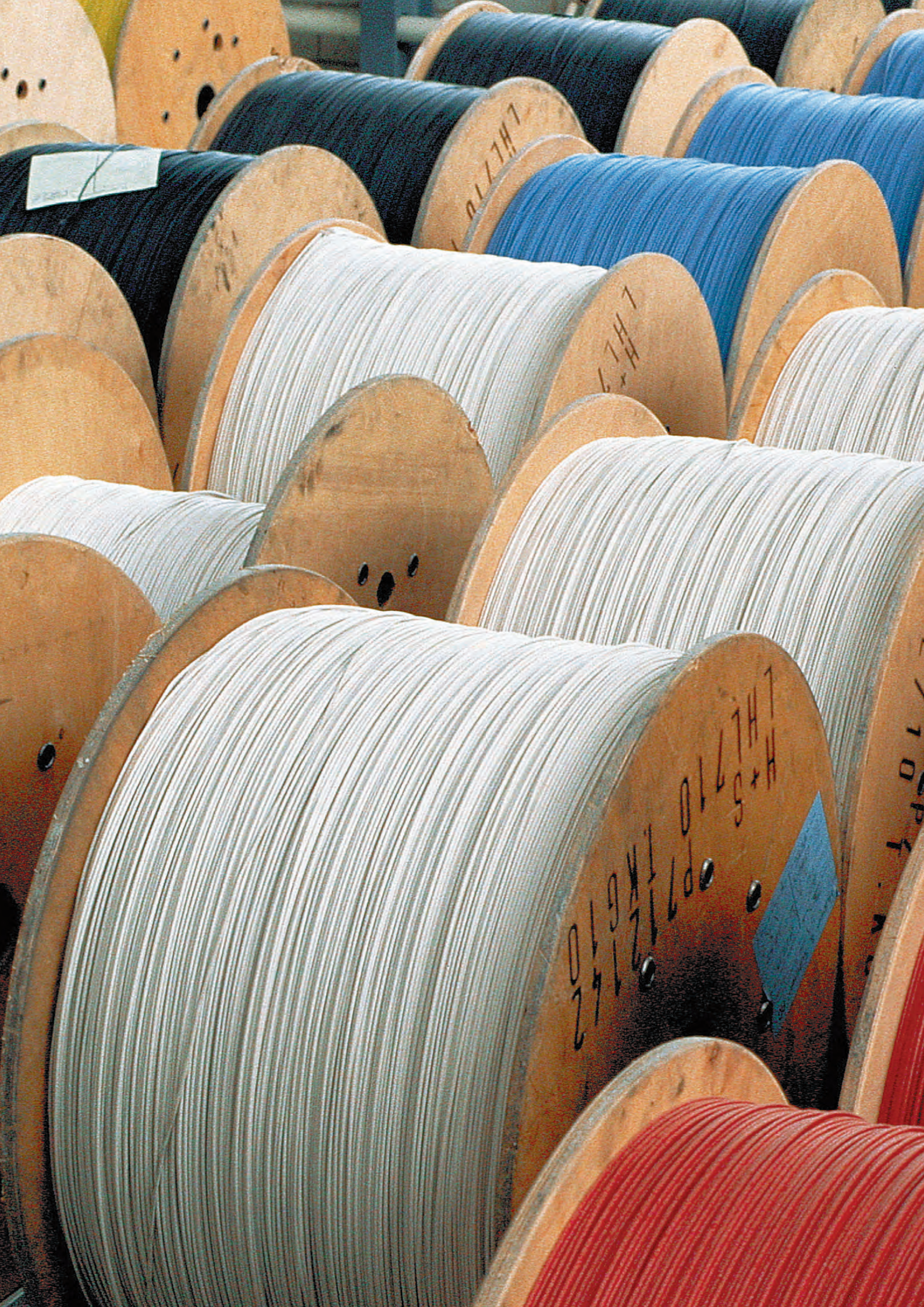


Introduction	
Short description of the application fields	5
RADOX® 125, RADOX® 155	
Control and power cables, flexible single cores	19
RADOX® UL/CSA	
Flexible single cores, cables and wires UL recognised	35
RADOX MFH	
Control/instrumentation and power lightweight cables	51
RADOX® Databus	
High data frequency transmission cables	55
General technical information	67

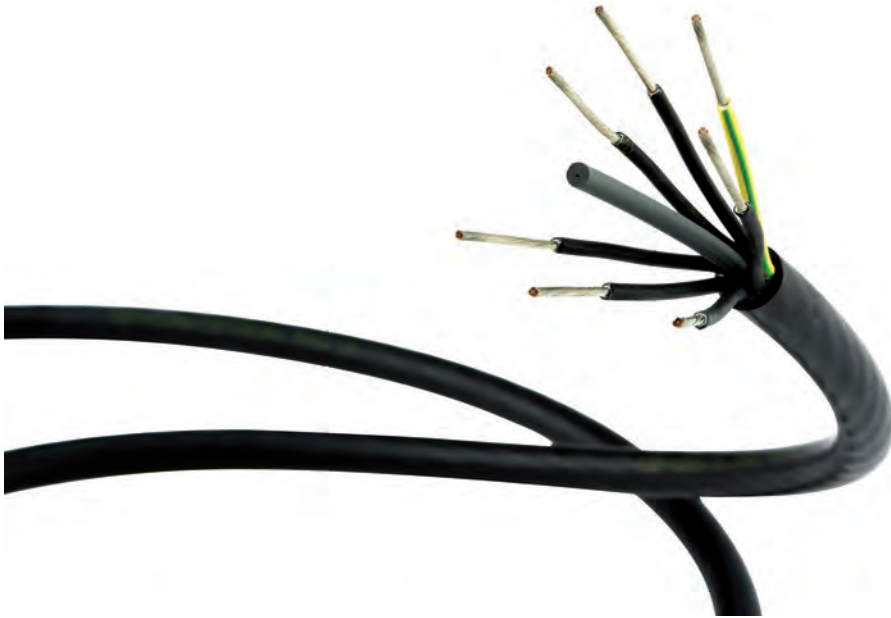
Your partner for connectivity solutions

The HUBER+SUHNER Group is a leading international manufacturer of electrical and optical interconnectivity components and systems. Our main markets are communication, transport and industry. Under one roof, we combine technological capabilities in the three core fields of Radio Frequency, Fiber Optics and Low Frequency.

RADOX®, the registered HUBER+SUHNER trademark, is synonymous with high-grade wire and cable products developed and produced in-house. RADOX electron-beam crosslinked insulating and jacketing materials, possess the special properties required for developing and manufacturing technically superior products. Its high temperature resistant, flame retardant, reduced wall thickness and easy process ability make it the ideal insulating material for wires and cables in industrial applications.



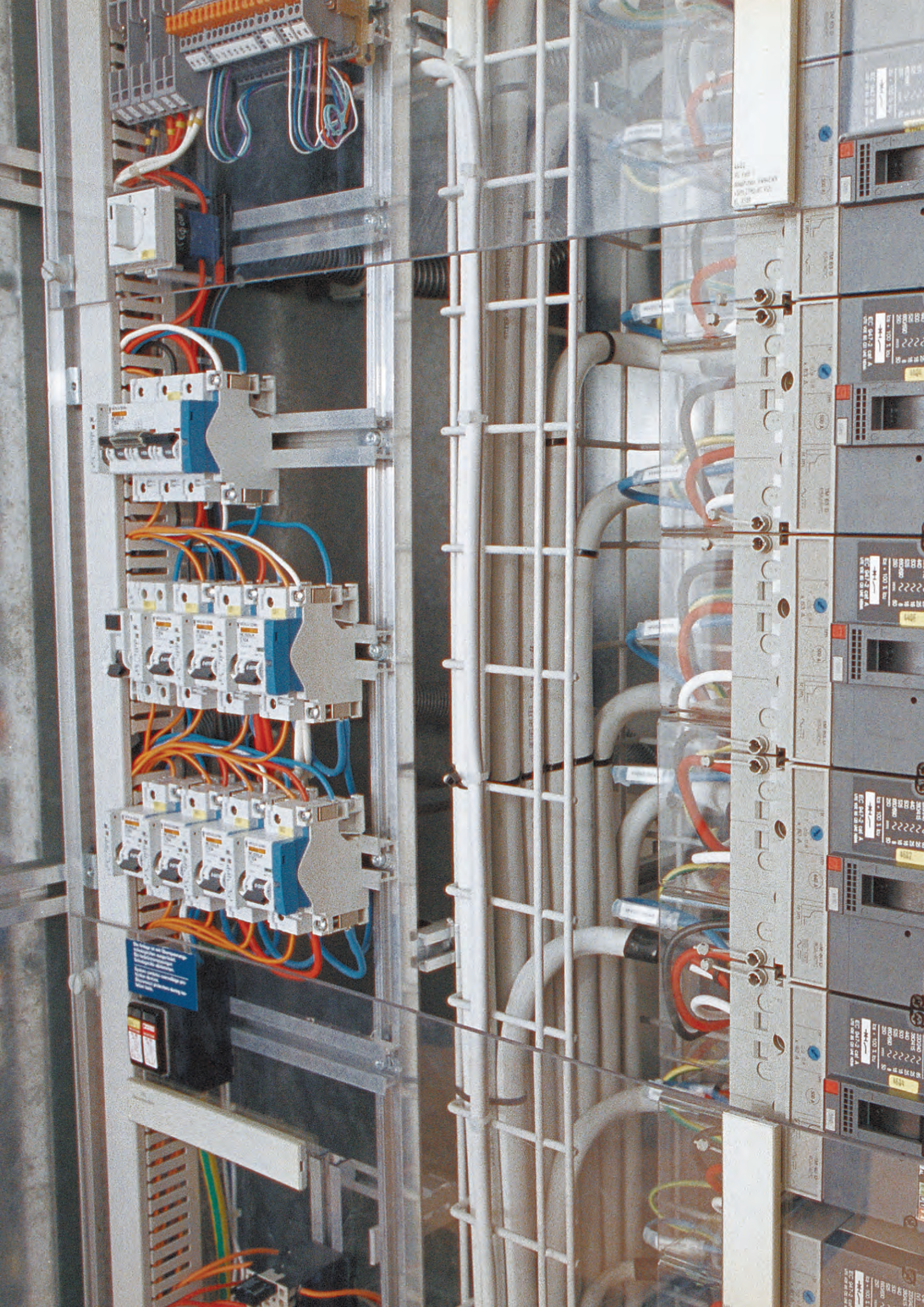
RADOX® by HUBER+SUHNER – for the toughest conditions



RADOX, the registered HUBER+SUHNER trademark, is synonymous with high-grade WIRE+CABLE products developed and produced in-house. RADOX insulating and jacketing material, which are predominantly electron-beam crosslinked, possess the special properties required for developing and manufacturing technically superior products.

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 2011/65/EU (RoHS).



Network patch panel with multiple ports and colored cables (blue, orange, red, white) plugged in.

Small white component, possibly a power supply or control module, with a label.

Network patch panel with blue and orange cables plugged in.

Network patch panel with blue and orange cables plugged in.

Network patch panel with blue and orange cables plugged in.

Blue warning label with text: "Bitte beachten: Bei Wartungsarbeiten an den Kabeln oder den Steckern ist die Stromversorgung zu unterbrechen." (Please note: During maintenance work on the cables or the connectors, the power supply must be interrupted.)

Small black component with a red and yellow label, possibly a fuse or indicator.

Network patch panel with multiple ports and colored cables (blue, orange, red, white) plugged in.

Network patch panel with multiple ports and colored cables (blue, orange, red, white) plugged in.

Server rack units with labels like 'GC 40-2-GR A' and '22222222'. The units are connected to a network patch panel on the left via various cables (blue, orange, red, white). The rack is filled with various cables and components.

Cables for power and signal transmission in energy distribution



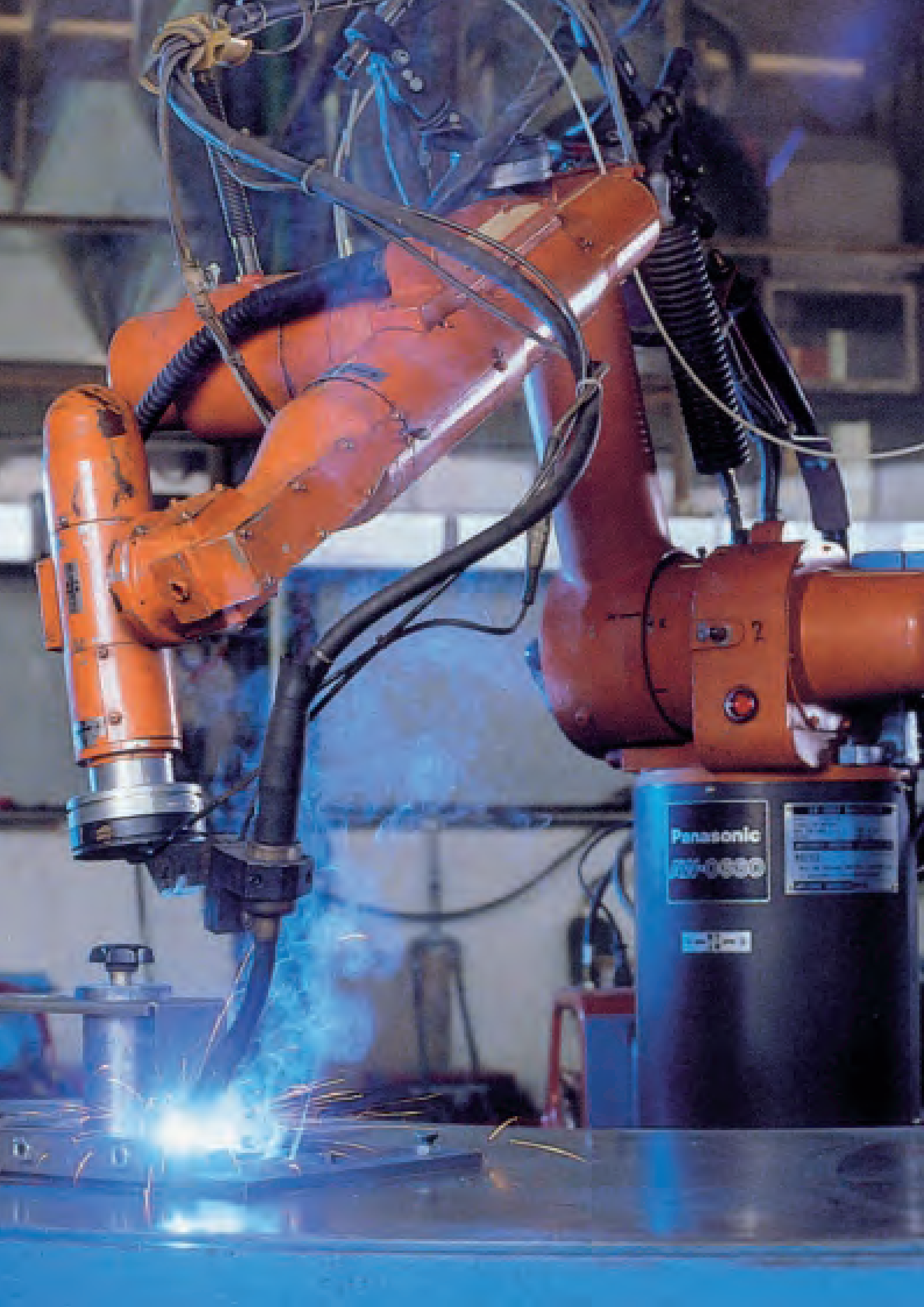
Electronic control systems automatically control processes, transmit data and govern motions such as swivelling and conveying etc. The reliability and uptime of such highly automated, complex technical systems is necessary to ensure the efficiency of state-of-the-art production processes. Trouble-free 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.

Flexible single cores, signal, control and power cables

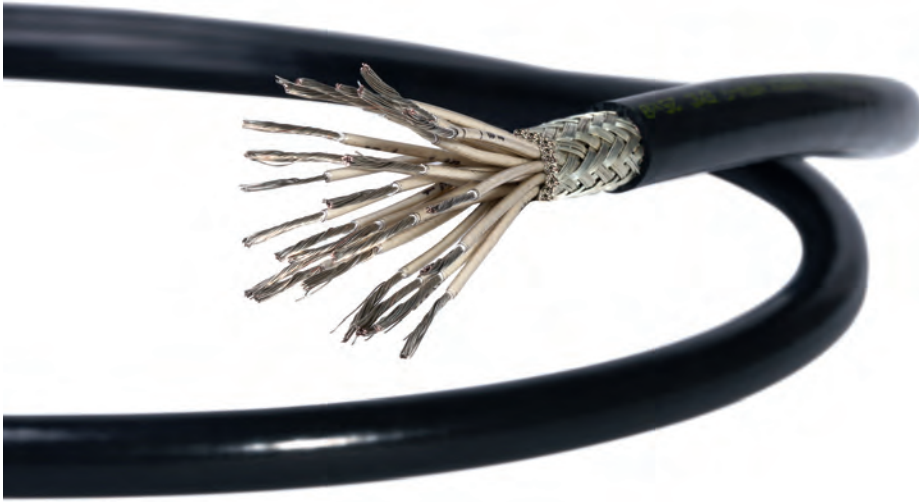
- RADOX® control and power cables, single core cables
- RADOX® UL cables

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 lightweight equipment.

