Top Cable

Rev.10 5 - September - 2017

Issued: J. Arjona Morente

Approved: F. Díaz Rubio

SCREENFLEX LiYCY VC4V-K

1. Object

This document defines de design and manufacturing characteristics of the cable manufactured by Top Cable type:

- SCREENFLEX LiYCY 110 VC4V-K 300/500 V

- SCREENFLEX LiYCY 200 VC4V-K 0,6/1 kV

2. Design

This type of cable is basically designed, manufactured and tested in accordance with EN 50525 (for 300/500 V cables) and IEC 60502-1 (for 0,6/1 kV cables).

3. Applications

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

The 100% coverage screen, makes it suitable for installations where it is necessary avoid electric interference of nearby circuits.

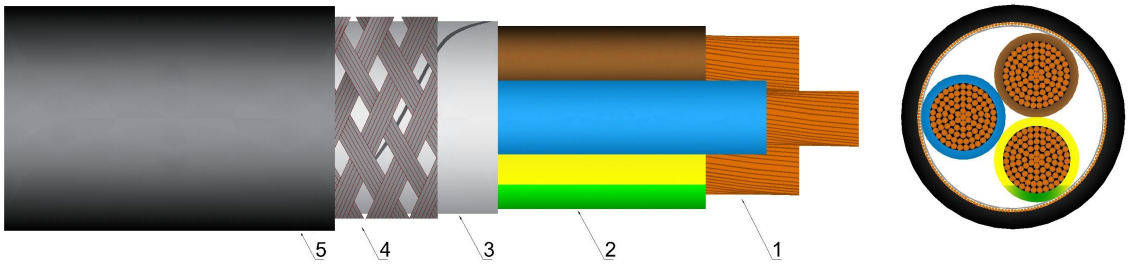
4. Characteristics

Nominal voltage: 300/500 V (up to 1,5 mm^2 cross section)
0,6/1 kV (from 2,5 mm^2 cross section)
Maximum conductor temperature: 70 ºC
Minimum service temperature: -40 °C (static, with protection)
Minimum installation and handling temperature: 0 °C
Maximum short-circuit temperature: 160 °C. (máximo 5 s)
Minimum bending radius (static): 5 x cable Ø

No flame propagation: according EN 60332-1/IEC 60332-1
No fire propagation (only grey outer sheath): according EN 60332-3 / IEC 60332-3/ EN 50399
Reaction to fire CPR: Eca according to EN 50575 (black outer sheath)
Cca-s2,d1,a3 according to EN 50575 (grey outer sheath 300/500 V)
Cca-s3,d1,a3 according to EN 50575 (grey outer sheath 0,6/1 kV)

SCREENFLEX LiYCY VC4V-K

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)

Flexible PVC insulation, type TI2 according to EN 50363-3 and type PVC/A according to IEC 60502.

The standard identification according to HD 308 and EN 50334 is the following:

- 2 x ..... brown + blue
- 3 x ..... brown + black + grey
- 3 G ..... blue + brown + green/yellow
- 4 G ..... brown + black + grey + green/yellow
- 4 x ..... brown + black + grey + blue
- 5 G ..... brown + black + grey + green/yellow + blue
- 6 or more cond….. black numbered + green/yellow

Other identifications (JZ, OZ, J, O) are available under request.

5.3 Assembly of cores

The cores are twisted together.

5.4 Screen

Coverage of 100% composed by aluminium-polyester tape (3) and tinned copper braid (4).

5.5 Outer sheath (5)

Flexible PVC outer sheath, type TM2 according EN 50363-4-1 and type ST_1 according to IEC 60502-1. Black or grey colour.

6.- Current-carrying capacities

6.1 Nominal current-carrying capacities

6.1.1 300/500 V cables (Screenflex LiYCY 110)

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

Current-carrying capacities, in amperes, are calculated according to HD 516 and for the following conditions:

- Open air installation: one cable with adequate ventilation and ambient temperature of 30 °C
- For all cables it is supposed single-phase circuits where not all conductors are fully charged.

