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

PROTOMONT FESTOON LWL Equivalent

FC-PMT-FST-LWL NTSKCGECWÖU 3,6/6 kV

Medium voltage underground festoon cable with integrated fibre optics — power, control, monitoring and data for automated face equipment.

Document No. **FC-TDS-FSTL-2026-B36D** Revision **0** Issue date **12 October 2026** Language **English (AU)**

01 Application & Product Overview

FC-PMT-FST-LWL NTSKCGECWÖU 3.6/6 kV combines the underground festoon cable with a fibre-optic element for control, automation and video links from mobile equipment.

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

Typical applications

- Festoon and monorail systems for longwall and development equipment
- Mobile substations moving with the face
- Twin-circuit supplies with 6-core designs
- Underground coal and hard-rock mines (with approved couplers)
- Earth-fault and insulation monitoring via ST / UELKON

9 variants
Conductor range 25 – 240 mm²

3.6/6 kV
Rated voltage, AC test 11 kV

± 25 °/m
Permissible torsional stress

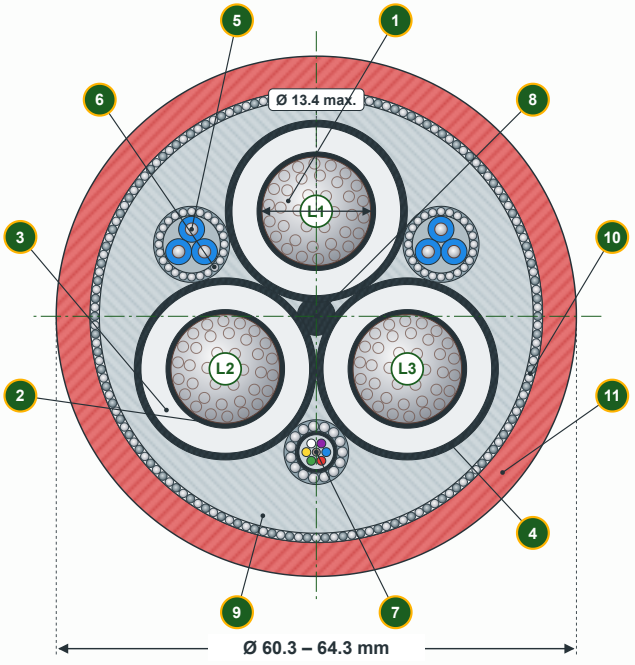
6 fibres
E9/125 standard, G50 / G62.5 on request

Cross-reference

REFERENCE TYPE	FEICHUN EQUIVALENT
PROTOMONT FESTOON NTSKCGECWÖU LWL 3,6/6 kV	FC-PMT-FST-LWL NTSKCGECWÖU 3,6/6 kV

Equivalent in construction and dimensions to PROTOMONT FESTOON NTSKCGECWÖU LWL 3,6/6 kV.

02 Construction



FEICHUN · SECTION A–A · 3.6/6 kV

FC-PMT-FST-LWL NTSKCGECWÖU

Doc. No. FC-TDS-FSTL-2026-B36D
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	Annealed copper, finely stranded, class 5 (IEC 60228)
2	Inner semi-conductive layer	Semi-conductive layer over the conductor
3	Insulation	EPR compound 3GI3 (DIN VDE 0207-20)
4	Outer semi-conductive layer	Semi-conductive NBR, easy strip
5	Control core (ST)	Tinned copper 1.5 mm², EPR insulated, blue
6	Concentric PE conductor (KON)	Tinned copper wires; earth split into three
7	Fibre-optic element (LWL)	6 fibres in a protected buffer element with concentric PE conductor
8	Centre filler	Semi-conductive elastomer
9	Inner sheath	EPR rubber compound GM1b
10	Monitoring conductor (UELKON)	Spinning of galvanised steel and tinned copper wires
11	Outer sheath	PCP compound 5GM5, red

Drawing: 3×95 mm² reference size.

Construction details

Element	Description
Conductor	Finely stranded tinned annealed copper, class 5 to DIN EN 60228 / IEC 60228
Inner semi-conductive layer	Semi-conductive EPR compound extruded over the conductor
Main core insulation	EPR rubber, special compound type 3GI3 to DIN VDE 0207-20
Outer semi-conductive layer	Semi-conductive NBR compound, cold-strippable ('easy strip'), forming the field-control screen of each main core
Main core identification	Natural colour (main cores); control cores blue
Control / PE elements	Two elements in outer interstices: three blue EPR-insulated tinned copper 1.5 mm^2 control cores (3x1,5ST) 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 single-mode E9/125 µm fibres (6E9LWL; G50/125 or G62.5/125 multimode on request) 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
Inner sheath	Special EPR rubber compound type GM1b, vulcanised
Monitoring conductor / armouring (UELKON)	Concentric spinning of galvanised steel and tinned copper wires applied over the inner sheath; acts as concentric monitoring conductor and provides mechanical protection (second screen of the double-screen design)
Outer sheath	Heavy-duty polychloroprene (PCP) rubber compound type 5GM5 to DIN VDE 0207-21, flame retardant, oil and abrasion resistant; colour red

03 Electrical, Thermal & Mechanical Data

Electrical parameters

Parameter	Value
Rated voltage U_0/U (Um)	3.6/6 (7.2) kV
Nominal voltage	6000 V
AC test voltage, main cores	11 kV
AC test voltage, control cores	2 kV
Current-carrying capacity	DIN VDE 0298-4 (rubber-insulated flexible cables, 30 °C ambient, single circuit); derate for ambient temperature and loop stacking. Six-core (twin-circuit) types rated with all six cores loaded
Monitoring	Concentric UELKON wire 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 (festoon)	−25 °C to +60 °C
Min. bending radius, fixed installation	6 × D (DIN VDE 0298-3)
Min. bending radius, flexible operation (festoon)	10 × D (DIN VDE 0298-3)
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 / EN 60811-404

