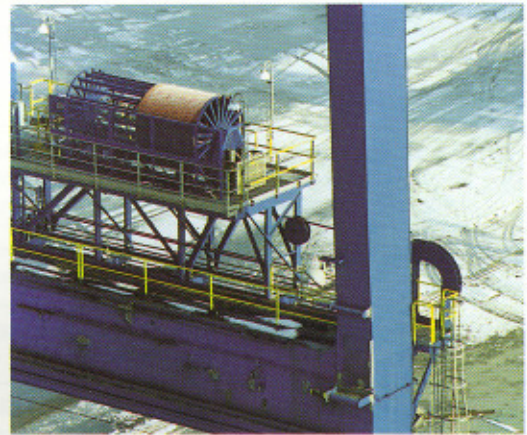
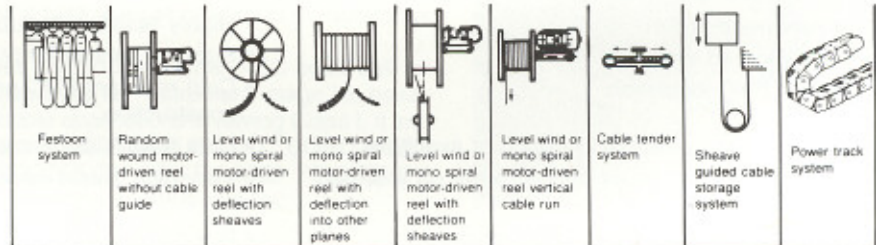


# PROTOLON (SM-R)

Portable power reeling cable, EP insulation, semiconductive EP shield, dual, Neoprene jacket with braid reinforcement, and jacket thickness to ICEA, 90°C, 5-15kV



## Application

- Stacker/reclaimer reels
- Container crane reels
- Log handling crane reels
- Shipunloader reels
- Shiploader reels

## Features

- Finely stranded tin coated copper conductors with a short length of lay, (shorter than PROTOLON)
- EP conductor shield, insulation and insulation shield are applied in a triple extrusion
- Semi-conductive EP shield
- Inner jacket locked construction of conductor assembly
- Wide mesh textile braid reinforcement in a vulcanized bond
- Extra heavy duty red neoprene double extruded jacket
- PROTOLON EP insulation
- Jacket thickness to ICEA
- Design exceeds NTSCgEwöu construction requirements specified in VDE 0250
- Composite cables with integrated optical fibers available (Please refer to catalog P9204)

## Benefits

- Highly flexible conductor assembly
- 100% shield coverage
- No mechanical deterioration as in copper braid shields
- Superior electrical field distribution
- Superior resistance to "knuckling" or "corkscrewing" of conductors due to torsion
- Provides high torsion resistance
- Very resistant to jacket deformation and compressive forces
- Red-high voltage i.d.
- Highly resistant to oil, flame, etc.
- Highly resistant to ozone
- Permits retrofitting to existing SHD-GC applications without equipment mods
- Optimal operational performance
- Power and control/data transmission through one single cable
- No interference of the control/data circuits

### Temperature ratings

- Maximum conductor temperature: 90°C
- Minimum permissible temperature for optimum fully flexible operation: - 20°C
- Minimum permissible ambient temperature: - 45°C

### Ampacity and voltage drop

The tables on pages 19 to 22 may be used to determine the appropriate ampacity for

PROTOLON (SM-R) cables. Voltage drop may be calculated by using the information on page 23

### Voltage ratings\*

Rated voltage	5 kV	8kV	15 kV	25 kV
*AC factory test voltage (R.M.S.)	13 kV	18 kV	27 kV	38 kV
*Recommended DC test voltage (15 min)	35 kV	55 kV	80 kV	85 kV

\* See Section 5 for additional information on A.C. and D.C. cable testing.

Details on PROTOLON cables up to 35kV are available upon request. Normal safety practices should be implemented when performing electrical tests. Particular attention is required in

discharging cables after testing to eliminate charge build-up associated with the capacitive characteristics of the insulation.

### Insulation colors

The three phase conductors are insulated with white EP and finished with a black extruded semi-conductive EP shield. The ground check is yellow

EP insulated while the ground wires are covered with black semi-conductive EP.

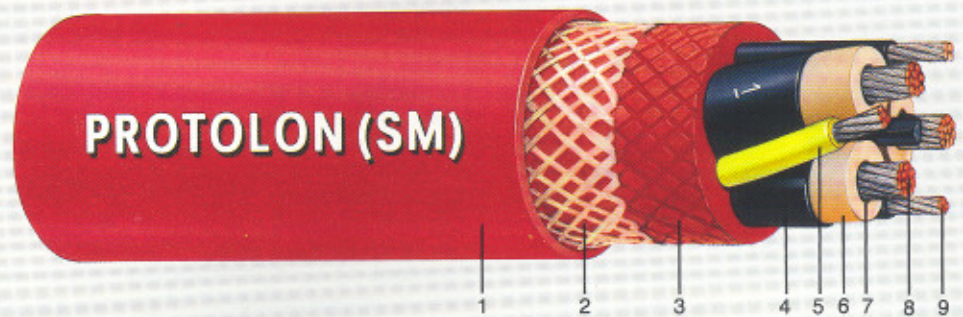
### Approvals

- PROTOLON(SM-R) is accepted by MSHA and is marked P-189-4-MSHA.
- VDE approved.

