Traction cable
RADOX 9 GKW-AX 3600V MM S

Product description:

RADOX 9 GKW-AX 3600V MM S	Single and multicore cables, screened (overall screen)
Nominal voltage:	3600 / 6000 V AC
Hazard level:	MM (extra low temperature, extra oil and extra fuel resistant)

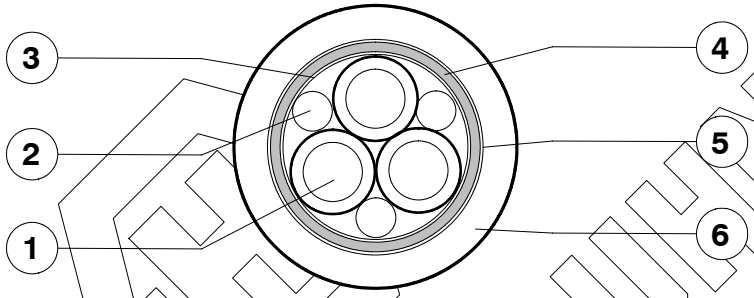
General features:

Halogen free, electron beam cross-linked cables with improved behaviour in case of fire, easy to strip, soldering iron resistant and flexible.

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.

General composition of cable:



1.	RADOX 9 GKW-AX 3600V M cores	Conductor:	stranded tin plated copper, acc. to EN 60228 cl. 5
		Insulation:	RADOX EI 110 / EI 109
		Colours:	black, numbered
2.	Filler (optional)		RADOX 125 REC
3.	Wrapping		Tape
4.	EMC-screen		Tin plated copper braid
5.	Wrapping		Tape
6.	Sheath		RADOX EM 104, colour: black (see Table 1), coloured (see Table 2)

Marking: HUBER+SUHNER RADOX 9 GKW-AX 3600V nX[cross section] MM S [part. No. + batch. No.]

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		11000	V AC
Temperature range		- 50 ...+ 120	°C

Min. bending radius

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

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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 ≤ 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 / F0	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, insulation	ITC ≤ 6	EN 50305, 9.2
Toxicity, filler and sheath	ITC ≤ 3	EN 50305, 9.2

Requirement of hazard level code M	**(according 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°C

Applicable documents:

- EN 50355 Guide line for applications
- H+S 557 578 Current rating for single core cables
- H+S 563 053 Current rating for multi core cables

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Table 1 : Sheath colour black

