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TRATOS

CABLES FOR A MOVING WORLD

TRATOS OIL&GAS®
NEK606

February **2025**
TCn07-Re28

INDEX

TRATOS OIL&GAS® NEK606

R . . . . . Ethylene propylene (HEPR or EPR) insulation Halogen free, flame retardant
B . . . . . Mica tape + HEPR or EPR insulation Fire resistant, halogen free, flame retardant
F . . . . . Thermosetting bedding compound Halogen free, flame retardant
O . . . . . Tinned copper wire braid armour
U . . . . . SHF2 MUD thermosetting dual compound Halogen free & mud resistant Flame retardant
(c). . . . . Common screen of copper / polyester tape Tinned copper drain wire over assembled pairs / triples
(i) . . . . . Individual screen of copper / polyester tape Tinned copper drain wire over each pair / triple
P1/P8 . . . . . Power Control 0.6/1 kV Halogen free & mud resistant, flame retardant
P2/P9 . . . . . Power - medium voltage 3.6/6 kV Halogen free & mud resistant, flame retardant
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S1/S5 . . . . . Instrumentation - individual screen 250 V Halogen free & mud resistant, flame retardant
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STANDARDS AND QUALITY SYSTEM

STANDARDS

Cables manufactured according to:

NEK 606:2009 . . . . . Cables for offshore installation halogen-free and/or mud resistant.
IEC 61892-4 . . . . . Mobile and fixed offshore unit.
IEC 60092-3 . . . . . Electrical installations in ships.
IEC 60092-350 . . . . . Low voltage shipboard power cables.
General construction and test requirements.
IEC 60092-351 . . . . . Insulating materials of shipboard power cables.
IEC 60092-352 . . . . . Electrical installations in ships.
Choice and installation of cables for low-voltage power systems.
IEC 60092-353 . . . . . Single and multicore non-radical field power cables with extruded solid insulation for rated voltages 1 kV and 3 kV.
IEC 60092-359 . . . . . Sheathing materials for shipboard power and telecommunication cables.
IEC 60092-376:2003 . . . . . Electrical installations in ships.
Cables for control instrumentation circuits 150/250 V (300 V).
IEC 60331-31 . . . . . Tests for electrical cables under fire conditions.
Circuit integrity procedure and requirements for fire with mechanical shock and water spray.
Cables of rated voltage up to including 0.6/1 kV
IEC 60332-1 . . . . . Tests on electric cables under fire conditions.
Test on a single vertical insulated wire or cable.
IEC 60332-3-22. . . . . Tests for electrical cables under fire conditions.
Tests for vertical flame spread of vertically mounted bunched wires of cables - Category A.
IEC 60754-1/2 . . . . . Tests on gases evolved during combustion of electric cables.
Part 1:1994 Determination of the halogen acid gas.
Part 2:1991 Determination of the degree of acidity during the combustion of material taken from electric cables by measuring pH and conductivity.
IEC 61034-2:1991 . . . . . Measurement of smoke density of cables burning under defined conditions.
CSA C22.2 Nº 38-95 . . . . . Thermoset Insulated Wires and Cables - Wiring Products
Clause 6.4.4 Low Temperature Flexibility (-40º C)
Clause 6.4.5 Low Temperature Impact (-40º C)

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

TECHNICAL INFORMATION

The characteristics of the cables in the catalogue are subject to variances based on parameters listed below:

CONDUCTOR RESISTANCE

For low frequencies, conductor resistance is equal to DC condition.

$$R = p \cdot L / S \quad (\Omega)$$

Where:

p	Specific resistance	($\Omega \cdot mm^2/m$)
L	Length of conductor	(m)
S	Cross sectional area	(mm^2)

To calculate the influence of temperature, use:

$$Re = Re_{20}(234.5 + T) / 254.5 \quad (\Omega)$$

Where:

Re	Conductor resistance	(Ω)
Re_{20}	Conductor resistance @ 20°C	(Ω)
T	Conductor temperature	(°C)

Conductor resistance increases with frequency.

INSULATION RESISTANCE

Cable insulation resistance constant (Ki) calculation

$$Ki = L \cdot R \cdot 10^{-11} / (\log_{10} D / d)$$

Where:

R	Measured insulation resistance	(Ω)
L	Cable Length	(m)
D	Insulation outer diameter	(mm)
d	Insulation inner diameter	(mm)

TECHNICAL INFORMATION

CURRENT RATINGS

The current ratings stated in these technical specifications are applicable for cables run open or enclosed in accordance with IEC60092.352 in an ambient temperature of 45ºC.

Correction factors based on ambient temperatures other than 45ºC:

Conductor Temperature	Correction Factors for Ambient Air Temperature								
ºC	35 ºC	40 ºC	50 ºC	55 ºC	60 ºC	65 ºC	70 ºC	75 ºC	80 ºC
60	1.28	1.15	0.83						
65	1.23	1.13	0.87	0.72					
70	1.19	1.10	0.90	0.76	0.65				
75	1.15	1.08	0.92	0.82	0.71	0.58			
80	1.14	1.07	0.93	0.85	0.75	0.66	0.53		
85	1.11	1.06	0.94	0.86	0.79	0.70	0.60	0.50	
90	1.10	1.05	0.95	0.88	0.81	0.74	0.67	0.57	0.47

SHORT CIRCUIT RATINGS

The maximum short circuit current allowed for a short period of time (a few seconds) for copper or aluminium conductors can be calculated by the following formula:

$$I_{cc} = K \cdot S / \sqrt{t} \qquad (A)$$

Where:

I_{cc}	short circuit current	(A)
K	factor of the conducting material	(A)
S	area conductor	(mm^2)
t	duration of short circuit	(sec.)

K is a factor of the conducting material which is obtained from the difference between starting and final temperature of short circuit; (K copper = 143; K aluminium = 92).

ELECTRICAL CHARACTERISTICS

Instrumentation and Telecommunication Cables.

Size	Inductance	Mutual Capacitance nF/km		Loop Resistance
		Individual Screen	Common Screen	
mm^2	mH/km			Ω/km
0.5	0.76	< 85	< 75	72.2
0.75	0.72	< 85	< 75	50.4
1.0	0.68	< 96	< 81	37.0
1.5	0.67	< 99	< 89	24.4

TECHNICAL INFORMATION

REACTANCE

The reactance of a cable operating in an AC systems relates to many things, but in particular the axial distance between conductors. The reactance for 2, 3 or 4 core cables per phase is given using the following formula:

$$X = 2 \cdot \pi \cdot f \cdot L \cdot l \qquad (\Omega)$$

Where:

f	frequency	(Hz)
L	inductance	(mH/km)
l	length of conductor	(m)

The inductance (L) is calculated as follows:

$$L = 0.2[(\ln 2a / d) + 0.25] \cdot 10^{-6} \qquad (H / m)$$

Where:

a	axial distance between conductors	(mm)
d	conductor diameter	(mm)

REACTANCE VALUES FOR MEDIUM VOLTAGE CABLES

Cross Section	Three Cores Ω/km		Single Core Ω/km	
mm²	60 Hz	50 Hz	60 Hz	50 Hz
25	0.144	0.119	0.176	0.147
35	0.139	0.117	0.174	0.144
50	0.131	0.108	0.166	0.137
70	0.122	0.101	0.155	0.129
95	0.116	0.096	0.143	0.118
120	0.113	0.094	0.138	0.114
150	0.109	0.092	0.128	0.108
185	0.107	0.088	0.127	0.106
240			0.126	0.105
300			0.103	0.088

IMPEDANCE

$$Z = \sqrt{(R^2 + X^2)} \qquad (\Omega)$$

Where:

R	resistance at operating temperature	(Ω)
X	reactance	(Ω)

TECHNICAL INFORMATION

CURRENT DETERMINATION (Three-phase systems)

Current intensity can be calculated in relation to voltage and power by using the following formula:

I = 722 kW / V
I = 578 kVA / V
I = 531 HP / V

Where:

