TYPE: SUB-MV | U_0/U (U_m) 6/10 (12) kV | EPR insulation | CPE rubber outer sheath | Permanent immersion | Screened pairs S(4×0.5)

Medium-Voltage Submersible Pump Motor Cable

FC-FLX™ SUB-MV (N)TSCGEWÖU 6/10 kV 3×50 + 2×25/2 + S(4×0.5) mm²

Flexible MV supply cable for 6000 V submersible pump motors (e.g. Flygt 3400 series, 250 kW class) in permanent immersion — replacement for (N)TSCGEWÖU / NTSCGEWCOEUS cables of Xylem part no. 950023 type.

Doc no. **FC-TDS-SUB-2026-9712** Issue date **18 September 2026**

Supply **Continuous lengths to order, no joints**

52.0 ± 1.5 mm Overall diameter (50.5 – 53.5 mm)	**≈ 4.25 kg/m** Nominal cable weight (4,250 kg/m)
315 / 520 mm Min. bending radius, fixed / during handling	**100 m** Max. permanent immersion depth (1.0 MPa)

1 Application and scope

This datasheet defines a flexible medium-voltage power cable with integrated screened control pairs, built to the (N)TSCGEWÖU design principle of DIN VDE 0250-813 for heavy-duty rubber-insulated flexible cables. It is engineered as a replacement for original supply cables of Flygt-type MV submersible pumps, for continuous operation with a 6000 V three-phase motor while permanently immersed in water.

The construction comprises three 50 mm² phase conductors, two split earth conductors totalling 25 mm², and one S(4×0.5) control element made of four copper conductors arranged as two twisted pairs under a common screen, for the motor

monitoring circuits — all integrated in one cable.

Design basis: DIN VDE 0250-813 construction principle · IEC 60228 class 5 conductors · DIN VDE 0207-20 (EPR 3GI3) insulation · DIN VDE 0207-21 (5GM5 / CPE) outer sheath · test methods of IEC 60502-2, IEC 60885-3 and IEC 60811 · flame propagation to IEC 60332-1-2.

2 Reference application used for the design check

Parameter	Value	Parameter	Value
Pump model	Flygt 3400 series	Rated current	≈ 30 A
Motor model	M54-60-6MDY/04	Speed	995 rpm
Rated power	250 kW	Power factor	cos ϕ 0.83
Rated voltage	6000 V, 3~, 50 Hz	Max. liquid temperature	40 °C
Connection	Star (Y)	Duty	Continuous, permanently immersed
Original cable	NTSCGEWÖU / NTSCGEWCOEUS	Original Xylem P/N	950023

3 Cable cross-section

FC-TDS-SUB-2026-9712 · FC-FLX™ SUB-MV 6/10 kV 3×50+2×25/2+S(4×0.5)

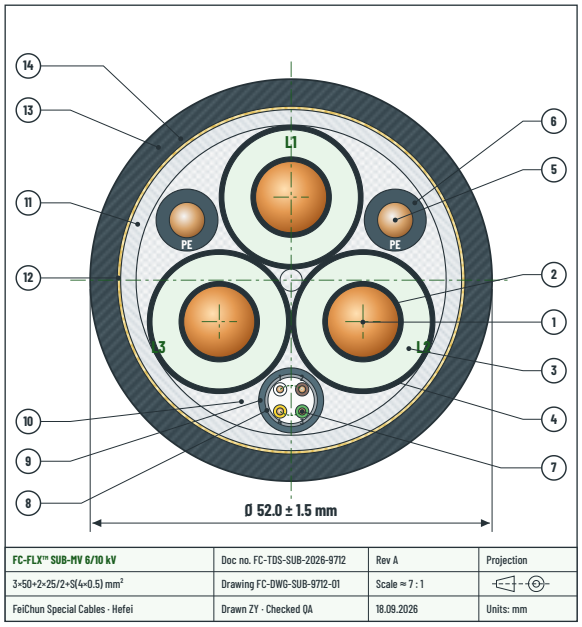


Fig. 1 — Section A–A, drawn to scale at nominal dimensions (first-angle projection).

Pos.	Element	Material / design
1	Phase conductor 3 × 50 mm²	Tinned annealed copper, class 5 (IEC 60228)
2	Conductor screen	Extruded semi-conductive EPR
3	Insulation	EPR type 3GI3, 3.4 mm nominal
4	Insulation screen	Extruded semi-conductive EPR, triple extruded with 2 and 3
5	Earth conductor 2 × 25/2 mm²	Tinned copper class 5, 2 × 12.5 mm² split in interstices
6	Earth covering	Semi-conductive rubber
7	Control conductors S(4×0.5)	Tinned Cu class 5, EPR insulated, 2 twisted pairs
8	Common screen	Tinned copper braid, ≥ 85 % coverage + drain contact
9	Control element sheath	Semi-conductive / rubber sheath
10	Filler and centre	Rubber filling compound, water-blocking
11	Inner sheath	Rubber compound, extruded into interstices
12	Anti-torsion reinforcement	High-tenacity polyester braid
13	Outer sheath	CPE heavy-duty rubber, 5GM5 grade, black

