

Cable type

PANZERFLEX-L 0.6/1 kV
(N)SHTÖU-J / -0 rubber cables suitable for reeling & festoon system

Main application

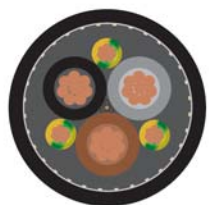
Flexible power cables for use on connecting movable parts of machine tools and any material handling equipment (i.e. Stacker/reclaimer, ship to shore crane, container crane festoon, grabtype ship unloading, gantry festoons, timber crane festoons, etc.).
Suitable for any energy supply on cable reels and festoon systems associated to high mechanical stresses, frequent bending/torsional operation and fast movement with strong acceleration.

Construction

Conductor:	Tinned copper conductor, flexible cl.5 IEC 60228 Specially designed for mobile application
Insulation:	HEPR compound better than 3GI3 New specially developed crushproof compound with improved electrical and mechanical characteristics
Cores identification:	Colours according to according to DIN VDE 0293 part 308 / HD 308 S2 Standard colours: - 1 core: black - 3+3 cores: brown, black, grey + 3 green/yellow - 4 cores: green/yellow, brown, black, grey - 5 cores: green/yellow, blue, brown, black, grey
Laying-up:	Short lay length for better flexibility ≤7,5 times the laying-up cores diameter
Separation (if any):	Tape(s)
Inner sheath:	Polychloroprene rubber based compound Better than GM1b
Antitwisting protection:	Synthetic yarns Firmly bonded between inner and outer sheath
Outer sheath:	Black polychloroprene rubber compound UV resistant oil and chemical resistant better than 5GM2
Marking:	PALAZZO - PANZERFLEX-L 0,6/1 kV <i>nc</i> x cross section

Parameters

Electrical	Rated voltage	U ₀ /U = 0,6/1 kV
	Maximum permissible operating voltage in AC systems	U _m = 1,2 kV
	AC test voltage over 5 minutes	3,5 kV
	Current Carrying Capacity	According to DIN VDE 0298 part 4
Thermal	Fully flexible operation	- 25 °C
	Fixed installation	- 40 °C
	Maximum permissible operating temperature of the conductor	90 °C
	Short-circuit temperature of the conductor	250 °C
Mechanical	Tensile load	Up to 20 N/mm ²
	Minimum bending radii	According to DIN VDE 0298 part 3
	Reeling operation	No restriction. Consult the manufacturer if speed exceeds 180 m/min
	Festoon systems	Up to 240 m/min
Chemical	Resistance to oil	According to VDE / IEC standard
	Weather resistance	Unrestricted use outdoor and indoor, UV resistant, moisture resistant.



If the environment reaches - 40 °C, Palazzo can provide a special version of this cable (differentiated from the standard one by the "-K" add to the code name), which is constructed with a special rubber compound that can face this condition.

For temperature down to - 40°C we suggest to use the Panzerflex®-K. To allow this cable operating at - 40°C we use an outer-sheath compound that is less resistant to abrasion and tear so please contact our sales department for more information regarding application.