I	current intensity	(A)
V	voltage rating	(V)
kW	power (cos ψ = 0.8)	(kW)
kVA	power	(kVA)
HP	horse power	(HP)

VOLTAGE DROP

The voltage drop for cables upto 1kV can be calculated by using the following formula:

ΔV = K • I • L / 1000

Where:

I	current rating	(A)
L	length of cable	(m)

For K use the following table:

Cross Section	**2 Cores**		**3 Cores**		**3 Cores** (three foil format)	
mm²	**cos ψ = 1**	**cos ψ = 0.8**	**cos ψ = 1**	**cos ψ = 0.8**	**cos ψ = 1**	**cos ψ = 0.8**
1	45.1	36.2	39.1	31.2	38.2	30.8
1.5	30.1	24.3	26.2	21.0	25.6	20.6
2	18.2	14.7	15.6	12.7	15.5	12.6
4	11.5	9.20	9.84	7.99	9.66	7.87
6	7.58	6.18	6.53	5.35	6.40	5.29
10	4.57	3.74	3.90	3.24	3.89	3.21
16	2.90	2.40	2.41	2.06	2.41	2.04
25	1.78	1.56	1.57	1.35	1.52	1.34
35	1.31	1.14	1.12	0.986	1.10	0.992
50	0.967	0.865	0.840	0.753	0.821	0.758
70	0.670	0.623	0.578	0.545	0.568	0.555
95	0.485	0.477	0.419	0.411	0.412	0.426
120	0.381	0.398	0.333	0.345	0.321	0.359
150	0.310	0.316	0.273	0.294	0.268	0.302
185	0.250	0.290	0.217	0.252	0.215	0.265
240	0.195	0.246	0.168	0.210	0.164	0.223
300	0.158	0.214	0.134	0.184	0.133	0.197

TECHNICAL INFORMATION

CONVERSION TABLES US - METRIC CROSS SECTIONAL AREA

AWG (US)	Metric Cross Section mm²	Standard Metric Cross Section mm²
20	0.52	0.75
18	0.82	1
16	1.31	1.5
14	2.08	2.5
12	3.31	4
10	5.26	6
8	8.37	10
6	13.30	16
4	21.15	25
2	33.62	35
1	42.41	50
1/0	53.49	70
2/0	67.23	70
3/0	85.01	95
4/0	107.2	120

MCM (US)	Metric Cross Section mm²	Standard Metric Cross Section mm²
250	126.7	150
300	152.1	150
350	177.5	185
400	202.7	185
450	227.9	240
500	253.5	300
550	278.7	300
600	304.1	300
650	329.3	300
700	354.6	400
750	380.2	400
800	405.4	400
850	430.9	400
900	455.8	500
950	481.4	500
1000	506.6	500
1250	633.3	630

TECHNICAL INFORMATION

MUTUAL CAPACITANCE

A small distortion of the signal is caused as a result of low mutual capacitance and digital signal transmissions are prone to this. Factors that can result in this are the type of conductor where larger sizes lead to larger capacitance, and also the insulation thickness, which is inversely proportional.

ATTENUATION

Attenuation is the gradual loss of signal strength over the total length of the cable. Attenuation increases with frequency, the higher the frequency the higher the attenuation. Efforts are made to minimise attenuation to achieve long distance transmissions without need for amplification and with no distortion.

INTERFERENCE

Interference is noise that influences signal transmission. This interference is produced both internally in the cable (e.g. crosstalk) and externally (e.g. power equipment or high frequency generators). A suitable screen layer can be used to reduce interference with increasing frequency.

POWER AND CONTROL CABLES 0.6/1 kV ACCORDING TO NEK606

TRATOS® RFOU P1/P8

CU/EPR/ZERO HAL/TCWB/EVA - Halogen Free & MUD Resistant

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** tinned copper IEC 60228 Class 2*
- **Insulation:** halogen free EPR compound
- **Bedding:** halogen free compound
- **Armour:** Tinned copper wire braid
- **Outer sheath:** SHF2 thermoset compound halogen free & MUD resistance
- **Sheath colour:** black, other colours on request

STANDARDS

- Design and construction: IEC 60092-353
- Nominal Voltage Uo/U: 0.6/1 kV
- Operating temperature: 90°C
- Flame retardancy: IEC 60332-1; IEC 60332-3-22
- Corrosivity: IEC 60754-1; IEC 60754-2
- Smoke density: IEC 61034-2
- MUD resistance: NEK 606:2009; IEC 61892-4 Annex D
- On request: Cold bend and Impact test (-40°C) CSA C22.2 No 38-9

* Flexible construction when requested

TRATOS RFOU P1/P8 - 0,6/1 kV - Power & Control

N. of cores x c.s.a.	Insulation Thickness Nominal	Under Armour Diameter	Outer Sheath Thickness	Overall Diameter (approx)	Weight (approx)	Min. Bending Radius	Conductor Resistance at 20°C	Current rating at 45°C	Short Circuit Rating
	mm	mm	mm	mm	kg/km	mm	Ω/km	A	kA
1x16	1.0	9.4	1.2	13	345	60	1.160	98	2.33
1x25	1.2	11.0	1.5	15.5	520	70	0.735	127	3.65
1x35	1.2	12.1	1.6	17	650	80	0.530	162	5.11
1x50	1.4	13.5	1.6	18.5	830	85	0.391	214	7.30
1x70	1.6	16.0	1.7	21	1100	95	0.270	266	10.20
1x95	1.6	17.1	1.8	22.5	1370	100	.195	307	13.90
1x120	1.6	18.6	1.9	24	1650	110	0.154	359	17.50
1x150	1.8	20.3	2.0	26	2010	115	0.126	406	21.90
1x185	2.0	22.4	2.1	28.5	2420	120	0.100	493	27.00
1x240	2.2	25.5	2.2	31.5	3070	140	0.076	556	35.00
1x300	2.4	28.5	2.3	34.5	3740	155	0.061	672	43.80
2x1.5/4	1.0	9.5	1.5	13.5	275	60	12.200	17	0.21
2x2.5/7	1.0	10.3	1.5	15	350	65	7.560	24	0.35
2x4/7	1.0	11.4	1.5	16	418	75	4.700	40	0.58
2x6/8	1.0	12.5	1.6	17.5	505	80	3.110	49	0.87
2x10/10	1.0	13.7	1.6	18.5	625	85	1.840	61	1.46
2x16/16	1.0	16.3	1.8	22	890	100	1.160	81	2.33
3x1.5/5	1.0	10.1	1.5	14.5	335	65	12.200	15	0.21
3x2.5/7	1.0	11.0	1.5	15.5	395	70	7.560	22	0.36
3x4/7	1.0	12.1	1.5	17	475	75	4.7	27	0.58
3x6/8	1.0	13.4	1.6	18	585	80	3.110	37	0.87
3x10/10	1.0	14.6	1.6	19.5	745	90	1.840	56	1.46
3x16/16	1.0	17.4	1.8	23	1070	105	1.160	69	2.33
3x25/16	1.2	21.0	1.8	26.5	1505	120	.0735	100	3.65
3x35/16	1.2	23.4	2.0	29.5	1925	135	0.530	120	5.11
3x50/25	1.4	26.6	2.2	33	2565	150	0.391	140	7.30
3x70/35	1.6	32.0	2.4	39.5	3515	180	0.270	179	10.20
3x95/50	1.6	34.5	2.6	42.5	4520	190	0.195	214	13.90
3x120/60	1.6	37.9	2.8	46.5	5565	210	0.154	243	17.50
3x150/75	1.8	46.7	2.8	55	7380	250	0.126	307	21.90
3x185/95	2.0	51.8	3.0	60	9075	270	0.100	348	27.00
3x240/120	2.2	53.1	3.2	65	11375	295	0.076	394	33.80
4x1.5/6	1.0	11.0	1.5	15.5	385	70	12.200	15	0.21
4x2.5/7	1.0	12.0	1.5	16.5	455	75	7.560	22	0.36
4x4/8	1.0	13.3	1.5	18	560	80	4.700	27	0.58
4x6/8	1.0	14.6	1.6	19.5	690	90	3.110	37	0.87
4x10/10	1.0	16.0	16.	21	890	95	1.840	56	1.46
4x16/16	1.0	19.1	1.8	24.5	1295	110	1.160	69	2.33
4x25/16	1.2	23.1	1.8	28.5	1840	130	0.735	100	3.65
4x35/16	1.2	25.8	2.0	32	2365	145	0.530	120	5.11
4x50/25	1.4	29.4	2.2	37.5	3335	170	0.391	140	7.30
4x70/35	1.6	35.4	2.4	42.5	4430	190	0.270	179	10.20
4x95/50	1.6	38.1	2.6	46	5630	210	0.195	214	13.90
4x120/60	1.6	42.0	2.8	50.5	6940	230	0.154	243	17.50
7x1.5/8	1.0	13.1	1.5	17.5	510	80	12.200	9	0.20
12x1.5/10	1.0	17.5	1.7	22.5	815	100	12.200	8	0.20
19x1.5/10	1.0	20.4	1.8	25.5	1095	115	12.200	8	0.20
27x1.5/11	1.0	24.8	2.0	30.5	1525	140	12.200	7	0.20
37x1.5/13	1.0	28.0	2.2	34	1930	155	12.20	7	0.20
7x2.5/8	1.0	14.5	1.5	19.2	630	85	7.560	15	0.36
12x2.5/11	1.0	19.2	1.7	24.5	1390	110	7.560	10/2	0.36
19x2.5/11	1.0	22.7	1.8	28	1390	125	7.560	10	0.36
27x2.5/16	1.0	27.5	2.0	33.5	1985	150	7.560	8	0.36
37x2.5/16	1.0	31.1	2.2	39.5	2700	180	7.560	8	0.36