**PROTOLON (SM-R)**

With jacket thickness to ICEA

- 1 Extra heavy duty Neoprene jacket
- 2 High tenacity textile braid
- 3 Neoprene inner jacket
- 4 Outer extruded semi-conductive rubber conductor shield
- 5 EP insulated ground check conductor
- 6 PROTOLON EP insulation
- 7 Inner semi-conductive rubber extruded conductor shield
- 8 Finely stranded tin coated copper conductor
- 9 Semi-conductive rubber covered ground conductor



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

Aixtel Part Number	Power Conductors			Ground Conductors (2)			Ground Check Conductor (1)		Jacket Wall Thickness		Nominal Overall Diameter		Cable Weight		Maximum Continuous Safe Reeling Tension			
	Number of Conductors	Conductor Size		Conductor Size		Approximate Number of Strands Per Conductor	Conductor Size		Approximate Number of Strands Per Conductor	Inch	mm	Inch	mm	Lbs/1000 ft	kg/km	lbs	Newtons	
		AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>		AWG	mm <sup>2</sup>										
5SP-0405SM-R	3	#4	21.15	318	#8	8.37	180	#8	8.37	180	0.220	5.5	1.770	45.0	1940	2890	285	1270
5SP-0205SM-R	3	#2	33.63	498	#6	13.30	196	#8	8.37	180	0.220	5.5	1.910	48.5	2440	3630	455	2020
5SP-0105SM-R	3	#1	42.41	460	#5	16.77	246	#8	8.37	180	0.250	6.5	1.990	50.5	2780	4140	575	2545
5SP-1005SM-R	3	#1/0	53.48	584	#4	21.15	318	#8	8.37	180	0.250	6.5	2.165	55.0	3370	5020	720	3210
5SP-2005SM-R	3	#2/0	67.43	736	#3	26.67	399	#8	8.37	180	0.250	6.5	2.285	58.0	3890	5790	910	4050
5SP-3005SM-R	3	#3/0	85.03	745	#2	33.63	513	#8	8.37	180	0.250	6.5	2.420	61.5	4540	6760	1150	5100
5SP-4005SM-R	3	#4/0	107.20	939	#1	42.41	475	#8	8.37	180	0.290	7.5	2.660	67.5	5600	8330	1445	6430
5SP-2505SM-R	3	250MCM	126.64	1110	#1/0	53.48	593	#8	8.37	180	0.320	8.0	2.875	73.0	6600	9820	1710	7600
5SP-3505SM-R	3	350MCM	177.35	1554	#2/0	67.43	746	#8	8.37	180	0.320	8.0	3.170	80.5	8430	12540	2390	10640
5SP-5005SM-R	3	500MCM	253.35	2330	#4/0	107.20	962	#8	8.37	180	0.390	10.0	3.800	96.5	12240	18220	3420	15200

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

5SP-0408SM-R	3	#4	21.15	318	#8	8.37	180	#8	8.37	180	0.220	5.5	1.950	49.5	2270	3380	285	1270
5SP-0208SM-R	3	#2	33.63	498	#6	13.30	196	#8	8.37	180	0.250	6.5	2.145	54.5	2920	4340	455	2020
5SP-0108SM-R	3	#1	42.41	460	#5	16.77	246	#8	8.37	180	0.250	6.5	2.245	57.0	3290	4890	575	2545
5SP-1008SM-R	3	#1/0	53.48	584	#4	21.15	318	#8	8.37	180	0.250	6.5	2.345	59.5	3750	5580	720	3210
5SP-2008SM-R	3	#2/0	67.43	736	#3	26.67	399	#8	8.37	180	0.250	6.5	2.440	62.0	4280	6370	910	4050
5SP-3008SM-R	3	#3/0	85.03	745	#2	33.63	513	#8	8.37	180	0.290	7.5	2.660	67.5	5150	7670	1150	5100
5SP-4008SM-R	3	#4/0	107.20	939	#1	42.41	475	#8	8.37	180	0.290	7.5	2.795	71.0	5940	8840	1445	6430

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

5SP-0415SM-R	3	#4	21.15	318	#8	8.37	180	#8	8.37	180	0.250	6.5	2.265	57.5	2950	4390	285	1270
5SP-0215SM-R	3	#2	33.63	498	#6	13.30	196	#8	8.37	180	0.250	6.5	2.400	61.0	3710	5520	455	2020
5SP-0115SM-R	3	#1	42.41	460	#5	16.77	246	#8	8.37	180	0.290	7.5	2.580	65.5	4080	6070	575	2545
5SP-1015SM-R	3	#1/0	53.48	584	#4	21.15	318	#8	8.37	180	0.290	7.5	2.680	68.0	4570	6800	720	3210
5SP-2015SM-R	3	#2/0	67.43	736	#3	26.67	399	#8	8.37	180	0.290	7.5	2.775	70.5	5130	7630	910	4050
5SP-3015SM-R	3	#3/0	85.03	745	#2	33.63	513	#8	8.37	180	0.320	8.0	2.915	74.0	5860	8720	1150	5100
5SP-4015SM-R	3	#4/0	107.20	939	#1	42.41	475	#8	8.37	180	0.320	8.0	3.130	79.5	6930	10320	1445	6430