TYPE · MV SHEARER CABLE · CHAIN · FIBRE OPTIC | 3.6/6 kV | 9 Variants

PROTOMONT (V) LWL Equivalent

FC-PMT-V-LWL NTSKCGECWÖU 3,6/6 kV

Medium voltage coal-cutter cable for chain operation with integrated fibre optics — power, control, monitoring and high-rate data for automated longwall faces in one cable.

Document No. **FC-TDS-PMV6F-2026-A89B** Revision **0** Issue date **12 October 2026**

Language **English (AU)**

01 Application & Product Overview

FC-PMT-V-LWL NTSKCGECWÖU 3.6/6 kV combines the proven chain-operation shearer design with a fibre-optic element, providing the data link for shearer automation, face monitoring and video directly in the supply cable.

Two outer interstices carry double-concentric elements with three (or four) 1.5 mm² control cores; the third carries a fibre-optic element with 6 single-mode or multimode fibres, surrounded by its own concentric PE conductor. The steel/copper spinning (UELKON) protects the cable and serves as monitoring conductor.

Typical applications

- Automated longwall faces — shearer control and condition monitoring
- Video and high-rate data transmission from the shearer
- Cable handlers on shearers with integrated data links
- Underground coal mines with firedamp / coal-dust explosion risk (with approved couplers)
- EMI-immune data links alongside 3.3–6 kV power

9 variants
25 – 185 mm² with 6 fibres

3.6/6 kV
Rated voltage, 11 kV test

6 × E9 / G62.5
Fibres per cable

15 N/mm²
Max. tensile load on conductors

Cross-reference

REFERENCE TYPE

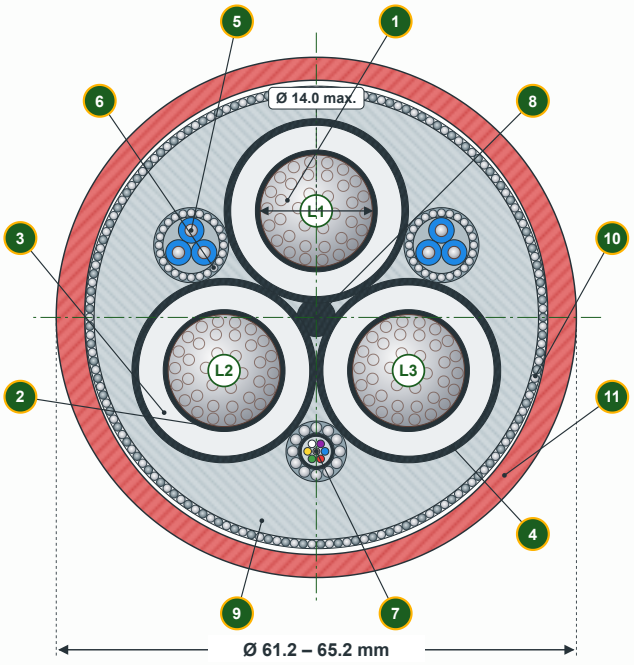
PROTOMONT (V) NTSKCGECWÖU 3,6/6 kV with fibre optics

FEICHUN EQUIVALENT

FC-PMT-V-LWL NTSKCGECWÖU 3,6/6 kV

Equivalent in construction and dimensions to PROTOMONT (V) NTSKCGECWÖU 3,6/6 kV LWL designs.

02 Construction



FEICHUN · SECTION A–A · 3.6/6 kV

FC-PMT-V-LWL NTSKCGECWÖU

Doc. No. FC-TDS-PMV6F-2026-A89B
Ref. 3×95 mm²
Rev. 0 · 2026-10-12 · 1st-angle · NTS

Drawing representative of the reference size; other sizes scale proportionally.