INSTRUMENTATION CABLES 250 V ACCORDING TO NEK606

TRATOS® RFOU(i) S1/S5

CU/EPR/ZERO HAL/TCWB/EVA - Halogen Free & MUD Resistant - Individual screen

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** stranded tinned copper IEC 60228 Class 2
- **Insulation:** halogen free EPR compound
- **Pairs/triples:** numbered and individually screened by copper/polyester tape + stranded tinned copper drain wire
- **Bedding:** halogen free compound
- **Armour:** tinned copper wire braid according to IEC 60092-376:2003
- **Outer sheath:** SHF2 thermoset compound halogen free & MUD resistant
- **Sheath colour:** grey (blue for intrinsically safe)

STANDARDS

- Design and construction: IEC 60092-353
- Nominal Voltage: 250 V
- Operating temperature: 90°C
- Flame Retardancy: IEC 60332-1 IEC 60332-3-22
- Corrosivity: IEC 60754-1; IEC 60754-2
- Smoke Density: IEC 61034-2
- MUD Resistance: NEK 606:2009; IEC 61892-4 Annex D
- CSA C22.2 No 38-95 Cold bend and Impact test (-40°C) (on request)

TRATOS RFOU(i) S1/S5 - 250 V - Instrumentation

N. of cores x c.s.a.	Insulation Thickness Nominal mm	Under Armour Diameter mm	Outer Sheath Thickness mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km
1x2x0.75	0.6	8.0	1.3	11.5	200	70	27.6
2x2x0.75	0.6	11.8	1.4	15.5	320	95	27.6
4x2x0.75	0.6	14.2	1.5	18.5	475	110	27.6
7x2x0.75	0.6	17.0	1.6	21.5	675	125	27.6
8x2x0.75	0.6	19.3	1.7	24	750	135	27.6
12x2x0.75	0.6	22.7	1.9	27.5	1030	160	27.6
16x2x0.75	0.6	25.1	2.0	31	1360	180	27.6
19x2x0.75	0.6	26.2	2.1	32	1555	195	27.6
24x2x0.75	0.6	30.4	2.2	35	2030	225	27.6
32x2x0.75	0.6	33.7	2.4	39	2465	245	27.6

TRATOS RFOU(i) S1/S5 - 250 V - Instrumentation

N. of cores x c.s.a.	Insulation Thickness Nominal mm	Under Armour Diameter mm	Outer Sheath Thickness mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km
1x3x0.75	0.6	8.4	1.3	12	215	75	27.6
2x3x0.75	0.6	13.1	1.5	17.5	380	105	27.6
4x3x0.75	0.6	15.5	1.6	20.5	570	120	27.6
7x3x0.75	0.6	19.5	1.7	25	840	145	27.6
8x3x0.75	0.6	21.0	1.8	26	940	155	27.6
12x3x0.75	0.6	25.8	2.0	30.5	1280	180	27.6
16x3x0.75	0.6	28.5	2.1	34	1625	200	27.6
19x3x0.75	0.6	31.5	2.2	37	1920	230	27.6
24x3x0.75	0.6	34.0	2.4	41	2370	240	27.6
32x3x0.75	0.6	38.2	2.6	46	3170	280	27.6
1x2x1	0.6	8.3	1.3	12	215	75	20.7
2x2x1	0.6	12.8	1.5	17	355	100	20.7
4x2x1	0.6	15.0	1.5	20	510	115	20.7
7x2x1	0.6	18.1	1.7	23.5	745	135	20.7
8x2x1	0.6	20.5	1.8	25.5	832	145	20.7
12x2x1	0.6	23.7	1.9	29.5	1130	165	20.7
16x2x1	0.6	26.1	2.0	32	1485	190	20.7
19x2x1	0.6	27.8	2.1	34	1705	205	20.7
24x2x1	0.6	32.2	2.4	38.5	2355	240	20.7
32x2x1	0.6	36.5	2.5	44	2790	260	20.7
1x3x1	0.6	8.8	1.3	12.5	230	75	20.7
2x3x1	0.6	14.0	1.5	18	415	105	20.7
4x3x1	0.6	16.0	1.6	21	620	125	20.7
7x3x1	0.6	21.2	1.8	26.5	940	150	20.7
8x3x1	0.6	22.1	1.9	28	1050	160	20.7
12x3x1	0.6	27.3	2.0	33.5	1460	190	20.7
16x3x1	0.6	29.8	2.2	36	2055	225	20.7
19x3x1	0.6	31.5	2.4	38.5	2370	240	20.7
24x3x1	0.6	37.0	2.5	45	2810	260	20.7
32x3x1	0.6	40.8	2.7	48.5	3550	295	20.7
1x2x1.5	0.7	9.0	1.3	12.5	240	75	14.1
2x2x1.5	0.7	13.8	1.5	18	395	105	14.1
4x2x1.5	0.7	16.5	1.6	21.5	595	120	14.1
7x2x1.5	0.7	20.0	1.7	24.5	865	145	14.1
8x2x1.5	0.7	21.8	1.9	27	980	155	14.1
12x2x1.5	0.7	26.3	2.0	32	1405	185	14.1
16x2x1.5	0.7	28.7	2.2	34.5	1770	205	14.1
19x2x1.5	0.7	29.7	2.2	36.5	2270	235	14.1
24x2x1.5	0.7	35.1	2.5	41.5	2630	250	14.1
32x2x1.5	0.7	37.5	2.6	46	3295	285	14.1
1x3x1.5	0.7	9.4	1.3	13	260	80	14.1
2x3x1.5	0.7	15.0	1.5	19.5	470	115	14.1
4x3x1.5	0.7	18.0	1.6	23.5	720	130	14.1
7x3x1.5	0.7	22.9	1.8	28	1100	160	14.1
8x3x1.5	0.7	24.0	1.9	29	1235	175	14.1
12x3x1.5	0.7	29.3	2.2	34.5	1795	205	14.1
16x3x1.5	0.7	33.3	2.3	40	2435	240	14.1
19x3x1.5	0.7	34.5	2.4	41	2710	250	14.1
24x3x1.5	0.7	38.5	2.7	45.5	3380	285	14.1
32x3x1.5	0.7	44.0	2.8	52.5	4260	320	14.1

