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TRATOS

CABLES FOR A MOVING WORLD

1966 TRATOS 60th 2026

TRATOS HV®
HIGH VOLTAGE CABLES
IEC 60840

March **2026**
TCn13-Rev23

INDEX

TRATOS HIGH VOLTAGE® IEC 60840

HIGH VOLTAGE CABLES BASED ON IEC 60840

STANDARDS AND QUALITY SYSTEM

STANDARDS

Cables manufactured based on:

IEC 60228 . . . . . Conductors of insulated cables
IEC 60287 . . . . . Electric cables - Calculation of the current rating.
IEC 60840 . . . . . Power cables with extruded insulation and their accessories for rated voltage above 30 kV (Um=36 kV) up to 150 kV (Um=170 kV). Test methods and requirements.
IEC 61443 . . . . . Short-circuit temperature limits of electric cables with rated voltages above 30 kV (Um=36 kV).
IEC 60853 . . . . . Calculation of the cyclic and emergency current rating of cables.
IEC 60885 . . . . . Electrical test for electric cables
HD 632 . . . . . Power cables with extruded insulation and their accessories for rated voltage above 36 kV (Um=42 kV) up to 150 kV (Um=170 kV). Part 1- General test requirements. Part 1 is based on IEC 60840, and follows that standard closely. HD 632 is completed with a number of parts and subsections for different cables intended to be used under special conditions which can vary nationally in Europe.

STANDARDS AND QUALITY SYSTEM

QUALITY SYSTEM

Tratos aim to work closely with customers to find better, more environmentally friendly solutions to their challenges.
We are committed to our vision and strategy to serve all our internal and external customers by providing high quality services and products. Tratos is an established industry leader in the design, manufacture and supply of cables and products and to maintain this leading position we are committed at every level to providing our customers with quality services and products at a competitive price. As a commercial enterprise we are aware of the importance of satisfying our customers and of the financial impact of which nonconformities may have on our profitability. For these reasons we are committed to complying with all customer requirements and specifications both legal and statutory requirements. Our Quality Management System has been audited and approved by two independent, Internationally recognized and accepted authorities: BSI and AENOR-IQNET (E), in accordance to BS EN ISO 9001:2015 covering the production, purchasing of raw materials design and final test including various document types. The Tratos Quality Management system is under frequent regular surveillance by inspectors working for the Certification Autorities.

ENVIRONMENTAL SYSTEM

Our Environmental Management System has been audited and approved by two independent, Internationally recognized and accepted authorities:
BSI and AENOR-IQNET (E), in accordance to BS EN ISO 14001:2015 covering the production, purchasing of raw materials design and final test including various document types. The Tratos Quality Management system is under frequent regular surveillance by inspectors working for the Certification Autorities.

ENERGY MANAGEMENT SYSTEMS

By complying with the BS EN ISO 50001:2018 Tratos follows a systematic approach in achieving continual improvement of energy performance and the Energy Management Systems (EnMS).
The BS EN ISO 50001:2018 is a standard issued by the International Standard Organization (ISO) which outlines the requirements for establishing, implementing, maintaining and improving an energy management system (EnMS).

CIRCULAR ECONOMY

The EU Eco-Management and Audit Scheme (EMAS) is a premium management instrument developed by the European Commission for companies and other organisations to evaluate, report, and improve their environmental performance. EMAS is open to every type of organisation eager to improve its environmental performance. It spans all economic and service sectors and is applicable worldwide.

AWARDS

Tratos cables are made with award winning Tratos-JBA® compound. Tratos UK Ltd has won a **Queen's Award for Enterprise - Innovation** for its technologically advanced Tratos-JBA® compound.

STANDARDS AND QUALITY SYSTEM

HEALTY & SAFETY SYSTEM

Oince its decision to create a board post dedicated to furthering best practice for Health and Safety, international cable manufacturer Tratos is celebrating receipt of ISO 45001.
ISO 45001 sets out the minimum requirements for occupational health and safety management best practice and helps companies achieve the maximum return for employees, operations and customers.

REACH, WEEE & ROHS

Tratos is fully compliant with the **REACH**. This is a European Union regulation concerning the **Registration, Evaluation, Authorisation and restriction of Chemicals**. It came into force on 1st June 2007 and replaced a number of European Directives and Regulations with a single system. REACH applies to substances manufactured or imported into the EU in quantities of 1 tonne or more per year. Generally, it applies to all individual chemical substances on their own, in preparations or in articles . To summarise, REACH makes the cable industry directly responsible for assessing and managing the risks posed by chemicals and providing safety information to their users.

