



Traction cable

RADOX 3 GWK 600V XM

Product description:

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

General features:

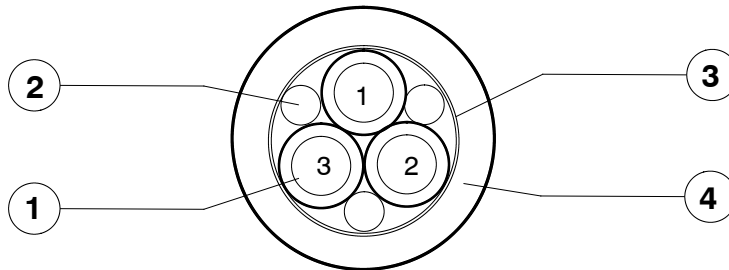
Halogen free, electron-beam cross-linked cables with improved behaviour in case of fire, easy to strip, soldering iron resistant and flexible.

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 cable:



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 colors optional
2.	Filler (optional)		RADOX 125 REC
3.	Wrapping		Tape
4.	Sheath		RADOX EM 104, according to EN 50264-1 Colour: black, yellow printed

Marking:

[a] HUBER+SUHNER RADOX 3 GWK 600V [b] XM [c]-[d] [e] [f] [g]

		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
[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.

HUBER+SUHNER AC
Low Frequency Division

CH-8330 Pfäffikon

+41 (0)44 952 22 11

+41 (0)44 952 26 40

www.hubersuhner.com



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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 ≤ 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, 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
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

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 nom. Dia. mm	Core dia. 2) nom. mm	Cable dia. mm	R ₂₀ 3) max. Ω/km	C' 4) nom. pF/m	Fireload nom. kJ/m	Weight nom.		H+S Part No.
							Copper	Cable kg/100m	
2x0.5	0.88	2.00	5.9 ± 0.3	40.1	110	410	0.9	4.8	12 561 172
3x0.5	0.88	2.00	6.25 ± 0.3	40.1	110	575	1.4	5.7	85 006 736
5x0.5	0.88	2.00	7.7 ± 0.3	40.1	110	790	2.3	8.6	12 561 175
6x0.5	0.88	2.00	8.4 ± 0.3	40.1	110	970	2.7	10	12 561 176
9x0.5	0.88	2.00	10.5 ± 0.4	40.1	110	1345	4.2	15	12 561 178
12x0.5	0.88	2.00	10.8 ± 0.4	40.1	110	1465	5.4	17	12 561 180
15x0.5	0.88	2.00	12.3 ± 0.4	40.1	110	1875	6.7	21	12 567 586
18x0.5	0.88	2.00	12.9 ± 0.4	40.1	110	2210	8.3	24	12 567 587
36x0.5	0.88	2.00	15.9 ± 0.5	40.1	110	3437	16.5	39.7	85 067 654 5)
72x0.5	0.88	2.00	21.8 ± 0.5	40.1	110	6462	33	75.6	85 067 659 5)
2x0.75	1.10	2.20	6.4 ± 0.3	26.7	110	625	1.4	6.0	12 561 181
3x0.75	1.10	2.20	6.8 ± 0.3	26.7	110	675	2.1	7.1	12 561 182
3G0.75	1.10	2.20	6.8 ± 0.3	26.7	110	675	2.1	7.1	84 142 651
4x0.75	1.10	2.20	7.6 ± 0.3	26.7	110	810	2.7	8.8	12 561 183
4G0.75	1.10	2.20	7.6 ± 0.3	26.7	110	810	2.7	8.8	12 566 700
5G0.75	1.10	2.20	8.4 ± 0.3	26.7	110	970	3.4	11	12 581 529
6G0.75	1.10	2.20	9.0 ± 0.3	26.7	110	1120	4.1	13	12 568 604
7x0.75	1.10	2.20	10.0 ± 0.3	26.7	110	1370	5.0	15	12 561 186
7G0.75	1.10	2.20	10.0 ± 0.3	26.7	110	1440	4.8	15	12 568 622
8x0.75	1.10	2.20	10.9 ± 0.4	26.7	110	1750	5.5	18	12 561 819
9G0.75	1.10	2.20	11.3 ± 0.4	26.7	110	1395	6.2	19	12 581 443
12x0.75	1.10	2.20	11.9 ± 0.4	26.7	110	1720	8.2	22	12 561 189
14x0.75	1.10	2.20	12.6 ± 0.4	26.7	110	1940	10	24	12 561 820
16x0.75	1.10	2.20	13.5 ± 0.4	26.7	110	2260	11	28	12 562 310
20x0.75	1.10	2.20	15.2 ± 0.5	26.7	110	2950	15.4	35.4	12 561 821
36x0.75	1.10	2.20	17.4 ± 0.5	26.7	110	3916	25.8	52.4	85 067 653 5)
72x0.75	1.10	2.20	23.9 ± 0.5	26.7	110	7345	52	100	85 067 658 5)

