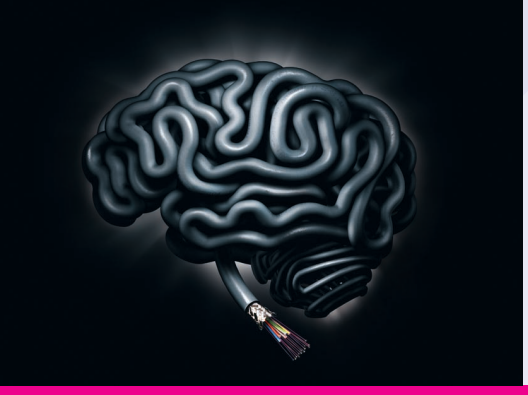


PRYSMIAN
CABLES & SYSTEMS

PROTOLON (FL) LWL

(N)TSFLCGEWOEU

Flat Medium Voltage Reeling Cable With Integrated Fiber Optics

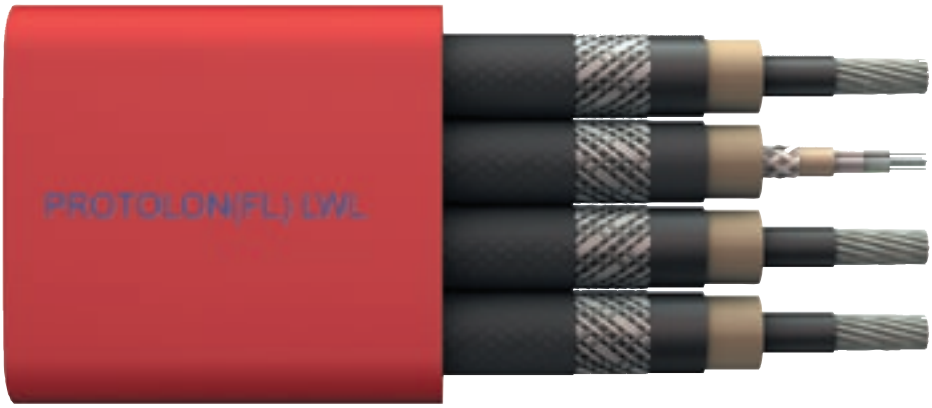
ENERGY

Technical Data

	Type	PROTOLON (FL) LWL		
	Type designation	(N)TSFLCGEWÖU		
	Approvals/ standards	DIN VDE 0250, Part 813		
	Application	Flexible H.V. flexible reeling cable, for high mechanical stresses, e.g. dynamic tensile loads, multiple changes of direction within one plane, running over rollers. Mainly for mobile equipment, e.g. container cranes, cranes, large mobile equipment and excavators.		
Electrical parameters	Rated voltage (Uo/U)	3,6/6 6/10 8,7/15		
	Maximum permissible operating voltage in AC systems (Uo/U)	4,2/7,2 6,9/12 10,4/18		
	Maximum permissible operating voltage in DC systems (Uo/U)	5,4/10,8 9/18 13,5/27		
	AC test voltage	11,0 17,0 24,0 according to DIN VDE 0250, Part 813		
	Current-carrying capacity	According to DIN VDE 0298, Part 4 Higher values are permissible in specific cases. Please consult the manufacturer.		
	Data transmission	Special design with fibre-optics for trouble free data transmission at high data rates.		
Optical parameters	Transmission data of the fibre-optics	Graded-index fibre 50/125	Graded-index fibre 62.5/125	Monomode fibre E9/125
	Max. attenuation at wavelength 850 nm	2.8 dB/km	3.3 dB/km	-
	Max. attenuation at wavelength 1300 nm	0.8 dB/km	0.4 dB/km	0.9 dB/km
	Max. attenuation at wavelength 1550 nm	-	-	0,3 dB/km
	Bandwidth at 850 nm	> 400 MHz	> 400 MHz	-
	Bandwidth at 1300 nm	> 1200 MHz	> 600 MHz	-
	Numerical aperture	0,200+/-0,200	0,275+/-0,02	0.14+/-0.02
	Chromatic dispersion at 1300 nm	-	-	<3,5 ps/nm km
	Chromatic dispersion at 1550 nm	-	-	<3,5 ps/nm km

