TYPE · FLAT MV REELING CABLE · WITH FIBRE OPTIC | 3.6/6 kV

4 VARIANTS | EQUIVALENT TO PROTOLON (FL)-LWL

FC-FL-LWL 3.6/6 kV

Flat Medium-Voltage Reeling Cable with Fibre-Optic Element

Flat medium-voltage reeling and festoon cable for cable trolleys and guided reeling — three screened EPR phase cores and three earth conductors side by side in one plane, with a heavy-duty 5GM5 rubber sheath. A central fibre-optic element carries control and data signals alongside the power supply.

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01 Application and product overview

Flat medium-voltage reeling and festoon cable for cable trolleys and guided reeling of mobile equipment with medium-voltage supply: gantry and overhead cranes, stacker and reclaimer systems, shiploaders, conveyor and transfer systems.

The flat design keeps the cable in a defined plane with low bending stress in festoon operation. Three screened EPR phase cores and three earth conductors are embedded in a rubber sheath of compound 5GM5. The central fibre-optic element carries control and data signals alongside the power supply.

Typical applications

- Ship-to-shore, gantry and overhead cranes
- Stacker and reclaimer systems, shiploaders
- Conveyor and transfer systems
- Festoon and cable-trolley systems
- Guided reeling where the cable must stay in a defined plane

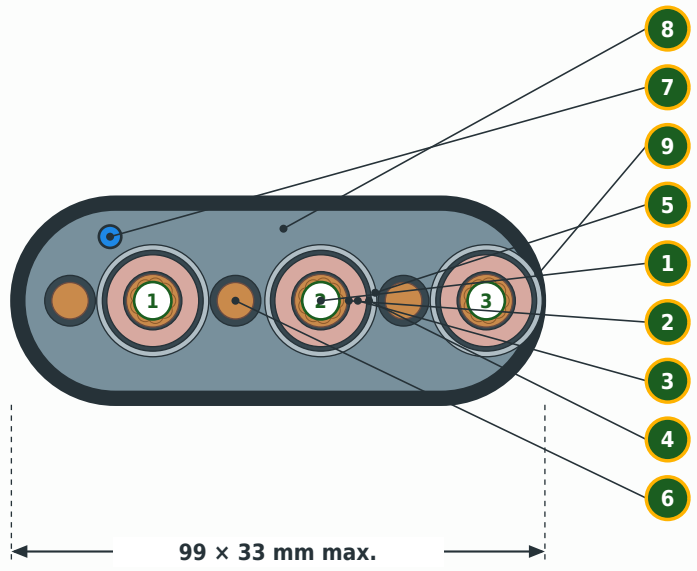
4 variants	3.6/6 kV	10 × h	EPR · 5GM5
Phase conductor 25 – 70 mm²	Rated voltage U_0/U	Min. bending radius, reeling	Insulation 3GI3 · rubber sheath

Equivalent reference type

REFERENCE TYPE	FEICHUN EQUIVALENT
PROTOLON (FL)-LWL (N)TSFLCGEWOEU 3,6/6kV	**FC-FL-LWL 3.6/6 kV**

Designed as a functional equivalent of the named reference type. The type code follows the reference designation; refer to the relevant DIN VDE part for its meaning.

02 Construction



Section A–A · FC-FL-LWL 3.6/6 kV · ref. 3x50/3E+6FO
Schematic, 1st-angle, not to scale; other sizes scale proportionally.

No.	Element	Material
1	**Conductor**	Fine-wire tinned copper conductor, class 5 (IEC 60228)
2	**Conductor screen**	Semi-conductive rubber compound
3	**Core insulation**	EPR insulation, compound 3GI3 (DIN VDE 0207-20)
4	**Insulation screen**	Semi-conductive rubber compound
5	**Core screen**	Braid of tinned copper wires over each phase core
6	**Earth conductor**	Fine-wire tinned copper earth conductor with semi-conductive covering
7	**Fibre-optic element**	Fibre-optic element, 6 fibres, tensile-protected loose tube
8	**Inner sheath**	Rubber inner sheath enclosing the flat core arrangement
9	**Outer sheath**	Heavy-duty rubber compound 5GM5 (DIN VDE 0207-21), black, oil- and weather-resistant

Core structure: Three phase cores and three earth conductors arranged side by side in one plane together with a fibre-optic element; phase cores identified by numbers. Earth conductors: total cross-section approx. equal to one phase conductor. Fibre-optic element: type per order (SM 9/125 µm or MM 50/125 µm).

