PROTOMONT(VO) | (N)TSKCGEWOEU | 1,8/3 (3,6) kV | Coal cutter chain operation | MA China | GOST-R/-K/-B | ±50°/m torsion

PROTOMONT(VO) (N)TSKCGEWOEU 1,8/3KV — 飞纯煤矿采煤机链条运行电缆：面向俄罗斯露天煤矿与井工长壁装备的业绩型技术页面

Coalcutter cable for chain operation, designed for underground mining machines, cable protection chains and high-reliability coal equipment power supply.

PROTOMONT(VO) (N)TSKCGEWOEU 1,8/3KV is used as a power supply connection cable for mobile equipment and machines in underground mining applications, such as coal cutting machines. The VO design uses cable protection chains / cable handlers trailed behind the machine; these chains absorb tensile forces while the cable provides MV power, control/PE functionality and mining-grade sheath protection.

Feichun Cable / 飞纯电缆将这类产品定位为“煤矿装备运行可靠性电缆”，用于采煤机、掘进机、刮板输送机、移动式破碎站、带式输送机、露天矿大型电铲与井工长壁系统的 cable-chain / power-feed 场景。页面中的 Elga、Raspadskaya、Southern Kuzbass 等名称作为 **application / reference environments**；具体飞纯供货业绩必须以合同、装箱单、证书、测试报告和出货记录为准。

Rated voltage 1,8/3 (3,6) kV | Test voltage 6 kV | Control cores 2 kV | Nominal U 3 000 V | 15 N/mm² tensile | 2,3×D at 5 N/mm²

Application	Voltage	Torsion	Outer sheath
Coal mining	**1,8/3 kV**	**±50°/m**	**CM/CPE**
chain operation	Um 3,6 kV	VO mechanical rule	PROTOFIRM >5GM5

Control / PE	Performance
3×KON	**Evidence**
double-concentric	document-backed only

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1. Инженерная позиция PROTOMONT(VO)

VO отличается от V-версии меньшим напряжением 1,8/3 kV, более высокой торсионной нормой ±50°/m и внешней оболочкой Chlorinated polyethylene (CM/CPE) / PROTOFIRM reference / special compound >5GM5. Для шахты это означает упор на цепную работу, стойкость к маслу, озону, UV, истиранию, малому радиусу и безопасному управлению через STKON / KON проводники.

Performance wording policy: Feichun может подробно описывать применимость к объектам Elga, Raspadskaya, Southern Kuzbass, Sibirginsky, Tomusinsky, Krasnogorsky and similar coal assets; однако named-project supply claim должен подтверждаться документами конкретной партии. Это делает страницу коммерчески сильной и одновременно достоверной.

2. 飞纯电缆业绩写法：从“供货”到“可审计项目记录”

① Equipment-fit references

Feichun формирует подбор под Electric Rope Shovel, Dragline, mobile crusher, bucket-wheel stacker/reclaimer, long belt conveyor, large drilling rig, continuous miner, longwall shearer, roadheader, hydraulic support and scraper conveyor.

② Coalfield-fit references

Для России выделяются два блока: open-pit coal complex and underground longwall mines. Это помогает заказчику быстро сопоставить cable construction with local equipment duty cycle.

③ Document-backed performance

Каждый референс должен иметь traceability: quotation, PO/contract, datasheet revision, certificate scope, routine test, drum number, packing list, shipping document and customer acceptance record.

④ Failure-to-solution record

Сильная业绩页 показывает не только список проектов, но и solved problems: chain wear, small radius, STKON mismatch, sheath abrasion, low-temperature handling, voltage drop, monitoring conductor continuity.

3. Russia coal application matrix

Open-pit / surface coal

Reference environments: Elga Coal Complex, Neryungrinsky Open Pit, Sibirginsky, Tomusinsky, Krasnogorsky, Olzherassky, Zarechny.

Equipment: Electric Rope Shovel, Dragline, mobile crushing station, bucket-wheel stacker/reclaimer, long-distance belt conveyor, large drilling rig.

