Top Cable

Rev.15 20 - October - 2014

Issued: J. Arjona Morente

Approved: F. Díaz Rubio

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)

GOST-R Certificate (Russian)

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 EN 60332-1/IEC 60332-1

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.

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

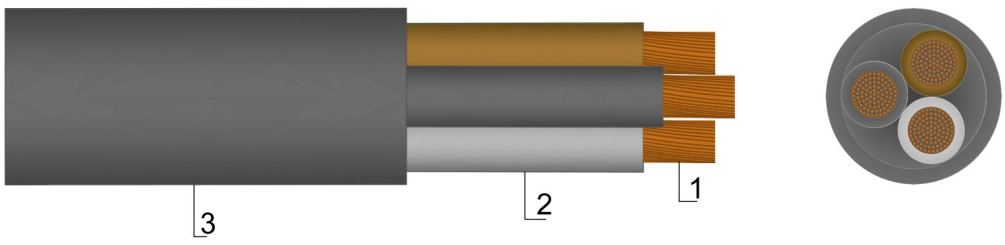
5.3 Assembly of cores.

The cores are twisted together.

5.4 Outer sheath (3).

Flexible PVC outer sheath, type DMV-18 according to HD 603; black colour.

5.5 Diagram representation



POWERFLEX RV-K 0,6/1 kV

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 $\varphi = 1$.

nº x Section (mm^2)	Open Air Int. (A)	Buried Int. (A)	Voltaje drop (V/A·km)
1 x 1,5	23	22	29,5
1 x 2,5	29	29	17,7
1 x 4	40	37	11,0
1 x 6	53	46	7,32
1 x 10	74	61	4,23
1 x 16	101	79	2,68
1 x 25	135	101	1,73
1 x 35	169	122	1,23
1 x 50	207	144	0,86
1 x 70	268	178	0,603
1 x 95	328	211	0,457
1 x 120	383	240	0,357
1 x 150	444	271	0,286

nº x Section (mm^2)	Open Air Int. (A)	Buried Int. (A)	Voltaje drop (V/A·km)
1 x 185	510	304	0,235
1 x 240	607	351	0,178
1 x 300	703	396	0,142
1 x 400	823	464	0,108
1 x 500	946	525	0,085
1 x 630	1.088	596	0,064
2 x 1,5	26	26	34,0
2 x 2,5	36	34	20,4
2 x 4	49	44	12,7
2 x 6	63	56	8,45
2 x 10	86	73	4,89
2 x 16	115	95	3,10
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)
2 x 35	185	146	1,42
2 x 50	225	173	0,99
2 x 70	289	213	0,694
3 G 1,5	26	26	34,0
3 G 2,5	36	34	20,4
3 G 4	49	44	12,7
3 G 6	63	56	8,45
3 G 10	86	73	4,89
3 x 16	100	79	2,68
3 x 25	127	101	1,73
3 x 35	158	122	1,23
3 x 50	192	144	0,860
3 x 70	246	178	0,603
3 x 95	298	211	0,457
3 x 120	346	240	0,357
3 x 150	399	271	0,286
3 x 185	456	304	0,235
3 x 16 + 1 x 10	100	79	2,68
3 x 25 + 1 x 16	127	101	1,73
3 x 35 + 1 x 16	158	122	1,23
3 x 50 + 1 x 25	192	144	0,860
3 x 70 + 1 x 35	246	178	0,603
3 x 95 + 1 x 50	298	211	0,457
3 x 120 + 1 x 70	346	240	0,357
3 x 150 + 1 x 70	399	271	0,286
3 x 185 + 1 x 95	456	304	0,235
3 x 240 + 1 x 120	538	351	0,178
3 x 300	621	396	0,142
4 G 1,5	23	22	29,5

