



Traction cable

RADOX 4 GWK-AX 1800V M

Product description:

RADOX 4 GWK-AX 1800V M Single core cables with reduced wall thickness
 Nominal voltage: 1800 / 3000 V AC
 Hazard level: M (extra low temperature, extra oil and extra fuel resistant)

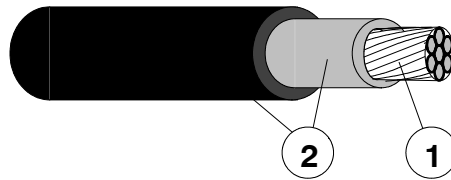
General Properties:

Halogen free, electron-beam cross-linked cables with improved behaviour in case of fire, easy to strip, soldering resistant and flexible. Excellent ozone, chemical, weather and UV resistance.
 The cables are in accordance with standard EN 50264-3-1 but significantly thinner 1.5...16mm².

Application:

The cables are intended for permanent installation in rail vehicles or for applications in which a limited alternating bending stress occur during service.
 Guidelines for selection and installation are described in the standards EN 50355 and EN 50343.
 For unscreened cables the guidelines of EN 50153 shall be followed.

General composition of cable:



1. Conductor : stranded tin plated copper, acc. to EN 60228 cl. 5
2. Insulation : inner layer RADOX EI 110, colour: white
 outer layer RADOX EI 109, colour : black (see Table 1)
 coloured (see Table 2)

Marking:

[a] HUBER+SUHNER RADOX 4 GWK-AX 1800V [b] M [c]- [d] [e] [f] [g]

		example:
[a]	Meter marking (in m)	= 1234 = m
[b]	Construction	1X150
[c]	Part number	12345678
[d]	Batch number	1234567
[e]	Production week and year	03- 2017
[f]	Production place (only if China)	CN
[g]	CRCC certification (only if available)	CRCC10218P11529R1M- 2

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The product fulfils the test and specification requirements described in this document for the stated areas of application and operating conditions. HUBER+SUHNER AG does not expressly or implicitly guarantee performance under additional or changed conditions. Deviations are to be agreed upon in writing.

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Technical Data:

Voltage rating cond.- earth	U_0	1800	V AC
Voltage rating cond.- cond.	U	3000	V AC
maximum permissible Voltage rating AC cond.- earth	.....		.....	2100	.....	V AC
maximum permissible Voltage rating AC cond.- cond.	.....	U_m	.....	3600	.....	V AC
maximum permissible Voltage rating DC cond.- earth	.....	V_0	.....	2700	.....	V DC
maximum permissible Voltage rating DC cond.- cond.	.....		.....	4500	.....	V DC
Test voltage.	.....		.....	6500	.....	V AC
Temperature range	.....		.....	- 50 ... + 120	.....	°C

Min. bending radius

fixed	.....	$D \leq 12 \text{ mm}$	.....	3 x D
	.....	$D > 12 \text{ mm}$	.....	4 x D
sporadic movement	.....	$D \leq 12 \text{ mm}$	.....	4 x D
	.....	$D > 12 \text{ mm}$	.....	5 x D

NB:

The upper temperature limit is determined by long term ageing according to EN 50305 Par. 7 and extrapolation to 20,000 hours.

The lower temperature limit is determined by bending and elongation tests according to EN 60811-504/505, respectively low temperature behaviour tests for static conditions, e.g. for fixed installation according to GOST 20.57.406-81 - method 204-1 and GOST 17491-80.

The specified bending radii require a careful and proper handling using proven fastening technologies.



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The cables are in conformity with:

