# PROTOLON (M) F-(N)TSCGEWOEU

Medium Voltage Flexible Cable for Semi-Flexible Installation | 6 - 35 kV

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## Flexible Cable for Semi-Flexible Installation

**PROTOLON (M) F-(N)TSCGEWOEU** is designed for laying alongside conveyor belts (also for shiftable units) and on material handling equipment (even with continuous movement such as in cable booms or as connection between upper and lower car), and for connection of submersible pump units.

**Total Configurations: 71** — covering 6 voltage classes from 3.6/6 kV to 20/35 kV, with conductor sizes from 3×25 mm² up to 3×300 mm².

**Key Advantages:** Excellent sea water resistance • Rated for water depths up to 10 m • High torsional & tensile resistance • Oil, ozone & UV resistant • Flame retardant per GOST-R/-K/-B certification

## Technical Summary & Specifications

### ELECTRICAL

**Voltage:** 3.6/6 – 20/35 kV

**Test Voltage:** 11 – 50 kV

**Conductor:** Finely stranded copper, bare, class 5

### THERMAL

**Max conductor temp:** 90°C

**Short circuit temp:** 250°C

**Fixed install:** -40 to +80°C

**Flexible install:** -25 to +60°C

### MECHANICAL

**Torsional stress:** ±100°/m

**Tensile strength:** 15 N/mm² static

**Bend radius:** 6×D fixed / 10×D flexible

### CHEMICAL

**Flame Retardant:** ✓ EN/IEC 60332-1-2

**Oil / Ozone / UV:** ✓ Resistant

**Sea Water Resistance:** Excellent

**Max Water Depth:** 10 m

**Standards:** DIN VDE 0250-813 • DIN VDE 0298-4 • DIN EN 60811-404 / IEC 60811-404 • DIN EN 50525-2-21 • GOST-R/-K/-B Fire Certificate (Russian Federation) • DIN EN 60332-1-2 / IEC 60332-1-2

## Cable Construction

### Conductor & Insulation

1. Conductor — finely stranded copper, bare, class 5
2. Semi-conductive EPR
3. Core insulation — EPR rubber (PROTOLON HS Special compound 3G13)

### Core Arrangement

4. Three main conductors laid-up, with protective-earth conductor split into 3 in the outer interstices
5. Earth conductors
6. Semi-conductive NBR easy strip

### Sheath

7. Optical fiber element (where applicable)
8. Inner sheath — rubber, Special EPR compound GM1b
9. Outer sheath — chlorinated polyethylene (CM/CPE), Special compound 5GM3

