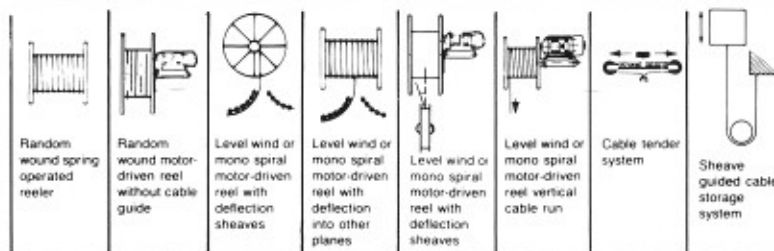


PROTOLON® (SM) Fiber-Optic Composite Cable

Portable Power Composite Reeling Cable, EP Insulation
semiconductive EP Shield, Optical Fiber Assembly,
Dual Lead Cured Neoprene Jacket with Braid
Reinforcement, 90°C, 5-15kV



2



Applications

PROTOLON® (SM) composite reeling cable is designed for high speed, high tensile stress applications characterized by frequent dynamic load peaks (eg. container cranes, stacker/reclaimers, shiploaders and unloaders, bucketwheel excavators, etc.)

PROTOLON® enables Data, Voice, and Video transmission to be combined with power into a single cable. The construction is particularly resistant to the high tension and transverse forces associated with high mounted reelers and high travel speeds.

Design

Finely stranded, tin coated copper conductors are laid up with an extra short length of lay to provide a highly flexible conductor assembly. The PROTOLON EP insulation has excellent electrical and mechanical characteristics and is extremely resistant to ozone. The semiconductive EP conductor shield, insulation, and insulation shield are extruded in a triple extrusion. The semiconductive EP shielding on the conductors and insulation control the electric field and prevent partial discharge. This shielding method possesses superior feature compared to metallic braided shielding which include:

- Consistent shield coverage during cable life due to lack of mechanical deterioration caused by abrasion.
- Excellent electric field control due to 100% coverage and bonded extrusion.

Two ground conductors have a semiconductive EP covering and are assembled using a short length of lay with the fiber-optic assembly into a cradle separator or saddle for protection from bending and tensile forces.

An inner neoprene jacket is extruded into the interstices of the conductor assembly. This "locked in" construction provides exceptional torsion resistance, eliminating the "corkscrewing" or "knuckling" of conductors present in many reeling cables.

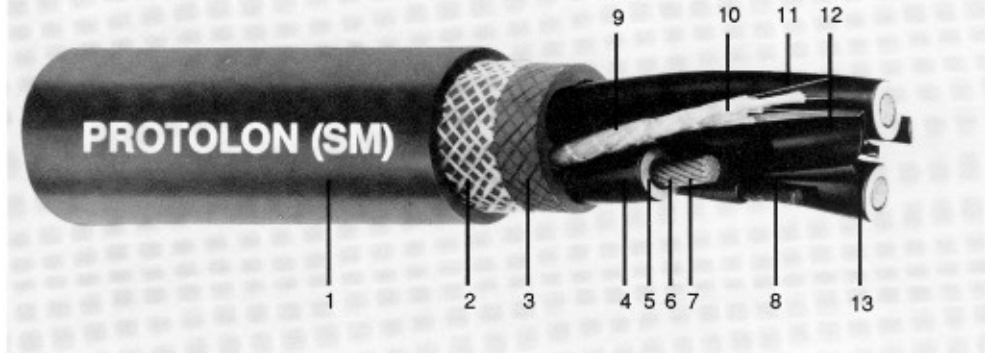
A heavy duty PROTOFIRM® neoprene jacket is extruded overall and has high resistance to ripping, notching, abrasion, lubricants, chemicals and weather. PROTOLON® (SM) is also available as a special two ground construction with an EP insulated 600V control conductor within both of the ground conductors. This construction allows functions such as emergency stops to be hard wired and retains the safety of being shielded by the ground. A high tenacity, wide mesh, synthetic textile braid lies in a vulcanized bond between the inner and outer jacket, providing additional torsion resistance.