Fire protection on railway vehicles, hazard level	HL1 - HL3	EN 45545
Vertical flame spread	50 < L ≤ 540 mm	EN 60332-1-2
Vertical flame spread, bunched, D ≤ 6 mm	L ≤ 1.5 m	EN 50305, 9.1.2
Vertical flame spread, bunched, 6 < D < 12 mm	L ≤ 2.5 m	EN 50305, 9.1.1 (EN 60332-3-25)
Vertical flame spread, bunched, D ≥ 12 mm	L ≤ 2.5 m	EN 60332-3-24
Smoke density	T ≥ 70 %	EN 61034-2
Toxicity	ITC ≤ 6	EN 50305, 9.2
Fire protection on railway vehicles, level of protection	1 - 4	DIN 5510
Vertical flame spread	50 < L ≤ 540 mm	EN 60332-1-2
Vertical flame spread, bunched, D ≤ 6 mm	L ≤ 1.5 m	EN 50305, 9.1.2
Vertical flame spread, bunched, 6 < D < 12 mm	L ≤ 2.5 m	EN 60332-3-25
Vertical flame spread, bunched, D ≥ 12 mm	L ≤ 2.5 m	EN 60332-3-24
Smoke density	T ≥ 60 %	EN 61034-2
Corrosivity of combustion gases	pH ≥ 4.3, C ≤ 10 μS/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
Fire protection on railway vehicles, category	A1, A2, B	NF F16-101
Fire protection on railway vehicles, class	C / F1	NF F16-101
Vertical flame spread	50 < L ≤ 540 mm	NF C32-070, 2.1
Vertical flame spread, bunched	L ≤ 300 mm	NF C32-070, 2.2
Smoke index	I.F. ≤ 5	X10-702-2, NF X70-100-1
Fire protection on railway vehicles, hazard level	LR1 - LR4	UNI CEI 11170
Vertical flame spread	50 < L ≤ 540 mm	EN 60332-1-2
Vertical flame spread, bunched, D ≤ 6 mm	L ≤ 1.5 m	EN 50305, 9.1.2
Vertical flame spread, bunched, 6 < D < 12 mm	L ≤ 2.5 m	EN 60332-3-25
Vertical flame spread, bunched, D ≥ 12 mm	L ≤ 2.5 m	EN 60332-3-24
Smoke density	T ≥ 70 %	EN 61034-2
Corrosivity of combustion gases	pH ≥ 4.3, C ≤ 10 μS/mm	EN 50267-2-2
Amount of halogen acid gas	HCl + HBr ≤ 0.5 %	EN 50267-2-1
Toxicity	ITC ≤ 3	EN 50305, 9.2
Fire protection on railway vehicles, category	Ia, Ib, II	BS 6853, GM/RT 2130
Vertical flame spread	50 < L ≤ 540 mm	EN 60332-1-2
Vertical flame spread, bunched	L ≤ 2.5 m	EN 50266, BS 6853 An. D.8.7
Smoke density	A ₀ ≤ BS 6853	BS 6853 An. D.8.7
Toxicity	R ≤ 1.0	BS 6853 An. B.1
Fire protection on railway vehicles	Fulfilled	NFPA 130
Vertical flame spread, bunched	L ≤ 1.5 m	UL 1685, 12 (FT4 exp.)
Smoke density	TSR ≤ 150 m ² , PSRR ≤ 0.40 m ² /s	UL 1685, 12 (FT4 exp.)
Requirement of hazard level code M	(acc. to EN 50264-1 or EN 50306-1)	
Extra low temperature	- 40 °C	
Extra oil resistance	IRM 902, 72h, 100°C	
Extra fuel resistance	IRM 903, 168h, 70°	

Applicable documents:

H+S 557 578 Current rating for single core cables



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Table 1 : Isolation outer layer colour: black

Cable type mm ²	Conductor ^{nom}		Cable dia. mm	R ₂₀ ¹⁾ max Ω / km	C _{H₂O} ²⁾ nom pF/m	Fireload nom kJ / m	Weight ^{nom}		H+S Part. Nr.
	construction n x mm	D mm					copper	cable	
0.5	19x0.18	0.9	2.45±0.10	38.5	236	95	0.45	1.1	84 118 052
0.75	24x0.18	1.1	2.65±0.10	26.7	276	105	0.71	1.4	84 118 059
1	37x0.18	1.2	3.00±0.10	20.0	266	135	0.88	1.8	12 555 986
1.5	37x0.23	1.5	3.35±0.10	13.7	307	160	1.3	2.5	12 536 686
2.5	61x0.23	1.9	3.75±0.10	8.21	362	190	2.2	3.5	12 536 692
4	61x0.29	2.4	4.50±0.10	5.09	396	270	3.5	5.3	12 536 694
6	84x0.3	2.9	5.20±0.15	3.39	419	355	5.1	7.4	12 536 696
10	80x0.4	3.9	6.40±0.15	1.95	488	485	9.1	12	12 545 527
16	119x0.4	5.3	8.40±0.20	1.24	535	865	14	19	12 545 528
25	182x0.4	6.6	10.2±0.3	0.795	565	1255	21	29	12 545 529
35	266x0.4	7.8	11.7±0.3	0.565	607	1605	30	41	12 545 530
50	378x0.4	9.3	13.5±0.3	0.393	660	2045	43	56	12 545 531
70	348x0.5	11.4	15.8±0.3	0.277	755	2520	59	75	12 545 532
95	456x0.5	12.9	17.5±0.3	0.210	808	2965	77	96	12 545 533
120	570x0.5	14.5	19.8±0.3	0.164	862	3805	98	122	12 544 522
150	722x0.5	16.0	22.1±0.3	0.132	894	4890	122	152	12 545 534
185	874x0.5	17.8	24.0±0.3	0.108	903	5455	150	184	12 544 523
240	1147x0.5	20.8	27.0±0.3	0.0817	994	6130	196	234	12 547 684
300	1443x0.5	23.0	29.9±0.4	0.0654	1060	7565	244	291	12 552 906
400	1952x0.5	26.5	34.1±0.5	0.0495	1115	9355	330	389	12 555 997