Table 1: PANZERFLEX-L 0.6/1 kV (N)SHTÖU-J /-O power cables

N. of cores and nominal section (n-mm ²)	Main conductor		Splitted protec. earth cond. nom. diam. mm	Overall diameter		Net weight approx. kg/km	Maximum permissible tensile force N	Laid straight A	Current carrying capacity at 30 °C *				Short circuit current 80 ° to 200 °C kA
	D.C. resist. at 20 °C Ohm/km	nom. diam. mm		min. mm	max. mm				Suspended in free air A	Spiral or 1 layer A	2 layer A	3 layer A	
1x16	1,24	5,4		10,6	12,7	265	320	141	148	-	-	-	2,0
1x25	0,795	6,6		12,2	14,3	370	500	187	196	-	-	-	3,2
1x35	0,565	8,0		13,9	15,9	505	700	231	243	-	-	-	4,5
1x50	0,393	9,3		15,6	17,7	650	1000	288	302	-	-	-	6,4
1x70	0,277	11,2		17,6	19,7	875	1400	357	375	-	-	-	9,0
1x95	0,210	13,0		20,0	22,1	1120	1900	430	452	-	-	-	12,2
1x120	0,164	15,0		22,2	24,3	1440	2400	503	528	-	-	-	15,4
1x150	0,132	16,9		24,9	27,0	1730	3000	577	606	-	-	-	19,2
1x185	0,108	18,3		26,7	28,8	2070	3700	658	691	-	-	-	23,7
1x240	0,0817	20,5		29,0	32,2	2660	4800	771	810	-	-	-	30,7
3x4	5,09	2,4		14,9	17,0	395	240	41	43	33	25	20	0,51
3x6	3,39	3,1		17,2	19,3	525	360	53	56	42	32	26	0,77
3x10	1,95	4,2		20,3	22,4	765	600	74	78	59	45	36	1,3
3x16	1,24	5,4		23,6	25,7	1080	960	99	104	79	60	49	2,0
3x25	0,795	6,6		27,0	29,1	1470	1500	131	138	105	80	64	3,2
3x35	0,565	8,0		30,4	33,6	2030	2100	162	170	130	99	79	4,5
3x50	0,393	9,3		35,4	38,6	2680	3000	202	212	162	123	99	6,4
3x70	0,277	11,2		39,6	42,8	3530	4200	250	263	200	153	123	9,0
3x95	0,210	13,0		43,8	47,0	4400	5700	301	316	241	184	147	12,2
3x120	0,164	15,0		49,0	53,5	5730	7200	352	370	282	215	172	15,4
3x150	0,132	16,9		55,5	60,0	7040	9000	404	424	323	246	198	19,2
3x185	0,108	18,3		59,5	64,0	8320	11100	461	484	369	281	226	23,7
3x240	0,0817	20,5		67,5	72,0	10850	14400	540	567	432	329	265	30,7
4x4	5,09	2,4		16,0	18,1	460	320	41	43	33	25	20	0,51
4x6	3,39	3,1		18,4	20,5	615	480	53	56	42	32	26	0,77
4x10	1,95	4,2		21,9	24,0	920	800	74	78	59	45	36	1,3
4x16	1,24	5,4		25,5	27,6	1310	1280	99	104	79	60	49	2,0
4x25	0,795	6,6		29,6	32,8	1860	2000	131	138	105	80	64	3,2
4x35	0,565	8,0		33,2	36,4	2490	2800	162	170	130	99	79	4,5
4x50	0,393	9,3		38,4	41,6	3300	4000	202	212	162	123	99	6,4
4x70	0,277	11,2		43,6	46,8	4420	5600	250	263	200	153	123	9,0
4x95	0,210	13,0		48,5	53,0	5610	7600	301	316	241	184	147	12,2
4x120	0,164	15,0		55,5	60,0	7360	9600	352	370	282	215	172	15,4
4x150	0,132	16,9		61,0	65,5	8770	12000	404	424	323	246	198	19,2
4x185	0,108	18,3		67,5	72,0	10730	14800	461	484	369	281	226	23,7
4x240	0,0817	20,5		74,0	78,5	13560	19200	540	567	432	329	265	30,7
5x4	5,09	2,4		18,0	20,1	575	400	41	43	33	25	20	0,51
5x6	3,39	3,1		19,8	21,9	725	600	53	56	42	32	26	0,77
5x10	1,95	4,2		24,5	26,6	1140	1000	74	78	59	45	36	1,3
5x16	1,24	5,4		27,6	29,7	1550	1600	99	104	79	60	49	2,0
5x25	0,795	6,6		32,2	35,4	2170	2500	131	138	105	80	64	3,2
5x35	0,565	8,0		37,0	40,2	3080	3500	162	170	130	99	79	4,5
5x50	0,393	9,3		42,2	45,4	4010	5000	202	212	162	123	99	6,4
5x70	0,277	11,2		48,0	52,5	5480	7000	250	263	200	153	123	9,0
5x95	0,210	13,0		54,5	59,0	7010	9500	301	316	241	184	147	12,2
3x50+3x25/3	0,393	9,3	4,0	34,2	37,4	2730	3000	202	212	162	123	99	6,4
3x70+3x35/3	0,277	11,2	4,9	39,6	42,8	3740	4200	250	263	200	153	123	9,0
3x95+3x50/3	0,210	13,0	5,4	43,8	47,0	4690	5700	301	316	241	184	147	12,2
3x120+3x70/3	0,164	15,0	6,6	49,5	54,0	6220	7200	352	370	282	215	172	15,4
3x150+3x70/3	0,132	16,9	6,6	55,5	60,0	7480	9000	404	424	323	246	198	19,2
3x185+3x95/3	0,108	18,3	8,0	59,5	64,0	9020	11100	461	484	369	281	226	23,7
3x240+3x120/3	0,0817	20,5	9,3	67,5	72,0	11760	14400	540	567	432	329	265	30,7
4x10+4x2.5	1,95	4,2		23,2	25,3	1060	80	74	78	59	45	36	1,3
4x16+4x2.5	1,24	5,4		25,5	27,6	1360	1280	99	104	79	60	4	2,0
4x25+4x2.5	0,795	6,6		29,6	32,8	1910	2000	131	138	105	80	64	3,2
4x35+4x2.5	0,565	8,0		32,8	36,0	2530	2800	162	170	130	99	79	4,5
4x50+4x4	0,393	9,3		38,0	41,2	3370	4000	202	212	162	123	99	6,4

