ÖLFLEX DC ESS SC

LK200101-5C
Version: 2 Date: 23.09.2024

1. Designation

ÖLFLEX DC ESS SC
(Energy Storage System)

2. Application

ÖLFLEX DC ESS SC are UV, ozone and weather resistant, double insulated single core cables for Energy Storage System applications. They are used for the fixed installation of Energy Storage System with working voltages up to DC 1.8kV.

3. Design

Conductor:	Fine wire strands of non-porous tinned copper wires according to IEC 60228, Class 5 Conductor resistance according to VDE 00295, Class 5
Core insulation:	Electron beam cross-linked polymer compound, halogen free acc. to EN 50525-1 Insulation compound type: EI 110 Core thickness see table on page 2 Core colour: white
Outer sheath:	Electron beam cross-linked Co-Polymer, halogen free acc. to EN 50525-1 and flame retardant acc. to IEC 60332-1-2, IEC 60332-3-24 Outer sheath compound type: EM 104 Wall thicknesses and diameters see table on page 2 Outer sheath colour: Black

The outer sheath is tight-fit extruded and must be strippable from the core insulation at least by a longitudinal cut. The surface of the sheath must be glossy, low adhesive, plane and round.

4. Technical data

Nominal voltage U_0/U	1 / 1kV AC according to EN 50168 1.5 / 1.5 kV DC according to EN 50618
Max. DC voltage	DC 1.8 kV (conductor/conductor, non earthed system) according to EN 50618
Test voltage	6.5 kV AC
Minimum bending radius	Static use: 5 x cable diameter Occasional flexing: 15 x cable diameter
Temperature range	Fixed installed -40℃ up to +120℃ (min. 20 000h acc. IEC 60216-2)
Ambient temperature	-40℃ up to +90℃
Max. conductor temperature	+120℃
Flammability	Flame retardant according to IEC 60332-1-2, IEC 60332-3-24

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5. Dimensions

Insulation colour	Jacket colour	Cross- Section [1 X mm²]	Nom. core wall thickness average [mm]	Nom. jacket wall thickness average [mm]	Outer Diameter [mm]	Conductor Resistance Ω/km
white	black	1 x 1.5	0.7	0.8	4.6	13.7
white	black	1 x 2.5	0.7	0.8	5.0	8.21
white	black	1 x 4	0.7	0.8	5.4	5.09
white	black	1 x 6	0.7	0.8	6.0	3.39
white	black	1 x 10	0.7	0.8	7.2	1.95
white	black	1 x 16	0.7	0.9	8.7	1.24
white	black	1 x 25	0.9	1.0	10.6	0.795
white	black	1 x 35	0.9	1.1	12.2	0.565
white	black	1 x 50	1.0	1.2	14.4	0.393
white	black	1 x 70	1.1	1.2	16.4	0.277
white	black	1 x 95	1.1	1.3	18.4	0.210
white	black	1 x 120	1.2	1.3	20.2	0.164
white	black	1 x 150	1.4	1.4	22.4	0.132
white	black	1 x 185	1.6	1.6	25.2	0.108
white	black	1 x 240	1.7	1.7	28.6	0.0817
white	black	1 x 300	2.0	1.9	32.0	0.0654

The average of the measured values shall be not less than the nominal thickness.
The smallest value measured at any point shall not be smaller than the minimum value.
The calculation of the min. insulation wall-thicknesses is based on VDE0276-603:2010-03 (0.1 + 10% of nominal value)
For calculation of the min. wall-thickness of the jacket the formula (0.1 + 15% of nominal value) shall be used

6. GENERAL REQUIREMENTS

RoHS: Dangerous and forbidden substances according to EC-Directive 2011/65/EU regarding Restriction of the use of certain hazardous substances **(RoHS)**, are not allowed during manufacturing.

REACH: All materials used in the manufacturing process of the product are subject to the EC-Regulation No. 1907/2006 regarding Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). If substances based on the current Candidate List are used, they must be listed with their designation and their concentration.