5) cable with reduced thickness



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Cable type ¹⁾ n x mm ²	Conductor nom. Dia. mm	Core dia. ²⁾ nom. mm	Cable dia. mm	R ₂₀ ³⁾ max. Ω/km	C' ⁴⁾ nom. pF/m	Fireload nom. kJ/m	Weight nom.		H+S Part No.	
							Copper	Cable kg/100m		
2x1	1.22	2.45	6.9 ± 0.3	20.0	120	690	1.8	7.2	12 561 190	
3x1	1.22	2.45	7.4 ± 0.3	20.0	120	760	2.7	8.6	12 561 191	
4x1	1.22	2.45	8.4 ± 0.3	20.0	120	980	3.6	11	12 561 192	
5x1	1.22	2.45	9.2 ± 0.3	20.0	120	1175	4.6	13	12 561 193	
6x1	1.22	2.45	10.0 ± 0.3	20.0	120	1405	5.5	16	12 561 194	
7x1	1.22	2.45	10.9 ± 0.3	20.0	120	1615	6.4	18	12 561 195	
7G1	1.22	2.45	10.9 ± 0.3	20.0	120	1615	6.4	18	84 136 232	
9x1	1.22	2.45	12.5 ± 0.4	20.0	120	1925	8.2	22	12 561 196	
10x1	1.22	2.45	12.5 ± 0.4	20.0	120	1770	9.1	23	12 561 197	
12x1	1.22	2.45	13.0 ± 0.3	20.0	120	2115	11	27	12 561 198	
25x1	1.22	2.45	18.7 ± 0.5	20.0	120	4005	23	52	12 568 300	
36x1	1.22	2.45	19.2 ± 0.5	20.0	120	4745	32.1	64	85 067 652	⁵⁾
72x1	1.22	2.45	26.5 ± 0.6	20.0	120	9025	64.2	124	85 067 657	⁵⁾

⁵⁾ cable with reduced thickness



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Cable type 1) n x mm ²	Conductor nom. Dia. mm	Core dia. 2) nom. mm	Cable dia. mm	R ₂₀ ³⁾ max. Ω/km	C' ⁴⁾ nom. pF/m	Fireload nom. kJ/m	Weight nom.		H+S Part No.
							Copper	Cable kg/100m	
2x1.5	1.52	2.70	7.5 ± 0.3	13.7	120	805	2.6	8.6	12 561 199
2G1.5	1.52	2.70	7.5 ± 0.3	13.7	120	805	2.6	8.6	12 567 588
3x1.5	1.52	2.70	8.0 ± 0.3	13.7	120	740	3.9	11	12 561 200
3G1.5	1.52	2.70	8.0 ± 0.3	13.7	120	740	3.9	11	12 563 588
4x1.5	1.52	2.70	9.0 ± 0.3	13.7	120	1100	5.2	14	12 561 201
4G1.5	1.52	2.70	9.0 ± 0.3	13.7	120	1100	5.2	14	12 563 589
5x1.5	1.52	2.70	10.2 ± 0.4	13.7	120	1405	6.5	17	12 561 202
5G1.5	1.52	2.70	10.2 ± 0.4	13.7	120	1405	6.5	17	12 567 589
6x1.5	1.52	2.70	11.1 ± 0.4	13.7	120	1570	7.9	20	12 561 203
6G1.5	1.52	2.70	11.1 ± 0.4	13.7	120	1570	7.9	20	12 583 845
7x1.5	1.52	2.70	12.1 ± 0.4	13.7	120	2055	9.2	24	12 561 204
7G1.5	1.52	2.70	12.1 ± 0.4	13.7	120	2055	9.2	24	12 564 173
8x1.5	1.52	2.70	13.3 ± 0.4	13.7	120	2540	11	28	12 582 522
9G1.5	1.52	2.70	13.7 ± 0.4	13.7	120	2110	12	28	12 581 530
10G1.5	1.52	2.70	13.7 ± 0.4	13.7	120	2500	13.6	31	12 568 729
10x1.5	1.52	2.70	13.7 ± 0.4	13.7	120	2500	13.6	31	85 028 702
12x1.5	1.52	2.70	14.2 ± 0.4	13.7	120	2300	16	34	12 561 207
12G1.5	1.52	2.70	14.2 ± 0.4	13.7	120	2300	16	34	12 567 590
16x1.5	1.52	2.70	16.2 ± 0.5	13.7	120	3075	22	44	84 116 849
18G1.5	1.52	2.70	17.2 ± 0.5	13.7	120	3660	25	50	84 117 785
19x1.5	1.52	2.70	18.2 ± 0.5	13.7	120	4100	25	55	12 567 941
25x1.5	1.52	2.70	20.4 ± 0.5	13.7	120	4485	34	66	84 116 846
36x1.5	1.52	2.70	23.2 ± 0.5	13.7	120	6320	49	92	12 567 364
72x1.5	1.52	2.70	29.0 ± 0.5	13.7	120	10233	97.7	165	85 067 656 ⁵⁾