*Tabulated values are valid up to three loaded conductors with or without earth

Cable type

PANZERFLEX-L 0.6/1 kV

(N)SHTÖU-JZ / -OZ rubber cables suitable for reeling & festoon system

Main application

Flexible control cables for use on connecting movable parts of machine tools and any material handling equipment (i.e. Stacker/reclaimer, ship to shore crane, container crane, festoon, grabtype ship unloading, gantry festoons, timber crane festoons, etc.).

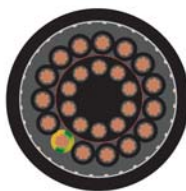
Suitable for signalling supply on cable reels and festoon systems associated to high mechanical stresses, frequent bending/torsional operation and fast movement with strong acceleration.

Construction

Conductor:	Tinned copper conductor, flexible cl.5 IEC 60228 Specially designed for mobile application
Insulation:	HEPR compound better than 3GI3 New specially developed crushproof compound with improved electrical and mechanical characteristics
Cores identification:	Black with printed numbers with or without 1 green/yellow Standard: with green/yellow core in the outer layer
Laying-up:	Short lay length for better flexibility ≤7,5 times the laying-up cores diameter in maximum 3 layer
Separation (if any):	Tape(s)
Inner sheath:	Polychloroprene rubber based compound Better than GM1b
Antitwisting protection:	Synthetic yarns Firmly bonded between inner and outer sheath
Outer sheath:	Black polychloroprene rubber compound UV resistant, oil and chemical resistant better than 5GM2
Marking:	PALAZZO - PANZERFLEX-L 0,6/1 kV <i>nc</i> x cross section

Parameters

Electrical	Rated voltage	U ₀ /U = 0,6/1 kV
	Maximum permissible operating voltage in AC systems	U _m = 1,2 kV
	AC test voltage over 5 minutes	3,5 kV
	Current Carrying Capacity	According to DIN VDE 0298 part 4
Thermal	Fully flexible operation	- 25 °C
	Fixed installation	- 40 °C
	Maximum permissible operating temperature of the conductor	90 °C
	Short-circuit temperature of the conductor	250 °C
Mechanical	Tensile load	Up to 20 N/mm ²
	Minimum bending radii	According to DIN VDE 0298 part 3
	Reeling operation	No restriction. Consult the manufacturer if speed exceeds 180 m/min
	Festoon systems	Up to 240 m/min
Chemical	Resistance to oil	According to VDE / IEC standard
	Weather resistance	Unrestricted use outdoor and indoor, UV resistant, moisture resistant.



If the environment reaches - 40 °C, Palazzo can provide a special version of this cable (differentiated from the standard one by the "K" add to the code name), which is constructed with a special rubber compound that can face this condition.

For temperature down to - 40°C we suggest to use the Panzerflex®-K. To allow this cable operating at - 40°C we use an outer-sheath compound that is less resistant to abrasion and tear so please contact our sales department for more information regarding application.