When PROTOLON® (SM) cable is selected for extreme applications, the design exceeds NTSCgEwou constructions requirements specified in VDE 0250. Other special PROTOLON® cable constructions are available on request.

PROTOLON® (SM)

Composite Cable

- 1 Extra heavy duty lead cured neoprene outer jacket
- 2 High tenacity textile braid
- 3 Neoprene inner jacket
- 4 Outer extruded semi-conductive rubber conductor shield
- 5 PROTOLON EP insulation
- 6 Inner semi-conductive rubber extruded conductor shield
- 7 Finely stranded tin coated copper conductor
- 8 Semi conductive rubber covered ground conductor
- 9 Clear ETFE deformation resistant fiber optic assembly jacket
- 10 ETFE loose buffer tube
- 11 62.5/125 μ m glass multimode optical fiber
- 12 Fiberglass composite central strength member
- 13 Cradle separator



PROTOLON (SM) Medium Voltage Reeling Cable with Jacket Thickness to ICEA - 5000V

Axister Part Number	Power Conductors				Ground Conductors (2)				# of Functional glass fibers	Nominal diameter of fiber core (μ m)	Nominal diameter of fiber cladding (μ m)	Diam. of Optical Fiber Assembly		Jacket Wall Thickness		Nominal Overall Diameter		Cable Weight		Maximum Continuous Safe Reeling Tension	
	Number of Conductors	Conductor Size		Approximate Number of Strands Per Conductor	Conductor Size		Approximate Number of Strands Per Conductor	Inches				mm	Inch	mm	Inch	mm	Lbs	kg/km	Lbs	Newtons	
		AWG	mm ²		AWG	mm ²															
5SP-0405SM40F-R	3	#4	21.15	318	#8	8.37	180	4 or 6	62.5	125	0.3	7.8	0.220	5.5	1.870	48.0	1980	2940	285	1270	
5SP-0205SM40F-R	3	#2	33.63	498	#6	13.30	196	4 or 6	62.5	125	0.3	7.8	0.220	5.5	2.090	52.0	2480	3690	455	2020	
5SP-0105SM40F-R	3	#1	42.41	460	#5	16.77	246	4 or 6	62.5	125	0.3	7.8	0.250	6.5	2.205	56.0	2980	4430	575	2545	
5SP-1005SM40F-R	3	#10	53.48	584	#4	21.15	318	4 or 6	62.5	125	0.3	7.8	0.250	6.5	2.300	59.0	3415	5090	720	3210	
5SP-2005SM40F-R	3	#20	67.43	736	#3	26.67	399	4 or 6	62.5	125	0.3	7.8	0.250	6.5	2.400	61.0	3940	5660	910	4050	
5SP-3005SM40F-R	3	#30	85.03	745	#2	33.63	513	4 or 6	62.5	125	0.3	7.8	0.250	6.5	2.600	66.0	4670	6950	1150	5100	
5SP-4005SM40F-R	3	#40	107.20	939	#1	42.41	475	4 or 6	62.5	125	0.3	7.8	0.290	7.5	2.850	73.0	5780	8600	1445	6430	
5SP-2505SM40F-R	3	250MCM	126.64	1110	#10	53.48	593	4 or 6	62.5	125	0.3	7.8	0.320	8.0	3.170	81.0	7960	10500	1710	7600	
5SP-3505SM40F-R	3	350MCM	177.35	1554	#20	67.43	746	4 or 6	62.5	125	0.3	7.8	0.320	8.0	3.405	87.0	8770	13050	2390	10640	
5SP-5005SM40F-R	3	500MCM	253.35	2230	#40	107.20	962	4 or 6	62.5	125	0.3	7.8	0.390	10.0	4.110	105.0	12935	19250	3420	15200	

