PROTOLON (M) R-(N)TSCGEWOEU LWL

Medium Voltage Reeling Cable with Integrated Fiber-Optics | 6 - 35 kV

AnHui Feichun Special Cable Co., Ltd

WhatsApp: +86 13855123218

feichuncables.com

reelingcable.com



Medium Voltage Reeling Cable with Integrated Fiber-Optics

For connection of large material handling machines such as excavators, dumpers, and mobile crushers in opencast mines. Flexible MV reeling cable suitable for high mechanical stresses in conjunction with mono-spiral reels and cylindrical reels.

Total Configurations: 91 — covering 7 voltage classes from 3.6 kV to 35 kV, combining power transmission with integrated optical fiber elements for data & signal transmission.

Key Advantages: Combined energy + data transmission • Extended lifespan • Superior weather & sea water resistance • High mechanical strength • Proven reliability in extreme mining conditions

Technical Summary & Specifications

ELECTRICAL

Voltage: 3.6/6 – 20/35 kV
Cores: 3-phase + 2× split earth + fiber
Conductor: Copper, bare, class FS
Insulation: EPR rubber (3GI3)

THERMAL

Op. Temp: -40 to +90°C
Install Temp (fixed): -40 to +80°C
Install Temp (flex): -30 to +80°C
Short Circuit: 250°C max

MECHANICAL

Bend (fixed): 6×D
Bend (flexible): 10×D
Torsion: ±100°/m
Speed: up to 120 m/min

CHEMICAL

Flame Retardant: ✓ EN/IEC 60332-1-2
Oil / Ozone / UV: ✓ Resistant
Sea Water: ✓ Resistant

Standards: DIN VDE 0250-813 • EN 50525-2-21 • DIN VDE 0207-21 • DIN VDE 0298-3 • DIN EN 60811-404 / IEC 60811-404 • GOST-R/-K/-B (Russian Federation) • DIN EN 60332-1-2 / IEC 60332-1-2

Configuration Overview — All 91 Specifications

Voltage Class	Configs	Conductor Range (mm²)	Earth / Fiber Option	Cable Ø Range (mm)	Current Range (A)	Test Voltage (kV)
3.6/6 kV	14	3×25 - 3×300	2× split + LWL fiber	40.0 - 81.5	131 - 620	11
6/10 kV	18	3×25 - 3×300	2× split + LWL fiber	41.3 - 82.7	131 - 620	17
8.7/15 kV	14	3×25 - 3×300	2× split + LWL fiber	43.6 - 88.5	139 - 660	24
12/20 kV	14	3×25 - 3×300	2× split + LWL fiber	44.1 - 91.4	139 - 660	29
14/25 kV	11	3×25 - 3×150	2× split + LWL fiber	47.9 - 77.4	139 - 428	36
18/30 kV	14	3×25 - 3×300	2× split + LWL fiber	52.2 - 99.6	139 - 660	43
20/35 kV	6	3×25 - 3×70	2× split + LWL fiber	56.8 - 72.2	139 - 265	50

Optical Fiber Element: Six tubes laid up around a central support element, each with one, two, three, or four optical fibers — providing integrated power + data/signal transmission in a single cable.

Complete Specifications — 3.6/6 kV (14 Configurations)

