FEICHUN SPECIAL CABLES

ANHUI FEICHUN SPECIAL CABLE CO., LTD. · HEFEI · CHINA

25 mm² Single-Core Concentric Neutral Distribution Cable 12 kV · TR-XLPE · Full Neutral · HDPE Jacketed

Technical data sheet and completed compliance schedule against enquiry SG-1729-26, Item ID 5279 — 40,000 m

IEC 60502-2 | IEC 60228 Class 2 | TR-XLPE | Full concentric neutral | Tropical marine duty | 95 kV BIL

DOCUMENT NO.	REVISION	DATE OF ISSUE	ENQUIRY REF.
FC-TDS-CNC-2026-51A1	Rev. 0	28 September 2026	SG-1729-26

QUANTITY: 40,000 m

1 Scope and product identification

This data sheet describes the cable offered by Anhui FeiChun Special Cable Co., Ltd. against enquiry **SG-1729-26**, Item ID 5279 — *25 mm² 1C concentric neutral cable, 12 kV TR-XLPE, full neutral, 40,000 m*. It is written to be read alongside the buyer's compliance schedule: **clause 4 reproduces that schedule line by line with the offered particulars entered against every field.** Clauses 5 to 13 give the supporting engineering data.

Product designation	**FC-MV™ CNJ 8,7/15 kV 1×25 mm² FN** — single-core, TR-XLPE insulated, full concentric neutral, HDPE jacketed distribution cable
Part number	FC-MV-CNJ-15-025-FN-HD-BK
Rated voltage U_0/U (U_m)	8,7/15 (17,5) kV — covering a 12 kV nominal system with 13,2 kV highest continuous voltage
Insulation level	133 % (4,5 mm wall), 15 kV class
BIL	95 kV
System	Three-phase, 60 Hz, solidly earthed, multi-grounded neutral
Service conditions	Tropical marine; 40 °C peak / 32 °C average ambient; 90 % monthly average humidity; altitude ≤ 1000 m
Installation	Direct burial, in duct, in air, or overhead on a messenger; wet and dry locations
Design basis	IEC 60502-2 and IEC 60228; construction additionally meets ICEA S-94-649 / AEIC CS8 for 15 kV class cable
Country of manufacture	People's Republic of China (Hefei, Anhui)

2 Construction

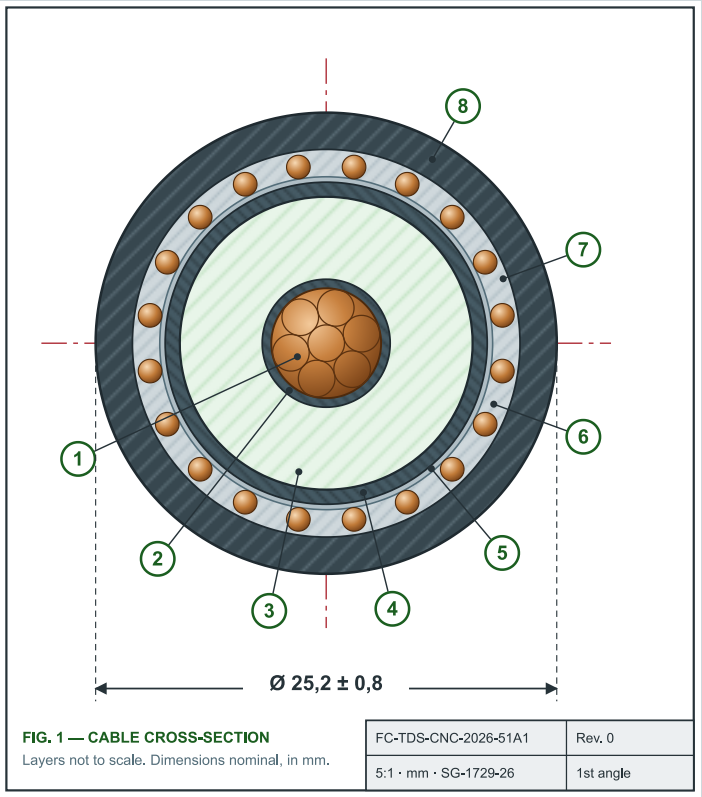


FIG. 1 — CABLE CROSS-SECTION
Layers not to scale. Dimensions nominal, in mm.

