Traction cable
RADOX 3 GKW 300V MM S FR RW

Product description:

RADOX 3 GKW 300V MM S FR RW : multi core cables with flame barrier and overall screen
Nominal voltage: 300 / 500 V AC
Hazard level: M (extra low temperature, extra oil and extra fuel resistant)

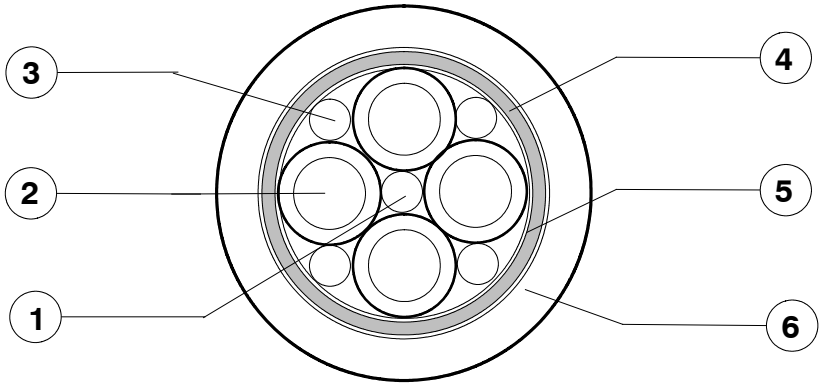
General Properties :

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

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.

General composition of cable:



1.	Center	RADOX 125 REC	
2.	RADOX 3 GKW 300V FR RW Cores	Conductor:	stranded tin plated copper according EN 60228 cl. 5
		Flame barrier:	MICA - tape
		Insulation:	RADOX EI 201
		Colour:	grey; black numbered
3.	Filler	RADOX 125 REC	
4.	EMC- screen optimised	Tin plated copper braid	
5.	Separator	Tape	
6.	ISheath	RADOX EM 104	
		Colour:	black; yellow marked

Marking:

[a] **HUBER+SUHNER RADOX 3 GKW 300V** [b] **MM S FR RW** [c]**-** [d] [e] [f]

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

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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	U_0	300	V AC
Voltage rating cond.- cond.	U	500	V AC
maximum permissible Voltage rating AC cond.- earth		360	V AC
maximum permissible Voltage rating AC cond.- cond.	U_m	600	V AC
maximum permissible Voltage rating DC cond.- earth	V_0	450	V DC
maximum permissible Voltage rating DC cond.- cond.		750	V DC
Test voltage		2000	V AC
Temperature range		- 50 ... + 120	°C

Min. bending radius *)

fixed installation	cable diameter ≤ 10 mm	3 x D
	cable diameter > 10 mm	4 x D
sporadic movement	cable diameter ≤ 10 mm	5 x D
	cable diameter > 10 mm	6 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- 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.

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The cables are in conformity with:

Isolation receipt in the case of fire

Resistance to fire with mechanical shock, D ≤ 20 mm	30 Min.	EN 50200

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

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

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

Applicable documents :

EN 50355	Guide to use
EN 50343	Installation rules
H+S 564 900	Technical Datasheet RADOX 3 GKW 300V FR RW

