



Traction cable

RADOX 3 GWK 600V XM S

Product description:

RADOX 3 GWK 600V XM S	Multicore cables, screened (overall screen)
Nominal voltage:	600 / 1000 V AC
Hazard level:	M (extra low temperature, extra oil and extra fuel resistant)

General features:

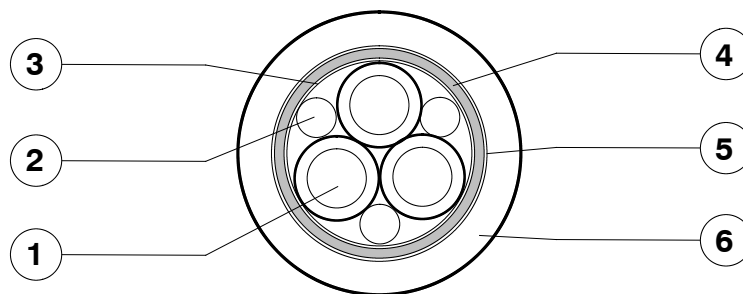
Halogen free, electron-beam cross-linked cables with improved behaviour in case of fire, easy to strip, soldering iron resistant and flexible.

Application:

The cables are intended for permanent installation in rail vehicles or for applications in which a limited alternating bending stress occur during service.

Guidelines for selection and installation are described in the standards EN 50355 and EN 50343.

General composition of cables:



1.	RADOX 3 GWK 600V cores	Conductor:	Tin plated copper, acc. to EN 60228 cl. 5
		Insulation:	RADOX EI 201, according to 3 GWK specification
		Colours:	grey, black numbered greenyellow optional
2.	Filler (optional)		RADOX 125 REC
3.	Wrapping (optional)		Tape
4.	EMC-screen optimised		Tin plated copper braid
5.	Wrapping		Tape
6.	Sheath		RADOX EM 104, according to EN 50264-1 Colour: black, yellow printed

Marking:

[a] HUBER+SUHNER RADOX GWK 600V [b] XM S [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 cond.-earth U_0	600	V AC
Voltage rating cond.-cond. U	1000	V AC
maximum permissible Voltage rating AC cond.-earth	.....	720	.....	V AC
maximum permissible Voltage rating AC cond.-cond.	..... U_m ..	1200	.....	V AC
maximum permissible Voltage rating DC cond.-earth	..... V_0	900	.....	V DC
maximum permissible Voltage rating DC cond.-cond.	.....	1500	.....	V DC
Test voltage	.....	3500	.....	V AC
Temperature range	.....	- 50 ...+ 120	.....	°C
Min. bending radius				
fixed installation	.....	cable diameter \leq 12 mm	.....	3 x D
.....	.....	cable diameter > 12 mm	.....	4 x D
sporadic movement	.....	cable diameter \leq 12 mm	.....	4 x D
.....	.....	cable diameter > 12 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 60811-1-4 Par. 8, respectively low temperature behaviour tests for according to GOST 20.57.406-81, method 204-1 and GOST 17491-80. (fixed installation)
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	$50 < L \leq 540$ mm	EN 60332-1-2
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, $6 < D < 12$ 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, insulation	$ITC \leq 6$	EN 50305, 9.2
Toxicity, filler and sheath	$ITC \leq 3$	EN 50305, 9.2
Fire protection on railway vehicles, category	A1, A2, B	NF F16-101
Fire protection on railway vehicles, class	C / F0	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	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.)
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, $6 < D < 12$ 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, insulation	$ITC \leq 6$	EN 50305, 9.2
Toxicity, filler and sheath	$ITC \leq 3$	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

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°C

Applicable documents:

H+S : 563054 (e) : Current rating for multicore cables
Doc. No. 0000355663 Technical specification RADOX 3 GWK 600V