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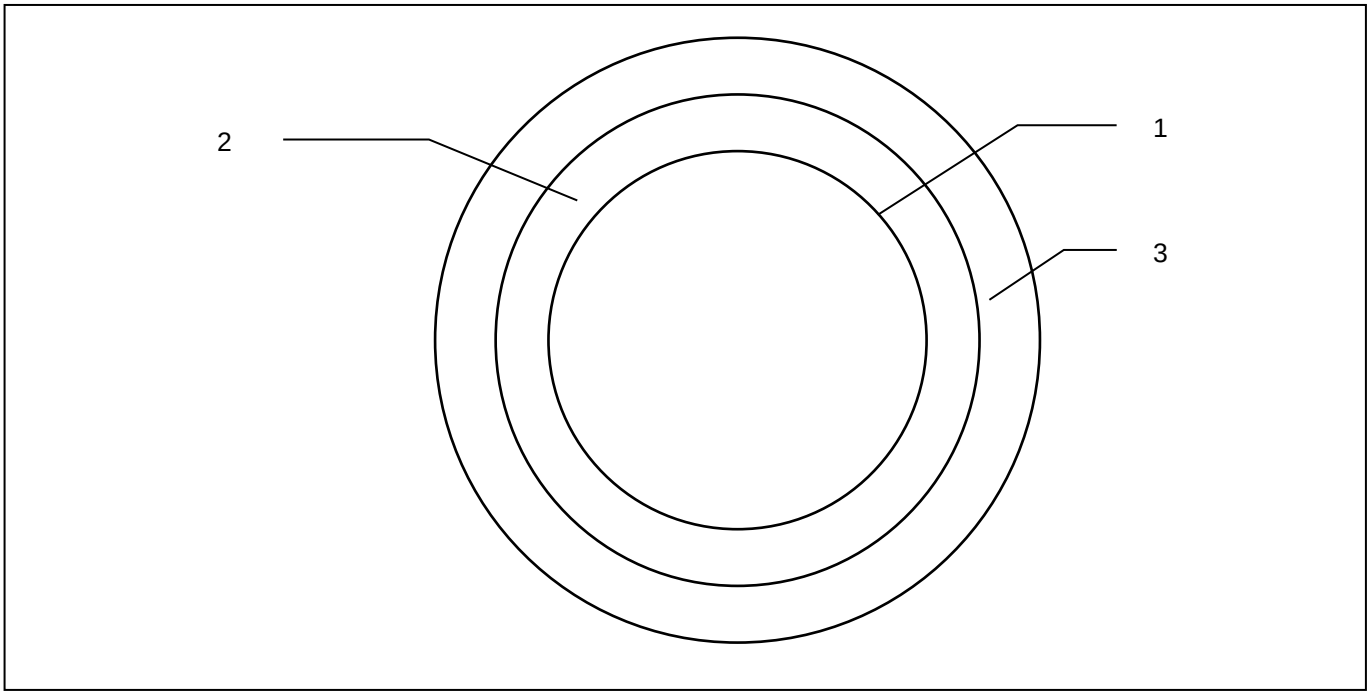
7. Drawing



Rep	Component description	mm	Features
1	**Conductor** Tinned copper acc. to IEC 60228 Cl.5		**Standard** IEC 60228 for conductor IEC 60332-1-2, IEC 60332-3-24 for flame retardant
2	**Insulation** E-Beam Cross linked Polyolefin compound, Halogen free Color is white		**Electric Characteristic** Operation voltage is DC 1500 V Testing voltage is AC 6.5 kV
3	**Sheath** E-Beam Cross linked Polyolefin compound, Halogen free Color is Black		**General Characteristic** Temperature range: -40℃ up to 120℃ Min. bending Radius: 5 x ODmm

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►Current rating of ÖLFLEX DC ESS SC cables according to EN 50355 and EN 50343◄

Nominal conductor cross sectional area [mm^2]	Current carrying capacity (effective value ; one cable in air) [A]
1.5	32
2.5	42
4	58
6	76
10	107
16	139
25	189
35	239
50	302
70	378
95	454
120	536
150	617
185	706
240	851
300	977
400	1197

They are based upon a 45 °C ambient air temperature with a maximum conductor operating temperature of 120 °C.

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Derating factors for other ambient temperatures

Temperature (℃)	Factor
30	1.15
35	1.10
40	1.05
45	1.00
50	0.94
55	0.88
60	0.81
65	0.74
70	0.66
75	0.57
80	0.47
85	0.33

Modification factor for individual cores within a multi core cable

Number of loaded cores	2	3	4	5	7	9	12	19
Correction factor	0.91	0.78	0.63	0.59	0.51	0.46	0.41	0.38

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Modification factor for installation type (grouping and installation conditions)

Number of cables being simultaneously loaded	Installation type							
	Cable in free air	Cables on trays, in one layer	Cables on trays, in two layers	Cables on trays, in several layers	Cables on the floor or on a wall	Cables on a ceiling or under floor	Cables in a closed tube, conduit or tray	Cables in a closed tube or conduit, thermally insulated
	Type a)	Type b)		Type c)	Type d)	Type e)	Type f)	Type g)
1 single cable	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.76
2 cables together	-	0.87	0.87	0.87	0.85	0.81	0.80	0.61
3 cables together	-	0.83	0.83	0.78	0.79	0.72	0.70	0.53
4 cables together	-	0.78	0.71	0.71	0.75	0.68	0.65	0.49
8 cables together	-	0.74	0.59	0.52	0.75	0.62	0.52	0.40
12 cables together	-	0.73	0.54	0.45	0.75	0.61	0.45	0.34
16 cables together	-	0.72	0.51	0.41	0.75	0.61	0.41	0.31
20 cables and more together	-	0.71	0.47	0.38	0.75	0.61	0.38	0.29

Details of installation types are as follows:

Type a) One single cable in free air with heat dissipation into the surrounding air ensured by all the following measures:
- distance between the cable and adjacent walls over, under or beside: At least equal to the cable diameter;
- distance between the cable and any other cable lying beside it in any direction: At least equal to the sum of its own cable diameter and the adjacent cable diameters;
- cable lying in an open tray or ladder support with perforations, the total area “A” in Figure 2 of the perforations being at least 15 % of the total supporting area in case of metallic tray or support with good thermal contact to car-body (otherwise at least 30 %), and without any cover.

Type b) Cables lying in one layer, touching each other, on an open tray or ladder support, with perforations as for type a).

Type c) As for type b) but cables in several layers over each other.

Type f) Cables lying in bundles in closed tubes, closed trays or boxes without significant air flow.

Type g) As for type f), but for thermally completely insulated closed tubes, closed trays or boxes.

Current flowing through the screen (e.g. motor cables and brake resistors) should be calculated as an additional conductor.