

PROTOMONT TBM

(N)TSCGECWOEU

RATED VOLTAGE 10 – 35 kV

Medium voltage reeling power supply cable purpose-built for Tunnel Boring Machines (TBM) in underground mining and tunnel construction sites. Engineered to withstand continuous reeling cycles, high tensile loads and the harsh mechanical, chemical and thermal conditions typical of tunnelling operations, while ensuring reliable, uninterrupted power transmission to the boring head.

THERMAL PARAMETERS

Max. conductor temperature	**0 °C**
Max. conductor temp. (short circuit)	**250 °C**
Fixed installation (min)	**-40 °C**
Fixed installation (max)	**80 °C**
Flexible installation (min)	**-20 °C**
Flexible installation (max)	**60 °C**

CHEMICAL PARAMETERS

Oil resistant	**Yes**
Ozone resistance	**Yes**
Resistant to UV	**Yes**

ELECTRICAL – TEST VOLTAGE

6/10 kV	**17 kV**
8.7/15 kV	**24 kV**
12/20 kV	**29 kV**
14/25 kV	**36 kV**
18/30 kV	**43 kV**
20/35 kV	**50 kV**

MECHANICAL PARAMETERS

Torsional stress	**± 25 °/m**
Tensile strength (reeling)	**max 15 N/mm²**
Tensile strength (TBM)	**max 30 N/mm²**
Travel speed	**max 30 m/min**

STANDARDS / APPROVALS

DIN VDE 0250-813	**General**
DIN EN/IEC 60332-1-2	**Fire perf.**
IEC 60811-404	**Chem. behav.**
DIN EN/IEC 60228	**Conductor**

CABLE CONSTRUCTION

1. **Conductor** – finely stranded copper, tinned, class 5
2. **Inner semi-conducting layer** – semi-conductive EPR
3. **Core insulation** – EPR rubber, PROTOLON
4. **Core arrangement** – three main conductors laid up with three control cores in the outer interstice. Main cores: natural colouring with black semi-conductive rubber. Control cores: black
5. **Outer semi-conducting layer** – semi-conductive NBR easy-strip
6. **Control cores** – mix screen over each core
7. **Earth** – EPR rubber
8. **Inner sheath** – overall spinning of Cu wires
9. **Monitoring** – PE: single concentric copper/textile mixed braid over every core, tinned, class 5
10. **Outer sheath** – rubber – polychloroprene (PCP), PROTOFIRM, special compound 5GM5

Application Notes

Suitable as reeling power supply cable for Tunnel Boring Machines (TBM) in underground mines and tunnel construction sites. Delivered across six rated voltage classes – 6/10, 8.7/15, 12/20, 14/25, 18/30 and 20/35 kV – and conductor cross-sections from 25 mm² up to 240 mm² per phase, allowing precise matching to project power and reeling-speed requirements. AC test voltage on control cores is 2 kV across all voltage classes.

PROTOMONT TBM (N)TSCGECWOEU — 6/10 kV (12 kV Um) — 9 Configurations

Basic Construction (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Cable Weight (kg/km)	Max. Tensile Strength (N)	Nom. Op. Capacitance (nF/km)	Operation Self Inductance (mH/km)	Conductor Resistance @20°C (Ω/km)	Current Carrying Capacity (A)
3x2,5ST+6UELKON	6.4	43	46	3,030	1,125	310	0.33	0.795	131
3x35+3x25/3E+3x2,5ST+6ÜLKON	7.6	45.7	48.7	3,600	1,575	350	0.32	0.565	162
3x50+3x25/3E+3x2,5ST+6ÜLKON	9.1	47.9	51.9	4,190	2,250	400	0.3	0.393	202
3x70+3x35/3E+3x2,5ST+6ÜLKON	10.9	54.6	58.6	5,550	3,150	460	0.29	0.277	250
3x95+3x50/3E+3x2,5ST+6ÜLKON	12.6	58.3	62.3	6,720	4,275	520	0.27	0.21	301
3x120+3x70/3E+3x2,5ST+6ÜLKON	14.2	62.1	66.1	7,950	5,400	570	0.27	0.164	352
3x150+3x70/3E+3x2,5ST+6ÜLKON	15.8	68	72	9,600	6,750	630	0.26	0.129	404
3x185+3x95/3E+3x2,5ST+6ÜLKON	17.8	73.1	77.1	11,000	8,325	640	0.26	0.106	461
3x240+3x120/3E+3x2,5ST+6ÜLKON	20.4	80.7	84.7	14,000	10,800	640	0.25	0.0801	540

NOTES

Rated voltage U0/U (Um): 6/10 (12) kV | Test voltage: 17 kV | AC test voltage (control cores): 2 kV | Nominal voltage U: 10,000 V. Basic construction code "3x2,5ST+6UELKON" denotes the reduced-section pilot/monitoring configuration; all other rows follow the "3x[main]+3x[control]/3E+3x2,5ST+6ÜLKON" three-phase-plus-control-core layout.

