HIGH-FLEX LV REELING CABLE · RTG / RMG / STS | 0.6/1 kV | 10 sizes | CSP rubber

FC-TCS-M-N 0.6/1 kV

Low-Voltage Port Reeling Cable 0.6/1 kV – 3 power cores + 3 split PE conductors, CSP rubber sheath. Complete technical data sheet: construction, dimensions, weights, current ratings, standards and installation guidance for 10 sizes.

Document no. FC-TDS-LV084-2026-BED60084-EN · Revision 0 · Issued 4 November 2026 · Language: English (AU)

01 Application and Product Overview

FC-TCS-M-N is a high-flex reeling cable for container terminals and heavy port equipment, rated 0.6/1 kV, with the configuration 3 power cores + 3 split PE conductors. It has fine-wire class 5 copper conductors, halogen-free EPR/HEPR rubber insulation, a halogen-free inner sheath and an outer sheath of chlorosulfonated polyethylene (CSP) rubber, resistant to weather, ozone and oil; power cores from 25 – 300 mm². Short-lay stranding makes it suitable for continuous winding on and off a cable reel under tensile and torsional load. The construction is derived from the FC-TPU-M D2X11Y platform with a rubber sheath.

Typical applications

- Reels that carry power only, with control and signalling handled by a separate control or fibre-optic cable
- Rubber-tyred gantry (RTG), rail-mounted gantry (RMG) and electrified RTG cranes fed through spring-driven or motor-driven cable reels
- Ship-to-shore (STS) crane auxiliary drives, automated stacking cranes, ship unloaders and bulk-handling machines in terminals
- Outdoor quayside and yard operation with exposure to seawater spray, salt mist, UV radiation and ozone
- Reeling operation at travel speeds up to 60 m/min with repeated tensile and torsional loads
- Outdoor duty that calls for a rubber sheath with proven weather, ozone and oil resistance

Design

Power and protective earth only. Three power cores and three split PE conductors laid with a very short lay length give a round, balanced cross-section that is the established design for reeling cables. Control and signal circuits are routed in a separate cable.

10 sizes	0.6/1 kV	+90 °C	CSP rubber
Cross-section 25 – 300 mm²	Rated voltage U_0/U	Maximum conductor temperature	Sheath: CSP rubber

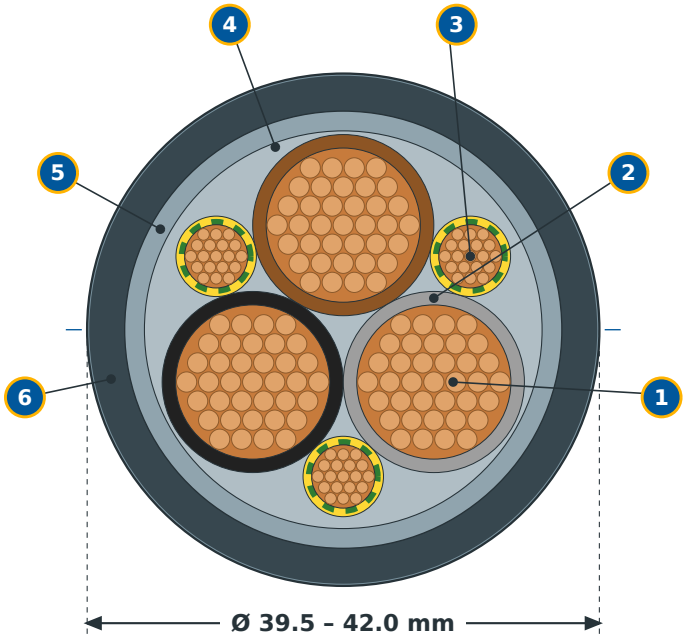
Key features

- Fine-wire class 5 copper conductors and a very short core lay length for repeated reeling
- Three split PE conductors in the interstices keep the cross-section round and balanced
- Designed for 20 N/mm² continuous tensile load (on the total copper cross-section of the power cores)
- CSP rubber sheath with proven weather, ozone and oil resistance
- Flame retardant to IEC 60332-1-2