Tratos fully subscribes to The **Waste Electrical and Electronic Equipment Directive (WEEE Directive)**, introduced into UK law in January 2007 by the Waste Electronic and Electrical Equipment Regulations 2006. The WEEE Directive aims to reduce the amount of electrical and electronic equipment being produced and to encourage everyone to reuse, recycle and recover it. The WEEE Directive also aims to improve the environmental performance of businesses that manufacture, supply, use, recycle and recover electrical and electronic equipment. TRATOS has enlisted the services of the UK's leading producer compliance scheme, Valpak, whom manage our recycling obligations and also ensure our compliance to the WEEE Regulations and the Waste Batteries and Accumulators Regulations.

Tratos is fully compliant with the **Restriction of Hazardous Substances (RoHS) Regulations**. These Regulations implement EU Directive 2011/65/EU which bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. Tratos fully understands the requirements of the RoHS Directive and ensures that our products, and their components, comply.

CORPORATE SOCIAL RESPONSABILITY

Tratos adoptes a Code of Ethics which adheres to the United Nations Global Compact on human rights, labour standards, protection of the environment and anti corruption measures.
Under this self regulatory code, Tratos will carry out initiatives in the environmental and social fields with special reference to environmental policies and social policies regarding child labour, compulsory labour, health and security, freedom of association and the right to collective bargaining, discrimination, disciplinary procedures, working hours and wages.

APPROVALS

High Voltage cables made by Tratos have been tested and certified by the following Approval Organisations:

TECHNICAL INFORMATION

TRATOS® HV - 38/66 kV (72.5 kV)

Table 1

38/66 (72,5) kV Cu - Technical Data

38/66 (72.5) kV Cu							
Size csa	Maximum D.C. Conductor at 20°C	Maximum D.C. Screen resistance at 20°C	Capacitance	Charging current	Inductance		Surge impedance
mm²	Ω/km	Ω/km	uF/km	A/km	Trefoil	Flat	Ω
					mH/km	mH/km	
185	0,0991	0,524	0,195	2,33	0,42	0,47	46
240	0,0754	0,524	0,226	2,70	0,40	0,44	41
300	0,0601	0,524	0,233	2,78	0,38	0,42	40
400	0,0470	0,524	0,255	3,04	0,36	0,41	37
500	0,0366	0,524	0,279	3,33	0,35	0,40	35
630	0,0283	0,524	0,309	3,69	0,34	0,39	33
800	0,0221	0,524	0,346	4,13	0,33	0,37	30

Table 2

38/66 (72,5) kV Al - Technical Data

38/66 (72.5) kV Al							
Size csa	Maximum D.C. Conductor at 20°C	Maximum D.C. Screen resistance at 20°C	Capacitance	Charging current	Inductance		Surge impedance
mm²	Ω/km	Ω/km	uF/km	A/km	Trefoil	Flat	Ω
					mH/km	mH/km	
185	0,164	0,524	0,195	2,33	0,42	0,47	46
240	0,125	0,524	0,226	2,70	0,40	0,44	41
300	0,100	0,524	0,233	2,78	0,38	0,42	40
400	0,0778	0,524	0,255	3,04	0,36	0,41	37
500	0,0605	0,524	0,279	3,33	0,35	0,40	35
630	0,0469	0,524	0,309	3,69	0,34	0,39	33
800	0,0367	0,524	0,346	4,13	0,33	0,37	30
1000	0,0291	0,524	0,385	4,60	0,31	0,36	28

TRATOS® HV - 76/132 kV-(145kV)

Table 3

76/132 (145) kV Cu - Technical Data

76/132 (72.5) kV Cu							
Size csa	Maximum D.C. Conductor at 20°C	Maximum D.C. Screen resistance at 20°C	Capacitance	Charging current	Inductance		Surge impedance
mm²	Ω/km	Ω/km	uF/km	A/km	Trefoil	Flat	Ω
					mH/km	mH/km	
400	0,0470	0,124	0,155	3,70	0,45	0,49	53
630	0,0283	0,124	0,192	4,58	0,41	0,45	45
800	0,0221	0,124	0,212	5,06	0,39	0,44	42
1200	0,0151	0,124	0,236	6,28	0,35	0,40	36

