

# POWERFLEX PLUS

## YMvKf

### 1. Object

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

### 2. Design

This type of cable is designed, manufactured and tested in accordance with IEC 60502-1.

Approvals available:

- KEMA-KEUR (Holland)

### 3. Applications

Flexible cable for fixed installations. Suitable for transport and distribution of electric power where it is necessary to prevent fire propagation. This cable is manufactured with flexible conductors in order to facilitate installations with sinuous courses.

### 4. Characteristics

Nominal voltage: 0,6/1 kV

Maximum operating temperature: 90 °C

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

Min. installation and handling temp.: -40 °C (cable surface)

Maximum operating temperature: 90 °C

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

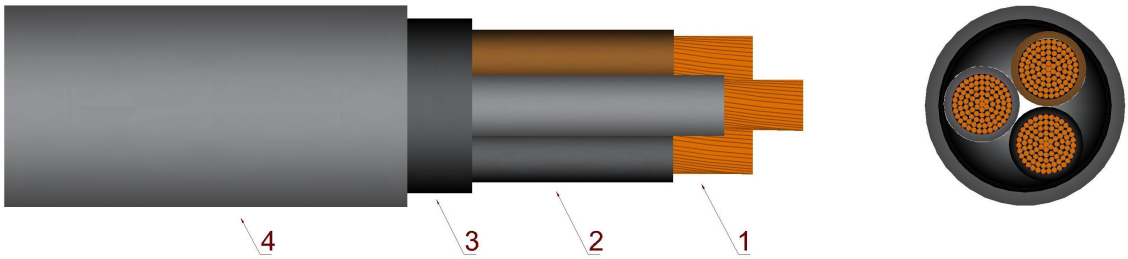
Minimum bending radius (static): 5 x Ø exterior

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

Reaction to fire CPR: Cca-s2,d2,a3 according to EN 50575

# POWERFLEX PLUS YMvKf

## 5. General make-up of the cables



### 5.1 Conductor (1)

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

### 5.2 Insulation (2)

Cross-linked polyethylene insulation, type XLPE according to IEC 60502-1 and HD 604.

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

- 1 cond.....black
- 2 cond .....blue + brown
- 3 cond.....brown + black + grey
- 4 cond.....brown + black + grey + green/yellow
- 5 cond.....brown + black + grey + blue + green/yellow

### 5.3 Assembly of cores

The cores are twisted together.

### 5.4 Inner covering (3)

Extruded inner covering of flexible PVC.

### 5.5 Outer sheath (4)

Flexible PVC outer sheath, grey, type PVC/ST2 in accordance with IEC 60502-1 and HD 604.

# POWERFLEX PLUS

## YMvKf

### 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 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<sup>2</sup>, 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 max. service temperature and for  $\cos \varphi = 1$ .

Cross Section (mm <sup>2</sup> )	Open Air Inst. (A)	Buried Inst. (A)	Voltage drop (V/A·km)	Cross Section (mm <sup>2</sup> )	Open Air Inst. (A)	Buried Inst. (A)	Voltage drop (V/A·km)
1 x 1,5	23	22	29,5	1 x 120	383	240	0,357
1 x 2,5	29	29	17,7	1 x 150	444	271	0,286
1 x 4	40	37	11,0	1 x 185	510	304	0,235
1 x 6	53	46	7,32	1 x 240	607	351	0,178
1 x 10	74	61	4,23	1 x 300	703	396	0,142
1 x 16	101	79	2,68	1 x 400	823	464	0,108
1 x 25	135	101	1,73	1 x 500	946	525	0,085
1 x 35	169	122	1,23	1 x 630	1.088	595	0,064
1 x 50	207	144	0,860	2 x 1,5	26	26	34,0
1 x 70	268	178	0,603	2 x 2,5	36	34	20,4
1 x 95	328	211	0,457	2 x 4	49	44	12,7

# POWERFLEX PLUS

## YMvKf

Cross Section (mm <sup>2</sup> )	Open Air Inst. (A)	Buried Inst. (A)	Voltage drop (V/A·km)	Cross Section (mm <sup>2</sup> )	Open Air Inst. (A)	Buried Inst. (A)	Voltage drop (V/A·km)
2 x 6	63	56	8,45	3 x 95 + 1 x 50	298	211	0,457
2 x 10	86	73	4,89	4 G 1,5	23	22	29,5
2 x 16	115	95	3,10	4 G 2,5	32	29	17,7
2 x 25	149	121	2,00	4 G 4	42	37	11,0
2 x 35	185	146	1,42	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 G 16	100	79	2,68
3 G 4	49	44	12,7	4 G 25	127	101	1,73
3 G 6	63	56	8,45	4 G 35	158	122	1,23
3 G 10	86	73	4,89	4 G 50	192	144	0,860
3 x 16	100	79	2,68	4 G 70	246	178	0,603
3 x 25	127	101	1,73	4 G 95	298	211	0,457
3 x 35	158	122	1,23	4 G 120	346	240	0,357
3 x 50	192	144	0,860	4 G 150	399	271	0,286
3 x 70	246	178	0,603	4 G 185	456	304	0,235
3 x 95	298	211	0,457	4 G 240	538	351	0,178
3 x 120	346	240	0,357	4 x 35 + 1 G 25	158	122	1,23
3 x 150	399	271	0,286	4 x 50 + 1 G 25	192	144	0,860
3 x 185	456	304	0,235	4 x 70 + 1 G 35	246	178	0,603
3 x 240	538	351	0,178	4 x 95 + 1 G 50	298	211	0,457
3 x 16 + 1 x 10	100	79	2,68	5 G 1,5	23	22	29,5
3 x 25 + 1 x 16	127	101	1,73	5 G 2,5	32	29	17,7
3 x 35 + 1 x 25	158	122	1,23	5 G 4	42	37	11,0
3 x 50 + 1 x 25	192	144	0,860	5 G 6	54	46	7,32
3 x 70 + 1 x 35	246	178	0,603	5 G 10	75	61	4,23