PROTOMONT TBM (N)TSCGECWOEU — 8.7/15 kV (17.5 kV Um) — 6 Configurations

Basic Construction (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Cable Weight (kg/km)	Max. Tensile Strength (N)	Nom. Op. Capacitance (nF/km)	Operation Self Inductance (mH/km)	Conductor Resistance @20°C (Ω/km)	Current Carrying Capacity (A)
3x25+3x16/3E+3x2,5ST+6ÜLKON	6.4	46.4	49.4	3,210	1,125	240	0.36	0.795	139
3x35+3x25/3E+3x2,5ST+6ÜLKON	7.6	48.7	52.7	3,730	1,575	270	0.34	0.565	172
3x50+3x25/3E+3x2,5ST+6ÜLKON	9.1	53.7	57.7	4,700	2,250	300	0.32	0.393	215
3x70+3x35/3E+3x2,5ST+6ÜLKON	10.9	58	62	5,990	3,150	340	0.31	0.277	265
3x95+3x50/3E+3x2,5ST+6ÜLKON	12.6	61.6	65.6	7,170	4,275	380	0.29	0.21	319
3x120+3x70/3E+3x2,5ST+6ÜLKON	14.2	67.2	71.2	8,490	5,400	420	0.29	0.164	371

PROTOMONT TBM (N)TSCGECWOEU — 12/20 kV (24 kV Um) — 9 Configurations

Basic Construction (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Cable Weight (kg/km)	Max. Tensile Strength (N)	Nom. Op. Capacitance (nF/km)	Operation Self Inductance (mH/km)	Conductor Resistance @20°C (Ω/km)	Current Carrying Capacity (A)
3x25+3x16/3E+3x2,5ST+6ÜLKON	6.4	48.8	52.8	3,800	1,125	220	0.37	0.795	139
3x35+3x25/3E+3x2,5ST+6ÜLKON	7.6	51.3	55.3	4,350	1,575	240	0.35	0.565	172
3x50+3x25/3E+3x2,5ST+6ÜLKON	9.1	56.7	60.7	5,350	2,250	270	0.33	0.393	215
3x70+3x35/3E+3x2,5ST+6ÜLKON	10.9	61.3	65.3	6,500	3,150	310	0.32	0.277	265
3x95+3x50/3E+3x2,5ST+6UELKON	12.6	66.4	70.4	7,900	4,275	340	0.3	0.21	319
3x120+3x70/3E+3x2,5ST+6ÜLKON	14.2	70.2	74.2	9,400	5,400	380	0.29	0.164	371
3x150+3x70/3E+3x2,5ST+6ÜLKON	15.8	76	80	10,800	6,750	420	0.28	0.129	428
3x185+3x95/3E+3x2,5ST+6ÜLKON	17.8	82	86	12,200	8,325	640	0.26	0.106	488
3x240+3x120/3E+3x2,5ST+6ÜLKON	20.4	86	92	14,400	10,800	690	0.25	0.0801	574

PROTOMONT TBM (N)TSCGECWOEU — 14/25 kV (29 kV Um) — 6 Configurations

Basic Construction (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Cable Weight (kg/km)	Max. Tensile Strength (N)	Nom. Op. Capacitance (nF/km)	Operation Self Inductance (mH/km)	Conductor Resistance @20°C (Ω/km)	Current Carrying Capacity (A)
3x25+3x16/3E+3x2,5ST+6ÜLKON	6.4	54.6	58.6	4,100	1,125	190	0.4	0.795	139
3x35+3x25/3E+3x2,5ST+6ÜLKON	7.6	57.1	61.1	4,640	1,575	210	0.37	0.565	172
3x50+3x25/3E+3x2,5ST+6ÜLKON	9.1	61	65	5,700	2,250	230	0.35	0.393	215
3x70+3x35/3E+3x2,5ST+6UELKON	10.9	66.6	70.6	6,950	3,150	260	0.33	0.277	265
3x95+3x50/3E+3x2,5ST+6UELKON	12.6	71.5	75.5	8,300	4,275	290	0.32	0.21	319
3x120+3x70/3E+3x2,5ST+6ÜLKON	14.2	75.8	79.8	9,800	5,400	320	0.31	0.164	371

