Traction cable
RADOX GKW-LW 600V MM

Product description:

RADOX GKW-LW 600V MM	Multicore cables, unscreened
Nominal voltage:	600 / 1000 V AC
Hazard level:	M (extra low temperature, extra oil and extra fuel resistant)

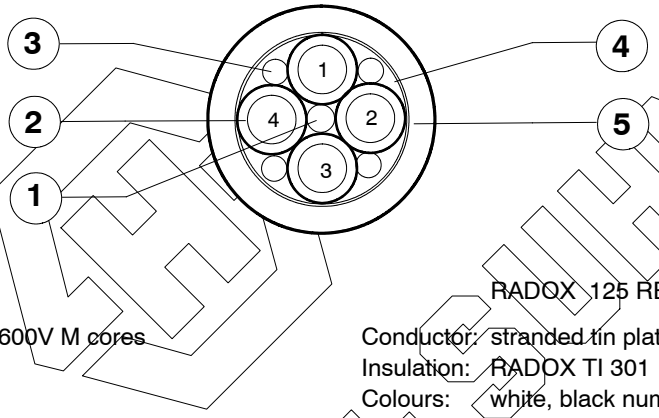
General features:

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

General composition of cable:



1.	Centre (optional)	RADOX 125 REC
2.	RADOX GKW-LW 600V M cores	Conductor: stranded tin plated copper, acc. to EN 50306-2 Insulation: RADOX TI 301 Colours: white, black numbered greenyellow (optional)
3.	Filler (optional)	RADOX 125 REC
4.	Separator	Tape
5.	Sheath	RADOX EM 104, acc. to EN 50264-1 Colour: black, yellow marked

Marking:

$mm^{2:}$	HUBER+SUHNER RADOX GKW-LW 600V nX[cross section] MM [part. no. + batch. no.]
AWG:	HUBER+SUHNER RADOX GKW-LW 600V nX[cross section] (..AWG) MM [part. no. + batch. no.]

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
		8400	V DC
Temperature range		- 50 ... + 120	°C
Min. bending radius			
fixed installation		D ≤ 12 mm	3 x D
		D > 12 mm	4 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 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.

The cables are in conformity with:

Fire protection on railway vehicles, category	**Ia, Ib, II**	**BS 6853, GM/RT 2130**
Vertical flame spread	50 < L ≤ 540 mm	EN 60332-1-2
Vertical flame spread, bunched	L ≤ 2.5 m	EN 50266, BS 6853 An. D.8.7
Smoke density	A_0 ≤ BS 6853	BS 6853 An. D.8.7
Toxicity	R ≤ 1.0	BS 6853 An. B.1
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 / 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
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	PSRR ≤ 0.40 m^2/s TSR ≤ 150 m^2	UL 1685, 12 (FT4 exp.)

Requirement of hazard level code M	(acc. 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

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Applicable documents :

H+S : 563078 (e) : Current rating for multicore cables

H+S : 554550 (e) : Technical Datasheet RADOX GKW-LW 600V M (cores)

H+S : DOC - 0000406988 : Technical Specification RADOX GKW-LW 600V Multi core cables screened and unscreened