# POWERFLEX PLUS

## YMvKf

Cross Section (mm <sup>2</sup> )	Open Air Inst. (A)	Buried Inst. (A)	Voltage drop (V/A·km)	Cross Section (mm <sup>2</sup> )	Open Air Inst. (A)	Buried Inst. (A)	Voltage drop (V/A·km)
5 G 16	100	79	2,68	5 G 95	298	211	0,457
5 G 25	127	101	1,73	5 G 120	346	240	0,357
5 G 35	158	122	1,23	5 G 150	399	271	0,286
5 G 50	192	144	0,860	5 G 185	456	304	0,235
5 G 70	246	178	0,603	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 <sup>2</sup>	449	318	259	201	142	116	100	90	82

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. (°C)	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. (°C)	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

# POWERFLEX PLUS YMvKf

Correction factors for soil thermal resistivity, that depend of damp, other than 2,5 °K·m/W.

Moisture degree of soil	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

## 7. Dimensions

Table 6 shows diameter and weight detailed for every cable.

n° x Section (mm <sup>2</sup> )	Diameter (mm)	Weight (kgkm)	n° x Section (mm <sup>2</sup> )	Diameter (mm)	Weight (Kg/km)
1 x 1,5	8,9	105	1 x 630	44,3	6.490
1 x 2,5	9,4	120	2 x 1,5	9,8	130
1 x 4	9,9	140	2 x 2,5	10,7	165
1 x 6	10,5	165	2 x 4	11,8	215
1 x 10	11,4	220	2 x 6	12,7	265
1 x 16	12,4	285	2 x 10	16,8	460
1 x 25	14,1	390	2 x 16	18,5	610
1 x 35	15,0	485	2 x 25	22,0	880
1 x 50	16,7	640	2 x 35	24,3	1.135
1 x 70	18,6	840	3 G 1,5	10,2	150
1 x 95	20,1	1.055	3 G 2,5	11,2	190
1 x 120	22,1	1.310	3 G 4	12,4	250
1 x 150	24,2	1.595	3 G 6	13,6	325
1 x 185	26,3	1.905	3 G 10	17,5	550
1 x 240	28,9	2.435	3 x 16	19,5	750
1 x 300	31,7	3.040	3 x 25	22,8	1.080
1 x 400	36,0	3.950	3 x 35	25,2	1.415
1 x 500	39,5	4.995	3 x 50	28,6	1.900

# POWERFLEX PLUS

## YMvKf

n° x Section (mm <sup>2</sup> )	Diameter (mm)	Weight (kgkm)	n° x Section (mm <sup>2</sup> )	Diameter (mm)	Weight (Kg/km)
3 x 70	31,5	2.535	4 G 120	45,4	5.330
3 x 95	36,2	3.295	4 G 150	50,7	6.635
3 x 120	40,8	4.180	4 G 185	56,1	8.055
3 x 150	45,7	5.205	4 G 240	62,7	10.445
3 x 185	50,4	6.295	4 x 35 + 1 G 25	29,6	2.040
3 x 240	55,9	8.130	4 x 50 + 1 G 25	33,5	2.665
3 x 16 + 1 x 10	20,5	855	4 x 70 + 1 G 35	38,6	3.645
3 x 25 + 1 x 16	23,9	1.235	4 x 95 + 1 G 50	42,6	4.705
3 x 35 + 1 x 25	26,7	1.660	5 G 1,5	11,8	205
3 x 50 + 1 x 25	29,8	2.125	5 G 2,5	13,1	265
3 x 70 + 1 x 35	34,1	2.890	5 G 4	14,5	355
3 x 95 + 1 x 50	37,7	3.725	5 G 6	16,0	465
4 G 1,5	11,0	175	5 G 10	20,4	785
4 G 2,5	11,9	225	5 G 16	23,0	1.105
4 G 4	13,4	300	5 G 25	27,3	1.630
4 G 6	14,7	390	5 G 35	29,7	2.135
4 G 10	18,9	660	5 G 50	34,7	2.905
4 G 16	21,2	920	5 G 70	39,6	3.975
4 G 25	24,6	1.330	5 G 95	44,7	5.160
4 G 35	26,8	1.740	5 G 120	49,7	6.514
4 G 50	31,8	2.395	5 G 150	55,9	8.120
4 G 70	36,4	3.265	5 G 185	62,5	9.875
4 G 95	39,7	4.170	5 G 240	69,8	12.830

Table 6