Table 4

76/132 (145) kV Al - Technical Data

76/132 (72.5) kV Al							
Size csa	Maximum D.C. Conductor at 20°C	Maximum D.C. Screen resistance at 20°C	Capacitance	Charging current	Inductance		Surge impedance
mm²	Ω/km	Ω/km	uF/km	A/km	Trefoil	Flat	Ω
					mH/km	mH/km	
400	0,0778	0,124	0,155	3,70	0,45	0,49	53
630	0,0469	0,124	0,192	4,58	0,41	0,45	45
1000	0,0291	0,124	0,241	5,75	0,37	0,42	39
1600	0,0186	0,124	0,285	6,80	0,34	0,39	34

TRATOS® HV - 87/150 kV (72.5 kV)

Table 5

87/150 (72,5) kV Cu - Technical Data

87/150 kV Cu							
Size csa	Maximum D.C. Conductor at 20°C	Maximum D.C. Screen resistance at 20°C	Capacitance	Charging current	Inductance		Surge impedance
mm²	Ω/km	Ω/km	uF/km	A/km	Trefoil	Flat	Ω
					mH/km	mH/km	
400	0,0470	0,124	0,151	4,13	0,45	0,50	54
630	0,0283	0,124	0,189	5,17	0,41	0,46	46
800	0,0221	0,124	0,208	5,69	0,39	0,44	43
1200	0,0151	0,124	0,258	7,05	0,36	0,40	37

Table 6

87/150 (72,5) kV Al - Technical Data

87/150 kV Al							
Size csa	Maximum D.C. Conductor at 20°C	Maximum D.C. Screen resistance at 20°C	Capacitance	Charging current	Inductance		Surge impedance
mm²	Ω/km	Ω/km	uF/km	A/km	Trefoil	Flat	Ω
					mH/km	mH/km	
400	0,0778	0,124	0,151	4,13	0,45	0,50	54
630	0,0469	0,124	0,189	5,17	0,41	0,45	46
1000	0,0291	0,124	0,228	6,23	0,37	0,42	40
1600	0,0186	0,124	0,271	7,41	0,35	0,39	35

CURRENT RATING FOR XLPE CABLE SYSTEMS

IMPORTANT NOTE: The values provided are for estimating puposes only, please request a data sheet for more accurate values before placing an order

Table 7

Size csa	Cables in ground				Cables in duct				Cables in air			
	Trefoil		Flat		Trefoil		Flat		Trefoil		Flat	
mm²	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB
185	420	425	415	450	375	380	370	405	540	540	575	625
240	485	495	470	520	435	445	420	465	635	640	655	740
300	550	560	520	590	495	500	465	530	725	735	750	855
400	620	630	575	675	555	565	515	605	835	850	850	995
500	695	720	635	765	625	645	570	685	955	985	950	1120
630	775	810	695	870	695	725	625	780	1090	1130	1060	1280
800	850	905	750	980	765	810	675	880	1225	1285	1170	1440

* BB both end bonding
SP/CB single end bonding/cross bonding

Table 8

Size csa	Cables in ground				Cables in duct				Cables in air			
	Trefoil		Flat		Trefoil		Flat		Trefoil		Flat	
mm²	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB
185	375	375	380	395	335	335	340	355	420	420	465	490
240	435	435	435	465	390	390	390	415	500	500	540	575
300	490	495	485	520	440	445	435	465	570	570	615	665
400	560	565	540	600	500	505	485	540	660	670	705	775
500	635	645	610	685	570	580	545	615	765	780	795	905
630	720	740	675	785	645	665	605	705	885	905	905	1050
800	805	840	740	890	720	755	665	800	1015	1050	1015	1215
1000	890	935	805	1000	800	840	720	900	1145	1190	1125	1380

* BB both end bonding
SP/CB single end bonding/cross bonding

CURRENT RATING FOR XLPE CABLE SYSTEMS

Table 9

Size csa	Cables in ground				Cables in duct				Cables in air			
	Trefoil		Flat		Trefoil		Flat		Trefoil		Flat	
mm²	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB
400	565	600	515	625	510	540	465	565	780	810	765	905
630	670	740	585	775	610	675	535	700	960	1030	905	1170
800	770	870	660	910	695	785	595	820	1110	1220	1030	1360
1200	910	1045	780	1095	815	940	705	985	1280	1400	1120	1500