Construction n x mm²	Conductor dia.nom mm	Core dia.[1] nom. mm	Screen nom. dia. mm	Screen nom. cross section mm²	Cable dia. mm	R_{20} [2] max. Ω/km	Z_T max. mΩ/m	C [3] core/ core pF/m	C [3] core/ screen pF/m	Fire load nom. kJ/m	Weight nom. copper kg/100m	Weight nom. cable kg/100m	H+S Part No.
1x1.5	1.52	4.5	4.96	1.37	6.8±0.15	13.7	70	-	210	461	2.6	7.5	12556520
3x1.5	1.52	4.5	10.7		13.6±0.4	13.7	40	-	-	-	-	29.5	85003034
1x2.5	1.94	5.1	5.6	1.47	7.6±0.15	8.21	70	-	240	991	3.6	9.6	12556521
2x2.5	1.94	5.1	11.2	5.55	14.1±0.4	8.21	50	110	180	2835	10.2	30.7	85068061
1x4	2.4	5.7	6.26	1.91	8.3±0.15	5.09	35	-	270	1170	5.3	12.2	12556522
3x4	2.4	5.7	13.3	7.13	16.5±0.5	5.09	30	-	-	4469	17.8	44.8	85014383
4x4	2.4	5.7	15.4	9.88	19.0±0.5	5.09	30	-	-	5781	23.6	58.5	85014470
6x4	2.4	5.7	18.9	12.5	22.8±0.5	5.09	25	-	-	8585	34	83.9	85014384
1x6	2.93	6.3	6.86	2.36	9.1±0.2	3.39	50	-	310	1392	7.4	15.6	12556523
3x6	2.93	6.3	14.6	8.32	18.0±0.5	3.39	30	-	-	4493	24	56	85018198
4x6	2.93	6.3	17	10.6	20.8±0.5	3.39	70	130	220	6976	31.5	73.2	12582210
9x6+ 4x2.5	2.93 1.94	6.3 5.1	27.1	22.2	32.6±0.6	3.39 8.21	20	-	-	12982	173	78.3	85024058
1x10	3.89	7.5	8.21	3.29	10.4±0.2	1.95	20	-	360	1729	12.3	22.3	12556524
2x10	3.89	7.5	16.1	9.72	19.7±0.5	1.95	70	150	260	5914	28.1	65.3	12582211
4x10	3.89	7.5	19.5	9.51	23.8±0.5	1.95	120	122	207	7704	46.5	101	85074137
1x16	5.3	9.4	10.3	5.55	12.9±0.25	1.24	40	-	420	2790	19	35	12556525
3x16	5.3	9.4	21.7	16.6	26.2±0.6	1.24	20	-	-	9179	58	122	85018199
1x25	6.6	11.0	11.7	4.59	14.3±0.25	0.8	50	-	470	3321	25.1	43.2	12556526
4x25	6.6	11.0	28.4	22.2	33.9±0.6	0.8	50	170	289	15400	105	210	85074582
1x35	7.80	12.6	13.3	4.94	15.7±0.3	0.57	70	-	500	2900	35	56	12556527
4x35	7.80	12.6	33.4	35.7	39.7±0.7	0.57	30	190	320	18860	158	294	12584431
1x50	9.30	14.6	15.3	5.65	17.7±0.3	0.39	70	-	540	3530	49	74	12556528
3x50	9.30	14.6	33.4	35.7	39.8±0.7	0.39	70	170	289	21067	167	309	85073925
3x50+ 1x10	9.30 3.89	14.6 7.5	33.4	35.7	39.8±0.7	0.39 1.95	70 20	170	289	20677	176	316	85063126
1x70	11.4	16.7	17.6	8.91	20.2±0.3	0.28	70	-	640	6147	70.6	102	12556529
3x70	11.4	16.7	37.9	40.8	44.7±0.7	0.28	70	210	357	25081	224	397	85073931
1x95	12.9	18.7	19.8	12.6	22.2±0.3	0.21	70	-	660	6805	90.9	126	12556530

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1x120	14.9	21.0	22.1	14.0	25.3±0.4	0.16	70	-	705	8200	114	160	12556531
1x150	16.8	23.2	24.3	15.7	27.6±0.4	0.13	70	-	750	10935	143	197	12556532
1x185	18.3	25.0	26.1	15.7	29.6±0.4	0.11	70	-	780	11781	170	230	12556533
1x240	21.1	28.0	29.4	22.6	32.7±0.4	0.08	70	-	860	13395	224	292	12556534
1x300	23.7	30.8	32.6	35.2	36.3±0.4	0.07	70	-	930	15313	291	370	12558472

Table 2 : Sheath colour different

Construction n x mm²	Conductor dia.nom mm	Core dia.[1] nom. mm	Screen nom. dia. mm	Screen nom. cross section mm²	Cable dia. mm	R_{20} [2] max. Ω/km	Z_T max. mΩ/m	C [3] core/ core pF/m	C [3] core/ screen pF/m	Fire load nom. kJ/m	Weight nom. copper kg/100m	Weight nom. cable kg/100m	Colour	H+S Part No.
1x300	23.7	30.8	32.6	35.2	36.3±0.4	0.07	70	-	930	15313	291	370	rd	84084762

Remarks:

[1]) Core details see H+S Datasheet 543 851
[2]) conductor resistance at 20 °C according to EN 60228
[3]) capacity typical value