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5:1 · mm · SG-1729-26	1st angle

Table 1 — Legend to Fig. 1 (layers from the centre outwards)

Pos.	Element	Material and description	Nominal
1	**Conductor**	Plain annealed copper, Class 2 compacted stranded, longitudinally water-blocked	25 mm²
2	**Conductor screen**	Extruded semi-conducting compound, bonded to conductor, triple-extruded	0,5 mm
3	**Insulation**	Tree-retardant cross-linked polyethylene (TR-XLPE), dry-cure / dry-cool	4,5 mm
4	**Insulation screen**	Extruded semi-conducting compound, fully strippable, bonded to insulation	0,8 mm
5	**Water-swellable tape**	Semi-conducting water-swellable tape, longitudinal water blocking	0,3 mm
6	**Concentric neutral**	20 × Ø 1,29 mm bare annealed copper wires, helical, evenly spaced	26,1 mm²
7	**Binder tape**	Non-hygroscopic polyester binder tape, open helix	0,2 mm
8	**Oversheath**	Black HDPE, UV- and abrasion-resistant, carbon-black stabilised	2,0 mm

The conductor screen, insulation and insulation screen are applied in a single pass by triple extrusion on a catenary

continuous-vulcanisation line with dry curing and dry cooling, so that no moisture or contaminant is introduced at either screen interface.

3 Why this design meets a 12 kV, 95 kV BIL system

The enquiry states a 12 kV nominal voltage, a 13,2 kV highest continuous voltage and a 95 kV basic lightning impulse level. In IEC terms those three figures together define the **8,7/15 kV (U_m 17,5 kV)** rating, and in North American terms the **15 kV class**. The 4,5 mm insulation wall called for in clause 3.4.2 is the 15 kV class 133 % insulation level. The cable offered therefore carries both designations, and each is stated on the sheath print and on the test certificates.

> **Margin over the specification.** U_m = 17,5 kV against 13,2 kV required; insulation 4,5 mm against 4,5 mm minimum; neutral 26,1 mm² against 25 mm² minimum; oversheath 2,0 mm against 1,8 mm minimum. No parameter is offered at or below the specified limit.

4 Completed compliance schedule — SG-1729-26

The table below reproduces every line of the buyer's *Product Compliance Specification Sheet* in the original order and numbering, with the offered particulars, the compliance mark and remarks entered against each field.

S.N	Field name	Technical specification	Offered details	Y / N	Remark
1.0	**Standards**	IEC 60502-2, IEC 60228 (alternative acceptable per T&TEC)	Designed, manufactured and tested to **IEC 60502-2:2021** and **IEC 60228:2004 Class 2**. Construction additionally satisfies ICEA S-94-649 / AEIC CS8 for 15 kV class, 133 % insulation level, and is offered as the recognised equivalent to the T&TEC specification.	**Y**	Dual-standard design. Declaration of conformity and full test schedule supplied with each shipment.
2.1	**Climate**	Tropical Marine	Suitable for tropical marine service: HDPE oversheath with carbon-black UV stabilisation, water-blocked conductor and water-swellable tape under the neutral to resist salt-laden humidity and moisture ingress.	**Y**	Wet-location rated. Salt-spray and UV data available on request.
2.1.2	**Peak ambient temperature**	40 °C	Rated for 40 °C peak ambient. Maximum continuous conductor temperature 90 °C; 130 °C emergency; 250 °C short circuit.	**Y**	Ampacity in clause 8 is stated at 40 °C air / 32 °C soil, with derating tables.
2.1.3	**Average ambient temperature**	32 °C	Buried ampacity figures are referenced to 32 °C soil temperature and 1,0 K·m/W soil thermal resistivity.	**Y**	—
2.1.4	**Humidity**	90 % max. monthly average	Fully suitable. Non-hygroscopic materials throughout; longitudinal water blocking in the conductor and under the concentric neutral.	**Y**	—
2.1.5	**Altitude**	≤ 1000 m	No derating applied up to 1000 m above sea level.	**Y**	—
2.2.1	**Nominal voltage**	12 kV	Rated **U_0/U (U_m) = 8,7/15 (17,5) kV** to IEC 60502-2 — the standard rating that covers a 12 kV nominal system with a 95 kV BIL.	**Y**	Insulation level exceeds the minimum required for 12 kV; suitable for 100 % and 133 % level duty.
2.2.2	**Highest continuous voltage**	13,2 kV	U_m = 17,5 kV — 33 % above the specified highest continuous system voltage.	**Y**	Exceeds requirement.