- Outstanding heat resistance
- High power handling capacity
- Ruggedness and compact design
- High flexibility
- Easy processing



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® control and power cables, screened and unscreened
- RADOX data cable for Ethernet and CAN-BUS

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

- Thin insulation walls
- Tight bending radii
- High flexibility
- Abrasion resistance
- High current carrying capacity
- Long service life



Cables for power and signal transmission in coil winding applications



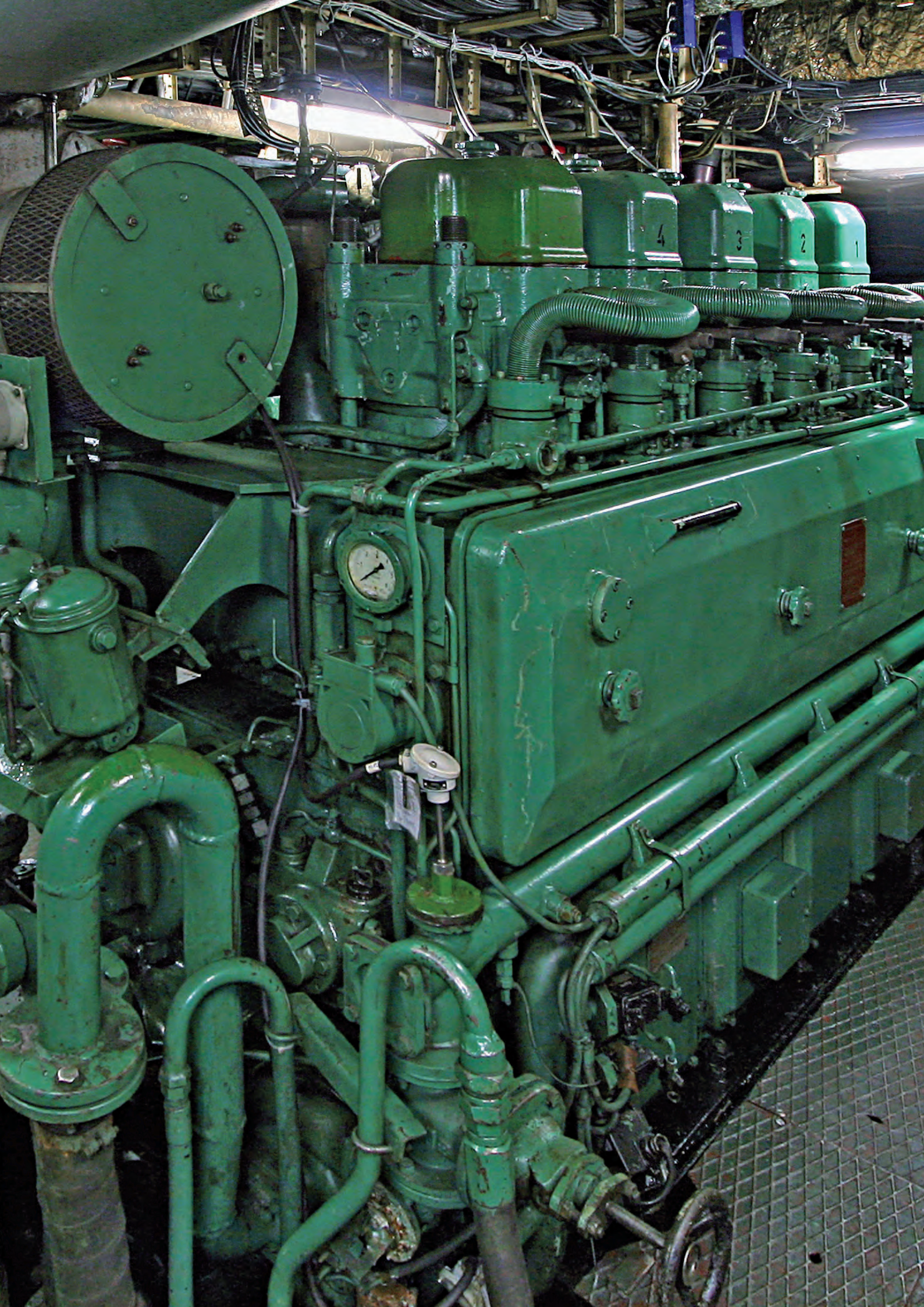
RADOX® 155 are flexible single core and multi core cables offering excellent resistance to heat, hot pressure and aging. The electronically crosslinked insulation offers high mechanical ruggedness. It will not melt and is resistant to most media as well as insulating varnishes and impregnating resins.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

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.

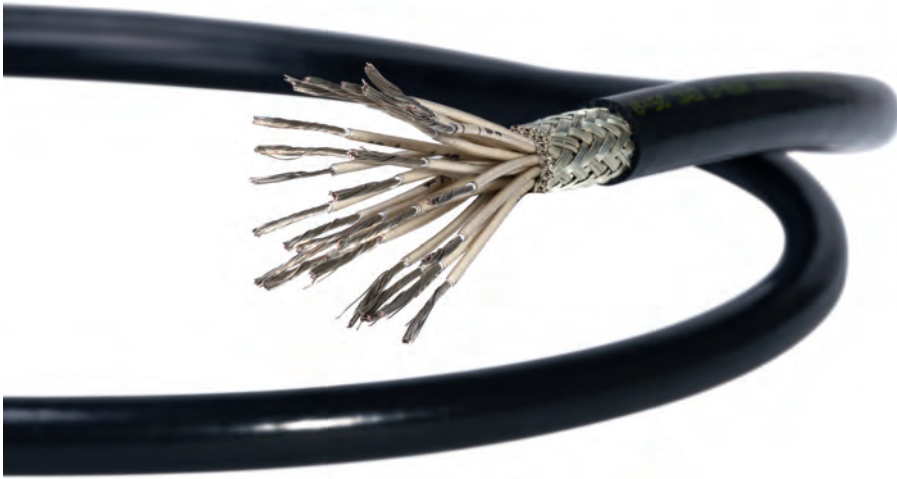
Flexible single core cables and wires for coil winding products

- RADOX 155, wires and flexible cables
- RADOX UL

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.



Cables for power and signal transmission in Marine/Diesel Engine 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 DNV-GL, ABS, BV, CCS approvals

- RADOX 125 IEC marine transmission line
- RADOX MFH control, data and power transmission lines for marine applications
- Data cable for Ethernet and CAN-BUS with marine approval
- SHF 2 mud jacket according to NEK 606

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



Cables for power and signal transmission in offshore 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.

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

- RADOX® flexible single core, signal, control and power cables
- Offshore cables with DNV-GL, ABS, BV, CCS approvals:
- RADOX 125IEC marine transmission line
- RADOX MFH control data and power transmission lines for offshore applications
- Data cable for Ethernet and CAN-BUS with offshore approval
- SHF2 mud jacket according to NEK 606

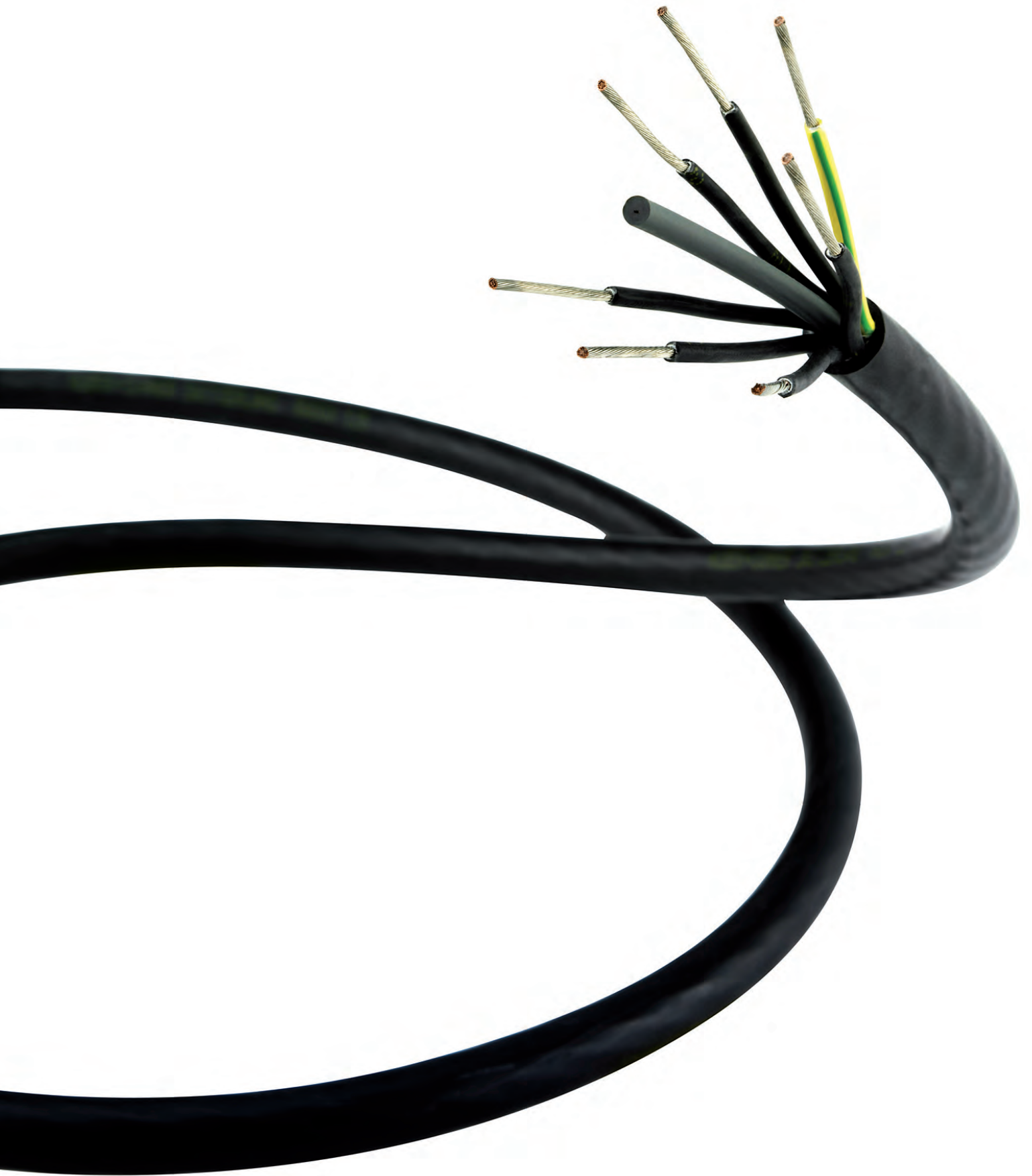
RADOX single core and multi core cables have been developed and are produced for high grade offshore applications.

- 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	Automation	Coil winding	Marine/diesel engine	Oil and gas/offshore	Energy distribution
RADOX® 125 flexible single core (2nd generation)	RADOX 125				RADOX 125
RADOX® 155 flexible single core	RADOX 155	RADOX 155			
RADOX® 155 S high resistance to oil	RADOX 155S				RADOX 155S
RADOX 125 signal, control and power cables, screened and unscreened	RADOX 125				RADOX 125
RADOX 155 control and power cables, screened and unscreened	RADOX 155				RADOX 155
RADOX® UL/CSA flexible single core	RADOX UL	RADOX UL			
RADOX UL4486/CSA control/instrumentation and power cables, screened and unscreened	RADOX UL	RADOX UL			
RADOX MFH control and power cables, marine and NEK606 approved			RADOX MFH	RADOX MFH	
RADOX DATABUS, Ethernet and CAN-BUS cables	RADOX DATABUS		RADOX DATABUS	RADOX DATABUS	RADOX DATABUS





RADOX® 125, RADOX® 155

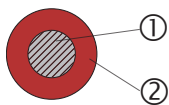
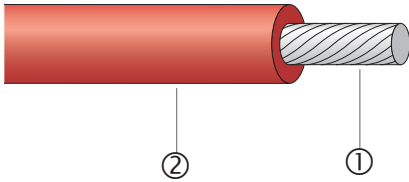
Flexible single cores, control and power cables

RADOX 125 (2 nd generation), flexible single core	22
RADOX 155, flexible single core	24
RADOX 155 S, high resistance to oil	26
RADOX 125, control and power cables	28
RADOX 125, control and power cables, screened	30
RADOX 155, control and power cables	32
RADOX 155, control and power cables, screened	34

All our cables fully comply with the European directives 76/769/EWG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2011/65/EU (RoHS).

RADOX® 125 (2nd generation)

Flexible single core



- Excellent high and low temperature and ozone resistance
- Weatherproof
- Halogen free
- Flexible, easy to strip and process
- High resistance to thermal pressure
- High abrasion resistance

Application

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

Composition of cable

- ① Conductor
- ② Insulation

Stranded tin plated copper, EN 60228 / IEC 60228 cl. 5
 RADOX 125
 Type E15 modified, EN 50363-5
 Type HF90 modified, IEC 60092-360
 extruded irradiation crosslinked polyolefin
 various, on request

Core colours

Technical data

Temperature range		-40 up to +125 °C
Maximum permitted operating temperature of the conductor EN50565/IEC 60092.		+90 °C
Short circuit temperature rating of the conductor EN50565/IEC 60092		+250 °C
Minimum bending radius	Outer diameter < 12 mm	3 × D
	Outer diameter > 12 mm	4 × D

Cross-section 1 - 300 mm²

Rated voltage	U ₀ /U	600/1000 V AC
Maximum permitted operating voltage cond.- earth	720	V AC
Maximum permitted operating voltage cond.- cond	U _m	1200 V AC
Maximum permitted operating voltage cond.- earth	V ₀	900 V DC
Maximum permitted operating voltage cond.- cond	1500	V DC
Test voltage	3500(8400)	V AC (V DC)

Cross-section 0.25 - 0.75 mm²

Rated voltage	U ₀ /U	300/500 V AC
Maximum permitted operating voltage cond.- earth	320	V AC
Maximum permitted operating voltage cond.- cond	U _m 550	V AC
Maximum permitted operating voltage cond.- earth	V ₀ 410	V DC
Maximum permitted operating voltage cond.- cond	820	V DC
Test voltage	2000(5000)	V AC (V DC)

RADOX® 125 (2nd generation)

Flexible single core

Table 1: U₀/U=300/500V

Extract from our delivery programme

Cross section nom. mm ²	Conductor			Core Dia. mm	Weight nom. kg/100 m	Bending radius min.
	Construction nom. n × mm dia.	Dia. max. mm	R ₂₀ IEC 60228 max. Ω/km			
0.25	19 × 0.13	0.61	85.9	1.3 ± 0.10	0.4	3 × dia.
0.34	19 × 0.16	0.77	52.1	1.5 ± 0.10	0.6	3 × dia.
0.50	19 × 0.18	0.9	40.1	2.0 ± 0.10	0.9	3 × dia.
0.75	24 × 0.20	1.13	26.7	2.25 ± 0.10	1.2	3 × dia.

Table 2: U₀/U=600/1000V

1.0	32 × 0.20	1.28	20.0	2.6 ± 0.10	1.6	3 × dia.
1.5	30 × 0.25	1.52	13.7	2.85 ± 0.10	2.1	3 × dia.
2.5	48 × 0.25	2.06	8.21	3.35 ± 0.10	3.0	3 × dia.
4.0	56 × 0.30	2.64	5.09	3.95 ± 0.10	4.6	3 × dia.
6.0	82 × 0.30	3.30	3.39	4.65 ± 0.15	6.5	3 × dia.
10	78 × 0.40	4.25	1.95	5.6 ± 0.15	10.6	3 × dia.
16	119 × 0.40	5.40	1.24	6.75 ± 0.15	15.6	3 × dia.
25	182 × 0.40	6.70	0.795	8.5 ± 0.2	24.2	3 × dia.
35	266 × 0.40	7.90	0.565	9.7 ± 0.20	34.3	3 × dia.
50	378 × 0.40	9.30	0.393	11.4 ± 0.20	46.1	3 × dia.
70	348 × 0.50	11.50	0.277	13.8 ± 0.25	66.2	3 × dia.
95	456 × 0.50	13.00	0.210	15.3 ± 0.25	85.3	4 × dia.
120	570 × 0.50	14.70	0.164	17.2 ± 0.30	108.3	4 × dia.
150	722 × 0.50	16.20	0.132	19.1 ± 0.30	135.3	4 × dia.
185	874 × 0.50	18.00	0.108	21.3 ± 0.30	166.8	4 × dia.
240	1147 × 0.50	21.00	0.0817	24.5 ± 0.30	216.3	4 × dia.
300	11443 × 0.50	23.20	1.80	27.1 ± 0.4	269.2	4 × dia.

Various colours on request.