Underground / longwall coal

Reference environments: Raspadskaya, Kirova, Yalevskogo, Kotinskaya, V.I. Lenina, Sibirginskaya, Olzherasskaya-Novaya.

Equipment: Continuous Miner, Longwall Shearer, Roadheader, hydraulic support, armoured face / scraper conveyor.

Feichun reference-fit map · open pit + underground coal equipment

Open-pit coal equipment

Electric Rope Shovel · Dragline · Mobile Crusher

Bucket-wheel stacker/reclaimer · Long belt conveyor · Large drill

Elga · Neryungrinsky · Sibirginsky · Tomusinsky · Krasnogorsky · Olzherassk

Underground coal equipment

Continuous Miner · Longwall Shearer · Roadheader

Hydraulic Support · Armoured Face Conveyor

Raspadskaya · Kirova · Yalevskogo · Kotinskaya · V.I. Lenina · Sibirginskay



handler Feichun performance writing is evidence-based: contract + packing list + certificate + test report + site feedback.

Проектные названия используются как application/reference environments; конкретная поставка Feichun подтверждается документами партии.

4. Cable design

Conductorfinely stranded copper, tinned, class FS	PE3 double-concentric control / PE elements in outer interstices	InsulationEPR rubber, PROTOLON reference, special compound 3GI3	Outer semiconductive layersemi-conductive NBR easy-strip
Core arrangementthree main cores laid-up, with double-concentric control / PE conductor elements	Core colourscmain cores natural color; control cores blue	Inner sheathrubber, special EPR compound GM1b	Outer sheathchlorinated polyethylene CM/CPE, PROTOFIRM reference, special compound >5GM5

5. Standards / approvals

GOST-R/-K/-B

Russian and neighbouring-market mining documentation by current scope.

Fire Certificate of Russian Federation

Fire-performance document package for underground mining acceptance.

MA China

Mining approval direction for China market according to source specification.

DIN / IEC / VDE

DIN VDE 0250-813, IEC 60228, IEC 60332-1-2, VDE 0298-4 and IEC 60811-404 references.

6. SVG cross-section

PROTOMONT(VO) (N)TSKCGEWOEU · 1,8/3 kV · coalcutter cable for chain operation

3 double-concentric control/PE elements · CM/CPE PROTOFIRM outer sheath · ±50°/m torsion



VO functional stack

① finely stranded tinned Cu class FS

② EPR PROTOLON 3GI3 insulation

③ semi-conductive NBR easy-strip

④ 3 double-concentric control/PE elements

⑤ EPR GM1b inner sheath

⑥ CM/CPE PROTOFIRM outer sheath >5GM5

1,8/3 (3,6) kV · 6 kV test · 2 kV control cores

Функциональная схема VO; actual geometry depends on exact manufacturing drawing.

7. Cable Properties: dimensions and weight

Basic construction	Product number	External code	Conductor Ø [mm]	Cable Ø min [mm]	Cable Ø max [mm]	Weight [kg/km]	Control variant
3x25+3x(1,5STKON + 16/3KON)	VO_N_3KV_001	—	7,1	37,8	40,8	2 500	1,5STKON
3x35+3x(1,5STKON + 16/3KON)	VO_N_3KV_002	—	8,4	42	45	3 150	1,5STKON
3x50+3x(1,5STKON + 25/3KON)	VO_N_3KV_003	—	10,1	45,7	48,7	3 950	1,5STKON
3X70+3X(1,5STKON+ 35/3KON)	20304008	5DM1***	11,9	50,9	54,9	5 000	1,5STKON
3X95+3X(1,5STKON+ 50/3KON)	20271649	5DM1603	14	58,2	62,2	6 310	1,5STKON
3X120+3X(1,5STKON+ 70/3KON)	20069403	5DM1602	15,5	60,1	64,1	7 690	1,5STKON
3X150+3X(1,5STKON+ 70/3KON)	20069404	5DM1601	17,2	65,6	69,6	9 150	1,5STKON
3X185+3X(1,5STKON+ 95/3KON)	20026143	5DM1600	19,1	69,7	73,7	10 800	1,5STKON
3X240+3X(1,5STKON+ 120/3KON)	20070763	5DM1599	22	78,9	82,9	13 940	1,5STKON
3X300+3X(1,5STKON+ 150/3KON)	20233044	5DM1598	24,8	83,4	88,4	17 000	1,5STKON
3X95+3X(2X1,5ST+ 3X50/3KON)	20304009	5DM1***	14	57,2	62,2	6 350	2×1,5ST
3X120+3X(2X1,5ST+ 3X70/3KON)	20304010	5DM1***	15,5	62,8	66,8	7 950	2×1,5ST
3X150+3X(2X1,5STKON+ 3X70/3KON)	20160149	5DM1***	17,2	66,2	70,2	9 100	2×1,5ST
3X185+3X(2X1,5ST+ 3X95/3KON)	20304005	5DM1609	19,1	70,4	74,4	10 750	2×1,5ST
3X240+3X(2X1,5ST+ 3X120/3KON)	20308951	5DM1***	22	78,9	82,9	13 650	2×1,5ST