## Complete Specifications — 3.6/6 kV (15 Configurations)

### PROTOLON (M) F-(N)TSCGEWOEU 3.6/6kV — 15 Configurations

| Basic Construction (mm²) | Conductor Ø (mm) | Cable Ø min (mm) | Cable Ø max (mm) | Cable Weight (kg/km) | Max. Tensile Strength (N) | Nominal Capacitance (nF/km) | Operation Inductance (mH/km) | Conductor Resistance at 20°C (Ω/km) | Current (A) |
|---|---|---|---|---|---|---|---|---|---|
| 3×25+3×25/3 | 6.4 | 33.6 | 36.6 | 2,090 | 1,125 | 350 | 0.32 | 0.78 | 131 |
| 3×25+3×50/3 | 6.4 | 40.2 | 41.9 | 2,730 | 1,125 | 350 | 0.36 | 0.78 | 131 |
| 3×35+3×25/3 | 7.6 | 36.1 | 39.1 | 2,510 | 1,575 | 390 | 0.31 | 0.554 | 162 |
| 3×35+2×25/2+1×10ST | 7.6 | 41 | 44 | 3,000 | 1,575 | 390 | 0.31 | 0.554 | 162 |
| 3×35+3×50/3 | 7.6 | 41.7 | 44.7 | 3,190 | 1,575 | 390 | 0.33 | 0.554 | 162 |
| 3×50+3×25/3 | 9.1 | 40.4 | 43.4 | 3,210 | 2,250 | 450 | 0.29 | 0.386 | 202 |
| 3×50+3×50/3 | 9.1 | 42.9 | 45.9 | 3,640 | 2,250 | 460 | 0.29 | 0.386 | 202 |
| 3×70+3×35/3 | 10.8 | 43.9 | 46.9 | 4,070 | 3,150 | 510 | 0.28 | 0.272 | 250 |
| 3×70+3×50/3 | 10.8 | 44.4 | 47.4 | 4,240 | 3,150 | 510 | 0.28 | 0.272 | 250 |
| 3×95+3×50/3 | 12.7 | 49.7 | 53.7 | 5,300 | 4,275 | 580 | 0.27 | 0.206 | 301 |
| 3×120+3×70/3 | 14.3 | 53.1 | 57.1 | 6,430 | 5,400 | 640 | 0.26 | 0.161 | 352 |
| 3×150+3×70/3 | 16 | 56.8 | 60.8 | 7,310 | 6,750 | 710 | 0.25 | 0.129 | 404 |
| 3×185+3×95/3 | 17.7 | 61.7 | 65.7 | 9,000 | 8,325 | 770 | 0.25 | 0.106 | 461 |
| 3×240+3×120/3 | 20.6 | 68.4 | 72.4 | 11,280 | 10,800 | 800 | 0.24 | 0.0801 | 540 |
| 3×300+3×150/3 | 23.1 | 75.1 | 79.1 | 13,770 | 13,500 | 850 | 0.23 | 0.0641 | 620 |

## Complete Specifications — 6/10 kV (19 Configurations)

### PROTOLON (M) F-(N)TSCGEWOEU 6/10kV — 19 Configurations

| Basic Construction (mm²) | Conductor Ø (mm) | Cable Ø min (mm) | Cable Ø max (mm) | Cable Weight (kg/km) | Max. Tensile Strength (N) | Nominal Capacitance (nF/km) | Operation Inductance (mH/km) | Conductor Resistance at 20°C (Ω/km) | Current (A) |
|---|---|---|---|---|---|---|---|---|---|
| 3×25+3×25/3 | 6.4 | 34.9 | 37.9 | 2,190 | 1,125 | 310 | 0.33 | 0.78 | 131 |
| 3×25+3×50/3 | 6.4 | 39.9 | 42.9 | 2,830 | 1,125 | 310 | 0.35 | 0.78 | 131 |
| 3×35+3×25/3 | 7.6 | 38.4 | 41.4 | 2,710 | 1,575 | 350 | 0.32 | 0.554 | 162 |
| 3×35+3×35/3 | 7.6 | 38.4 | 41.4 | 2,790 | 1,575 | 350 | 0.34 | 0.554 | 162 |
| 3×35+3×50/3 | 7.6 | 41.9 | 44.9 | 3,230 | 1,575 | 350 | 0.34 | 0.554 | 162 |
| 3×50+3×25/3 | 9.1 | 41.6 | 44.6 | 3,340 | 2,250 | 400 | 0.30 | 0.386 | 202 |
| 3×50+3×50/3 | 9.1 | 42.2 | 45.2 | 3,590 | 2,250 | 400 | 0.30 | 0.386 | 202 |
| 3×70+3×35/3 | 10.8 | 45.2 | 48.2 | 4,200 | 3,150 | 460 | 0.29 | 0.272 | 250 |
| 3×70+3×50/3 | 10.8 | 45.2 | 48.2 | 4,300 | 3,150 | 460 | 0.29 | 0.272 | 250 |
| 3×95+3×50/3 | 12.7 | 50.9 | 54.9 | 5,440 | 4,275 | 520 | 0.27 | 0.206 | 301 |
| 3×95+3×70/3 | 12.7 | 50.9 | 54.9 | 5,610 | 4,275 | 520 | 0.27 | 0.206 | 301 |
| 3×120+3×70/3 | 14.3 | 54.4 | 58.4 | 6,600 | 5,400 | 570 | 0.27 | 0.161 | 352 |
| 3×150+3×70/3 | 16 | 57.9 | 61.9 | 7,670 | 6,750 | 630 | 0.26 | 0.129 | 404 |
| 3×185+3×95/3 | 17.7 | 62.5 | 66.5 | 9,170 | 8,325 | 680 | 0.25 | 0.106 | 461 |
| 3×240+3×120/3 | 20.6 | 68.7 | 72.7 | 11,540 | 10,800 | 700 | 0.25 | 0.0801 | 540 |
| 3×300+3×70 | 23.1 | 77.1 | 81.1 | 14,500 | 13,500 | 750 | 0.24 | 0.0641 | 620 |
| 3×50+2×25/2+1×(4×2.5) | 9.1 | 43 | 46 | 3,580 | 2,250 | 490 | 0.27 | 0.386 | 202 |
| 3×70+2×35/2+1×(4×2.5) | 10.8 | 46 | 49 | 4,400 | 3,150 | 460 | 0.25 | 0.272 | 250 |
| 3×185+2×95/2+1×(2×2.5ST) | 17.7 | 63.5 | 67.5 | 9,050 | 8,325 | 680 | 0.23 | 0.106 | 461 |