* BB both end bonding
CB cross bonding

Table 10

Size csa	Cables in ground				Cables in duct				Cables in air			
	Trefoil		Flat		Trefoil		Flat		Trefoil		Flat	
mm²	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB
400	490	500	455	515	440	450	410	460	625	640	610	680
630	650	690	600	720	585	620	540	645	825	860	790	885
1000	725	795	700	840	655	715	630	760	1050	1135	1000	1200
1600	930	1000	810	1080	840	900	730	970	1325	1400	1115	1500

* BB both end bonding
CB cross bonding

Table 11

Size csa	Cables in ground				Cables in duct				Cables in air			
	Trefoil		Flat		Trefoil		Flat		Trefoil		Flat	
mm²	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB
400	565	600	515	625	510	540	465	565	780	810	765	905
630	670	740	585	775	610	675	535	700	960	1030	905	1170
800	770	870	660	910	695	785	595	820	1110	1220	1030	1360
1200	910	1045	780	1095	815	940	705	985	1280	1400	1120	1500

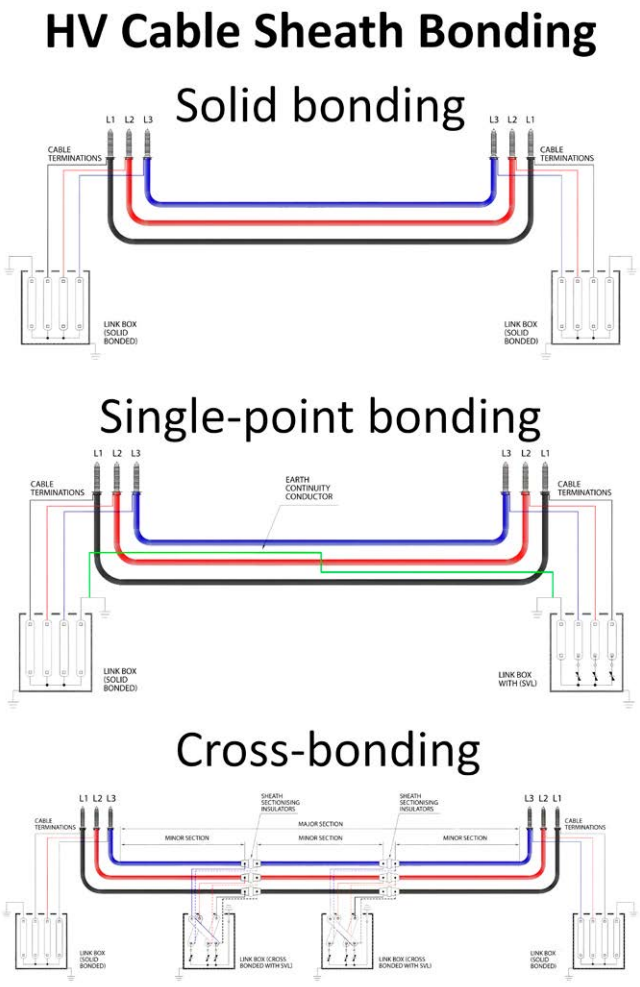
* BB both end bonding
CB cross bonding

CURRENT RATING FOR XLPE CABLE SYSTEMS

Table 12

Size csa	Cables in ground				Cables in duct				Cables in air			
	Trefoil		Flat		Trefoil		Flat		Trefoil		Flat	
mm²	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB	BB	CB
400	490	500	455	515	440	450	410	460	625	640	610	680
630	650	690	600	720	585	620	540	645	825	860	790	885
1000	725	795	700	840	655	715	630	760	1050	1135	1000	1200
1600	930	1000	810	1080	840	900	730	970	1325	1400	1115	1500

* BB both end bonding
CB cross bonding



LAYING CONDITIONS

Table 13

Standard depth of laying	1.2m
Thermal resistivity of soil	1.0K.m/W
Standard ground temperature	20°C
Ambient air temperature	30°C
Maximum conductor temperature	90°C

RATING FACTORS

Rating factors for cross section area of the metal screen of single core cables.
The rating factor is applicable to single-core cables in flat and trefoil formation.