Cable type n x mm²	**Conductor** Dia.nom. mm	**Core** Dia.nom. mm	**Cable Dia.** mm	**R_{20}** max. Ω/km	**C'** nom. pF/m	**Fireload** nom. kJ/m	**Weight nom.** Copper kg / 100m	Cable kg / 100m	**H+S** Part No.
2 x 0.5	0.88	1.30	4.0 ± 0.2	40.1	105	245	1.0	2.7	12 556 756
3 x 0.5	0.88	1.30	4.2 ± 0.2	40.1	105	265	1.4	3.1	12 556 757
4 x 0.5	0.88	1.30	4.5 ± 0.2	40.1	105	305	1.9	3.7	12 556 758
5 x 0.5	0.88	1.30	5.0 ± 0.2	40.1	105	375	2.3	4.6	12 556 759
5 G 0.5	0.88	1.30	5.0 ± 0.2	40.1	105	375	2.3	4.6	12 562 757
6 x 0.5	0.88	1.30	5.4 ± 0.2	40.1	105	440	2.8	5.3	12 556 760
7 x 0.5	0.88	1.30	5.8 ± 0.3	40.1	105	515	3.2	6.2	12 556 761
9 x 0.5	0.88	1.30	6.7 ± 0.3	40.1	105	600	4.2	7.6	12 561 299
10 x 0.5	0.88	1.30	6.7 ± 0.3	40.1	105	595	4.6	7.9	12 556 762
12 x 0.5	0.88	1.30	6.9 ± 0.3	40.1	105	660	5.5	9.0	12 556 763
15 x 0.5	0.88	1.30	7.8 ± 0.3	40.1	105	865	6.9	11.5	12 561 300
16 x 0.5	0.88	1.30	7.8 ± 0.3	40.1	105	860	7.4	11.9	12 556 764
24 x 0.5	0.88	1.30	9.5 ± 0.3	40.1	105	1145	11.1	16.9	12 556 766
25 x 0.5	0.88	1.30	9.5 ± 0.3	40.1	105	1175	11.5	17.1	12 561 301
36 x 0.5	0.88	1.30	11.2 ± 0.4	40.1	105	1710	16.6	24.7	12 556 811

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2 x 0.75	1.09	1.52	4.4 ± 0.2	26.7	110	290	1.4	3.4	12 556 767
3 x 0.75	1.09	1.52	4.6 ± 0.2	26.7	110	310	2.1	4.1	12 556 768
3 G 0.75	1.09	1.52	4.6 ± 0.2	26.7	110	310	2.1	4.1	12 562 758
4 x 0.75	1.09	1.52	5.0 ± 0.2	26.7	110	355	2.8	5.0	12 556 769
5 x 0.75	1.09	1.52	5.7 ± 0.3	26.7	110	460	3.5	6.3	12 556 770
5 G 0.75	1.09	1.52	5.7 ± 0.3	26.7	110	460	3.5	6.3	12 562 262
6 x 0.75	1.09	1.52	6.0 ± 0.3	26.7	110	520	4.3	7.2	12 556 771
7 x 0.75	1.09	1.52	6.8 ± 0.3	26.7	110	675	5.0	8.9	12 556 772
9 x 0.75	1.09	1.52	7.7 ± 0.3	26.7	110	755	6.4	10.7	12 581 701
9 G 0.75	1.09	1.52	7.7 ± 0.3	26.7	110	755	6.4	10.7	12 581 833
10 x 0.75	1.09	1.52	7.7 ± 0.3	26.7	110	750	7.1	11.3	12 556 773
12 x 0.75	1.09	1.52	7.9 ± 0.3	26.7	110	820	8.5	12.8	12 556 673
14 x 0.75	1.09	1.52	8.4 ± 0.3	26.7	110	937	9.9	14.8	12 561 830
16 x 0.75	1.09	1.52	9.0 ± 0.3	26.7	110	1082	11.3	16.9	12 556 774
18 x 0.75	1.09	1.52	9.4 ± 0.3	26.7	110	1200	12.7	18.8	12 556 775
20 x 0.75	1.09	1.52	10.2 ± 0.4	26.7	110	1400	14.2	21.1	12 561 831
24 x 0.75	1.09	1.52	11.1 ± 0.4	26.7	110	1485	17.0	24.7	12 556 776

