TYPE · FLAT MV REELING | 3.6/6 kV | Based on DIN VDE 0250-813 | PROTOLON (FL) Equivalent

FC-FLR (N)TSFLCGEWÖU 3,6/6 kV

Medium voltage flat reeling cable — EPR insulated, split concentric earth, red CR outer sheath — for fast-moving container cranes, gantries, large mobile equipment and excavators.

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01 Application & Product Overview

FC-FLR is a flexible medium voltage flat reeling cable for high mechanical stresses — dynamic tensile loads, frequent directional changes within one plane and continuous running over rollers and guides.

The parallel (flat) core arrangement gives a low stacking height on monospiral reeling drums and in flat-cable guiding systems, while the split concentric earth conductor around each core ensures symmetrical field distribution and reliable fault-current return. Where data transmission is required, the fibre-optic version FC-FLR-LWL is available.

Typical applications

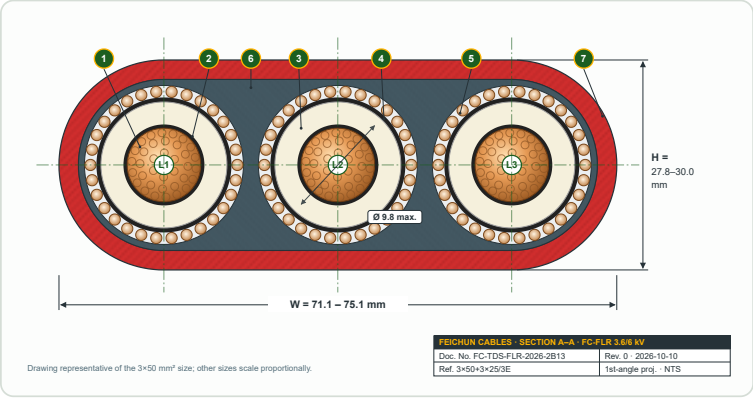
- STS / ship-to-shore and RMG container cranes on monospiral drums
- Stacker-reclaimers, ship loaders and bulk handling gantries
- Large mobile equipment and mining excavators
- Outdoor and indoor use — resistant to ozone, UV, moisture and oil
- Feeder cables for mobile substations and transfer cars

3.6/6 kV	120 m/min	15 N/mm²	−35 / +80 °C
Rated voltage U_0/U	Travel speed (reeling)	Max. tensile load on conductor	Ambient, fully flexible operation

Cross-reference

REFERENCE TYPE	FEICHUN EQUIVALENT
PROTOLON (FL) (N)TSFLCGEWÖU 3,6/6 kV	FC-FLR (N)TSFLCGEWÖU 3,6/6 kV

02 Construction



Pos.	Element	Material
1	Phase conductor	Tinned annealed Cu, finely stranded, class 5 (IEC 60228) / class F (DIN VDE 0295)
2	Inner semiconductive layer	Extruded semiconductive EPR
3	Insulation	High-grade EPR, min. 3GI3 (DIN VDE 0207-20), natural colour
4	Outer semiconductive layer	Modified EPR, black, strippable (warm)
5	Earth conductor	Tinned Cu wires, split & concentrically applied around each core
6	Inner sheath / bedding	Rubber compound, black, filling the inter-core spaces
7	Outer sheath	Polychloroprene (CR), min. 5GM5, red

Design features

Item	Description
Core arrangement	Three power cores laid in parallel (flat); earth conductor split into equal parts and concentrically distributed around each power core
Electrical field control	Triple-extruded inner semicon / EPR insulation / outer semicon, cured in one continuous process
Core identification	Natural insulation with black semiconductive layer; numbered tapes L1, L2, L3
Separation	Rubber bedding fills the inter-core spaces, holding the cores in a fixed parallel position under tension and on the drum
Data transmission	Fibre-optic version available as FC-FLR-LWL (6–24 fibres, G50 / G62.5 / E9)
Sheath colour	Red (standard); yellow or black on request

03 Electrical, Thermal & Mechanical Data

Electrical parameters

Parameter	Value
Rated voltage U_0/U	3.6/6 kV
Max. operating voltage AC	4.2/7.2 kV
Max. operating voltage DC	5.4/10.8 kV
AC test voltage	11 kV, 5 min
Partial discharge	≤ 10 pC at 1.73 U_0
Current rating basis	DIN VDE 0298-4; reeled in 1 layer, 30 °C ambient
Short-circuit duration basis	1 s, from 90 °C to 250 °C

