

REV. 10



CCI

ControlCavi Industria

OFFSHORE CABLES

NEK 606 : 2016

with **FIREBAR®** the TOTAL SAFETY fire and water resistant cable



CCI Quality

DNV-GL

MANAGEMENT SYSTEM CERTIFICATE

Certificato no./Certificate No.: CERT-01319-96-AQ-RQM-SINCERT Data prima emissione/Initial date: 03 dicembre 1996 Validità/Valid: 31 ottobre 2017 - 31 ottobre 2020

Si certifica che il sistema di gestione di/This is to certify that the management system of

CONTROLCAVI INDUSTRIA S.r.l.

S.S. Casalini Km. 78.600 - 03013 Ferentino (FR) - Italy

È conforme ai requisiti della norma per il Sistema di Gestione Qualità/
has been found to conform to the Quality Management System standard:

UNI EN ISO 9001:2015 (ISO 9001:2015)

Questa certificazione è valida per il seguente campo applicativo:
Progettazione e produzione di conduttori e cavi elettrici per bassa e media tensione
(Settore EA: 19 - 14)

This certificate is valid for the following scope:
Design and manufacture of conductors and electrical cables for low and medium voltages
(EA Sector: 19 - 14)

Lungo e Data/Place and date:
Vimercate (MB), 31 luglio 2017

Per l'Organismo di Certificazione/
For the Certification Body

ACCREDIA

Nicola Privato
Management Representative

La validità del presente Certificato è subordinata al rispetto delle condizioni contenute nel Contratto di Certificazione/
Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.
CCI s.p.a. Business Assurance Italia S.r.l., Via Energy Park, 14 - 20091 Vimercate (MI) - Italy - Tel: +39 0362 99 900 - www.dnvgl.it/certification

CCI Environmental

DNV-GL

MANAGEMENT SYSTEM CERTIFICATE

Certificato no./Certificate No.: 117616-2013-AE-ITA-ACCREDIA Data prima emissione/Initial date: 25 giugno 2013 Validità/Valid: 25 giugno 2018 - 25 giugno 2021

Si certifica che il sistema di gestione di/This is to certify that the management system of

CONTROLCAVI INDUSTRIA S.r.l. - Sede Amministrativa ed Operativa

S.S. Casalini Km. 78.600 - 03013 Ferentino (FR) - Italy

È conforme ai requisiti della norma per il Sistema di Gestione Ambientale/
Has been found to conform to the Environmental Management System standard:

ISO 14001:2015

Valutato secondo le prescrizioni del Regolamento Tecnico RT-09/
Evaluated according to the requirements of Technical Regulations RT-09

Questa certificazione è valida per il seguente campo applicativo:
Progettazione e produzione di conduttori e cavi elettrici per bassa e media tensione, attraverso le fasi di trafilatura, trefolatura, isolamento, spiratura, estrusione, confezionamento e collaudo
(EA 19, 14)

This certificate is valid for the following scope:
Design and manufacture of conductors and electrical cables for low and medium voltages, through the phases of drawing, stranding, insulation, twisting, extrusion, packaging and testing
(EA 19, 14)

Lungo e Data/Place and date:
Vimercate (MB), 25 maggio 2018

Per l'Organismo di Certificazione/
For the Certification Body

ACCREDIA

Zeno Beltrami
Management Representative

La validità del presente Certificato è subordinata al rispetto delle condizioni contenute nel Contratto di Certificazione/
Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.
CCI s.p.a. Business Assurance Italia S.r.l., Via Energy Park, 14 - 20091 Vimercate (MI) - Italy - Tel: +39 0362 99 900 - www.dnvgl.it

CCI Health & Safety

DNV-GL

MANAGEMENT SYSTEM CERTIFICATE

Certificato no./Certificate No.: 121510-2012-ASISO-ITA-RVA Data prima emissione/Initial date: 12 settembre 2012 Validità/Valid: 12 settembre 2018 - 12 marzo 2021

Si certifica che il sistema di gestione di/This is to certify that the management system of

CONTROLCAVI INDUSTRIA S.r.l. - Sede Amministrativa e Operativa

S.S. Casalini Km. 78.600 - 03013 Ferentino (FR) - Italy

È conforme ai requisiti della norma per il Sistema di Gestione della Salute e Sicurezza sul Lavoro/
has been found to conform to the Occupational Health and Safety Management System standard:

OHSA 18001:2007

Questa certificazione è valida per il seguente campo applicativo:
Progettazione e produzione di conduttori e cavi elettrici per bassa e media tensione
(EA 19, 14)

This certificate is valid for the following scope:
Design and manufacturing of conductors and electrical cables for low and medium voltages
(EA 19, 14)

Lungo e Data/Place and date:
Vimercate (MB), 15 giugno 2018

Per l'Organismo di Certificazione/
For the Issuing Office

DNV GL - Business Assurance
Via Energy Park, 14 - 20091 Vimercate (MB) - Italy

Zeno Beltrami
Management Representative

La validità del presente Certificato è subordinata al rispetto delle condizioni contenute nel Contratto di Certificazione/
Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT - DNV GL Business Assurance Italia S.p.A. - ZUCCHETTI 1, 2794 US, SAVENHOUT, NETHERLANDS, TEL: +31 187023445, www.dnvgl.com

CABLE SERVICE Quality

DNV-GL

MANAGEMENT SYSTEM CERTIFICATE

Certificato no./Certificate No.: 108/94/S Data prima emissione/Initial date: 18.05.2018 Validità/Valid: 18.05.2021

Si certifica che il sistema di gestione per la qualità di/IT IS HEREBY CERTIFIED THAT THE QUALITY MANAGEMENT SYSTEM OF

CABLE SERVICE S.R.L.

VIALE CAMPANIA, 31 20133 Milano (MI) ITALIA

NELLE SEGUENTI UNITÀ OPERATIVE / IN THE FOLLOWING OPERATIONAL UNITS

STRADA PROVINCIALE, 117 20010 Bernate Ticino (MI) ITALIA

È CONFORME ALLA NORMA / IS IN COMPLIANCE WITH THE STANDARD

ISO 9001:2015

PER I SEGUENTI CAMPI DI ATTIVITÀ / FOR THE FOLLOWING FIELD(S) OF ACTIVITIES

TAGLIO, MISURAZIONE, CONFEZIONAMENTO E COMMERCIALIZZAZIONE DI CAVI ELETTRICI E RELATIVE PROVE E COLLAUDI FINALI

CUTTING, MEASURING, PACKAGING AND TRADE OF ELECTRIC CABLES AND RELATED TESTING AND FINAL INSPECTION

La validità del presente certificato è subordinata al rispetto delle condizioni contenute nel Contratto di Certificazione/
The validity of this certificate is dependent on an annual / six monthly audit and on a complete review, every three years, of the management system.
L'uso e la validità del presente certificato sono soggetti al rispetto del documento RQM, Regolamento per la Certificazione di Sistemi di Gestione per la Qualità.
The use and validity of this certificate are subject to compliance with the RQM document - Rules for the certification of Quality Management Systems

Prima emissione First issue	09.05.1994	Data decisione di rinnovo Renewal decision date	18.05.2018
Data scadenza Expiry Date	27.05.2021	Data revisione Revision date	18.05.2018

Principale Fattore
Main Management System
Certification Head

RINA Services S.p.A.
Via Corsica 12 - 10128 Genova Italy

ACCREDIA

IAF

CISQ

La validità del presente Certificato è subordinata al rispetto delle condizioni contenute nel Contratto di Certificazione/
Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.
Cable Service S.p.A. - Via Corsica 12 - 10128 Genova Italy - Tel: +39 010 5511111 - www.cable-service.it

Offshore cables NEK 606 : 2016

Halogen free
Low smoke
Flame retardant
Fire resistant

Fire & water resistant FIREBAR®

Oils & MUDs resistant



CCI offshore cables

according to NEK 606:2016

Are designed and manufactured for installations in the inhospitable conditions where oil & gas rigs are usually working (saline atmosphere, UV radiation, extremes of temperature, hydrocarbons, oils, drilling fluids and muds) still maintaining the highest levels of performance. Recognized by the most acknowledged Certification Bodies (refer to page 8), they present remarkable characteristics such as:

■ **CONDUCTOR:** an unique **flexible Class 2 conductor**, originally patented by CCI and still utilised in all ships and offshore cables designs, allows for such **ease of installation** and thus reducing the time and cost, an ease of handling in the restrictions and confines of vessels and offshore platforms.

The formation and manufacture process of our conductors, not only allows for the cables to safely be handled/installed at **4 times the Outer Diameter of the cable** (normally allowed by Class 5 conductors), but with a cable affording superior handling characteristics (normally found with Class 5 conductors) we **still maintain the Class 2 electrical characteristics**, giving the added advantage over Class 5 conductors, which have higher resistance values and thus reduced ampacity.

■ **INSULATION:** improved Ethylene Propylene Rubber (**EPR**) and Hard grade Ethylene Propylene Rubber (**HEPR**) for MV cables, are formulated and proven for conductor operating temperatures **greater than 100 °C** (refer to page 7)

■ **FLAMEBAR®:** CCI has never compromised in choosing the components used to produce its cables, and **Flamebar® tapes** used in all constructions are testament of this. The high temperature resistance of these **fibre glass tapes** afford a very good **heat barrier** and further enhance non propagation of the flame of all our cables.