PROTOLON (SM) Medium Voltage Reeling Cable with Jacket Thickness to ICEA - 8000V

Axister Part Number	Power Conductors				Ground Conductors (2)				# of Functional glass fibers	Nominal diameter of fiber core (μ m)	Nominal diameter of fiber cladding (μ m)	Diam. of Optical Fiber Assembly		Jacket Wall Thickness		Nominal Overall Diameter		Cable Weight		Maximum Continuous Safe Reeling Tension	
	Number of Conductors	Conductor Size		Approximate Number of Strands Per Conductor	Conductor Size		Approximate Number of Strands Per Conductor	Inches				mm	Inch	mm	Inch	mm	Lbs	kg/km	Lbs	Newtons	
		AWG	mm ²		AWG	mm ²															
5SP-0408SM40F-R	3	#4	21.15	318	#8	8.37	180	4 or 6	62.5	125	0.3	7.8	0.220	5.5	2.065	53.0	2305	3430	285	1270	
5SP-0208SM40F-R	3	#2	33.63	498	#6	13.30	196	4 or 6	62.5	125	0.3	7.8	0.250	6.5	2.260	56.0	2980	4430	455	2020	
5SP-0108SM40F-R	3	#1	42.41	460	#5	16.77	246	4 or 6	62.5	125	0.3	7.8	0.250	6.5	2.360	60.0	3340	4970	575	2545	
5SP-1008SM40F-R	3	#10	53.48	584	#4	21.15	318	4 or 6	62.5	125	0.3	7.8	0.250	6.5	2.480	63.0	3800	5650	720	3210	
5SP-2008SM40F-R	3	#20	67.43	736	#3	26.67	399	4 or 6	62.5	125	0.3	7.8	0.250	6.5	2.600	66.0	4340	6460	910	4050	
5SP-3008SM40F-R	3	#30	85.03	745	#2	33.63	513	4 or 6	62.5	125	0.3	7.8	0.290	7.5	2.800	71.0	5250	7810	1150	5100	
5SP-4008SM40F-R	3	#40	107.20	939	#1	42.41	475	4 or 6	62.5	125	0.3	7.8	0.290	7.5	2.970	76.0	6030	8980	1445	6430	

PROTOLON (SM) Medium Voltage Reeling Cable with Jacket Thickness to ICEA - 15000V

Axister Part Number	Power Conductors				Ground Conductors (2)				# of Functional glass fibers	Nominal diameter of fiber core (μ m)	Nominal diameter of fiber cladding (μ m)	Diam. of Optical Fiber Assembly		Jacket Wall Thickness		Nominal Overall Diameter		Cable Weight		Maximum Continuous Safe Reeling Tension	
	Number of Conductors	Conductor Size		Approximate Number of Strands Per Conductor	Conductor Size		Approximate Number of Strands Per Conductor	Inches				mm	Inch	mm	Inch	mm	Lbs	kg/km	Lbs	Newtons	
		AWG	mm ²		AWG	mm ²															
5SP-0415SM40F-R	3	#4	21.15	318	#8	8.37	180	4 or 6	62.5	125	0.3	7.8	0.250	6.5	2.380	61.0	3000	4460	285	1270	
5SP-0215SM40F-R	3	#2	33.63	498	#6	13.30	196	4 or 6	62.5	125	0.3	7.8	0.290	6.5	2.540	65.0	3575	5320	455	2020	
5SP-0115SM40F-R	3	#1	42.41	460	#5	16.77	246	4 or 6	62.5	125	0.3	7.8	0.290	7.5	2.715	69.0	4150	6180	575	2545	
5SP-1015SM40F-R	3	#10	53.48	584	#4	21.15	318	4 or 6	62.5	125	0.3	7.8	0.290	7.5	2.795	71.0	4640	6910	720	3210	
5SP-2015SM40F-R	3	#20	67.43	736	#3	26.67	399	4 or 6	62.5	125	0.3	7.8	0.290	7.5	2.910	74.0	5200	7740	910	4050	
5SP-3015SM40F-R	3	#30	85.03	745	#2	33.63	513	4 or 6	62.5	125	0.3	7.8	0.320	8.5	3.150	80.0	6180	9200	1150	5100	
5SP-4015SM40F-R	3	#40	107.20	939	#1	42.41	475	4 or 6	62.5	125	0.3	7.8	0.320	8.5	3.290	84.0	7060	10500	1445	6430	

Note: Two non-functional dummy fibers are present with two functional fibers available as an option.