Top Cable

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POWERFLEX RV-K 0,6/1 kV

1. Object

This document defines the design and manufacturing characteristics of the cable type RV-K manufactured by Top Cable.

2. Design

This type of cable is designed, manufactured and tested according to IEC 60502 and UNE 21123-2.

Approvals available:

AENOR

KEMA-KEUR (Holland)

BUREAU VERITAS

SASO (Saudi Arabia)

3. Applications

Flexible cable for fixed installations. Suitable for transport and distribution of electric power. Suitable for open air and buried installations. This cable is manufactured with flexible conductors in order to facilitate installations with sinuous courses.

4. Characteristics

Nominal voltage: 0,6/1 kV

Maximum conductor temperature: 90 ºC

Minimum operating temperature: -40 °C (static, with protection)

Minimum installation and handling temperature: 0 °C

Maximum short-circuit temperature: 250 °C. (maximum 5 s.)

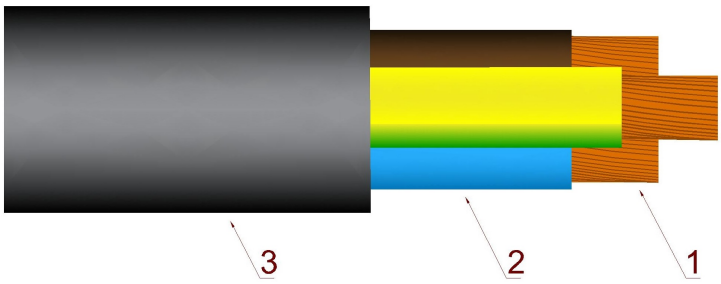
Minimum bending radius (static): 5 x cable Ø

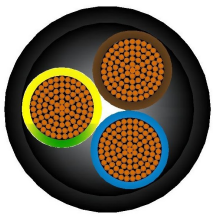
No flame propagation: according to EN 60332-1/ IEC 60332-1

Reaction to fire CPR: Eca according to EN 50575

POWERFLEX RV-K 0,6/1 kV

5. General make-up of the cable





5.1 Conductor (1)

Electrolytic annealed copper conductor, class 5 according to IEC 60228.

5.2 Insulation (2)

Cross-linked polyethylene insulation, type DIX-3 according to HD 603 and type XLPE according to IEC 60502-1.

The standard identification, according to HD 308, is the following:

- 1 x.....natural
- 2 x.....blue + brown
- 3 G.....blue + brown + green/yellow
- 3 x.....brown + black + grey
- 3 x + 1 x.....brown + black + grey + blue (reduced cross section)
- 4 G.....brown + black + grey + green/yellow
- 4 x.....brown + black + grey + blue
- 5 G.....brown + black + grey + green/yellow + blue

5.3 Assembly of cores

The cores are twisted together.

5.4 Outer sheath (3)

Flexible PVC outer sheath, type DMV-18 according to HD 603 and type ST2 according to IEC 60502-1. Black colour.

6.- Current-carrying capacities

6.1 Nominal current-carrying capacities

Table 1 shows the current-carrying capacities and voltage drop detailed for every cable.

Current-carrying capacities, in amperes, are calculated according to IEC 60364-5-52 and for the following conditions:

- Open air installation: one cable with adequate ventilation and ambient temperature of 30 °C, supported by cleats and hangers or on perforated tray (reference method F for single-core and E for multicore cables).
- Buried installation: one cable in a duct or direct buried at depth of 0,7 m, with soil thermal resistivity of 2,5 K·m/W, and 20 °C of ground temperature (reference method D).
- For cables having 2 and 3 conductors up to 10 mm^2, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

For conditions other than this apply the adequate correction factors (point 6.3).