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Cable type 1) n x mm ²	Conductor dia. nom. mm	Core 2) dia. nom. mm	Screen		Cable dia. mm	R ₂₀ 3) max. Ω/km	Z _T max. mΩ/m	C' 4) core/ core/ screen pF/m		Fire load nom. kJ/m	Weight nom. copper cable kg/100m		H+S Part No.
			dia. mm	nom. cross section mm ²				core/ core/ screen	core/ screen		copper	nom. cable	
2x0.5	0.88	2.00	4.6	1.3	6.6±0.3	40.1	120	170	300	610	2.3	6.8	12 561 219
3x0.5	0.88	2.00	5.0	1.4	6.9±0.3	40.1	110	170	300	630	2.8	7.7	12 561 220
4x0.5	0.88	2.00	5.6	1.7	7.5±0.3	40.1	80	170	300	660	3.6	9.4	12 561 221
5x0.5	0.88	2.00	6.2	1.9	8.4±0.3	40.1	70	170	300	935	4.1	11	12 561 222
6x0.5	0.88	2.00	7.0	2.8	9.3±0.3	40.1	60	170	300	1145	5.5	14	12 561 223
7x0.5	0.88	2.00	7.6	2.8	9.8±0.3	40.1	60	170	300	1215	6.2	14	12 561 224
12x0.5	0.88	2.00	9.1	3.7	11.8±0.4	40.1	50	170	300	1690	9.3	22	12 561 227
16x0.5	0.88	2.00	10.3	4.2	13.1±0.4	40.1	50	170	300	2260	11.3	28	85 092 628
25x0.5	0.88	2.00	13.2	7.1	16.5±0.5	40.1	30	170	300	3520	18.6	44	85 028 418
30x0.5	0.88	2.00	14.0	8.3	17.3±0.5	40.1	30	170	300	3610	22.2	48	85 017 224
2x2x0.5	0.88	2.00	8.1	3.2	10.6±0.4	40.1	50	170	300	1205	5.0	15	12 567 598
6x2x0.5	0.88	2.00	13.3	9.4	16.5±0.5	40.1	30	170	300	2960	14	35	12 566 368
9x2x0.5	0.88	2.00	16.9	10.6	20.6±0.5	40.1	25	170	300	4925	18	53	85 003 451
2x0.75	1.10	2.20	5.1	1.4	7.0±0.3	26.7	100	170	300	670	2.9	8.1	12 561 228
3x0.75	1.10	2.20	5.4	1.7	7.5±0.3	26.7	90	170	300	740	3.7	9.4	12 561 229
4x0.75	1.10	2.20	6.0	1.7	8.1±0.3	26.7	80	170	300	865	4.7	11	12 561 230
4G0.75	1.10	2.20	6.0	1.7	8.1±0.3	26.7	80	170	300	865	4.7	11	84 139 937
5x0.75	1.10	2.20	6.8	2.3	9.0±0.3	26.7	60	170	300	1050	6.0	14	12 561 231
6x0.75	1.10	2.20	7.7	3.2	9.9±0.3	26.7	60	170	300	1265	7.4	16	12 561 232
7x0.75	1.10	2.20	8.3	3.2	10.7±0.4	26.7	50	170	300	1525	8.2	19	12 561 233
8x0.75	1.10	2.20	9.2	3.7	11.2±0.3	26.7	50	170	300	1645	9.5	21	12 561 827
9x0.75	1.10	2.20	9.7	5.3	12.3±0.4	26.7	50	170	300	1585	12	24	12 561 234
10x0.75	1.10	2.20	9.7	5.3	12.3±0.3	26.7	50	170	300	1690	12	25	12 561 235
12x0.75	1.10	2.20	10.2	5.3	12.6±0.4	26.7	40	170	300	1840	14	27	12 561 236
16x0.75	1.10	2.20	11.5	6.1	14.4±0.4	26.7	40	170	300	2450	17	35	12 562 206
2x2x0.75	1.10	2.20	8.8	3.3	10.8±0.4	26.7	50	170	300	1330	6.1	16	12 561 828
5x2x0.75	1.10	2.20	12.8	8.2	16.0±0.5	26.7	30	170	300	2090	15	35	12 566 117