RADOX® 125 (2nd generation)

Flexible single core

Fire protection in ships 1- 300 mm²

Vertical flame spread of a single cable
Vertical flame spread of bunched cables
Smoke density
Corrosivity of combustion gases
Amount of halogen acid gas

Fulfilled

50 < L < 540 mm
L < 2.5 m
T > 60 % IEC 61034- 2
pH > 4.3, C < 10 mS/mm
HCl+HBr < 0.5 %

IEC 60092

IEC 60332- 1- 2
IEC 60332- 3- 22

IEC 60754- 2
IEC 60754- 1

Fire protection on railway vehicles, hazard level

Vertical flame spread
Vertical flame spread, bunched, D < 6mm
Vertical flame spread, bunched, 6 < D < 12 mm
Vertical flame spread, bunched, D > 12 mm
Smoke density
Toxicity

HL1 - HL3

50 < L < 540 mm
L < 1.5 m
L < 2.5 m
L < 2.5 m
T > 70 %
ITC < 6

EN 45545

EN 60332- 1- 2
EN 50305, 9.1.2
EN 50305, 9.1.1
EN 60332- 3- 24
EN 61034- 2
EN 50305, 9.2

Fire protection on building products , hazard level

Cross-section 0.5 - 300 mm²
Flame spread

Eca EN 13501-6
H ≤ 425 mm EN 60332-1-2

Approvals :

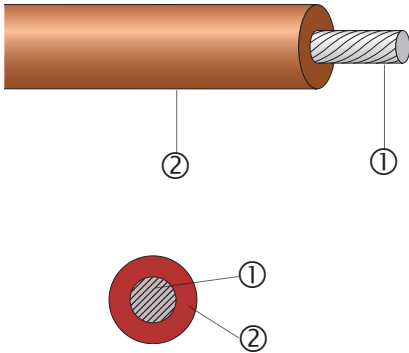
DNV (Det Norske Veritas)

TAE00003GH
section range: 1-300mm²
according to EN50575 .
Eca

CPR (Construction Product Regulation)
[Prod. plant CH]

RADOX® 155

Flexible single core



- Excellent high and low temperature and ozone resistance
- Weatherproof
- Easy to process
- 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
- ② Insulation

Core colours

stranded tin plated copper, acc. to EN 60228, class 5
RADOX 155
extruded and electron beam crosslinked polyolefin copolymer
various, on request

Technical data

Voltage rating U_0/U	$\leq 0.50 \text{ mm}^2$	450/750 V AC
Test voltage	$\leq 0.50 \text{ mm}^2$	2500 V AC
Voltage rating U_0/U	$> 0.50 \text{ mm}^2$	600/1000 V AC
Test voltage	$> 0.50 \text{ mm}^2$	3500 V AC
Temperature range		-55 up to +155 °C

RADOX® 155

Flexible single core

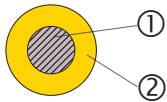
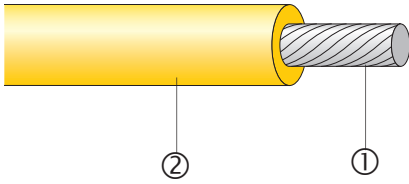
Extract from our delivery programme

Cross section	Conductor			Core	Weight	Bending radius
nom. mm ²	Construction nom. n × mm dia.	Dia. max. mm	R ₂₀ IEC 60228 max. Ω/km	Dia. mm	nom. kg/100 m	min.
0.25	19 × 0.13	0.6	86.0	1.45 ± 0.05	0.4	3 × dia.
0.34	19 × 0.16	0.8	53.1	1.60 ± 0.10	0.5	3 × dia.
0.50	19 × 0.18	0.9	40.1	1.71 ± 0.10	0.7	3 × dia.
0.75	24 × 0.20	1.15	26.7	2.25 ± 0.10	1.1	3 × dia.
1.0	32 × 0.20	1.3	20.0	2.50 ± 0.10	1.5	3 × dia.
1.5	30 × 0.25	1.55	13.7	2.85 ± 0.10	1.9	3 × dia.
2.5	48 × 0.25	2.05	8.21	3.50 ± 0.10	3.0	3 × dia.
4.0	56 × 0.30	2.6	5.09	4.20 ± 0.15	4.5	3 × dia.
6.0	82 × 0.30	3.0	3.39	5.0 ± 0.15	6.5	3 × dia.
10	78 × 0.40	3.9	1.95	6.4 ± 0.15	11	3 × dia.
16	119 × 0.40	5.4	1.24	7.6 ± 0.15	16.5	3 × dia.
25	182 × 0.40	6.7	0.795	9.2 ± 0.2	25	3 × dia.
35	266 × 0.40	7.9	0.565	10.7 ± 0.3	36.3	3 × dia.
50	378 × 0.40	9.4	0.393	12.3 ± 0.3	50	4 × dia.
70	348 × 0.50	11.5	0.277	14.6 ± 0.3	68	4 × dia.
95	444 × 0.50	13.0	0.210	16.4 ± 0.3	89	4 × dia.
120	570 × 0.50	15.4	0.164	18.5 ± 0.3	110	4 × dia.
150	722 × 0.50	17.0	0.132	20.8 ± 0.3	142	4 × dia.
185	874 × 0.50	18.5	0.108	22.7 ± 0.3	171	4 × dia.
240	1147 × 0.50	21.3	0.0817	26.1 ± 0.4	225	4 × dia.

Various colours 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
- ② Insulation

Core colours

stranded tin plated copper, acc. to EN 60228, class 5
RADOX 155 S
extruded electron beam crosslinked polyolefin copolymer
various, on request

Technical data

Voltage rating U_0/U	$\leq 0.50 \text{ mm}^2$	450/750 V AC
Test voltage	$\leq 0.50 \text{ mm}^2$	2500 V AC
Voltage rating U_0/U	$> 0.50 \text{ mm}^2$	600/1000 V AC
Test voltage	$> 0.50 \text{ mm}^2$	3500 V AC
Temperature range		-55 up to +155 °C
Min. bending radius		3 x core-dia.

RADOX® 155 S

Flexible single core - high oil resistance

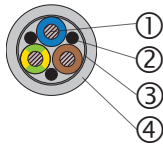
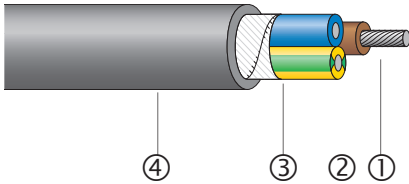
Extract from our delivery programme

Cross section	Conductor			Core	Weight
nom. mm ²	Construction nom. n × mm dia.	Dia. max. mm	R ₂₀ IEC 60228 max. Ω/km	Dia. mm	nom. kg/100 m
0.50	19 × 0.18	0.9	40.1	1.70 ± 0.10	0.7
0.75	24 × 0.20	1.15	26.7	2.20 ± 0.10	1.1
1.0	32 × 0.20	1.3	20.0	2.60 ± 0.10	1.5
1.5	30 × 0.25	1.55	13.7	2.70 ± 0.10	1.9
2.5	48 × 0.25	2.05	8.21	3.50 ± 0.10	3.0
4.0	56 × 0.25	2.6	5.09	4.15 ± 0.15	4.5
6.0	81 × 0.25	3.4	3.39	5.20 ± 0.15	6.6

Various colours on request.

RADOX® 125

Control and power cable, unscreened



- 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 EN 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 75) 6 core and more: black numbered with yellow/green earthing
② Fillers (optional)	RADOX 125
③ Separator	plastic tape
④ Sheath	RADOX 125M: extruded and electron beam crosslinked polyolefin copolymer
Colour	black

Technical data

Voltage rating U_0/U	$\leq 16 \times 0.50 \text{ mm}^2$	450/750 V AC
Test voltage	$\leq 16 \times 0.50 \text{ mm}^2$	2500 V AC
Voltage rating U_0/U	$> 16 \times 0.50 \text{ mm}^2$	600/1000 V AC
Test voltage	$> 16 \times 0.50 \text{ mm}^2$	3500 V AC
Temperature range	fixed	-40 up to +125 °C
Min. operating temperature	flexing	-25 °C
Max. conductor temperature	at short circuit (max. 5 s)	+280 °C
Min. bending radius	fixed	3 × cable-dia.
	flexing	5 × cable-dia.

The cables are in conformity with:

Halogen free compound	fulfilled	EN 50363
Corrosivity of combustion gases	$\text{pH} \geq 4.3$, $\sigma \leq 10 \text{ } \mu\text{S}/\text{mm}$	EN 50267-2-2
Amount of halogen acid gas	$\text{HCl} + \text{HBr} \leq 0.5 \%$	EN 50267-2-1
Content of fluorine	$\text{HF} \leq 0.1 \%$	EN 60684-2, # 45.2

RADOX® 125

Control and power cable, unshielded

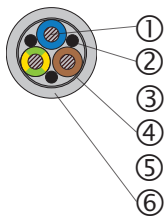
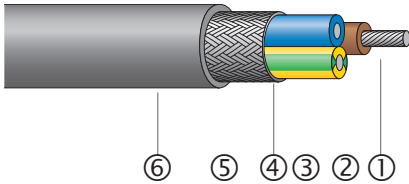
Extract from our delivery programme

Cross section n × mm ²	Conductor			Core	Cable	Weight
	Construction nom. n × mm dia.	Dia. max. mm	R ₂₀ IEC 60228 max. Ω/km	Dia. mm	Dia. mm	nom. kg/100 m
4 × 0.25	19 × 0.12	0.61	88.5	1.45 ± 0.05	5.4 ± 0.3	4.0
4 × 0.5	19 × 0.18	0.9	40.1	1.7 ± 0.10	6.1 ± 0.3	6.5
2 × 0.75	24 × 0.20	1.15	26.7	2.2 ± 0.10	6.6 ± 0.3	6.3
3 × 0.75	24 × 0.20	1.15	26.7	2.2 ± 0.10	7.3 ± 0.3	7.9
4 × 0.75	24 × 0.20	1.15	26.7	2.2 ± 0.10	7.7 ± 0.3	8.8
5 × 0.75	24 × 0.20	1.15	26.7	2.2 ± 0.10	8.6 ± 0.3	10.9
2 × 1.0	32 × 0.20	1.3	20.0	2.6 ± 0.10	7.5 ± 0.3	7.4
3 × 1.0	32 × 0.20	1.3	20.0	2.6 ± 0.10	7.9 ± 0.3	9.1
2 × 1.5	30 × 0.25	1.55	13.7	2.73 ± 0.10	7.8 ± 0.3	8.6
3 × 1.5	30 × 0.25	1.55	13.7	2.73 ± 0.10	8.3 ± 0.3	11.0
4 × 1.5	30 × 0.25	1.55	13.7	2.73 ± 0.10	9.2 ± 0.3	13.6
5 × 1.5	30 × 0.25	1.55	13.7	2.73 ± 0.10	10.4 ± 0.4	16.8
7 × 1.5	30 × 0.25	1.55	13.7	2.73 ± 0.10	12.3 ± 0.4	23.6
2 × 2.5	50 × 0.25	2.05	8.21	3.50 ± 0.10	9.1 ± 0.3	13.0
3 × 2.5	50 × 0.25	2.05	8.21	3.50 ± 0.10	10.1 ± 0.4	16.6
4 × 2.5	50 × 0.25	2.05	8.21	3.50 ± 0.10	11.3 ± 0.4	20.9
5 × 2.5	50 × 0.25	2.05	8.21	3.50 ± 0.10	12.4 ± 0.4	24.9
4 × 4.0	56 × 0.30	2.6	5.09	4.15 ± 0.15	13.0 ± 0.4	29.8
5 × 4.0	56 × 0.30	2.6	5.09	4.15 ± 0.15	14.6 ± 0.4	36.7
4 × 10	78 × 0.40	4.4	1.95	6.15 ± 0.15	19.0 ± 0.5	78.2
5 × 10	78 × 0.40	4.4	1.95	6.15 ± 0.15	21.4 ± 0.5	83.3

Other cross sections on request.

RADOX® 125

Control and power 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 EN 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 75) 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: $\geq 85\%$
⑤ Separator (optional)	plastic tape
⑥ Sheath	RADOX 125M extruded and electron beam crosslinked polyolefin copolymer
Colour	black

Technical data

Voltage rating U_0/U	$\leq 16 \times 0.50 \text{ mm}^2$	450/750 V AC
Test voltage	$\leq 16 \times 0.50 \text{ mm}^2$	2500 V AC
Voltage rating U_0/U	$> 16 \times 0.50 \text{ mm}^2$	600/1000 V AC
Test voltage	$> 16 \times 0.50 \text{ mm}^2$	3500 V AC
Temperature range	fixed	-40 up to +125 °C
Min. operating temperature	flexing	-25 °C
Max. conductor temperature	at short circuit (max. 5 s)	+280 °C
Min. bending radius	fixed	4 x cable-dia.
	flexing	5 x cable-dia.

The cables are in conformity with:

Halogen free compound	fulfilled	EN 50363
Corrosivity of combustion gases	$\text{pH} \geq 4.3$, $\sigma \leq 10 \mu\text{S}/\text{mm}$	EN 50267-2-2
Amount of halogen acid gas	$\text{HCl} + \text{HBr} \leq 0.5\%$	EN 50267-2-1
Content of fluorine	$\text{HF} \leq 0.1\%$	EN 60684-2, # 45.2

RADOX® 125

Control and power cable, screened

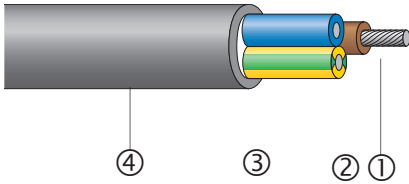
Extract from our delivery programme

Cross section	Conductor			Core	Screen	Cable	Weight
	Construction nom. n × mm dia.	Dia. max. mm	R ₂₀ IEC 60228 max. Ω/km				
4 × 0.25	19 × 0.13	0.6	85.9	1.45 ± 0.05	4.1	5.9 ± 0.3	5.2
2 × 0.5	19 × 0.18	0.9	40.1	1.7 ± 0.10	4.0	5.9 ± 0.3	5.7
4 × 0.5	19 × 0.18	0.9	40.1	1.7 ± 0.10	4.8	6.8 ± 0.3	8.0
2 × 0.75	24 × 0.20	1.15	26.7	2.2 ± 0.10	4.9	6.9 ± 0.3	7.4
3 × 0.75	24 × 0.20	1.15	26.7	2.2 ± 0.10	5.5	7.6 ± 0.3	9.7
4 × 0.75	24 × 0.20	1.15	26.7	2.2 ± 0.10	6.2	8.4 ± 0.3	11.7
2 × 1.0	32 × 0.20	1.3	20.0	2.6 ± 0.10	5.9	7.9 ± 0.3	10.6
3 × 1.0	32 × 0.20	1.3	20.0	2.6 ± 0.10	6.3	8.7 ± 0.3	12.7
4 × 1.0	32 × 0.20	1.3	20.0	2.6 ± 0.10	7.0	9.3 ± 0.3	14.4
3 × 1.5	30 × 0.25	1.55	13.7	2.73 ± 0.10	6.5	8.7 ± 0.3	13.2
4 × 1.5	30 × 0.25	1.55	13.7	2.73 ± 0.10	7.6	10.0 ± 0.4	17.5
4 × 2.5	50 × 0.25	2.05	8.21	3.50 ± 0.10	9.8	12.4 ± 0.4	26.8
5 × 2.5	50 × 0.25	2.05	8.21	3.50 ± 0.10	10.4	13.1 ± 0.4	30.9

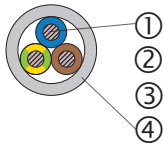
Other cross sections on request.

RADOX® 155

Control and power cable, unshielded



- 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 EN 60228, class 5
Insulation	RADOX 155
Core colours	extruded and electron beam crosslinked polyolefin copolymer 2 up to 5 core acc. to CENELEC HD 308 (see page 75) 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
Colour	extruded and electron beam crosslinked polyolefin copolymer black

Technical data

Voltage rating U_0/U	$\leq 16 \times 0.50 \text{ mm}^2$	450/750 V AC
Test voltage	$\leq 16 \times 0.50 \text{ mm}^2$	2500 V AC
Voltage rating U_0/U	$> 16 \times 0.50 \text{ mm}^2$	600/1000 V AC
Test voltage	$> 16 \times 0.50 \text{ mm}^2$	3500 V AC
Temperature range	fixed	-55 up to +155 °C
Min. operating temperature	flexible	-40 °C
Max. conductor temperature	at short circuit (max. 5 s)	+280 °C
Min. bending radius	fixed	3 × cable-dia.
	flexible	5 × cable-dia.