S.N	Field name	Technical specification	Offered details	Y / N	Remark
2.2.3	**Basic lightning impulse level**	95 kV	Type-tested at **95 kV BIL**, 10 positive and 10 negative impulses at a conductor temperature of 95–100 °C, followed by a 15 min power-frequency withstand test.	**Y**	Per IEC 60502-2 clause 18.
2.2.4	**Frequency**	60 Hz	Suitable for 50 Hz and 60 Hz. All reactance, capacitance and charging-current data in clause 7 are calculated at 60 Hz.	**Y**	—
2.2.5	**Earthing**	Solidly earthed	Full concentric neutral designed for solidly earthed, multi-grounded distribution systems; neutral carries continuous unbalance and full earth-fault current.	**Y**	—
3.1.1	**Cable type**	Single core, stranded copper, TR-XLPE insulated, concentric neutral, jacketed	Single-core, Class 2 compacted stranded copper, extruded semi-conducting conductor screen, TR-XLPE insulation, strippable extruded semi-conducting insulation screen, full concentric copper neutral, black HDPE oversheath.	**Y**	Triple-extrusion (dry-cure, dry-cool) in a single pass — catenary CCV line.
3.2.1	**Conductor size**	25 mm² (Item ID 5279)	**25 mm²** nominal cross-sectional area.	**Y**	70 mm² can be supplied to the same design on request.
3.2.2	**Conductor class**	Class 2 per IEC 60228	Class 2 compacted stranded, 7 wires, plain annealed copper to IEC 60228 Table 2.	**Y**	Compacted to improve roundness and reduce overall diameter.
3.2.3	**Moisture barrier**	Means to minimise moisture ingress	Two independent barriers: (a) conductor strands filled with water-swellable powder/yarn giving longitudinal water blocking; (b) semi-conducting water-swellable tape applied over the insulation screen, beneath the concentric neutral.	**Y**	Meets the water-penetration test of IEC 60502-2 Annex F.
3.2.5	**DC resistance**	≤ IEC 60228 Table 2 value at 20 °C	**0,727 Ω/km** maximum at 20 °C — equal to the IEC 60228 Table 2 limit for 25 mm² Class 2 plain copper. Typical production value 0,714 Ω/km.	**Y**	Routine-tested on 100 % of lengths.

S.N	Field name	Technical specification	Offered details	Y / N	Remark
3.3	**Conductor screen**	Extruded semi-conducting material, removable, bonded to insulation	Extruded semi-conducting cross-linked compound, nominal 0,5 mm, firmly bonded to the insulation and free-stripping from the conductor, applied by triple extrusion so that no air gap or contaminant can form at the interface.	Y	Super-smooth compound; screened and filtered to ≤ 0,05 mm protrusion.
3.4.1	**Insulation material**	Tree-resistant XLPE (TR-XLPE)	**TR-XLPE**, dry-cure / dry-cool, unfilled tree-retardant cross-linked polyethylene. Retained AC breakdown strength verified by accelerated water-treeing (ACLT) testing to AEIC CS8.	Y	Material data sheet supplied on request.
3.4.2	**Insulation thickness**	≥ 4,5 mm	**4,5 mm** nominal; minimum measured value at any point ≥ 4,05 mm (90 % of nominal per IEC 60502-2). Corresponds to the 133 % insulation level for 15 kV class.	Y	—
3.5	**Insulation screen**	Non-metallic, semi-conducting, removable without damage	Extruded semi-conducting cross-linked compound, nominal 0,8 mm, bonded to the insulation yet fully strippable by hand tool without heat and without damaging the insulation surface.	Y	Strip force within 4–45 N per ICEA S-94-649. Termination and splice kits are readily available worldwide.
3.6.1	**Neutral wire material**	Bare annealed copper wires, helical, evenly spaced	**20 × Ø 1,29 mm** bare annealed copper wires, applied helically with a left-hand lay, evenly spaced around the circumference, held by an open-helix polyester binder tape.	Y	Lay length 6–10 × diameter over the wires.
3.6.2	**Neutral cross-section**	≥ phase conductor area (full neutral)	**26,1 mm²** total neutral area = **104 %** of the 25 mm² phase conductor — full-neutral construction.	Y	Exceeds requirement.
3.7.1	**Oversheath material**	PVC, HDPE, or TPE (UV + abrasion resistant)	Black **HDPE** to IEC 60502-2 type ST7, carbon-black stabilised (≥ 2,5 % carbon black) for UV resistance, with high abrasion and cut-through resistance for direct burial and duct pulling.	Y	LSZH or PVC (type ST2) offered as an alternative if preferred.
3.7.2	**Oversheath thickness**	≥ 1,8 mm	**2,0 mm** nominal; minimum measured value at any point ≥ 1,80 mm.	Y	Exceeds requirement.