■ **OUTER SHEATH SHF2 H-M oils & Muds resistant:** is compliant with SHF2, as stated in IEC 60092-360, together with the highest level of resistance when tested in **Mineral, Hydraulic oils and Muds (type H-M)** as defined in **Table 1 of NEK 606:2016** (refer to Generals section).

■ **LOW OPERATING TEMPERATURE:** CCI's compounds, used in the production of ship and offshore cables, are formulated and proven, according to CSA standards, to operate down to **-40 °C**.

■ **SUNLIGHT, UV & OZONE RESISTANCE:** the whole range of sheathing compounds have been independently type tested to pass the most severe requirements of the standards for these critical factors **when cables are installed externally** on-board ships and offshore units.



CCI cable Fire resistance

When fire breaks out in remote locations, such as oil/gas platforms or ships, the survival of all on board, and the containment of damage to equipment and structure, depends on the effectiveness of anti-fire devices, which are undoubtedly powered and controlled by electrical cables.

The cables installed in areas, with an assessed potential risk of fire, are always specified to be fire resistant.

At CCI, our manufacturing programme includes two cable constructions with substantial differences in their capabilities of maintaining circuit integrity, whilst sustain fire damage and the effects of extinguishing:

traditional

Until recently, standards have legislated for a resistance to fire, and maintaining circuit integrity against the effects of fire **ONLY**.

Once these cable types are attempted to be extinguished with water (the usual method for fire extinguishing) the cables fail, as the protection of conductors relies solely upon a **mica glass tape(s) which do not support water**.

Mica glass tape, as a sole fire barrier, also has limitations in that it is **only** useful for voltages **up to 1kV**.

Fire tests are according to **IEC 60331-1 or IEC 60331-2** applicable to the appropriate diameter of cable under test, with a requirement of **Fire** (at least 830°C) **only and Mechanical shocks for a duration up to 2 hours**.

FIREBAR®

The research and development to the 'age old' issue of installing a fire resistant cable that survives all aspects of fire and the extinguishing effects and is as easy to install as a conventional cable, has culminated in the CCI patented design of **FIREBAR®**.

The extensive proving and re-proving of the design allowed CCI to offer a guarantee for all **TOTAL SAFETY** on board, with unequalled performance.

FIREBAR® not only continues to operate in fire conditions, as you would expect, but, due to a unique design, fully functions whilst subject simultaneously attack of **Fire, Mechanical shocks and a Water spray or Water jets** combination.

What this means is that **FIREBAR®** provides, for an **extended time to 2 hours**, for safe evacuation of personnel and subsequent fire extinguishing.

FIREBAR® cables are already installed on platforms operated by BP, Total & Saipem, Shell & Technip, on SBM FPSOs and FNLGs and also where significant numbers of people would potentially be contained on Cruise ships operated by Carnival Group and built by Fincantieri.

FIREBAR® constructions, when manufactured to IEC standards, cover the range from **150/250 Volt** (Instrument types) **up to 12/20 kV** (Medium Voltage), and all in between.

The most stringent requirements set for cable testing have been in accordance to:

- **BS7846:2000 Category F3** for instrumentation and Low Voltage Power cables
- **BS8491** for Medium Voltage Power cables

When submitted to the requirements of the a.m. standards, **FIREBAR®** cables, **powered at nominal voltage rate**, demonstrate their survival and continued operation against the combined effects of **Fire** (at least 830°C) + **Mechanical Shocks** + **Water Spray or Water Jets, for a test timing of 2 hours**, even when considering Medium Voltage cables.

Furthermore, beyond the requirements of ANY INTERNATIONAL STANDARDS, **FIREBAR® burned cables**, after fully surviving 2 hours tests, as detailed above, **are then immersed in water, still powered**, to demonstrate the integrity of the construction (even after the effects of fire damage and extinguishing) and continued operation.





Insulating Compound

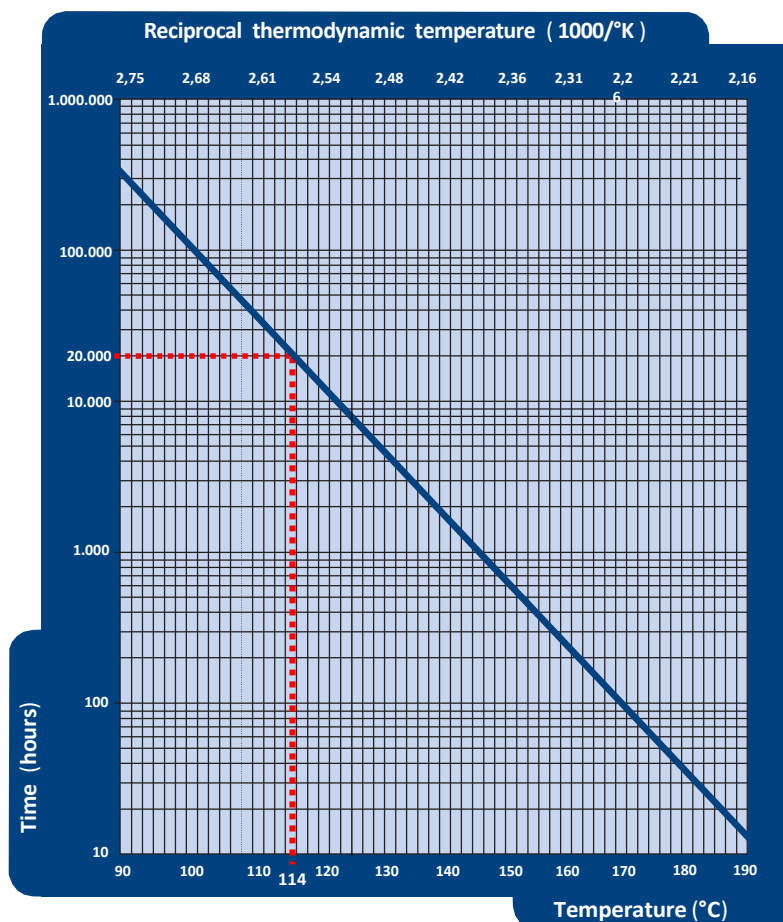
The maximum operating temperature allowed in an electrical cable depends on the insulating material.

CCI developed improved **(H)EPR** insulating compounds which offer superior **insulation constant (Ki)** and improved ageing performance at higher operating temperature than 90°C requested by IEC 60092-360

Arrhenius graph, hereunder reported, shows the **Temperature Index Ti(*)** achieved by performing a **Thermal Endurance Evaluation** (witnessed by DNV) on **(H)EPR** compounds in accordance to IEC 60216 standards

$$Ti = 114^{\circ}\text{C}$$

(*) Temperature Index (Ti) is the the maximum continuous working temperature at which full insulation characteristics are still maintained.



Product type approvals



American Bureau of Shipping (USA)



Det Norske Veritas -
Germanischer Lloyd (Norway)



Lloyd's Register (UK)



Reference standards

NEK 606:2016	Cables for offshore installations
IEC 60092-350	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications. Choice and installation of cables for low-voltage power system.
IEC 60092-353	Electrical installations in ships - Power cables for rated voltages 1 kV and 3 kV
IEC 6002-354	Single and three core power cables with extruded solid insulation for rated voltages 6 kV up to 30 kV.
IEC 60092-360	Insulation and sheathing materials for shipboard and offshore units, power control and instrumentation cables.
IEC 60092-376	Electrical installations in ships - Cables for control and instrumentation circuits 150 / 250 V (300 V).
IEC 60331-1	Tests for electric cables under fire conditions. Part 1: Test method for fire with shock at a temperature of at least 830°C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter exceeding 20 mm.
IEC 60331-2	Part 2: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter not exceeding 20 mm.
IEC 60332-1-2	Test for vertical flame propagation for a single insulated wire or cable. Procedure for 1 kW pre-mixed flame
IEC 60332-3-22	Tests on electric cables under fire conditions. Tests for vertical flame spread of vertically-mounted bunched wires of cables - Category A.
IEC 60754-1	Test on gases evolved during combustion of electric cables. Part 1: Determination of the halogen acid gas
IEC 60754-2	Part 2: Determination of acidity (by pH measurement) and conductivity.
IEC 61034-1 & 2	Measurement of smoke density of cables burning under defined conditions.
IEC 60533	Electrical and electronic installations in ships. Electromagnetic compatibility (EMC). Ships with a metallic hull
CSA C 22.2 N° 38-05	Thermoset insulated wires and cables Clause 5.11 - Cold bend and impact @ - 40 Deg C
UL 1581	§ 1200 - Sunlight (UV) resistance.
BS 7846:2000	Annex L – Fire resistance test Cat F3
BS 8491	Method for assessment of fire integrity of large diameter power cables