RADOX® 155

Control and power cable, unshielded

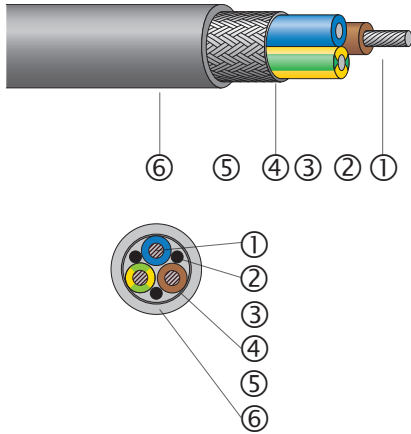
Extract from our delivery programme

Cross section n × mm ²	Conductor			Core	Cable	Weight
	Construction nom. n × mm dia.	Dia. max. mm	R ₂₀ IEC 60228 max. Ω/km	Dia. mm	Dia. mm	nom. kg/100 m
4 × 0.25	19 × 0.13	0.6	85.9	1.45 ± 0.05	5.4 ± 0.3	3.3
3 × 0.34	19 × 0.15	0.75	57.2	1.55 ± 0.10	5.1 ± 0.3	3.4
2 × 0.50	19 × 0.18	0.9	40.1	1.7 ± 0.10	5.2 ± 0.3	3.3
3 × 0.50	19 × 0.18	0.9	40.1	1.7 ± 0.10	5.6 ± 0.3	4.0
8 × 0.50	19 × 0.18	0.9	40.1	1.7 ± 0.10	8.75 ± 0.3	10.0
16 × 0.50	19 × 0.18	0.9	40.1	1.7 ± 0.10	10.4 ± 0.4	18.5
3 × 0.75	24 × 0.20	1.15	26.7	2.2 ± 0.10	6.7 ± 0.3	5.9
4 × 0.75	24 × 0.20	1.15	26.7	2.2 ± 0.10	7.5 ± 0.3	7.2
2 × 1.0	32 × 0.20	1.3	20.0	2.6 ± 0.10	7.0 ± 0.3	6.1
3 × 1.0	32 × 0.20	1.3	20.0	2.6 ± 0.10	7.6 ± 0.3	7.7
2 × 1.5	30 × 0.25	1.55	13.7	2.7 ± 0.10	7.5 ± 0.3	6.6
3 × 1.5	30 × 0.25	1.55	13.7	2.7 ± 0.10	7.9 ± 0.3	9.2
4 × 1.5	30 × 0.25	1.55	13.7	2.7 ± 0.10	8.8 ± 0.3	11.7
5 × 1.5	30 × 0.25	1.55	13.7	2.7 ± 0.10	10.1 ± 0.4	15.0
3 × 2.5	50 × 0.25	2.05	8.21	3.35 ± 0.10	9.9 ± 0.3	14.6
4 × 2.5	50 × 0.25	2.05	8.21	3.35 ± 0.10	11.0 ± 0.4	18.6
5 × 2.5	50 × 0.25	2.05	8.21	3.35 ± 0.10	11.9 ± 0.4	22.3

Other cross sections on request.

RADOX® 155

Control and power cable, unscreened



- 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 EN 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 75) 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_0/U	< 0.75 mm ²	450/750 V AC
Test voltage	< 0.75 mm ²	2500 V AC
Voltage rating U_0/U	≥ 0.75 mm ²	600/1000 V AC
Test voltage	≥ 0.75 mm ²	3500 V AC
Temperature range	fixed	-55 up to +155 °C
Min. operating temperature	flexible	-40 °C
Max. conductor temperature	at short circuit (max. 5 s)	+280 °C
Min. bending radius	fixed	4 × cable-dia.
	flexible	5 × cable-dia.

Fire tests

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

RADOX® 155

Control and power cable, unshielded

Extract from our delivery programme

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

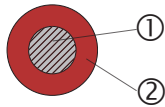
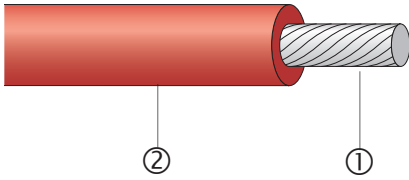
Flexible single cores, control and power cables

RADOX UL 3266/CSA AWM I A/B flexible single core, 300 V	38
RADOX UL 3271/CSA AWM I A/B flexible single core, 600 V	40
RADOX UL 3289/CSA CL 1503 flexible single core, 600 V	42
RADOX UL 4486/CSA AWM I/II A/B control cables, 300 V	44
RADOX UL 4486/CSA AWM I/II A/B control cables, screened, 300 V	46
RADOX UL 4486/CSA AWM I/II A/B power cables, 600 V	48
RADOX UL 4486/CSA AWM I/II A/B power cables, screened, 600 V	50

All our cables fully comply with the European directives 76/769/EEG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2011/65/EU (RoHS).

RADOX® UL 3266/CSA AWM I A/B

Flexible single core



- Excellent high and low temperature and ozone resistance
- Weatherproof
- High abrasion resistance
- 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 EN 60228, class 5
② Insulation	RADOX 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		+125 °C
Max. conductor temperature	at short circuit (max. 5 s)	+280 °C
Min. operating temperature	flexing	-25 °C
	fixed	-40 °C
Min. bending radius		3 × core-dia.

Standards

Appliance wiring material	CSA C22.2 no. 210.2	AWM I A/B 125 °C 300 V
Appliance wiring material	UL 758	style 3266

Approvals

UL	Underwriters Laboratories	file no. E63322
CSA	Canadian Standards Association	report no. 69581

The cables pass the following fire tests:

Vertical flame spread FT2	$L \leq 100$ mm	CSA C22.2 no. 0.3 # 4.11.2
Horizontal flame spread, Appliance-wire	$V \leq 25$ mm/Min.	UL 1581 # 1090

RADOX® UL 3266/CSA AWM I A/B

Flexible single core

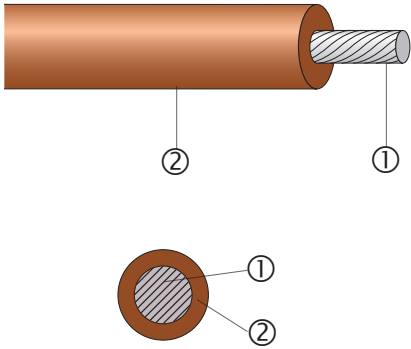
Extract from our delivery programme

Cross section		Conductor		Core	Weight
nom.		Construction n × mm dia.	Dia. max. mm	Dia. mm	nom. kg/100 m
AWG	mm ²				
26	0.15	19 × 0.10	0.51	1.32 ± 0.05	0.32
24	0.25	19 × 0.13	0.61	1.45 ± 0.05	0.41
22	0.38	19 × 0.16	0.77	1.65 ± 0.10	0.53
20	0.62	19 × 0.20	0.99	1.85 ± 0.10	0.83
18	0.96	19 × 0.25	1.23	2.10 ± 0.10	1.13
(16)	1.5	19 × 0.31	1.52	2.41 ± 0.10	1.65
14	2.1	19 × 0.37	1.86	2.72 ± 0.10	2.33
12	3.3	37 × 0.35	2.35	3.21 ± 0.10	3.53
10	5.26	37 × 0.44	3.02	3.88 ± 0.10	5.61

Various colours on request.

RADOX® UL 3271/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 abrasion resistance
- 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
- ② Insulation

Core colours

stranded tin plated copper, acc. to EN 60228, class 5
 RADOX
 extruded and electron beam crosslinked polyolefin copolymer
 various, on request

Technical data

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

Standards

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

Approvals

UL Underwriters Laboratories		file no. E63322
CSA	Canadian Standards Association	certificate no. 1418425

RADOX® UL 3271/CSA AWM I A/B

Flexible single core

The cables pass the following fire tests:

Vertical flame spread FT1	L ≤ 250 mm, t ≤ 60 s	CSA C22.2 no. 0.3 # 4.11.1
Horizontal flame spread FT2	L ≤ 100 mm	CSA C22.2 no. 0.3 # 4.11.2
Vertical flame spread	50 < L ≤ 540 mm	EN 60332-1-2, IEC 60332-1-2
Horizontal flame spread,		
Appliance-wire	V ≤ 25 mm/Min.	UL 1581 # 1090
Vertical flame spread, VW-1	L ≤ 250 mm, t ≤ 60 s	UL 1581 # 1080

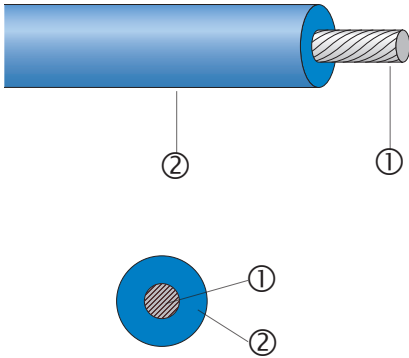
Extract from our delivery programme

Cross section		Conductor			Core	Weight	Bending radius
nom.		Construction nom. n × mm dia.	Dia. max. mm	R ₂₀ IEC 60228 max. Ω/km	Dia. mm	nom. kg/100 m	min.
AWG	mm ²						
24	(0.25)	19 × 0.13	0.61	84.2	2.22 ± 0.10	0.72	3 × dia.
22	(0.38)	19 × 0.16	0.77	52.1	2.40 ± 0.10	0.92	3 × dia.
20	(0.62)	19 × 0.20	0.99	31.8	2.60 ± 0.10	1.2	3 × dia.
18	(0.96)	19 × 0.25	1.23	20.2	2.85 ± 0.10	1.6	3 × dia.
(16)	1.5	19 × 0.31	1.52	12.9	3.20 ± 0.10	2.1	3 × dia.
14	(2.1)	19 × 0.37	1.86	8.8	3.50 ± 0.10	2.9	3 × dia.
12	(3.3)	37 × 0.35	2.35	5.53	4.0 ± 0.15	4.2	3 × dia.
10	(5.26)	37 × 0.44	3.02	3.34	4.7 ± 0.15	6.4	3 × dia.
(8)	10	80 × 0.40	4.3	1.91	6.4 ± 0.15	12.1	3 × dia.
(6)	16	119 × 0.40	5.4	1.22	8.6 ± 0.2	18.8	3 × dia.
(4)	25	182 × 0.40	6.7	0.795	9.9 ± 0.2	26.8	3 × dia.
(2)	35	266 × 0.40	7.9	0.554	11.1 ± 0.2	36.4	3 × dia.
(1)	50	378 × 0.40	9.4	0.385	13.7 ± 0.25	54.3	4 × dia.
(2/0)	70	348 × 0.50	11.5	0.271	15.8 ± 0.25	72.3	4 × dia.
(3/0)	95	444 × 0.50	13.0	0.206	17.4 ± 0.3	95.5	4 × dia.
(4/0)	120	551 × 0.50	15.1	0.164	19.3 ± 0.3	116	4 × dia.
	150	722 × 0.50	17.0	0.132	22.2 ± 0.3	150	4 × dia.

Various colours 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 EN 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	+150 °C
Max. conductor temperature	at short circuit (max. 5 s) +280 °C
Min. operating temperature	flexing -40 °C fixed -55 °C

Standards

Appliance wiring material	CSA	CL 1503
Appliance wiring material	UL 758	style 3289

Approvals

UL	Underwriters Laboratories	file no. E63322
CSA	Canadian Standards Association	certificate no. 039507

RADOX® UL 3289/CSA CL 1503

Flexible single core

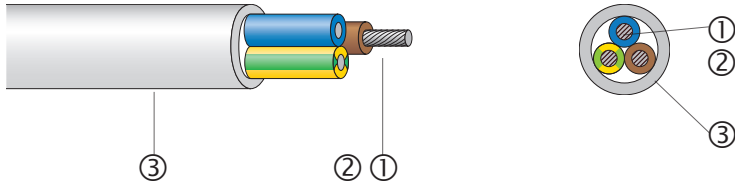
Extract from our delivery programme

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

Various colours on request.

RADOX® UL4486 / CSA AWM I/II A/B

Control cable - UL approved - 300 V



- Excellent high and low temperature and ozone resistance
- Weatherproof
- 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 EN 60228, class 5
Insulation	RADOX
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		+125 °C
Max. conductor temperature	at short circuit (max. 5 s)	+280 °C
Min. operating temperature	flexing	-25 °C
	fixed	-40 °C
Min. bending radius		5 × cable-dia.

Standards

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

RADOX® UL4486 / CSA AWM I/II A/B

Control cable - UL approved - 300 V

Fire tests

Flame propagation:

Vertical flame spread, 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 flame spread, single cable	EN 50265-2-1, IEC 60332-1	
Vertical flame spread, bunched cables	EN 50266-2-4, IEC 60332-3-24	category C

Flame propagation:

Horizontal flame propagation of an appliance wire	UL 1581 sec. 1090	
Vertical flame spread, single cable	UL 1581 sec. 1061	
Vertical flame spread, single cable	UL 1581 sec. 1080	VW-1

Approvals

CSA certificate	1241318
UL file	E63322

Extract from our delivery programme

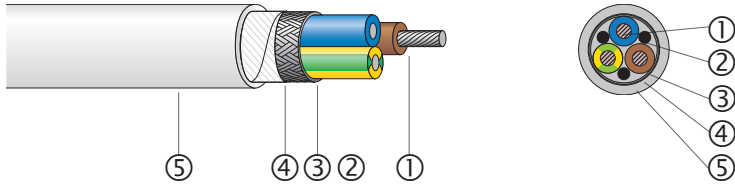
Cross section nom. n x(G) AWG	Conductor		Core		Cable
	Construction nom. n × mm dia.	R ₂₀ IEC 60228 max. Ω/km	Dia. nom. mm	Colours*	Dia. nom. mm
2 × 20	19 × 0.20	32.6	1.85	BU, BN	5.5 ± 0.3
2 × 18	19 × 0.25	21.3	2.10	BU, BN	6.0 ± 0.3
2 × 12	37 × 0.34	5.67	3.21	BU, BN	8.3 ± 0.3
4 × 14	19 × 0.37	9.02	2.72	BU, BN, BK, GY	8.5 ± 0.3

* Abbreviations for core colours see page 74.

Other cross sections on request.

RADOX® UL4486 / CSA AWM I/II A/B

Control cable - UL approved - screened - 300 V



- Excellent high and low temperature and ozone resistance
- Weatherproof
- 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 EN 60228, class 5
Insulation		RADOX
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		+125 °C
Max. conductor temperature	at short circuit (max. 5 s)	+280 °C
Min. operating temperature	flexing	-25 °C
	fixed	-40 °C
Min. bending radius		5 × cable-dia.

Standards

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

RADOX® UL4486 / CSA AWM I/II A/B

Control cable - UL approved - screened - 300 V

Fire tests

Flame propagation:

Vertical flame spread, single cable	CSA C22.2 no. 0.3 cl. 4.11.1	FT1
Horizontal flame spread, single cable	CSA C22.2 no. 0.3 cl. 4.11.2	FT2
Vertical flame spread, single cable	EN 50265-2-1, IEC 60332-1	
Vertical flame spread, bunched cables	EN 50266-2-4, IEC 60332-3-24	category C

Flame propagation:

Horizontal flame propagation of an appliance wire	UL 1581 sec. 1090	
Vertical flame spread, single cable	UL 1581 sec. 1061	
Vertical flame spread, single cable	UL 1581 sec. 1080	VW-1

Approvals

CSA certificate	1241318
UL file	E63322

Extract from our delivery programme

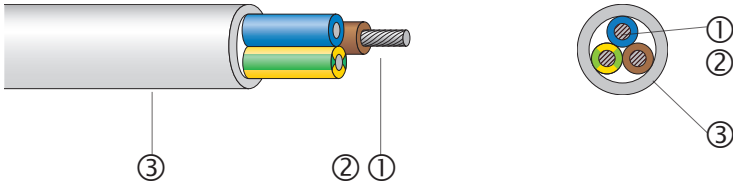
Cross section	Conductor		Core		Screen	Cable
nom. n x(G) AWG	Construc. nom. n x mm dia.	R ₂₀ IEC 60228 max. Ω/km	Dia. nom. mm	Colours*	Dia. nom. mm	Dia. nom. mm
2 × 18	19 × 0.25	21.3	2.10	BU, BN	4.6	6.6 ± 0.3
2 × 14	19 × 0.37	9.02	2.72	BU, BN	6.0	7.9 ± 0.3
3 G 20	19 × 0.20	32.6	1.85	BU, BN, GNYE	4.5	6.4 ± 0.3
3 × 14	19 × 0.37	9.02	2.72	BU, BN, BK	6.5	8.3 ± 0.3
4 G 18	19 × 0.25	21.3	2.10	BU, BN, BK, GNYE	5.7	7.6 ± 0.3
4 × 12	37 × 0.34	5.67	3.21	BU, BN, BK, GY	8.8	10.7 ± 0.4

* Abbreviations for core colours see page 74.

Other cross sections on request

RADOX® UL4486 / CSA AWM I/II A/B

Power cable - UL approved - 600 V



- Excellent high and low temperature and ozone resistance
- Weatherproof
- 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 EN 60228, class 5
Insulation	RADOX
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
Operating temperature		+125 °C
Max. conductor temperature	at short circuit (max. 5 s)	+280 °C
Min. operating temperature	flexing	-25 °C
	fixed	-40 °C
Min. bending radius		5 × cable-dia.

Standards

Appliance wiring material	CSA C22.2 no. 210.2	AWM I/II A/B 125 °C 600 V FT1
Appliance wiring material	UL 758	style 4486

RADOX® UL4486 / CSA AWM I/II A/B

Power cable - UL approved - 600 V

Fire tests

Flame propagation:

Vertical flame spread, single cable	CSA C22.2 no. 0.3 cl. 4.11.1	FT1
Horizontal flame spread, single cable	CSA C22.2 no. 0.3 cl. 4.11.2	FT2
Vertical flame spread, single cable	EN 50265-2-1, IEC 60332-1	
Vertical flame spread, bunched cables	EN 50266-2-4, IEC 60332-3-24	category C

Flame propagation:

Horizontal flame propagation of an appliance wire	UL 1581 sec. 1090	
Vertical flame spread, single cable	UL 1581 sec. 1061	
Vertical flame spread, single cable	UL 1581 sec. 1080	VW-1

Approvals

CSA certificate	1241318
UL file	E63322

Extract from our delivery programme

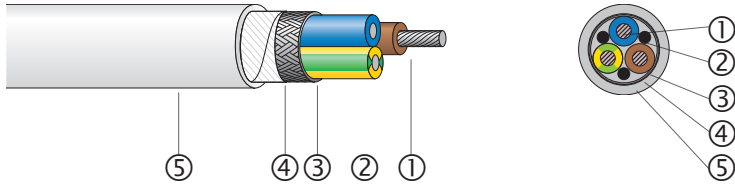
Cross section nom. n × (G) AWG	Conductor		Core		Cable
	Construction nom. n × mm dia.	R ₂₀ IEC 60228 max. Ω/km	Dia. nom. mm	Colours*	Dia. nom. mm
1 × 1	378 × 0.40	0.385	13.7	BK	16.5 ± 0.3
2 × 20	19 × 0.20	32.6	2.60	BU, BN	7.0 ± 0.3
3 G 20	19 × 0.20	32.6	2.60	BU, BN, GNYE	7.45 ± 0.3
3 × 14	19 × 0.37	9.02	3.50	BU, BN, BK	9.4 ± 0.3
4 G 12	37 × 0.34	5.67	4.00	BU, BN, BK, GNYE	11.7 ± 0.4

* Abbreviations for core colours see page 74.