1) conductor resistance according to EN 60228

2) capacity in water



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Table 2 : Isolation outer layer colour: see table

Cable type mm ²	Conductor nom		Cable dia. mm	R ₂₀ ¹⁾ max Ω / km	C _{H2O} ²⁾ nom pF/m	Fireload nom kJ / m	Weight nom		Colour	H+S Part. Nr.
	construction n x mm	D mm					copper	cable		
0.5	19x0.18	0.9	2.45±0.10	38.5	236	95	0.45	1.1	bn	84 118 053
									bu	84 118 056
									gy	84 118 058
									rd	84 118 057
									og	85 068 090
0.75	24x0.18	1.1	2.65±0.10	26.7	276	105	0.71	1.4	rd	85 070 897
1	37x0.18	1.2	3.00±0.10	20.0	266	135	0.88	1.8	wh	85 095 527
									ye	12 586 321
1.5	37x0.23	1.5	3.35±0.10	13.7	307	160	1.3	2.5	ye	12 562 189
									bu	12 543 842
									gy	12 567 226
									rd	12 555 769
									wh	85 078 973
									bn	85 078 975
2.5	61x0.23	1.9	3.75±0.10	8.21	362	190	2.2	3.5	ye	85 067 621
									bu	85 067 625
									rd	12 554 310
									gy	84 091 279
									bn	12 584 664
4	61x0.29	2.4	4.50±0.10	5.09	396	270	3.5	5.3	wh	85 023 707
									rd	12 559 555
									bu	85 066 538
									ye	85 067 561
6	84x0.3	2.9	5.2±0.15	3.39	419	355	5.1	7.4	wh	84 090 550
									bu	12 568 594
									rd	12 582 984
									ye	85 031 740
10	80x0.4	3.9	6.4±0.15	1.95	488	485	9.1	12	bu	85 067 547
									ye	85 067 546
									rd	12 582 985
16	119x0.4	5.3	8.4±0.20	1.24	535	865	14	19	ye	85 067 521
									bu	85 067 520
									rd	12 566 008
25	182x0.4	6.6	10.2±0.3	0.795	565	1255	21	29	rd	12 568 968



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Table 2 : Isolation outer layer colour: see table

Cable type mm ²	Conductor nom construction D n x mm mm		Cable dia. mm	R ₂₀ ¹⁾ max Ω / km	C _{H2O} ²⁾ nom pF/m	Fireload nom kJ / m	Weight nom copper cable kg / 100m		Colour ³⁾	H+S Part. Nr.
35	266x0.4	7.8	11.7±0.3	0.565	607	1605	30	41	rd	12 568 008
									bu	85 019 626
									ye	85 019 627
50	378x0.4	9.3	13.5±0.3	0.393	660	2045	43	56	rd	12 582 459
70	348x0.5	11.4	15.8±0.3	0.277	755	2520	59	75	rd	12 566 010
95	456x0.5	12.9	17.5±0.3	0.210	808	2965	77	96	rd	12 582 460
120	570x0.5	14.5	19.8±0.3	0.164	862	3805	98	122	rd	85 070 814
150	722x0.5	16.0	22.1±0.3	0.132	894	4890	122	152	ye	85 067 495
									bu	85 067 494
									rd	85 067 468
185	874x0.5	17.8	24.0±0.3	0.108	903	5455	150	184	rd	12 559 659

1) conductor resistance according to EN 60228

2) capacity in water

3) bn: brown

bu: blue

gy: grey

rd: red

ye: yellow

wh: white