Find your flavour!

Made in Germany

PROTOLON MV reeling cables – we have the best recipe for every craving.

prysmian

The planet's pathways

Exceptional longevity

German made PROTOLON MV reeling cables guarantee an extended working lifetime in comparison with standard reeling cables, and thus a lower total cost of ownership.

Unique performance

Our PROTOLON MV reeling cables are designed to withstand extreme conditions in terms of for example tensile loads and high travel speeds and acceleration.

Excellent fibre optic efficiency

With our state-of-the art optical fibre solutions we can ensure safe, reliable and multifunctional operation qualities for years to come.

PROTOLON MV reeling cables – we have the best recipe for every craving.

Avoid downtime hours by using reliable cables in key with the harsh and fast-paced environment facing cranes in industrial seaports. Our PROTOLON MV range includes cables with different reeling speed, flexibility and resistance to freezing cold temperatures. And all tough as old boots. Add PROTOLON(SC) Shore Connection cables to keep the vessels energized while loading/unloading and start wheeling in the profits. All in all, it's pretty much like having the cake and eat it, too.

What we offer

Our PROTOLON MV reeling cables for heavy-duty and flexible applications, in particular for ports and mining, are designed to withstand harsh environmental conditions and high mechanical stresses. The offer adds significant benefits to a broad variety of specialized industry professionals such as OEMs, specifiers, contractors, installers, terminal operators and more.

The forced motion of mobile reeling cables during the winding and unwinding phases, may result in high tensile loads and twisting. Excessive elongation of the cable can cause the tensile load to be transferred to the electrical conductors, with consequent damage, while prolonged tensile force can result in permanent cable deformation.

To avoid this from happening we also offer a complete PROTOLON(IQ) System, which detects and reports sudden irregularities on a cable, enabling root-cause analysis and risk-based decisions. For in-depth information about the PROTOLON(IQ) System, please see our brochure on:
https://de.prysmiangroup.com/en/media/brochures

To complete the offer, the PROTOLON range also includes Shore Connection cables. Instead of keeping the diesel engines running, the anchored cargo ships get more sustainable energy while saving on fuel and reducing the carbon footprints. A win-win for everyone.

COMMITTED TO SERVICE

Service beyond the ordinary.

We're not only the largest cable maker in the world, our offer also includes a complete palette of services. Thanks to our skilled and experienced co-workers we can provide you with everything from custom made cables and cables cut to length to project leading on the field and the best technical support on the market. Before, during and after purchase. Being at the forefront of both the energy and fibre optic evolution, we can develop and put together whatever you need, and have it delivered in no time. Doing business with us pays off.

The track record speaks for itself.

Our superior crane cables are developed and produced at our excellence centres in Germany where our experts have gathered know-how for over 100 years. Decades of track records from more than 100 ports around the world show that our cables aren't any one hit wonders. Try them out and experience what real quality means!

What speed do you need?

Choose between PROTOLON(SMK) reeling cables for speeds of 200, 240 and 300 m/min.

A smart cable saving the day

The PROTOLON(IQ) reeling cable is made for permanent monitoring of reeling operations to avoid unexpected downtime and financial losses.

Prepared with polar properties!

PROTOLON(SMK) -50 °C cables operate with full flexibility down to incredibly -50 °C – from being already superior at cold temperatures, we made it even better.

Shut off and just float.

PROTOLON(SC) Shore Connection cables will keep your ship sustainably energised instead of keeping the diesel engines running.