Other cross sections on request.

RADOX® UL 4486/CSA AWM I/II A/B

Power cable - UL approved - screened - 600 V



- Excellent high and low temperature and ozone resistance
- Weatherproof
- 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 EN 60228, class 5
Insulation	RADOX
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		+125 °C
Max. conductor temperature	at short circuit (max. 5 s)	+280 °C
Min. operating temperature	flexing	-25 °C
	fixed	-40 °C
Min. bending radius		5 × cable-dia.

Standards

Appliance wiring material	CSA C22.2 no. 210.2	AWM I/II A/B 125 °C 600 V FT1
Appliance wiring material	UL 758	style 4486

RADOX® UL 4486/CSA AWM I/II A/B

Power cable - UL approved - screened - 600 V

Fire tests

Flame propagation:

Vertical flame spread, single cable	CSA C22.2 no. 0.3 cl. 4.11.1	FT1
Horizontal flame spread, single cable	CSA C22.2 no. 0.3 cl. 4.11.2	FT2
Vertical flame spread, single cable	EN 50265-2-1, IEC 60332-1	
Vertical flame spread, bunched cables	EN 50266-2-4, IEC 60332-3-24	category C

Flame propagation:

Horizontal flame propagation of an appliance wire	UL 1581 sec. 1090	
Vertical flame spread, single cable	UL 1581 sec. 1061	
Vertical flame spread, single cable	UL 1581 sec. 1080	VW-1

Approvals

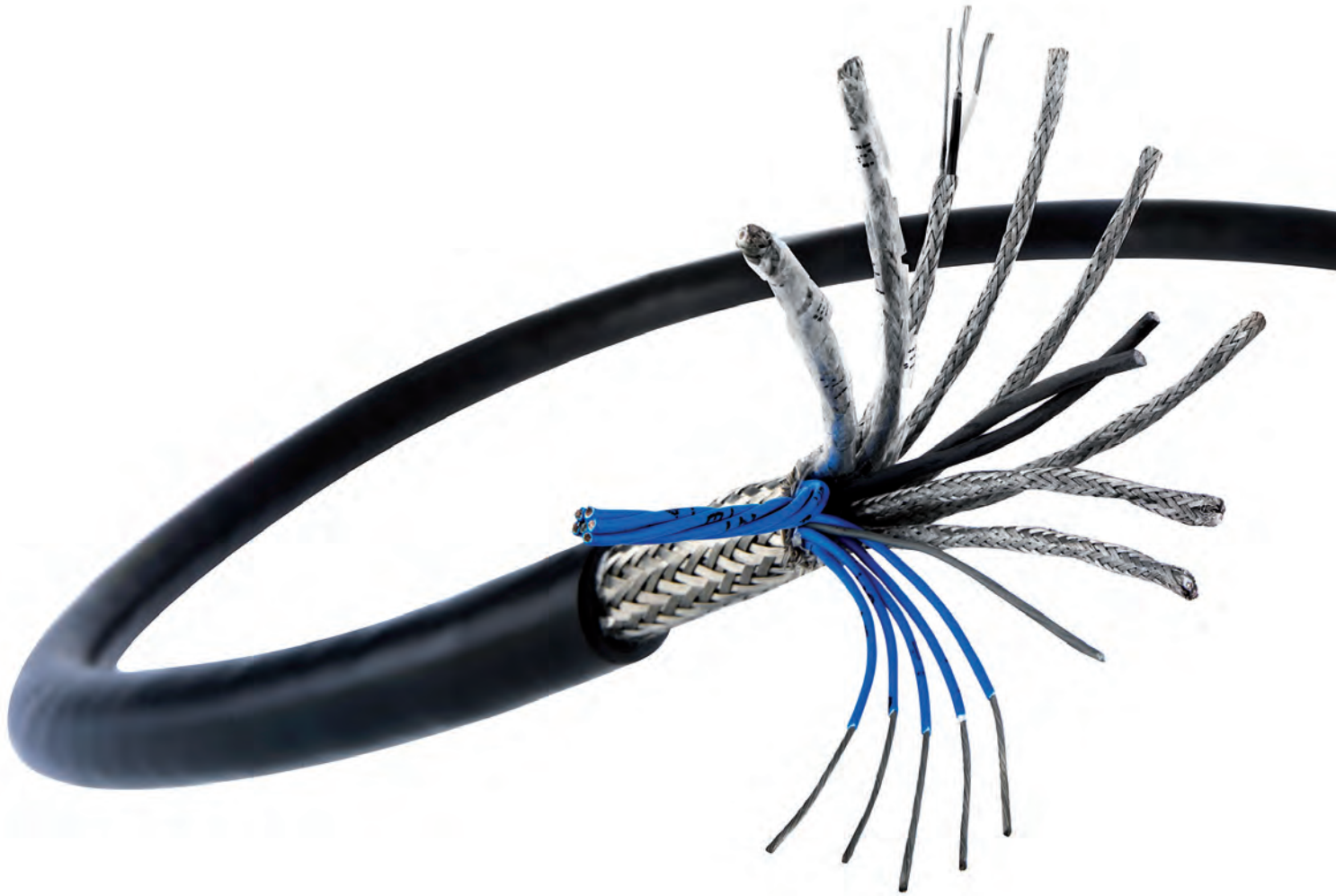
CSA certificate	1241318
UL file	E63322

Extract from our delivery programme

Cross section nom. n × (G) AWG	Conductor		Core		Screen	Cable
	Construct. nom. n × mm dia.	R ₂₀ IEC 60228 max. Ω/km	Dia. nom. mm	Colours*	Dia. nom. mm	Dia. mm
1 G 2*	266 × 0.40	0.554	11.1	GNYE	12.2	14.1 ± 0.3
1 × 3/0	444 × 0.50	0.206	17.3	BK	18.4	22.8 ± 0.3
2 × 14	19 × 0.37	9.02	3.50	BU, BN	7.7	9.6 ± 0.3
3 G 20	19 × 0.20	32.6	2.60	BU, BN, GNYE	6.2	8.1 ± 0.3
3 × 8	80 × 0.40	1.96	6.40	BK, YE num.	15.1	18.2 ± 0.5
4 × 22	19 × 0.16	54.7	2.40	WH num.	6.6	8.5 ± 0.3
4 G 16	19 × 0.31	13.7	3.10	BU, BN, BK, GNYE	8.7	10.7 ± 0.4
4 × 6	119 × 0.40	1.25	8.60	BU, BN, BK, GY	22.5	27.3 ± 0.6
5 × 18	19 × 0.25	21.3	2.85	BU, BN, BK, GY, BK	8.7	10.7 ± 0.4
12 G 14	19 × 0.37	9.02	3.50	BK, YE num., GNYE	15.7	18.8 ± 0.5

* Abbreviations for core colours see page 74.

Other cross sections on request.



RADOX® MFH

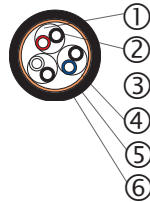
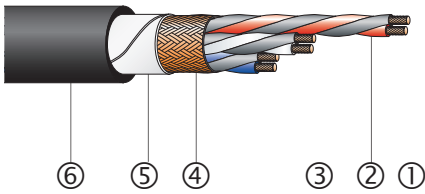
Power, instrumentation and control cables, marine and NEK606 approved

RADOX MFH-S B	
Power, instrumentation and control cables, screened	54

All our cables fully comply with the European directives 76/769/EWG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2011/65/EU (RoHS).

RADOX® MFH

MFH-S, control/instrumentation and power cables, screened



- Ozone, hydrolysis, chemical resistant
- Weatherproof
- Easy to process
- Leight weight
- Wide operating temperature range
- Halogen free
- Flame retardant

Application

Highly flexible cable for fixed and free installations of power, control and lightning applications in harsh environments like diesel engines, ships, oil rigs and other offshore units.

Resistant to oil and drilling fluids according to NEK TS 606.

Suitable for moving cable carriers; flexible up to -40 °C and -50 °C for fixed installation..

Composition of cable

① Centre (if necessary)	RADOX filler
② Cores Conductor	type MA14; RADOX T1301 (145 °C/20 000 hours) stranded tin plated copper, acc. to EN 60228, class 5 optional with pair screen and drain wire
Core colours	see table
③ Fillers (optional)	RADOX
④ EMV screening	optimised tin plated copper braid, optical coverage: ≥ 85 %
⑤ Separator	textile yarn
⑥ Sheath Colour	RADOX elastomer S FH (SHF 2; SHF mud NEK 606) black and blue

Technical data

Voltage rating U_0/U		600/1000 V AC
Test voltage		3500 V AC
Temperature range		-50 up to +145 °C
Min. bending radius	fixed	≤ 12 mm 3 × cable-dia.
		≥ 12 mm 4 × cable-dia.
	flexing	> 12 mm 5 × cable-dia.
		> 12 mm 6 × cable-dia.

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

Fire protection in rolling stock:

Level of protection	DIN 5510	Level 1 - 4
Hazard level	EN 45545	HL1 - HL3

Approvals

DNV-GL	certificate no. TAE00002Y1
NEK606	mud resistant
ABS (American Burau of Shipping)	certificate no. 15GD1369103
CCS (China classification society)	certificate no. HB17W00001
BV (Bureau veritas)	certificate no. 12915/CO BV

RADOX® MFH

Extract from our delivery programme

Power and control cables

Cross section n × mm ²	R ₂₀ IEC 60228 max. Ω/km	Overall screen cross section mm ²	Cable Ø mm	Core colours	Weight nom. kg/100 m
3 × 0.5	40.1	2.11	5.75 ± 0.3	bk, bu, bn	6.4
5 × 0.75	26.7	2.9	7.35 ± 0.3	bk, bu, bn, gy, light blu	10.9
7 × 0.75	26.7	3.43	8.35 ± 0.3	bk, bu, bn, gy, light blu, wh, og	14.1
12 × 0.75	26.7	3.96	9.55 ± 0.3	wh num	18.8
25 × 0.75	26.7	5.94	12.9 ± 0.4	wh num	33.6
37 × 0.75	26.7	9.98	14.8 ± 0.4	wh num	50.0
50 × 0.75	26.7	11.64	17.1 ± 0.5	wh num	64.8
3 × 1.5	13.7	2.9	7.45 ± 0.3	bk, bu, bn	11.8
5 × 1.5	13.7	3.96	8.9 ± 0.3	bk, bu, bn, gy, light blu	16.8
7 × 1.5	13.7	4.0	10.1 ± 0.4	bk, bu, bn, gy, light bu, wh, og	21.7
12 × 1.5	13.7	5.55	11.9 ± 0.4	wh num	31.4
3 × 2.5	8.21	2.9	8.6 ± 0.3	bk, bu, bn	15.6
5 G 2.5	26.7	4.36	10.5 ± 0.4	gnye, bu, bn, bk, gy	23.7
19 × 2.5	8.21	10.9	17.9 ± 0.5	wh num	73.4
3 × 4	4.8	3.7	9.8 ± 0.3	bk, bu, bn	22.0
4 × 4	5.09	5.22	13.0 ± 0.4	bu, bn, bk, bk	29.7
3 × 6	3.2	4.22	11.3 ± 0.4	bk, bu, bn	30.1
8 × 2.5 und 2 × 0.75	26.7	9.98	15.3 ± 0.5	wh num	47.7

Further cross sections on request.

Instrumentation cables

Cross section n × mm ²	R ₂₀ IEC 60228 max. Ω/km	Overall screen cross section mm ²	Cable Ø mm	Core colours	Weight nom. kg/100 m
2 × 0.5	40.1	2.11	5.55 ± 0.3	bk, bu	5.8
2 × 2 × 0.5	40.1	2.38	7.9 ± 0.3	bk, bu, bn, gy	10.1
2 × (2 × 0.5)	40.1	3.17	8.3 ± 0.3	bk, bu, bn, gy	12.0
5 × 2 × 0.5	40.1	3.96	9.75 ± 0.3	wh num	16.4
7 × 2 × 0.5	40.1	4.75	11.8 ± 0.4	wh num	22.8
14 × 2 × 0.5	40.1	9.98	14.1 ± 0.4	wh num	34.8
14 × (2 × 0.5)	40.1	9.98	15.5 ± 0.5	wh num	45.5
4 × 2 × 0.75	26.7	3.96	10.0 ± 0.3	wn num	16.4
4 × (2 × 0.75)	26.7	4.75	10.5 ± 0.3	wh num	21.3
8 × 2 × 0.75	26.7	9.98	11.6 ± 0.4	wn num	24.5
12 × 2 × 0.75	26.7	9.98	15.6 ± 0.5	wh num	43.9
12 × (2 × 0.75)	26.7	11.64	17.1 ± 0.5	wh num	54.0
19 × 2 × 0.75	26.7	11.64	18.3 ± 0.5	wh num	60.4
8 × (2 × 1.5)	13.7	13.86	19.5 ± 0.5	wh num	72.4
16 × (2 × 1.5)	13.7	16.63	24.0 ± 0.5	wh num	122.2
2 × 4	5.09	3.7	10.8 ± 0.4	bk, bu	18.6
2 × 2 × 2.5	8.21	5.55	13.7 ± 0.4	bk, bu, bn, gy	28.7
2 × (2 × 2.5)	8.21	5.15	13.9 ± 0.4	bk, bu, bn, gy	33.0
2 × 2 × 4	4.8	9.98	16.6 ± 0.5	bk, bu, bn, gy	46.8
2 × 6	3.2	4.36	10.7 ± 0.4	bk, bu	24.4
2 × 2 × 6	3.2	13.3	18.9 ± 0.5	bk, bu, bn, gy	58.9



RADOX® Databus cables

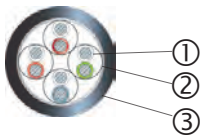
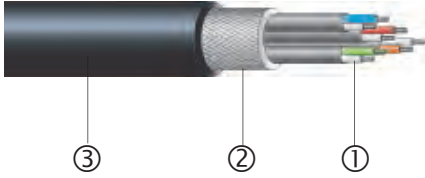
Databus cables for industrial applications, high speed data transmission and frequency range

RADOX CAT7	58
RADOX Marine CAT5e (Ethernet)	
- RADOX Marine CAT5e 2 × (2 × 0.5)	60
- RADOX Marine CAT5e 4 × (2 × 0.5)	60
- RADOX Marine CAT5e (4 × 0.5)	62
RADOX Marine Databus (CAN-Bus)	
- RADOX Marine Databus nx (2 × 0.5)	64
- RADOX Marine Databus (2 × 0.75)	66

All our cables fully comply with the European directives 76/769/EWG, 2003/11/EG, 2000/53/EG, 2003/53/EG and 2011/65/EU (RoHS).

RADOX® CAT7

Gigabit-Ethernet databus Cat. 7 data transmission



- High speed data transmission at 600 MHz at 100 Ω
- Resistance to acid, alkali, mud and weathering
- Halogen free
- Improved behaviour in case of fire
- Easy to strip
- Soldering iron is resistant and flexible
- Can be fitted with M12 connectors
- Fixed and mobile installation
- Gigabit Ethernet for tough environment

Application

This Ethernet databus is especially designed for applications in harsh environment.

Composition of cable

① 4 pairs, 2 × 24 AWG twisted Cores	conductor insulation	flexible tin plated copper RADOX FOAM	AWG 24 (7 × 32AWG) D 1.35 mm
2 cores twisted	pair A pair B pair C pair D	white/orange-orange white/green-green white/brown-brown white/blue-blue	
Pair screen	aluminium tape		
② EMC screen	tin plated copper braid		D 6.0 mm
③ Sheath Colour	RADOX REMS FH see table		D 8.1 ± 0.5 mm

Technical data

Voltage rating U_0/U		125 V AC
Test voltage		1000 V AC
Temperature range		-50 up to +125 °C
Min. bending radius	fixed	4 × cable-dia
Fire load		approx 705 kJ/m.