Table 14

Rating factors for depth of laying	
Laying depth	Rating factor
(m)	
1.0	1.0
1.2	0.95
1.5	0.93
2.0	0.89
2.5	0.88
3.0	0.86

Table 15

Temperature de-rating factors for Ground temperature									
Ground temperature °C	10	15	20	25	30	35	40	45	50
Rating factor (Maximum conductor temperature 90 °C)	1.03	1.00	0.96	0.93	0.89	0.85	0.81	0.77	0.73

Table 16

Temperature de-rating factors for Ambient temperature										
Ambient temperature °C	10	15	20	25	30	35	40	45	50	55
Rating factor (Maximum conductor temperature 90 °C)	1.1	1.07	1.04	1.00	0.96	0.92	0.87	0.83	0.78	0.73

Table 17

Rating factors for ground thermal resistivity							
Thermal resistivity Km/W	0.7	1.0	1.2	1.5	2.0	2.5	3.0
Factor	1.2	1.08	1.0	0.9	0.79	0.70	0.65

CURRENT RATING FOR XLPE CABLE SYSTEMS

OVERLOAD CAPACITY

An XLPE cable may be overloaded up to 105°C. Singular emergency events are not expected to have any significant impact on the service life of the cable. The number of and the duration of overloads should be kept low, though. Cyclic and emergency ratings can be calculated based on IEC publication 60853.

SHORT-CIRCUIT CURRENTS

During short circuit events the maximum allowable temperature in conductor or screen/metallic sheath is determined by the adjoining insulation and sheath materials. This is specified in IEC 61443 "Short circuit temperature limits of electric cables with rated voltage above 30 kV (Um=36 kV). The dynamic forces between the conductors must be taken into account for cable installations.

Maximum short circuit currents due to thermal restrictions. The thermal energy developed during a short-circuit is determined by the short-circuit magnitude and duration. For design purposes, an equivalent short-circuit current with a duration of 1 sec is used according to formula below. This formula is valid for a short-circuit duration of 0.2 to 5.0 sec.

$$I_{sh} = I_1 / \sqrt{t_{sh}} \quad \text{(kA)}$$

Where:

I_{sh}	short-circuit current during time tsh	
I_1	short-circuit current rating during 1 second	(Hz)
t_{sh}	short-circuit duration	(sec)

For XLPE insulated conductors the maximum allowable short circuit temperature is 250oC.

* See the 1 second value in tables 20 for the conductor and in Table 21 for the metallic screen.

Table 18

Max. short-circuit current on the conductor during 1 s, kA				
Conductor temperature before the short-circuit				
Cross section	Aluminium conductor		Copper conductor	
mm²	65°C	90°C	65°C	90°C
185	19,2	17,5	29,0	26,5
240	24,8	22,7	37,6	34,5
300	31,1	28,3	47,0	42,9
400	41,4	37,8	62,7	57,2
500	51,8	47,2	78,4	71,5
630	65,2	59,5	98,7	90,1
800	82,8	75,6	125	114
1000	104	94,5	157	143
1200	124	113	188	172
1400	145	132	219	200
1600	166	151	251	229
per mm²	0,104	0,0945	0,157	0,143

CURRENT RATING FOR XLPE CABLE SYSTEMS

Copper screens may reach a temperature of 250°C without damaging adjacent insulating material. With an initial temperature of 80°C this corresponds to a current density of 148(98) A/ mm2 during 1s (both higher and lower current densities may be allowed if other conditions apply).

Table 19

Max. short-circuit current on the screen during 1 s, kA		
Metallic screen cross section, mm2		Metallic screen temperature before the short-circuit
Copper screen	Aluminium	80°C
35	53	5.1
50	76	7.4
95	144	14
150	204	22.2
300	454	44.4

DYNAMIC FORCES DURING SHORT CIRCUIT EVENTS

In addition to the thermal stresses, the dynamic forces in the cables and accessories during a short circuit event must also be considered.
The dynamic effect of parallel conductors carrying current is responsible for the dynamic force.
The dynamic force between two conductors, can be calculated as:

$$F = 0,2/S) \cdot I^2_{peak} \quad \text{(kA)}$$

Where:

I_{peak}	Short-circuit current RMS	(kA)
S	Centre to centre spacing between conductors	(m)
F	Maximum force	(N/m)

FORMULAE

FORMULA FOR CAPACITANCE

$C = \varepsilon_r / [18 \cdot \ln (r_0/r_1)]$ (µF/km)

Where:

ε	relative permittivity of the insulation	
r_0	external radius of the insulation	(mm)
r_1	radius of conductor, including screen	(mm)
ε_r XLPE	2.5 (Value from IEC 60287)	