Pos.	Element	Material
1	Conductor	Tinned annealed copper, very finely stranded, class FS (DIN VDE 0295) / class 5 (IEC 60228)
2	Conductor screen	Extruded semi-conductive EPR layer over the conductor
3	Insulation	EPR rubber compound type 3GI3 (DIN VDE 0207-20), main cores in natural colour with black / grey / brown marking
4	Insulation screen	Semi-conductive NBR layer, cold-strippable ('easy strip')
5	Control core(s) (ST)	Tinned copper 1.5 mm², EPR 3GI3 insulation, blue
6	Concentric PE conductor (KON)	Tinned copper wires laid concentrically over the control core(s); total earth cross-section split into three
7	Fibre-optic element (LWL)	6 fibres E9/125 µm or G62.5/125 µm in a protected buffer element, with concentric tinned copper PE conductor
8	Centre filler	Semi-conductive elastomer

Pos.	Element	Material
9	Inner sheath	Special EPR rubber compound GM1b (DIN VDE 0207-21), vulcanised
10	Monitoring conductor (UELKON)	Concentric spinning of galvanised steel and tinned copper wires, vulcanised between the sheaths — monitoring conductor, reinforcement and anti-torsion
11	Outer sheath	Heavy-duty polychloroprene (PCP) compound 5GM5 (DIN VDE 0207-21), flame-retardant, oil- and abrasion-resistant, red

Drawing: 3×95 mm² reference size.

Construction details

Element	Description
Conductor	Very finely stranded tinned annealed copper, class FS (finer than class 5) to DIN VDE 0295 / IEC 60228
Main core insulation	EPR rubber, special compound type 3GI3 to DIN VDE 0207-20
Electrical field control	Semi-conductive layer over the insulation of each main core (semi-conductive NBR, cold-strippable 'easy strip')
Main core identification	Natural colour (black / grey / brown marking)
Control / PE elements	Two double-concentric elements in outer interstices: three (or four) blue EPR-insulated tinned copper 1.5 mm² control cores (ST) surrounded by a concentric protective-earth conductor of tinned copper wires (KON, earth cross-section split /3)
Fibre-optic / PE element	Third outer interstice: fibre-optic element with 6 fibres (single-mode E9/125 µm or multimode G62.5/125 µm) in a protected buffer element, surrounded by a concentric tinned copper protective-earth conductor (KON)
Lay-up	Three main cores, two control/PE elements and one FO/PE element laid up together over a central semi-conductive elastomer filler, short lay length for chain operation
Inner sheath	Special EPR rubber compound type GM1b, vulcanised
Monitoring conductor / reinforcement (UELKON)	Concentric spinning of galvanised steel and tinned copper wires vulcanised between inner and outer sheath; acts as concentric monitoring conductor and provides torsional stability and mechanical protection
Outer sheath	Heavy-duty polychloroprene (PCP) rubber compound type 5GM5 to DIN VDE 0207-21, flame retardant, oil and abrasion resistant; standard colour red, other colours on request

03 Electrical, Thermal & Mechanical Data

Electrical parameters

Parameter	Value
Rated voltage U_0/U (Um)	3.6/6 (7.2) kV
AC test voltage	11 kV
AC test voltage, control cores	2 kV
Current-carrying capacity	DIN VDE 0298-4, Table 15 (rubber trailing cables, 30 °C ambient); derate for grouping and ambient temperature in the chain
Monitoring	Concentric UELKON spinning allows continuous earth / insulation monitoring between control circuit and monitoring conductor

Thermal & mechanical parameters

Parameter	Value
Max. permissible conductor temperature	+90 °C
Max. short-circuit conductor temperature	+250 °C
Ambient temperature, fixed installation	−40 °C to +80 °C
Ambient temperature, flexible operation	−20 °C to +60 °C
Min. bending radius in cable protection chain	2.3 × D at max. 5 N/mm² tensile load
Min. distance between S-type direction changes	20 × D
Max. permanent tensile load on conductors	15 N/mm² (based on total main conductor cross-section)
Max. torsional stress	±25 °/m
Flame retardance	IEC 60332-1-2 / EN 60332-1-2
Oil resistance	IEC 60811-404