S.N	Field name	Technical specification	Offered details	Y / N	Remark
3.7.3	**Overall diameter**	To state	**25,2 mm ± 0,8 mm** nominal overall diameter. Approximate mass 820 kg/km; copper content approximately 454 kg/km.	**Y**	Confirmed dimensional report issued with the first production run.
4.0	**Cable markings**	National sign + manufacturer + conductor size + insulation type + voltage + year, at intervals ≤ 1 m	Indent-printed and surface ink-printed on the HDPE oversheath at intervals of **≤ 1 m**, plus sequential metre marking: T&TEC • FEICHUN • 25mm² Cu • TR-XLPE • 12kV • 2026 • nnnn m	**Y**	Exact marking legend, including the national sign, to be confirmed in writing before production.
6.0	**Type test certificates**	Required from an independent accredited laboratory	Type test certificates to IEC 60502-2 issued by an ILAC-MRA / CNAS accredited independent laboratory will be supplied for this design. Full routine and sample test records are issued for every drum.	**Y**	Project-specific witness testing or re-testing at a nominated third-party laboratory can be arranged at the buyer's cost.

Overall compliance: fully compliant — no deviations. Every line of the schedule is answered “Y”. The only points requiring the buyer's written confirmation before production are the wording of the national sign in the sheath marking (clause 4.0) and the drum length preference (clause 12).

5 Dimensional and mass data

Table 2 — Dimensional build-up (nominal values, mm)

Element	Wall / wire dia.	Diameter over element	Tolerance
Conductor, Class 2 compacted, 7 wires	—	6,0	± 0,2
Conductor screen, semi-conducting	0,5	7,0	min. 0,4
TR-XLPE insulation	4,5	16,0	min. at any point 4,05
Insulation screen, semi-conducting, strippable	0,8	17,6	min. 0,6
Semi-conducting water-swellable tape	0,3	18,2	—
Concentric neutral, 20 × Ø 1,29 mm Cu	1,29	20,8	± 0,03 on wire dia.
Polyester binder tape	0,2	21,2	—
HDPE oversheath, black	**2,0**	**25,2**	min. at any point 1,80

Table 3 — Mass and material content

Item	Value	Unit
Copper — phase conductor	222	kg/km
Copper — concentric neutral	232	kg/km
Total copper content	**454**	kg/km
TR-XLPE insulation	150	kg/km
Semi-conducting screens and tapes	75	kg/km
HDPE oversheath	139	kg/km
Approximate total cable mass	**820**	kg/km
Net cable mass for 40,000 m	**32,800**	kg

Dimensional and mass figures are design values carrying a manufacturing tolerance of ± 5 % on mass and ± 0,8 mm on overall diameter. A measured dimensional report is issued with the first production run.