FORMULA FOR DIELECTRIC LOSSES

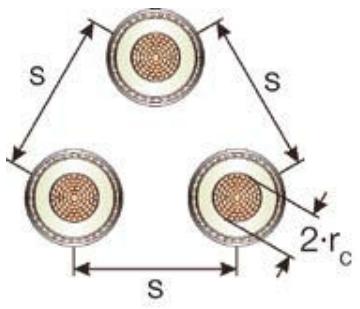
$W = (U^2/3) \cdot 2\pi f \cdot C \cdot \tan(\delta)$ (W/km)

Where:

U	rated voltage	(k/V)
f	frequency	(Hz)
C	capacitance	(µF/km)
tan(δ)	loss angle	

FORMULA FOR INDUCTANCE

$L = 0{,}05 + 0{,}2 \cdot \ln (K \cdot s/r_c)$ (mH/km)

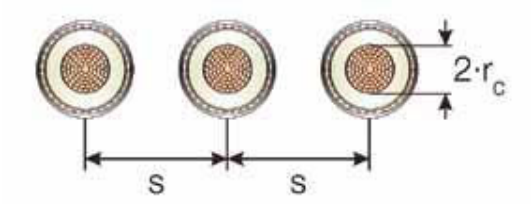


Where:

K =1	trefoil formation	
K =1,26	flat formation	
s	distance between conductor axes	(mm)
r_c	conductor radius	(mm)

FORMULA FOR REACTANCE

$X = 2\pi f \cdot (L/1000)$ (Ω/km)



Where:

f	frequency	(Hz)
L	inductance	(mH/km)

FORMULAE

FORMULA FOR ELECTRIC STRESS

Conductor screen:

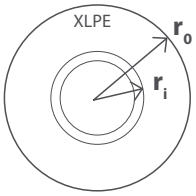
$$E_{max} = U_0 / [r_i \ln (r_0/r_i)] \quad \text{(kV/km)}$$

Insulation screen:

$$E_{min} = U_0 / [r_0 \ln (r_0/r_i)] \quad \text{(kV/km)}$$

Where:

r_i	radius of conductor screen
r_0	radius of XLPE insulation
U_0	voltage across insultaion



HIGH VOLTAGE CABLES BASED ON IEC 608040

TRATOS® HV-CU - 38/66 kV (72.5 kV)

Tratos HV cable is used for the transmission and distribution of electric power and is suitable for installation in ducts, trenches or direct buried underground or within buildings. These cables are ideal for use to connect wind farms and other renewable energy to existing grid systems.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** stranded circular compacted annealed copper
- **Conductor screen:** semi-conducting layer
- **Insulation:** XLPE
- **Insulation screen:** non metallic - semi-conducting layer and copper or aluminium wire as metallic
- **Tape:** semiconductive water blocking
- **Moisture barrier:** copolymer coated aluminum
- **Outer sheath:** HDPE sheathed with extruded semi-conducting layer
- **Standard colour:** black
- **Marking:** TRATOS Cable type + Cable Size (e.g. "1x150") + lot production + year + metre marking

STANDARDS

- Design and Tested: IEC 60228, 60840 and 60811

Size csa	Nominal Conductor diameter	Thickness conductor screen	Thickness insulation	Thickness core screen	Nominal core diameter	Nominal diameter screen wire	Area of copper wire screen	Thickness of aluminium copolymer tape	Nominal thickness of HDPE sheath	Approximate overall diameter
mm^2	mm	mm	mm	mm	mm	mm	mm^2	mm	mm	mm
185	15,9	1,5	9,8	0,8	38,5	1.0	35	0,2	3,0	50,6
240	18,3	1,5	9,0	0,8	39,3	1.0	35	0,2	3,0	51,5
300	20,6	0,8	9,0	0,8	40,2	1.0	35	0,2	3,0	53,0
400	23,4	0,8	9,0	0,8	43,6	1.0	35	0,2	3,0	55,6
500	26,4	0,8	9,0	0,8	46,6	1.0	35	0,2	3,5	59,6
630	30,2	0,8	9,0	0,8	50,6	1.0	35	0,2	3,5	65,0
800	35,0	0,8	9,0	0,8	56,0	1.0	35	0,2	3,5	70,0

HIGH VOLTAGE CABLES BASED ON IEC 608040

TRATOS® HV-AL - 38/66 kV (72.5 kV)