Parameter	Value
Ozone and UV resistance	Resistant

04 Optical Fibre Data

Characteristic	Value
Fibre types	Single-mode E9/125 µm (ITU-T G.652.D type) or multimode G62.5/125 µm (OM1 type)
Max. number of fibres	6
Element	6 fibres in a protected FO element with concentric tinned copper PE conductor (FO/PE element) in one outer interstice
Attenuation — E9/125 at 1310 nm	≤ 0.4 dB/km
Attenuation — E9/125 at 1550 nm	≤ 0.3 dB/km
Attenuation — G62.5/125 at 850 nm	≤ 3.3 dB/km
Attenuation — G62.5/125 at 1310 nm	≤ 0.9 dB/km
Bandwidth (G62.5/125) — 850 nm	≥ 400 MHz·km
Bandwidth (G62.5/125) — 1300 nm	≥ 600 MHz·km
Numerical aperture — E9/125	0.14 ± 0.02
Numerical aperture — G62.5/125	0.275 ± 0.02
Chromatic dispersion (E9/125) — 1300 nm	≤ 3.5 ps/(nm·km)
Chromatic dispersion (E9/125) — 1550 nm	≤ 18 ps/(nm·km)

Fibre type and count per variant as stated in the type designation; other fibre types and counts on request.

05 Dimensions, Weights & Ratings — 3.6/6 kV (9 variants)

Type designation cores × mm²	FeiChun part no.	Conductor Ø max. mm	Outer diameter min. mm	Outer diameter max. mm	Min. bending radius mm	Weight approx. kg/km	Max. tensile force N	R_{20} max. Ω/km	Current rating A	Short-circuit current kA (1 s)
3×25+2×((3×1.5ST)+16/3KON)+ 1×(6E9LWL+16/3KON)+UELKON	FC-PMV6F-001	7.1	46.0	50.0	115	3,800	1,125	0.795	131	3.57
3×35+2×((3×1.5ST)+25/3KON)+ 1×(6E9LWL+25/3KON)+UELKON	FC-PMV6F-002	8.4	49.0	53.0	122	4,700	1,575	0.565	162	5.00
3×50+2×((3×1.5ST)+25/3KON)+ 1×(6E9LWL+25/3KON)+UELKON	FC-PMV6F-003	10.1	54.0	58.0	133	5,600	2,250	0.393	202	7.15
3×70+2×((3×1.5ST)+35/3KON)+ 1×(6E9LWL+35/3KON)+UELKON	FC-PMV6F-004	11.9	57.0	61.0	140	6,800	3,150	0.277	250	10.01
3×95+2×((3×1.5ST)+50/3KON)+ 1×(6E9LWL+50/3KON)+UELKON	FC-PMV6F-005	14.0	61.2	65.2	150	8,200	4,275	0.210	301	13.58
3×95+2×((4×1.5ST)+50/3KON)+ 1×(6G62.5LWL+50/3KON)+UELKON	FC-PMV6F-006	14.0	61.8	65.8	151	8,100	4,275	0.210	301	13.58
3×120+2×((3×1.5ST)+70/3KON)+ 1×(6G62.5LWL+70/3KON)+UELKON	FC-PMV6F-007	15.5	67.3	71.3	164	10,100	5,400	0.164	352	17.16
3×150+2×((3×1.5ST)+70/3KON)+ 1×(6E9LWL+70/3KON)+UELKON	FC-PMV6F-008	17.2	71.0	75.0	172	11,000	6,750	0.132	404	21.45
3×185+2×((3×1.5ST)+95/3KON)+ 1×(6E9LWL+95/3KON)+UELKON	FC-PMV6F-009	19.1	75.0	79.0	182	13,000	8,325	0.108	461	26.45

Current rating: DIN VDE 0298-4 values for flexible rubber cables at 30 °C ambient — apply the factors below for other ambient temperatures, grouping and multi-layer laying. Bending radius: 2.3 × D in the cable protection chain at ≤ 5 N/mm² tensile load. Tensile force: 15 N/mm² × total phase cross-section. Further sizes and special designs are manufactured to order.

Ambient temperature factors (90 °C conductor)

°C	20	25	30	35	40	45	50
Factor	1.08	1.04	1.00	0.96	0.91	0.87	0.82

Short-circuit rating

Permissible short-circuit current for 1 s: $I_k = 0.143$ kA/mm² × phase cross-section (EPR, 90 °C → 250 °C, tinned copper). For other durations t: $I_{k,t} = I_{k,1s} / \sqrt{t}$ (0.1 s ≤ t ≤ 5 s).

