FEICHUN CABLE

安徽飞纯特种电缆有限公司

Anhui Feichun Special Cable Co., Ltd.

TECHNICAL SPECIFICATION SHEET

(N)TSCGECEWÖU Submersible Cable

3.6/6kV and 6/10kV

APPLICATION & SERVICE CONDITIONS

High-performance flexible power transmission cable engineered for continuous underwater operation in marine and brackish water environments. Designed to withstand depths up to 300 meters under extreme mechanical stress conditions. Primary applications include submersible pumping systems, marine dredging operations, floating dock installations, and mobile mining equipment for opencast operations. The cable construction ensures reliable performance in both stationary and dynamic applications across indoor and outdoor environments.

ELECTRICAL CHARACTERISTICS & PERFORMANCE PARAMETERS

3.6/6kV Rating

Rated Voltage Uo/U:	3.6/6kV
Test Voltage:	11kV

6/10kV Rating

Rated Voltage Uo/U:	6/10kV
Test Voltage:	17kV

ENVIRONMENTAL OPERATING CONDITIONS

Temperature Specifications

Fixed Installation:	-40°C to +80°C
Flexible Installation:	-25°C to +60°C
Maximum Water Temperature:	+40°C

Mechanical Properties

Minimum Bending Radius (Fixed):	6 × Overall Diameter
Minimum Bending Radius (Flexed):	10 × Overall Diameter
Maximum Submersion Depth:	300 meters

CABLE CONSTRUCTION & MATERIALS SPECIFICATION

Detailed Construction Parameters

Phase Conductor:	Class 5 tinned copper stranded conductor (IEC 60228), circular stranded formation with left-hand lay, conductor temperature rating: 90°C continuous
Conductor Screening:	Extruded semi-conductive compound, thickness 0.7±0.1mm, volume resistivity ≤500 Ω·cm, smooth interface with insulation
Primary Insulation:	Cross-linked polyethylene (XLPE) compound, dielectric strength >20kV/mm, tan δ <0.0004, water tree resistant grade

Insulation Screening: Extruded semi-conductive compound with strippable interface, thickness 0.8±0.1mm, volume resistivity ≤500 Ω·cm

Metallic Screen: Helically applied copper wire braid, minimum coverage 85%, wire diameter 0.3mm, corrosion resistant tinned copper

Earth Conductor: Individual copper wire conductors, Class 5 stranded, positioned symmetrically around phase cores, green/yellow identification

Core Assembly: Three insulated phase cores with three earth conductors, assembled with right-hand lay, polyester textile filler maintaining circular cross-section

Inner Sheath: Ethylene Propylene Rubber (EPR) compound, shore hardness 75±5, enhanced water blocking with polymeric water swelling tape

Outer Sheath: Chloroprene rubber (CR) compound, shore hardness 70±5, UV resistant, ozone resistant, flame retardant, black color standard

Material Properties & Specifications

Conductor Specifications

Parameter	Value
Material	Tinned copper
Stranding Class	Class 5 (IEC 60228)
Conductivity	≥97% IACS
DC Resistance (@20°C)	As per IEC 60228
Temperature Coefficient	3.93×10^{-3} /°C
Lay Direction	Left-hand

Insulation Properties

Parameter	Value
Material Type	TR-XLPE
Dielectric Constant (50Hz)	2.3 ± 0.1
Loss Factor (tan δ)	<0.0004
Volume Resistivity	$>10^{16}$ Ω·cm
Dielectric Strength	>20 kV/mm
Water Absorption	<0.1%

Sheath Properties

Parameter	Inner (EPR)	Outer (CR)
Shore Hardness	75 ± 5	70 ± 5
Tensile Strength	≥12 MPa	≥15 MPa
Elongation at Break	≥300%	≥400%
Low Temperature Bend	-40°C	-25°C
Volume Resistivity	10^{12} Ω·cm	10^{11} Ω·cm

Screening System

Component	Specification
Conductor Screen	Extruded semiconductive XLPE
Screen Thickness	0.7 ± 0.1 mm
Insulation Screen	Strippable semiconductive XLPE
Screen Thickness	0.8 ± 0.1 mm
Metallic Screen	Copper wire braid, 85% coverage
Wire Diameter	0.3 mm tinned copper

STANDARDS & CERTIFICATIONS

Manufacturing Standards: VDE 0250 Part 813, VDE 0295, EN 60228
Fire Performance: Flame retardant according to IEC/EN 60332-1-2
Quality Assurance: ISO 9001:2015 certified manufacturing process

CABLE CROSS-SECTION STRUCTURE & LAYER CONFIGURATION

Structural Layer Composition



- Tinned Copper Conductor
- Conductor Screen
- XLPE Insulation
- Insulation Screen
- Inner Sheath
- Outer Sheath

Layer Thickness Specifications

Layer	Material	Thickness (mm)
Conductor Screen	Semi-conductive compound	0.7 ± 0.1
Main Insulation	XLPE compound	2.5 - 4.5
Insulation Screen	Semi-conductive compound	0.8 ± 0.1
Metallic Screen	Copper wire braid	1.0 ± 0.2
Inner Sheath	EPR compound	1.8 - 2.5
Outer Sheath	CR compound	3.0 - 4.0