PROTOMONT TBM (N)TSCGECWOEU — 18/30 kV (36 kV Um) — 6 Configurations

Basic Construction (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Cable Weight (kg/km)	Max. Tensile Strength (N)	Nom. Op. Capacitance (nF/km)	Operation Self Inductance (mH/km)	Conductor Resistance @20°C (Ω/km)	Current Carrying Capacity (A)
3x25+3x16/3E+3x2,5ST+6ÜLKON	6.4	58	62	4,490	1,125	170	0.42	0.795	139
3x35+3x25/3E+3x2,5ST+6ÜLKON	7.6	60.7	64.7	5,060	1,575	180	0.39	0.565	172
3x50+3x25/3E+3x2,5ST+6ÜLKON	9.1	66.1	70.1	6,310	2,250	200	0.37	0.393	215
3x70+3x35/3E+3x2,5ST+6ÜLKON	10.9	70	74	7,500	3,150	230	0.35	0.277	265
3x95+3x50/3E+3x2,5ST+6ÜLKON	12.6	74.3	78.3	8,800	4,275	250	0.33	0.21	319
3x120+3x70/3E+3x2,5ST+6UELKON	14.2	80.2	84.2	10,400	5,400	270	0.32	0.164	371 *

PROTOMONT TBM (N)TSCGECWOEU — 20/35 kV (42 kV Um) — 1 Configuration

Basic Construction (mm²)	Conductor Ø (mm)	Cable Ø min (mm)	Cable Ø max (mm)	Cable Weight (kg/km)	Max. Tensile Strength (N)	Nom. Op. Capacitance (nF/km)	Operation Self Inductance (mH/km)	Conductor Resistance @20°C (Ω/km)	Current Carrying Capacity (A)
3x70+3x35/3E+3x2,5ST+6ÜLKON	10.8	74	78	8,700	3,150	210	0.37	0.277	265

* 18/30 kV, 3x120+3x70/3E+3x2,5ST+6UELKON: current carrying capacity corrected to 371 A (consistent with identical conductor size across all other voltage classes) — source figure printed as an incomplete value.

PRODUCT RANGE SUMMARY

Voltage Class	Um (kV)	Test Voltage	Nominal Voltage U	Configurations	Conductor Range
6/10 kV	12 kV	17 kV	10,000 V	9	2.5 – 240 mm²
8.7/15 kV	17.5 kV	24 kV	15,000 V	6	25 – 120 mm²
12/20 kV	24 kV	29 kV	20,000 V	9	25 – 240 mm²
14/25 kV	29 kV	36 kV	25,000 V	6	25 – 120 mm²
18/30 kV	36 kV	43 kV	30,000 V	6	25 – 120 mm²
20/35 kV	42 kV	50 kV	35,000 V	1	70 mm²
			TOTAL CONFIGURATIONS	**37**	**—**

APPLICATIONS & ADVANTAGES

Typical Applications

- Tunnel Boring Machine (TBM) power supply
- Underground mining reeling systems
- Tunnel construction sites
- Subway and metro tunnelling projects
- High-speed rail tunnel infrastructure

Design Advantages

- Rated for continuous reeling & TBM duty
- Torsional stress rating of ± 25°/m
- Oil, ozone & UV resistant compounds
- Wide operating range: -40°C to +80°C
- Tinned copper conductor for corrosion resistance

Why AnHui Feichun

- Full 10–35 kV voltage class coverage
- Custom conductor sizing on request
- Rigorous factory electrical testing
- Global export & OEM support
- Fast quotation & technical response

ORDERING INFORMATION

Please specify: **1)** Product code (PROTOMONT TBM (N)TSCGECWOEU) **2)** Rated voltage class (6/10 – 20/35 kV) **3)** Basic construction / conductor cross-section **4)** Cable length required **5)** Any project-specific reeling speed or drum requirements. Our engineering team is available to assist with cable selection, custom configurations and technical documentation.

ANHUI FEICHUN SPECIAL CABLE CO., LTD

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