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Cable type 1) n x mm ²	Conductor	Core 2)	Screen		Cable	R ₂₀ 3)	Z _T	C' 4)		Fire load	Weight		H+S Part No.
	dia. nom. mm	dia. nom. mm	dia. mm	nom. cross section mm ²	dia. mm	max. Ω/km	max. mΩ/m	core/ core	core/ screen pF/m	nom. kJ/m	copper kg/100m	nom. cable	
2x1	1.22	2.45	5.7	1.8	7.6±0.3	20.0	90	190	330	790	3.7	9.8	12 559 722
3x1	1.22	2.45	6.0	2.2	8.1±0.3	20.0	80	190	330	700	5.0	11	12 559 723
4x1	1.22	2.45	6.8	2.8	8.8±0.3	20.0	70	190	330	995	6.5	14	12 559 724
7x1	1.22	2.45	9.2	3.7	11.8±0.4	20.0	50	190	330	1850	10	23	12 559 727
16x1	1.22	2.45	12.7	7.1	15.9±0.5	20.0	30	190	330	3200	21	45	12 585 329
2x2x1	1.22	2.45	9.7	3.8	12.5±0.4	20.0	40	190	330	2010	7.4	22	12 569 225
2x1.5	1.52	2.70	6.0	2.0	8.2±0.3	13.7	80	190	330	895	4.6	11	12 559 728
3x1.5	1.52	2.70	6.6	2.8	8.6±0.3	13.7	70	190	330	930	6.9	14	12 559 729
3G1.5	1.52	2.70	6.6	2.8	8.6±0.3	13.7	70	190	330	930	6.9	14	12 565 287
4x1.5	1.52	2.70	7.4	2.8	9.6±0.3	13.7	60	190	330	1145	8.1	17	12 559 730
4G1.5	1.52	2.70	7.4	2.8	9.6±0.3	13.7	50	190	330	1145	8.1	17	12 568 731
5x1.5	1.52	2.70	8.4	3.2	10.9±0.4	13.7	50	190	330	1475	9.9	21	12 559 731
5G1.5	1.52	2.70	8.4	3.2	10.8±0.4	13.7	50	190	330	1475	9.9	21	12 565 288
6x1.5	1.52	2.70	9.1	3.7	11.8±0.4	13.7	50	190	330	1775	12	25	12 559 732
7x1.5	1.52	2.70	10.3	5.3	13.0±0.4	13.7	40	190	330	2145	15	30	12 559 733
7G1.5	1.52	2.70	10.3	5.3	13.0±0.4	13.7	40	190	330	2145	15	30	84 101 306
8x1.5	1.52	2.70	11.4	6.3	14.2±0.4	13.7	40	190	330	2560	17	35	12 567 854
9x1.5	1.52	2.70	12.2	8.2	14.9±0.4	13.7	40	190	330	3000	20	39	12 559 844
10G1.5	1.52	2.70	11.7	6.1	14.5±0.4	13.7	40	190	330	2280	20	37	12 565 289
12x1.5	1.52	2.70	12.2	7.1	15.4±0.5	13.7	40	190	330	2675	24	43	12 559 845
12G1.5	1.52	2.70	12.2	7.1	15.4±0.5	13.7	40	190	330	2675	24	43	12 585 633
16x1.5	1.52	2.70	14.2	9.4	17.4±0.5	13.7	30	190	330	3325	30	54	12 559 846
25x1.5	1.52	2.70	17.7	11.5	21.6±0.5	13.7	25	190	330	5140	46	81	84 109 154
27x1.5	1.52	2.70	17.8	11.7	21.6±0.5	13.7	25	190	330	6730	47	82	12 562 489
2x2x1.5	1.52	2.70	10.1	5.3	12.7±0.4	13.7	40	190	330	1500	11	22	12 559 853
6x2x1.5	1.52	2.70	16.3	10.6	19.9±0.3	13.7	25	190	330	4315	27	57	12 559 855



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Cable type 1) n x mm ²	Conductor dia. nom. mm	Core 2) dia. nom. mm	Screen		Cable dia. mm	R ₂₀ 3) max. Ω/km	Z _T max. mΩ/m	C' 4) core/ core/ screen pF/m		Fire load nom. kJ/m	Weight copper nom. cable kg/100m		H+S Part No.
			dia. mm	nom. cross section mm ²				core/ core/ screen	core/ screen		kg/100m	kg/100m	
2x2.5	1.95	3.30	7.4	2.9	9.6±0.3	8.21	60	200	350	1170	7.3	16	12 559 734
2G2.5	1.95	3.30	7.4	2.9	9.6±0.3	8.21	60	200	350	1170	7.3	16	84 139 932
3x2.5	1.95	3.30	7.9	3.2	10.4±0.4	8.21	50	200	350	1370	10	20	12 559 735
3G2.5	1.95	3.30	7.9	3.2	10.4±0.4	8.21	60	200	350	1370	10	20	12 566 192
4x2.5	1.95	3.30	8.9	3.2	11.3±0.3	8.21	50	200	350	1550	13	24	12 559 736
4G2.5	1.95	3.30	9.2	3.8	11.3±0.4	8.21	50	200	350	1550	13	24	12 582 562
5G2.5	1.95	3.30	9.8	3.7	12.4±0.4	8.21	40	200	350	1700	15	29	12 565 290
7x2.5	1.95	3.30	12.6	7.1	15.7±0.5	8.21	30	200	350	3120	23	45	12 559 739
8x2.5	1.95	3.30	13.9	7.8	17.2±0.5	8.21	30	200	350	3875	26	53	12 559 847
25x2.5	1.95	3.30	21.7	17.7	26.2±0.6	8.21	20	200	350	7310	73	124	84 109 142
3x4	2.45	3.95	9.3	3.7	11.8±0.4	5.09	50	200	350	1810	14	27	12 559 743
3G4	2.45	3.95	9.3	3.7	11.8±0.4	5.09	50	200	350	1810	14	29	12 565 291
4x4	2.45	3.95	10.6	5.3	13.4±0.3	5.09	40	200	350	2120	19	36	12 559 848
4G4	2.45	3.95	10.6	5.3	13.4±0.3	5.09	40	200	350	2120	19	36	12 582 563
4x4 +1G2.5	2.45 1.95	3.95 3.30	12.1	7.1	15.2±0.5	5.09 8.21	40	200	350	2750	23	43	12 586 412
5x4	2.45	3.95	12.0	6.1	14.7±0.4	5.09	40	200	350	2320	23	38	12 561 508
2x6	2.93	4.70	10.3	5.3	12.9±0.4	3.39	40	230	400	2095	16	31	12 560 867
3x6	2.93	4.70	11.1	6.1	13.8±0.4	3.39	40	230	400	2375	22	39	12 559 744
3G6	2.93	4.70	11.1	6.1	13.8±0.4	3.39	40	230	400	2375	22	39	85 023 404
4x6	2.93	4.70	12.6	6.1	15.6±0.4	3.39	30	230	400	2865	27	49	12 559 745
4G6	2.93	4.70	12.6	6.1	15.6±0.4	3.39	30	230	400	2865	27	49	12 567 507
5x6	2.93	4.70	14.0	7.7	17.3±0.5	3.39	30	230	400	3535	34	61	12 559 849