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Cable type 1) n x mm²	Conductor dia. nom. mm	Core 2) dia. nom. mm	Screen nom. dia. mm	Screen nom. cross section mm²	Cable dia. mm	R_{20} 3) max. Ω/km	Z_T max. mΩ/m	C' 4) core/ core pF/m	C' 4) core/ screen pF/m	Fire load nom. kJ/m	Weight nom. copper kg/100m	Weight nom. cable kg/100m	H+S Part No.	
2x0.5	0.88	2.00	4.6	1.4	6.0±0.3	40.1	150	180	315	405	2.3	5.9	12 566 709	
14x0.5	0.88	2.00	9.7	4.0	11.8±0.4	40.1	50	180	315	1565	10	23	85 102 843	
24x0.5	0.88	2.00	13	7.1	15.5±0.5	40.1	30	180	315	2330	18	37	85 022 939	
2x2x0.5	0.88	2.00	8.2	3.29	10.1±0.4	40.1	70	180	315	935	5.0	14	12 566 714	
3x2x0.5	0.88	2.00	8.6	3.85	10.5±0.4	40.1	60	180	315	1190	6.5	17	12 585 599	
4x2x0.5	0.88	2.00	10.5	5.55	12.5±0.4	40.1	60	180	315	1330	9.0	21	12 585 096	
6x2x0.5	0.88	2.00	13	7.9	15.2±0.5	40.1	60	180	315	1865	13	31	12 567 021	
7x2x0.5	0.88	2.00	11.4	5.9	13.6±0.4	40.1	60	180	315	1560	12	27	12 566 367	
2x0.75	1.10	2.25	5.2	1.5	6.4±0.3	26.7	140	190	335	480	2.9	7.0	12 564 627	
4x0.75	1.10	2.25	6.2	2.1	7.5±0.3	26.7	100	190	335	605	4.8	9.7	12 564 628	
6x0.75	1.10	2.25	7.6	2.9	9.05±0.3	26.7	80	190	335	895	7.1	14	12 568 276	
8x0.75	1.10	2.25	8.4	3.3	10.2±0.4	26.7	70	190	335	980	8.8	17	12 566 544	
12x0.75	1.10	2.25	10.5	5.1	12.4±0.4	26.7	60	190	335	1525	13	25	12 566 278	
3x2x0.75	1.10	2.25	9.1	3.25	11.1±0.4	26.7	50	190	335	1324	7.6	17.6	85 011 100	
4x2x0.75	1.10	2.25	11.5	6.3	13.7±0.4	26.7	40	190	335	1813	12	26	85 021 421	
5x2x0.75	1.10	2.25	12.5	7.9	14.7±0.4	26.7	60	190	335	1600	14	30	12 565 935	
6x2x0.75	1.10	2.25	14.3	9.1	16.9±0.5	26.7	55	190	335	2420	17	38	12 566 366	
2x1	1.22	2.50	5.6	1.7	7.1±0.3	20.0	120	190	335	630	3.6	8.5	12 567 871	
4x1	1.22	2.50	7.0	2.3	8.5±0.3	20.0	70	190	335	830	6.0	13	12 584 298	
8x1	1.22	2.50	10.7	5.55	12.6±0.4	20.0	40	190	335	1905	13	27	12 583 521	
4x2x1	1.22	2.50	12.8	7.1	15.0±0.5	20.0	40	190	335	2085	15	31	12 585 097	
4x4x1	1.22	2.50	10.6	16.4	19.3±0.5	20.0	25	190	335	4164	25.1	56.2	85 032 218	5)

5) 3 GKW 300V 4x4x1 MM S FR RW UIC, cable construction according to UIC 558 (16- core connection cable); numbering of cores: 1,4,2,3 / 5,8,6,7 / 9,12,10,11 / 14,20,15,16

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Cable type [1] n x mm²	Conductor dia. nom. mm	Core [2] dia. nom. mm	Screen nom. dia. mm	Screen nom. cross section mm²	Cable dia. mm	R_{20} [3] max. Ω/km	Z_T max. mΩ/m	C' [4] core/core pF/m	C' [4] core/screen pF/m	Fire load nom. kJ/m	Weight nom. copper kg/100m	Weight nom. cable kg/100m	H+S Part No.
2x1.5	1.49	2.80	6.3	2.0	7.8±0.3	13.7	90	200	350	670	4.6	11	12 566 485
3x1.5	1.49	2.80	6.8	2.0	8.3±0.3	13.7	90	200	350	720	6.1	13	12 566 486
5G1.5	1.49	2.80	8.6	3.25	10.5±0.4	13.7	50	200	350	1259	10	19.6	85 021 405
6x1.5	1.49	2.80	9.4	3.7	11.3±0.4	13.7	65	200	350	1285	12	23	12 566 487
8x1.5	1.49	2.80	11.6	6.4	13.9±0.4	13.7	40	200	350	2390	17.2	34.7	85 068 044
12X1.5	1.49	2.80	12.6	7.1	14.8±0.4	13.7	40	200	350	2156	23.3	40	84 141 395
12G1.5	1.49	2.80	12.6	7.1	14.8±0.4	13.7	40	200	350	2156	23.3	40	85 021 350
20x1.5	1.49	2.80	16.4	10.2	18.9±0.5	13.7	40	200	350	2940	37	64	12 566 488
2x2.5	1.94	3.20	7.2	7.3	8.8±0.3	8.21	80	200	350	550	7.3	15	12 566 545

1) X: one colour, numbered
   G: one green- yellow core, others one colour, numbered
2) Cores: Tolerances of core diameter see H+S Datasheet 564 900
3) R_{20}: Conductor resistance according to EN 60228
4) C': Capacity per unit length