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 Inst. (A)	Buried Inst. (A)	Voltaje drop (V/A·km)
2 x 0,75	6	- -	62,4
2 x 1	10	- -	46,8
2 x 1,5	16	- -	31,9
3 G 0,75	6	- -	62,4
3 G 1	10	- -	46,8
3 G 1,5	16	- -	31,9
4 G 0,75	6	- -	62,4
4 G 1	10	- -	46,8
4 G 1,5	16	- -	31,9
5 G 0,75	6	- -	62,4
5 G 1	10	- -	46,8
5 G 1,5	16	- -	31,9
6 G 0,75	6	- -	62,4

nº x Section (mm^2)	Open air Inst. (A)	Buried Inst. (A)	Voltaje drop (V/A·km)
6 G 1	10	- -	46,8
6 G 1,5	16	- -	31,9
7 G 0,75	6	- -	62,4
7 G 1	10	- -	46,8
7 G 1,5	16	- -	31,9
8 G 0,75	6	- -	62,4
8 G 1	10	- -	46,8
8 G 1,5	16	- -	31,9
10 G 0,75	6	- -	62,4
10 G 1	10	- -	46,8
10 G 1,5	16	- -	31,9
12 G 0,75	6	- -	62,4
12 G 1	10	- -	46,8

nº x Section (mm²)	Open air Inst. (A)	Buried Inst. (A)	Voltaje drop (V/A·km)
12 G 1,5	16	- -	31,9
14 G 0,75	6	- -	62,4
14 G 1	10	- -	46,8
14 G 1,5	16	- -	31,9
16 G 0,75	6	- -	62,4
16 G 1	10	- -	46,8
16 G 1,5	16	- -	31,9
19 G 0,75	6	- -	62,4
19 G 1	10	- -	46,8
19 G 1,5	16	- -	31,9

nº x Section (mm²)	Open air Inst. (A)	Buried Inst. (A)	Voltaje drop (V/A·km)
24 G 0,75	6	- -	62,4
24 G 1	10	- -	46,8
24 G 1,5	16	- -	31,9
30 G 0,75	6	- -	62,4
30 G 1	10	- -	46,8
30 G 1,5	16	- -	31,9
37 G 1	10	- -	46,8
37 G 1,5	16	- -	31,9
52 G 1	10	- -	46,8
61 G 1	10	- -	46,8

Table 1

6.1.2 0,6/1 kV cables (Screenflex LiYCY 200)

Table 2 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 multi-core 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 conductors or 3 conductors up to 10 mm2, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.
- For cables having 6 or more conductors, it is supposed single-phase circuits where not all conductors are fully charged.

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.

SCREENFLEX LiYCY VC4V-K

nº x Section (mm^2)	Open Air Inst. (A)	Buried Inst. (A)	Voltage drop (V/A·km)
1 x 10	60	52	3,97
1 x 16	82	67	2,51
1 x 25	110	86	1,62
1 x 35	137	103	1,15
1 x 50	167	122	0,802
1 x 70	216	151	0,565
1 x 95	264	179	0,428
1 x 120	308	203	0,335
1 x 150	356	230	0,268
1 x 185	409	258	0,220
1 x 240	485	297	0,166
1 x 300	561	336	0,133
2 x 2,5	30	29	19,2
2 x 4	40	38	11,9
2 x 6	51	47	7,92
2 x 10	70	63	4,58
2 x 16	94	81	2,90
2 x 25	119	104	1,87
2 x 35	148	125	1,33
3 G 2,5	30	29	19,2
3 G 4	40	38	11,9
3 G 6	51	47	7,92
3 G 10	70	63	4,58
3 x 16	80	67	2,51
3 x 25	101	86	1,62
3 x 35	126	103	1,15
3 x 50	153	122	0,802
3 x 70	196	151	0,565

nº x Section (mm^2)	Open Air Inst. (A)	Buried Inst. (A)	Voltage drop (V/A·km)
4 x 2,5	25	24	16,6
4 x 4	34	31	10,3
4 x 6	43	39	6,86
4 x 10	60	52	3,97
4 x 16	80	67	2,51
4 x 25	101	86	1,62
4 x 35	126	103	1,15
4 x 50	153	122	0,802
4 x 70	196	151	0,565
4 x 95	238	179	0,428
5 G 2,5	25	24	16,6
5 G 4	34	31	10,3
5 G 6	43	39	6,86
5 G 10	60	52	3,97
5 G 16	80	67	2,51
5 G 25	101	86	1,62
5 G 35	126	103	1,15
6 G 2,5	30	29	19,2
7 G 2,5	30	29	19,2
10 G 2,5	30	29	19,2
12 G 2,5	30	29	19,2
14 G 2,5	30	29	19,2
16 G 2,5	30	29	19,2
19 G 2,5	30	29	19,2
24 G 2,5	30	29	19,2
27 G 2,5	30	29	19,2
30 G 2,5	30	29	19,2
37 G 2,5	30	29	19,2

Table 2

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	0,1	0,2	0,3	0,5	1	1,5	2	2,5	3
A/mm^2	364	257	210	163	115	94	81	73	66

Table 3

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	1,12	1,06	1	0,94	0,87	0,79	0,71	0,61	0,50

Table 4

Correction factors for ground temperature other than 20 °C.