06 Standards & Tests

Standard	Scope
DIN VDE 0250-813	Basis of design — flexible mining cables, medium voltage
DIN VDE 0295 / IEC 60228	Conductors, class FS / 5 — class FS, tinned
DIN VDE 0207-20	Insulating compound 3GI3 — insulation 3GI3

Routine & type tests

- AC voltage test 11 kV on every drum (main cores); 2 kV on control cores
- Conductor resistance, dimensional and continuity checks of PE, control and monitoring conductors
- OTDR attenuation measurement of every fibre, report supplied with the drum
- Insulation resistance and screen / semi-conductive layer resistance
- Bending, torsion and tensile tests in a cable protection chain (type test)

Standard	Scope
DIN VDE 0207-21	Sheathing compounds — sheath 5GM5
DIN VDE 0298-4	Current-carrying capacity
IEC 60332-1-2 / EN 60332-1-2	Flame propagation, single cable
IEC 60811-404	Oil resistance of sheath
IEC 60793-2-10 / IEC 60793-2-50	Optical fibres — optical fibres

- Flame retardance (IEC 60332-1-2) and oil resistance (IEC 60811-404) of the outer sheath

Test documentation: each delivery is accompanied by a FeiChun in-house laboratory inspection certificate. Third-party witnessed testing can be arranged at the buyer's cost.

07 Installation, Marking & Delivery

Installation notes

- Guide the cable in the cable protection chain (cable handler) — the chain takes the tensile forces; minimum bending radius 2.3 × D at ≤ 5 N/mm² tensile load.
- Keep at least 20 × D between S-type direction changes and keep torsion within the stated limit.
- Do not exceed the permanent tensile load of 15 N/mm² on the main conductors, including start-up and braking peaks.
- Unwind tangentially from the delivery drum — never pull off over the flange; lay out and relax the cable before fitting it into the chain.
- Connect all three PE parts at both ends; connect control and monitoring conductors to the earth-fault / insulation monitoring relay of the shearer supply.
- Use flameproof (Ex d) or increased-safety plugs and couplers suited to the cable diameter and approved for the mine.
- Fibre-optic versions: factory pre-assembly of FO connectors or splice enclosures is recommended — please supply connection details with the order.

Sheath marking

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FEICHUN FC-PMT-V-LWL NTSKCGECWÖU [size] + 6 [fibre type] 3,6/6 kV [year] [serial no.] [metre mark]
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Packing & delivery

Item	Standard
Drum	Steel or fumigated wooden drums, ends sealed with heat-shrink caps
Lengths	To order, single continuous length (no joints)
Production lead time	2–3 weeks after technical confirmation
Warranty	Min. 3 years against manufacturing defects
Drum label	Type, size, length, gross/net weight, batch no., drum no.

08 Certifications & Quality

CE — LVD 2014/35/EU

Attestation No. M.2025.206.C116598 · EN 50525-1:2011+A1:2022 · UDEM International Certification · valid to 01.04.2030

EAC — TR CU 004/2011

Certificate No. ЕАЭС KG417/052.CN.02.15390 · GOST 31996-2012, GOST 31565-2012 · valid 24.10.2025–23.10.2030

UKCA — Verification

No. ICR/VC/HS2508110 · BS EN 50525-1:2011+A1:2022 · ICR Polska · valid to 17.08.2030

FeiChun also holds ATEX (Directive 2014/34/EU) documentation verification and IECEx / VDE related approvals for designated product families. Mine-specific approvals are arranged with the end user or local distributor where required. Certificate copies are available on request.

09 Trademark Notice & Intellectual Property

PROTOMONT® and the type designation PROTOMONT (V) NTSKCGECWÖU 3,6/6 kV with fibre optics are cited to identify the reference product of Prysmian Group, the trademark owner. They are used solely for technical cross-referencing; FeiChun Cables has no affiliation with, and is not endorsed by, the trademark owner. FC-PMT-V-LWL is a FeiChun product designed to equivalent functional performance.

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Document Control

Doc. No. FC-TDS-PMV6F-2026-A89B

Revision 0 — first issue

Date 12 October 2026

Product FC-PMT-V-LWL NTSKCGECWÖU 3,6/6 kV

Prepared — Technical Dept.	Checked — QA	Approved — Intl. Business

FEICHUN CABLE