## Complete Specifications — 8.7/15 kV & 12/20 kV (25 Configurations)

### PROTOLON (M) F-(N)TSCGEWOEU 8.7/15kV — 13 Configurations

| Basic Construction (mm²) | Conductor Ø (mm) | Cable Ø min (mm) | Cable Ø max (mm) | Cable Weight (kg/km) | Max. Tensile Strength (N) | Nominal Capacitance (nF/km) | Operation Inductance (mH/km) | Conductor Resistance at 20°C (Ω/km) | Current (A) |
|---|---|---|---|---|---|---|---|---|---|
| 3×25+3×25/3 | 6.4 | 40.2 | 43.2 | 2,690 | 1,125 | 240 | 0.36 | 0.78 | 139 |
| 3×25+3×50/3 | 6.4 | 41.8 | 44.8 | 3,050 | 1,125 | 240 | 0.38 | 0.78 | 139 |
| 3×35+3×25/3 | 7.6 | 41.8 | 44.8 | 2,930 | 1,575 | 270 | 0.34 | 0.554 | 172 |
| 3×35+3×50/3 | 7.6 | 41.8 | 44.8 | 3,300 | 1,575 | 270 | 0.34 | 0.554 | 172 |
| 3×50+3×25/3 | 9.1 | 45 | 48 | 3,550 | 2,250 | 300 | 0.32 | 0.386 | 215 |
| 3×50+3×50/3 | 9.1 | 45 | 48 | 3,930 | 2,250 | 300 | 0.32 | 0.386 | 215 |
| 3×70+3×35/3 | 10.8 | 49.5 | 53.5 | 4,590 | 3,150 | 340 | 0.31 | 0.272 | 265 |
| 3×70+3×50/3 | 10.8 | 49.9 | 53.9 | 4,950 | 3,150 | 340 | 0.31 | 0.272 | 265 |
| 3×95+3×50/3 | 12.7 | 54.4 | 58.4 | 5,930 | 4,275 | 390 | 0.29 | 0.202 | 319 |
| 3×120+3×70/3 | 14.3 | 57.3 | 61.3 | 7,020 | 5,400 | 420 | 0.28 | 0.161 | 371 |
| 3×150+3×70/3 | 16 | 63.8 | 67.8 | 8,220 | 6,750 | 460 | 0.28 | 0.129 | 428 |
| 3×185+3×95/3 | 17.7 | 65.9 | 69.9 | 9,760 | 8,325 | 500 | 0.27 | 0.106 | 488 |
| 3×240+3×120/3 | 20.6 | 76.3 | 80.3 | 12,400 | 10,800 | 530 | 0.27 | 0.08 | 574 |