INSTRUMENTATION CABLES 250 V ACCORDING TO NEK606

TRATOS® RFOU(c) S2/S6

CU/EPR/ZERO HAL/TCWB/EVA - Halogen Free & MUD Resistant - Common screen

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** tinned stranded copper wire IEC 60228 class 2
- **Insulation:** halogen free EPR compound
- **Assembled pairs/triples**
- **Common screen:** by copper/polyester tape + stranded tinned copper tinned drain wire
- **Bedding:** halogen free compound
- **Armour:** tinned copper wire braid according to IEC 60092-376:2003
- **Outer sheath:** SHF2 thermoset compound Halogen free & MUD resistant
- **Sheath colour:** grey (blue for intrinsically safe and others available on request)

STANDARDS

- Design and Construction: IEC 60092-376
- Nominal Voltage: 250 V
- Operating Temperature: 90° C
- Flame Retardancy: IEC 60332-1; IEC 60332-3-22
- Corrosivity: IEC 60754-1; IEC 60754-2
- Smoke Density: IEC 61034-2
- MUD Resistance: NEK 606:2009; IEC 61892-4 Annex D
- CSA C22.2 No 38-95 Cold bend and Impact test (-40°C) (on request)

TRATOS RFOU(c) S2/S6 - 250 V - Instrumentation

N. of cores x c.s.a.	Insulation Thickness Nominal mm	Under Armour Diameter mm	Outer Sheath Thickness mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km
1x2x0.75	0.6	8.0	1.3	11.5	200	70	27.6
2x2x0.75	0.6	11.5	1.4	15.5	315	95	27.6
4x2x0.75	0.6	13.8	1.5	18	435	110	27.6
7x2x0.75	0.6	16.2	1.6	20.5	590	130	27.6
8x2x0.75	0.6	18.3	1.7	22.5	660	135	27.6
12x2x0.75	0.6	21.3	1.9	26	880	160	27.6
16x2x0.75	0.6	24.2	2.0	28.5	1115	185	27.6
19x2x0.75	0.6	25.2	2.1	29.5	1300	195	27.6
24x2x0.75	0.6	29.1	2.2	33.5	1705	225	27.6
32x2x0.75	0.6	32.3	2.4	37.5	2025	245	27.6

TRATOS RFOU(c) S2/S6 - 250 V - Instrumentation

N. of cores x c.s.a.	Insulation Thickness Nominal mm	Under Armour Diameter mm	Outer Sheath Thickness mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km
1x3x0.75	0.6	8.4	1.3	12	215	75	27.6
2x3x0.75	0.6	12.9	1.5	17	360	105	27.6
4x3x0.75	0.6	15.1	1.6	19.5	505	120	27.6
7x3x0.75	0.6	19.1	1.7	24	710	145	27.6
8x3x0.75	0.6	20.5	1.8	25	790	155	27.6
12x3x0.75	0.6	24.2	2.0	29	1040	180	27.6
16x3x0.75	0.6	27.2	2.1	32	1355	200	27.6
19x3x0.75	0.6	28.9	2.2	34	1715	230	27.6
24x3x0.75	0.6	32.8	2.4	38	1960	245	27.6
32x3x0.75	0.6	36.3	2.6	42.5	2490	275	27.6
1x2x1	0.6	8.3	1.3	12	215	75	20.7
2x2x1	0.6	12.4	1.5	16.5	345	100	20.7
4x2x1	0.6	14.5	1.5	19	475	115	20.7
7x2x1	0.6	17.0	1.7	22	670	135	20.7
8x2x1	0.6	18.5	1.8	24	745	145	20.7
12x2x1	0.6	22.5	1.9	27.5	980	165	20.7
16x2x1	0.6	24.7	2.0	29	1280	190	20.7
19x2x1	0.6	26.1	2.1	31	1455	205	20.7
24x2x1	0.6	30.6	2.4	35.5	1940	240	20.7
32x2x1	0.6	34.7	2.5	40.5	2355	260	20.7
1x3x1	0.6	8.8	1.3	12.5	230	75	20.7
2x3x1	0.6	13.5	1.5	17.5	390	110	20.7
4x3x1	0.6	15.5	1.6	20	555	125	20.7
7x3x1	0.6	20.1	1.8	24.5	805	150	20.7
8x3x1	0.6	21.6	1.9	27	895	160	20.7
12x3x1	0.6	25.9	2.0	31	1210	190	20.7
16x3x1	0.6	28.5	2.2	33.5	1715	225	20.7
19x3x1	0.6	30.0	2.4	36	1965	240	20.7
24x3x1	0.6	34.5	2.5	41.5	2290	260	20.7
32x3x1	0.6	38.0	2.7	45	2850	295	20.7
1x2x1.5	0.7	9.0	1.3	12.5	240	75	14.1
2x2x1.5	0.7	13.3	1.5	17.5	390	105	14.1
4x2x1.5	0.7	15.5	1.6	20	560	120	14.1
7x2x1.5	0.7	19.0	1.7	23	785	145	14.1
8x2x1.5	0.7	20.4	1.9	25	885	155	14.1
12x2x1.5	0.7	24.9	2.0	29.5	1215	185	14.1
16x2x1.5	0.7	27.2	2.2	32	1560	205	14.1
19x2x1.5	0.7	28.2	2.2	33.5	1930	235	14.1
24x2x1.5	0.7	33.1	2.5	38.5	2305	250	14.1
32x2x1.5	0.7	33.5	2.6	43	2850	285	14.1
1x3x1.5	0.7	9.4	1.3	13	260	80	14.1
2x3x1.5	0.7	14.5	1.5	19	445	115	14.1
4x3x1.5	0.7	17.0	1.6	22	650	130	14.1
7x3x1.5	0.7	21.7	1.8	26	955	160	14.1
8x3x1.5	0.7	23.3	1.9	27	1065	175	14.1
12x3x1.5	0.7	27.8	2.2	32	1535	205	14.1
16x3x1.5	0.7	30.8	2.3	36	2080	240	14.1
19x3	1.5	19T1.5-Y	0.7	32.7	2.4	38.5	2280
24x3x1.5	0.7	37	2.7	42.5	2830	285	14.1
32x3x1.5	0.7	42	2.8	48.5	3515	320	14.1

TRATOS OIL&GAS® NEK606

MEDIUM VOLTAGE CABLES ACCORDING TO NEK606

TRATOS® RFOU P2/P9 - 3.6/6 kV
TRATOS® RFOU P3/P10 - 6/10 kV

CU/EPR/ZERO HAL/TCWB/EVA - Halogen Free & MUD Resistant

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** tinned copper IEC 60228 class 2*
- **Conductor screen:** semiconducting layer
- **Insulation:** halogen free HEPR compound
- **Insulation screen:** semiconducting layer
- **Screen:** tinned copper wire braid according to IEC 60092-352
- **Bedding:** halogen free compound
- **Armour:** tinned copper wire braid
- **Outer sheath:** SHF2 thermoset compound halogen free & MUD resistant
- **Sheath colour:** red (other colours available on request)

STANDARDS

- Design and Construction: IEC 60092-354; IEC 60502
- Nominal Voltage: 3.6/6 kV 6/10 kV
- Maximal Rated Temperature: 90° C
- Flame Retardancy: IEC 60332-1; IEC 60332-3-22**
- Corrosivity: IEC 60754-1; IEC 60754-2
- Smoke Density: IEC 61034-2
- MUD Resistance: NEK 606:2009; IEC 61892-4 Annex D
- CSA C22.2 No 38-95 Cold bend and Impact test (-40°C) (on request)