Technical Data

Thermal parameters	Ambient temperature - Fully flexible operation - Fixed installation	 -35°C to +80°C -50°C to +80°C
	Maximum permissible operating temperature of the conductor	90°C
	Short-circuit temperature of the conductor	250°C
Mechanical parameters	max. permissible tensile load	up to 15 N/mm² (acc. to DIN VDE 0298 part 3)
	Torsional stresses	n.a.
	Minimum bending radii	According to DIN VDE 0298, Part 3 recommendation: applied cable OD = 1.5 x hight of the flat cable
	Minimum distance with S-type directional changes	20xD (cable diameter)
	Travel speed - Gantry (reeling operation)	 120 m/min
	Additional tests	Reversed bending test, reeling test
Chemical parameters	Resistance to oil	DIN VDE 0473, Part 811-2-1 Para. 10
	Weather resistance	Unrestricted use outdoors and indoors, resistant to ozone, UV and moisture
	Water compatibility	According to HD 2216
Note on installation		Preparation of fibre-optics requires special skills and use of elaborate tools. It is therefore recommended that performance of this work be entrusted to our customer service. (Assembly at works) Please give the connection dimensions.



Design features

Type	PROTOLON (FL) LWL
Conductor and protective-earth conductor (refer also to DIN VDE 0295)	Electrolytic copper tinned, finely stranded, class F
Insulation (refer also to DIN VDE 0207, Part 20)	PROTOLON special compound based on high-quality EPR (at least 3GI3); improved mechanical and electrical characteristics
Field control	inner semiconductive layer of EPR, outer semiconductive layer of modified EPR, removable in warm condition
Core identification	natural coloured insulation with black semiconductive layer
Core arrangement	parallel core arrangement, Earth conductor splitted and concentric distributed around each core
Fibre-optics	Fibre core diameter 62.5, 50 or 9µm; diameter across the cladding 125µm, diameter over the coating 250µm
Fibre optic tubes	Tubes filled with special gel, compound based on ETFE
Fibre covering	Specially developed color code for identification of the individual fibres
Fibre optic arrangement	six tubes, lay up in one layer, with one, two or three FO´s each and special support element into the centre
Sheath system	- PROTOFIRM Special compound based on CR, quality at least 5GM5, colour: red
Marking	PROTOLON (FL) LWL (N)TSFLCGEWOEU (number of cores)x(cross-section) (rated voltage) (year of manufacture) (serial number)

Selection and ordering data

Number of cores and nominal cross-section	Order No.	Conductor diameter [mm]	min. Dimensions (guidance value) [mm]	max. Dimensions (guidance value) [mm]	Approx. net weight for 1000 m [kg/km]	Maximum permissible tensile force (dyn. value) [N]
3,6/6kV (N)TSFLCGEWOEU						
3x35+4x25/4E+1x(6LWL)	5DK ...	8,2	24,5x83,5	27,5x88,5	3700	1575
3x50+4x25/4E+1x(6LWL)	5DK ...	9,7	27,0x90,9	30,0x95,9	4530	2250
3x70+4x35/4E+1x(6LWL)	5DK ...	11,4	28,7x97,7	31,7x102,7	5590	3150
3x95+4x50/4E+1x(6LWL)	5DK ...	13,1	30,6x105,3	33,6x110,3	6720	4275
6/10kV (N)TSFLCGEWOEU						
3x35+4x25/4E+1x(6LWL)	5DK4 254	8,2	25,3x86,7	28,3x91,7	3870	1575
3x50+4x25/4E+1x(6LWL)	5DK4 253	9,7	27,8x94,1	30,8x99,1	4730	2250
3x70+4x35/4E+1x(6LWL)	5DK ...	11,4	29,5x100,9	32,5x105,9	5800	3150
3x95+4x50/4E+1x(6LWL)	5DK ...	13,1	31,4x108,5	34,4x113,5	6940	4275
8,7/15kV (N)TSFLCGEWOEU						
3x35+4x25/4E+1x(6LWL)	5DK5 435	8,2	28,5x96,9	31,5x101,9	4610	1575
3x50+4x25/4E+1x(6LWL)	5DK5 014	9,7	30,0x102,9	33,0x107,9	5340	2250
3x70+4x35/4E+1x(6LWL)	5DK ...	11,4	31,7x109,7	33,7x114,7	6460	3150