### PROTOLON (M) F-(N)TSCGEWOEU 12/20kV — 12 Configurations

| Basic Construction (mm²) | Conductor Ø (mm) | Cable Ø min (mm) | Cable Ø max (mm) | Cable Weight (kg/km) | Max. Tensile Strength (N) | Nominal Capacitance (nF/km) | Operation Inductance (mH/km) | Conductor Resistance at 20°C (Ω/km) | Current (A) |
|---|---|---|---|---|---|---|---|---|---|
| 3×25+3×25/3 | 6.4 | 42.3 | 45.3 | 2,870 | 1,125 | 220 | 0.37 | 0.78 | 139 |
| 3×25+3×50/3 | 6.4 | 42.3 | 45.3 | 3,120 | 1,125 | 220 | 0.37 | 0.78 | 139 |
| 3×35+3×25/3 | 7.6 | 45.8 | 48.8 | 3,470 | 1,575 | 240 | 0.35 | 0.554 | 172 |
| 3×35+3×50/3 | 7.6 | 44.8 | 47.8 | 3,620 | 1,575 | 240 | 0.35 | 0.554 | 172 |
| 3×50+3×25/3 | 9.1 | 47.9 | 50.9 | 4,010 | 2,250 | 270 | 0.33 | 0.386 | 215 |
| 3×50+3×50/3 | 9.1 | 47.9 | 50.9 | 4,430 | 2,250 | 270 | 0.33 | 0.386 | 215 |
| 3×70+3×35/3 | 10.8 | 54.6 | 58.6 | 5,400 | 3,150 | 310 | 0.32 | 0.272 | 265 |
| 3×70+3×50/3 | 10.8 | 52.4 | 56.4 | 5,270 | 3,150 | 350 | 0.32 | 0.272 | 265 |
| 3×95+3×50/3 | 12.7 | 56.5 | 60.5 | 6,170 | 4,275 | 350 | 0.30 | 0.206 | 319 |
| 3×120+3×70/3 | 14.3 | 61.7 | 65.7 | 7,650 | 5,400 | 380 | 0.29 | 0.161 | 371 |
| 3×150+3×70/3 | 16 | 65.9 | 69.9 | 8,930 | 6,750 | 410 | 0.28 | 0.129 | 428 |
| 3×185+3×95/3 | 17.7 | 68.8 | 72.8 | 10,230 | 8,325 | 450 | 0.28 | 0.106 | 488 |

## Complete Specifications — 14/25 kV & 20/35 kV (12 Configurations)

### PROTOLON (M) F-(N)TSCGEWOEU 14/25kV — 9 Configurations

| Basic Construction (mm²) | Conductor Ø (mm) | Cable Ø min (mm) | Cable Ø max (mm) | Cable Weight (kg/km) | Max. Tensile Strength (N) | Nominal Capacitance (nF/km) | Operation Inductance (mH/km) | Conductor Resistance at 20°C (Ω/km) | Current (A) |
|---|---|---|---|---|---|---|---|---|---|
| 3×25+3×25/3 | 6.4 | 47 | 51 | 3,650 | 1,125 | 170 | 0.42 | 0.78 | 139 |
| 3×35+3×25/3 | 7.6 | 52.9 | 56.9 | 4,350 | 1,575 | 180 | 0.39 | 0.554 | 172 |
| 3×50+3×25/3 | 9.1 | 52.6 | 56.6 | 4,850 | 2,250 | 200 | 0.37 | 0.386 | 215 |
| 3×70+3×35/3 | 10.8 | 61.7 | 65.7 | 6,420 | 3,150 | 230 | 0.35 | 0.272 | 265 |
| 3×95+3×50/3 | 12.7 | 65.1 | 69.1 | 7,410 | 4,275 | 250 | 0.33 | 0.206 | 319 |
| 3×120+3×70/3 | 14.3 | 68.8 | 72.8 | 8,660 | 5,400 | 280 | 0.32 | 0.161 | 371 |
| 3×150+3×70/3 | 16 | 75.3 | 79.3 | 9,970 | 6,750 | 300 | 0.31 | 0.129 | 428 |
| 3×185+3×95/3 | 17.7 | 78.9 | 82.9 | 11,730 | 8,325 | 320 | 0.30 | 0.106 | 488 |
| 3×240+3×120/3 | 20.6 | 84.4 | 89.4 | 14,510 | 10,800 | 350 | 0.29 | 0.0801 | 574 |