Configuration (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Weight (kg/km)	Tensile Strength (N)	Capacitance (nF/km)	Inductance (mH/km)	Resistance (Ω/km)	Current (A)
3×25+2×25/2+LWL	7.1	40.0	43.0	2,590	1,500	370	0.35	0.7839	131
3×25+2×50/2+LWL	7.1	42.6	45.6	2,900	1,500	370	0.38	0.7839	131
3×35+2×25/2+LWL	8.4	41.6	44.6	2,960	2,100	430	0.32	0.5540	162
3×35+2×50/2+LWL	8.4	44.5	47.5	3,300	2,100	430	0.32	0.5540	162
3×50+2×25/2+LWL	10.1	42.8	45.8	3,430	3,000	490	0.28	0.3860	202
3×50+2×50/2+LWL	10.1	46.4	49.4	3,950	3,000	490	0.28	0.3860	202
3×70+2×35/2+LWL	11.8	46.4	49.4	4,350	4,200	550	0.27	0.2720	250
3×70+2×50/2+LWL	11.8	49.8	53.8	4,700	4,200	550	0.29	0.2720	250
3×95+2×50/2+LWL	13.8	51.5	55.5	5,630	5,700	630	0.26	0.2060	301
3×120+2×70/2+LWL	15.5	55.2	59.2	6,800	7,200	700	0.25	0.1610	352
3×150+2×70/2+LWL	17.4	59.2	63.2	7,970	9,000	760	0.25	0.1290	404
3×185+2×95/2+LWL	19.2	64.4	68.4	9,630	11,100	820	0.24	0.1060	461
3×240+2×120/2+LWL	22.1	70.6	74.6	12,160	14,400	930	0.24	0.0801	540
3×300+2×150/2+LWL	24.7	77.5	81.5	14,880	18,000	1,030	0.23	0.0641	620

Complete Specifications — 6/10 kV (18 Configurations)

Configuration (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Weight (kg/km)	Tensile Strength (N)	Capacitance (nF/km)	Inductance (mH/km)	Resistance (Ω/km)	Current (A)
3×25+2×25/2+LWL	7.1	41.3	44.3	2,660	1,500	330	0.35	0.7839	131
3×25+2×50/2+LWL	7.1	43.6	46.6	2,900	1,500	330	0.38	0.7839	131
3×35+2×25/2+LWL	8.4	42.9	45.9	3,070	2,100	380	0.33	0.5540	162
3×35+2×50/2+LWL	8.4	45.2	48.2	3,500	2,100	380	0.35	0.5540	162
3×50+2×25/2+FO	10.1	44.1	47.1	3,560	3,000	430	0.29	0.3860	202
3×50+2×50/2+LWL	10.1	47.8	50.8	3,900	3,000	430	0.32	0.3860	202
3×70+2×35/2+LWL	11.8	47.7	50.7	4,480	4,200	490	0.28	0.2720	250
3×70+2×50/2+LWL	11.8	51.2	55.2	5,010	4,200	490	0.30	0.2720	250
3×95+2×50/2+LWL	13.8	52.8	56.8	5,770	5,700	560	0.27	0.2060	301
3×120+2×70/2+LWL	15.5	56.4	60.4	6,950	7,200	620	0.25	0.1610	352
3×150+2×70/2+LWL	17.4	61.9	65.9	8,350	9,000	670	0.25	0.1290	404
3×185+2×95/2+LWL	19.2	65.7	69.7	9,810	11,100	730	0.24	0.1060	461
3×240+2×120/2+LWL	22.1	73.3	77.3	12,600	14,400	820	0.24	0.0801	540
3×300+2×150/2+LWL	24.7	78.7	82.7	15,090	18,000	910	0.23	0.0641	620
3×50+1×25+1×(4×2.5ST)+LWL	10.1	47.8	50.8	3,990	3,000	430	0.32	0.3860	202
3×70+1×35+1×(4×2.5ST)+LWL	11.8	52.2	55.2	5,100	4,200	490	0.28	0.2720	250
3×95+1×50+1×(4×2.5ST)+LWL	13.8	60.1	64.1	7,350	5,700	560	0.27	0.2060	301
3×120+1×70+1×(4×2.5ST)+LWL	15.5	66.0	70.0	8,800	7,200	620	0.25	0.1610	352

Complete Specifications — 8.7/15 kV (14 Configurations)

