

## Reeling cables in line with **VDE 0250 part. 813**

### Cable type

**PANZERFLEX-ELX + OF 3,6/6 + 12/20 kV**  
with integrated OPTICAL FIBRES- (N)TSCGEWÜU - H.V. reeling cable 6 to 20 kV

### Main application

Flexible H.V. reeling combined power and data transmission cables for use on connecting movable parts of machine tools and any material handling equipment (i.e. Stackers/reclaimer, ship to shore crane, container crane, excavators, also suitable for festoon system).

Perfectly suitable for any energy supply on cable reels systems associated from high to extreme mechanical stresses, frequent bending/torsional operation and fast movement with strong acceleration.

### Construction

<b>Conductor:</b>	Tinned copper conductor, flexible cl. 5 IEC 60228 Specially designed for mobile application
<b>Insulation:</b>	Micro filtered HEPR rubber compound better than 3G13 New specially developed compound with improved electrical and mechanical characteristics
<b>Cores identification:</b>	Main cores: natural colour with black semiconductive layer Splitting earth cores: identified by position and covered with special black semiconductive compound
<b>Field control:</b>	- Conductor screen: semiconductive layer - Insulation screen: semiconductive layer of special compound Applied with insulation
<b>Identification:</b>	Printed numbers on semiconductive layer
<b>Laying-up:</b>	Short lay length for better flexibility and mechanical characteristics ≤ 8 times the laying-up cores diameter, three cores design with protective earth cores split in 2 interstitial areas + 1 module with optical fibers in 1 interstitial area
<b>Separation (if any):</b>	Tape(s)
<b>Inner sheath:</b>	Polychloroprene rubber based compound Special developed with improved mechanical characteristics
<b>Antitwisting protection:</b>	Textile braid of synthetic yarns Firmly bonded between inner and outer sheath
<b>Outer sheath:</b>	Red polychloroprene rubber compound UV resistant, oil and chemical resistant better than 5GM3 compound
<b>Marking:</b>	PALAZZO - PANZERFLEX-ELX rated voltage $n \times$ cross section, fiber optics $n$ , & type OPTICAL FIBER year of manufacturing

### Parameters

<b>Electrical</b>	Rated voltage	U <sub>0</sub> /U = 3,6/6 kV to 12/20 kV*
	Maximum permissible operating voltage in AC systems	U <sub>m</sub> = 7.2 kV to 24 kV
	AC test voltage over 5 minutes	11 kV to 29 kV according to VDE 0250 part 813
<b>EMC</b>	Current Carrying Capacity	According to DIN VDE 0298 part 4
	Symmetrical design + narrow production tolerances	Very low interference
	Fibre-optics for absolute immunity from electrical interferences.	
<b>Data transmission</b>	Main type: graded index 62,5/125. Available also graded index 50/125 and monomode E9/125	
	6 (main type), 12, 18 fibre-optics in a structure composed by 6 loose tubes (1, 2 or 3 fibres per tube)**	
<b>Thermal</b>	Fully flexible operation	- 30 °C
	Fixed installation	- 40 °C
	Maximum permissible operating temperature of the conductor	90 °C
<b>Mechanical</b>	Short-circuit temperature of the conductor	250 °C
	Tensile load	Up to 20 N/mm <sup>2</sup>
	Minimum bending radii	According to DIN VDE 0298 part 3
	Reeling operation	No restriction.
		Consult the manufacturer if speed exceeds 180 m/min
<b>Chemical</b>	Festoon systems	Up to 120 m/min
	Resistance to oil	According to VDE / IEC standard
	Weather resistance	Unrestricted use outdoor and indoor, UV resistant, moisture resistant.



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**Table 1: PANZERFLEX-ELX + OF 3,6/6 + 12/20 kV (N)TSCGEWÜ\***