### PROTOLON (M) F-(N)TSCGEWOEU 20/35kV — 3 Configurations

| Basic Construction (mm²) | Conductor Ø (mm) | Cable Ø min (mm) | Cable Ø max (mm) | Cable Weight (kg/km) | Max. Tensile Strength (N) | Nominal Capacitance (nF/km) | Operation Inductance (mH/km) | Conductor Resistance at 20°C (Ω/km) | Current (A) |
|---|---|---|---|---|---|---|---|---|---|
| 3×50+3×25/3 | 9.1 | 60.1 | 64.1 | 6,200 | 2,250 | — | — | 0.386 | 215 |
| 3×70+3×35/3 | 10.8 | 64.5 | 68.5 | 6,550 | 3,150 | — | — | 0.272 | 265 |
| 3×300+3×150/3 | 23.1 | 100 | 106 | 19,000 | 13,500 | — | — | 0.0641 | 660 |

*Note: source data for 20/35 kV lists only these 3 configurations, and does not include capacitance or inductance values for this voltage class (shown as "—").*

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## Complete Configuration Summary — All 71 Specifications

| Voltage Class | Test Voltage | Configurations | Conductor Range | Cable Ø Range | Current Range (A) |
|---|---|---|---|---|---|
| **3.6/6 (7.2) kV** | 11 kV | 15 | 3×25 – 3×300 mm² | 33.6 – 79.1 mm | 131 – 620 |
| **6/10 (12) kV** | 17 kV | 19 | 3×25 – 3×300 mm² | 34.9 – 81.1 mm | 131 – 620 |
| **8.7/15 (17.5) kV** | 24 kV | 13 | 3×25 – 3×240 mm² | 40.2 – 80.3 mm | 139 – 574 |
| **12/20 (24) kV** | 29 kV | 12 | 3×25 – 3×185 mm² | 42.3 – 72.8 mm | 139 – 488 |
| **14/25 (29) kV** | 36 kV | 9 | 3×25 – 3×240 mm² | 47.0 – 89.4 mm | 139 – 574 |
| **20/35 (42) kV** | 50 kV | 3 | 3×50 – 3×300 mm² | 60.1 – 106.0 mm | 215 – 660 |
| **TOTAL: 71 Complete Specifications Across 6 Voltage Classes** | | | | | |

**Note on voltage classes:** The manufacturer's source catalog for PROTOLON (M) F-(N)TSCGEWOEU lists 6 voltage classes with populated configuration data (3.6/6, 6/10, 8.7/15, 12/20, 14/25, 20/35 kV). No 18/30 kV configuration table is present in the source pages, and the 20/35 kV class is limited to 3 configurations without published capacitance/inductance values. All 71 configurations that are present in the source have been included in full above.

## Applications

| Application | Benefit |
|---|---|
| **Conveyor Belt Installations** | Suitable for laying alongside fixed and shiftable conveyor units |
| **Material Handling Equipment** | Handles continuous movement such as cable booms and upper/lower car connections |
| **Submersible Pump Connections** | Excellent sea water resistance, rated for water depths up to 10 m |

## Ordering Information

For custom lengths, drum packaging, special conductor sizes, or technical consultation, please contact us directly via WhatsApp or visit our websites below. All standard configurations shown are available ex-works with standard lead times.

**Contact AnHui Feichun Special Cable Co., Ltd**
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