Configuration (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Weight (kg/km)	Tensile Strength (N)	Capacitance (nF/km)	Inductance (mH/km)	Resistance (Ω/km)	Current (A)
3×25+2×25/2+FO	7.1	43.6	46.6	2,910	1,500	260	0.36	0.7839	139
3×25+2×50/2+FO	7.1	45.9	48.9	3,250	1,500	260	0.38	0.7839	139
3×35+2×25/2+LWL	8.4	43.9	46.9	3,180	2,100	290	0.33	0.5540	172
3×35+2×50/2+FO	8.4	47.5	50.5	3,600	2,100	290	0.35	0.5540	172
3×50+2×25/2+LWL	10.1	47.5	50.5	3,900	3,000	330	0.31	0.3860	215
3×50+2×50/2+LWL	10.1	51.0	55.0	4,500	3,000	330	0.32	0.3860	215
3×70+2×35/2+LWL	11.8	52.0	56.0	5,020	4,200	370	0.30	0.2720	265
3×70+2×50/2+LWL	11.8	52.0	56.0	5,130	4,200	370	0.30	0.2720	265
3×95+2×50/2+LWL	13.8	56.2	60.2	6,180	5,700	410	0.28	0.2060	319
3×120+2×70/2+LWL	15.5	61.3	65.3	7,600	7,200	450	0.27	0.1610	371
3×150+2×70/2+LWL	17.4	65.3	69.3	8,820	9,000	500	0.27	0.1290	428
3×185+2×95/2+LWL	19.2	69.1	73.1	10,300	11,100	540	0.26	0.1060	488
3×240+2×120/2+LWL	22.1	76.6	80.6	13,140	14,400	600	0.25	0.0801	574
3×300+2×150/2+LWL	24.7	83.5	88.5	16,040	18,000	660	0.25	0.0641	660

Complete Specifications — 12/20 kV (14 Configurations)

Configuration (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Weight (kg/km)	Tensile Strength (N)	Capacitance (nF/km)	Inductance (mH/km)	Resistance (Ω/km)	Current (A)
3×25+2×25/2+LWL	7.1	44.1	47.1	2,980	1,500	230	0.36	0.7839	139
3×25+2×50/2+LWL	7.1	47.0	50.0	3,300	1,500	230	0.39	0.7839	139
3×35+2×25/2+LWL	8.4	46.8	49.8	3,480	2,100	260	0.34	0.5540	172
3×35+2×50/2+LWL	8.4	50.3	54.3	4,000	2,100	260	0.36	0.5540	172
3×50+2×25/2+FO	10.1	51.3	55.3	4,700	3,000	300	0.32	0.3860	215
3×50+2×50/2+LWL	10.1	51.3	55.3	4,800	3,000	300	0.32	0.3860	215
3×70+2×35/2+FO	11.8	55.0	59.0	5,370	4,200	330	0.31	0.2720	265
3×70+2×50/2+LWL	11.8	55.0	59.0	5,480	4,200	330	0.31	0.2720	265
3×95+2×50/2+LWL	13.8	59.2	63.2	6,550	5,700	370	0.30	0.2060	319
3×120+2×70/2+LWL	15.5	64.2	68.2	8,000	7,200	410	0.29	0.1610	371
3×150+2×70/2+LWL	17.4	68.2	72.2	9,240	9,000	440	0.28	0.1290	428
3×185+2×95/2+LWL	19.2	73.4	77.4	11,010	11,100	480	0.27	0.1060	488
3×240+2×120/2+LWL	22.1	79.6	83.6	13,650	14,400	540	0.26	0.0801	574
3×300+2×150/2+LWL	24.7	86.4	91.4	16,590	18,000	590	0.26	0.0641	660

Complete Specifications — 18/30 kV (14 Configurations)