Product/Designation	Additional elements	Tensile load max.	Speed max.	Temp. moving	Special features
ROUND MEDIUM VOLTAGE REELING CABLES					
 **PROTOLON(SMK) 200** (N)TSCGEWOEU	F.O., control cores	25 N/mm² (dynamic)	200 m/min	-35 °C/+80 °C	Optimized design for moderate speed and tensile load **NEW**
 **PROTOLON(SMK) 240** (N)TSCGEWOEU LWL: (N)TSKCGEWOEU	F.O., control cores, TSP, CAN-BUS	30 N/mm² (dynamic)	240 m/min	-35 °C/+80 °C	Reliable design and highly customizable for high and higher mechanical performances
 **PROTOLON(SMK+HS) 300** (N)TSKCGEWOEU	F.O., control cores	Increased with support element. ~40 N/mm² (dynamic)	300+ m/min	-35 °C/+80 °C	Central carrier and "air bag" system for highest mechanical performances
 **Protolon(IQ)** (N)TSKCGEWOEU	F.O., control cores	30 N/mm² (dynamic)	240 m/min	-35 °C/+80 °C	Embedded sensor fibre for real-time monitoring of cable mechanical stress
 **PROTOLON(SMK) -50 °C** (N)TSCGEWOEU LWL: (N)TSKCGEWOEU	F.O., control cores	30 N/mm² (dynamic)	240 m/min	-50 °C/+80 °C	Arctic-grade compounds, with no compromise on the mechanical performances
CABLES FOR SHORE-CONNECTION SYSTEMS					
 **PROTOLON(SC)** (N)TSCGEWOEU	F.O., control cores	25 N/mm² (dynamic)	–	-25 °C/+80 °C	Designed for the use on Shore-Connection system

SUCCESS STORY #1:
The Australian experience

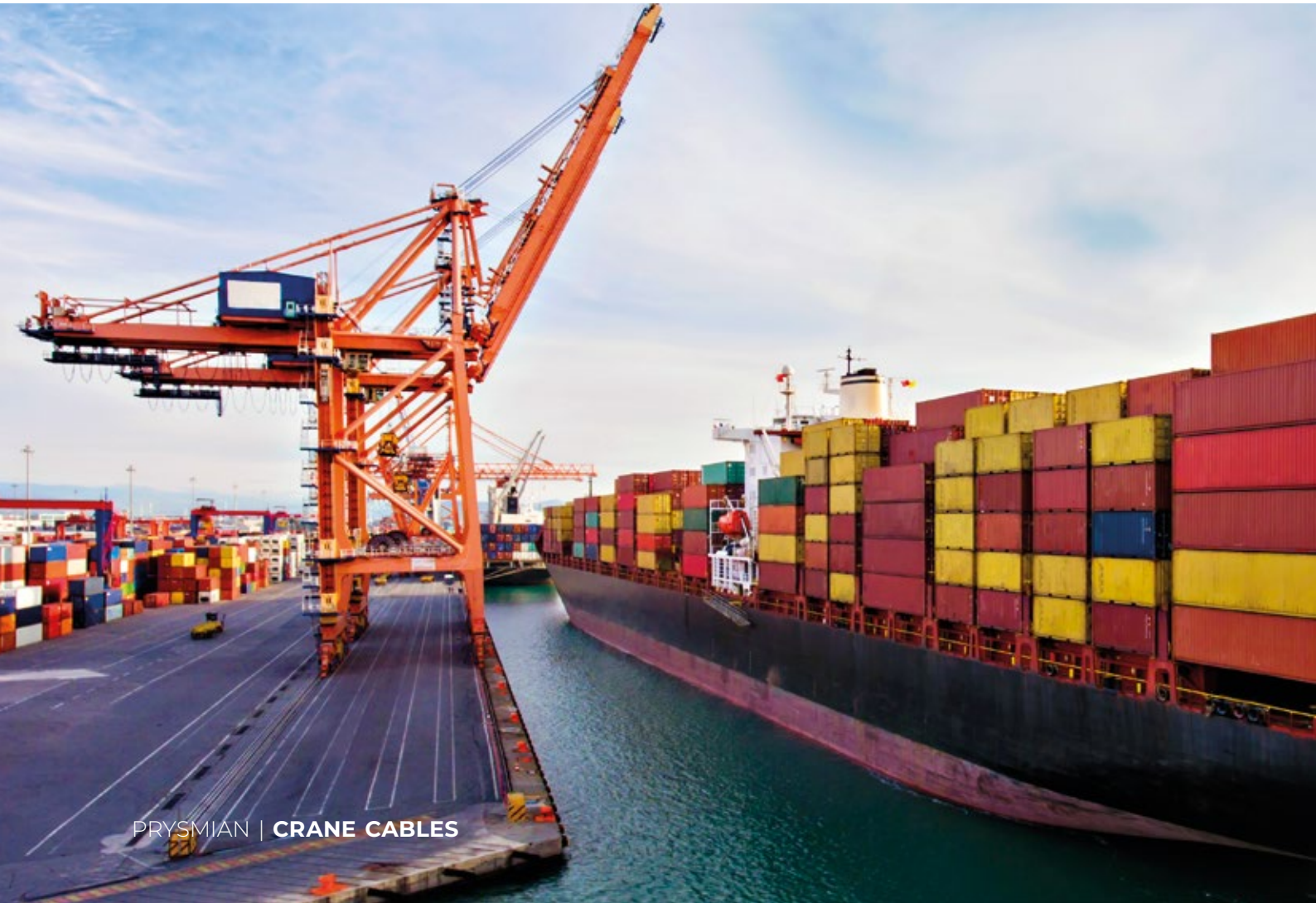
Location: An open-cast iron mine located in the Port Hedland shire in Western Australia.

