REELING CONTROL CABLE · PORT CRANES & SPREADERS | 0.6/1 kV | 5 sizes | CSP rubber

FC-CR-S 4G 0.6/1 kV

Reeling Control Cable for Port Cranes 0.6/1 kV – 4-core reeling control cable, CSP rubber sheath. Complete technical data sheet: construction, dimensions, weights, current ratings, standards and installation guidance for 5 sizes.

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01 Application and Product Overview

FC-CR-S 4G is a 4-core reeling control cable rated 0.6/1 kV for cable reels on port cranes, spreaders and yard equipment. It has fine-wire class 5 copper cores with halogen-free EPR/HEPR rubber insulation, an inner sheath and an outer sheath of chlorosulfonated polyethylene (CSP) rubber, resistant to weather, ozone and oil. Core cross-sections: 0.75 – 4 mm².

Design

4 cores in concentric layers with a short lay length and polyester binder tape. Black cores carry white numbers; the green-yellow protective core lies in the outer layer. The cores are bound with halogen-free filler and covered by an inner sheath before the outer sheath is applied. Cables with few cores are used for dedicated circuits such as brake, limit-switch or sensor supply on the trolley.

Typical applications

- Control, signal and measuring circuits of crane trolleys, spreaders, headblocks and mobile machinery supplied through a cable reel
- Spring-driven and motor-driven cable reels on RTG, RMG, STS and yard equipment
- Operation with repeated winding, unwinding and bending within the permitted bending radius
- Wet, oily and abrasive outdoor environments typical of container terminals and bulk ports
- Control cabinets, junction boxes and trolley equipment of crane and handling systems

5 sizes	0.6/1 kV	+90 °C	CSP rubber
Cross-section 0.75 – 4 mm²	Rated voltage U_0/U	Maximum conductor temperature	Sheath: CSP rubber

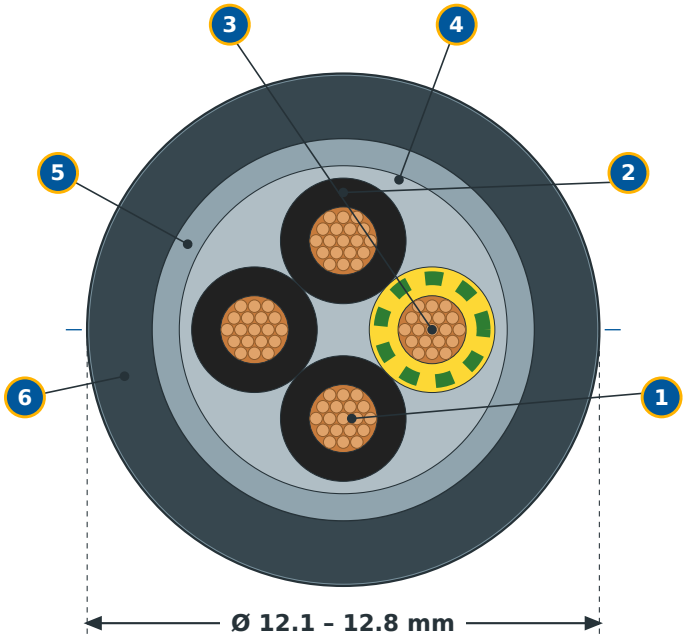
Key features

- Fine-wire class 5 copper cores with insulation thickness to 0.6/1 kV for reliable operation on a reel
- Cores laid in concentric layers with a short lay length and polyester binder tape
- Number-printed black cores; green-yellow protective core in the outer layer (G types)
- 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-CR-S
Sample size 4G1.5 · 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	Protective (PE) core	Class 5 copper, green-yellow insulation
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 4G1.5. 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	Black cores with white numbers; green-yellow protective core in the outer layer
Stranding	Cores stranded in concentric layers with a short lay length; polyester binder tape
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	3.5 kV AC, 5 min
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	Fixed: 4 × D (D ≥ 8 mm), 3 × D (D < 8 mm); moving or reeling: 6 × D (D ≤ 12 mm), 8 × D (D ≤ 20 mm), 10 × D (D > 20 mm)
Maximum tensile load	15 N/mm² continuous, on the total copper cross-section of the power cores
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 (5 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	Current per core A	I_k (1 s) kA
4G0.75	FC-CR053-001	1.2	10.8	11.5	68	142	45	26.0	12	0.107
4G1	FC-CR053-002	1.4	11.3	12.0	72	160	60	19.5	14	0.143
4G1.5	FC-CR053-003	1.7	12.1	12.8	102	192	90	13.3	18	0.214
4G2.5	FC-CR053-004	2.2	13.3	14.1	112	252	150	7.98	25	0.357
4G4	FC-CR053-005	2.7	14.8	15.7	126	335	240	4.95	33	0.572

Current-carrying capacity: rated design values to DIN VDE 0298-4 for flexible cables, free air, 30 °C ambient; values per core include the derating factor for the number of cores; for other ambient temperatures, grouping or layered winding on a reel, apply the factors below. Pull force = 15 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).