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Cable type 1) n x mm ²	Conductor dia. nom. mm	Core 2) dia. nom. mm	Screen		Cable dia. mm	R ₂₀ 3) max. Ω/km	Z _T max. mΩ/m	C' 4) core/ core/ screen pF/m		Fire load nom. kJ/m	Weight copper nom. cable kg/100m		H+S Part No.
			dia. mm	nom. cross section mm ²				core/ core/ screen	core/ screen				
2x10	3.89	5.85	12.6	7.1	15.8±0.5	1.95	30	230	400	3160	25	48	84 152 221
3x10	3.89	5.85	13.8	10.6	17.2±0.5	1.95	30	230	400	3545	37	63	12 559 746
4x10	3.89	5.85	15.7	10.6	19.2±0.5	1.95	30	230	400	4320	47	79	12 559 747
4G10	3.89	5.85	15.7	10.6	19.2±0.5	1.95	30	230	400	4320	47	79	12 560 389
5x10	3.89	5.85	17.4	5.8	21.1±0.5	1.95	25	230	400	4720	57	95	12 562 116
5G10	3.89	5.85	17.4	5.8	21.1±0.5	1.95	25	230	400	4720	57	95	12 582 564
6x10	3.89	5.85	19.2	13.2	23.1±0.5	1.95	25	230	400	6290	69	113	12 559 748
7x10	3.89	5.85	22.1	18	26.5±0.6	1.95	20	230	400	8165	82	142	84 118 486
8x10	3.89	5.85	23.1		27.7±0.6	1.95	20	230	400	8600	92	151	84 120 441
2x16	5.30	7.25	15.7	10.8	19.2±0.5	1.24	30	230	400	4585	38	70	84 090 510
3x16	5.30	7.25	16.8	10.6	20.6±0.5	1.24	25	230	400	5025	49	86	12 559 749
4x16	5.30	7.25	19.2	12.3	23.2±0.5	1.24	25	230	400	6000	65	109	12 559 850
4G16	5.30	7.25	19.2	12.3	23.2±0.5	1.24	25	230	400	6000	65	110	84 128 245
5x16	5.30	7.25	21.3	14.1	25.7±0.6	1.24	20	230	400	7325	80	136	12 559 851
5G16	5.30	7.25	21.3	14.1	25.7±0.6	1.24	20	230	400	7325	80	136	84 107 672
2x25	6.60	8.90	18.9	12.3	22.9±0.5	0.795	25	230	400	6385	54	100	12 566 322
3x25	6.60	8.90	20.5	13.8	24.8±0.5	0.795	25	230	400	7010	78	126	12 560 047
4x25	6.60	8.90	23.7	18	28.3±0.6	0.795	20	230	400	9380	102	168	12 559 750
4G25	6.60	8.90	23.7	18	28.3±0.6	0.795	20	230	400	9380	102	168	85 022 194
4x35	7.80	10.20	26.7	22.1	31.6±0.6	0.565	20	230	400	10990	143	220	12 559 752
2x50	9.30	11.90	25.0	15.7	29.8±0.6	0.393	20	230	400	14900	102	175	12 560 868
3x50	9.30	11.90	27.5	22.1	32.8±0.6	0.393	20	230	400	12130	152	233	12 584 207

- 1) X: one colour, numbered
 G: one green-yellow core, others one colour, numbered
 V: various colours
 2) Cores: Tolerances of core diameter see H+S Datasheet 547 907
 3) R₂₀: Conductor resistance according to EN 60228
 4) C': Capacity per unit length