



Traction cable

RADOX 9 GKW-AX 3600V M

Product description:

RADOX 9 GKW-AX 3600V M

Nominal voltage:

Single core cables with reduced wall thickness

3600 / 6000 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. The cables are in accordance to EN 50264-3-1, but significantly thinner.

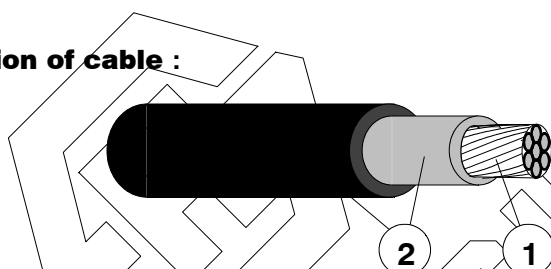
Application :

The cables are intended for permanent installation in rail vehicles or for applications in which a limited alternating bending stress occurs 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: red
outer layer RADOX EI 109, colour : black (see table 1), coloured (see table 2)
- Cable marking : HUBER+SUHNER RADOX 9 GKW-AX 3600V 1X[cross section] M [part-No.] - [batch-No.] [prod.-place]

Technical Data :

Voltage rating cond.- earth	U ₀	3600	V AC
Voltage rating cond.- cond.	U	6000	V AC
maximum permissible Voltage rating AC cond.- earth		4300	V AC
maximum permissible Voltage rating AC cond.- cond.	U _m	7200	V AC
maximum permissible Voltage rating DC cond.- earth	V ₀	5400	V DC
maximum permissible Voltage rating DC cond.- cond.		9000	V DC
Test voltage.		12000	V AC
Temperature range		- 50 ... + 120	°C

Min. bending radius

fixed	D ≤ 12 mm	3 x D
	D > 12 mm	4 x D
sporadic movement	D ≤ 12 mm	4 x D
	D > 12 mm	5 x D

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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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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 60811-1-4 Par. 8, 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.

The cables are in conformity with:

Fire protection on railway vehicles, hazard level	HL1 - HL3	EN 45545
Vertical flame spread	$50 < L \leq 540$ mm	EN 60332-1-2
Vertical flame spread, bunched, $D \leq 6$ mm	$L \leq 1.5$ m	EN 50305, 9.1.2
Vertical flame spread, bunched, $6 < D < 12$ mm	$L \leq 2.5$ m	EN 50305, 9.1.1 (EN 60332-3-25)
Vertical flame spread, bunched, $D \geq 12$ mm	$L \leq 2.5$ m	EN 60332-3-24
Smoke density	$T \geq 70$ %	EN 61034-2
Toxicity	$ITC \leq 6$	EN 50305, 9.2
Fire protection on railway vehicles, level of protection	1 - 4	DIN 5510
Vertical flame spread	$50 < L \leq 540$ mm	EN 60332-1-2
Vertical flame spread, bunched, $D \leq 6$ mm	$L \leq 1.5$ m	EN 50305, 9.1.2
Vertical flame spread, bunched, $6 < D < 12$ mm	$L \leq 2.5$ m	EN 60332-3-25
Vertical flame spread, bunched, $D \geq 12$ mm	$L \leq 2.5$ m	EN 60332-3-24
Smoke density	$T \geq 60$ %	EN 61034-2
Corrosivity of combustion gases	$pH \geq 4.3$, $C \leq 10$ μ S/mm	EN 50267-2-2
Amount of halogen acid gas	$HCl + HBr \leq 0.5$ %	EN 50267-2-1
Content of fluorine	$HF \leq 0.1$ %	EN 60684-2, 45.2
Toxicity	$ITC \leq 3$	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	$50 < L \leq 540$ mm	NF C32-070, 2.1
Vertical flame spread, bunched	$L \leq 300$ mm	NF C32-070, 2.2
Smoke index	$I.F. \leq 5$	X10-702-2, NF X70-100-1
Fire protection on railway vehicles, hazard level	LR1 - LR4	UNI CEI 11170
Vertical flame spread	$50 < L \leq 540$ mm	EN 60332-1-2
Vertical flame spread, bunched, $D \leq 6$ mm	$L \leq 1.5$ m	EN 50305, 9.1.2
Vertical flame spread, bunched, $6 < D < 12$ mm	$L \leq 2.5$ m	EN 60332-3-25
Vertical flame spread, bunched, $D \geq 12$ mm	$L \leq 2.5$ m	EN 60332-3-24
Smoke density	$T \geq 70$ %	EN 61034-2
Corrosivity of combustion gases	$pH \geq 4.3$, $C \leq 10$ μ S/mm	EN 50267-2-2
Amount of halogen acid gas	$HCl + HBr \leq 0.5$ %	EN 50267-2-1
Toxicity	$ITC \leq 3$	EN 50305, 9.2
Fire protection on railway vehicles, category	Ia, Ib, II	BS 6853, GM/RT 2130
Vertical flame spread	$50 < L \leq 540$ mm	EN 60332-1-2
Vertical flame spread, bunched	$L \leq 2.5$ m	EN 50266, BS 6853 An. D.8.7
Smoke density	$A_0 \leq BS 6853$	BS 6853 An. D.8.7
Toxicity	$R \leq 1.0$	BS 6853 An. B.1
Fire protection on railway vehicles	Fulfilled	NFPA 130
Vertical flame spread, bunched	$L \leq 1.5$ m	UL 1685, 12 (FT4 exp.)
Smoke density	$TSR \leq 150$ m ² , $PSRR \leq 0.40$ m ² /s	UL 1685, 12 (FT4 exp.)

