

Extra Heavy Duty Flexible Mining Cables



APPLICATION

- Above ground mining of coal, iron ore and uranium
- Quarries
- Construction & Heavy Industry
- Drills, pumps & cutters
- Conveyors
- 400Hz Installations

DESIGN

PROTOMONT heavy duty cables combine flexibility with toughness to provide long service life in aggressive operating conditions.

Finely stranded tinned copper conductors are rope laid to form a flexible construction. R-EP-90 elastomer insulation offers a high insulation resistance and excellent current carrying capacity. Each power core has a concentric screen of tinned copper wires and the entire conductor assembly is bound together with a textile tape. Both the elastomer inner sheath and heavy duty PCP outer sheath protect the cable from mechanical damage. Control cores, when required, are laid up in the three interstices outside the screens. The 5DL2 design is an overall screened version.

PROTOMONT is also suitable for 400Hz installations with its symmetrical design and core screens.

OPERATING TEMPERATURES

- Minimum permissible ambient temperature -40°C
- Maximum permissible conductor temperature 90°C
- Maximum permissible short circuit temperature 250°C

MINIMUM BENDING RADII

The following minimum recommended bending radii should be observed to ensure operating reliability.

- For fixed installation 4 x cable diameter
- When freely flexing 5 x cable diameter

CURRENT CARRYING CAPACITY

Current ratings are based on a continuous operating ambient temperature of 40°C. At other temperatures these values must be converted using the following table.

°C	15	20	25	30	35	40	45	50	55	60	65	70	75	80
Factor	1.26	1.20	1.15	1.10	1.05	1.00	0.94	0.88	0.81	0.73	0.65	0.57	0.47	0.34

TENSILE STRENGTH

The maximum allowable tensile stress on the conductors is 15N/mm². This ensures no conductor damage will occur in operation.

VOLTAGE RATING

- Rated Voltage: $U_0/U = 0.6/1kV$
- Maximum operating voltages in:
 - 3 phase AC operation $U_0/U = 0.7/1.2kV$
 - DC operation $U_0/U = 0.9/1.8kV$
- AC test voltage = 3kV

CORE COLOUR IDENTIFICATION

3 core : blue, brown & black
 Pilots: blue, brown & black
 5 core : black, blue, black, brown, black

CABLE DESCRIPTION

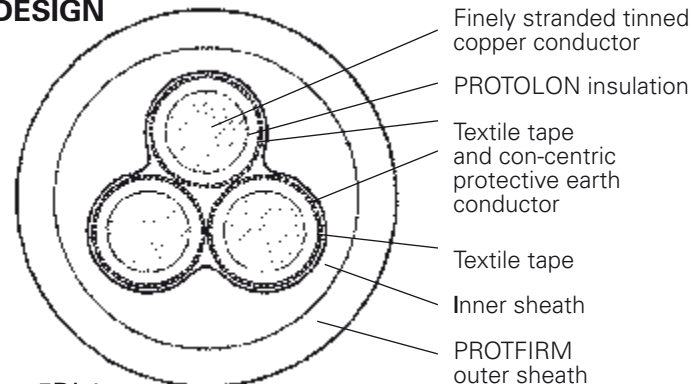
Protomont has a particular description to detail its construction fully.

eg., 3 x 25 + 3 x 16/3E indicates 3 power cores each 25 mm² and 3 split earth screens (one over each power core) totaling 16 mm².

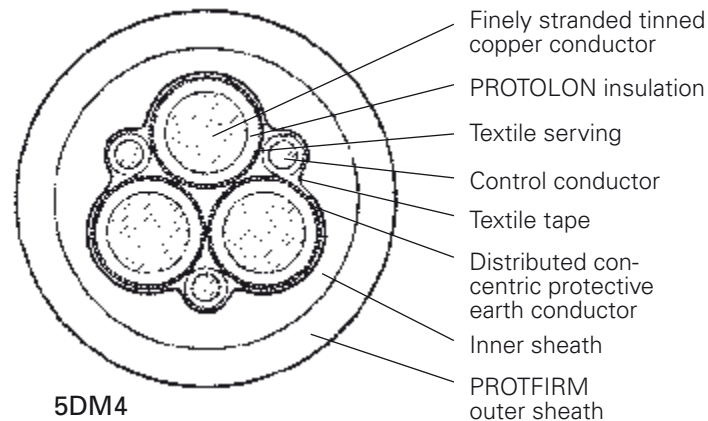
+ 3 x 2.5 indicates 3 insulated control cores.