02 Construction

FEICHUN · CROSS-SECTION A-A · 0.6/1 kV

FC-TCS-M-N
Sample size 3×95+3G16 · Rev 0 · Illustrative, not to scale



No.	Component	Material
1	Conductor	Bare annealed fine-wire copper, class 5 to IEC 60228
2	Insulation	Halogen-free EPR/HEPR rubber
3	Split PE conductor	Class 5 copper, green-yellow insulation, laid in the interstices between the power cores
4	Filler and binder tape	Halogen-free compound, polyester tape
5	Inner sheath	Halogen-free polymer compound
6	Outer sheath	Chlorosulfonated polyethylene (CSP) rubber, resistant to weather, ozone and oil

The drawing shows size 3×95+3G16. Other sizes have the same construction with scaled dimensions.

Construction details

Conductor	Bare annealed fine-wire copper, class 5 to DIN EN 60228 / IEC 60228 / VDE 0295
Insulation	Halogen-free EPR/HEPR rubber to IEC 60502-1, maximum conductor temperature 90 °C
Core identification	Power cores brown, black, grey to DIN VDE 0298-300
Protective conductor	Three PE conductors (3G), green-yellow, 16 mm² each, laid in the interstices between the power cores
Stranding	Power cores, split PE conductors and control or optical elements are stranded together with a very short lay length
Inner sheath	Halogen-free polymer compound, extruded tightly over the stranded cores
Outer sheath	Chlorosulfonated polyethylene (CSP) rubber, resistant to weather, ozone and oil

Sheath material

The chlorosulfonated polyethylene (CSP) rubber sheath is a proven reeling-cable material for open-air cranes: excellent resistance to weather, ozone and mineral oil, good mechanical robustness and low-temperature flexibility to −30 °C in motion. CSP contains halogen; where halogen-free cables are specified, select the HFFR rubber or PUR version of the same construction.

03 Electrical, Thermal and Mechanical Characteristics

Electrical data

Rated voltage U_0/U	0.6/1 kV AC
Test voltage	2.5 kV AC (power cores); 2 kV AC (control cores)
Maximum operating voltage, DC	0.9/1.8 kV
Current-carrying capacity	To DIN VDE 0298-4 at 30 °C ambient; the table gives rated design values
Conductor resistance	Maximum at 20 °C, class 5 to IEC 60228

Thermal and mechanical data

Maximum conductor temperature	+90 °C
Maximum temperature at short circuit	+250 °C
Ambient temperature, fixed installation	−40 °C to +90 °C
Ambient temperature, in motion	−30 °C to +90 °C
Minimum bending radius	4 × D fixed; 8 × D on a cable reel (DIN VDE 0298-3)
Maximum tensile load	20 N/mm² continuous, on the total copper cross-section of the power cores
Maximum torsional load	±50 °/m
Maximum travelling speed	60 m/min on a cable reel; higher speeds on request
Flame propagation	IEC 60332-1-2 / DIN EN 60332-1-2
Halogen-free	No (CSP rubber sheath)
UV and ozone resistance	Resistant
Mineral oil resistance	Resistant, IEC 60811-404

Sheath material comparison

Property	PUR	PUR low-temp	CSP rubber	CPE rubber	PCP rubber	HFFR rubber
Abrasion resistance	Excellent	Excellent	**Good**	Good	Very good	Good
Cut and tear resistance	Excellent	Excellent	**Good**	Good	Very good	Good
Mineral oil resistance	Very good	Very good	**Very good**	Very good	Very good	Good
Weather, UV and ozone resistance	Very good	Very good	**Excellent**	Very good	Excellent	Very good
Cold flexibility (moving)	−30 °C	−40 °C	**−30 °C**	−30 °C	−25 °C	−25 °C
Halogen-free (IEC 60754-1/-2)	Yes	Yes	**No**	No	No	Yes

The column of the sheath used in this cable is highlighted. Ratings are qualitative; ask FeiChun for test data on a specific requirement.