nº x Section (mm^2)	Open Air Int. (A)	Buried Int. (A)	Voltaje drop (V/A·km)
4 G 2,5	32	29	17,7
4 G 4	42	37	11,0
4 G 6	54	46	7,32
4 G 10	75	61	4,23
4 x 16	100	79	2,68
4 x 25	127	101	1,73
4 x 35	158	122	1,23
4 x 50	192	144	0,860
4 x 70	246	178	0,603
4 x 95	298	211	0,457
4 x 120	346	240	0,357
4 x 150	399	271	0,286
4 x 185	456	304	0,235
4 x 240	538	351	0,178
5 G 1,5	23	22	29,5
5 G 2,5	32	29	17,7
5 G 4	42	37	11,0
5 G 6	54	46	7,32
5 G 10	75	51	4,23
5 G 16	100	79	2,68
5 G 25	127	101	1,73
5 G 35	158	122	1,23
5 G 50	192	144	0,860
5 G 70	246	178	0,603
5 G 95	298	211	0,457
5 G 120	346	240	0,357
5 G 150	399	271	0,286
5 G 185	456	304	0,235
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/mm2	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 depend of 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)	nº x Section (mm^2)	Diameter (mm)	Weight (Kg/Km)
1 x 1,5	5,7	45	2 x 50	25,7	1.375
1 x 2,5	6,2	55	2 x 70	29,5	1.880
1 x 4	6,7	70	3 G 1,5	8,9	110
1 x 6	7,3	90	3 G 2,5	9,8	145
1 x 10	8,2	135	3 G 4	11,0	200
1 x 16	9,2	190	3 G 6	12,1	265
1 x 25	11,0	285	3 G 10	14,3	405
1 x 35	12,1	385	3 x 16	16,4	595
1 x 50	13,8	520	3 x 25	20,7	955
1 x 70	15,7	715	3 x 35	23,1	1.275
1 x 95	17,6	925	3 x 50	26,8	1.750
1 x 120	19,2	1.165	3 x 70	29,6	2.370
1 x 150	21,5	1.450	3 x 95	35,0	3.140
1 x 185	23,9	1.750	3 x 120	39,8	4.115
1 x 240	26,9	2.280	3 x 150	44,7	5.130
1 x 300	29,6	2.830	3 x 185	49,9	6.285
1 x 400	33,8	3.735	3 x 16 + 1 x 10	17,6	695
1 x 500	37,4	4.780	3 x 25 + 1 x 16	22,7	1.140
1 x 630	42,7	6.280	3 x 35 + 1 x 16	25,0	1.465
2 x 1,5	8,2	90	3 x 50 + 1 x 25	29,1	2.035
2 x 2,5	9,2	120	3 x 70 + 1 x 35	33,8	2.835
2 x 4	10,3	165	3 x 95 + 1 x 50	38,2	3.705
2 x 6	11,3	215	3 x 120 + 1 x 70	42,1	4.725
2 x 10	13,2	320	3 x 150 + 1 x 70	46,8	5.780

POWERFLEX RV-K 0,6/1 kV

nº x Section (mm²)	Diameter (mm)	Weight (Kg/Km)	nº x Section (mm²)	Diameter (mm)	Weight (Kg/Km)
2 x 16	14,9	450	3 x 185 + 1 x 95	53,5	7.205
2 x 25	20,8	810	3 x 240 + 1 x 120	60,4	9.310
2 x 35	22,0	1.000	3 x 300	62,3	10.050
4 G 1,5	9,7	130	5 G 1,5	10,4	155
4 G 2,5	10,7	175	5 G 2,5	11,6	215
4 G 4	12,0	245	5 G 4	13,2	300
4 G 6	13,4	330	5 G 6	14,7	405
4 G 10	15,7	505	5 G 10	17,1	625
4 x 16	18,2	750	5 G 16	20,2	935
4 x 25	24,1	1.245	5 G 25	26,6	1.555
4 x 35	26,3	1.675	5 G 35	29,3	2.080
4 x 50	31,3	2.315	5 G 50	34,5	2.895
4 x 70	36,1	3.205	5 G 70	38,7	3.930
4 x 95	40,2	4.130	5 G 95	44,6	5.190
4 x 120	44,6	5.245	5 G 120	49,7	6.560
4 x 150	49,8	6.575	5 G 150	55,6	8.145
4 x 185	56,1	8.050	5 G 185	62,5	9.975
4 x 240	64.5	10.695	5 G 240	71,8	13.210

Table 6