Manufacturing Program

cable codes according to NEK 606:2016

Flame Retardant

P101 RFOU H-M		page 14
Power & Control, armoured	0,6/1 kV	
RFOU H-M VFD EMC		page 17
Power, armoured for Variable Frequency Driver	1,8/3 kV	
P108 UX H-M		page 19
Earth	0,6/1 kV	
P111 RU H-M		page 21
Power & Control, unarmoured	0,6/1 kV	
P102 RFOU H-M		page 25
Medium Voltage, armoured	3,6 /6 kV	
RFOU H-M VFD EMC		page 27
for Variable Frequency Drive systems	3,6 /6 kV	
P103 RFOU H-M		page 29
Medium Voltage, armoured	6/10 kV	
RFOU H-M VFD EMC		page 31
for Variable Frequency Drive systems	6/10 kV	
P104 RFOU H-M		page 33
Medium Voltage, armoured	8,7/15 kV	
RFOU H-M VFD EMC		page 35
for Variable Frequency Drive systems	8,7/15 kV	
P112 RFOU H-M		page 37
Medium Voltage, armoured	12/20 kV	
RFOU H-M VFD EMC		page 39
for Variable Frequency Drive system	12/20 kV	
P113 RFOU H-M		page 41
Medium Voltage, armoured	18/30 kV	
S101 RFOU(i) H-M		page 44
Instrumentation, individual screen, armoured	250 V	
S102 RFOU(c) H-M		page 47
Instrumentation, common screen, armoured	250 V	
S105 RU(i) H-M		page 50
Instrumentation, individual screen, unarmoured	250 V	
S106 RU(c) H-M		page 53
Instrumentation, common screen, unarmoured	250 V	

Manufacturing Program

cable codes according to NEK 606:2016

Flame Retardant Fire Resistant

P105 BFOU H-M		page 58
Power & control, armoured	0,6/1 kV	
P110 BU H-M		page 61
Power & control, unarmoured	0,6/1 kV	
S103 BFOU(i) H-M		page 65
Instrumentation, individual screen, armoured	250 V	
S104 BFOU(c) H-M		page 68
Instrumentation, common screen, armoured	250 V	
S107 BU(i) H-M		page 71
Instrumentation, individual screen, unarmoured	250 V	
S108 BU(c) H-M		page 74
Instrumentation, ind. & com. screen, unarmoured	250 V	

FIREBAR®

Flame Retardant Fire & Water Resistant

P120 RFOU H-M FIREBAR®		page 79
Medium voltage, armoured	3,6/6 kV	
P121 RFOU H-M FIREBAR®		page 81
Medium voltage, armoured	6/10 kV	
P122 RFOU H-M FIREBAR®		page 83
Medium voltage, armoured	8,7/15 kV	
P123 RFOU H-M FIREBAR®		page 85
Medium voltage, armoured	12/20 kV	
P125 SFOU H-M FIREBAR®		page 87
Power & control, armoured	0,6/1 kV	
S112 SFOU (ic) H-M FIREBAR®		page 90
Instrumentation, ind. & com. Screen, armoured	250 V	
S113 SFOU (c) H-M FIREBAR®		page 92
Instrumentation, common screen, armoured	250 V	

Electrical data

Flame retardant - Fire resistant	page 94
FIREBAR® Fire & water resistant	page 102

Generals

	page 108
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Low voltage Power & Control VFD EMC Earth

**Flame retardant
Oils & MUDs resistant**



Flame retardant tests

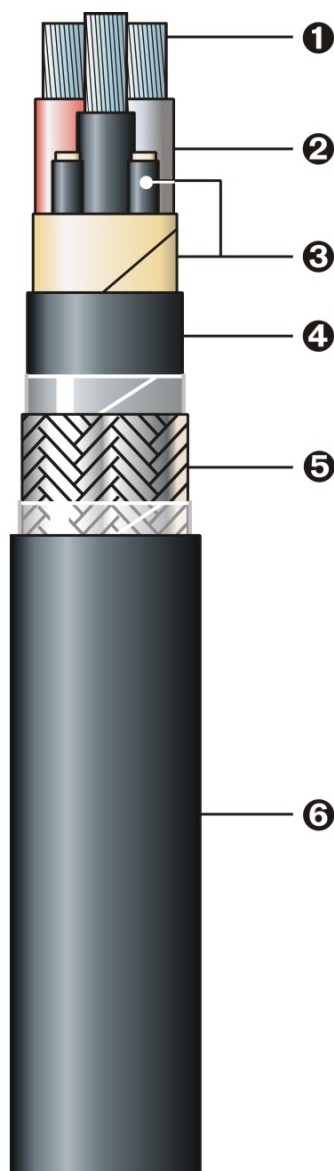
IEC 60332-1-2
on single cable



IEC 60332-3-22 Category A
on bunched cables



power & control 0,6/1 kV
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
operating temperature over 100 °C
 (see page 7)



Design and construction	IEC 60092-353	NEK 606:2016
Nominal voltage U₀ / U	0,6/1 kV	
Maximum Voltage U_{max}	1,2 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 INSULATION	EPR HF compound IEC 60092-360
3 BEDDING & FILLERS	FLAMEBAR® fiberglass tape(s) (*) + fiberglass ropes, EPR sheathed (when sect. ≥ 16 mm²)
4 INNER SHEATH	HF extruded compound
5 ARMOUR	tinned copper wire braid
6 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white	4 cores	off-white	black	red	blue
2 cores	off-white	black	5 cores and above	white & numbered		
3 cores	off-white	black	red			

Sheath colour	black
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Minimal sheath marking

CCI P101 RFOU H-M 0,6/1 kV n x sect mm² IEC 60092-353 NEK 606
 IEC 60332-3-22 Cat A meter marking year QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx.
n		[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	16	5.2	1.0	10,9	15	480
1	x	25	6.5	1.2	12,6	17	620
1	x	35	7.5	1.2	13,6	18	745
1	x	50	8.3	1.4	14,7	19	900
1	x	70	10.0	1.4	16,4	21	1145
1	x	95	11.8	1.6	18,6	24	1500
1	x	120	13.2	1.6	20,4	26	1800
1	x	150	14.6	1.8	22,2	28	2150
1	x	185	16.5	2.0	24,5	30	2630
1	x	240	19.0	2.2	27,8	34	3320
1	x	300	21.8	2.4	31	38	4030
2	x	1,5	1,6	1,0	9.5	14	290
2	x	2,5	2,0	1,0	10.5	15	350
2	x	4	2,8	1,0	12.1	17	470
2	x	6	3,3	1,0	13.1	18	560
2	x	10	4,1	1,0	15.3	21	770
2	x	16	5,2	1,0	17.5	24	990
3	x	1,5	1,6	1,0	9,8	14	320
3	x	2,5	2,0	1,0	10,6	16	380
3	x	4	2,8	1,0	12,4	18	560
3	x	6	3,3	1,0	13,4	19	640
3	x	10	4,1	1,0	15,2	22	890
3	x	16	5,2	1,0	17,6	25	1.190
3	x	25	6,5	1,2	21,2	29	1.610
3	x	35	7,5	1,2	23,4	32	2.100
3	x	50	8,3	1,4	26,0	35	2.720
3	x	70	10,0	1,4	30,0	39	3.550
3	x	95	11,8	1,6	34,8	45	4.700
3	x	120	13,2	1,6	37,8	49	5.650
3	x	150	14,6	1,8	42,1	53	6.970
3	x	185	16,5	2,0	47,1	59	8.520
3	x	240	19,0	2,2	53,3	66	10.790
3	x	300	21,8	2,4	60,3	77	13.370

0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
n [mm ²]			nominal [mm]	nominal [mm]	nominal [mm]	approx [mm]	approx [kg/km]
4	x	1,5	1,6	1,0	11,0	15	390
4	x	2,5	2,0	1,0	12,2	16	470
4	x	4	2,8	1,0	14,5	19	680
4	x	6	3,3	1,0	15,9	22	850
4	x	10	4,1	1,0	18,5	24	1.100
4	x	16	5,2	1,0	21,5	27	1.500
4	x	25	6,5	1,2	25,3	33	2.110
4	x	35	7,5	1,2	27,8	35	2.640
4	x	50	8,3	1,4	31,0	38	3.440
4	x	70	10,0	1,4	35,5	43	4.510
4	x	95	11,8	1,6	41,2	49	5.950
4	x	120	13,2	1,6	45,0	54	7.270
4	x	150	14,6	1,8	48,2	57	8.550
4	x	185	16,5	2,0	54,2	64	10.775
4	x	240	19,0	2,2	61,0	71	13.760
4	x	300	21,8	2,4	69,0	79	16.480

5	x	1,5	1,6	1,0	13,3	18	500
7	x	1,5	1,6	1,0	14,5	19	590
12	x	1,5	1,6	1,0	19,2	25	930
19	x	1,5	1,6	1,0	22,8	28	1240
37	x	1,5	1,6	1,0	30,8	37	2140

5	x	2,5	2,0	1,0	14,8	19	590
7	x	2,5	2,0	1,0	16,1	21	720
12	x	2,5	2,0	1,0	21,5	27	1150
19	x	2,5	2,0	1,0	25,4	31	1480
37	x	2,5	2,0	1,0	34,4	41	2755

power 1,8/3 kV

(for Variable Frequency Drives)