* Flexible construction when requested

** Fire resistant upon request

TRATOS RFOU P2/P9 - 3.6/6 kV - Medium Voltage

N. of cores x c.s.a.	Conductor Diameter (approx) mm	Under Armour Diameter mm	Diam. over Bedding (approx) mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km	Current rating at 45°C A	Short Circuit Rating kA
1x25	6.1	14.1	18.5	23.5	900	190	0.734	140	3.4
1x35	7.2	15.2	20.5	25.5	1170	205	0.529	171	5.0
1x50	8.3	16.3	22.5	29	1360	230	0.391	204	7.1
1x70	10.3	18.4	25.0	30	1650	240	0.270	257	9.9
1x95	11.8	19.8	27.0	32	1960	255	0.195	314	13.5
1x120	13.2	21.3	29.0	34	2270	270	0.154	363	17.0
1x150	14.3	22.5	30.0	36	2550	290	0.126	410	21.2
1x185	16.5	24.5	32.0	38.5	3190	310	0.100	472	26.0
1x240	19.0	27.1	34.5	40	3715	320	0.076	558	34.5
1x300	22.0	30.0	37.0	44.5	4580	360	0.061	640	43.0
3x25	6.1	14.1	39.5	45.5	3220	365	0.734	102	3.4
3x35	7.2	15.2	43.0	48.5	3820	390	0.53	123	5.0
3x50	8.3	16.3	46.5	53	4550	425	0.391	148	7.1
3x70	10.3	18.4	49.0	56	5610	450	0.270	185	9.9
3x95	11.8	19.8	52.5	61	6880	490	0.195	224	13.5
3x120	13.2	21.3	56.0	63.5	7930	510	0.154	259	17.0
3x150	14.3	22.5	58.0	67	9390	535	0.126	292	21.2
3x185	16.5	24.5	65.0	74	11,100	590	0.100	336	26.0

TRATOS RFOU P3/P10 - 6/10 kV - Medium Voltage

N. of cores x c.s.a.	Conductor Diameter (approx) mm	Under Armour Diameter mm	Diam. over Bedding (approx) mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km	Current rating at 45°C A	Short Circuit Rating kA
1x25	6.1	15.4	21.0	25.5	950	205	0.734	140	3.4
1x35	7.2	16.5	22.5	27.5	1190	220	0.529	172	5.0
1x50	8.3	17.6	23.5	31.0	1400	240	0.391	204	7.1
1x70	10.3	19.6	25.0	31.5	1740	250	0.270	255	9.9
1x95	11.8	21.0	27.0	33	2080	260	0.195	313	13.5
1x120	13.2	22.4	29.0	35	2390	280	0.154	361	17.0
1x150	14.3	23.6	30.5	37	2790	295	0.126	409	21.2
1x185	16.5	25.7	32.5	39	3360	310	0.100	472	26.0
1x240	19.0	28.3	35.5	42	3930	335	0.076	555	34.5
1x300	22.0	31.1	38.5	47.5	4800	380	0.061	637	43.0
3x25	6.1	15.4	41.5	47	3390	375	0.735	111	3.4
3x35	7.2	16.5	44.5	50.5	4100	405	0.530	133	5.0
3x50	8.3	17.6	48.5	55	4780	440	0.391	159	7.1
3x70	10.3	19.6	51.0	58	5920	465	0.270	198	9.9
3x95	11.8	21.0	54.0	63.5	7190	510	0.195	293	13.5
3x120	13.2	22.4	59.0	66.5	8340	530	0.154	275	17.0
3x150	14.3	23.6	62.0	70	9750	560	0.126	307	21.2
3x185	16.5	25.7	67.0	77	11,720	615	0.100	351	26.0

MEDIUM VOLTAGE CABLES ACCORDING TO NEK606

TRATOS® RFOU P4/P11 - 8.7/15 kV
TRATOS® RFOU P19/P21 - 12/20 kV

CU/EPR/ZERO HAL/TCWB/EVA - Halogen Free & MUD Resistant

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** tinned copper IEC 60228 class 2*
- **Conductor screen:** semiconducting layer
- **Insulation:** halogen free HEPR compound
- **Insulation screen:** semiconducting layer
- **Screen:** tinned copper wire braid according to IEC 60092-352
- **Bedding:** halogen free compound
- **Armour:** tinned copper wire braid
- **Outer sheath:** SHF2 thermoset compound halogen free & MUD resistant
- **Sheath colour:** red (other colours available on request)

STANDARDS

- Design and Construction: IEC 60092-354; IEC 60502
- Nominal Voltage: 8.7/15 kV - 12/20 kV
- Maximum Rated Temperature: 90° C
- Flame Retardancy: IEC 60332-1; IEC 60332-3-22**
- Corrosivity: IEC 60754-1; IEC 60754-2
- Smoke Density: IEC 61034-2
- MUD Resistance: NEK 606:2009; IEC 61892-4 Annex D
- CSA C22.2 No 38-95 Cold bend and Impact test (-40°C) (on request)

* Flexible construction when requested

** Fire resistant upon request

TRATOS RFOU P4/P11 - 8.7/15 kV - Medium Voltage

N. of cores x c.s.a.	Conductor Diameter (approx) mm	Under Armour Diameter mm	Diam. over Bedding (approx) mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km	Current rating at 45°C A	Short Circuit Rating kA
1x25	6.1	18.1	22.5	28	1280	225	0.734	138	3.4
1x35	7.2	19.2	24.0	30	1420	240	0.529	167	5.0
1x50	8.3	20.3	25.5	33	1630	265	0.391	201	7.1
1x70	10.3	22.3	28.0	34.5	1950	275	0.270	252	9.9
1x95	11.8	23.7	29.0	36	2260	290	0.195	307	13.5
1x120	13.2	25.1	30.5	37.5	2580	300	0.154	354	17.0
1x150	14.3	26.3	32.0	39.5	3090	315	0.126	402	21.2
1x185	16.5	28.3	33.5	41	3580	330	0.100	460	26.0
1x240	19.0	30.9	37.5	44.5	4450	355	0.076	551	34.5
1x300	22.0	33.9	41.0	49	5180	395	0.061	625	43.0
3x25	6.1	18.1	45.0	53	4270	425	0.735	110	3.4
3x35	7.2	19.2	48.0	56	4890	450	0.530	134	5.0
3x50	8.3	20.3	51.5	59	5650	470	0.391	159	7.1
3x70	10.3	22.3	54.5	64	6850	510	.0270	198	9.9
3x95	11.8	23.7	59.0	68.5	8110	550	0.195	239	13.5
3x120	13.2	25.1	63.0	72	9750	575	0.154	275	17.0
3x150	14.3	26.3	67.0	76.5	10,900	610	0.126	351	21.1

TRATOS RFOU P19/P21 - 12/20 kV - Medium Voltage

N. of cores x c.s.a.	Conductor Diameter (approx) mm	Under Armour Diameter mm	Diam. over Bedding (approx) mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km	Current rating at 45°C A	Short Circuit Rating kA
1x50	8.3	21.3	27.0	32.5	1910	260	0.391	201	7.1
1x70	10.3	23.4	28.5	34	2220	270	0.270	252	9.9
1x95	11.8	25.3	30.2	36	2590	290	0.195	307	13.5
1x120	13.2	26.4	31.5	37.5	2980	300	0.154	354	17.0
1x150	14.3	27.6	33.5	39.5	3450	315	0.126	402	21.2
1x185	16.5	29.8	36.0	43	4120	345	0.100	460	26.0
1x240	19.0	32.5	39.5	46.5	4740	370	0.076	551	34.5
1x300	22.0	35.4	42.2	50.5	5420	405	0.061	625	43.0
3x50	8.3	21.3	60.0	67.5	7050	540	0.391	159	7.1
3x70	10.3	23.4	62.5	70	8200	560	0.270	198	9.9
3x95	11.8	25.3	65.0	74	9550	590	0.195	239	13.5
3x120	13.2	26.4	67.5	78	11,000	625	0.154	275	17.0
3x150	14.3	27.6	71.0	82	12,900	655	0.126	351	21.2