6 Temperature ratings

Maximum continuous conductor temperature	90 °C
Emergency overload	130 °C, 100 h per year, 500 h cumulative over the cable life
Short-circuit conductor temperature	250 °C, maximum 5 s
Minimum installation temperature	− 10 °C (cable and ambient), without pre-heating
Storage and transport	− 30 °C to + 70 °C

7 Electrical characteristics

Table 4 — Electrical data at 60 Hz

Parameter	Value	Unit	Condition
Maximum DC resistance of conductor	0,727	Ω/km	20 °C, IEC 60228 Table 2
Typical DC resistance of conductor	0,714	Ω/km	20 °C, production average
AC resistance of conductor	0,93	Ω/km	90 °C, 60 Hz
DC resistance of concentric neutral	0,69	Ω/km	20 °C
Inductive reactance	0,18	Ω/km	trefoil, touching
Inductive reactance	0,23	Ω/km	flat, 200 mm spacing
Capacitance	0,155	µF/km	ε_r = 2,3
Charging current	0,40	A/km	U_0 = 6,93 kV, 60 Hz
Dielectric dissipation factor tan δ	≤ 0,0010	—	U_0, 90–95 °C
Insulation resistance constant	≥ 3670	MΩ·km	20 °C
Partial discharge	≤ 5	pC	at 1,73 U_0 = 15 kV
Routine AC withstand	30,5	kV	3,5 U_0, 5 min
Impulse withstand (BIL)	95	kV	10 positive + 10 negative, 95–100 °C

8 Current-carrying capacity

Values are calculated to IEC 60287 for a three-phase circuit of three single-core cables, concentric neutrals earthed at both ends, conductor at 90 °C, 100 % load factor.

Table 5 — Continuous current rating, 25 mm² (A per phase)

Installation method	Rating, A	Reference conditions
In free air, trefoil touching	115	40 °C ambient, not exposed to direct sun
In free air, flat spaced one diameter	128	40 °C ambient
Direct buried, trefoil touching	110	32 °C soil, 0,8 m depth, 1,0 K·m/W
Direct buried, flat, 200 mm spacing	120	32 °C soil, 0,8 m depth, 1,0 K·m/W
In buried duct, trefoil	95	32 °C soil, 0,8 m depth, 1,0 K·m/W

Table 6 — Derating factors

Ambient air temperature, °C	30	35	40	45	50
Factor (base 40 °C)	1,15	1,08	1,00	0,91	0,82
Soil temperature, °C	**25**	**30**	**32**	**35**	**40**
Factor (base 32 °C)	1,06	1,01	1,00	0,97	0,90
Soil thermal resistivity, K·m/W	**0,7**	**1,0**	**1,2**	**1,5**	**2,0**
Factor (base 1,0 K·m/W)	1,12	1,00	0,95	0,88	0,79
Buried circuits in parallel, 0,3 m apart	**1**	**2**	**3**	**4**	**6**
Factor	1,00	0,80	0,70	0,64	0,57

Ratings are indicative design values. A project-specific ampacity study for the actual trench profile, backfill and load factor can be provided on request.

9 Short-circuit performance

Table 7 — Symmetrical short-circuit current (kA rms), 90 °C initial

Element	0,2 s	0,5 s	1,0 s	2,0 s	3,0 s	Final temp.
Phase conductor, 25 mm²	8,00	5,06	3,58	2,53	2,07	250 °C
Concentric neutral, 26,1 mm²	8,35	5,28	3,73	2,64	2,16	250 °C

Calculated as $I = k \cdot S/\sqrt{t}$ with $k = 143$ for copper conductors in cross-linked insulation, per IEC 60949. The full neutral therefore carries at least the same earth-fault current as the phase conductor, as required by clause 3.6.2.

10 Mechanical and installation data

Minimum bending radius, fixed installation	12 × overall diameter = 305 mm
Minimum bending radius during pulling	15 × overall diameter = 380 mm
Maximum pulling tension, pulling eye on conductor	50 N/mm² × 25 mm² = 1,250 N
Maximum sidewall bearing pressure	7 kN/m
Oversheath abrasion and cut-through	HDPE, suitable for direct burial and duct pulling without an outer protective layer
Water penetration	Longitudinal water blocking in the conductor and under the neutral; passes IEC 60502-2 Annex F
Termination and jointing	Standard 15 kV class heat-shrink, cold-shrink or push-on cable accessories
Design life	30 years under the stated service conditions