04 Dimensions, Weights and Rated Data – 0.6/1 kV (10 sizes)

Type designation cores × mm²	FeiChun article no.	Conductor Ø max mm	Outer Ø min mm	Outer Ø max mm	Min. bend radius mm	Weight approx. kg/km	Max. pull force N	R_{20} max Ω/km	Rated current A	I_k (1 s) kA
3×25+3G6	FC-LV084-001	6.2	21.1	22.4	180	1,110	1,500	0.780	131	3.58
3×35+3G6	FC-LV084-002	7.8	24.5	26.0	208	1,490	2,100	0.554	162	5.00
3×50+3G10	FC-LV084-003	9.6	29.0	31.0	248	2,160	3,000	0.386	202	7.15
3×70+3G16	FC-LV084-004	11.1	35.0	37.0	296	3,130	4,200	0.272	250	10.01
3×95+3G16	FC-LV084-005	12.6	39.5	42.0	336	3,770	5,700	0.206	302	13.59
3×120+3G25	FC-LV084-006	14.8	44.0	46.5	372	4,920	7,200	0.161	350	17.16
3×150+3G25	FC-LV084-007	16.0	49.0	52.0	416	5,910	9,000	0.129	402	21.45
3×185+3G35	FC-LV084-008	17.7	53.0	56.5	452	7,480	11,100	0.106	459	26.45
3×240+3G50	FC-LV084-009	20.2	61.0	65.0	520	9,850	14,400	0.0801	540	34.32
3×300+3G50	FC-LV084-010	22.4	67.0	71.5	572	11,860	18,000	0.0641	621	42.90

Current-carrying capacity: rated design values to DIN VDE 0298-4 for flexible cables, free air, 30 °C ambient; for other ambient temperatures, grouping or layered winding on a reel, apply the factors below. Pull force = 20 N/mm² × total copper cross-section of the power cores. Diameters, dimensions and weights are nominal design values and vary within manufacturing tolerances; confirm critical dimensions before dimensioning reels, guides or festoon systems. Other sizes and configurations are produced to order.

Ambient temperature factors (conductor 90 °C)

°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 current rating

I_k = 0.143 kA/mm² × cross-section of the power core (conductor 90 °C → 250 °C). For another short-circuit duration t: $I_{k,t} = I_{k,1s} / \sqrt{t}$ (0.1 s ≤ t ≤ 5 s).

Derating on a cable reel (DIN VDE 0298-4)

1 layer: 0.80 · 2 layers: 0.61 · 3 layers: 0.49 · 4 layers: 0.41. Permissible current = table current × layer factor × temperature factor.

05 Reeling Performance and Reel Design Data

The values below support the dimensioning of the cable reel: minimum reel core diameter, copper weight for earthing and loop-resistance calculations, cable weight, and the rated current for the number of layers wound on the reel.

Type designation cores × mm²	Outer Ø max mm	Min. bend radius on reel, mm	Min. reel core Ø mm	Copper weight kg/km	Cable weight kg/100 m	Current, 1 layer A	2 layers A	3 layers A	4 layers A
3×25+3G6	22.4	180	360	830	111.0	105	80	64	54
3×35+3G6	26.0	208	416	1,090	149.0	130	99	79	66
3×50+3G10	31.0	248	496	1,600	216.0	162	123	99	83
3×70+3G16	37.0	296	592	2,290	313.0	200	152	122	102
3×95+3G16	42.0	336	672	2,960	377.0	242	184	148	124
3×120+3G25	46.5	372	744	3,870	492.0	280	214	172	144
3×150+3G25	52.0	416	832	4,670	591.0	322	245	197	165
3×185+3G35	56.5	452	904	5,870	748.0	367	280	225	188
3×240+3G50	65.0	520	1,040	7,730	985.0	432	329	265	221
3×300+3G50	71.5	572	1,144	9,330	1,186.0	497	379	304	255

Reel design guidance

- Minimum reel core diameter = 2 × minimum bending radius = 16 × D (outer diameter D).
- Spring reels suit short travel and low tensile load; motor-driven reels with torque control keep the cable under constant, low tension.
- Fit a guide or level-wind that keeps the cable parallel to the reel axis to prevent crossing turns.
- Rated current falls with the number of layers on the reel because heat is not dissipated; see the layer factors below.

06 Selection Guide and Sizing Aid

FC-TCS-M-N covers 10 sizes. The smallest, 3×25+3G6, has an outer diameter of up to 22.4 mm and weighs about 1,110 kg/km; the largest, 3×300+3G50, has an outer diameter of up to 71.5 mm and weighs about 11,860 kg/km, 10.7 times as much. Across the range the rated current in free air rises from 131 A to 621 A at 30 °C, and the minimum bending radius from 180 mm to 572 mm.

