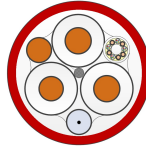


## PROTOLON(SC) (N)TSCGEWOU 6/10kV Medium Voltage cable for shore-connection systems



### Application

The cables are suitable for use high voltage shore connection systems (HVCS), on board the ship and on shore, to supply the ship with electrical power from shore, using control cores and fiber optics to adapt different type of vessels.

### Global data

Brand	PROTOLON(SC)
Type designation	(N)TSCGEWOU
Standard	Based on DIN VDE 0250-813 based on IEC/ISO/IEEE 80005-1

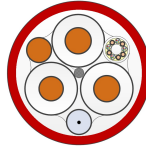
### Design features

Conductor	Bare copper, finely stranded class 5 acc. to IEC 60228 / DIN EN 60228			
PE-Conductor	Bare copper, finely stranded class 5 acc. to IEC 60228 / DIN EN 60228			
Insulation	Basic material EPR, acc. to DIN VDE 0207 Part 20			
Electrical field control	Inner and outer layer of semiconductive rubber compound			
Core identification	Natural coloured insulation with black semiconductive layer			
Optical fiber properties	Fiber type	G62,5/125µm Multi-mode graded index	G50/125µm Multi-mode graded index	E9/125µm Single-mode step index
	Core diameter	62,5µm	50µm	9µm
	Cladding diameter	125µm	125µm	125µm
	Fiber diameter	250µm	250µm	250µm
	Attenuation at 850nm	< 3,3dB/km	< 2,8dB/km	
	Attenuation at 1310nm	< 0,9dB/km	< 0,8dB/km	< 0,4dB/km
	Attenuation at 1550nm			< 0,3dB/km
	Bandwidth at 850nm	> 400MHz	> 400MHz	
	Bandwidth at 1310nm	> 600MHz	> 1200MHz	
	Numerical Aperture	0,275 +/- 0,02	0,2 +/- 0,02	0,14 +/- 0,02
	Chromatic Dispersion at 1300nm			< 3,5ps/nm km
	Chromatic Dispersion at 1550nm			< 18ps/nm km
Fiber covering	Loose tube with filling compound, Basic material: ETFE, Compound: 7YI 1, Natural color			
Control core	Cores made of bare copper, finely stranded class 5 acc. to IEC 60228 / DIN EN 60228, with EPR insulation			
Core arrangement	Three core design laid around a central support element. Earth conductor, screened control element and filler (if needed) positioned in the interstices. Screened control element: control cores and multi fiber loose buffer laid around a central support element. Screen made of aluminium tape with tinned copper drain wire.			
Support element	Central support element made of aramid yarns and rubber covering			
Inner sheath	Vulcanized rubber compound, basic material EPR, type: GM1b acc. to DIN VDE 0207 part 21. Colour: natural			
Outer sheath	Abrasion and tear-proof high grade rubber compound, basic material CR/PCP, compound type: 5GM5 acc. to DIN VDE 0207 part 21. Colour: bright red/red			

### Electrical parameters

Rated voltage	6/10 kV
Max. permissible operating voltage AC	6,9/12 kV
Max. permissible operating voltage DC	9/18 kV
AC test voltage	21 kV
AC test voltage - control cores	2 kV
EMC	Extremely low interference level as a result of use a symmetrical three-core design with very narrow manufacturing tolerances
Data transmission	Special design with fibre-optics for trouble free data transmission at high data rates
Current Carrying Capacity description	According to DIN VDE 0298, Part 4

## PROTOLON(SC) (N)TSCGEW0EU 6/10kV Medium Voltage cable for shore-connection systems



### Chemical parameters

Flame propagation	DIN EN 60332-1-2
Resistance to oil	Acc. to DIN EN 60811-404 and DIN VDE 0473-811-404, paragraph 10
Weather resistance	Unrestricted use outdoors and indoors, resistant to ozone, UV and moisture

### Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Ambient temperature for fixed installation	min -40 °C ; max +80 °C
Ambient temperature in fully flexible operation	min -25 °C ; max +80 °C

### Mechanical parameters

Max. tensile load on the conductor	20 N/mm <sup>2</sup>
Max. tensile load on the conductor during acceleration	25 N/mm <sup>2</sup>
Min. bending radius	Acc. to DIN VDE 0298 part 3
Additional tests	Acc. to IEC/ISO/IEEE 80005-1

Number of cores x cross section	Part number	Conductor diameter max. mm	Earth conductor diameter max. mm	Outer diameter min. mm	Outer diameter max. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Dynamic tensile force max. N	Conductor resistance at 20°C max. Ω/km	Current carrying capacity (1) A	Short Circuit Current (conductor) max. (1s) kA
3x185+1x95+1x(5x2,5ST+4x3G62,5LWL)C	20129011	17.8	13	74	78	780	10850	13875	0.106	461	26.46

(1) Nominal current carrying capacity for rubber cables laid on a surface, at 30°C ambient temperature (see also VDE 0298-4, Table 15).