The cables are in conformity with:

Vertical flame spread	50 < L ≤ 540 mm	EN 60332-1-2
Vertical flame spread, bunched, 6 < D < 12 mm	L ≤ 2.5 m	EN 60332-3-25
Smoke density	T ≥ 60 %	EN 61034-2
Corrosivity of combustion gases	pH ≥ 4.3, C ≤ 10 mS/mm	EN 50267-2-2
Amount of halogen acid gas	HCl + HBr ≤ 0.5 %	EN 50267-2-1
Content of fluorine	HF ≤ 0.1 %	EN 60684-2, 45.2
Toxicity	ITC ≤ 3	EN 50305, 9.2

RADOX® CAT7

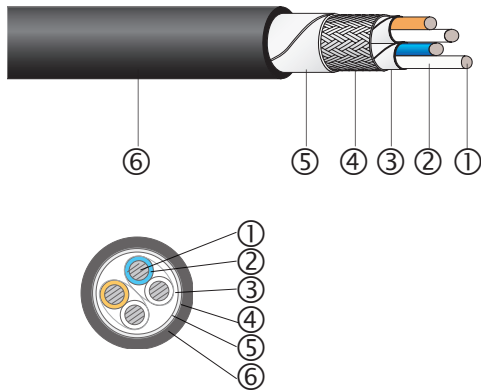
Gigabit-Ethernet databus Cat. 7 data transmission

Extract from our delivery programme

Cross section	Conductor	Core	Cable	Cable sheet	Weight	H+S no.
AWG	Construction nom. n × AWG	Dia. mm	Dia. mm	Colour	nom. kg/100 m	
2 × 24	7 × 32	1.35	8.1 ± 0.5	black	8.8	85030430
2 × 24	7 × 32	1.35	8.1 ± 0.5	blue	8.8	85028693

RADOX® Marine CAT5e nx (2 × 0.5)

High speed Ethernet databus CAT5e, DNV approved and NEK TS 606, robust



- Particularly robust thanks to larger cross-section
- For data transmission in high frequency ranges
- Halogen free and mud resistant to NEK TS 606
- Databus cable is DNV approved
- Limited fire hazard
- Halogen free
- Flame retardant at high temperature
- Low temperature and ozone resistance
- Solder iron resistant
- Easily strippable and flexible
- Excellent screening properties

Application

For permanent installation on: ships, oil-gas platforms, refineries and other harsh environment.

Composition of cable

① Conductor	tin plated copper, stranded
② Core insulation	RADOX COM (XLPE)
Core colours	see table
③ Wrapping over pair	tape and plastic laminated Al-tape
④ Fillers	PE-LD
⑤ EMV screening	braid, tin plated copper
Wrapping	tape
⑥ Sheath	RADOX elastomer S FH (SHF 2; SHF mud)
Colour	black

Technical data

Voltage rating U_0/U	300 V AC
Test voltage	2000 V AC
Temperature range	-50 up to +90 °C
Min. bending radius	fixed 6 × cable-dia

The cables are in conformity with:

Fire protection in ships	fulfilled	DNV 827.50-2
Vertical flame spread of a single cable	50 < L ≤ 540 mm	IEC 60332-1-2
Smoke density	T ≥ 70 %	IEC 61034-2
Corrosivity of combustion gases	pH ≥ 4.3, C ≤ 10 mS/mm	IEC 60754-2
Amount of halogen acid gas	HCl + HBr ≤ 0.5 % l	IEC 60754-2
Content of fluorine	HF ≤ 0.1 %	IEC 60684-2, 45.2

Approvals

DNV-GL	certificate no. E-14199
NEK606	mud resistant

RADOX® Marine CAT5e nx (2 × 0.5)

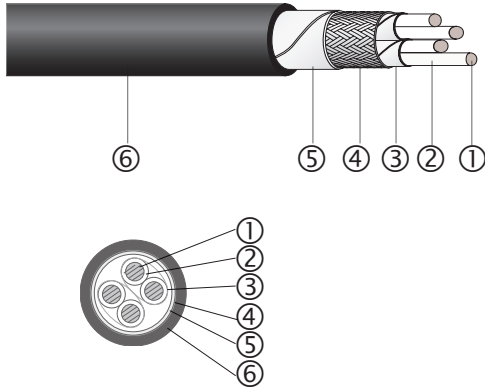
High speed Ethernet databus CAT5e, DNV approved and NEK TS 606, robust

Extract from our delivery programme

Cross section	Conductor	Core	Core colours	Braid wire	Screen	Cable	Cable sheet	Weight	H+S no.
mm ²	Construction nom. mm	Dia. mm		Dia. mm	Dia. mm	Dia. mm	Colour	nom. kg/100 m	
2 × (2 × 0.5)	19 × 0.18	2.3	BU-WH/BU OG-WH/OG	0.20	10.22	12.4 ± 0.4	black	19.5	85 026 655
4 × (2 × 0.5)	19 × 0.18	2.3	OG-WH/OG GN-WH/GN BN-BN/WH BU-WH/BU	0.25	13.13	17.1 ± 0.5	black	35.3	85 026 657

RADOX® Marine CAT5e (4 × 0.5)

High speed Ethernet databus CAT5e, DNV approved and NEK TS 606, quad



- For data transmission in high frequency ranges
- Halogen free and mud resistant to NEK TS 606
- Databus cable is DNV approved
- Flexible and thin wall construction
- Flame retardant at high temperature
- Low temperature and ozone resistance
- Solder iron resistant
- Easily strippable
- Excellent screening properties

Application

For permanent installation on ships, oil-gas platforms, refineries and other harsh environment.

Composition of cable

① Conductor	tin plated copper, stranded
② Core	insulation RADOX COM (XLPE)
Core colour, numbering, pair	WH (no.1) - WH (no.2); WH (no.3) - WH (no.4)
③ Wrapping over pair	tape + plastic laminated Al-tape
④ EMV screening	braid, tin plated copper
⑤ Wrapping	tape
⑥ Sheath	RADOX elastomer S FH (SHF 2; SHF mud)
Colour	black

Technical data

Voltage rating U_0/U	300 V AC
Test voltage	2000 V AC
Temperature range	-50 up to +90 °C
Min. bending radius	fixed 6 × cable-dia.

The cables are in conformity with:

Fire protection in ships	fulfilled	DNV GL-CP-0403
Vertical flame spread of a single cable	50 < L ≤ 540 mm	IEC 60332-1-2
Smoke density	T ≥ 70 %	IEC 61034-2
Corrosivity of combustion gases	pH ≥ 4.3, C ≤ 10 mS/mm	IEC 60754-2
Amount of halogen acid gas	HCl + HBr ≤ 0.5%	IEC 60754-1
Content of fluorine	HF ≤ 0.1 %	IEC 60684-2, 45.2

Approvals

DNV GL	certificate no. TAE00002G1
NEK 606	mud resistant

RADOX® Marine CAT5e (4 × 0.5)

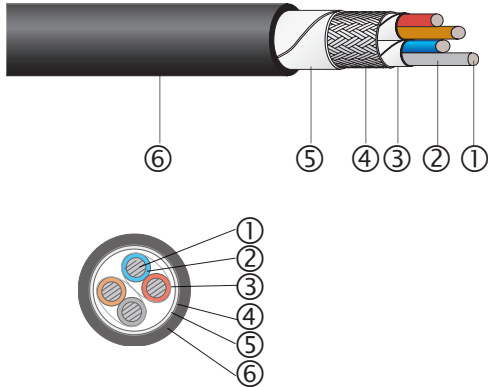
High speed Ethernet databus CAT5e, DNV approved and NEK TS 606, quad

Extract from our delivery programme

Cross section	Conductor	Core	Cable	Cable sheet	Weight	H+S no.
mm	Construction nom. mm	Dia. mm	Dia. mm	Colour	nom. kg/100 m	
4 × 0.5	19 × 0.18	2.3 × 0.03	8.1 ± 0.3	black	10.5	85066809

RADOX® Marine Databus nx (2 × 0.5)

Databus for CAN Bus application, DNV approved and NEK TS 606



- CAN technology
- Largely resistant to acids, oil and other chemical media
- Databus communication in ships
- Can be installed in dry and wet areas
- Can be used in tough industrial environments
- Halogen free and flexible
- Flame retardant at high temperature
- Low temperature and ozone resistance
- Solder iron resistant
- Easily strippable
- Excellent screening properties

Application

For permanent installation inside of ships to connect fixed parts.

Composition of cable

① n × 2 cores (Databus) Colours	conductor insulation see table	flexible tin plated copper RADOX foam
② n × cores 0.5 mm ² type Radox 125 RW Core colours	conductor insulation see table	stranded tin plated copper RADOX 125
③ n Fillers	PE-LD	
④ Wrapping	PP-E tape	
⑤ EMC screen	tin plated copper braid	
⑥ Sheath Colour	RADOX elastomer S FH black	

Technical data

Voltage rating U ₀ /U		300 V AC
Test voltage		2000 V AC
Temperature range	fixed	-40 up to +90 °C
	flexing	-25 up to +90 °C
Min. bending radius	fixed	3 × cable-dia.
	flexing	5 × cable-dia.

The cables are in conformity with:

Fire protection on railway vehicles protection level	HL1, HL2, HL3	EN 45545-2
Vertical flame spread	50 < L ≤ 540mm	EN 60332-1-2, IEC60332-1-2
Vertical flame spread, bunched (6 < D < 12 mm)	L ≤ 2.5m	EN 60332-3-25
Vertical flame spread, bunched (D ≥ 12 mm)	L ≤ 2.5m	EN 60332-3-24
Vertical flame spread, cat A	L ≤ 2.5m	IEC 60332-3-22
Smoke density	T ≥ 70%	EN 61034-2, IEC 61034-2
Amount of halogen acid gas	HCL + HBr ≤ 0.5%	EN 60754-1, IEC 60754-1
Corrosivity of combustion gases	pH ≥ 4.3, C ≤ 10 mS/mm	EN 60754-2, IEC 60754-2
Amount of halogen acid gas	HF ≤ 0.1%	EN 60684-2 # 45.2, IEC 60684-2 # 45.2
Toxicity	ITC ≤ 6	EN 50305 # 9.2

Approvals

DNV GL certificate no. TAE00002HJ

RADOX® Marine Databus nx (2 × 0.5)

Databus for CAN Bus application, DNV approved and NEK TS 606

Extract from our delivery programme

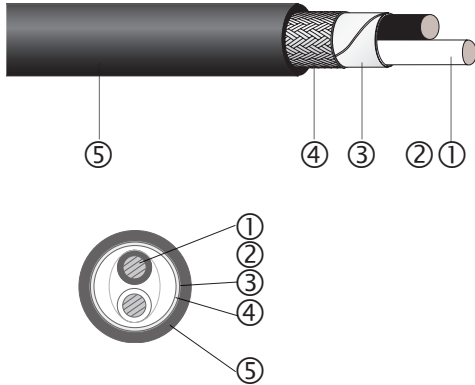
n × mm ²		Databus (pairs and quads)				R125 (singles)				Cable assembly				
no. of cores × csa ¹⁾		Insulation: Radox foam Colours: blue, red				Insulation: Radox 125 Colour: black				Sheat: Radox Elastomer S FH Colour: black				
2 cores Databus	1 core R125	Conductor	Core	R ₂₀	Core colour*	Conductor	Core	R ₂₀	Core colour*	Bundle	EMC screen	Cable	Weight	H+S no.
n mm ²	n × mm ²	mm	Dia. mm	max. Ω/km		mm	Dia. mm	max. Ω/km			Dia. mm	Dia.	nom. kg/ 100 m	
2 × 0.5	--	19 × 0.18	2.30	40.1	RD-BU	--	--	40.1		4.9	5.5	7.9 × 0.3	8.3	12582660
2 × 0.5	1 × 0.5	19 × 0.18	2.30	40.1	RD-BU	19 × 0.18	1.40	40.1	BK	4.9	5.5	7.9 × 0.3	8.7	12582724
4 × 0.5	--	19 × 0.18	2.30	40.1	RD-BU BN-GY	--	--	40.1		5.7	6.4	8.2 × 0.3	9.2	85069238
2 × 2 × 0.5	--	19 × 0.18	2.30	40.1	RD-BU BN-GY	--	--	40.1		8.6	9.4	12.2 × 0.4	17.4	12584413
2 × 2 × 0.5	2 × 0.5	19 × 0.18	2.30	40.1	RD-BU BN-GY	19 × 0.18	1.40	40.1	BK, YE	8.6	9.4	12.2 × 0.4	17.9	12584414

¹⁾ csa = cross-sectional area

* Abbreviations for core colours see page 74.

RADOX® Marine Databus (2 × 0.75)

Databus for CAN Bus application, DNV approved and NEK TS 606



- Electrical installation cable
- Halogen free
- Flame retardant
- High temperature
- Low temperature and ozone resistance
- Solder and iron resistant
- Easily strippable
- Flexible
- Excellent screening properties

Application

For permanent installation inside of ships to connect fixed parts.

Composition of cable

① 2 cores 0.75 mm ²	conductor insulation colours and numbering	flexible tin plated copper RADOX foam black no.1, white no.2	19 × 0.22 mm Ø 2.65 mm
② 2 fillers	PE-LD		
③ Wrapping	tape		
④ EMV screening	optimised tin plated copper braid		Ø 6.5 mm
⑤ Sheath Colour	RADOX elastomer S FH, SHF 2; SHF mud black		

Technical data

Voltage rating U ₀ /U		300 V AC
Test voltage		2000 V AC
Temperature range	fixed	-40 up to +90 °C
	flexing	-25 up to +90 °C
Min. bending radius	fixed	3 × cable-dia.
	flexing	5 × cable-dia.

The cables are in conformity with:

Fire protection in ships	fulfilled	DNV GL-CP-0403
Vertical flame spread of a single cable	50 < L ≤ 540 mm	IEC 60332-1-2
Smoke density	T ≥ 70 %	IEC 61034-2
Vertical flame spread, bunched, 6 < D < 12 mm	L ≤ 2.5 m	IEC 60332-3-22
Corrosivity of combustion gases	pH ≥ 4.3, C ≤ 10 mS/mm	IEC 60754-2
Amount of halogen acid gas	HCl + HBr ≤ 0.5%	IEC 60754-1
Content of fluorine	HF ≤ 0.1 %	IEC 60684-2, 45.2

Approvals

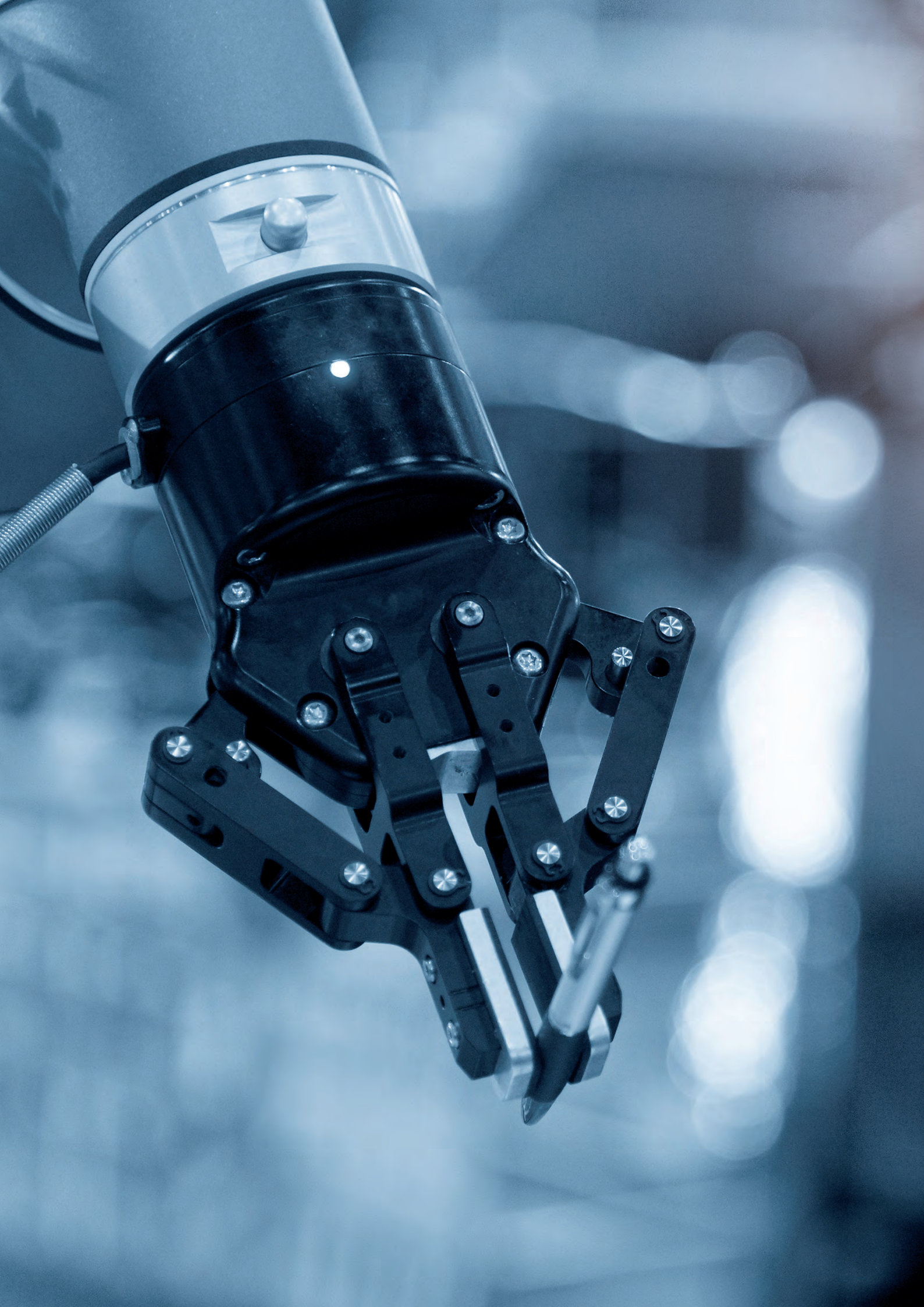
DNV GL certificate no. TAEE00002Y5

RADOX® Marine Databus (2 × 0.75)

Databus for CAN Bus application, DNV approved and NEK TS 606

Extract from our delivery programme

Cross section	Conductor	Core	Cable	Cable sheet	Weight	H+S no.
mm	Construction nom. mm	Dia. mm	Dia. mm	Colour	nom. kg/100 m	
2 × 0.75	19 × 0.22	1.09	8.5 ± 0.3	black	9.8	85063638



General technical information

Electrical formulas	70
Table of three phase current	71
Material characteristics	72
Colour table	73
Material designations	74
Core colours	75
Resistance to cold and heat	76
Conversion AWG	77
Thermal classes of insulating materials according to IEC 60085	77
Wire cross sections	78
Guide to installation	80
Delivery spools	82
EMC screened cables	84
Fire test methods	86
Current carrying capacity	90

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 mm ²
γ	=	Conductivity (copper 56, aluminium 34)	u ₀	=	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 ₀	=	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)

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

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.