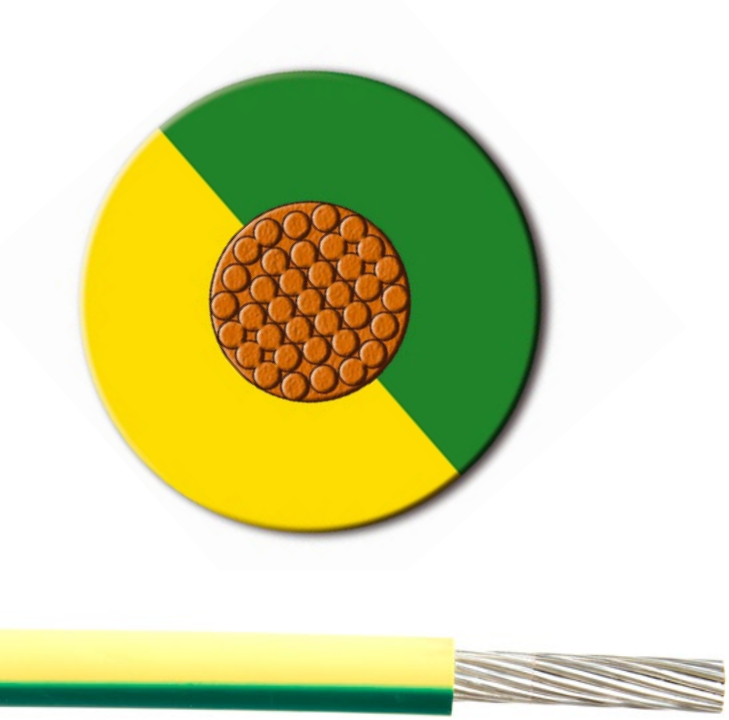
TRATOS OIL&GAS® NEK606

EARTHING CABLES 1000 V ACCORDING TO IEC 60092-354

TRATOS® UX P15

CU/EVA - Halogen Free & MUD Resistant

FEATURES AND PERFORMANCES



CONSTRUCTION

- **Conductor:** tinned copper IEC 60228 Class 2
- **Insulation:** SHF2 thermoset compound halogen free & MUD resistant

STANDARDS

- Design and Construction: IEC 60092-354
- Flame retardancy : IEC 60332-1
- Corrosivity: IEC 60754-1; IEC 60754-2
- Smoke density: IEC 61034-1-2
- MUD resistance : NEK 606:2009; IEC 61892-4 Annex D
- on request :Cold bend and Impact test (-40 Deg C) CSA C22.2 No 38-95

Working Specifications:		
Chemicals resistance	**Good**	Outer sheath resistance to chemicals (oil, extra oil and fuel resistance)
Impacts	**Good**	Cable mechanical resistance to impacts
Temperature	**-25°C/-40°C** **+90°C**	Permissible minimum ambient temperature during laying and maximum conductor temperature in normal operation (+90°C) Compound resistance at low temperature (-40°C; -40°C)
Bending radius	**D < 12 mm: r = 3D** **D > 12 mm: r = 4D**	Minimum bending radius for installed cables

TRATOS UX P15 - 1000 V - Earthing Cable

N. of cores x c.s.a.	Insulation Thickness Nominal mm	Conductor Diameter (approx) mm	Overall Diameter (approx) mm	Weight (approx) kg/km
6	1.0	3.15	5.5 ± 0.8	80
10	1.0	4.05	6.5 ± 0.8	120
16	1.0	5.15	7.5 ± 0.8	180
25	1.2	6.40	9.5 ± 0.8	280
35	1.2	7.65	10.5 ± 1.0	370
50	1.4	9.00	12.5 ± 1.0	520
70	1.4	10.85	14.5 ± 1.0	730
95	1.6	12.60	16.5 ± 1.0	970
120	1.6	14.20	18.5 ± 1.0	1220
150	1.8	15.90	20.0 ± 1.5	1520
185	2.0	17.70	22.0 ± 1.5	1890
240	2.2	20.15	25.0 ± 1.5	2450
300	2.4	22.60	28.0 ± 1.5	3090

POWER AND CONTROL CABLES 0.6/1 kV ACCORDING TO NEK606

TRATOS® BFOU P5/P12

CU/MT/EPR/ZERO HAL/TCWB/EVA - Halogen Free, MUD Resistant & Fire Resistant

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Tinned copper IEC 60228 class 2*
- **Insulation:** mica tape + halogen free EPR compound
- **Separator** (if necessary)**:** halogen free tape
- **Bedding:** halogen free compound
- **Armour:** tinned copper wire braid according to IEC 60092-352
- **Outer sheath:** SHF2 thermoset compound halogen free & MUD resistant
- **Sheath colour:** black (other colours available on request)

STANDARDS

- Design and construction: IEC 60092-353
- Nominal Voltage: 0.6/1 kV
- Operating temperature: 90°C
- IEC 60332-1 IEC 60332-3-22 Flame retardancy
- IEC 60331-31 Fire resistant
- IEC 60754-1 IEC 60754-2 Corrosivity
- IEC 61034-2 Smoke density
- NEK 606:2009 & IEC 61892-4 Annex D MUD resistance
- CSA C22.2 No 38-95 Cold bend and impact test (-40°C) (on request)

* Flexible construction when requested

TRATOS BFOU P5/P12 - 0,6/1 kV - power and control

N. of cores x c.s.a.	Insulation Thickness Nominal	Under Armour Diameter	Outer Sheath Thickness	Overall Diameter (approx)	Weight (approx)	Min. Bending Radius	Conductor Resistance at 20°C	Current rating at 45°C	Short Circuit Rating
	mm	mm	mm	mm	kg/km	mm	Ω/km	A	kA
1x16	1.0	10.0	1.2	13.5	365	60	1.160	104	2.33
1x25	1.2	11.6	1.5	16.5	545	70	0.735	139	3.65
1x35	1.2	12.7	1.6	17.5	675	80	0.530	168	5.11
1x50	1.4	14.1	1.6	19	860	85	0.391	208	7.30
1x70	1.6	16.6	1.7	21.5	1130	95	0.270	261	10.20
1x95	1.6	17.8	1.8	23	1400	105	0.195	319	13.90
1x120	1.6	19.2	1.9	24.5	1960	110	0.154	371	17.50
1x150	1.8	21.0	2.0	26.5	2050	120	0.126	423	21.90
1x185	2.0	23.1	2.1	29	2460	130	0.100	480	27.00
1x240	2.2	26.2	2.2	32.5	3115	145	0.076	568	35.00
1x300	2.4	29.0	2.3	35.5	3960	160	0.061	649	43.80
2x1.5/4	1.0	10.7	1.5	15	325	70	12.200	19	0.21
2x2.5/7	1.0	11.5	1.5	16	400	75	7.560	27	0.35
2x4/7	1.0	12.6	1.5	17	470	80	4.700	37	0.58
2x6/8	1.0	13.7	1.6	18.5	560	85	3.110	47	0.87
2x10/10	1.0	14.9	1.6	20	685	90	1.840	66	1.46
2x16/16	1.0	17.5	1.8	23	960	105	1.160	89	2.33
3x1.5/5	1.0	11.4	1.5	16	400	70	12.200	16	0.21
3x2.5/7	1.0	12.2	1.5	17	450	75	7.560	23	0.36
3x4/7	1.0	13.4	1.5	18	535	80	4.700	31	0.58
3x6/8	1.0	14.6	1.6	19.5	645	90	3.110	39	0.87
3x10/10	1.0	15.9	1.6	21	810	95	1.840	54	1.46
3x16/16	1.0	18.7	1.8	24.5	1155	110	1.160	73	2.33
3x25/16	1.2	22.4	1.8	28	1600	125	0.735	97	3.65
3x35/16	1.2	24.7	2.0	30.5	2025	140	0.530	118	5.11
3x50/25	1.4	28.0	2.2	34.5	2675	155	0.391	146	7.30
3x70/35	1.6	33.4	2.4	40.5	3705	180	0.270	183	10.20
3x95/50	1.6	35.8	2.6	44	4760	200	0.195	223	13.90
3x120/60	1.6	39.4	2.8	48	5735	215	0.154	259	17.50
3x150/75	1.8	48.4	2.8	57	7700	255	0.126	296	21.90
3x185/95	2.0	53.5	3.0	62	9480	280	0.100	337	27.00
3x240/120	2.2	55.0	3.2	67.5	11,750	305	0.076	398	33.80
4x1.5/6	1.0	12.4	1.5	17	450	75	12.200	16	0.21
4x2.5/7	1.0	13.4	1.5	18	525	80	7.560	23	0.36
4x4/8	1.0	14.7	1.5	19.5	625	90	4.700	31	0.58
4x6/8	1.0	16.1	1.6	21	765	95	3.110	39	0.87
4x10/10	1.0	17.5	1.6	22.5	970	100	1.840	54	1.46
4x16/16	1.0	20.6	1.8	26	1395	115	1.160	73	2.33
4x25/16	1.2	24.6	1.8	30	1950	135	0.735	97	3.65
4x35/16	1.2	27.3	2.0	33.5	2485	150	0.530	118	5.11
4x50/25	1.4	30.9	2.2	39	3480	175	0.391	146	7.30
4x70/35	1.6	36.9	2.6	44	4585	200	0.270	183	10.20
4x95/50	1.6	39.6	2.6	47.5	5800	215	0.195	223	13.90
4x120/60	1.6	43.6	2.8	52	7145	235	0.154	259	17.50
7x1.5/8	1.0	14.9	1.5	19.5	600	90	12.200	12	0.21
12x1.5/10	1.0	20.0	1.7	25	935	110	12.200	10	0.21
19x1.5/10	1.0	23.4	1.8	28.5	1240	130	12.200	9	0.21
27x1.5/11	1.0	28.5	2.0	36	1895	160	12.200	8	0.21
37x1.5/13	1.0	32.2	2.2	39	2395	175	12.200	8	0.21
7x2.5/8	1.0	16.3	1.5	21	725	95	7.560	17	0.36
12x2.5/11	1.0	21.6	1.7	26.5	1175	120	7.560	13	0.36
19x2.5/11	1.0	25.7	1.8	31	1615	140	7.560	12	0.36
27x2.5/16	1.0	31.2	2.0	39	2495	175	7.560	10	0.36
37x2.5/16	1.0	35.3	2.2	43	3150	195	7.560	10	0.36