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Cable type n x mm²	Conductor Dia.nom. mm	Core Dia.nom. mm	Cable Dia. mm	R_{20} max. Ω/km	C' nom. pF/m	Fireload nom. kJ/m	Weight nom. Copper kg / 100m	Weight nom. Cable kg / 100m	H+S Part No.
2 x 1	1.23	1.67	4.7 ± 0.2	20.0	115	320	1.8	4.1	12 556 777
3 x 1	1.23	1.67	5.0 ± 0.2	20.0	115	350	2.7	5.0	12 556 778
4 x 1	1.23	1.67	5.5 ± 0.2	20.0	115	405	3.6	6.1	12 556 779
5 x 1	1.23	1.67	6.0 ± 0.3	20.0	115	500	4.5	7.5	12 556 780
5 G 1	1.23	1.67	6.0 ± 0.3	20.0	115	500	4.5	7.5	12 563 051
6 x 1	1.23	1.67	6.6 ± 0.3	20.0	115	605	5.4	9.0	12 556 781
7 x 1	1.23	1.67	7.3 ± 0.3	20.0	115	750	6.3	10.7	12 556 475
12 x 1	1.23	1.67	8.6 ± 0.3	20.0	115	920	10.9	15.8	12 556 783
16 x 1	1.23	1.67	9.6 ± 0.3	20.0	115	11700	14.5	20.5	12 556 784
20 x 1	1.23	1.67	11.2 ± 0.4	20.0	115	1600	18.1	26.6	12 556 476
22 x 1	1.23	1.67	11.6 ± 0.4	20.0	115	1680	20.0	27.0	12 583 631
36 x 1	1.23	1.67	14.0 ± 0.4	20.0	115	2365	32.7	44.1	12 556 817

Cross section [1mm2] correspond to 18 AWG

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2 x 1.5	1.49	2.04	5.4 ± 0.3	13.7	120	420	2.7	5.7	12 556 786
3 x 1.5	1.49	2.04	5.8 ± 0.3	13.7	120	465	4.1	7.2	12 555 404
3 G 1.5	1.49	2.04	5.8 ± 0.3	13.7	120	465	4.1	7.2	12 559 973
4 x 1.5	1.49	2.04	6.5 ± 0.3	13.7	120	570	5.4	9.1	12 556 787
4 G 1.5	1.49	2.04	6.5 ± 0.3	13.7	120	570	5.4	9.1	12 562 759
5 x 1.5	1.49	2.04	7.2 ± 0.3	13.7	120	705	6.7	11.2	12 555 405
5 G 1.5	1.49	2.04	7.2 ± 0.3	13.7	120	705	6.7	11.2	12 559 974
6 x 1.5	1.49	2.04	7.9 ± 0.3	13.7	120	855	8.1	13.5	12 556 788
6 G 1.5	1.49	2.04	7.9 ± 0.3	13.7	120	855	8.1	13.5	12 563 990
7 x 1.5	1.49	2.04	8.4 ± 0.3	13.7	120	1000	9.4	15.6	12 556 789
7 G 1.5	1.49	2.04	8.4 ± 0.3	13.7	120	1000	9.4	15.6	12 559 975
8 x 1.5	1.49	2.04	9.3 ± 0.3	13.7	120	1235	10.7	18.4	12 559 717
10 x 1.5	1.49	2.04	10.0 ± 0.3	13.7	120	1180	13.5	20.9	12 556 791
10 G 1.5	1.49	2.04	10.0 ± 0.3	13.7	120	1180	13.5	20.9	12 566 521
12 x 1.5	1.49	2.04	10.4 ± 0.4	13.7	120	1330	16.1	24.4	12 555 406
14 x 1.5	1.49	2.04	11.1 ± 0.4	13.7	120	1530	18.8	28.5	12 562 572
16 x 1.5	1.49	2.04	11.7 ± 0.4	13.7	120	1705	21.5	31.7	12 556 792
18 x 1.5	1.49	2.04	12.5 ± 0.4	13.7	120	1950	24.2	36.0	12 556 793
24 x 1.5	1.49	2.04	14.5 ± 0.4	13.7	120	2325	32.2	46.6	12 556 818
25 G 1.5	1.49	2.04	14.6 ± 0.4	13.7	120	2430	33.6	48.3	12 564 477
30 x 1.5	1.49	2.04	15.7 ± 0.5	13.7	120	2870	40.3	56.9	12 556 820
36 G 1.5	1.49	2.04	17.1 ± 0.5	13.7	120	3490	48.4	69.0	12 568 635
36 x 1.5	1.49	2.04	17.1 ± 0.5	13.7	120	3490	48.4	69.0	12 555 408
50 x 1.5	1.49	2.04	20.1 ± 0.5	13.7	120	4565	69	93.6	12 565 315