Ground T. (ºC)	10	15	20	25	30	35	40	45	50
Factor	1,10	1,05	1	0,95	0,89	0,84	0,77	0,71	0,63

Table 5

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
Therm. Resist. (K·m / W)	1	1,5	2,0	2,5	3,0
Factor	1,18	1,1	1,05	1	0,96

Table 6

7. Dimensions

7.1 300/500 V cables (Screenflex LiYCY 110)

Table 7 shows diameter and weight detailed for every cable.

nº x Section (mm^2)	Diameter (A)	Weight (kg/km)	nº x Section (mm^2)	Diameter (A)	Weight (kg/km)
2 x 0,75	6,2	55	10 G 1,5	12,5	265
2 x 1	6,3	60	12 G 0,75	10,3	170
2 x 1,5	7,3	75	12 G 1	10,8	210
3 G 0,75	6,5	65	12 G 1,5	12,9	300
3 G 1	6,6	70	14 G 0,75	10,7	195
3 G 1,5	7,7	95	14 G 1	11,1	235
4 G 0,75	6,9	75	14 G 1,5	13,7	340
4 G 1	7,0	85	16 G 0,75	11,4	220
4 G 1,5	8,4	120	16 G 1	12,0	270
5 G 0,75	7,4	90	16 G 1,5	14,5	370
5 G 1	7,8	105	19 G 0,75	12,0	245
5 G 1,5	9,5	150	19 G 1	12,8	310
6 G 0,75	7,9	105	19 G 1,5	15,4	450
6 G 1	8,3	125	24 G 0,75	13,4	305
6 G 1,5	10,2	175	24 G 1	14,2	380
7 G 0,75	8,0	110	24 G 1,5	17,5	555
7 G 1	8,3	130	30 G 0,75	14,4	380
7 G 1,5	10,2	190	30 G 1	15,5	465
8 G 0,75	8,7	125	30 G 1,5	19,0	680
8 G 1	9,3	155	37 G 1	16,9	560
8 G 1,5	11,0	215	37 G 1,5	20,5	815
10 G 0,75	9,7	150	52 G 1	19,4	730
10 G 1	10,3	185	61 G 1	20,5	835

Table 7

7.2 0,6/1kV cables (Screenflex LiYCY 200)

Table 8 shows diameter and weight detailed for every cable.

nº x Section (mm^2)	Diameter (mm)	Weight (kg/km)
1 x 10	11,7	225
1 x 16	12,6	290
1 x 25	14,5	405
1 x 35	15,6	510
1 x 50	17,5	675
1 x 70	19,6	900
1 x 95	21,7	1.140
1 x 120	23,3	1.395
1 x 150	25,6	1.715
1 x 185	27,4	2.010
1 x 240	31,4	2.650
1 x 300	34,3	3.255
2 x 2,5	8,6	110
2 x 4	11,4	180
2 x 6	12,5	225
2 x 10	15,2	350
2 x 16	17,5	485
2 x 25	21,4	670
2 x 35	24,2	895
3 G 2,5	9,4	145
3 G 4	11,7	225
3 G 6	12,9	285
3 G 10	16,1	450
3 x 16	18,7	630
3 x 25	23,1	965
3 x 35	25,2	1.255
3 x 50	29,6	1.745
3 x 70	33,6	2.360

nº x Section (mm^2)	Diameter (mm)	Weight (kg/km)
4 x 2,5	10,2	180
4 x 4	12,6	275
4 x 6	14,4	360
4 x 10	17,5	570
4 x 16	20,1	815
4 x 25	24,5	1.225
4 x 35	28,2	1.655
4 x 50	32,3	2.270
4 x 70	37,5	3.105
4 x 95	42,6	4.020
5 G 2,5	11,2	220
5 G 4	14,3	340
5 G 6	16,0	450
5 G 10	19,6	725
5 G 16	22,3	1.030
5 G 25	28,1	1.565
5 G 35	31,3	2.100
6 G 2,5	12,4	255
7 G 2,5	12,5	275
10 G 2,5	14,9	375
12 G 2,5	15,6	445
14 G 2,5	16,9	505
16 G 2,5	17,8	575
19 G 2,5	18,9	665
24 G 2,5	21,4	825
27 G 2,5	22,4	925
30 G 2,5	23,3	1.015
37 G 2,5	25,5	1,280

Table 8