Application: A reeling cable installed on a stacker-reclaimer.

Travelling distance: 1,000 metres

Challenge: Before the customer had to replace the very expensive reeling cable almost every year. Now they wanted a long-term, and less expensive solution without tampering on any other quality.

Solution: A PROTOLON(IQ) system including an 11/11 kV cable, which revealed a massive cable twist. After re-adjusting the guiding system of the reel and to periodically measure the effect on the cable stress level with the PROTOLON(IQ) system, the mechanical deformation stopped. The cable is in flawless operation since 2016 with a payback time of less than two years.



SUCCESS STORY #2:
The Singapore experience

Location: The Singapore container terminal.

Application: A reeling cable on an automated gantry crane.

Travelling distance: 270 metres

Challenge: The cable in place developed kinks which led to production downtime.

Solution: A PROTOLON(IQ) 6/10 kV cable together with the monitoring system. The monitoring of the mechanical and thermal stress of the cable is ongoing 24/7. Should anything happen to the cable it will be detected almost in real-time and proper measures can be taken. It has been in continuous operation since May 2019, with no flaws detected.

SUCCESS STORY #3
For an outside observer: What a beautiful bay view!

Port operations is anything but romantic. It is a high demanding business where full asset utilization is a critical success factor. Every single component has to do its job, also the cable since nothing works without power.

Only in the last 5 years we have delivered more than 1,220 km of PROTOLON(SMK) to users all over the world. With an average operating length of 400 metre/facility, it means that more than 3,000 devices are equipped with PROTOLON(SMK).

From Los Angeles to Busan, from Hamburg to Durban – our cable is in action in all of the Top 100 container sea ports and in an unbeatable high number of cranes in other intermodal affiliates all around the globe.

PROTOLON(SMK) impresses with its high reliability, best performance and long service life – a fact that is evidenced by the high level of customer satisfaction.

SUCCESS STORY #4:
The Chinese experience

Location: An automation terminal in Qingdao Qianwan located on China's Yellow Sea coast.

Application: A reeling cable installed on an automated rail mounted gantry crane.

Travelling distance: 420 metres

Challenge: For this fully automated crane the customer needed a small cross-section cable which could handle a long distance gantry speed of 270 metres/minute.

Solution: A PROTOLON(SMK) 6/10 kV high speed cable (3x25+2x25/2+24E9). With its integrated support element, the cable is resisting and managing mechanical stresses like extra high tension, increased pressure and twist. The cable is in continuous and trouble-free operation since 2019.

PROTOLON(SMK-200)
3.6/6 kV, 6/10 kV, 8.7/15 kV, 12/20 kV

NEW 200 METRES PER MINUTE

Medium voltage reeling cable for medium mechanical stress.

Application

Flexible medium voltage reeling cable for application under medium mechanical stresses, e.g. moderate travel speeds, dynamic tensile loads, multiple changes of direction into different planes, churning on running over rollers and torsional stresses.

Mainly for mobile equipment, e.g. container cranes and large moving equipment.