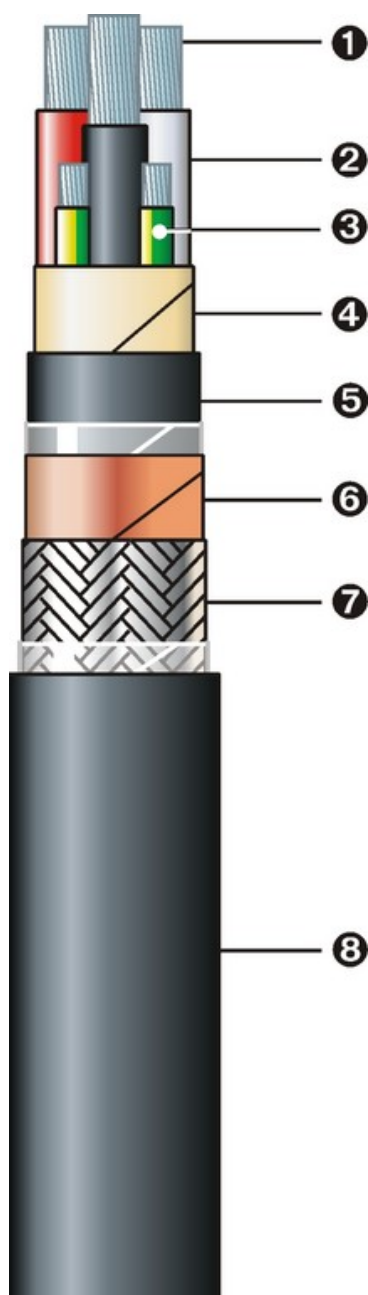
halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

electromagnetic shield – armoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-353	NEK 606:2016
Nominal voltage U_0 / U	1,8/3 kV	(U_{max} 3,6 kV)
Operating voltage U_0 / U	0,6/1 kV	
Maximum Voltage U_{max}	1,2 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
ElectroMagnetic Compatibility	IEC 60533	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5	IEC 60228
2 INSULATION	EPR HF compound	IEC 60092-360
3 EARTH CONDUCTORS	tinned copper flexible CI 2, EPR sheathed	
4 BEDDING	FLAMEBAR® fiberglass tape(s) (*)	
5 INNER SHEATH	HF extruded compound	
6 ELECTROMAGNETIC SHIELD	plain copper tape (*)	
7 ARMOUR	tinned copper wire braid	
8 OUTER SHEATH	SHF2 H-M compound	NEK 606:2016
	separator PE tapes (*) where necessary	
	(*) tape overlapping ≥ 50 %	

Cores identification

3 cores	off-white	black	red
earth	green / yellow		

Sheath colour

black

Minimal sheath marking

CCI	RFOU H-M VFD EMC 1,8/3 kV	n x sect	mm ²	IEC 60092-353	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA n°		

- Minimum Bending Radius: **4D** (Overall Diameter) - see **Generals** section

1,8/3 kV

CONSTRUCTION				CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
CONDUCTORS		EARTHS						
n	[mm ²]	n	[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
3	x 10	3	x 2,5	4,1	2,2	22,9	29	1.390
3	x 16	3	x 4	5,2	2,2	25,2	32	1.750
3	x 25	3	x 6	6,5	2,2	28,0	35	2.200
3	x 35	3	x 6	7,5	2,2	30,2	37	2.530
3	x 50	3	x 10	8,3	2,2	32,4	39	2870
3	x 70	3	x 16	10,0	2,2	36,2	43	3.690
3	x 95	3	x 16	11,7	2,4	40,8	48	4.720
3	x 120	3	x 25	13,0	2,4	44,0	51	5.680
3	x 150	3	x 25	14,4	2,4	47,0	55	6.630
3	x 185	3	x 35	16,3	2,4	52,2	60	8.230

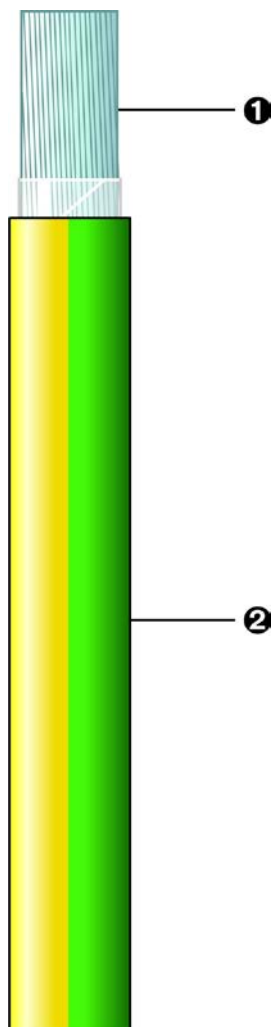
earth 0,6/1 kV

halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

operating temperature over 100 °C

(see page 6)



Design and construction	IEC 60092-353	NEK 606:2016
Nominal voltage U₀ / U	0,6/1 kV	
Maximum Voltage U_{max}	1,2 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 OUTER SHEATH	SHF2 H-M compound NEK 606:2016 separator PE tape over conductor overlapping ≥ 50 %

Sheath colour

yellow - green

Minimal sheath marking

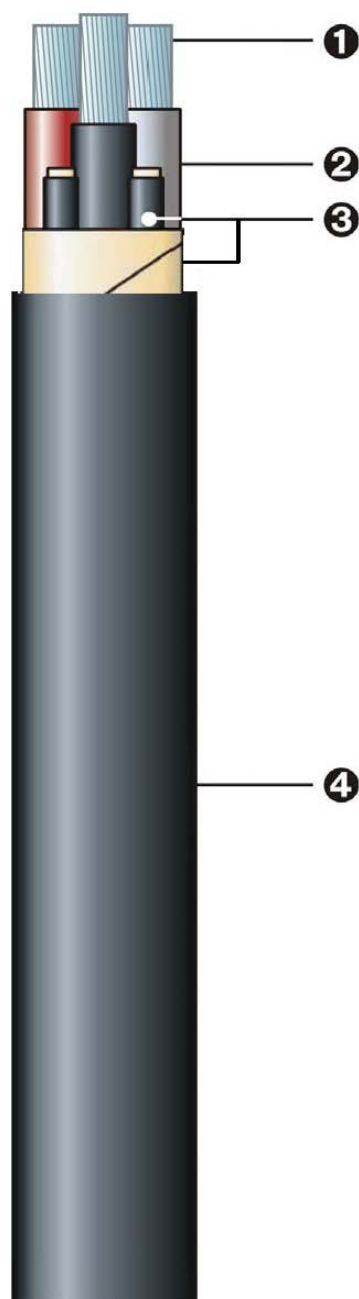
CCI P108 UX H-M 0,6/1 kV sect mm² IEC 60092-353 NEK 606
IEC 60332-3-22 Cat A meter marking year QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) - see **Generals** section

0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	SHEATH THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx.
n		[mm ²]	[mm]	[mm]	[mm]	[kg/km]
1	x	6	3,3	1,0	5	115
1	x	10	4,1	1,0	6	155
1	x	16	5,2	1,0	7	220
1	x	25	6,5	1,2	9	300
1	x	35	7,5	1,2	10	390
1	x	50	8,3	1,4	11	490
1	x	70	10,0	1,4	13	670
1	x	95	11,8	1,6	15	920
1	x	120	13,2	1,6	16	1.170
1	x	150	14,6	1,8	18	1.445
1	x	185	16,5	2,0	20	1.930
1	x	240	19,0	2,2	23	2.425
1	x	300	21,8	2,4	31	3.000

power & control 0,6/1 kV
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
unarmoured
operating temperature over 100 °C
 (see page 7)



Design and construction	IEC 60092-353	NEK 606:2016
Nominal voltage U₀ / U	0,6/1 kV	
Maximum Voltage U_{max}	1,2 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 INSULATION	EPR HF compound IEC 60092-360
3 BEDDING & FILLERS	FLAMEBAR® fiberglass tape(s) (*) + fiberglass ropes, EPR sheathed (when sect. ≥ 16 mm ²)
4 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white	4 cores	off-white	black	red	blue
2 cores	off-white	black	5 cores and above	white & numbered		
3 cores	off-white	black	red			

Sheath colour

black

Minimal sheath marking

CCI	P111 RU H-M	0,6/1 kV	n x sect mm ²	IEC 60092-353	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA n°		

- Minimum Bending Radius: **4D** (Overall Diameter) - see **Generals** section

0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx.
n		[mm ²]	[mm]	[mm]	[mm]	[kg/km]
1	x	16	5,2	1,0	10	300
1	x	25	6,5	1,2	12	440
1	x	35	7,5	1,2	13	560
1	x	50	8,3	1,4	14	720
1	x	70	10,0	1,4	16	950
1	x	95	11,8	1,6	19	1.300
1	x	120	13,2	1,6	20	1.560
1	x	150	14,6	1,8	22	1.920
1	x	185	16,5	2,0	25	2.410
1	x	240	19,0	2,2	28	3.100
1	x	300	21,8	2,4	31	3.740
2	x	1,5	1,6	1,0	10	140
2	x	2,5	2,0	1,0	11	170
2	x	4	2,8	1,0	13	220
2	x	6	3,3	1,0	14	290
2	x	10	4,1	1,0	15	370
2	x	16	5,2	1,0	18	540
3	x	1,5	1,6	1,0	11	170
3	x	2,5	2,0	1,0	12	210
3	x	4	2,8	1,0	13	280
3	x	6	3,3	1,0	15	370
3	x	10	4,1	1,0	17	490
3	x	16	5,2	1,0	19	730
3	x	25	6,5	1,2	23	1.040
3	x	35	7,5	1,2	25	1.370
3	x	50	8,3	1,4	28	1.800
3	x	70	10,0	1,4	32	2.450
3	x	95	11,8	1,6	38	3.400
3	x	120	13,2	1,6	41	4.140
3	x	150	14,6	1,8	45	5.040
3	x	185	16,5	2,0	50	5.580
3	x	240	19,0	2,2	57	7.280
3	x	300	21,8	2,4	65	9.970