Pos.	Element	Material / design
14	Outer surface / marking	Embossed legend and metre marks

4 Construction details

Element	Specification	Nominal value
Phase conductors	Tinned annealed copper, flexible class 5, IEC 60228	3 × 50 mm², Ø ≈ 9.2 mm
Conductor screen	Semi-conductive EPR, extruded	≈ 0.6 mm
Insulation	EPR 3GI3, DIN VDE 0207-20; 90 °C rated	3.4 mm nominal
Insulation screen	Semi-conductive EPR, extruded, strippable	≈ 0.6 mm
Diameter over core	Triple-extruded, dry-cured (CCV)	≈ 18.6 mm
Phase core identification	Printed numbers on semi-conductive screen	1 · 2 · 3 (L1 · L2 · L3)
Earth conductors	Two tinned copper class 5 conductors in outer interstices, each with semi-conductive rubber covering	2 × 12.5 mm² (Σ 25 mm²)
Control element S(4×0.5)	4 × 0.5 mm² tinned copper class 5, EPR insulated; two twisted pairs; common tinned-copper braid screen; semi-conductive/rubber sheath; placed in third interstice	Ø ≈ 8.4 mm
Control core colours	Pair A: white / brown · Pair B: green / yellow (DIN 47100)	+ printed 1–4
Lay-up	Three phase cores, earths and control element stranded with short lay length; water-blocking rubber filler	Ø ≈ 40.1 mm
Inner sheath	Rubber compound, extruded to fill interstices	≈ 2.0 mm
Reinforcement	Polyester anti-torsion braid between sheaths	≈ 0.5 mm
Outer sheath	CPE-based heavy-duty rubber, 5GM5 grade (DIN VDE 0207-21); water, oil, ozone and UV resistant; flame retardant	≈ 3.5 mm, black

5 Dimensions and weights

Characteristic	Value	Remark
Overall diameter, nominal	52.0 mm	Measured to IEC 60811-201/-203
Overall diameter, tolerance	± 1.5 mm (50.5 – 53.5 mm)	Guaranteed range on the supplied drum
Cable weight, nominal	≈ 4.25 kg/m (4,250 kg/km)	Tolerance ± 5 %
Copper content	≈ 1.62 kg/m	Phase + earth + control
Net weight per 100 m	≈ 425 kg	Cable only

6 Electrical characteristics

Characteristic	Value
Rated voltage U_0/U (U_m)	6/10 (12) kV, AC
Routine AC test voltage, core to core and to earth	21 kV (3.5 U_0), 5 min
Partial discharge at 1.73 U_0 (10.4 kV)	⩽ 10 pC
Max. DC resistance, phase conductor at 20 °C	0.393 Ω/km
Max. DC resistance, earth (2 × 12.5 mm² in parallel) at 20 °C	0.795 Ω/km
Max. DC resistance, control conductor 0.5 mm² at 20 °C	40.1 Ω/km
Insulation resistance at 20 °C (power cores)	⩾ 2,000 MΩ·km
Capacitance per core, approx.	0.33 µF/km
Inductance per phase, approx.	0.34 mH/km
Current rating, in air 30 °C / immersed in water ≤ 40 °C	180 A / 180 A
Short-circuit current, phase conductor (1 s, 90 → 250 °C)	7.15 kA
Control element rating / test voltage	300/500 V · 2 kV AC, 5 min

7 Mechanical, thermal and immersion characteristics

Characteristic	Value
Min. bending radius, fixed installation (6 × D)	315 mm
Min. bending radius, during handling / pump lifting (10 × D)	520 mm
Max. conductor temperature, continuous / short circuit	+90 °C / +250 °C
Ambient temperature, flexing / fixed	–25 … +60 °C / –40 … +60 °C
Water temperature, permanent immersion	up to +40 °C (motor limit)
Max. permanent immersion depth	100 m water column (1.0 MPa)
Max. static tensile load on phase conductors (15 N/mm²)	2,250 N
Flame propagation	IEC 60332-1-2
Oil, ozone and UV resistance	Yes (5GM5 / CPE)

> **Handling note:** the pump must be lifted by its lifting chain or wire — never by the cable. Keep at least 520 mm bending radius at the cable entry and cable holder, and use a support grip every 3–5 m on vertical runs.

8 Application engineering check for the Flygt 6000 V motor

8.1 Voltage class selection

The motor's rated voltage of 6000 V is the phase-to-phase voltage U. A 3.6/6 kV cable (U_m 7.2 kV) is rated exactly at the motor voltage and leaves only the IEC voltage-tolerance margin. A 6/10 kV cable (U_m 12 kV) gives a thicker EPR wall, a lower electrical stress in permanent immersion and a large reserve against supply over-voltage, switching transients and long-term water ageing. **FeiChun recommends 6/10 kV** for this duty, and this datasheet is based on it.