Example 1. A drive draws 128 A continuously, the cable is wound in 2 layers on the reel and the ambient temperature is 40 °C. Required table current = 128 / (0.61 × 0.91) = 231 A. The smallest suitable size is 3×70+3G16 with 250 A.

Example 2. A drive draws 284 A continuously, the cable is wound in 1 layer on the reel and the ambient temperature is 35 °C. Required table current = 284 / (0.80 × 0.96) = 370 A. The smallest suitable size is 3×150+3G25 with 402 A.

Type designation cores × mm²	Apparent power at 400 V kVA (1 layer)	Apparent power at 690 V kVA (1 layer)	Winding capacity m
3×25+3G6	72.6	125.2	8,260
3×35+3G6	89.8	154.9	6,255
3×50+3G10	112.0	193.1	4,310
3×70+3G16	138.6	239.0	2,895
3×95+3G16	167.4	288.7	2,120
3×120+3G25	194.0	334.6	1,690
3×150+3G25	222.8	384.3	1,430
3×185+3G35	254.4	438.8	1,140

Type designation cores × mm²	Apparent power at 400 V kVA (1 layer)	Apparent power at 690 V kVA (1 layer)	Winding capacity m
3×240+3G50	299.3	516.3	820
3×300+3G50	344.2	593.7	590

Apparent power S = √3 × U × I × 0.80 (one layer on the reel, 30 °C). Winding capacity is an indicative value for a reel with 2,500 mm flange diameter, 1,000 mm traverse width, core diameter equal to the minimum reel core diameter and 90 % fill; it is not a substitute for the reel manufacturer's calculation.

07 Standards and Testing

Standard	Scope
DIN EN 60228 / IEC 60228 / VDE 0295	Conductors, class 5
IEC 60502-1	Insulation compound, power cables up to 1 kV
DIN VDE 0298-3	Application of cables – bending radii and tensile loads
DIN VDE 0298-4	Application of cables – current-carrying capacity
DIN EN 60332-1-2 / IEC 60332-1-2	Flame propagation, single cable
DIN VDE 0298-300	Core identification
DIN VDE 0250-814	Design reference for flexible reeling and trailing cables (NSHTÖU type)
IEC 60811-404	Mineral oil immersion test

Routine and type tests

- AC voltage test on every reel length (routine test): 2.5 kV AC (power cores); 2 kV AC (control cores)
- Conductor resistance and checks of dimensions, insulation thickness and sheath thickness
- Continuity of conductors and protective earth
- Bending, tensile and reeling torsion tests (type test)
- Flame propagation (IEC 60332-1-2)

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

08 Installation, Marking and Delivery

Installation guidance

- Use a spring-driven or motor-driven cable reel with a core diameter of at least twice the minimum bending radius (16 × D).
- Unwind from the shipping reel tangentially; never pull the cable over the flange of the drum, and avoid loops and kinks.
- Keep torsion within the permitted limit (±50 °/m) and tensile load within the value in the table.
- Guide the cable so that it is not run over by vehicles or crushed; inspect the sheath regularly.
- Connect all parts of the split PE conductor at both ends of the cable.
- Suitable for wet conditions; consult FeiChun for continuous immersion.

Sheath marking

```
FEICHUN FC-TCS-M-N [cross-section] 0.6/1 kV [year] [serial no.] [metre mark]
```

Packing and delivery

Reel	Steel or fumigated wooden reels; cable ends sealed with heat-shrink caps
Delivery length	As ordered, in one continuous length without joints
Lead time	2–3 weeks after technical approval
Warranty	1 year, covering failures not caused by human factors
Reel label	Type, cross-section, length, gross/net weight, batch no., reel no.

Ordering information

Field	Example	Meaning
Series code	FC-TCS-M-N	FeiChun series and sheath system
Core configuration	3×95+3G16	Number × cross-section (mm²) of the power cores, split PE conductors (G) and control or optical elements
Rated voltage	0.6/1 kV	U_0/U, AC
Length and packing	500 m, steel reel	Delivery length in one piece; reel type on request

Order example: FC-TCS-M-N 3×95+3G16 0.6/1 kV – 500 m on one steel reel. When requesting a quotation, state the cable type, configuration, cross-section, voltage, length per piece, required standards and installation conditions.