Voltage drop is the maximum that may occur. It is calculated for the maximum service temperature and for cos φ= 1.

nº x Section (mm^2)	Open Air Int. (A)	Buried Int. (A)	Voltaje drop (V/A·km)	nº x Section (mm^2)	Open Air Int. (A)	Buried Int. (A)	Voltaje drop (V/A·km)
1 x 1,5	23	23	29,5	1 x 185	510	324	0,235
1 x 2,5	29	30	17,7	1 x 240	607	375	0,178
1 x 4	40	39	11,0	1 x 300	703	419	0,142
1 x 6	53	49	7,32	1 x 400	823	473	0,108
1 x 10	74	65	4,23	1 x 500	946	535	0,085
1 x 16	101	84	2,68	1 x 630	1.088	604	0,064
1 x 25	135	107	1,73	2 x 1,5	26	26	34,0
1 x 35	169	129	1,23	2 x 2,5	36	34	20,4
1 x 50	207	153	0,86	2 x 4	49	44	12,7
1 x 70	268	188	0,603	2 x 6	63	56	8,45
1 x 95	328	226	0,457	2 x 10	86	73	4,89
1 x 120	383	257	0,357	2 x 16	115	95	3,10
1 x 150	444	287	0,286	2 x 25	149	121	1,99

POWERFLEX RV-K 0,6/1 kV

nº x Section (mm^2)	Open Air Int. (A)	Buried Int. (A)	Voltaje drop (V/A·km)	nº x Section (mm^2)	Open Air Int. (A)	Buried Int. (A)	Voltaje drop (V/A·km)
2 x 35	185	146	1,42	4 G 2,5	32	29	17,7
2 x 50	225	173	0,99	4 G 4	42	37	11,0
2 x 70	289	213	0,694	4 G 6	54	46	7,32
3 G 1,5	26	26	34,0	4 G 10	75	61	4,23
3 G 2,5	36	34	20,4	4 x 16	100	79	2,68
3 G 4	49	44	12,7	4 x 25	127	101	1,73
3 G 6	63	56	8,45	4 x 35	158	122	1,23
3 G 10	86	73	4,89	4 x 50	192	144	0,860
3 x 16	100	79	2,68	4 x 70	246	178	0,603
3 x 25	127	101	1,73	4 x 95	298	211	0,457
3 x 35	158	122	1,23	4 x 120	346	240	0,357
3 x 50	192	144	0,860	4 x 150	399	271	0,286
3 x 70	246	178	0,603	4 x 185	456	304	0,235
3 x 95	298	211	0,457	4 x 240	538	351	0,178
3 x 120	346	240	0,357	5 G 1,5	23	22	29,5
3 x 150	399	271	0,286	5 G 2,5	32	29	17,7
3 x 185	456	304	0,235	5 G 4	42	37	11,0
3x16+1x10	100	79	2,68	5 G 6	54	46	7,32
3x25+1x16	127	101	1,73	5 G 10	75	51	4,23
3x35+1x16	158	122	1,23	5 G 16	100	79	2,68
3x50+1x25	192	144	0,860	5 G 25	127	101	1,73
3x70+1x35	246	178	0,603	5 G 35	158	122	1,23
3x95+1x50	298	211	0,457	5 G 50	192	144	0,860
3x120+1x70	346	240	0,357	5 G 70	246	178	0,603
3x150+1x70	399	271	0,286	5 G 95	298	211	0,457
3x185+1x95	456	304	0,235	5 G 120	346	240	0,357
3x240+1x120	538	351	0,178	5 G 150	399	271	0,286
3 x 300	621	396	0,142	5 G 185	456	304	0,235
4 G 1,5	23	22	29,5	5 G 240	538	351	0,178

Table 1

6.2 Short-circuit current-carrying capacities

The maximum short-circuit current that a cable can withstand depend on the time of reaction of the protection elements installed in the line. The maximum current-carrying capacity in a short-circuit accident, for a specific type of cable, is the result of multiplying the cross section of the cable for the values shown in table 2. These values are taken from IEC 949.

Time (s)	0,1	0,2	0,3	0,5	1	1,5	2	2,5	3
A/mm^2	452	320	261	202	143	117	101	90	83

Table 2

6.3 Correction factors.

The current-carrying capacities must be multiplied with the adequate correction factor when the installation conditions differs from point 6.1

Correction factors for air temperature other than 30 °C.