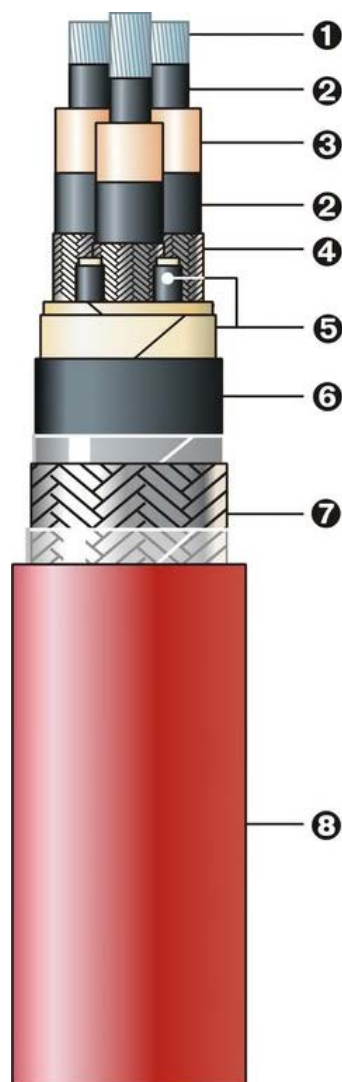
0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER	INSULATION THICKNESS	OVERALL DIAMETER	WEIGHT
n		[mm ²]	nominal [mm]	nominal [mm]	approx [mm]	approx [kg/km]
4	x	1,5	1,6	1,0	12	190
4	x	2,5	2,0	1,0	13	240
4	x	4	2,8	1,0	15	320
4	x	6	3,3	1,0	16	440
4	x	10	4,1	1,0	18	600
4	x	16	5,2	1,0	21	900
4	x	25	6,5	1,2	25	1.300
4	x	35	7,5	1,2	28	1.730
4	x	50	8,3	1,4	31	2.270
4	x	70	10,0	1,4	36	3.110
4	x	95	11,8	1,6	42	4.340
4	x	120	13,2	1,6	45	5.280
4	x	150	14,6	1,8	50	6.290
4	x	185	16,5	2,0	56	8.040
4	x	240	19,0	2,2	63	11.000
4	x	300	21,8	2,4	71	13.280
5	x	1,5	1,6	1,0	13	260
7	x	1,5	1,6	1,0	14	320
12	x	1,5	1,6	1,0	19	500
19	x	1,5	1,6	1,0	22	720
27	x	1,5	1,6	1,0	27	1.000
37	x	1,5	1,6	1,0	30	1.320
5	x	2,5	2,0	1,0	14	330
7	x	2,5	2,0	1,0	15	400
12	x	2,5	2,0	1,0	20	640
19	x	2,5	2,0	1,0	24	940
27	x	2,5	2,0	1,0	29	1.310
37	x	2,5	2,0	1,0	33	1.740

Medium voltage & VFD EMC

Flame retardant
Oils & MUDs resistant

3,6/6 kV - radial field
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
operating temperature over 100 °C
(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U₀ / U	3,6/6 kV	
Maximum Voltage U_{max}	7,2 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 SEMICONDUCTORS	HF extruded compound
3 INSULATION	HEPR HF compound IEC 60092-360
4 SCREEN	tinned copper wire braid
5 BEDDING & FILLERS	FLAMEBAR® fiberglass tape(s) (*) + fiberglass ropes, HEPR sheathed
6 INNER SHEATH	HF extruded compound
7 ARMOUR	tinned copper wire braid
8 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white
3 cores	off-white (identification by coloured or numbered tapes)

Sheath colour

red

Minimal sheath marking

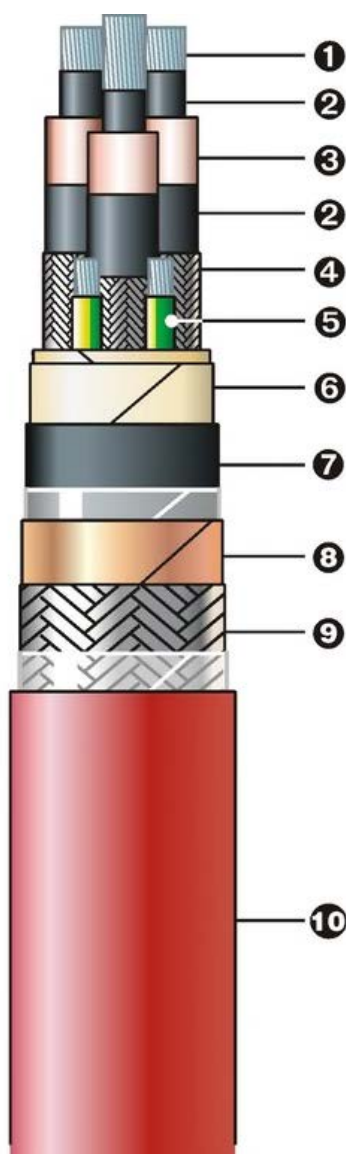
CCI P102 RFOU H-M	3,6/6 kV	n x sect mm ²	IEC 60092-354	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA n°	

- Minimum Bending Radius: **4/5D** according to Overall Diameter - see **Generals** section

3,6 / 6 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n	[mm ²]		[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	25	6,5	2,5	20,9	26	1.060
1	x	35	7,5	2,5	21,8	27	1.200
1	x	50	8,3	2,5	22,7	28	1.350
1	x	70	10,0	2,5	24,4	30	1.620
1	x	95	11,8	2,5	26,2	32	1.960
1	x	120	13,2	2,5	27,6	34	2.250
1	x	150	14,6	2,5	29,0	35	2.570
1	x	185	16,5	2,5	30,9	38	3.120
1	x	240	19,0	2,6	33,7	41	3.820
1	x	300	21,8	2,8	37,4	45	4.570
3	x	25	6,5	2,5	40,3	48	2.960
3	x	35	7,5	2,5	43,3	51	3.540
3	x	50	8,3	2,5	45,1	53	4.020
3	x	70	10,0	2,5	48,8	57	4.890
3	x	95	11,8	2,5	53,4	62	6.160
3	x	120	13,2	2,5	56,8	66	7.040
3	x	150	14,6	2,5	59,8	69	8.030
3	x	185	16,5	2,5	64,5	74	9.600

3,6/6 kV - radial field
(for Variable Frequency Drives)
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
operating temperature over 100 °C
(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U₀ / U	3,6/6 kV	
Maximum Voltage U_{max}	7,2 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
ElectroMagnetic Compatibility	IEC 60533	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5	IEC 60228
2 SEMICONDUCTORS	halogen free compound	
3 INSULATION	HEPR HF compound	IEC 60092-360
4 SCREEN	tinned copper wire braid	
5 EARTH CONDUCTORS	tinned copper flexible Cl 2 , HEPR sheathed	
6 BEDDING	FLAMEBAR® fiberglass tape(s) (*)	
7 INNER SHEATH	HF extruded compound	
8 ELECTROMAGNETIC SHIELD	plain copper tape (*)	
9 ARMOUR	tinned copper wire braid	
10 OUTER SHEATH	SHF2 H-M compound	NEK 606:2016
	separator PE tapes (*) where necessary	
	(*) tape overlapping ≥ 50 %	

Cores identification

3 cores	off-white (identification by coloured or numbered tapes)
earth	yellow-green

Sheath colour	red
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Minimal sheath marking

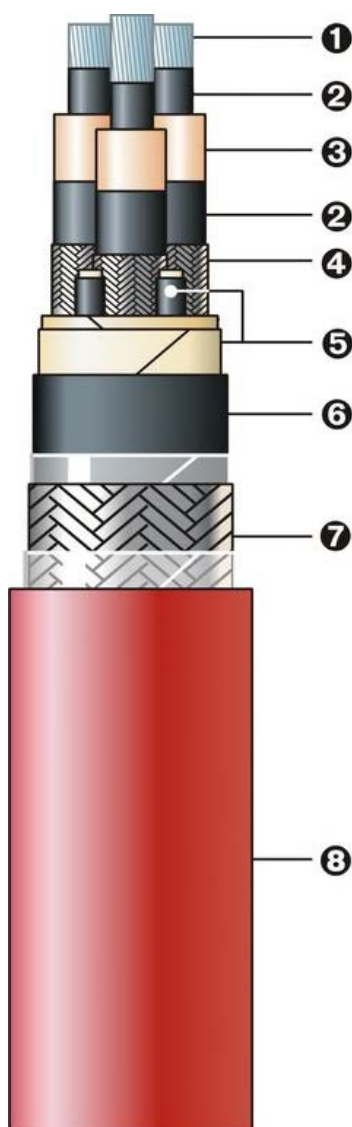
CCI	RFOU H-M VFD EMC	3,6/6 kV	n x sect	mm ²	IEC 6002-354	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA	n°		