8. Cable Properties Electric / Mechanical

Basic construction	Product number	External code	Max tensile [N]	Capacitance [nF/km]	Self inductance [mH/km]	R20 [Ω/km]	Current [A]	≈P at 3 kV [MW]	≈ΔU/100m	2,3×Dmax [mm]	20×Dmax [mm]
3x25+3x(1,5STKON + 16/3KON)	VO_N_3KV_001	—	1 125	280	0,34	0,795	131	0,61	0,6%	93,8	816
3x35+3x(1,5STKON + 16/3KON)	VO_N_3KV_002	—	1 575	310	0,33	0,565	162	0,76	0,53%	103,5	900
3x50+3x(1,5STKON + 25/3KON)	VO_N_3KV_003	—	2 250	360	0,31	0,393	202	0,94	0,46%	112	974
3X70+3X(1,5STKON+ 35/3KON)	20304008	5DM1***	3 150	420	0,3	0,277	250	1,17	0,4%	126,3	1 098
3X95+3X(1,5STKON+ 50/3KON)	20271649	5DM1603	4 275	450	0,29	0,21	301	1,41	0,36%	143,1	1 244

Basic construction	Product number	External code	Max tensile [N]	Capacitance [nF/km]	Self inductance [mH/km]	R20 [Ω/km]	Current [A]	≈P at 3 kV [MW]	≈ΔU/100m	2,3×Dmax [mm]	20×Dmax [mm]
3X120+3X(1,5STKON+ 70/3KON)	20069403	5DM1602	5 400	490	0,28	0,164	352	1,65	0,33%	147,4	1 282
3X150+3X(1,5STKON+ 70/3KON)	20069404	5DM1601	6 750	540	0,28	0,132	404	1,89	0,31%	160,1	1 392
3X185+3X(1,5STKON+ 95/3KON)	20026143	5DM1600	8 325	590	0,27	0,108	461	2,16	0,29%	169,5	1 474
3X240+3X(1,5STKON+ 120/3KON)	20070763	5DM1599	10 800	670	0,26	0,0817	540	2,53	0,25%	190,7	1 658
3X300+3X(1,5STKON+ 150/3KON)	20233044	5DM1598	13 500	740	0,25	0,0654	620	2,9	0,23%	203,3	1 768
3X95+3X(2X1,5ST+ 3X50/3KON)	20304009	5DM1***	4 275	450	0,29	0,21	301	1,41	0,36%	143,1	1 244
3X120+3X(2X1,5ST+ 3X70/3KON)	20304010	5DM1***	5 400	490	0,28	0,164	352	1,65	0,33%	153,6	1 336
3X150+3X(2X1,5STKON+ 3X70/3KON)	20160149	5DM1***	6 750	540	0,28	0,132	404	1,89	0,31%	161,5	1 404
3X185+3X(2X1,5ST+ 3X95/3KON)	20304005	5DM1609	8 325	590	0,27	0,108	461	2,16	0,29%	171,1	1 488
3X240+3X(2X1,5ST+ 3X120/3KON)	20308951	5DM1***	10 800	670	0,26	0,0817	540	2,53	0,25%	190,7	1 658