INSTRUMENTATION CABLES 250 V ACCORDING TO NEK606

TRATOS® BFOU(i) S3/S7

CU/MT/EPR/ZERO HAL/TCWB/EVA - Halogen Free, MUD Resistant & Fire Resistant - Individual Screen

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Tinned stranded copper IEC 60228 class 2
- **Insulation:** mica tape + halogen free EPR compound
- **Pairs/triples:** numbered and individually screened by copper/polyester tape + tinned copper drain wire
- **Bedding:** halogen free compound
- **Armour:** Tinned copper wire braid according to IEC 60092-376:2004
- **Outer sheath:** SHF2 thermoset compound halogen free & MUD resistant
- **Sheath colour:** grey or blue for intrinsically safe (other colours available on request)

STANDARDS

- Design and construction: IEC 60092-353
- Nominal Voltage: 250 V
- Operating temperature: 90°C
- IEC 60332-1 IEC 60332-3-22 Flame retardancy
- IEC 60331-31 Fire resistant
- IEC 60754-1 IEC 60754-2 Corrosivity
- IEC 61034-2 Smoke density
- NEK 606:2009 IEC 61892-4 Annex D MUD resistance
- CSA C22.2 No 38-95 Cold bend and Impact test (-40°C) (on request)

TRATOS BFOU(i) S3/S7 - 250 V - Instrumentation

N. of cores x c.s.a.	Insulation Thickness Nominal mm	Under Armour Diameter mm	Outer Sheath Thickness mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km
1x2x0.75	0.6	8.4	1.3	12	215	75	27.6
2x2x0.75	0.6	13.0	1.4	16.5	360	105	27.6
4x2x0.75	0.6	15.0	1.5	19.5	505	120	27.6
7x2x0.75	0.6	17.3	1.6	22	700	140	27.6
8x2x0.75	0.6	19.9	1.7	25	780	150	27.6
12X2x0.75	0.6	23.2	1.9	28.5	1040	180	27.6
16x2x0.75	0.6	25.3	2.0	32	1360	205	27.6
19x2x0.75	0.6	26.3	2.1	33	1715	230	27.6
24x2x0.75	0.6	30.5	2.2	37.5	1850	240	27.6
32x2x0.75	0.6	34.2	2.4	40	2415	275	27.6

TRATOS BFOU(i) S3/S7 - 250 V - Instrumentation

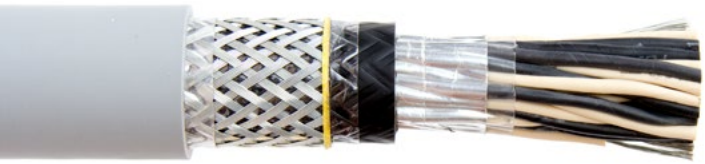
N. of cores x c.s.a.	Insulation Thickness Nominal	Under Armour Diameter	Outer Sheath Thickness	Overall Diameter (approx)	Weight (approx)	Min. Bending Radius	Conductor Resistance at 20°C
	mm	mm	mm	mm	kg/km	mm	Ω/km
1x3x0.75	0.6	9.0	1.3	12.5	235	75	27.6
2x3x0.75	0.6	14.1	1.5	18.5	410	115	27.6
4x3x0.75	0.6	16.5	1.6	21	580	130	27.6
7x3x0.75	0.6	21.3	1.7	25	830	160	27.6
8x3x0.75	0.6	22.3	1.8	27.5	925	170	27.6
12x3x0.75	0.6	26.5	2.0	31.5	1230	200	27.6
16x3x0.75	0.6	28.5	2.1	34	1785	240	27.6
19x3x0.75	0.6	31.5	2.2	37	1845	245	27.6
24x3x0.75	0.6	35.8	2.4	42.5	2320	275	27.6
32x3x0.75	0.6	39.1	2.6	45.5	2960	315	27.6
1x2x1	0.6	9.1	1.3	13	240	75	20.7
2x2x1	0.6	14.0	1.5	18	405	110	20.7
4x2x1	0.6	15.5	1.5	20	565	130	20.7
7x2x1	0.6	18.5	1.7	23.5	805	150	20.7
8x2x1	0.6	21.0	1.8	26	890	160	20.7
12x2x1	0.6	25.1	1.9	30	1185	190	20.7
16x2x1	0.6	26.5	2.0	32	1720	230	20.7
19x2x1	0.6	28.5	2.1	35	1950	245	20.7
24x2x1	0.6	33.1	2.4	38.5	2265	265	20.7
32x2x1	0.6	36.5	2.5	43	2870	300	20.7
1x3x1	0.6	9.6	1.3	13.5	260	80	20.7
2x3x1	0.6	15.0	1.5	18.5	455	120	20.7
4x3x1	0.6	17.5	1.6	23	665	140	20.7
7x3x1	0.6	22.5	1.8	24.5	965	170	20.7
8x3x1	0.6	23.5	1.9	29.5	1075	185	20.7
12x3x1	0.6	28.5	2.0	34	1635	225	20.7
16x3x1	0.6	30.5	2.2	36	1895	245	20.7
19x3x1	0.6	32.6	2.4	39.5	2180	265	20.7
24x3x1	0.6	38.0	2.5	44.5	2780	300	20.7
32x3x1	0.6	42.0	2.7	49.5	3470	335	20.7
1x2x1.5	0.7	9.7	1.3	13.5	260	80	14.1
2x2x1.5	0.7	14.0	1.5	18.5	450	120	14.1
4x2x1.5	0.7	16.8	1.6	21.5	655	135	14.1
7x2x1.5	0.7	20.1	1.7	25	930	160	14.1
8x2x1.5	0.7	23.1	1.9	28.5	1045	175	14.1
12x2x1.5	0.7	26.4	2.0	31.5	1390	210	14.1
16x2x1.5	0.7	29.1	2.2	34.5	1780	235	14.1
19x2x1.5	0.7	30.5	2.2	36	2215	255	14.1
24x2x1.5	0.7	35.5	2.5	42	2750	285	14.1
32x2x1.5	0.7	39.0	2.6	45.5	3415	320	14.1
1x3x1.5	0.7	10.2	1.3	14	285	85	14.1
2x3x1.5	0.7	15.5	1.5	20	515	130	14.1
4x3x1.5	0.7	18.5	1.6	22.5	765	150	14.1
7x3x1.5	0.7	23.5	1.8	27	1130	185	14.1
8x3x1.5	0.7	25.5	1.9	30	1300	195	14.1
12x3x1.5	0.7	30.6	2.2	35.5	2000	235	14.1
16x3x1.5	0.7	34.0	2.3	39.5	2380	265	14.1
19x3x1.5	0.7	35.5	2.4	41.5	2715	286	14.1
24x3x1.5	0.7	40.8	2.7	47	3370	320	14.1
32x3x1.5	0.7	46.0	2.8	52.5	4200	360	14.1