PROTOLON(SMK-200)	
Global data	
Brand	PROTOLON(SMK-200)
Type designation	(N)TSCGEWOEU
Standard	Based on DIN VDE 0250-813
Design features	
Conductor	Plain copper, finely stranded class 5
Insulation	PROTOLON HS – High grade special insulation compound based on high-quality EPR, better than 3GI3
Electrical field control	Inner semiconductive layer of EPR, outer semiconductive layer of modified NBR, Easy-Strip
Core arrangement	Cores laid up around conductive filler, earth conductor and FO element into the interstices
Inner sheath	Rubber, special compound, mechanical properties acc. to 5GM3
Reinforcement	Polyester anti-torsion braid
Outer sheath	PROTOFIRM outer sheath – Abrasion and tear-proof high grade rubber compounds based on PCP, better than 5GM5

PROTOLON(SMK-200)			
Electrical parameters			
Rated voltage U_0/U (kV)	Max. permissible operating voltage (kV)		AC test voltage (kV)
	AC	DC	
3.6/6	4.2/7.2	5.4/10.8	11
6/10	6.9/12	9/18	17
8.7/15	10.4/18	13.5/27	24
12/20	13.9/24	18/36	29
Current carrying capacity		According to DIN VDE 0298, part 4	
Data transmission		Integration with up to 24 fibre optics, single-mode E9 or multi-mode G62.5 or G50	
Chemical parameters			
Oil resistance		Acc. to DIN EN 60811-404 and DIN VDE 0473-811-404, para. 10	
Weather resistance		Unrestricted use outdoors and indoors, resistant to ozone, UV, moisture and cold temperatures	
Thermal parameters			
Max. operating temperature of the conductor		90 °C	
Max. short circuit temperature of the conductor		250 °C	
Ambient temperature for fixed installation		min. -50 °C, max. +80 °C	
Ambient temperature in fully flexible operation		min. -35 °C, max. +80 °C	
Mechanical parameters			
Max. tensile load on the conductor		Static: 20 N/mm² Dynamic: 25 N/mm²	
Bending radii min.		Acc. to DIN VDE 0298, part 3	
Travel speed		Reeling operation: 160 m/min (centre-feed) 200 m/min (end-feed)	

PROTOLON(SMK) / PROTOLON(SMK)-LWL
1.8/3 kV / 3.6/6 kV, 6/10 kV, 8.7/15 kV, 12/20 kV

Medium voltage reeling cable.

Application

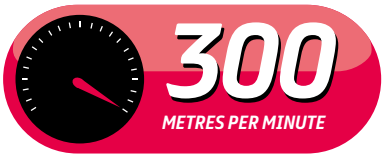
Flexible medium voltage reeling cable for application under high to extreme mechanical stresses, e.g. high travel speeds, dynamic tensile loads, multiple changes of direction into different planes, churning on running over rollers and torsional stresses.

Mainly for mobile equipment, e.g. fast-moving container cranes and large moving equipment.

PROTOLON(SMK) / PROTOLON(SMK)-LWL	
Global data	
Brand	PROTOLON(SMK) PROTOLON(SMK)-LWL
Type designation	(N)TSCGEWOEU LWL: (N)TSKCGEWOEU
Standard	Based on DIN VDE 0250-813
Certifications / Approvals	GOST-R/-K/-B, Fire Certificate of Russia Federation
Design features	
Conductor	Electrolytic copper tinned, very finely stranded, class FS
Insulation	PROTOLON HS - High grade special insulation compound based on high-quality EPR, better than 3GI3
Electrical field control	Inner semiconductive layer of EPR, outer semiconductive layer of modified NBR (Easy Strip design)
Core arrangement	Three-core design, with earth split into 3 interstices. LWL: Three core design with cradle separator, earth and FO element in interstices
Inner sheath	PROTOFIRM Sandwich Special compound based on EPR/PCP, quality at least 5GM3
Anti-torsion braid	Reinforced braid made of polyester threads
Outer sheath	PROTOFIRM outer sheath – Abrasion and tear-proof high grade rubber compound based on PCP, better than 5GM5