Configuration (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Weight (kg/km)	Tensile Strength (N)	Capacitance (nF/km)	Inductance (mH/km)	Resistance (Ω/km)	Current (A)
3×25+2×25/2+LWL	7.1	52.2	56.2	3,900	1,500	180	0.40	0.7839	139
3×25+2×50/2+LWL	7.1	52.2	56.2	3,980	1,500	180	0.40	0.7839	139
3×35+2×25/2+LWL	8.4	55.0	59.0	4,450	2,100	200	0.38	0.5540	172
3×35+2×50/2+LWL	8.4	55.0	59.0	4,530	2,100	200	0.38	0.5540	172
3×50+2×25/2+LWL	10.1	58.6	62.6	5,250	3,000	220	0.35	0.3860	215
3×50+2×50/2+LWL	10.1	58.6	62.6	5,320	3,000	220	0.35	0.3860	215
3×70+2×35/2+LWL	11.8	63.6	67.6	6,510	4,200	250	0.34	0.2720	265
3×70+2×50/2+LWL	11.8	63.6	67.6	6,610	4,200	250	0.34	0.2720	265
3×95+2×50/2+LWL	13.8	67.8	71.8	7,770	5,700	270	0.33	0.2060	319
3×120+2×70/2+LWL	15.5	72.8	76.8	9,230	7,200	290	0.31	0.1610	371
3×150+2×70/2+LWL	17.4	76.9	80.9	10,630	9,000	320	0.30	0.1290	428
3×185+2×95/2+LWL	19.2	80.6	84.6	12,190	11,100	340	0.30	0.1060	488
3×240+2×120/2+LWL	22.1	88.1	93.1	15,310	14,400	380	0.28	0.0801	574
3×300+2×150/2+LWL	24.7	94.6	99.6	18,220	18,000	420	0.28	0.0641	660

Complete Specifications — 14/25 kV & 20/35 kV (17 Configurations)

14/25 kV — 11 Configurations

Configuration (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Weight (kg/km)	Tensile Strength (N)	Capacitance (nF/km)	Inductance (mH/km)	Resistance (Ω/km)	Current (A)
3×25+2×25/2+LWL	7.1	47.9	50.9	3,360	1,500	200	0.38	0.7839	139
3×25+2×50/2+LWL	7.1	47.9	50.9	3,440	1,500	200	0.40	0.7839	139
3×35+2×25/2+FO	8.4	51.5	55.5	4,050	2,100	220	0.36	0.5540	172
3×35+2×50/2+LWL	8.4	51.5	55.5	4,130	2,100	220	0.36	0.5540	172
3×50+2×25/2+LWL	10.1	55.2	59.2	4,830	3,000	260	0.34	0.3860	215
3×50+2×50/2+LWL	10.1	55.2	59.2	4,900	3,000	260	0.34	0.3860	215
3×70+2×35/2+LWL	11.8	58.8	62.8	5,840	4,200	280	0.32	0.2720	265
3×70+2×50/2+LWL	11.8	58.8	62.8	5,950	4,200	280	0.32	0.2720	265
3×95+2×50/2+LWL	13.8	64.4	68.4	7,280	5,700	310	0.31	0.2060	319
3×120+2×70/2+LWL	15.5	68.0	72.0	8,530	7,200	350	0.30	0.1610	371
3×150+2×70/2+LWL	17.4	73.4	77.4	10,080	9,000	370	0.29	0.1290	428

20/35 kV — 6 Configurations

Configuration (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Weight (kg/km)	Tensile Strength (N)	Capacitance (nF/km)	Inductance (mH/km)	Resistance (Ω/km)	Current (A)
3×25+2×25/2+LWL	7.1	56.8	60.8	4,450	1,500	160	0.42	0.7839	139
3×35+2×25/2+LWL	8.4	61.1	65.1	5,250	2,100	180	0.40	0.5540	172
3×50+2×25/2+LWL	10.1	64.6	68.6	6,180	3,000	200	0.37	0.3860	215
3×50+2×35/2+LWL	10.1	64.6	68.6	6,390	3,000	200	0.37	0.3860	215
3×70+2×35/2+LWL	11.8	68.2	72.2	7,320	4,200	230	0.36	0.2720	265
3×70+2×50/2+1×(24E9LWL)	11.8	68.2	72.2	7,600	4,200	230	0.36	0.2720	265

Optical Fiber Element, Cable Construction & Electrical Ratings

Optical Fiber Element & Construction

Optical Fiber Element

Six tubes laid up around a central support element

Each tube: one, two, three or four optical fibers

Fiber options: standard multi-mode / E9 single-mode (24E9LWL variant)