03 Electrical, thermal and mechanical characteristics

Electrical

Rated voltage U_0/U	3.6/6 kV
Max. operating voltage U_m	7.2 kV
Test voltage (AC, 5 min)	9 kV (2.5 × U_0)
Max. conductor temperature	+90 °C
Semi-conductive layers	Conductor screen and insulation screen on every phase core
Earth conductors	3 conductors, total cross-section approx. equal to one phase conductor

Thermal, mechanical and environmental

Temperature, flexing / reeling	−30 °C to +90 °C
Temperature, fixed installation	−40 °C to +90 °C
Bending radius, reeling operation	min. 10 × h (bending about the flat axis)
Tensile load	max. 15 N/mm² (sum of copper cross-sections)
Flame retardance	IEC 60332-1-2
Oil / weather resistance	Oil-resistant; resistant to UV, ozone and weathering
Halogen-free	No (chlorine-containing rubber sheath)
Lead-free / REACH	RoHS II (2011/65/EU); REACH (EC) No. 1907/2006

04 Dimensions, weights and ratings — 3.6/6 kV (4 variants)

Cores × cross-section mm²	FeiChun part no.	Earth conductors mm²	Width × height max. mm	Copper index kg/km	Weight approx. kg/km	Max. tensile load kN	Min. bending radius mm
3×25/3E + 6 FO	FC-FL-LWL-3606-001	3×10	87 × 30	933	3,834	1.6	290
3×35/3E + 6 FO	FC-FL-LWL-3606-002	3×10	90 × 31	1,200	4,284	2.0	300
3×50/3E + 6 FO	FC-FL-LWL-3606-003	3×16	99 × 33	1,760	5,268	3.0	320
3×70/3E + 6 FO	FC-FL-LWL-3606-004	3×25	109 × 35	2,534	6,526	4.3	340

Dimensions, copper index, weight, tensile load and bending radius are calculated reference values (tensile load 15 N/mm² of total copper cross-section; bending radius for reeling operation); final values are confirmed in the product data sheet at order.

Max. phase conductor resistance at 20 °C (Ω/km): 25: 0.795; 35: 0.565; 50: 0.393; 70: 0.277.

05 Standards and testing

Standard	Scope
DIN VDE 0250 series	Design basis of the cable
DIN VDE 0207-20	EPR insulation compound 3GI3
DIN VDE 0207-21	Rubber sheath compound 5GM5
IEC 60228	Conductors, class 5
IEC 60332-1-2	Flame propagation, single cable
2011/65/EU · (EC) 1907/2006	RoHS II · REACH

Routine and type tests

- AC voltage test, 9 kV for 5 min (2.5 × U_0)
- Conductor resistance and dimensional check
- Continuity of earth conductors and fibre-optic element
- Winding, bending and torsion tests (type test)
- Flame retardance (IEC 60332-1-2)

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

06 Installation and supply

Installation notes

- Observe the minimum bending radius of 10 × h (bending about the flat axis) in reeling operation; the drum core should not be smaller than this radius allows.
- Keep tensile load within 15 N/mm² of the total copper cross-section.
- Pay off from the shipping drum tangentially — never pull it over the flange; avoid loops and kinks.
- Protect against machine run-over and crushing; inspect the sheath regularly.
- Connect the earth conductors at both ends.

Packaging and supply

Drum	Steel or fumigated wooden drums; ends sealed with heat-shrink caps
Delivery lengths	To order, in one continuous length (no joints)
Lead time	2–3 weeks after technical approval
Warranty	At least 3 years against manufacturing defects
Drum label	Type, size, length, gross/net weight, batch no., drum no.

07 Certification and quality

CE — LVD 2014/35/EU

Certificate No. M.2025.206.C116598 · EN 50525-1:2011+A1:2022 · UDEM International Certification · valid until 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 until 17.08.2030

FeiChun also holds confirmation of documentation review for ATEX (Directive 2014/34/EU) and IECEx / VDE approvals for certain product groups. Approvals for specific mines are arranged with the end user or local distributor where required. Certificate copies are available on request.

08 Trademark notice and intellectual property

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