PROTOLON(SMK) / PROTOLON(SMK)-LWL			
Electrical parameters			
Rated voltage U_0/U (kV)	Max. permissible operating voltage (kV)		AC test voltage (kV)
	AC	DC	
1.8/3	2.1/3.6	2.7/5.4	6
3.6/6	4.2/7.2	5.4/10.8	11
6/10	6.9/12	9/18	17
8.7/15	10.4/18	13.5/27	24
12/20	13.9/24	18/36	29
Data transmission	Special designs with twisted shielded pairs or individually screened control elements available on request. LWL: Integration with up to 24 fibre optics, single-mode E9 or multi-mode G62.5 or G50		
Current carrying capacity	Acc. to DIN VDE 0298, part 4		
Chemical parameters			
Oil resistance	Acc. to DIN EN 60811-404 and DIN VDE 0473-811-404, para. 10		
Weather resistance	Unrestricted use outdoors and indoors, resistant to ozone, UV, moisture and cold temperatures		
Water resistance	According to HD 2216		
Thermal parameters			
Max. operating temperature of the conductor	90 °C		
Max. short circuit temperature of the conductor	250 °C		
Ambient temperature for fixed installation	min. -50 °C, max. +80 °C		
Ambient temperature in fully flexible operation	min. -35 °C, max. +80 °C		
Mechanical parameters			
Max. tensile load on the conductor	Static: 20 N/mm² Dynamic: 30 N/mm²		
Bending radii min.	Acc. to DIN VDE 0298, part 3		
Travel speed	Reeling operation: 240 m/min		

PROTOLON(SMK+HS)
6/10 kV, 8.7/15 kV, 12/20 kV



Medium voltage reeling cable for high speed moving cranes.

Application

Flexible medium voltage reeling cable with integrated fibre optics for the combined transmission of energy and data, for application under high or extreme mechanical stresses and very high travel speeds, dynamic tensile loads, multiple changes of direction into different planes, churning on running over rollers and torsional stresses. Especially suitable for fast-moving container cranes (> 240 m/min).

PROTOLON(SMK+HS)	
Global data	
Brand	PROTOLON(SMK+HS)
Type designation	(N)TSKCGEWOEU
Standard	Based on DIN VDE 0250-813
Design features	
Conductor	Electrolytic copper tinned, very finely stranded, class FS
Insulation	PROTOLON HS+, lead-free, with optimized wall thickness, better than 3GI3
Electrical field control	Inner semiconductive layer of EPR, outer semiconductive layer of modified NBR (Easy Strip design)
Core arrangement	Three core design with cradle separator and aramid support element in the centre, earth and FO element in interstices
Inner sheath	PROTOFIRM Sandwich – double layer inner sheath with increased thickness. Special compound based on EPR/PCP, quality at least 5GM3
Anti-torsion braid	Reinforced braid made of polyester threads
Outer sheath	PROTOFIRM outer sheath – Abrasion and tear-proof high grade rubber compounds based on PCP, better than 5GM5

PROTOLON(SMK+HS)			
Electrical parameters			
Rated voltage U_0/U (kV)	Max. permissible operating voltage (kV)		AC test voltage (kV)
	AC	DC	
6/10	6.9/12	9/18	17
8.7/15	10.4/18	13.5/27	24
12/20	13.9/24	18/36	29
Data transmission		Integration with up to 24 fibre optics, single-mode E9 or multi-mode G62.5 or G50	
Current carrying capacity		Acc. to DIN VDE 0298, part 4	
Chemical parameters			
Oil resistance		Acc. to DIN EN 60811-404 and DIN VDE 0473-811-404, para. 10	
Weather resistance		Unrestricted use outdoors and indoors, resistant to ozone, UV and moisture	
Water resistance		According to HD 2216	
Thermal parameters			
Max. operating temperature of the conductor		90 °C	
Max. short circuit temperature of the conductor		250 °C	
Ambient temperature for fixed installation		min. -50 °C, max. +80 °C	
Ambient temperature in fully flexible operation		min. -35 °C, max. +80 °C	
Mechanical parameters			
Max. tensile load on the conductor		Increased tensile load through additional support element	
Torsional stress		± 25 °/m	
Bending radii min.		Acc. to DIN VDE 0298, part 3	
Travel speed		Reeling operation: 300 m/min	

PROTOLON(IQ)
3.6/6 kV, 6/10 kV, 8.7/15 kV, 12/20 kV

Medium voltage reeling cable with integrated sensor fibre.