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Cable type n x mm²	Conductor Dia.nom. mm	Core Dia.nom. mm	Cable Dia. mm	R_{20} max. Ω/km	C' nom. pF/m	Fireload nom. kJ/m	Weight nom. Copper kg / 100m	Weight nom. Cable kg / 100m	H+S Part No.
2 x 2.5	1.93	2.54	6.6 ± 0.3	8.21	125	630	4.4	8.5	12 556 794
3 x 2.5	1.93	2.54	7.0 ± 0.3	8.21	125	690	6.6	10.5	12 556 415
3 G 2.5	1.93	2.54	7.0 ± 0.3	8.21	125	690	6.6	10.5	12 564 478
4 x 2.5	1.93	2.54	7.9 ± 0.3	8.21	125	865	8.8	13.5	12 556 795
4 G 2.5	1.93	2.54	7.9 ± 0.3	8.21	125	865	8.8	13.5	12 562 760
5 G 2.5	1.93	2.54	8.8 ± 0.3	8.21	125	1060	11.0	16.7	12 567 459
6 x 2.5	1.93	2.54	9.6 ± 0.3	8.21	125	1265	13.2	19.8	12 556 797
7 x 2.5	1.93	2.54	10.5 ± 0.4	8.21	125	1575	15.4	23.7	12 556 798
7 G 2.5	1.93	2.54	10.5 ± 0.4	8.21	125	1575	15.4	23.7	12 566 649
10 x 2.5	1.93	2.54	12.3 ± 0.4	8.21	125	1790	22.0	31.0	12 556 800
12 x 2.5	1.93	2.54	12.6 ± 0.4	8.21	125	1975	26.3	35.7	12 556 416
16 x 2.5	1.93	2.54	14.5 ± 0.4	8.21	125	2645	35.1	47.6	12 556 801
18 x 2.5	1.93	2.54	15.4 ± 0.5	8.21	125	3005	39.5	53.7	12 556 802
20 x 2.5	1.93	2.54	16.2 ± 0.5	8.21	125	3355	43.9	59.5	12 562 080
25 x 2.5	1.93	2.54	18.2 ± 0.5	8.21	125	3915	54.8	72.4	12 556 803
25 G 2.5	1.93	2.54	18.2 ± 0.5	8.21	125	3915	54.8	72.4	12 568 634
33 x 2.5	1.93	2.54	20.1 ± 0.5	8.21	125	4760	72.4	93.2	12 563 721
35 x 2.5	1.93	2.54	21.1 ± 0.5	8.21	125	5370	76.7	101	12 562 081

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AWG- cross sections:

Cable type n x mm²	Conductor Dia.nom. mm	Core Dia.nom. mm	Cable Dia. mm	R_{20} max. Ω/km	C' nom. pF/m	Fireload nom. kJ/m	Weight nom. Copper kg / 100m	Weight nom. Cable kg / 100m	H+S Part No.
3 x 0.4	0.76	1.18	4.2 ± 0.3	54.7	110	268	1.1	2.9	84 134 931
2 x 2	1.7	2.29	6.1 ± 0.3	10.3	180	498	3.8	6.5	12 566 059

Cores : Core details according to H+S Datasheet 554550

R_{20} : Conductor resistance according to EN 50306-2

C': Capacity per unit length, core/core

AWG cross sections:
0.4 = 22 AWG
0.6 = 20 AWG
1.0 = 18 AWG
1.2 = 16 AWG

Legend:
G : green-yellow core
V : various colours