8.2 Current-carrying capacity

Motor current ≈ 30 A versus 180 A rating of 3 × 50 mm² — a utilisation of about 17 %. Conductor operating temperature will stay close to the water temperature.

8.3 Voltage drop for typical lengths

$\Delta U = \sqrt{3} \cdot I \cdot L \cdot (R_{90} \cos\phi + X \sin\phi)$, with I = 30 A, $R_{90} \approx 0.50$ Ω/km, X ≈ 0.10 Ω/km, cos ϕ = 0.83:

Length	ΔU	ΔU as % of 6000 V	Result
100 m	≈ 2.4 V	≈ 0.04 %	Negligible
200 m	≈ 4.9 V	≈ 0.08 %	Negligible
300 m	≈ 7.3 V	≈ 0.12 %	Negligible

8.4 Earth and control functions

The two split earth conductors (Σ 25 mm²) are embedded in semi-conductive rubber in contact with the core screens, forming the protective-earth and screen-return path required for 6 kV operation. The S(4×0.5) screened pairs carry the motor's monitoring circuits (thermal and leakage sensors) with their common screen protecting them from the adjacent 6 kV field.

8.5 Cable entry

The overall diameter of 52.0 ± 1.5 mm is designed to suit the original Flygt MV cable entry. The cable is terminated in the entry with a Flygt grommet/seal sleeve matched to the measured OD; FeiChun confirms the final OD against the original cable marking or entry dimensions supplied with the order.

9 Factory tests and test reports supplied

Test	Method / criterion	Report
High-voltage AC withstand	21 kV, 5 min, each core to all others and earth — no breakdown	Supplied
Partial discharge	IEC 60885-3; ≤ 10 pC at 1.73 U_0	Supplied
Insulation resistance	500/2500 V DC, corrected to 20 °C; ≥ 2,000 MΩ·km	Supplied
Water immersion test	Full drum length immersed in water, then HV and insulation resistance repeated — no breakdown, no IR drop beyond limit	Supplied
Conductor resistance	IEC 60228 limits, all phase, earth and control conductors	Supplied
Control element	Continuity, pair identity, screen continuity, 2 kV AC test	Supplied
Dimensional check	OD, insulation and sheath thickness, length and joint-free confirmation	Supplied

A complete factory test report and inspection certificate is issued for the actual drum and sent with the shipping documents. Sample reports from previous production of the same design can be provided before the order is placed.

10 Supply, marking and packing

Item	Detail
Delivery length	Each ordered length supplied as one continuous length on one drum, without joints or repairs
Sheath marking	**FEICHUN FC-FLX™ SUB-MV (N)TSCGEWÖU 6/10 kV 3×50+2×25/2+S(4×0.5) 2026 + metre marks**
Drum	Steel-reinforced wooden drum, barrel Ø ≥ 1,100 mm; cable ends sealed with heat-shrink caps; drum lagged
Drum size / gross weight (est.)	**Selected to length · e.g. 200 m: flange ≈ Ø 1,800 × W 1,100 mm, ≈ 1,250 kg gross**
HS code	**8544.60**

11 Statement of suitability

Statement of suitability — FC-TDS-SUB-2026-9712

FEICHUN SPECIAL CABLES QA

Anhui FeiChun Special Cable Co., Ltd. hereby confirms that the cable FC-FLX™ SUB-MV (N)TSCGEWÖU 6/10 kV 3×50+2×25/2+S(4×0.5) mm², manufactured to this datasheet:

1. is suitable for continuous operation with 6000 V, 3~, 50 Hz submersible pump motors such as the Flygt 3400 series (250 kW class, rated current ≈ 30 A);
2. is suitable for permanent immersion in water at up to 40 °C and up to 100 m depth;
3. has EPR insulation and a waterproof CPE rubber outer sheath, and contains the S(4×0.5) control element as two copper twisted pairs with a common screen, with no optical fibres;
4. is designed to fit the original Flygt cable entry, and will be supplied in continuous lengths without joints.

Zihao Yang
Technical Sales Manager, International Business Department

Quality Assurance Department
Anhui FeiChun Special Cable Co., Ltd. · Date: 18.09.2026

Trademark and intellectual property notice. Xylem, Flygt and part number 95023 are trademarks or identifiers of their respective owners and are cited only to identify the equipment for which this cable is intended; FeiChun has no affiliation with those owners. FC-FLX™ and FeiChun® are trademarks of Anhui FeiChun Special Cable Co., Ltd. This datasheet, including the cross-section drawing, is protected under the Copyright Law and Anti-Unfair Competition Law of the People's Republic of China and the Copyright Act 1968 (Cth) of Australia; it may not be copied or passed to third parties for manufacturing purposes without written consent. Values marked "≈" are nominal design values; binding values are those in the factory test report of the supplied drum.

Anhui FeiChun Special Cable Co., Ltd.

International Business Department · Hefei, Anhui Province, China

www.feichuncables.com

Technical: Tech@feichuncables.com

Mining & pump cables: mining@feichuncables.com

Sales: zihao.yang@feichuncables.com

WhatsApp: +86 138 5512 3218