Application

Flexible medium voltage reeling cable with integrated sensor fibre for detecting and analysing the mechanical and thermal stress acting on the cable during gantry operation; for application under high or extreme mechanical stresses, e.g. high travel speeds, dynamic tensile loads, multiple changes of direction into different planes, churning on running over rollers and torsional stresses. Mainly intended for large mobile equipment, e.g. fast-moving gantry cranes, automated stacking cranes, ship-loaders, etc., that require continuous monitoring of the cable conditions to enable preventive maintenance actions.

PROTOLON(IQ)	
Global data	
Brand	PROTOLON(IQ)
Type designation	(N)TSKCGEWOEU
Standard	Based on DIN VDE 0250-813
Design features	
Conductor	Electrolytic copper tinned, very finely stranded, class FS
Insulation	PROTOLON HS - High grade special insulation compound based on high-quality EPR, better than 3GI3
Electrical field control	Inner semiconductive layer of EPR, outer semiconductive layer of modified NBR, (Easy Strip design)
Sensor fibre	Special single-mode sensor fibre (IQ), for monitoring the mechanical and thermal conditions of the cable
Core arrangement	Three core design with cradle separator, earth and FO element in the interstices
Inner sheath	PROTOFIRM Sandwich Special compound based on EPR/PCP, quality at least 5GM3
Anti-torsion braid	Reinforced braid made of polyester threads
Outer sheath	PROTOFIRM outer sheath – Abrasion and tear-proof high grade rubber compound based on PCP, better than 5GM5

PROTOLON(IQ)			
Electrical parameters			
Rated voltage U_0/U (kV)	Max. permissible operating voltage (kV)		AC test voltage (kV)
	AC	DC	
1.8/3	2.1/3.6	2.7/5.4	6
3.6/6	4.2/7.2	5.4/10.8	11
6/10	6.9/12	9/18	17
8.7/15	10.4/18	13.5/27	24
12/20	13.9/24	18/36	29
Data transmission		Integration with up to 24 fibre optics, single-mode E9 or multi-mode G62.5 or G50	
Current carrying capacity		According to DIN VDE 0298, part 4	
Chemical parameters			
Oil resistance		Acc. to DIN EN 60811-404 and DIN VDE 0473-811-404, para. 10	
Weather resistance		Unrestricted use outdoors and indoors, resistant to ozone, UV and moisture	
Thermal parameters			
Max. operating temperature of the conductor		90 °C	
Max. short circuit temperature of the conductor		250 °C	
Ambient temperature for fixed installation		min. -50 °C, max. +80 °C	
Ambient temperature in fully flexible operation		min. -35 °C, max. +80 °C	
Mechanical parameters			
Max. tensile load on the conductor		Static: 20 N/mm² Dynamic: 30 N/mm²	
Bending radii min.		Acc. to DIN VDE 0298, part 3	
Travel speed		Gantry (reeling operation): up to 240 m/min.	

PROTOLON(SMK) -50 °C / PROTOLON(SMK)-LWL -50 °C
1.8/3 kV / 3.6/6 kV, 6/10 kV, 8.7/15 kV, 12/20 kV

Medium voltage reeling cable.

Application

Flexible medium voltage reeling cable for application under high to extreme mechanical stresses, e.g. high travel speeds, dynamic tensile loads, multiple changes of direction into different planes, churning on running over rollers and torsional stresses.

Mainly for mobile equipment, e.g. fast-moving container cranes and large moving equipment.

LWL: Optional with integrated fibre optics for the combined transmission of energy and data.

