AnHui Feichun Special Cable Co., Ltd

PROTOLON(FL)

Flat Medium Voltage Reeling Cable

Type: (N)TSFLCGEWOEU
Standard: DIN VDE 0250-813
Edition: Complete Technical Spec

Flat Cable Structure



Product Overview

Application:

Flexible flat medium voltage reeling cable for high mechanical stresses including dynamic tensile loads, multiple changes of direction within one plane, and running over rollers. Mainly for mobile equipment such as fast-moving container cranes, large mobile equipment and excavators.

Key Features:

- ✓ Flat design optimized for roller motion
- ✓ Parallel core arrangement
- ✓ Concentric ground conductor distribution
- ✓ High-quality EPR insulation
- ✓ Extended temperature range (-35°C to +80°C)
- ✓ High-speed reeling operation (120 m/min)
- ✓ Compact flat profile for space-efficient routing

Global Technical Data

Brand	PROTOLON(FL)
Type Designation	(N)TSFLCGEWOEU
Standard	Based on DIN VDE 0250-813
Conductor	Electrolytic copper tinned, finely stranded, class F (DIN VDE 0295)
Insulation	High-quality EPR-based compound (at least 3GI3) with semiconductive layers
Core Arrangement	Parallel cores with split earth conductor distributed concentrically around each core
Inner Sheath	PROFIRM - CR-based compound (5GM5 quality)
Color	Red (PROTOLON color-coded)
Design	Flat configuration optimized for roller systems and compact cable routing

Electrical Parameters

Voltage Rating	Max Operating Voltage (AC)	AC Test Voltage
3.6/6 kV	6.9/12 kV	17 kV
6/10 kV	10.4/18 kV	24 kV
8.7/15 kV	13.5/27 kV	29 kV

Thermal Parameters

Max Conductor Temperature (continuous)	90°C
Max Short Circuit Temperature	250°C
Ambient Temp (Fixed Installation)	-50°C to +80°C
Ambient Temp (Flexible Operation)	-35°C to +80°C

Mechanical Parameters

Max Tensile Load	15 N/mm²
Torsional Stress	Not allowed (flat cable design)
Min Bending Radius	See configuration tables
Travel Speed (Reeling)	Up to 120 m/min
Directional Changes	Multiple changes within one plane (optimized for rollers)

Chemical & Environmental Resistance

Oil Resistance	According to DIN EN 60811-404 and DIN VDE 0473-811-404
Weather Resistance	Unrestricted indoor/outdoor use, resistant to ozone, UV and moisture
Water Resistance	According to HD 2216

Rated Voltage: 3.6/6 kV (6 Configurations)

Cores x Section	MLFB	Ø max (mm)	Min H (mm)	Max H (mm)	Min W (mm)	Max W (mm)	Bend R (mm)	Weight (kg/km)	Tensile (N)	Resis (Ω/km)	Current (A)	I²t (kA²)
3×25+3×25/3E	5DK3...	6.9	24.2	27.2	46.3	68.3	408	2.73	1125	0.80	105	3.58
3×35+3×25/3E	5DK3...	8.3	24.7	27.7	65.8	69.8	416	3.12	1575	0.57	130	5.01
3×50+3×25/3E	20090795	9.8	27.8	30.0	71.1	75.1	450	3.86	2250	0.39	162	7.15
3×70+3×35/3E	5DK3...	11.4	28.9	31.9	76.8	80.8	479	4.73	3150	0.28	200	10.01
3×95+3×50/3E	20008330	13.3	29.2	30.9	75.5	79.5	464	5.28	4275	0.21	241	13.59
3×120+3×70/3E	20141934	15.1	35.4	37.4	92.3	97.3	561	7.40	5400	0.16	282	17.16

Rated Voltage: 6/10 kV (8 Configurations)