Air T. (ºC)	20	25	30	35	40	45	50	55	60
Factor	1,08	1,04	1	0,96	0,91	0,87	0,82	0,76	0,71

Table 3

Correction factors for ground temperature other than 20 °C.

Ground T. (ºC)	10	15	20	25	30	35	40	45	50
Factor	1,07	1,04	1	0,96	0,93	0,89	0,85	0,80	0,76

Table 4

Correction factors for soil thermal resistivity, that depends on damp, other than 2,5 K·m/W.

Moisture degree of soil	Very damp	Slightly damp	Slightly dry	Dry	Very dry
Thermal Resist. (K·m/W)	1	1,5	2,0	2,5	3,0
Factor	1,18	1,1	1,05	1	0,96

Table 5

POWERFLEX RV-K 0,6/1 kV

7. Dimensions

Table 6 shows diameter and weight detailed for every cable.

nº x Section (mm^2)	Diameter (mm)	Weight (kg/km)
1 x 1,5	5,7	45
1 x 2,5	6,2	55
1 x 4	6,7	70
1 x 6	7,3	90
1 x 10	8,2	135
1 x 16	9,2	190
1 x 25	11,0	285
1 x 35	12,1	385
1 x 50	13,8	520
1 x 70	15,7	715
1 x 95	17,6	925
1 x 120	19,2	1.165
1 x 150	21,5	1.450
1 x 185	23,9	1.750
1 x 240	26,9	2.280
1 x 300	29,6	2.830
1 x 400	33,8	3.735
1 x 500	37,4	4.780
1 x 630	42,7	6.280
2 x 1,5	8,2	90
2 x 2,5	9,2	120
2 x 4	10,3	165
2 x 6	11,3	215
2 x 10	13,2	320
2 x 16	14,9	450
2 x 25	20,8	810
2 x 35	22,0	1.000
2 x 50	25,7	1.375

nº x Section (mm^2)	Diameter (mm)	Weight (kg/km)
2 x 70	29,5	1.880
3 G 1,5	8,9	110
3 G 2,5	9,8	145
3 G 4	11,0	200
3 G 6	12,1	265
3 G 10	14,3	405
3 x 16	16,4	595
3 x 25	20,7	955
3 x 35	23,1	1.275
3 x 50	26,8	1.750
3 x 70	29,6	2.370
3 x 95	35,0	3.140
3 x 120	39,8	4.115
3 x 150	44,7	5.130
3 x 185	49,9	6.285
3x16+1x10	17,6	700
3x25+1x16	22,7	1.140
3x35+1x16	25,0	1.480
3x50+1x25	29,1	2.050
3x70+1x35	33,8	2.850
3x95+1x50	38,2	3.700
3x120+1x70	42,1	4.750
3x150+1x70	46,8	5.800
3x185+1x95	53,5	7.200
3x240+1x120	58,5	9.100
3 x 300	62,3	10.100
4 G 1,5	9,7	130
4 G 2,5	10,7	175

POWERFLEX RV-K 0,6/1 kV

nº x Section (mm^2)	Diameter (mm)	Weight (kg/km)
4 G 4	12,0	245
4 G 6	13,4	330
4 G 10	15,7	505
4 x 16	18,2	750
4 x 25	24,1	1.245
4 x 35	26,3	1.675
4 x 50	31,3	2.315
4 x 70	36,1	3.205
4 x 95	40,2	4.130
4 x 120	44,6	5.245
4 x 150	49,8	6.575
4 x 185	56,1	8.050
4 x 240	64.5	10.695
5 G 1,5	10,4	155

nº x Section (mm^2)	Diameter (mm)	Weight (kg/km)
5 G 2,5	11,6	215
5 G 4	13,2	300
5 G 6	14,7	405
5 G 10	17,1	625
5 G 16	20,2	935
5 G 25	26,6	1.555
5 G 35	29,3	2.080
5 G 50	34,5	2.895
5 G 70	38,7	3.930
5 G 95	44,6	5.190
5 G 120	49,7	6.560
5 G 150	55,6	8.145
5 G 185	62,5	9.975
5 G 240	71,8	13.210

Table 6