Thermal & mechanical parameters

Parameter	Value
Max. conductor temperature	+90 °C
Short-circuit temperature	+250 °C (max. 5 s)
Ambient – fixed installation	−50 °C to +80 °C
Ambient – fully flexible	−35 °C to +80 °C
Max. tensile load	15 N/mm² of total phase conductor cross-section
Min. bending radius	Per DIN VDE 0298-3 — see table §04 (based on D = 1.5 × flat cable height)
S-type direction changes	Min. spacing 20 × D
Travel speed	Up to 120 m/min (gantry, reeling)
Torsional stress	Not permitted

04 Dimensions, Weights & Ratings — 3.6/6 kV

Cores × cross-section mm²	FeiChun part no.	Conductor Ø max. mm	Height (H) min. mm	Height (H) max. mm	Width (W) min. mm	Width (W) 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+3×25/3E	FC-FLR06-02525	6.9	24.2	27.2	64.3	68.3	408	2,730	1,125	0.795	105	3.58
3×35+3×25/3E	FC-FLR06-03525	8.3	24.7	27.7	65.8	69.8	416	3,120	1,575	0.565	130	5.01
3×50+3×25/3E	FC-FLR06-05025	9.8	27.8	30.0	71.1	75.1	450	3,860	2,250	0.393	162	7.15
3×70+3×35/3E	FC-FLR06-07035	11.4	28.9	31.9	76.8	80.8	479	4,730	3,150	0.277	200	10.01
3×95+3×50/3E	FC-FLR06-09550	13.3	31.0	34.0	82.5	86.5	495	5,600	4,275	0.210	241	13.59
3×120+3×70/3E	FC-FLR06-12070	15.1	35.4	37.4	92.3	97.3	561	7,400	5,400	0.164	282	17.16

Current rating: nominal value for rubber-insulated cables reeled in one layer at 30 °C ambient (DIN VDE 0298-4). Larger sizes, alternative sheath colours and fibre-optic versions (FC-FLR-LWL) are manufactured to order — dimensions confirmed with the order acknowledgement.

Ambient temperature correction factors (90 °C conductor)

Ambient °C	10	15	20	25	30	35	40	45	50
Factor	1.15	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82

05 Standards, Tests & Resistance Properties

Standard	Scope
DIN VDE 0250-813	Basis of design (flat MV trailing / reeling cable)
DIN VDE 0295 / IEC 60228	Conductors, class 5 / F
DIN VDE 0207-20 / -21	Insulation (3GI3) and sheath (5GM5) compounds
DIN VDE 0298-3 / -4	Bending radii, current ratings
DIN EN 60811-404	Oil resistance of sheath
HD 22.16 / EN 50525-1	Water resistance; general requirements
IEC 60502-2 (ref.)	Partial discharge and electrical type-test methods

Routine & type tests

- AC voltage test 11 kV on every drum, partial discharge measurement
- Conductor resistance and dimensional checks
- Insulation resistance and semiconductive layer strippability
- Reversed bending test and reeling test (type test)
- Ozone, UV and weathering resistance — unrestricted outdoor use
- Oil resistance per DIN EN 60811-404

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

06 Installation, Marking & Delivery

Installation notes

- Use monospiral reeling drums sized for flat cable; drum core diameter ≥ 2 × minimum bending radius.
- Unwind tangentially from the delivery drum — never pull off over the flange; avoid loops and twisting.
- Torsion is not permitted; maintain at least 20 × D between S-type direction changes.
- Keep tensile force within the tabulated limit, including

Sheath marking

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FEICHUN FC-FLR (N)TSFLCGEWÖU 3×50+3×25/3E 3,6/6 kV 2026 [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.

acceleration and deceleration peaks.

- Lay out and relax the cable before the first reeling; check tension-control settings at commissioning.

Terminations: use stress-control terminations rated for 3.6/6 kV EPR cables and connect each split earth conductor at both ends. Remove the outer semiconductive layer only in warm condition with suitable stripping tools.

07 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. EAЭC 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. Certificate copies are available on request.

08 Trademark Notice & Intellectual Property

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FEICHUN CABLES