09 Certification and Quality

All cable is subject to FeiChun's quality control, with routine testing over 100 % of the delivered length. Certificates, type tests and third-party tests (for example partial discharge or compatibility with cable accessories) are provided per project requirement; copies of the records are available on request.

The CE, EAC and UKCA certificates listed in datasheet FC-TDS-TMP-2026-9238-EN apply to the FC-TPU-M D2X11Y product group. Confirm with FeiChun that the certificate scope covers this construction before quoting it in a tender.

10 Related Datasheets

Variants of this cable that differ in one attribute – sheath, configuration, optical fibres or voltage. All datasheets are in PDF format.

- FC-TPU-M D2X11Y-N 0.6/1 kV – 3 power cores + 3 split PE conductors, PUR
- FC-TCS-M 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 control cores, CSP rubber
- FC-TCS-M-F6 0.6/1 kV – 3 power cores + 3 split PE conductors + 6 single-mode fibres G.652.D, CSP rubber
- FC-TPU-MA D2X11Y-N 0.6/1 kV – 3 power cores + 3 split PE conductors, PUR low-temp
- FC-TCS-M-P 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 pilot cores 2×2.5 mm², CSP rubber
- FC-TCS-M-F 0.6/1 kV – 3 power cores + 3 split PE conductors + 12 single-mode fibres G.652.D, CSP rubber
- FC-TRB-M-N 0.6/1 kV – 3 power cores + 3 split PE conductors, CPE rubber
- FC-TCS-M-NS 0.6/1 kV – 3 power cores + 3 split PE conductors + overall screen, CSP rubber

Overview of all datasheets: Low-Voltage Port Reeling Cables 0.6/1 kV

Frequently asked questions

What is FC-TCS-M-N used for?
Typical applications include reels that carry power only, with control and signalling handled by a separate control or fibre-optic cable.

What are the outer diameter and minimum bending radius of 3×95+3G16?
The outer diameter is 39.5 to 42.0 mm and the minimum bending radius in moving or reeling operation is 336 mm (8 × D).

What minimum reel core diameter is needed for 3×95+3G16?
At least 672 mm, which is twice the minimum bending radius of 336 mm. A larger core diameter extends cable life.

What current rating applies to 3×95+3G16 on a cable reel?
The rated current in free air at 30 °C ambient is 302 A. Multiply it by 0.80 for one layer on the reel, 0.61 for two layers, 0.49 for three layers and 0.41 for four layers (DIN VDE 0298-4), and by the ambient temperature factor.

Is this cable halogen-free?
No. The CSP rubber sheath contains halogen. If halogen-free cables are required, select the HFFR rubber or PUR version of the same construction.

Which cross-sections are available?
FC-TCS-M-N: 25, 35, 50, 70, 95, 120, 150, 185, 240, 300 mm². Other sizes and special designs can be produced to order.

11 Trademark Notice and Intellectual Property

© 2026 Anhui FeiChun Special Cable Co., Ltd. — All rights reserved. This document, including its drawings, tables and layout, is the intellectual property of FeiChun and is protected under the Copyright Law and the Anti-Unfair Competition Law of the People's Republic of China and the Copyright Act 1968 (Cth) of Australia. Reproduction, distribution or modification of the whole or any part without written consent is prohibited. Technical data may change without notice as part of continuous product improvement.

Technical and commercial contacts

Anhui FeiChun Special Cable Co., Ltd.
International Business Department
Park No. 1, Private Science and Technology Park, Hefei National Economic and Technological Development Zone, Hefei, Anhui, China
Technical support: Tech@feichuncables.com
Mining and heavy industry: mining@feichuncables.com
Zihao Yang, Global Sales Manager: zihao.yang@feichuncables.com
WhatsApp: +86 138 5512 3218
Web: www.feichuncables.com

Document control

Document no. FC-TDS-LV084-2026-BED60084-EN
Revision 0 — first issue
Date 4 November 2026
Product FC-TCS-M-N 0.6/1 kV

Prepared — Engineering | Checked — QC | Approved — International Business