N. of cores and nominal section nmm <sup>2</sup> +nmm <sup>2</sup> /3	Main conductor D.C. resist. at 20 °C Ohm/km	Protective earth cond. nom. diam. mm	Overall diameter		Net weight approx. kg/km	Maximum permissible tensile force N	Current carrying capacity at 30 °C				Short circuit current 80 ° to 200 °C kA-1 sec.	
			min.	max.			Laid straight A	Spiral or 1 layer A	2 layers A	3 layers A		
<b>3,6/6 kV</b>												
3x25+2x25/2+1x16 OF	0,795	6,6	4,9	38,8	41,8	2.490	1.500	131	105	80	64	3,2
3x35+2x25/2+1x16 OF	0,565	8,0	4,9	41,2	44,2	2.980	2.100	162	130	99	79	4,5
3x50+2x25/2+1x16 OF	0,393	9,3	4,9	44,0	47,0	3.510	3.000	202	162	123	99	6,4
3x70+2x35/2+1x16 OF	0,277	11,2	6,1	48,1	51,1	4.500	4.200	250	200	153	123	9,0
3x95+2x50/2+1x16 OF	0,210	13,0	6,6	52,7	56,7	5.580	5.700	301	241	184	147	12,2
3x120+2x70/2+1x16 OF	0,164	15,0	8,0	56,9	60,9	6.950	7.200	352	282	215	172	15,4
3x150+2x70/2+1x16 OF	0,132	16,9	8,0	62,7	66,7	8.190	9.000	404	323	246	198	19,2
3x185+2x95/2+1x16 OF	0,108	18,3	9,3	66,4	70,4	9.630	11.100	461	369	281	226	23,7
3x240+2x120/2+1x16 OF	0,0817	20,5	11,2	76,1	80,1	12.770	14.400	540	432	329	265	30,7
<b>6/10 kV</b>												
3x25+2x25/2+1x16 OF	0,795	6,6	4,9	39,5	42,5	2.540	1.500	131	105	80	64	3,2
3x35+2x25/2+1x16 OF	0,565	8,0	4,9	42,0	45,0	3.060	2.100	162	130	99	79	4,5
3x50+2x25/2+1x16 OF	0,393	9,3	4,9	44,8	47,8	3.930	3.000	202	162	123	99	6,4
3x70+2x35/2+1x16 OF	0,277	11,2	6,1	48,3	52,3	4.570	4.200	250	200	153	123	9,0
3x95+2x50/2+1x16 OF	0,210	13,0	6,6	53,5	57,5	5.680	5.700	301	241	184	147	12,2
3x120+2x70/2+1x16 OF	0,164	15,0	8,0	57,6	61,6	7.020	7.200	352	282	215	172	15,4
3x150+2x70/2+1x16 OF	0,132	16,9	8,0	63,3	67,3	8.280	9.000	404	323	246	198	19,2
3x185+2x95/2+1x16 OF	0,108	18,3	9,3	67,0	71,0	9.720	11.100	461	369	281	226	23,7
3x240+2x120/2+1x16 OF	0,0817	20,5	11,2	76,8	80,8	12.880	14.400	540	432	329	265	30,7
<b>8,7/15 kV</b>												
3x25+2x25/2+1x16 OF	0,795	6,6	4,9	42,7	45,7	2.830	1.500	139	111	85	68	3,2
3x35+2x25/2+1x16 OF	0,565	8,0	4,9	45,5	48,5	3.390	2.100	172	138	105	84	4,5
3x50+2x25/2+1x16 OF	0,393	9,3	4,9	48,3	51,3	3.930	3.000	215	172	131	105	6,4
3x70+2x35/2+1x16 OF	0,277	11,2	6,1	53,1	57,1	5.130	4.200	265	212	162	130	9,0
3x95+2x50/2+1x16 OF	0,210	13,0	6,6	57,0	61,0	6.120	5.700	319	255	195	156	12,2
3x120+2x70/2+1x16 OF	0,164	15,0	8,0	62,9	66,9	7.770	7.200	371	297	226	182	15,4
3x150+2x70/2+1x16 OF	0,132	16,9	8,0	67,0	71,0	8.820	9.000	428	342	261	210	19,2
3x185+2x95/2+1x16 OF	0,108	18,3	9,3	70,0	74,0	10.190	11.100	488	390	298	239	23,7
3x240+2x120/2+1x16 OF	0,0817	20,5	11,2	78,2	83,2	13.190	14.400	574	459	350	281	30,7
<b>12/20 kV</b>												
3x25+2x25/2+1x16 OF	0,795	6,6	4,9	48,0	51,0	3.360	1.500	139	111	85	68	3,2
3x35+2x25/2+1x16 OF	0,565	8,0	4,9	51,4	55,4	4.080	2.100	172	138	105	84	4,5
3x50+2x25/2+1x16 OF	0,393	9,3	4,9	54,2	58,2	4.670	3.000	215	172	131	105	6,4
3x70+2x35/2+1x16 OF	0,277	11,2	6,1	58,3	62,3	5.790	4.200	265	212	162	130	9,0
3x95+2x50/2+1x16 OF	0,210	13,0	6,6	63,7	67,7	7.040	5.700	319	255	195	156	12,2
3x120+2x70/2+1x16 OF	0,164	15,0	8,0	68,0	72,0	8.510	7.200	371	297	226	182	15,4
3x150+2x70/2+1x16 OF	0,132	16,9	8,0	73,9	77,9	9.920	9.000	428	342	261	210	19,2
3x185+2x95/2+1x16 OF	0,108	18,3	9,3	77,0	81,0	11.310	11.100	488	390	298	239	23,7
3x240+2x120/2+1x16 OF	0,0817	20,5	11,1	82,1	87,1	13.840	14.400	574	459	350	281	30,7

\* 18/30 kV available on request.

\*\* For fibre-optics parameters please refer to page 20.