Cores x Section	Part Number	MLFB	Ø max (mm)	Min H (mm)	Max H (mm)	Min W (mm)	Max W (mm)	Bend R (mm)	Weight (kg/km)	Tensile (N)	Resis (Ω/km)	Current (A)	I²t (kA²)
3×25+3×25/3E	20135391	5DK4505	6.9	25.0	27.5	66.7	69.7	413	2.86	1125	0.80	105	3.58
3×35+3×25/3E	20008722	5DK4508	8.3	25.5	28.5	68.2	72.2	428	3.26	1575	0.57	130	5.01
4×35+4×25/4E	20154113	5DK4514	8.3	25.5	28.5	86.7	91.7	428	4.11	2100	0.57	130	5.01
3×50+3×25/3E	20014334	5DK4509	9.8	28.1	31.1	74.6	78.6	467	4.03	2250	0.39	162	7.15
3×70+3×35/3E	20040832	5DK4512	11.4	29.7	32.7	79.2	83.2	491	4.85	3150	0.28	200	10.01
4×70+4×35/4E	20048375	5DK4513	11.4	29.5	32.5	100.9	105.9	488	6.24	4200	0.28	200	10.01
3×95+3×50/3E	-	5DK4...	13.3	31.7	34.7	84.7	89.7	521	5.92	4275	0.21	241	13.59
3×120+3×70/3E	-	5DK4...	15.1	35.1	38.1	92.9	97.9	572	7.42	5400	0.16	282	17.16

Rated Voltage: 8.7/15 kV (6 Configurations)

Cores x Section	Part Number	MLFB	Ø max (mm)	Min H (mm)	Max H (mm)	Min W (mm)	Max W (mm)	Bend R (mm)	Weight (kg/km)	Tensile (N)	Resis (Ω/km)	Current (A)	I²t (kA²)
3×25+3×25/3E	20168238	5DK5...	6.9	27.7	30.7	73.3	77.3	461	3.39	1125	0.80	111	3.58
3×35+3×25/3E	-	5DK5...	8.3	28.7	31.7	76.2	80.2	476	3.82	1575	0.57	138	5.01
3×50+3×25/3E	-	5DK5...	9.8	30.2	33.2	80.7	84.7	498	4.44	2250	0.39	172	7.15
3×70+3×35/3E	-	5DK5...	11.4	33.3	36.3	87.5	92.5	545	5.61	3150	0.28	212	10.01
3×95+3×50/3E	-	5DK5...	13.3	35.3	38.3	93.5	98.5	575	6.70	4275	0.21	255	13.59
3×120+3×70/3E	-	5DK5...	15.1	37.3	40.3	99.5	104.5	605	8.00	5400	0.16	297	17.16

Summary & Total Configuration Count

Voltage Rating	Number of Configurations	Conductor Range
3.6/6 kV	6 configurations	3×25 to 3×120 mm²
6/10 kV	8 configurations	3×25 to 3×120 mm² (3/4 core options)
8.7/15 kV	6 configurations	3×25 to 3×120 mm²
TOTAL: 20 Complete Configurations		**All Voltage Levels**

Unique Advantages of PROTOLON(FL)

- ✓ Flat design minimizes cable volume and allows compact routing
- ✓ Optimized for roller-based cable routing systems
- ✓ Parallel core arrangement for simplified installation
- ✓ Concentric earth conductor distribution ensures uniform grounding
- ✓ Suitable for multi-directional movement within one plane
- ✓ High mechanical durability under tensile loads (15 N/mm²)
- ✓ Red PROFIRM outer sheath provides excellent durability
- ✓ Operating speed up to 120 m/min for reeling operations
- ✓ Chemical resistance to oil, ozone, UV and moisture

Recommended Applications

- ✓ Fast-moving container cranes (STS) with roller systems
- ✓ Mobile cranes and large mobile equipment
- ✓ Excavators and mobile construction machinery
- ✓ Systems requiring multiple directional changes in one plane
- ✓ Cable management requiring compact flat profile routing
- ✓ High-frequency reeling operation scenarios
- ✓ Outdoor and harsh environmental conditions

Standards & Compliance

- ✓ DIN VDE 0250-813 (Medium Voltage Reeling Cable)
- ✓ DIN EN 60228 (Conductor Classes)
- ✓ VDE 0295 (Copper Standards)
- ✓ DIN VDE 0298 Part 4 (Current Carrying Capacity)
- ✓ DIN VDE 0298 Part 3 (Bending radius and S-type changes)
- ✓ DIN EN 60811-4 (Insulation & Sheath Testing)
- ✓ HD 2216 (Water Resistance)

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