Cable Construction

1. Conductor — very finely stranded copper, bare, class FS
2. Semi-conductive EPR inner layer
3. Three-core design with split earth conductor in interstices
4. EPR rubber core insulation (PROTOLON 3GI3)

Outer Layers

5. Semi-conductive NBR easy-strip outer layer
8. Inner sheath — rubber (5GM3)
9. Polyester mesh tape reinforcement
10. Outer sheath — polychloroprene (PCP, 5GM5)

Rated Voltage / Test Voltage by Class: 3.6/6 (7.2) kV → 11 kV test | 6/10 (12) kV → 17 kV test | 8.7/15 (17.5) kV → 24 kV test | 12/20 (24) kV → 29 kV test | 14/25 (29) kV → 36 kV test | 18/30 (36) kV → 43 kV test | 20/35 (42) kV → 50 kV test

Key Performance Metrics (All 91 Configurations)

Resistance

0.0641 – 0.7839 Ω/km

Capacitance

160 – 1,030 nF/km

Inductance

0.23 – 0.42 mH/km

Current Capacity

131 – 660 A

Mechanical & Thermal Parameters

🌡 Thermal

Max. conductor temp: 90°C

Short circuit temp: 250°C

Fixed install: -40 to +80°C

Flexible install: -30 to +80°C

💪 Mechanical

Torsional stress: ±100°/m

Tensile: 20 N/mm² static, 25 N/mm² dynamic

Rewinding speed: up to 100 m/min

Reeling speed: up to 120 m/min

📐 Bend Radius

Fixed installation: 6×D

Flexible operation: 10×D

S-type directional changes: 20×D min distance

Complete Configuration Summary — All 91 Specifications

Voltage Class	Test Voltage	Configurations	Conductor Range	Cable Ø Range	Weight Range (kg/km)	Current Range (A)
3.6/6 kV (7.2 kV)	11 kV	14	3×25 – 3×300 mm²	40.0 – 81.5 mm	2,590 – 14,880	131 – 620
6/10 kV (12 kV)	17 kV	18	3×25 – 3×300 mm²	41.3 – 82.7 mm	2,660 – 15,090	131 – 620
8.7/15 kV (17.5 kV)	24 kV	14	3×25 – 3×300 mm²	43.6 – 88.5 mm	2,910 – 16,040	139 – 660
12/20 kV (24 kV)	29 kV	14	3×25 – 3×300 mm²	44.1 – 91.4 mm	2,980 – 16,590	139 – 660
14/25 kV (29 kV)	36 kV	11	3×25 – 3×150 mm²	47.9 – 77.4 mm	3,360 – 10,080	139 – 428
18/30 kV (36 kV)	43 kV	14	3×25 – 3×300 mm²	52.2 – 99.6 mm	3,900 – 18,220	139 – 660
20/35 kV (42 kV)	50 kV	6	3×25 – 3×70 mm²	56.8 – 72.2 mm	4,450 – 7,600	139 – 265
TOTAL: 91 Complete Specifications Across 7 Voltage Classes						

Applications

Application	Benefit of Integrated Fiber-Optics
Opencast Mining Excavators	Combined power + real-time monitoring/control data in a single reeling cable
Bucket-Wheel Excavators & Draglines	SCADA / sensor data transmission alongside high-power supply
Mobile Crushers & Conveyor Systems	Remote diagnostics and process control integration
Spreaders & Stackers	Reduced cable count — single cable for power and communications

Ordering Information

For custom configurations, alternative fiber counts (multi-mode / single-mode E9), special color-coded sheaths, or technical consultation, please contact us directly via WhatsApp or visit our websites below. All 91 standard configurations are available ex-works with standard lead times; custom lengths and drum packaging available on request.

Contact AnHui Feichun Special Cable Co., Ltd
WhatsApp: +86 13855123218 | feichuncables.com | reelingcable.com