INSTRUMENTATION 250 V CABLES ACCORDING TO NEK606

TRATOS® BFOU(c) S4/S8

CU/MT/EPR/ZERO HAL/TCWB/EVA - Halogen Free, MUD Resistant & Fire Resistant - Common Screen

FEATURES AND PERFORMANCES



CONSTRUCTION

- **Conductor:** Tinned stranded compacted copper IEC 60228 class 2
- **Insulation:** mica tape + halogen free EPR compound
- **Assembled pairs/triples**
- **Common screen:** copper/polyester tape tinned copper drain wire
- **Bedding:** halogen free compound
- **Armour:** tinned copper wire braid according to IEC 60092-376:2003
- **Outer sheath:** SHF2 thermoset compound halogen free & MUD resistant
- **Sheath colour:** grey (blue for intrinsically safe)

STANDARDS

- Design and construction: IEC 60092-353
- Nominal Voltage: 250 V
- Operating temperature: 90°C
- IEC 60332-1 IEC 60332-3-22 Flame retardancy
- IEC 60331-31 Fire resistant
- IEC 60754-1 IEC 60754-2 Corrosivity
- IEC 61034-2 Smoke density
- NEK 606:2009 IEC 61892 Annex D MUD resistance
- CSA C22.2 No 38-95 Cold bend and Impact test (-40°C) (on request)

TRATOS BFOU(c) S4/S8 - 250 V - Instrumentation

N. of cores x c.s.a.	Insulation Thickness Nominal mm	Under Armour Diameter mm	Outer Sheath Thickness mm	Overall Diameter (approx) mm	Weight (approx) kg/km	Min. Bending Radius mm	Conductor Resistance at 20°C Ω/km
1x2x0.75	0.6	8.4	1.3	12	215	75	27.6
2x2x0.75	0.6	13.1	1.4	17	360	100	27.6
4x2x0.75	0.6	15.4	1.5	20	530	120	27.6
7x2x0.75	0.6	18.6	1.6	23	760	140	27.6
8x2x0.75	0.6	20.7	1.7	26	855	150	27.6
12X2x0.75	0.6	23.9	1.9	30	1165	175	27.6
16x2x0.75	0.6	27.2	2.0	33.5	1535	200	27.6
19x2x0.75	0.6	28.5	2.1	36.5	1925	225	27.6
24x2x0.75	0.6	33.0	2.2	40	2300	250	27.6
32x2x0.75	0.6	36.0	2.4	45	2800	270	27.6

TRATOS BFOU(c) S4/S8 - 250 V - Instrumentation

N. of cores x c.s.a.	Insulation Thickness Nominal	Under Armour Diameter	Outer Sheath Thickness	Overall Diameter (approx)	Weight (approx)	Min. Bending Radius	Conductor Resistance at 20°C
	mm	mm	mm	mm	kg/km	mm	Ω/km
1x3x0.75	0.6	9.0	1.3	12.5	235	75	27.6
2x3x0.75	0.6	14.4	1.5	19.5	430	110	27.6
4x3x0.75	0.6	17.5	1.6	22	645	130	27.6
7x3x0.75	0.6	21.4	1.7	26.5	960	155	27.6
8x3x0.75	0.6	23.5	1.8	28.5	1075	170	27.6
12x3x0.75	0.6	27.5	2.0	33	1465	195	27.6
16x3x0.75	0.6	30.7	2.1	36.5	2000	235	27.6
19x3x0.75	0.6	32.5	2.2	39.5	2335	240	27.6
24x3x0.75	0.6	37.3	2.4	46	2820	270	27.6
32x3x0.75	0.6	41.5	2.6	51.5	3640	310	27.6
1x2x1	0.6	9.1	1.3	13	240	75	20.7
2x2x1	0.6	14.0	1.5	19	405	110	20.7
4x2x1	0.6	16.3	1.5	21.5	590	125	20.7
7x2x1	0.6	19.2	1.7	25	865	150	20.7
8x2x1	0.6	21.5	1.8	27.5	965	160	20.7
12x2x1	0.6	26.0	1.9	32	1410	185	20.7
16x2x1	0.6	27.8	2.0	34.5	1890	225	20.7
19x2x1	0.6	30.0	2.1	37.5	2155	240	20.7
24x2x1	0.6	34.5	2.5	41.5	2680	260	20.7
32x2x1	0.6	38.0	2.5	46	3245	295	20.7
1x3x1	0.6	9.6	1.3	13.5	260	80	20.7
2x3x1	0.6	15.5	1.5	19.5	475	120	20.7
4x3x1	0.6	18.3	1.6	24	720	135	20.7
7x3x1	0.6	23.5	1.8	28	1095	170	20.7
8x3x1	0.6	25.0	1.9	31	1230	180	20.7
12x3x1	0.6	29.5	2.0	36	1875	220	20.7
16x3x1	0.6	32.5	2.2	40	2230	240	20.7
19x3x1	0.6	33.8	2.4	43.5	2735	260	20.7
24x3x1	0.6	39.9	2.5	48	3300	290	20.7
32x3x1	0.6	44.0	2.7	53	4180	330	20.7
1x2x1.5	0.7	9.7	1.3	13.5	260	80	14.1
2x2x1.5	0.7	14.6	1.5	19	450	115	14.1
4x2x1.5	0.7	18.0	1.6	23	675	135	14.1
7x2x1.5	0.7	21.5	1.7	27	985	160	14.1
8x2x1.5	0.7	24.0	1.9	30.5	1120	170	14.1
12x2x1.5	0.7	27.9	2.0	34	1605	205	14.1
16x2x1.5	0.7	31.0	2.2	37	2055	240	14.1
19x2x1.5	0.7	34.0	2.2	41	2420	250	14.1
24x2x1.5	0.7	37.8	2.5	46	3020	280	14.1
32x2x1.5	0.7	44.0	2.6	52	3960	315	14.1
1x3x1.5	0.7	10.2	1.3	14	285	85	14.1
2x3x1.5	0.7	16.5	1.5	21	535	125	14.1
4x3x1.5	0.7	20.0	1.6	24.5	830	145	14.1
7x3x1.5	0.7	24.5	1.8	29	1270	180	14.1
8x3x1.5	0.7	27.0	1.9	32	1425	190	14.1
12x3x1.5	0.7	31.5	2.2	38	2255	230	14.1
16x3x1.5	0.7	36.5	2.3	43	2730	260	14.1
19x3x1.5	0.7	37.5	2.4	46	3140	280	14.1
24x3x1.5	0.7	42.5	2.7	51	3915	315	14.1
32x3x1.5	0.7	47.0	2.8	56	4945	355	14.1

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February 2025