Conductor Size	Reactance Ω/km	Impedance Ω/km	Inductance mH/km	Capacitance μF/km
mm ²	Ω/km	Ω/km	mH/km	μF/km
4	0.1019	6.49	0.290	0.380
6	0.0942	4.32	0.270	0.440
10	0.0924	2.49	0.370	0.480
16	0.0870	1.58	0.250	0.570
25	0.0868	1.02	0.250	0.600
35	0.0821	0.725	0.240	0.690
50	0.0812	0.508	0.240	0.720
70	0.0786	0.363	0.230	0.840
95	0.0780	0.280	0.230	0.860
120	0.0761	0.223	0.230	0.960
150	0.0763	0.186	0.230	1.110
185	0.0757	0.158	0.230	1.190
240	0.0749	0.131	0.225	1.33
300	0.0743	0.114	0.223	1.44

DESIGN



5DL4



5DM4

Selection and Ordering Data

	No. of Cores Conductor Size	Part No.	Approx. No. of Strands x Max. Strand Diameter	Diameter of Bare Conductor		Cable Overall Diameter		Cable Weight	Current Carrying Capacity	
				Max mm	Min mm	Max mm	kg/km		free in air	Touching a surface
	mm ²		mm						A	A
PROTOMONT	3 x 4 + 3 x 4/3E	5DL4 406	56 x 0.31	3.1	17.0	19.5	490	38	35	
3 Screened	3 x 6 + 3 x 6/3E	5DL4 407	84 x 0.31	3.8	18.0	21.0	610	48	45	
Power Cores	3 x 10 + 3 x 10/3E	5DL4 410	80 x 0.41	5.0	21.5	24.5	880	66	62	
	3 x 16 + 3 x 16/3E	5DL4 412	126 x 0.41	6.3	27.0	30.0	1400	88	83	
	3 x 25 + 3 x 16/3E	5DL4 713	196 x 0.41	8.0	30.0	33.5	1750	120	110	
	3 x 35 + 3 x 16/3E	5DL4 714	276 x 0.41	9.2	35.0	39.0	2350	145	135	
	3 x 50 + 3 x 25/3E	5DL4 715	396 x 0.41	11.0	41.0	45.5	3290	180	170	
	3 x 70 + 3 x 35/3E	5DL4 716	560 x 0.41	13.0	45.0	49.5	4130	230	215	
	3 x 95 + 3 x 50/3E	5DL4 717	740 x 0.41	15.2	51.5	56.5	5490	285	265	
	3 x 120 + 3 x 70/3E	5DL4 718	950 x 0.41	17.0	62.0	68.0	6760	330	305	
PROTOMONT	3 x 6 + 3 x 6/3E + 3 x 1.5	5DM4 730	84 x 0.31	3.8	19.0	21.5	650	48	45	
3 Screened Power	3 x 10 + 3 x 10/3E + 3 x 2.5	5DM4 731	80 x 0.41	5.0	23.5	26.5	1120	66	62	
Cores including 3	3 x 16 + 3 x 16/3E + 3 x 2.5	5DM4 432	126 x 0.41	6.3	25.5	29.0	1300	88	83	
Control Cores	3 x 25 + 3 x 16/3E + 3 x 2.5	5DM4 733	196 x 0.41	8.0	30.0	33.5	1800	120	110	
	3 x 35 + 3 x 16/3E + 3 x 2.5	5DM4 734	273 x 0.41	9.2	35.0	39.0	2390	145	135	
	3 x 50 + 3 x 25/3E + 3 x 2.5	5DM4 735	396 x 0.41	11.0	41.0	45.5	3320	180	170	
	3 x 70 + 3 x 35/3E + 3 x 2.5	5DM4 736	560 x 0.41	13.0	45.0	49.5	4170	230	215	
	3 x 95 + 3 x 50/3E + 3 x 2.5	5DM4 737	740 x 0.41	15.2	51.5	56.5	5530	285	265	