Requirement of hazard level code M

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
Doc.No. 0000356416	Technical Specification RADOX 4/9 GKW-AX

Issue	Release	Supersedes issue	TechnicalDatasheet
18.06.2014 / 2553	2647	AB 07.04.2014	Page 2/3

543 851 AC (e)



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Table 1 : Isolation outer layer colour: black

Cable type mm ²	Conductor construction n x mm	nom D 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		H+S Part. Nr.
1.5	37x0.23	1.52	4.50±0.10	13.7	215	317	1.4	3.6	12 537 829
2.5	61x0.23	1.94	5.10±0.10	8.21	242	397	2.2	4.9	12 537 830
4	61x0.29	2.40	5.70±0.10	5.09	280	474	3.5	6.7	12 537 831
6	84x0.30	2.93	6.30±0.10	3.39	309	560	5.2	8.9	12 537 832
10	80x0.40	3.89	7.50±0.15	1.95	363	742	9.1	14.1	12 545 520
16	119x0.40	5.30	9.40±0.15	1.24	416	1138	13	21	12 544 525
25	182x0.40	6.60	11.0±0.2	0.795	471	1444	21	30	12 547 257
35	266x0.40	7.80	12.6±0.3	0.565	502	1868	30	42	12 547 260
50	378x0.40	9.30	14.6±0.3	0.393	537	2355	43	58	12 545 521
70	348x0.50	11.4	16.7±0.3	0.277	637	2720	61	80	12 547 262
95	444x0.50	12.9	18.7±0.3	0.210	658	3404	78	101	12 547 264
120	570x0.50	14.9	21.0±0.3	0.164	704	4441	100	128	12 545 522
150	722x0.50	16.8	23.2±0.3	0.132	752	5208	127	160	12 547 268
185	874x0.50	18.3	25.0±0.3	0.108	781	5593	153	189	12 545 523
240	1147x0.50	21.1	28.0±0.3	0.0817	863	6462	201	243	12 547 678
300	1443x0.50	23.7	30.8±0.3	0.0654	933	7379	253	301	12 551 573
400	1952x0.50	27.3	35.3±0.5	0.0495	955	10112	343	404	12 564 160

Table 2 : Isolation outer layer colour: see table

Cable type mm ²	Conductor construction n x mm	nom D 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	H+S Part. Nr.
1.5	37x0.23	1.52	4.50±0.10	13.7	215	317	1.4	3.6	gy	84 096 994
4	61x0.29	2.40	5.70±0.10	5.09	280	474	3.5	6.7	og	12 583 016
6	84x0.40	2.93	6.30±0.10	3.39	309	560	5.2	8.9	og	85 020 961
10	80x0.40	3.89	7.50±0.15	1.95	363	742	9.1	14.1	og	12 583 017
16	119x0.40	5.30	9.40±0.15	1.24	416	1138	13	21	og	12 583 018
50	378x0.40	9.30	14.6±0.3	0.393	537	2623	43	60	og	85 018 076
70	348x0.50	11.4	16.7±0.3	0.277	637	3096	61	81	og	85 018 068

1) conductor resistance according to EN 60228

2) capacity in water