Table 1: PANZERFLEX-L 0.6/1 kV (N)SHTÖU-JZ / -OZ control cables

N. of cores and nominal section (n-mm ²)	Conductor		Overall diameter		Net weight approx. kg/km	Maximum permissible tensile force N	Laid straight A	Current carrying capacity at 30 °C *					Short circuit current 80 ° to 200 °C kA
	D.C. resist. at 20 °C Ohm/km	nom. diam. mm	min. mm	max. mm				Suspended in free air A	Spiral or 1 layer A	2 layer A	3 layer A		
3x1.5	13,7	1,5	12,4	14,5	255	68	23	24	18	14	11	0,19	
4x1.5	13,7	1,5	13,1	15,2	285	90	23	24	18	14	11	0,19	
5x1.5	13,7	1,5	14,0	16,0	320	113	23	24	18	14	11	0,19	
7x1.5	13,7	1,5	15,8	17,9	415	158	23	24	18	14	11	0,19	
12x1.5	13,7	1,5	19,1	21,2	585	270	23	24	18	14	11	0,19	
18x1.5	13,7	1,5	21,6	23,7	765	405	23	24	18	14	11	0,19	
24x1.5	13,7	1,5	25,6	27,6	1040	540	23	24	18	14	11	0,19	
30x1.5	13,7	1,5	26,6	28,7	1140	675	23	24	18	14	11	0,19	
36x1.5	13,7	1,5	28,6	31,8	1370	810	23	24	18	14	11	0,19	
3x2.5	8,21	2,0	13,4	15,5	310	113	30	32	24	18	15	0,32	
4x2.5	8,21	2,0	14,3	16,3	355	150	30	32	24	18	15	0,32	
5x2.5	8,21	2,0	15,2	17,3	410	188	30	32	24	18	15	0,32	
7x2.5	8,21	2,0	18,1	20,2	570	263	30	32	24	18	15	0,32	
12x2.5	8,21	2,0	21,1	23,2	760	450	30	32	24	18	15	0,32	
18x2.5	8,21	2,0	24,7	26,8	1070	675	30	32	24	18	15	0,32	
24x2.5	8,21	2,0	28,6	31,8	1450	900	30	32	24	18	15	0,32	
30x2.5	8,21	2,0	30,0	33,0	1600	1125	30	32	24	18	15	0,32	
36x2.5	8,21	2,0	31,8	35,0	1850	1350	30	32	24	18	15	0,32	
7x4	5,09	2,4	20,6	22,6	1850	420	41	43	33	25	20	0,51	
12x4	5,09	2,4	25,0	27,0	1851	720	41	43	33	25	20	0,51	
18x4	5,09	2,4	28,4	30,4	1852	1080	41	43	33	25	20	0,51	

*Tabulated values are valid up to three loaded conductors with or without earth.
Derating factor shall be used for multicore cables depending on loaded conductors. See page 49.

The Tensile Load on control cables is calculated considering the limit of 15N/mm² instead of the standard 20N/mm². This is due to the construction of these multi-core cables. For higher Tensile Load please consider to use our VS type as it is provided of a central Kevlar® strainer that allows much higher tensile loads.

Cable type

PANZERFLEX-SIGNAL 0.6/1 kV
(N)SHTÖU-JZ / -OZ suitable for festoon system and simple reeling operation

Main application

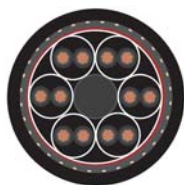
Flexible signal/control for use on connecting movable parts of machine tools and any material handling equipment
Suitable for signalling supply on festoon systems with fast movement with strong acceleration, suitable also for simple reeling

