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

FC-TRB-M-S 0.6/1 kV

Low-Voltage Port Reeling Cable 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 control cores + overall screen, CPE rubber sheath. Complete technical data sheet: construction, dimensions, weights, current ratings, standards and installation guidance for 10 sizes.

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01 Application and Product Overview

FC-TRB-M-S 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 + 2 control cores + overall screen. It has fine-wire class 5 copper conductors, halogen-free EPR/HEPR rubber insulation, a halogen-free inner sheath and an outer sheath of chlorinated polyethylene (CPE) 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

- Converter-fed crane drives where control signals in the same cable must be protected against electromagnetic interference
- 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

Combined power and control cable with an overall tinned-copper braid screen between the inner and outer sheath. The screen limits interference from frequency-converter-fed drives into the control cores and into nearby signal cables. A 360° screen termination at both ends is recommended.

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

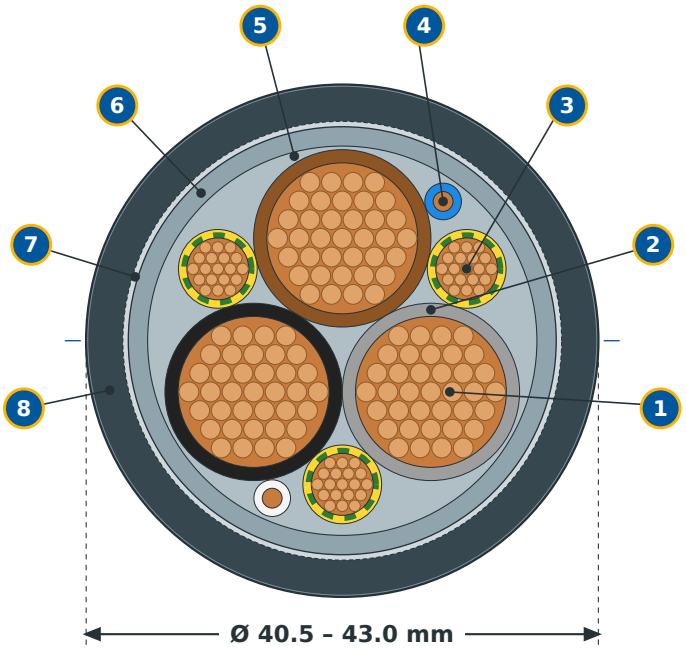
Key features

- 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)
- CPE rubber sheath with proven weather, ozone and oil resistance
- Overall tinned-copper braid screen (≥ 85 % coverage) for EMC
- Flame retardant to IEC 60332-1-2

02 Construction

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

FC-TRB-M-S
Sample size 3×95+3G16+2×1.5 C · 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	Control cores	Class 5 copper, blue and white insulation
5	Filler and binder tape	Halogen-free compound, polyester tape
6	Inner sheath	Halogen-free polymer compound
7	Overall screen	Tinned-copper wire braid, coverage ≥ 85 %
8	Outer sheath	Chlorinated polyethylene (CPE) rubber, resistant to weather, ozone and oil

The drawing shows size 3×95+3G16+2×1.5 C. 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
Control cores	Two control cores 2 × 1.5 mm² (blue, white) laid in the free space between the power cores
Stranding	Power cores, split PE conductors and control or optical elements are stranded together with a very short lay length
Overall screen	Tinned-copper wire braid, coverage ≥ 85 %, between inner and outer sheath
Inner sheath	Halogen-free polymer compound, extruded tightly over the stranded cores
Outer sheath	Chlorinated polyethylene (CPE) rubber, resistant to weather, ozone and oil

