



Traction cable

RADOX 4 GWK-AX 1800V M FR

Product description:

RADOX 4 GWK-AX 1800V M FR Single core cables with reduced wall thickness with flame barrier
 Nominal voltage: 1800 / 3000 V AC
 Hazard level: M (extra low temperature, extra oil and extra fuel resistant)

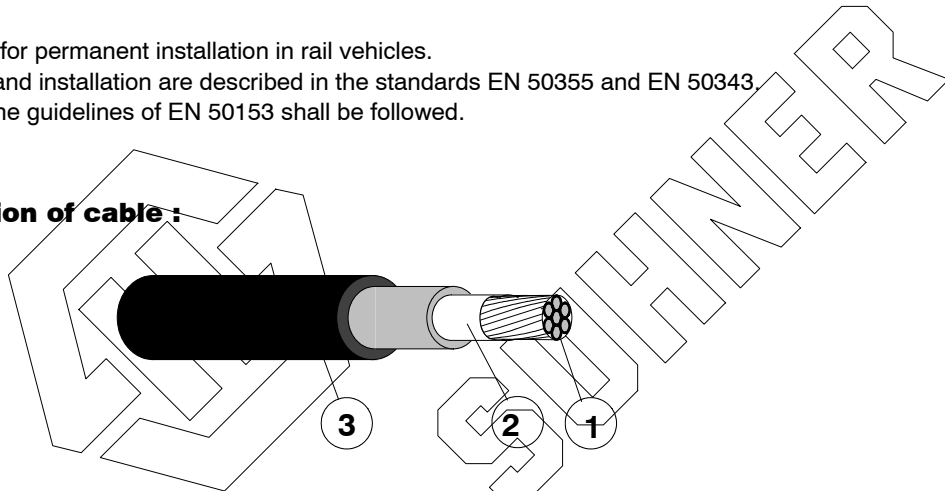
General Properties :

Halogen free, electron- beam cross- linked cables with improved behaviour in case of fire and maintains circuit integrity, easy to strip, soldering 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.
 For unscreened cables the guidelines of EN 50153 shall be followed.

General composition of cable :



- 1. Conductor : stranded tin plated copper, acc. to EN 60228 cl. 5
 - 2. Flame barrier: MICA - tape
 - 3. Insulation : inner layer RADOX EI 110, colour: white
 outer layer RADOX EK 109, colour : black
- Cable marking : HUBER+SUHNER RADOX 4 GWK-AX 1800V 1X[cross section] M FR [part No. + batch No.]

Technical Data :

Voltage rating cond.- earth	U ₀	1800	V AC
Voltage rating cond.- cond.	U	3000	V AC
maximum permissible Voltage rating AC cond.- earth		2100	V AC
maximum permissible Voltage rating AC cond.- cond.	U _m	3600	V AC
maximum permissible Voltage rating DC cond.- earth	V ₀	2700	V DC
maximum permissible Voltage rating DC cond.- cond.		4500	V DC
Test voltage.		6500	V AC
Temperature range		- 50 ... + 120	°C

Min. bending radius
 Fixed installation D ≤ 12 mm 3 x D
 D > 12 mm 4 x D

Copyright 2015 HUBER+SUHNER AG. This document may not be amended and its content is confidential. It may not be passed on to third party which are not bound by confidentiality.

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 AG
 Low Frequency Division
 CH- 8330 Pfäffikon
 +41 (0)44 952 22 11
 +41 (0)44 952 26 40
www.hubersuhner.com



Traction cable

RADOX 4 GKW-AX 1800V M FR

Conditions:

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 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 cores are in conformity with:

Isolation receipt in the case of fire

Resistance to fire with mechanical shock, $D > 20$ mm 30 Min / 1030 V AC EN 50362
Resistance to fire with mechanical shock, $D \leq 20$ mm 30 Min / 1030 V AC EN 50200

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, $D \leq 6$ mm $L \leq 1.5$ m EN 50305, 9.1.2
Vertical flame spread, bunched, $6 < D < 12$ mm $L \leq 2.5$ m EN 50305, 9.1.1 (EN 60332-3-25)
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, $D \leq 6$ mm $L \leq 1.5$ m EN 50305, 9.1.2
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 $pH \geq 4.3, C \leq 10 \mu S/mm$ 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 $ITC \leq 3$ EN 50305, 9.2

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, $D \leq 6$ mm $L \leq 1.5$ m EN 50305, 9.1.2
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 $pH \geq 4.3, C \leq 10 \mu S/mm$ EN 50267-2-2
Amount of halogen acid gas $HCl + HBr \leq 0.5$ % EN 50267-2-1
Toxicity $ITC \leq 3$ 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°

Applicable documents :

EN 50355 Guide to use
H+S 557 578 Current rating for single core cables
Doc.No. 0000383094 Technical Specification RADOX 4 GKW-AX 1800V M FR



Traction cable

RADOX 4 GW-AX 1800V M FR

Table :

Cross section mm ²	Conductor nom		Cable dia. mm	R ₂₀ ¹⁾ max Ω / km	C _{H2O} ²⁾ nom pF/m	Fireload nom kJ / m	Weight nom		H+S Part. Nr.
	construction n x mm	D mm					copper	cable	
1.5	37x0.23	1.50	3.8±0.10	13.7	249	199	1.3	2.8	12 552 226
2.5	61x0.23	1.95	4.3±0.15	8.21	289	240	2.2	4	12 559 357
4	61x0.29	2.40	4.95±0.15	5.09	330	304	3.5	5.7	12 552 871
6	84x0.30	2.95	5.50±0.15	3.39	362	367	5.2	7.8	12 559 772
10	80x0.40	3.90	6.80±0.15	1.95	417	519	9.1	12.7	12 552 228
16	119x0.40	5.30	8.60±0.20	1.24	485	849	13.5	19.4	12 555 388
25	182x0.40	6.60	10.2±0.2	0.795	553	1124	20.7	28.6	12 559 773
35	266x0.40	7.80	11.7±0.2	0.565	595	1446	30.3	40.2	12 560 644
50	378x0.40	9.30	13.8±0.25	0.393	611	1994	43.0	56.6	12 560 645
70	348x0.50	11.4	15.8±0.25	0.277	737	2288	61.2	76.7	12 552 873
95	444x0.50	12.9	17.6±0.3	0.210	788	2740	78.1	96.8	12 560 646
120	570x0.50	14.9	20.2±0.3	0.164	788	3496	100.2	123.7	12 552 230
150	722x0.50	16.8	22.4±0.3	0.132	831	4175	127	154.8	12 562 955
185	874x0.50	18.3	24.3±0.3	0.108	844	4885	153.7	186.1	12 584 028
240	1147x0.50	21.1	27.3±0.4	0.0817	946	5436	201.7	238.7	84 131 740
300*	1443x0.50	23.7	30.3±0.4	0.0654	985	6570	253.8	297.7	85 009 365

1) conductor resistance according to EN 60228

2) capacity in water

* The fire safety certifications are not available yet. Once the products are manufactured for the first time, the product will be tested in accredited laboratories against the railway vehicle fire safety standards which have to be agreed with the customer.