Tratos HV cable is used for the transmission and distribution of electric power and is suitable for installation in ducts, trenches or direct buried underground or within buildings. These cables are ideal for use to connect wind farms and other renewable energy to existing grid systems.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** stranded circular compacted aluminium
- **Conductor screen:** semi-conducting layer
- **Insulation:** XLPE
- **Insulation screen:** non metallic - semi-conducting layer and copper or aluminium wire as metallic
- **Tape:** semiconductive water blocking
- **Moisture barrier:** copolymer coated aluminum
- **Outer sheath:** HDPE sheathed with extruded semi-conducting layer
- **Standard colour:** black
- **Marking:** TRATOS Cable type + Cable Size (e.g. "1x150") + lot production + year + metre marking

STANDARDS

- Design and Tested: IEC 60228, 60840 and 60811

Size csa	Nominal Conductor diameter	Thickness conductor screen	Thickness insulation	Thickness core screen	Nominal core diameter	Nominal diameter screen wire	Area of copper wire screen	Thickness of aluminium copolymer tape	Nominal thickness of HDPE sheath	Approximate overall diameter
mm^2	mm	mm	mm	mm	mm	mm	mm^2	mm	mm	mm
185	15,9	1,5	9,8	0,8	38,5	1.0	35	0,2	3,0	50,6
240	18,3	1,5	9,0	0,8	39,3	1.0	35	0,2	3,0	51,5
300	20,6	0,8	9,0	0,8	40,2	1.0	35	0,2	3,0	53,0
400	23,4	0,8	9,0	0,8	43,6	1.0	35	0,2	3,0	55,6
500	26,4	0,8	9,0	0,8	46,6	1.0	35	0,2	3,5	59,6
630	30,2	0,8	9,0	0,8	50,6	1.0	35	0,2	3,5	65,0
800	35,0	0,8	9,0	0,8	56,0	1.0	35	0,2	3,5	70,0
1000	40,0	1,5	9,0	0,8	62,0	1.0	35	0,2	3,5	75,2

HIGH VOLTAGE CABLES BASED ON IEC 608040

TRATOS® HV-CU - 76/132 kV (145 kV)

Tratos HV cable is used for the transmission and distribution of electric power and is suitable for installation in ducts, trenches or direct buried underground or within buildings. These cables are ideal for use to connect wind farms and other renewable energy to existing grid systems.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** stranded circular compacted annealed copper
- **Conductor screen:** semi-conducting layer
- **Insulation:** XLPE
- **Insulation screen:** non metallic - semi-conducting layer and aluminium wire as metallic
- **Tape:** semiconductive water blocking
- **Moisture barrier:** copolymer coated aluminum
- **Outer sheath:** HDPE sheathed with extruded semi-conducting layer
- **Standard colour:** black
- **Marking:** TRATOS Cable type + Cable Size (e.g. "1x150") + lot production + year + metre marking

STANDARDS

- Design and Tested: IEC 60228, 60840 and 60811

Size csa	Nominal Conductor diameter	Thickness conductor screen	Thickness insulation	Thickness core screen	Nominal core diameter	Nominal diameter screen wire	Area of aluminium wire screen	Thickness of aluminium copolymer tape	Nominal thickness of HDPE sheath	Approximate overall diameter
mm²	mm	mm	mm	mm	mm	mm	mm²	mm	mm	mm
400	23,4	1,5	19,0	1,5	63,4	2.0	204	0,2	4,0	85,0
630	30,2	1,5	17,5	1,5	69,0	2.0	204	0,2	4,0	89,5
800	35,0	1,5	17,5	1,5	74,0	2.0	204	0,2	4,0	95,5
1200	46,0	1,5	17,0	1,5	84,5	2.0	204	0,2	4,5	105,0

HIGH VOLTAGE CABLES BASED ON IEC 608040

TRATOS® HV-AL - 76/132 kV (145 kV)

Tratos HV cable is used for the transmission and distribution of electric power and is suitable for installation in ducts, trenches or direct buried underground or within buildings. These cables are ideal for use to connect wind farms and other renewable energy to existing grid systems.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** stranded circular or segmantal compacted aluminium
- **Conductor screen:** semi-conducting layer
- **Insulation:** XLPE
- **Insulation screen:** non metallic - semi-conducting layer and aluminium wire as metallic
- **Tape:** semiconductive water blocking
- **Moisture barrier:** copolymer coated aluminum
- **Outer sheath:** HDPE sheathed with extruded semi-conducting layer
- **Standard colour:** black
- **Marking:** TRATOS Cable type + Cable Size (e.g. "1x150") + lot production + year + metre marking