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

Three phase current:

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

P = Rated power in W

U = Voltage in V

I = Current in A

cos φ = Phase shift

η = Efficiency

Example:

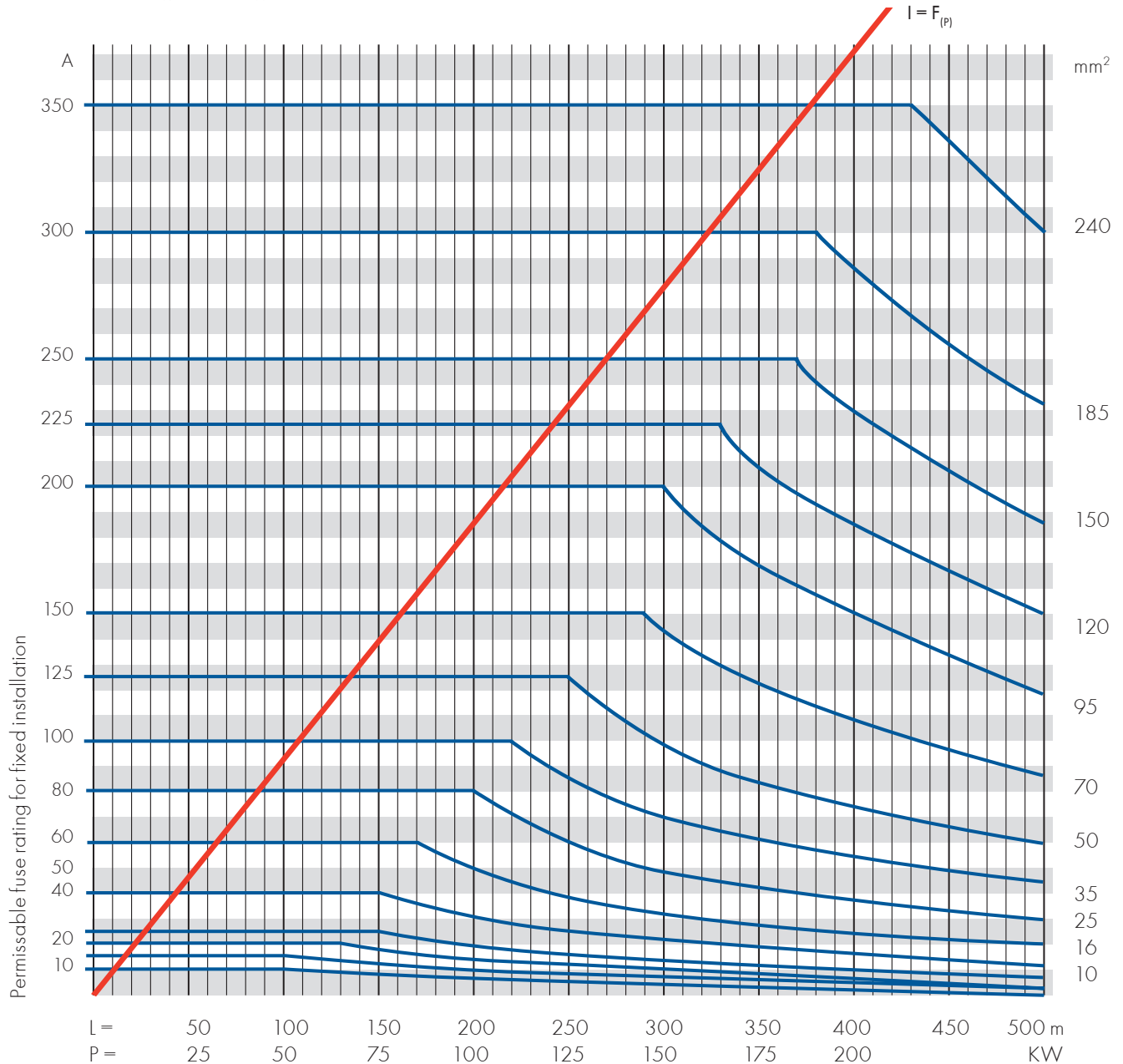
What current does a three phase motor of 22 kW consume at 400 V, 50 Hz, with cos φ = 0,89 and an efficiency of 90 %?

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

Table of three phase current

Permissible three phase cable loading at 5 % voltage drop

Presentation: $I = F_{(I)}$ and $I = F_{(P)} \cos \varphi = 0.82$



Example:

A power of 70 kW is to be transmitted across a distance of $L = 450$ m. The function $I = F_{(P)}$ gives us $70 \text{ kW} \approx 130 \text{ A}$ (mixed users). The function $I = F_{(I)}$ 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: $I = F_{(I)}$ shows that, for example, for 95 mm^2 the permissible fuse of 200 A determines the load limit up to $L = 300$ m, i.e. $U_v < 5 \%$.

From 300 mm^2 the cross section can no longer be fully utilised.

Characteristics of materials

Typical characteristics of various insulation and jacket materials for cables

Abbreviations ¹⁾ CENELEC type		Insulation compounds													
		Thermoplastics							Crosslinked materials						
		PVC	PE	PBT-FR	TPE-E	ETFE	FEP	PTFE	EPR	PE-X	RX 125	RX 155S	RX 155	PVDF-X	SIR
		TII							EI6						EI2
Thermal 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
Flexibility ²⁾		satisf.	poor	poor	poor	poor	poor	poor	very good	poor	satisf.	poor	satisf.	poor	very good
Electrical 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															
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	poor	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	poor	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

Abbreviation ¹⁾ CENELEC type	Sheat compounds								
	Thermoplastics		Crosslinked materials						
	LSFH	TPU	CR	RX 125A	RX 125M	RX 125TM	REMS	REMS FH	
	TMPU	EM2							
Thermal 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	
Flexibility ²⁾	satisf.	satisf.	very good	satisf.	good	good	good	good	
Electrical 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									
Solvents ³⁾	poor	satisf.	satisf.	satisf.	satisf.	satisf.	satisf.	satisf.	
Oils and fuels ³⁾	poor	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
LSFH™	Halogen free, flame retardant material (low smoke free of halogen)
PBT FR	Flame retardant polybutylene terephthalate
PE	Polyethylene
PTFE	Polytetrafluoroethylene
PVC	Polyvinylchloride
TPE-E	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
ETFE-X	Crosslinked Ethylene tetrafluorethylene

RADOX® is a registered trademark of HUBER+SUHNER for electron beam crosslinked, heat resistant cable insulations and sheaths.
LSFH™ is a registered trademark of HUBER+SUHNER for halogen free, flame retardant cable sheaths.

Core colours VDE 0293-308/HD 308 S2 vs. HD 308

Example

Core numbers:

New
HD 308 S2

Old
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					

black



brown



blue



grey

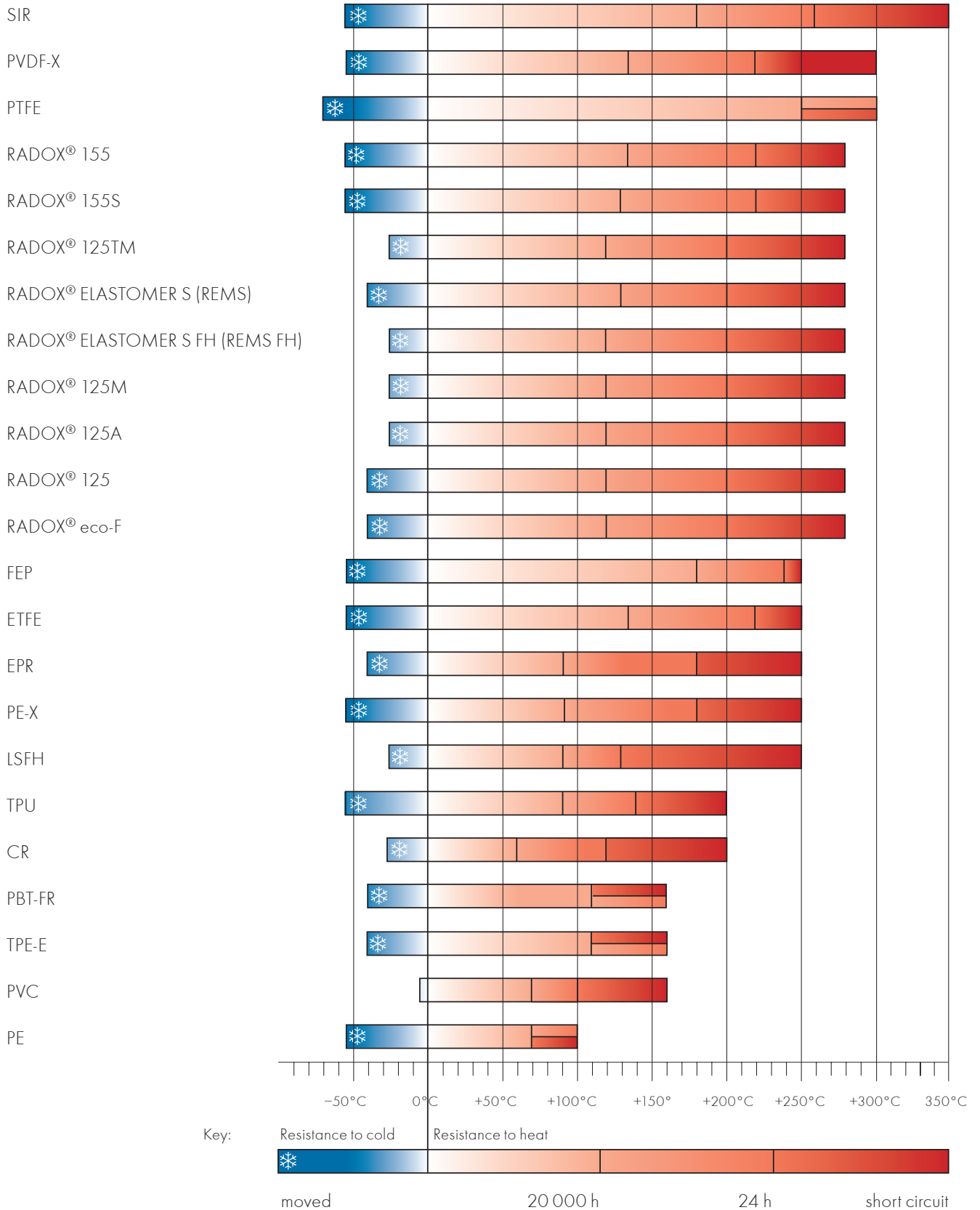


yellow-green



Resistance to cold and heat

Typical operating temperature ranges of different insulations and sheaths



Conversion AWG

Metric wire cross sections and wire diameters

AWG = American Wire Gauge

AWG	with UL/CSA		with MIL
	Cross section mm ² nom.	Diameter mm nom.	Cross section mm ² 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 acc. to EN 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 EN 60228 and Cenelec HD 383

Table 1

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

Terminals:

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

Wire cross sections

according to EN 60228 and Cenelec HD 383

Table 2

Nom. cross section mm ²	Construction: number of wires (approximate value) strand diameter (maximum)		Max. direct current at 20 °C	
	Stranded, class 5 n × mm	Stranded, class 6 n × mm	Bare Ω/km	Tinned Ω/km
0.5	19 × 0.21	25 × 0.16	39.0	40.1
0.75	24 × 0.21	38 × 0.16	26.0	26.7
1	32 × 0.21	50 × 0.16	19.5	20.0
1.5	30 × 0.26	75 × 0.16	13.3	13.7
2.5	50 × 0.26	125 × 0.16	7.98	8.21
4	56 × 0.31	200 × 0.16	4.95	5.09
6	80 × 0.31	174 × 0.21	3.30	3.39
10	77 × 0.41	290 × 0.21	1.91	1.95
16	123 × 0.41	462 × 0.21	1.21	1.24
25	190 × 0.41	722 × 0.21	0.780	0.795
35	266 × 0.41	1012 × 0.21	0.554	0.565
50	385 × 0.41	664 × 0.31	0.386	0.393
70	348 × 0.51	928 × 0.31	0.272	0.277
95	468 × 0.51	1260 × 0.31	0.206	0.210
120	589 × 0.51	1590 × 0.31	0.161	0.164
150	741 × 0.51	1990 × 0.31	0.129	0.132
185	912 × 0.51	2452 × 0.31	0.106	0.108
240	1184 × 0.51	3180 × 0.31	0.0801	0.0817
300	1480 × 0.51	3976 × 0.31	0.0641	0.0654
400	1961 × 0.51	-	0.0486	0.0495
500	1702 × 0.61	-	0.0384	0.0391
630	2146 × 0.61	-	0.0287	0.0292

Guide to installation

Smallest allowable bending radii for power and signal cables

Conductor type	Cable diameter D mm			
	D ≤ 8	8 < D ≤ 12	12 < D ≤ 20	D > 20
Installation method				
solid, class 1/stranded, class 2				
- carefully bent 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:

$$P = 50 \times A \text{ (N)}$$

A = Sum of conductor cross section (mm²)

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

$$P = 9 \times D^2 \text{ (N)}$$

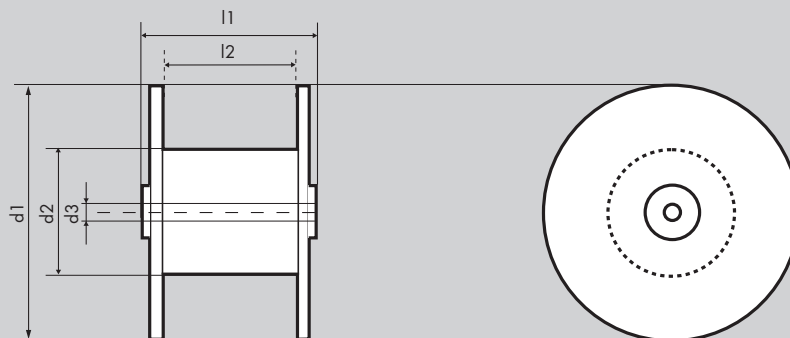
D = cable diameter over armouring (mm)

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 =	$10 \times G \times L \times \mu$	P =	$10 \times G \times (L \times \mu \pm h)$
with	P: pulling force at the end of the stretch (N)	with	h: elevation difference (m)
	G: weight of the cable (kg/m)		Friction coefficient 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 cables with thermoplastic sheaths can be pulled into plastic pipes with the aid of lubricants only. Local heating, occurring mainly in bends, may cause the cable to stick to the pipe wall.

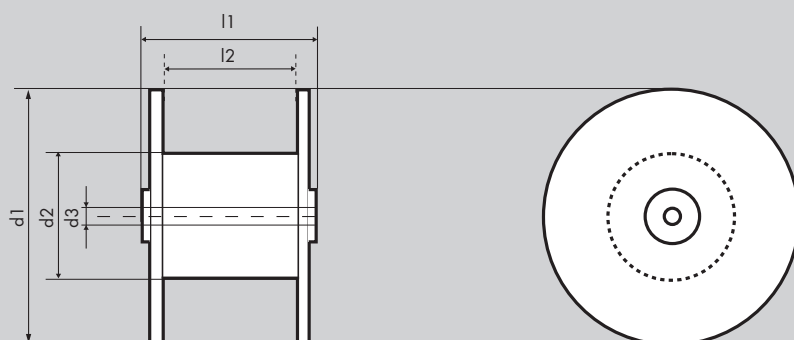
Delivery spools



	Spool HS 150	Spool HS 151	Spool HS 200	Spool HS 400	Spool HS 401	Spool HS 600
d1	150	150	195	395	395	595
d2	65	65	100	180	180	350
d3	60	60	60	60	60	80
l1	76	166	250	185	280	500
l2	70	160	210	145	240	430
Tara kg	0.095	0.135	0.480	1.475	1.645	7.460

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

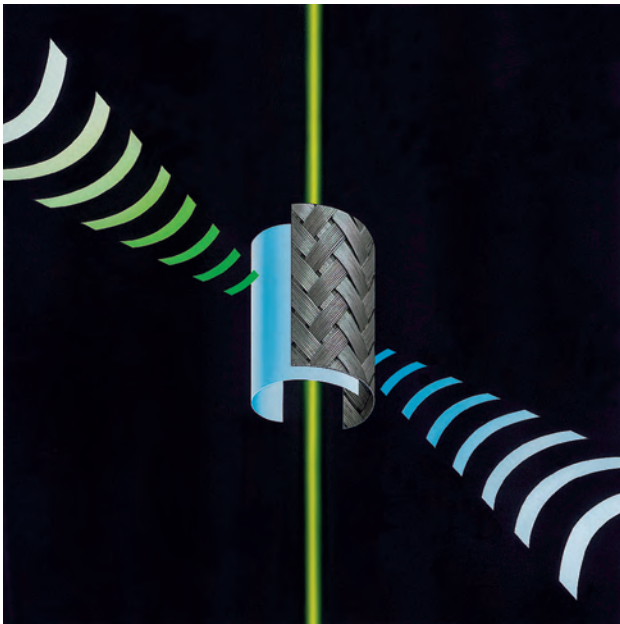
d1 flange diameter (mm), d2 core diameter (mm), d3 drill hole diameter (mm)
 l1 external width (mm)
 l2 reel width (mm)



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

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

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/...