- Minimum Bending Radius: **4/5D** according to **Overall Diameter** - see **Generals** section

3,6 / 6 kV

CONSTRUCTION				CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
CONDUCTORS		EARTHS		nominal	nominal	nominal	approx	approx
n	[mm ²]	n	[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
3	x 50	3	x 10	8,3	2,5	46,5	54	4.300
3	x 70	3	x 16	10,0	2,5	51,2	59	5.380
3	x 95	3	x 16	11,7	2,5	54,9	63	6.660
3	x 120	3	x 25	13,0	2,5	58,7	68	7.840
3	x 150	3	x 25	14,4	2,5	61,6	71	8.840
3	x 185	3	x 35	16,3	2,5	65,8	78	11.170

6/10 kV - radial field
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
operating temperature over 100 °C
(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U_0 / U	6/10 kV	
Maximum Voltage U_{max}	12 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 SEMICONDUCTORS	HF extruded compound
3 INSULATION	HEPR HF compound IEC 60092-360
4 SCREEN	tinned copper wire braid
5 BEDDING & FILLERS	FLAMEBAR® fiberglass tape(s) (*) + fiberglass ropes, EPR sheathed
6 INNER SHEATH	HF extruded compound
7 ARMOUR	tinned copper wire braid
8 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white
3 cores	off-white (identification by coloured or numbered tapes)

Sheath colour

red

Minimal sheath marking

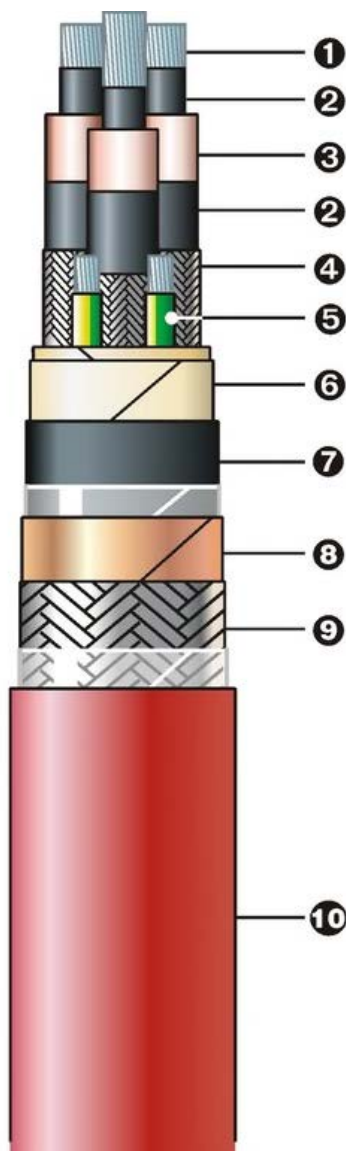
CCI P103 RFOU H-M	6/10 kV	n x sect mm ²	IEC 60092-354	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA n°	

- Minimum Bending Radius: **4/5D** according to **Overall Diameter** - see **Generals** section

6 / 10 kV

CONSTRUCTION			CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
			nominal	nominal	nominal	approx	approx
n	[mm ²]		[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	25	6,5	3,4	22,1	28	1.150
1	x	35	7,5	3,4	23,1	29	1.290
1	x	50	8,3	3,4	23,9	30	1.430
1	x	70	10,0	3,4	25,6	31	1.710
1	x	95	11,8	3,4	27,5	33	2.070
1	x	120	13,2	3,4	28,9	36	2.350
1	x	150	14,6	3,4	30,3	37	2.770
1	x	185	16,5	3,4	32,2	39	3.250
1	x	240	19,0	3,4	34,7	42	3.920
1	x	300	21,8	3,4	38,1	45	4.630
3	x	25	6,5	3,4	44,7	53	3.480
3	x	35	7,5	3,4	46,8	55	3.920
3	x	50	8,3	3,4	48,6	57	4.380
3	x	70	10,0	3,4	53,0	62	5.460
3	x	95	11,8	3,4	57,7	67	6.640
3	x	120	13,2	3,4	60,3	69	7.460
3	x	150	14,6	3,4	63,9	73	8.620
3	x	185	16,5	3,4	68,0	78	10.080

6/10 kV - radial field
(for Variable Frequency Drives)
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
operating temperature over 100 °C
 (see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U₀ / U	6/10 kV	
Maximum Voltage U_{max}	12 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
ElectroMagnetic Compatibility	IEC 60533	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228	
2 SEMICONDUCTORS	HF extruded compound	
3 INSULATION	HEPR HF compound	IEC 60092-360
4 SCREEN	tinned copper wire braid	
5 EARTH CONDUCTORS	tinned copper flexible CI 2 , HEPR sheathed	
6 BEDDING	FLAMEBAR® fiberglass tape(s) (*)	
7 INNER SHEATH	HF extruded compound	
8 ELECTROMAGNETIC SHIELD	plain copper tape (*)	
9 ARMOUR	tinned copper wire braid	
10 OUTER SHEATH	SHF2 H-M compound	NEK 606:2016
separator PE tapes (*) where necessary		
(*) tape overlapping ≥ 50 %		

Cores identification

3 cores	off-white (identification by coloured or numbered tapes)
earth	yellow-green

Sheath colour	red
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Minimal sheath marking

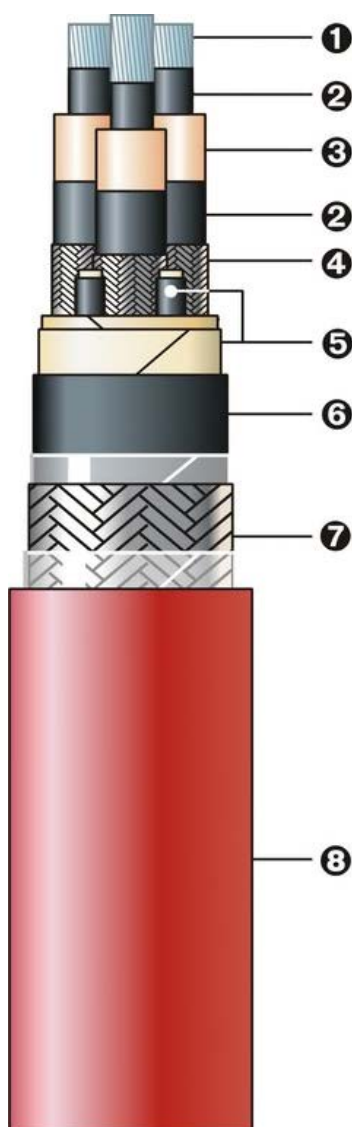
CCI RFOU H-M VFD EMC	6/10 kV	n x sect	mm ²	IEC 60092-354	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA n°		

- Minimum Bending Radius: **4/5D** according to **Overall Diameter** - see **Generals** section

6 / 10 kV

CONSTRUCTION				CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
CONDUCTORS		EARTHS		nominal	nominal	nominal	approx	approx
n	[mm ²]	n	[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
3	x 50	3	x 10	8,3	3,4	51,3	59	4.920
3	x 70	3	x 16	10,0	3,4	55,1	63	5.980
3	x 95	3	x 16	11,7	3,4	59,4	69	7.290
3	x 120	3	x 25	13,0	3,4	62,6	72	8.390
3	x 150	3	x 25	14,4	3,4	65,5	75	9.400
3	x 185	3	x 35	16,3	3,4	69,7	82	11.850

8,7/15 kV - radial field
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
 operating temperature over 100 °C
 (see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U_0 / U	8,7/15 kV	
Maximum Voltage U_{max}	17,5 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228	
2 SEMICONDUCTORS	HF extruded compound	
3 INSULATION	HEPR HF compound	IEC 60092-360
4 SCREEN	tinned copper wire braid	
5 BEDDING & FILLERS	FLAMEBAR® fiberglass tape(s) (*) + fiberglass ropes, HEPR sheathed	
6 INNER SHEATH	HF extruded compound	
7 ARMOUR	tinned copper wire braid	
8 OUTER SHEATH	SHF2 H-M compound	NEK 606:2016
separator PE tapes (*) where necessary		
(*) tape overlapping ≥ 50 %		

Cores identification

1 core	off-white
3 cores	off-white (identification by coloured or numbered tapes)