⁵⁾ cable with reduced thickness



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Cable type 1) n x mm ²	Conductor nom. Dia. mm	Core dia. 2) nom. mm	Cable dia. mm	R ₂₀ ³⁾ max. Ω/km	C' ⁴⁾ nom. pF/m	Fireload nom. kJ/m	Weight nom.		H+S Part No.
							Copper kg/100m	Cable	
2x2.5	1.95	3.30	8.8 ± 0.3	8.21	130	1090	4.4	12	12 561 208
3x2.5	1.95	3.30	9.5 ± 0.3	8.21	130	1220	6.5	16	12 561 085
3G2.5	1.95	3.30	9.5 ± 0.3	8.21	130	1220	6.5	15	12 563 590
4x2.5	1.95	3.30	10.7 ± 0.4	8.21	130	1495	8.7	20	12 561 209
4G2.5	1.95	3.30	10.7 ± 0.4	8.21	130	1495	8.7	20	12 566 698
5x2.5	1.95	3.30	11.8 ± 0.4	8.21	130	1835	11	24	12 561 210
5G2.5	1.95	3.30	11.8 ± 0.4	8.21	130	1835	11	24	12 567 591
6x2.5	1.95	3.30	12.9 ± 0.4	8.21	130	2215	13	29	12 561 211
7x2.5	1.95	3.30	14.0 ± 0.4	8.21	130	2695	15	34	12 561 212
7G2.5	1.95	3.30	14.0 ± 0.4	8.21	130	2695	15	34	12 567 592
9x2.5	1.95	3.30	16.4 ± 0.5	8.21	130	2910	20	42	12 561 213
10x2.5	1.95	3.30	16.5 ± 0.5	8.21	130	3295	23	47	12 561 214
12x2.5	1.95	3.30	17.2 ± 0.5	8.21	130	3405	26	52	12 561 215
14x2.5	1.95	3.30	18.2 ± 0.5	8.21	130	3900	31.7	60	85 015 825
24x2.5	1.95	3.30	24.0 ± 0.5	8.21	130	6000	52	97	12 567 594
25x2.5	1.95	3.30	24.5 ± 0.5	8.21	130	6300	55	99	12 567 593
30x2.5	1.95	3.30	25.9 ± 0.6	8.21	130	7300	68	119	12 583 722
42G2.5	1.95	3.30	31.0 ± 0.6	8.21	130	10820	92	169	12 566 919
2x4	2.46	3.95	10.4 ± 0.4	5.09	150	1515	6.9	18	12 561 216
3x4	2.46	3.95	11.1 ± 0.4	5.09	150	1550	10	22	12 561 822
3G4	2.46	3.95	11.1 ± 0.4	5.09	150	1550	10	22	12 563 591
4x4	2.46	3.95	12.4 ± 0.4	5.09	150	1995	14	29	12 561 823
4G4	2.46	3.95	12.4 ± 0.4	5.09	150	1995	14	29	12 566 542
5x4	2.46	3.95	14.0 ± 0.4	5.09	150	2480	17	36	12 561 218
5G4	2.46	3.95	14.0 ± 0.4	5.09	150	2480	17	36	12 567 596
6x4	2.46	3.95	15.8 ± 0.5	5.09	150	3448	21	46	85 121 117
7x4	2.46	3.95	17.0 ± 0.5	5.09	150	3860	24	52	84 116 268
10x4	2.46	3.95	19.4 ± 0.5	5.09	150	4310	35	68	12 583 215