Parameter	Value
Ozone and UV resistance	Resistant
Festoon installation (guidance)	Trolley spacing typically 1.5–3 m; loop depth and trolley count to suit travel; avoid twisting the cable on installation

04 Optical Fibre Data

Characteristic	Value
Fibre types	Single-mode E9/125 µm (ITU-T G.652.D type) standard (6E9LWL); multimode G50/125 µm (OM2 type) or G62.5/125 µm (OM1 type) on request
Max. number of fibres	6
Element	6 fibres (250 µm coated, 125 µm cladding) 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 — G50/125 at 850 nm	≤ 2.8 dB/km
Attenuation — G50/125 at 1300 nm	≤ 0.8 dB/km
Attenuation — G62.5/125 at 850 nm	≤ 3.3 dB/km
Attenuation — G62.5/125 at 1300 nm	≤ 0.9 dB/km
Bandwidth — G50/125	≥ 400 MHz·km at 850 nm; ≥ 1200 MHz·km at 1300 nm
Bandwidth — G62.5/125	≥ 400 MHz·km at 850 nm; ≥ 600 MHz·km at 1300 nm
Numerical aperture — E9/125	0.14 ± 0.02
Numerical aperture — G50/125	0.20 ± 0.02
Numerical aperture — G62.5/125	0.275 ± 0.02

Characteristic	Value
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)+6UELKON	FC-FSTL-001	7.0	47.0	51.0	510	3,300	1,125	0.795	131	3.57
3×35+2×((3×1.5ST)+25/3KON)+1×(6E9LWL+25/3KON)+6UELKON	FC-FSTL-002	8.2	49.4	53.4	534	4,300	1,575	0.565	162	5.00
3×50+2×((3×1.5ST)+25/3KON)+1×(6E9LWL+25/3KON)+6UELKON	FC-FSTL-003	9.8	53.7	57.7	577	5,100	2,250	0.393	202	7.15
3×70+2×((3×1.5ST)+35/3KON)+1×(6E9LWL+35/3KON)+6UELKON	FC-FSTL-004	11.3	55.8	59.8	598	5,800	3,150	0.277	250	10.01
3×95+2×((3×1.5ST)+50/3KON)+1×(6E9LWL+50/3KON)+6UELKON	FC-FSTL-005	13.4	60.3	64.3	643	7,300	4,275	0.210	301	13.58
3×120+2×((3×1.5ST)+70/3KON)+1×(6E9LWL+70/3KON)+6UELKON	FC-FSTL-006	15.1	66.0	70.0	700	8,400	5,400	0.164	352	17.16
3×150+2×((3×1.5ST)+70/3KON)+1×(6E9LWL+70/3KON)+6UELKON	FC-FSTL-007	16.8	69.7	73.7	737	9,700	6,750	0.132	404	21.45
3×185+2×((3×1.5ST)+95/3KON)+1×(6E9LWL+95/3KON)+6UELKON	FC-FSTL-008	18.2	73.0	77.0	770	12,800	8,325	0.108	461	26.45
3×240+2×((3×1.5ST)+120/3KON)+1×(6E9LWL+120/3KON)+6UELKON	FC-FSTL-009	21.0	81.0	85.0	850	15,800	10,800	0.0817	540	34.32

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: 10 × D when moved, 6 × D fixed. 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 EN 60228 / IEC 60228	Conductors, class 5 — class 5, tinned
DIN VDE 0207-20	Insulating compound 3GI3 — insulation 3GI3
DIN VDE 0207-21	Sheathing compounds — sheath 5GM5
DIN VDE 0298-3	Use of cables — bending radii, tensile load
DIN VDE 0298-4	Current-carrying capacity — current ratings
DIN EN 60332-1-2 / IEC 60332-1-2	Flame propagation, single cable
DIN EN 60811-404 / IEC 60811-404	Oil resistance of sheath
IEC 60793-2-10 / IEC 60793-2-50	Optical fibres

Routine & type tests

- AC voltage test 11 kV on every drum
- Conductor resistance and dimensional checks
- OTDR attenuation measurement of every fibre, report supplied with the drum
- Continuity of earth, screen and control conductors
- Partial discharge test on main cores
- 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

- Festoon systems: hang the cable on trolleys every 1.5 – 3 m with uniform loop lengths; minimum bending radius 10 × D on saddles.
- Keep torsion within ± 25 °/m and tensile force within 15 N/mm² of the total phase cross-section.
- Unwind tangentially from the delivery drum and lay out to relax before fitting to the festoon.

Sheath marking

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FEICHUN FC-PMT-FST-LWL NTSKCGECWÖU
[size] 3,6/6 kV [year] [serial no.]
[metre mark]
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- Connect all PE parts at both ends; connect control and monitoring (UELKON) conductors to the earth-fault / insulation monitoring relay.
- Use MV couplers and terminations approved for the mine and suited to 3.6/6 kV.
- Fibre-optic versions: factory pre-assembly of FO connectors or splice enclosures is recommended — please supply connection details with the order.

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 FESTOON NTSKCGECWÖU LWL 3,6/6 kV 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-FST-LWL is a FeiChun product designed to equivalent functional performance.

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Document Control

Doc. No. FC-TDS-FSTL-2026-B36D
Revision 0 — first issue
Date 12 October 2026
Product FC-PMT-FST-LWL NTSKCGECWÖU 3,6/6 kV

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