11 Testing and certification

Table 8 — Test programme to IEC 60502-2

Category	Tests	Frequency and documentation
Routine	Conductor DC resistance; partial discharge at 1,73 U_0 (≤ 5 pC); AC voltage withstand 3,5 U_0 for 5 min; oversheath spark test at 6 kV DC	Every manufactured length. Results listed on the works test certificate issued per drum.
Sample	Conductor examination and dimensional check; measurement of insulation, screen and sheath thickness; overall diameter; hot-set test on the insulation; 4 h AC voltage test	One length per manufactured batch, or 10 % of lengths, whichever is greater.
Type	Bending test followed by partial discharge; tan δ measurement; heating cycle voltage test (20 cycles) followed by partial discharge; impulse test at 95 kV at 95–100 °C followed by 15 min at 4 U_0; water penetration; ageing and compatibility of insulation and sheath; carbon-black content and UV resistance of the HDPE sheath; accelerated water-treeing (ACLT) on the TR-XLPE insulation	Certificates from an ILAC-MRA / CNAS accredited independent laboratory, supplied with the offer documentation and referenced on the declaration of conformity.

> **Inspection.** Third-party inspection by SGS, BV, Intertek or the buyer's own inspector is welcomed at our Hefei works. Witness testing, a pre-inspection meeting and a project quality plan can be arranged; third-party inspection charges are for the buyer's account unless agreed otherwise.

12 Marking, packing and delivery

Sheath marking

Continuous indent and ink marking on the black HDPE oversheath, repeated at intervals not exceeding 1 m, with sequential metre marks:

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[NATIONAL SIGN] • ANHUI FEICHUN SPECIAL CABLE • 1×25 mm² Cu • TR-XLPE • 12 kV • 2026 • nnnn m
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The exact wording of the national sign and any additional utility reference is to be confirmed by the buyer in writing before production starts.

Drums and packing

Item	Standard offer	Alternative
Standard delivery length	1,000 m per drum (40 drums for 40,000 m)	500 m or 2,000 m per drum
Length tolerance	+ 3 % / − 0 % on the ordered drum length	—
Drum type	Heat-treated timber drum, ISPM 15 fumigated and stamped	Steel or steel-timber composite drum
Drum size (approximate)	Flange Ø 1,800 mm × barrel Ø 1,000 mm × traverse 900 mm	—
Net mass per drum	approx. 820 kg	—
Gross mass per drum	approx. 1,170 kg	—
Protection	Both ends sealed with heat-shrink end caps; full timber battened lagging over the cable	Plastic film plus lagging
Drum marking	Contract and item number, cable description, drum number, length, gross and net mass, direction-of-rolling arrow, destination	Buyer's own drum-tag format
Documentation per drum	Works test certificate, dimensional report, packing list	—

Commercial summary

Quantity offered	40,000 m
Minimum order quantity	1,000 m
Production lead time	Approximately 25–30 days from receipt of the advance payment and written approval of the marking legend, for the full 40,000 m
Delivery terms	FCA buyer's nominated forwarder's warehouse in China (Incoterms® 2020). Export packing, export declaration and inland freight within China are to our account; origin port charges, ocean freight, insurance and all destination charges are to the buyer's account, and risk passes at the forwarder's warehouse. CIF or other terms quoted on request.
Payment terms	T/T 50 % with order, balance 50 % before shipment
Pricing basis	Prices are quoted separately and are subject to LME copper market fluctuation; the copper base is confirmed at order acceptance
Warranty	36 months against manufacturing defects from the date of delivery
Technical support	Two online training sessions per year; installation and jointing guidance from our technical department
HS code	8544.60 (electric conductors for a voltage exceeding 1,000 V)

13 Quality system and certification

Anhui FeiChun Special Cable Co., Ltd. manufactures under ISO 9001, ISO 14001 and ISO 45001 management systems. Product certifications held include **CE**, **UKCA**, **VDE**, **EAC**, **ATEX** and **IECEx**. UL and MSHA listings are not held. In-house testing is carried out in our own accredited laboratory; independent third-party type testing is arranged as described in clause 11.

14 Part number key

Segment	Code	Meaning
Range	FC-MV	FeiChun medium-voltage distribution cable
Construction	CNJ	Concentric neutral, jacketed
Voltage class	15	15 kV class / 8,7/15 (17,5) kV
Conductor	025	25 mm², Class 2 compacted copper
Neutral	FN	Full neutral (≥ 100 % of phase area)
Oversheath	HD	HDPE (PV = PVC, LS = LSZH available)
Colour	BK	Black

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