Sheath colour

red

Minimal sheath marking

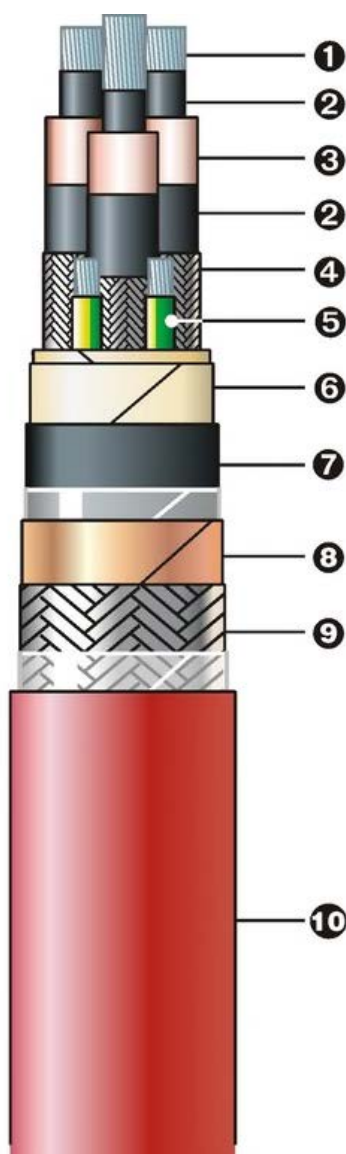
CCI P104 RFOU H-M	8,7/15 kV	n x sect mm ²	IEC 60092-354	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA n°	

- Minimum Bending Radius: **4/5D** according to **Overall Diameter** - see **Generals** section

8,7 / 15 kV

CONSTRUCTION			CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
			nominal	nominal	nominal	approx	approx
n	[mm ²]		[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	25	6,5	4,5	24,9	31	1.350
1	x	35	7,5	4,5	25,8	32	1.490
1	x	50	8,3	4,5	26,7	33	1.660
1	x	70	10,0	4,5	28,4	35	1.940
1	x	95	11,8	4,5	30,2	37	2.390
1	x	120	13,2	4,5	31,6	39	2.700
1	x	150	14,6	4,5	33,0	40	3.030
1	x	185	16,5	4,5	35,0	42	3.520
1	x	240	19,0	4,5	37,5	45	4.210
1	x	300	21,8	4,5	40,8	48	4.940
3	x	25	6,5	4,5	50,6	59	4.160
3	x	35	7,5	4,5	52,6	61	4.680
3	x	50	8,3	4,5	54,4	63	5.240
3	x	70	10,0	4,5	58,5	67	6.110
3	x	95	11,8	4,5	63,0	72	7.390
3	x	120	13,2	4,5	66,0	76	8.330
3	x	150	14,6	4,5	69,1	79	9.400

8,7/15 kV - radial field
(for Variable Frequency Drives)
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
operating temperature over 100 °C
(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U₀ / U	8,7/15 kV	
Maximum Voltage U_{max}	17,5 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
ElectroMagnetic Compatibility	IEC 60533	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 SEMICONDUCTORS	HF extruded compound
3 INSULATION	HEPR HF compound IEC 60092-360
4 SCREEN	tinned copper wire braid
5 EARTH CONDUCTORS	tinned copper flexible CI 2 , HEPR sheathed
6 BEDDING	FLAMEBAR® fiberglass tape(s) (*)
7 INNER SHEATH	HF extruded compound
8 ELECTROMAGNETIC SHIELD	plain copper tape (*)
9 ARMOUR	tinned copper wire braid
10 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
separator PE tapes (*) where necessary	
(*) tape overlapping ≥ 50 %	

Cores identification

1 core	off-white (identification by coloured or numbered tapes)
earth	yellow-green

Sheath colour	red
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Minimal sheath marking

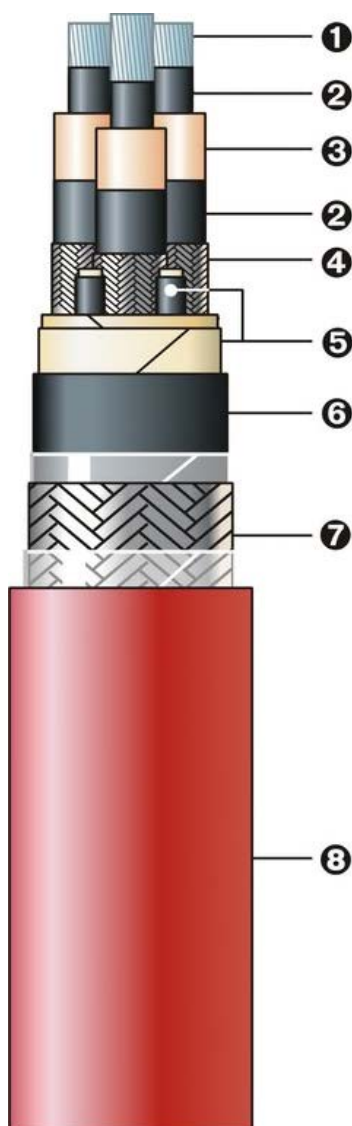
CCI	RFOU H-M VFD EMC	8,7/15 kV	n x sect	mm ²	IEC 60092-354	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA	n°		

- Minimum Bending Radius: **4/SD** according to **Overall Diameter** - see **Generals** section

8,7/ 15 kV

CONSTRUCTION				CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
CONDUCTORS		EARTHS		nominal	nominal	nominal	approx	approx
n	[mm²]	n	[mm²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
3	x 50	3	x 10	8,3	4,5	57,1	65	5.830
3	x 70	3	x 16	10,0	4,5	60,9	69	6.700
3	x 95	3	x 16	10,0	4,5	67,0	72	8.290
3	x 120	3	x 25	11,7	4,5	64,5	74	7.980
3	x 150	3	x 25	13,0	4,5	67,4	77	9.120
3	x 185	3	x 35	14,4	4,5	70,3	80	10.160

12/20 kV - radial field
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
operating temperature over 100 °C
(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U₀ / U	12/20 kV	
Maximum Voltage U_{max}	24 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 SEMICONDUCTORS	HF extruded compound
3 INSULATION	HEPR compound IEC 60092-360
4 SCREEN	tinned copper wire braid
5 BEDDING & FILLERS	FLAMEBAR® fiberglass tape(s) (*) + fiberglass ropes, EPR sheathed
6 INNER SHEATH	HF extruded compound
7 ARMOUR	tinned copper wire braid
8 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white
3 cores	off-white (identification by coloured or numbered tapes)

Sheath colour

red

Sheath marking

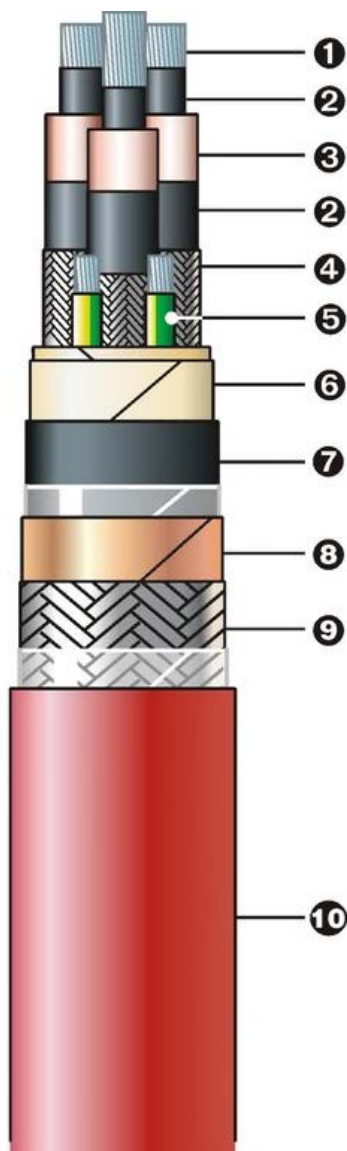
CCI P112 RFOU H-M	12/20 kV	n x sect mm ²	IEC 60092-354	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA n°	

- Minimum Bending Radius: **4/5D** according to Overall Diameter - see **Generals** section

12 / 20 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n	[mm ²]		[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	35	7,5	5,5	27,9	34	1.660
1	x	50	8,3	5,5	28,7	35	1.810
1	x	70	10,0	5,5	30,4	37	2.200
1	x	95	11,8	5,5	32,2	39	2.580
1	x	120	13,2	5,5	33,7	41	2.900
1	x	150	14,6	5,5	35,9	43	3.420
1	x	185	16,5	5,5	37,0	45	3.740
1	x	240	19,0	5,5	39,5	47	4.440
1	x	300	21,8	5,5	43,8	52	5.350
3	x	35	7,5	5,5	57,3	66	5.270
3	x	50	8,3	5,5	59,2	68	5.780
3	x	70	10,0	5,5	63,4	73	6.810
3	x	95	11,8	5,5	67,3	77	8.030
3	x	120	13,2	5,5	70,3	80	9.010
3	x	150	14,6	5,5	73,4	84	10.060

12/20 kV - radial field
(for Variable Frequency Drives)
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
operating temperature over 100 °C
(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U₀ / U	12/20 kV	
Maximum Voltage U_{max}	24 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
ElectroMagnetic Compatibility	IEC 60533	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 SEMICONDUCTORS	HF extruded compound
3 INSULATION	HEPR compound IEC 60092-360
4 SCREEN	tinned copper wire braid
5 EARTH CONDUCTORS	tinned copper flexible CI 2, HEPR sheathed
6 BEDDING	FLAMEBAR® fiberglass tape(s) (*)
7 INNER SHEATH	HF extruded compound
8 ELECTROMAGNETIC SHIELD	plain copper tape (*)
9 ARMOUR	tinned copper wire braid
10 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
separator PE tapes (*) where necessary	
(*) tape overlapping ≥ 50 %	