Construction

Conductor:	Tinned copper conductor, flexible cl.5 IEC 60228 Specially designed for mobile application
Insulation:	EPR compound better than 3GI3 Specially developed crushproof compound with improved electrical and mechanical characteristics
Cores identification:	Black with printed numbers with or without 1 green/yellow Each cores consecutively numbered
Shield (on single core or pair):	Tinned copper braid screen At least 70 % on cores At least 80 % on pairs
Pairs (if any):	Two cores layed-up Textile filler in the interstices to mantein good geometrical characteristics
Laying-up:	Short lay length for better flexibilty ≤7 times the laying-up cores diameter (in maximum 3 layer for multicores cables)
Separation (if any):	Tape(s)
Inner sheath:	Polychloroprene rubber based compound Better than GM1b
Antitwisting protection:	Synthetic yarns Firmly bonded between inner and outer sheath
Outer sheath:	Black polychloroprene rubber compound UV resistant oil and chemical resistant better then 5GM2
Marking:	PALAZZO - PANZERFLEX 0,6/1 kV n. of cores/pairs x cross section

Parameters

Electrical	Rated voltage	U ₀ /U = 0,6/1 kV
	Maximum permissible operating voltage in AC systems	U _m = 1,2 kV
	AC test voltage over 5 minutes	2,5 kV
	Current Carrying Capacity	According to DIN VDE 0298 part 4
	Bus compatibility	Cable with twisted and individually shielded pairs can be used for bus systems
Thermal	Fully flexible operation	- 25 °C
	Fixed installation	- 40 °C
	Maximum permissible operating temperature of the conductor	90 °C
	Short-circuit temperature of the conductor	250 °C
Mechanical	Tensile load	Up to 15 N/mm ²
	Minimum bending radii	According to DIN VDE 0298 part 3
	Reeling operation	Up to 60 m/min
	Festoon systems	Up to 180 m/min
Chemical	Resistance to oil	According to VDE / IEC standard
	Weather resistance	Unrestricted use outdoor and indoor, UV resistant, moisture resistant.



If the environment reaches - 40 °C, Palazzo can provide a special version of this cable (differentiated from the standard one by the "-K" add to the code name), which is constructed with a special rubber compound that can face this condition.
For temperature down to - 40°C we suggest to use the Panzerflex®-K. To allow this cable operating at - 40°C we use an outer-sheath compound that is less resistant to abrasion and tear so please contact our sales department for more information regarding application.

Table 1: PANZERFLEX-signal 0.6/1 kV (N)SHTÖU-JZ / -OZ

N. of cores and nominal section (n·mm ²)	Conductor		Overall diameter		Net weight approx. kg/km	Maximum permissible tensile force N	Laid straight A	Current carrying capacity at 30 °C *					Short circuit current 80 ° to 200 °C kA
	D.C. resist. at 20 °C Ohm/km	nom. diam. mm	min. mm	max. mm				Suspended in free air A	Spiral or 1 layer A	2 layer A	3 layer A		
3x(2x1.0)C	20,0	1,3	20,9	23,0	670	90	-	-	-	-	-	-	0,13
3x(2x1.5)C	13,7	1,5	21,4	23,5	740	135	-	-	-	-	-	-	0,19
6x(2x1.0)C	20,0	1,3	26,9	29,0	1080	180	-	-	-	-	-	-	0,13
6x(2x1.5)C	13,7	1,5	28,3	30,3	1210	270	-	-	-	-	-	-	0,19
6x(2x2.5)C	8,21	2	30,6	33,6	1570	450	-	-	-	-	-	-	0,32
19x2,5+5x1(c)	8,21	2	30,6	33,8	1580	713	30	32	24	18	15	15	0,32
19x2,5+5x1,5(c)	8,21	2	30,6	33,8	1630	713	30	32	24	18	15	15	0,32
25x2,5+5x1(c)	8,21	2	32,6	35,8	1820	938	30	32	24	18	15	15	0,32
25x2,5+5x1,5(c)	8,21	2	32,6	35,8	1850	938	30	32	24	18	15	15	0,32
26x2,5+10x1(c)	8,21	2	36,2	39,4	2150	975	30	32	24	18	15	15	0,32

*Tabulated values are valid up to three loaded conductors with or without earth.
Derating factor shall be used for multicore cables depending on loaded conductors. See page 49.

The Tensile Load on control cables is calculated considering the limit of 15N/mm² instead of the standard 20N/mm². This is due to the construction of these multi-core cables. For higher Tensile Load please consider to use our VS type as it is provided of a central Kevlar® strainer that allows much higher tensile loads.