Core Configuration:

- 3 Phase conductors + 3 Earth conductors
- Circular stranded formation
- Left-hand lay direction
- Core identification by color coding

DIMENSIONAL SPECIFICATIONS & TECHNICAL DATA

Part Number	Voltage Rating (kV)	Configuration (Phase + Earth)	Phase Conductor Cross-Section (mm²)	Earth Conductor Cross-Section (mm²)	Conductor Diameter (mm)	Overall Diameter Min/Max (mm)	Current Rating @30°C (Amps)	Max Tensile Load (N)	Nominal Weight (kg/km)
FC06KV1025BK	3.6/6	3+3	25	25/3E	6.8	43.2 / 45.3	**133**	1150	2850
FC06KV1035BK	3.6/6	3+3	35	25/3E	7.8	44.8 / 46.9	**164**	1600	3200
FC06KV1050BK	3.6/6	3+3	50	25/3E	9.4	47.9 / 50.0	**204**	2300	3850
FC06KV1070BK	3.6/6	3+3	70	35/3E	11.2	53.5 / 55.7	**252**	3200	4980
FC06KV1095BK	3.6/6	3+3	95	50/3E	12.7	58.2 / 60.4	**303**	4300	6190
FC06KV1120BK	3.6/6	3+3	120	70/3E	14.4	62.7 / 65.4	**354**	5450	7560
FC06KV1150BK	3.6/6	3+3	150	70/3E	16.3	69.1 / 71.9	**406**	6800	9070
FC06KV1185BK	3.6/6	3+3	185	95/3E	17.6	71.9 / 74.7	**463**	8400	10370
6/10kV VOLTAGE RATING									
FC10KV1025BK	6/10	3+3	25	25/3E	6.8	43.2 / 45.9	**133**	1150	2890
FC10KV1035BK	6/10	3+3	35	25/3E	7.8	44.8 / 47.5	**164**	1600	3240
FC10KV1050BK	6/10	3+3	50	25/3E	9.4	47.9 / 50.6	**204**	2300	3890
FC10KV1070BK	6/10	3+3	70	35/3E	11.2	53.5 / 56.3	**252**	3200	5020
FC10KV1095BK	6/10	3+3	95	50/3E	12.7	58.2 / 61.0	**303**	4300	6230
FC10KV1120BK	6/10	3+3	120	70/3E	14.4	62.7 / 66.1	**406**	5450	7600
FC10KV1150BK	6/10	3+3	150	70/3E	16.3	69.1 / 72.6	**354**	6800	9110
FC10KV1185BK	6/10	3+3	185	95/3E	17.6	71.9 / 75.4	**463**	8400	10410

CURRENT CARRYING CAPACITY & INSTALLATION METHODS

Standard Conditions: *Current ratings calculated for ambient temperature of 30°C, ground temperature of 20°C at 0.7m depth. For different conditions, apply appropriate correction factors.*

Current Ratings by Installation Method

Nominal Cross-Section (mm²)	Standard Installation (Amps)			Reeled Configuration (Amps)						
	Laying on Sea Floor	Free in Water	Buried in Sand	1 Layer	2 Layer	3 Layer	4 Layer	5 Layer	6 Layer	7 Layer
25	**133**	**140**	**125**	107	82	66	57	52	37	31
35	**164**	**172**	**155**	132	101	81	70	64	46	38
50	**204**	**214**	**192**	164	125	101	87	79	57	46
70	**252**	**265**	**238**	202	155	125	107	97	70	57
95	**303**	**318**	**287**	243	186	149	128	116	83	68
120	**354**	**372**	**335**	284	217	174	150	136	97	79
150	**406**	**426**	**384**	325	248	200	172	156	111	91
185	**463**	**486**	**438**	371	283	228	196	177	126	103

Installation Method Definitions

Laying on Sea Floor

Cable laid directly on seabed or lake bottom with good thermal dissipation through water circulation.

Thermal Resistance: 1.0 K·m/W
Typical Use: Permanent underwater installations

Free in Water

Cable suspended in water with optimal cooling conditions and unrestricted water flow.

Thermal Resistance: 0.8 K·m/W
Typical Use: Floating applications, temporary installations

Buried in Sand

Cable buried in sand or sediment with reduced heat dissipation capacity.

Thermal Resistance: 1.2 K·m/W
Typical Use: Protected underwater installations

VOLTAGE DROP CHARACTERISTICS (MV/A/M)

Nominal Cross-Section (mm²)	Power Factor			
	0.7	0.8	0.9	1.0
25	1.31	1.47	1.62	1.73
35	0.97	1.08	1.18	1.25
50	0.71	0.79	0.85	0.89
70	0.53	0.58	0.62	0.63
95	0.43	0.47	0.49	0.49
120	0.36	0.38	0.40	0.38
150	0.31	0.33	0.34	0.31
185	0.27	0.29	0.29	0.26

TEMPERATURE DE-RATING FACTORS

Ambient Temperature (°C)	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
De-rating Factor	1.17	1.14	1.10	1.06	1.00	0.98	0.93	0.89	0.84	0.78	0.73	0.67	0.60	0.52	0.43

FEICHUN SPECIAL CABLES

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