

TOPSOLAR PV H1Z2Z2-K

1. Object

This document defines the design and manufacturing characteristics of the cables type TOP SOLAR PV H1Z2Z2-K manufactured by Top Cable.

2. Design

This type of cables are designed, manufactured and tested according to the latest revision of EN 50618 and IEC 62930 standard.

Approvals available:

EN 50618 (TÜV Rheinland) and IEC 62930 (in process).

3. Applications

Low smoke halogen-free, flexible, single-core power cables with cross-linked insulation and sheath. In particular for use at direct current (d.c.) side of photovoltaic systems, with a nominal d.c. voltage of 1,5 kV between conductors and between conductor and earth.

The cables are suitable to be used with Class II equipment.

The cables are designed to operate at a normal maximum conductor temperature of 90 °C, but for a maximum of 20 000 hours a max. conductor temperature of 120 °C at a max. ambient temperature of 90 °C is permitted. The expected period of use under normal usage conditions as specified in the standard EN 50618 is at least 25 years. Suitable for submerged installations (AD8).

4. Characteristics

Rated voltage DC: nominal 1,5 kV, both between conductors as well between conductors and earth. The maximum permitted operating d.c. voltage of the systems shall not exceed 1,8 kV.

Rated voltage AC: voltage rating is 1,0/1,0 kV (U_0/U). U_0 is the r.m.s. value between any insulated conductor and earth. U is the r.m.s. value between any two phases.

Ambient temperature range: -40 °C to + 90 °C

Maximum conductor temperature: 120 °C

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

Minimum bending radius (fixed): 5 x cable Ø

No flame propagation: according to EN 60332-1-2/ IEC 60332-1-2/ EN 50399

No fire propagation: according to EN 50399

Reaction to fire CPR: Cca-s1b,d2,a1 according to EN 50575 (from 4 mm²)

Dca-s2,d2,a2 according to EN 50575 (1,5 and 2,5 mm²)

UV resistance: according to EN 50618

TOPSOLAR PV H1Z2Z2-K

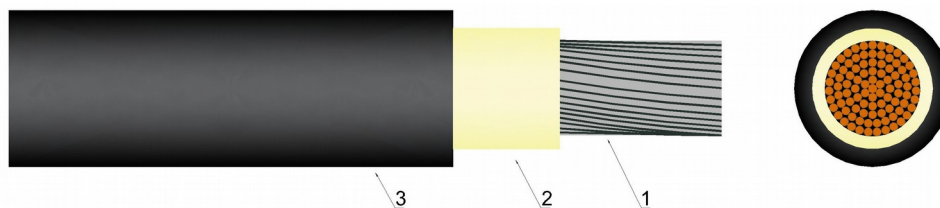
Water resistance: AD8 immersion

Halogen free: according to EN 50525-1 (Annex B)

HCl content < 0,5%

pH > 4,3; conductivity < 10 μ S/mm

5. General make-up of the cable



5.1 Conductor (1)

Electrolytic annealed tinned copper conductor, class 5 according to EN 60228.

5.2 Insulation (2)

Halogen free cross-linked rubber insulation. Requirements of insulation of table B.1 in Annex B of EN 50618 and IEC 62930.

5.3 Outer sheath (3)

Halogen free cross-linked rubber outer sheath. Requirements of sheath of table B.1 in Annex B of EN 50618 and IEC 62930. Black or red colour.

6. Current-carrying capacities

6.1 Nominal current-carrying capacities

Table 1 show the current-carrying capacities and electric parameters detailed for every cable.

Current-carrying capacities, in amperes, are according to EN 50618, and for the following conditions:

- Single cables free in air installation: one single-core cable and ambient temperature of 60 °C; with adequate ventilation (supported by cleats and hangers or on perforated tray).
- Single cable on surfaces installation: one single-core cable directly on a wall with low thermal conductivity, ambient temperature of 60 °C.
- To cables adjacent on surfaces installation: ambient temperature of 60 °C.
- In all cases it is supposed a direct current circuit.

TOPSOLAR PV H1Z2Z2-K

Voltage drop is calculated with conductor temperature of 120 °C.

For conditions other than this apply the adequate correction factors (point 6.2).

Cross-section mm ²	Single cable free in air A	Single cable on surfaces A	To cables adjacent on surface A	Voltage drop V/A·km
1 x 1,5	30	29	24	38,2
1 x 2,5	41	39	33	23,0
1 x 4	55	52	44	14,3
1 x 6	70	67	57	9,49
1 x 10	98	93	79	5,46
1 x 16	132	125	107	3,47
1 x 25	176	167	142	2,23
1 x 35	218	207	176	1,58
1 x 50	276	262	221	1,10
1 x 70	347	330	278	0,772
1 x 95	416	395	333	0,585
1 x 120	488	464	390	0,457
1 x 150	566	538	453	0,368
1 x 185	644	612	515	0,301
1 x 240	775	736	620	0,228

Table 1

6.2 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 temperatures other than 60°C.

Air Temp. (°C)	Up to 60	70	80	90
Factor	1	0,92	0,84	0,75

Table 2

6.3 Groups

For groups reduction factors according to IEC 60364-5-52, Table A.52-17 shall apply.

TOPSOLAR PV H1Z2Z2-K

7. Dimensions

Table 3 show diameters and weight detailed for every cable.

Cross-section mm ²	Outer Ø ⁽¹⁾ mm	Weight kg/km
1 x 1,5	4,6	35
1 x 2,5	5,0	45
1 x 4	5,4	60
1 x 6	6,0	80
1 x 10	7,0	120
1 x 16	8,2	180
1 x 25	10,2	280
1 x 35	11,5	375
1 x 50	13,3	525
1 x 70	15,0	720
1 x 95	17,0	930
1 x 120	18,7	1.175
1 x 150	21,0	1.475
1 x 185	23,5	1.805
1 x 240	26,3	2.345

Table 3

(1) The tolerances on the nominal outer diameters are:

Cables with outer diameter $d \leq 7$ mm. → -0,1 +0,2 mm

Cables with outer diameter $7 < d < 10$ mm. → -0,1 +0,3 mm

Cables with outer diameter $d \geq 10$ mm. → -0,2 +0,4 mm