PROTOLON(SMK) -50 °C / PROTOLON(SMK)-LWL -50 °C	
Global data	
Brand	PROTOLON(SMK) -50 °C PROTOLON(SMK)-LWL -50 °C
Type designation	(N)TSCGEWOEU LWL: (N)TSKCGEWOEU
Standard	Based on DIN VDE 0250-813
Certifications / Approvals	GOST-R/-K/-B, Fire Certificate of Russia Federation
Design features	
Cross section range	3C+3G (also + control or BUS) LWL: 3C+2G+FO (also + control or BUS)
Conductor	Electrolytic copper tinned, very finely stranded, class FS
Insulation	Special compound based on high-quality EPR for extreme cold conditions down to -50 °C
Electrical field control	Inner and outer semi-conductive layer
Core arrangement	Three-core design, with earth split into 3 interstices. LWL: Three core design with cradle separator, earth and FO element in interstices
Sheath system	Inner sheath and outer sheath made of special rubber compound type PCP (better than 5GM5) for extreme cold conditions down to -50 °C With integrated reinforcement made of polyester braid for torsion protection

PROTOLON(SMK) -50 °C / PROTOLON(SMK)-LWL -50 °C			
Electrical parameters			
Rated voltage U_0/U (kV)	Max. permissible operating voltage (kV)		AC test voltage (kV)
	AC	DC	
3.6/6	4.2/7.2	–	11
6/10	6.9/12	–	17
8.7/15	10.4/18	–	24
12/20	13.9/24	–	29
Data transmission		Integration with up to 24 fibre optics, single-mode E9 or multi-mode G62.5 or G50	
Current carrying capacity		Acc. to DIN VDE 0298, part 4	
Chemical parameters			
Oil resistance		Acc. to DIN EN 60811-404.	
Weather resistance		Unrestricted use outdoors and indoors, resistant to ozone, UV, moisture and cold temperatures	
Thermal parameters			
Max. operating temperature of the conductor		90 °C	
Max. short circuit temperature of the conductor		250 °C	
Ambient temperature for fixed installation		min. -50 °C, max. +80 °C	
Ambient temperature in fully flexible operation		min. -50 °C, max. +80 °C	
Mechanical parameters			
Max. tensile load on the conductor		20 N/mm²	
Bending radii min.		Acc. to DIN VDE 0298, part 3	
Travel speed		Reeling operation: up to 240 m/min.	

PROTOLON(SC)
6/10 kV

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 fibre optics to adapt different type of vessels.

The cable is suitable for permanent immersion in water.

PROTOLON(SC)	
Global data	
Brand	PROTOLON(SC)
Type designation	(N)TSCGEWOEU
Standard	Based on DIN VDE 0250-813, based on IEC/ISO/IEEE 80005-1
Design features	
Conductor / PE-Conductor	Bare copper, finely stranded class 5 acc. to IEC 60228 / DIN EN 60228
Insulation	Basic material EPR, type 3GI3, acc. to DIN VDE 0207 Part 20
Electrical field control	Inner and outer layer of semiconductive rubber compound
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
Support element	Aramid yarns and rubber covering
Inner sheath	Vulcanized rubber compound, basic material EPR, type: GM1b acc. to DIN VDE 0207 part 21.
Outer sheath	Abrasion and tear-proof high grade rubber compound, basic material CM/CPE acc. to DIN VDE 0207 part 21

PROTOLON(SC)	
Electrical parameters	
Rated voltage	6/10 kV
Max. permissible operating voltage AC	6.9/12 kV
AC Test Voltage	21 kV
Data transmission	Integration with up to 24 fibre optics, single-mode E9 or multi-mode G62.5 or G50
Current carrying capacity	According to DIN VDE 0298, part 4
Chemical parameters	
Flame propagation	DIN EN 60332-1-2
Oil resistance	Acc. to DIN EN 60811-404 and DIN VDE 0473-811-404, para. 10
Weather resistance	Unrestricted use outdoors and indoors, resistant to ozone, UV and moisture. Water resistant
Thermal parameters	
Max. operating temperature of the 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	Static: 20 N/mm^2 Dynamic: 25 N/mm^2
Bending radii min.	Acc. to DIN VDE 0298 part 3
Additional tests	Acc. to IEC/ISO/IEEE 80005-1

The planet's pathways

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