STANDARDS

- Design and Tested: IEC 60228, 60840 and 60811

Size csa	Nominal Conductor diameter	Thickness conductor screen	Thickness insulation	Thickness core screen	Nominal core diameter	Nominal diameter screen wire	Area of aluminium wire screen	Thickness of aluminium copolymer tape	Nominal thickness of HDPE sheath	Approximate overall diameter
mm^2	mm	mm	mm	mm	mm	mm	mm^2	mm	mm	mm
400	23,4	1,5	19,0	1,5	63,4	2,0	204	0,2	4,0	85,0
630	30,2	1,5	17,5	1,5	69,0	2,0	204	0,2	4,0	89,5
1000	41,0	1,5	17,5	1,5	81,0	2,0	204	0,2	4,5	101,1
1600	50,5	1,5	17,0	1,5	89,7	2,0	204	0,2	4,5	109,1

HIGH VOLTAGE CABLES BASED ON IEC 608040

TRATOS® HV-CU - 87/150 kV (170 kV)

Tratos HV cable is used for the transmission and distribution of electric power and is suitable for installation in ducts, trenches or direct buried underground or within buildings. These cables are ideal for use to connect wind farms and other renewable energy to existing grid systems.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** stranded circular compacted annealed copper
- **Conductor screen:** semi-conducting layer
- **Insulation:** XLPE
- **Insulation screen:** non metallic - semi-conducting layer and aluminium wire as metallic
- **Tape:** non-conductive water blocking
- **Moisture barrier:** copolymer coated aluminum
- **Outer sheath:** HDPE sheathed with extruded semi-conducting layer
- **Standard colour:** black
- **Marking:** TRATOS Cable type + Cable Size (e.g. "1x150") + lot production + year + metre marking

STANDARDS

- Design and Tested: IEC 60228, 60840 and 60811

Size csa	Nominal Conductor diameter	Thickness conductor screen	Thickness insulation	Thickness core screen	Nominal core diameter	Nominal diameter screen wire	Area of copper wire screen	Thickness of aluminium copolymer tape	Nominal thickness of HDPE sheath	Approximate overall diameter
mm^2	mm	mm	mm	mm	mm	mm	mm^2	mm	mm	mm
400	23,4	1,5	19,8	1,5	67,0	2,0	204	0,2	4,0	86,5
630	30,2	1,5	18,0	1,5	70,0	2,0	204	0,2	4,0	91,0
800	35,0	1,5	18,0	1,5	76,0	2,0	204	0,2	4,0	97,0
1200	46,0	1,5	17,6	1,5	86,3	2,0	204	0,2	4,5	107,0

HIGH VOLTAGE CABLES BASED ON IEC 608040

TRATOS® HV-AL - 87/150 kV (170 kV)

Tratos HV cable is used for the transmission and distribution of electric power and is suitable for installation in ducts, trenches or direct buried underground or within buildings. These cables are ideal for use to connect wind farms and other renewable energy to existing grid systems.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** stranded circular compacted aluminium
- **Conductor screen:** semi-conducting layer
- **Insulation:** XLPE
- **Insulation screen:** non metallic - semi-conducting layer and aluminium wire as metallic
- **Tape:** semiconductive water blocking
- **Moisture barrier:** copolymer coated aluminum
- **Outer sheath:** HDPE sheathed with extruded semi-conducting layer
- **Standard colour:** black
- **Marking:** TRATOS Cable type + Cable Size (e.g. "1x150") + lot production + year + metre marking

STANDARDS

- Design and Tested: IEC 60228, 60840 and 60811

Size csa	Nominal Conductor diameter	Thickness conductor screen	Thickness insulation	Thickness core screen	Nominal core diameter	Nominal diameter screen wire	Area of copper wire screen	Thickness of aluminium copolymer tape	Nominal thickness of HDPE sheath	Approximate overall diameter
mm^2	mm	mm	mm	mm	mm	mm	mm^2	mm	mm	mm
400	23,4	1,5	19,8	1,5	67,0	2,0	204	0,2	4,0	86,5
630	30,2	1,5	18,0	1,5	70,0	2,0	204	0,2	4,0	90,6
1000	40,0	1,5	18,0	1,5	81,0	2,0	204	0,2	4,5	101,1
1600	49,3	1,5	17,4	1,5	87,7	2,0	204	0,2	4,5	109,1

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