Sheath material

The chlorinated polyethylene (CPE) rubber sheath offers good resistance to weather, ozone and mineral oil with good mechanical robustness and flexibility to −30 °C in motion, at a favourable cost level. CPE contains halogen; where halogen-free cables are specified, select the 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 (CPE 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+2×1 C	FC-LV143-001	6.2	23.2	24.7	198	1,270	1,500	0.780	131	3.58
3×35+3G6+2×1.5 C	FC-LV143-002	7.8	27.0	29.0	232	1,700	2,100	0.554	162	5.00
3×50+3G10+2×1.5 C	FC-LV143-003	9.6	31.0	33.0	264	2,360	3,000	0.386	202	7.15
3×70+3G16+2×1.5 C	FC-LV143-004	11.1	36.0	38.0	304	3,280	4,200	0.272	250	10.01
3×95+3G16+2×1.5 C	FC-LV143-005	12.6	40.5	43.0	344	3,940	5,700	0.206	302	13.59
3×120+3G25+2×1.5 C	FC-LV143-006	14.8	44.5	47.5	380	5,100	7,200	0.161	350	17.16
3×150+3G25+2×1.5 C	FC-LV143-007	16.0	50.0	53.0	424	6,110	9,000	0.129	402	21.45
3×185+3G35+2×1.5 C	FC-LV143-008	17.7	54.0	57.5	460	7,690	11,100	0.106	459	26.45
3×240+3G50+2×1.5 C	FC-LV143-009	20.2	62.0	66.0	528	10,070	14,400	0.0801	540	34.32
3×300+3G50+2×1.5 C	FC-LV143-010	22.4	68.0	72.5	580	12,090	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+2×1 C	24.7	198	396	950	127.0	105	80	64	54
3×35+3G6+2×1.5 C	29.0	232	464	1,240	170.0	130	99	79	66
3×50+3G10+2×1.5 C	33.0	264	528	1,760	236.0	162	123	99	83
3×70+3G16+2×1.5 C	38.0	304	608	2,460	328.0	200	152	122	102
3×95+3G16+2×1.5 C	43.0	344	688	3,150	394.0	242	184	148	124
3×120+3G25+2×1.5 C	47.5	380	760	4,070	510.0	280	214	172	144
3×150+3G25+2×1.5 C	53.0	424	848	4,890	611.0	322	245	197	165
3×185+3G35+2×1.5 C	57.5	460	920	6,110	769.0	367	280	225	188
3×240+3G50+2×1.5 C	66.0	528	1,056	8,010	1,007.0	432	329	265	221
3×300+3G50+2×1.5 C	72.5	580	1,160	9,630	1,209.0	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-TRB-M-S covers 10 sizes. The smallest, 3×25+3G6+2×1 C, has an outer diameter of up to 24.7 mm and weighs about 1,270 kg/km; the largest, 3×300+3G50+2×1.5 C, has an outer diameter of up to 72.5 mm and weighs about 12,090 kg/km, 9.5 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 198 mm to 580 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+2×1.5 C 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+2×1.5 C 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+2×1 C	72.6	125.2	6,810
3×35+3G6+2×1.5 C	89.8	154.9	4,975
3×50+3G10+2×1.5 C	112.0	193.1	3,655
3×70+3G16+2×1.5 C	138.6	239.0	2,680
3×95+3G16+2×1.5 C	167.4	288.7	2,175
3×120+3G25+2×1.5 C	194.0	334.6	1,725
3×150+3G25+2×1.5 C	222.8	384.3	1,255
3×185+3G35+2×1.5 C	254.4	438.8	1,040

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+2×1.5 C	299.3	516.3	730
3×300+3G50+2×1.5 C	344.2	593.7	600

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 and control cores
- 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

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FEICHUN FC-TRB-M-S [cross-section] 0.6/1 kV [year] [serial no.] [metre mark]
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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-TRB-M-S	FeiChun series and sheath system
Core configuration	3×95+3G16+2×1.5 C	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-TRB-M-S 3×95+3G16+2×1.5 C 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-S 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 control cores + overall screen, PUR
- FC-TRB-M 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 control cores, CPE rubber
- FC-TRB-M-SF6 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 control cores + overall screen + 6 single-mode fibres G.652.D, CPE rubber
- FC-TPU-MA D2X11Y-S 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 control cores + overall screen, PUR low-temp
- FC-TRB-M-N 0.6/1 kV – 3 power cores + 3 split PE conductors, CPE rubber
- FC-TRB-M-SF 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 control cores + overall screen + 12 single-mode fibres G.652.D, CPE rubber
- FC-TCS-M-S 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 control cores + overall screen, CSP rubber
- FC-TRB-M-P 0.6/1 kV – 3 power cores + 3 split PE conductors + 2 pilot cores 2×2.5 mm², CPE rubber

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

Frequently asked questions

What is FC-TRB-M-S used for?
Typical applications include converter-fed crane drives where control signals in the same cable must be protected against electromagnetic interference.

What are the outer diameter and minimum bending radius of 3×95+3G16+2×1.5 C?
The outer diameter is 40.5 to 43.0 mm and the minimum bending radius in moving or reeling operation is 344 mm (8 × D).

What minimum reel core diameter is needed for 3×95+3G16+2×1.5 C?
At least 688 mm, which is twice the minimum bending radius of 344 mm. A larger core diameter extends cable life.

What current rating applies to 3×95+3G16+2×1.5 C 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 CPE 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-TRB-M-S: 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

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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

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