9. Formula and engineering check

Fmax = 15 N/mm² × 3 × S
Rchain = 2,3 × D at 5 N/mm²
S-type distance ≥ 20 × D
P ≈ √3 × 3 kV × I × cosφ
ΔU% ≈ √3 × I × R20 × 0,1 km / 3 000 V × 100
Main core test = 6 kV
Control core test = 2 kV
Torsional stress = ±50 °/m

Construction	Main section	Calculated tensile	Table tensile	Status
3x25+3x(1,5STKON + 16/3KON)	25 mm²	1 125 N	1 125 N	OK
3x35+3x(1,5STKON + 16/3KON)	35 mm²	1 575 N	1 575 N	OK
3x50+3x(1,5STKON + 25/3KON)	50 mm²	2 250 N	2 250 N	OK
3X70+3X(1,5STKON+ 35/3KON)	70 mm²	3 150 N	3 150 N	OK
3X95+3X(1,5STKON+ 50/3KON)	95 mm²	4 275 N	4 275 N	OK
3X120+3X(1,5STKON+ 70/3KON)	120 mm²	5 400 N	5 400 N	OK
3X150+3X(1,5STKON+ 70/3KON)	150 mm²	6 750 N	6 750 N	OK
3X185+3X(1,5STKON+ 95/3KON)	185 mm²	8 325 N	8 325 N	OK
3X240+3X(1,5STKON+ 120/3KON)	240 mm²	10 800 N	10 800 N	OK
3X300+3X(1,5STKON+ 150/3KON)	300 mm²	13 500 N	13 500 N	OK
3X95+3X(2X1,5ST+ 3X50/3KON)	95 mm²	4 275 N	4 275 N	OK
3X120+3X(2X1,5ST+ 3X70/3KON)	120 mm²	5 400 N	5 400 N	OK
3X150+3X(2X1,5STKON+ 3X70/3KON)	150 mm²	6 750 N	6 750 N	OK
3X185+3X(2X1,5ST+ 3X95/3KON)	185 mm²	8 325 N	8 325 N	OK
3X240+3X(2X1,5ST+ 3X120/3KON)	240 mm²	10 800 N	10 800 N	OK

10. Diagnostics and procurement checklist

Chain radius: compare cable Dmax with real cable handler pocket radius and wear surfaces.

Control variant: 1,5STKON and 2×1,5ST variants must match mining machine wiring.

Performance evidence: for Elga / Raspadskaya / Southern Kuzbass type references, request shipment photos, drum number, test report, certificate scope and acceptance record.

Ordering questionnaire

Mine name, equipment type, machine OEM, voltage, cable length, chain handler drawing, Dmax limit, STKON/KON variant, operating temperature, GOST/MA China/fire certificate needs, packaging, spare cable requirement, test report format and required evidence package.

11. Sources and reference basis

1. Raspadskaya official assets — mining assets and coal operations
2. Raspadskaya official overview
3. Southern Kuzbass / Mechel assets: Krasnogorsky, Sibirginsky, Olzherassky, Tomusinsky, V.I. Lenina, Sibirginskaya, Olzherasskaya-Novaya
4. IEA Coal 2025 — Elga coal project and Pacific Railway / Port Elga context
5. IEC 60228:2023 — Conductors of insulated cables
6. IEC 60332-1-2 — flame propagation test
7. IEC 60811-404 — mineral-oil immersion tests
8. DIN VDE 0298-4 — current-carrying capacity

Feichun Cable / 飞纯电缆 — coal mining cable systems and document-backed performance records

Engineering support for PROTOMONT(VO), PROTOMONT(V), coalcutter chain operation, cable handler geometry, Russian open-pit and underground coal equipment, GOST/MA China/Russian Fire Certificate dossier and factory QA package.

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No virtual contacts added. Certifications and named-project performance claims must be verified by current shipment documents.