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
4G0.75	11.5	68	136	27	14.2
4G1	12.0	72	144	36	16.0
4G1.5	12.8	102	204	53	19.2
4G2.5	14.1	112	224	89	25.2
4G4	15.7	126	252	142	33.5

Reel design guidance

- Minimum reel core diameter = 2 × minimum bending radius = 2 × minimum bending radius (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-CR-S 4G covers 5 sizes. The smallest, 4G0.75, has an outer diameter of up to 11.5 mm and weighs about 142 kg/km; the largest, 4G4, has an outer diameter of up to 15.7 mm and weighs about 335 kg/km, 2.4 times as much. Across the range the rated current per core rises from 12 A to 33 A at 30 °C, and the minimum bending radius from 68 mm to 126 mm.

Example 1. A circuit carries 12 A per core at an ambient temperature of 40 °C. Required table current = 12 / 0.91 = 14 A per core. The smallest suitable size is 4G1 with 14 A per core.

Example 2. A circuit carries 22 A per core at an ambient temperature of 35 °C. Required table current = 22 / 0.96 = 23 A per core. The smallest suitable size is 4G2.5 with 25 A per core.

Type designation cores × mm²	Total copper mm²	Cable weight kg/100 m	Winding capacity m
4G0.75	3	14.2	32,465
4G1	4	16.0	30,360
4G1.5	6	19.2	26,365
4G2.5	10	25.2	21,405
4G4	16	33.5	17,285

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): 3.5 kV AC, 5 min
- Conductor resistance and checks of dimensions, insulation thickness and sheath thickness
- Continuity of conductors and protective earth
- Bending, tensile 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 reel core diameter of at least twice the minimum bending radius; keep the cable free of loops and kinks while winding.
- Do not exceed the tensile load in the table; relieve the cable of tension at the reel hub and at the trolley.
- Connect the protective core (G types) at both ends; terminate the screen 360° where fitted.
- Keep control cables away from unscreened power cables running in parallel where possible.
- Inspect the sheath regularly for abrasion and mechanical damage.

Sheath marking

FEICHUN FC-CR-S [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-CR-S	FeiChun series and sheath system
Core configuration	4G1.5	Number of cores with G (protective core included) or × (no protective core), and core cross-section in mm²
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-CR-S 4G1.5 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-CR-U 4G 0.6/1 kV – 4-core reeling control cable, PUR
- FC-CR-S 2× 0.6/1 kV – 2-core reeling control cable, CSP rubber
- FC-CR-S-C 4G 0.6/1 kV – 4-core reeling control cable with overall tinned-copper braid screen, CSP rubber
- FC-CR-A 4G 0.6/1 kV – 4-core reeling control cable, PUR low-temp
- FC-CR-S 3G 0.6/1 kV – 3-core reeling control cable, CSP rubber
- FC-CR-R 4G 0.6/1 kV – 4-core reeling control cable, CPE rubber
- FC-CR-S 5G 0.6/1 kV – 5-core reeling control cable, CSP rubber
- FC-CR-P 4G 0.6/1 kV – 4-core reeling control cable, PCP rubber

Overview of all datasheets: Reeling Control Cables 0.6/1 kV

Frequently asked questions

What is FC-CR-S 4G used for?
Typical applications include control, signal and measuring circuits of crane trolleys, spreaders, headblocks and mobile machinery supplied through a cable reel.

What are the outer diameter and minimum bending radius of 4G1.5?
The outer diameter is 12.1 to 12.8 mm and the minimum bending radius in moving or reeling operation is 102 mm (6 to 10 × D depending on diameter).

What minimum reel core diameter is needed for 4G1.5?
At least 204 mm, which is twice the minimum bending radius of 102 mm. A larger core diameter extends cable life.

What current can each core of 4G1.5 carry?
The table gives 18 A per core in free air at 30 °C ambient, already reduced for the number of cores; apply the ambient temperature factor and, on a reel, the layer 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-CR-S 4G: 0.75, 1, 1.5, 2.5, 4 mm². Other sizes and special designs can be produced to order.

11 Trademark Notice and Intellectual Property

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