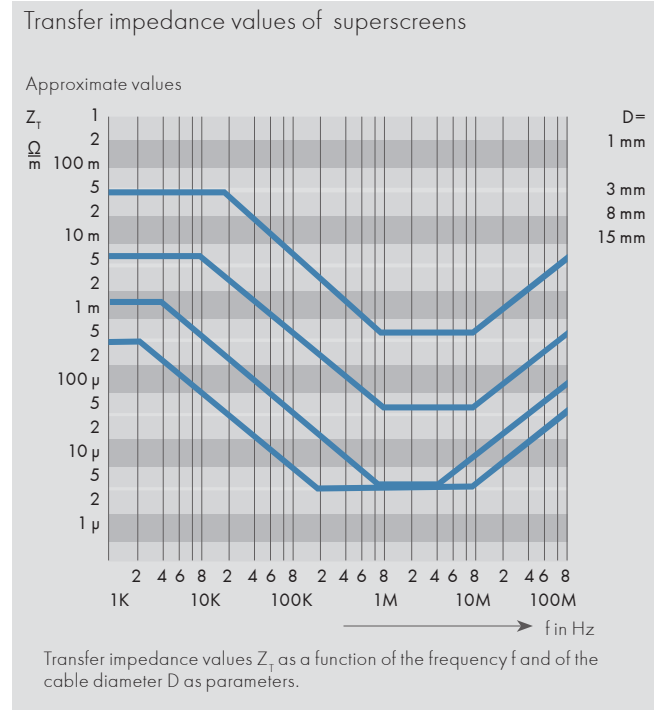
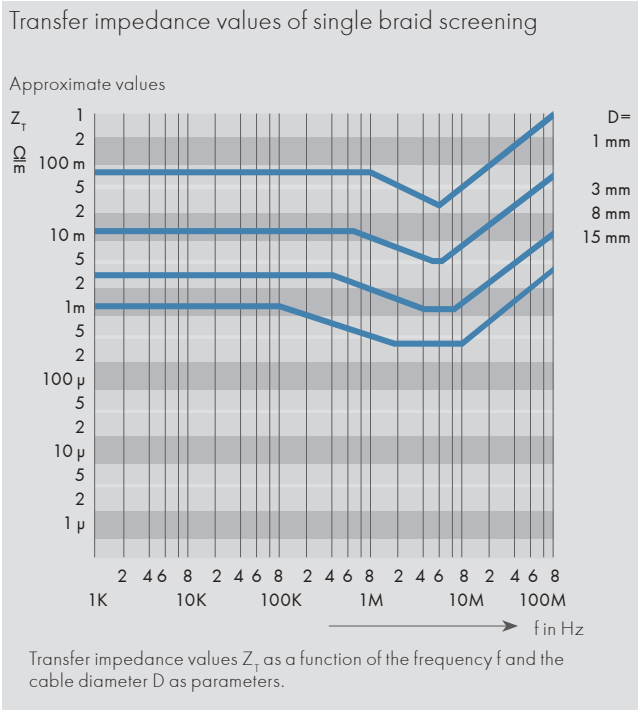


Screenings for all EMC requirements

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.

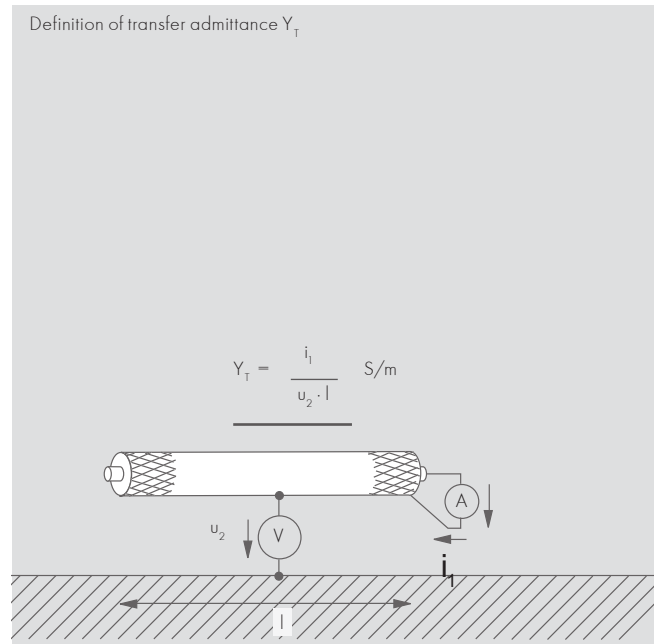
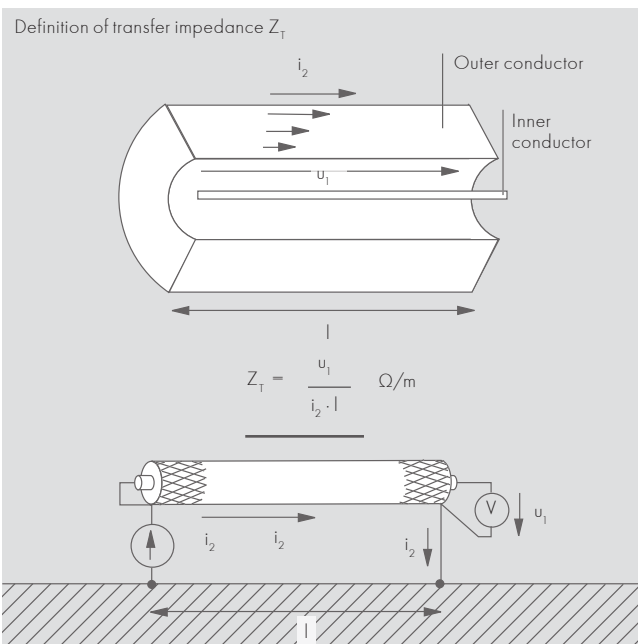
EMC screened cables

Screened cables from single braid to superscreen



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).

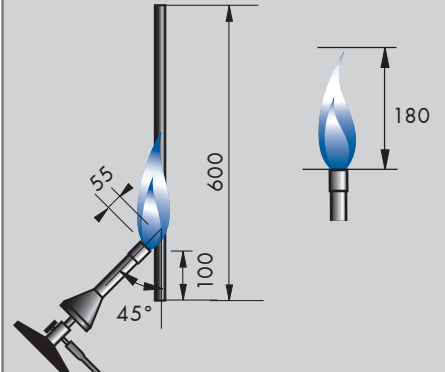
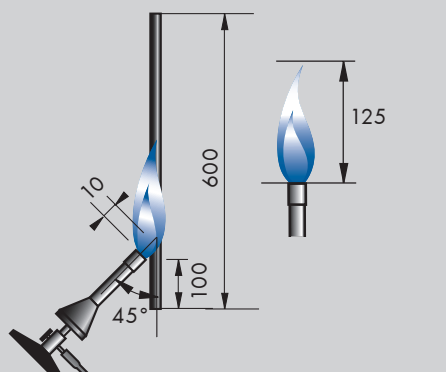
The transfer admittance Y_T refers to the relationship between the voltage in one wire and the leak current it induces in the other line (capacitive coupling).

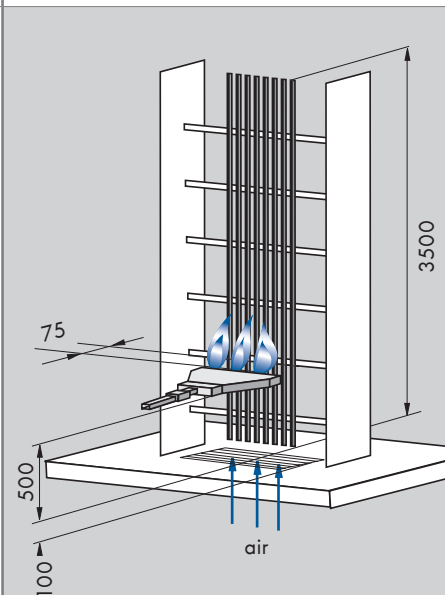
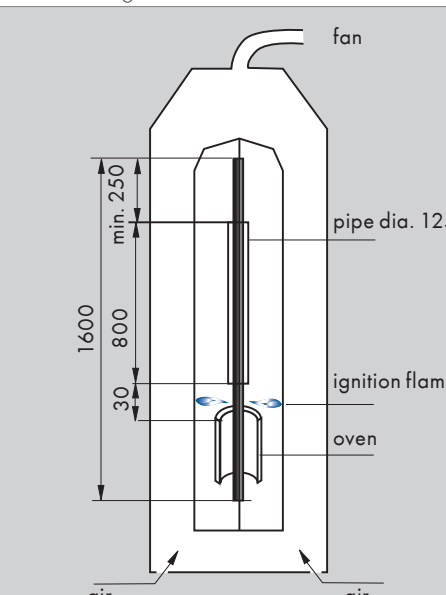


The cable together with its surroundings form a three-conductor system. It consists of two coupled conductors with one common conductor (screen). Transfer impedance Z_T and transfer admittance Y_T are cable quantities which are always defined in conjunction with the surroundings of the cable and the construction of the cable itself.

Fire test methods

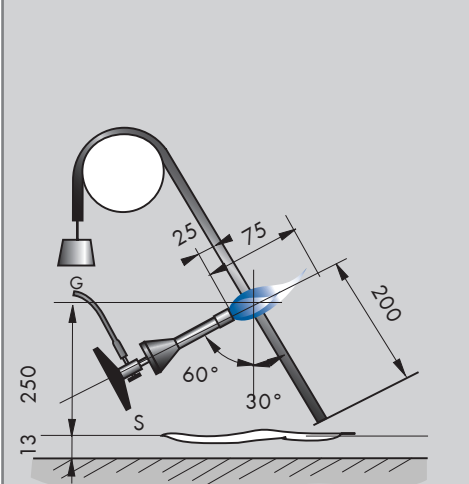
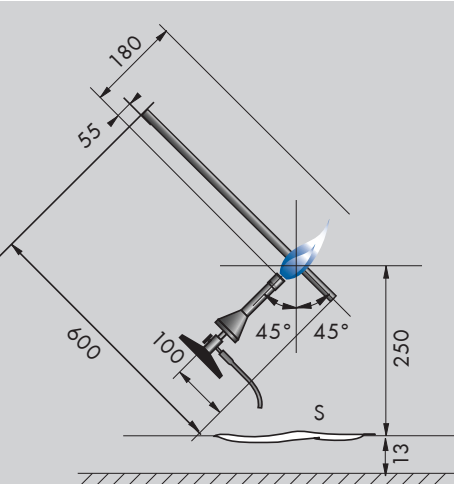
Fire test methods for electrical wires and cables

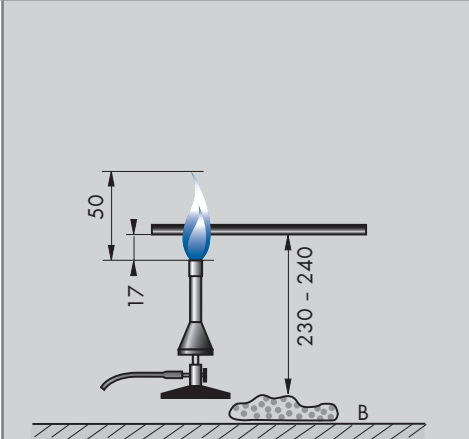
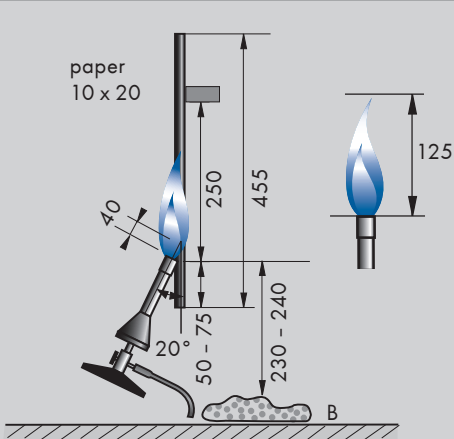
Designation	EN 50265-2-1 IEC 60332-1	EN 50265-2-2 IEC 60332-2
Flame temperature	Determined by the prescribed adjustment of the flame.	Determined by the prescribed adjustment of the flame.
Test duration	cable dia $D \leq 25$ mm: 60 s cable dia $25 < D \leq 50$ mm: 120 s	20 s
Conditions	The cable shall 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 combustible material): 40 min. cat. B (3.5 l combustible material): 40 min. cat. C (1.5 l combustible 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

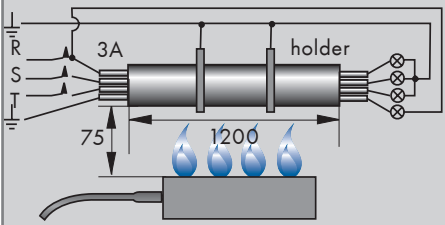
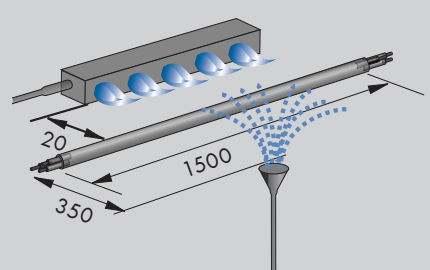
Fire test methods for electrical wires and cables

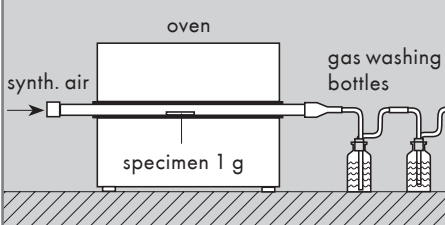
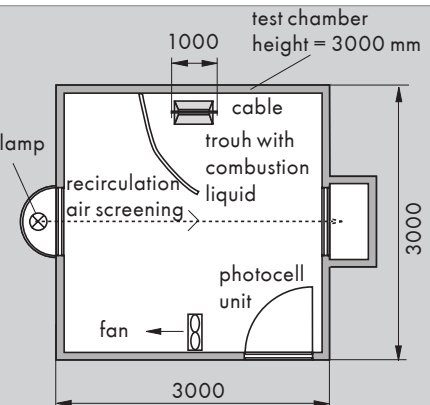
Designation	MIL-W-22759 and MIL-W-81044 VG 95218-2 procedure 4	VG 95218-2 procedure 3
Flame temperature	min. 950 °C	Determined by the prescribed adjustment of the flame.
Test duration	30 s	cable dia $D \leq 25$ mm: 60 s cable dia $25 < D \leq 50$ mm: 120 s
Conditions	The specimen shall not continue to 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: 60 s flaming, 30 s pause (3 ×) sect.1080: 15 s flaming, 15 s pause (5 ×)
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_0/U IEC, DIN VDE: data cable: 110 V DIN VDE: power cable: 230/400 V BS: all U_0/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_0/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® 125 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 conductor 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 current 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 in A

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

I in A Current rating for continuous operation under service conditions

I_N in 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 banded 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):

PVC, CR	70 °C
PE-X, EPR	90 °C
RADOX 125	120 °C
RADOX 155	135 °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, i.e. 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	1.04	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

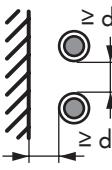

Reduction factors for increased frequency (f_4)

Frequency Hz*	400	600	800	1000	2000	3000	4000	5000	10 000
Copper conductor cross section mm ²	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_s	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 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

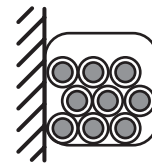
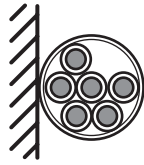
of RADOX® single cores

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_s	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 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

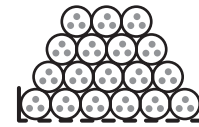
Current carrying capacity

of RADOX® multi core cables

Installation method	Multicore cables in free air or perforated trays										
Number of simultaneous loaded conductors on each tray											
	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 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

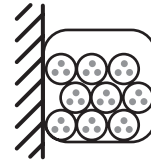
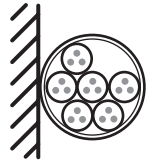
of RADOX® multi core cables

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 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

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Waiver

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