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Cable type 1) n x mm ²	Conductor nom. Dia. mm	Core dia. 2) nom. mm	Cable dia. mm	R ₂₀ ³⁾ max. Ω/km	C' ⁴⁾ nom. pF/m	Fireload nom. kJ/m	Weight nom.		H+S Part No.
							Copper	Cable kg/100m	
2x6	2.93	4.70	12.1 ± 0.4	3.39	150	2035	10	26	12 567 458
3x6	2.93	4.70	12.9 ± 0.4	3.39	150	2220	16	32	12 561 824
4x6	2.93	4.70	14.6 ± 0.4	3.39	150	2630	21	42	12 561 080
4G6	2.93	4.70	14.6 ± 0.4	3.39	150	2630	21	42	12 567 536
5x6	2.93	4.70	16.8 ± 0.5	3.39	150	3520	26	53	12 564 572
5G6	2.93	4.70	16.8 ± 0.5	3.39	150	3520	26	53	12 567 454
7x6	2.93	4.70	20.3 ± 0.5	3.39	150	5405	36	77	12 581 318
2x10	3.89	5.85	14.6 ± 0.4	1.95	150	2875	18.4	39	85 017 208
3x10	3.89	5.85	16.0 ± 0.5	1.95	150	3280	27	51	12 561 825
4x10	3.89	5.85	17.9 ± 0.5	1.95	150	3895	36	66	12 561 561
4G10	3.89	5.85	17.9 ± 0.5	1.95	150	3895	36	66	12 567 616
5G10	3.89	5.85	19.8 ± 0.5	1.95	150	4765	45	82	12 567 455
2x16	5.30	7.25	18.0 ± 0.5	1.24	150	4700	28	60	85 064 649
3x16	5.30	7.25	19.5 ± 0.5	1.24	150	4750	41	75	12 566 137
4x16	5.30	7.25	22.1 ± 0.5	1.24	150	6165	54	101	12 561 826
4G16	5.30	7.25	22.1 ± 0.5	1.24	150	6165	54	101	12 567 456
5x16	5.30	7.25	24.3 ± 0.5	1.24	150	6780	68	118	84 126 032
6x16	5.30	7.25	27.3 ± 0.6	1.24	150	8990	82	146	84 104 017
6G16	5.30	7.25	27.3 ± 0.6	1.24	150	8990	82	146	85 098 571
3x25	6.60	8.90	23.8 ± 0.5	0.795	150	6190	62	112	12 565 118
5G25	6.60	8.90	29.8 ± 0.6	0.795	150	10313	105	179	85 010 213
2x35	7.80	10.2	24.7 ± 0.5	0.565	150	7995	61	115	84 104 053
4G35	7.80	10.2	30.3 ± 0.5	0.565	150	10440	121	192	12 567 457
3x50+ 3G10	9.3 3.89	11.9 5.85	30.8 ± 0.6	0.393 1.95	150	10390	130	231	85 016 273
4G50	9.3	11.9	34.8 ± 0.6	0.393	150	13480	174	265	85 016 109



Traction cable

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Colours:

Cable type 1) n x mm ²	Conductor D _{nom} mm	Core colours	Core dia. 2) nom. mm	Cable dia. mm	R ₂₀ 3) max Ω/km	C' 4) nom. pF/m	Fireload kJ/m	Weight nom.		H + S Part No.
								Copper	Cable kg/100m	
3V1.5	1.52	bk/bu/gnye	2.70	8.0 ± 0.3	13.7	120	740	3.9	11	12 584 076
4V4	2.54	bk/bn/bu/gnye	3.95	12.4 ± 0.4	5.09	150	1630	15	29	12 565 993
4V6	3.10	bk/bn/bu/gnye	4.70	14.6 ± 0.4	3.39	150	2440	23	42	12 565 994
3V10	4.10	bk/bn/bu	5.85	16.0 ± 0.5	1.95	150	2770	27	51	12 565 995
4V10	4.10	bk/bn/bu/bk	5.85	17.9 ± 0.5	1.95	150	3560	38	66	12 565 996
2V16	5.30	rd/bk	7.25	18.0 ± 0.5	1.24	150	4694	27	59	85 066 504
4V16	5.30	bu/bn/bk/bk	7.25	22.1 ± 0.5	1.24	150	6165	54	101	12 585 843
4V16	5.30	bk/bn/bu/gnye	7.25	22.1 ± 0.5	1.24	150	6165	54	101	12 584 075
6V50+ (4X2.5)	9.30	rd 5+6/ bu7+8/wh9+10 gy 1-4	9.3	42.2 ± 0.6	1.24	150	21690	277	425	85 063 502
	1.95		3.3		8.21						130

- 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, core/core