Cores identification

3 cores	off-white (identification by coloured or numbered tapes)
earth	yellow-green

Sheath colour	red
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Minimal sheath marking

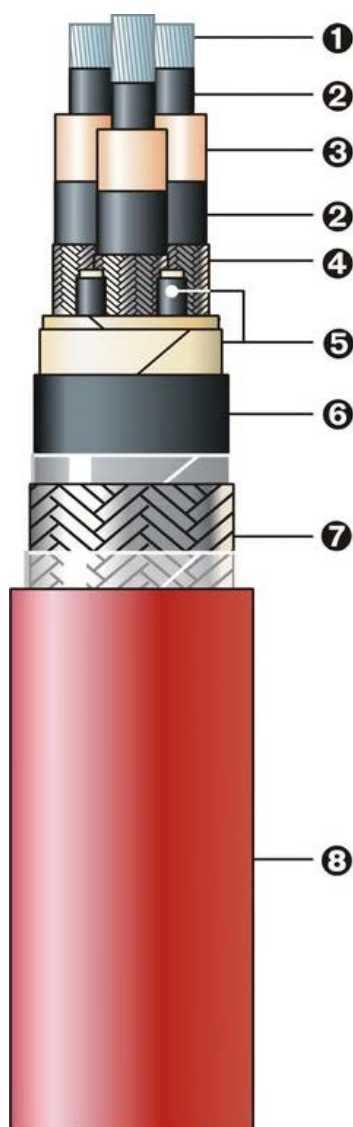
CCI RFOU H-M VFD EMC	12/20 kV	n x sect	mm ²	IEC 60092-354	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA n°		

- Minimum Bending Radius: **4/5D** according to **Overall Diameter** - see **Generals** section

12 / 20 kV

CONSTRUCTION				CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
CONDUCTORS		EARTHS		nominal	nominal	nominal	approx	approx
n	[mm ²]	n	[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
3	x 50	3	x 10	8,3	5,5	59,0	68	6.380
3	x 70	3	x 16	10,0	5,5	63,2	73	7.430
3	x 95	3	x 16	11,7	5,5	67,1	77	8.850
3	x 120	3	x 25	13,0	5,5	70,1	80	10.110
3	x 150	3	x 25	14,4	5,5	73,2	84	11.180
3	x 185	3	x 35	16,3	5,5	77,2	88	13.410

18/30 kV - radial field
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant
armoured
 operating temperature over 100 °C
 (see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U_0 / U	18/30 kV	
Maximum Voltage U_{max}	36 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228	
2 SEMICONDUCTORS	HF extruded compound	
3 INSULATION	HEPR compound	IEC 60092-360
4 SCREEN	tinned copper wire braid	
5 BEDDING & FILLERS	FLAMEBAR® fiberglass tape(s) (*) + fiberglass ropes, EPR sheathed	
6 INNER SHEATH	HF extruded compound	
7 ARMOUR	tinned copper wire braid	
8 OUTER SHEATH	SHF2 H-M compound	NEK 606:2016
separator PE tapes (*) where necessary		
(*) tape overlapping ≥ 50 %		

Cores identification

1 core	off-white
3 cores	off-white (identification by coloured or numbered tapes)

Sheath colour

red

Minimal sheath marking

CCI P113 RFOU H-M	18/30 kV	n x sect mm²	IEC 60092-354	NEK 606
IEC 60332-3-22 Cat A	meter marking	year	QA n°	

- Minimum Bending Radius: **4/5 D** according to **Overall Diameter**

18 / 30 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n	[mm ²]		[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	50	8,3	8,0	33,8	41	2.390
1	x	70	10,0	8,0	35,5	43	2.700
1	x	95	11,8	8,0	37,3	45	3.100
1	x	120	13,2	8,0	38,7	46	3.430
1	x	150	14,6	8,0	40,1	48	3.790
1	x	185	16,5	8,0	42,0	50	4.310
1	x	240	19,0	8,0	45,5	53	5.170
1	x	300	21,8	8,0	48,8	57	6.020
3	x	50	8,3	8,0	70,6	81	7.470
3	x	70	10,0	8,0	74,2	85	8.530
3	x	95	11,8	8,0	78,1	89	9.790
3	x	120	13,2	8,0	81,1	92	10.760
3	x	150	14,6	8,0	84,2	95	11.980

Instrumentation & Telecommunication

Flame retardant
Oils & MUDs resistant



instrumentation 150/250 V

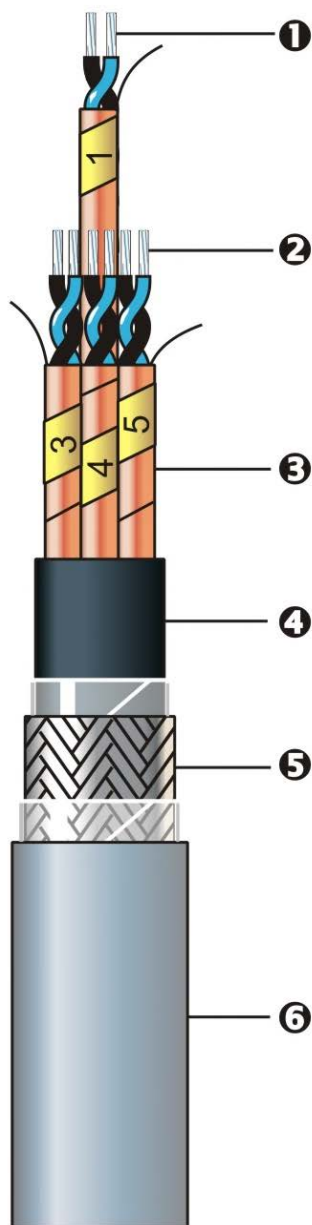
halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

individual screen - armoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U_0 / U	150 / 250 V	
Maximum voltage U_{max}	300 V	
Maximum rated temperature	90 °C according to IEC 60092-360	
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Corrosivity	IEC 60754-1 / 2	
Smoke density	IEC 61034-1 / 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092.360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60092-376
2 INSULATION	EPR HF compound IEC 60092-360
CORES TWISTING	in pairs / triples
3 INDIVIDUAL SCREEN	Cu/PE tape (*) + tinned copper drain wire
4 INNER SHEATH	HF extruded compound
5 ARMOUR	tinned copper wire braid
6 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

pair	black light blue
triple	black light blue brown
multipairs/triples	identified by progressively numbered tapes

Sheath colour	grey
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Minimal sheath marking

CCI S101 RFOU(i) H-M 150/250 V	n x (pair/triple) x sect	mm ²	IEC 60092-376
NEK 606 IEC 60332-3-22 Cat A	meter marking	year	QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

150/250 V

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair triple	[m m ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x 2	x 0,75	1,1	0,6	7,0	11	190
2	x 2	x 0,75	1,1	0,6	11,1	16	410
4	x 2	x 0,75	1,1	0,6	12,8	18	550
7	x 2	x 0,75	1,1	0,6	15,3	21	770
8	x 2	x 0,75	1,1	0,6	16,3	22	870
12	x 2	x 0,75	1,1	0,6	19,4	26	1.190
16	x 2	x 0,75	1,1	0,6	22,4	29	1.520
19	x 2	x 0,75	1,1	0,6	24,1	31	1.760
24	x 2	x 0,75	1,1	0,6	26,7	34	2.130
32	x 2	x 0,75	1,1	0,6	30,4	38	2.790
1	x 3	x 0,75	1,1	0,6	7,4	11	210
2	x 3	x 0,75	1,1	0,6	12,1	17	480
4	x 3	x 0,75	1,1	0,6	14,0	19	640
7	x 3	x 0,75	1,1	0,6	17,5	23	960
8	x 3	x 0,75	1,1	0,6	18,7	25	1.080
12	x 3	x 0,75	1,1	0,6	21,9	28	1.460
16	x 3	x 0,75	1,1	0,6	25,3	32	1.880
19	x 3	x 0,75	1,1	0,6	27,3	34	2.170
24	x 3	x 0,75	1,1	0,6	30,3	38	2.740
32	x 3	x 0,75	1,1	0,6	34,9	43	3.530
1	x 2	x 1	1,4	0,6	7,6	11	220
2	x 2	x 1	1,4	0,6	12,1	17	470
4	x 2	x 1	1,4	0,6	14,0	19	630
7	x 2	x 1	1,4	0,6	16,8	23	900
8	x 2	x 1	1,4	0,6	17,9	24	1.010
12	x 2	x 1	1,4	0,6	21,4	28	1.380
16	x 2	x 1	1,4	0,6	24,7	31	1.790
19	x 2	x 1	1,4	0,6	26,6	33	2.060
24	x 2	x 1	1,4	0,6	29,5	37	2.530
32	x 2	x 1	1,4	0,6	34,0	42	3.350
1	x 3	x 1	1,4	0,6	8,0	12	240
2	x 3	x 1	1,4	0,6	13,2	18	540
4	x 3	x 1	1,4	0,6	15,4	21	750
7	x 3	x 1	1,4	0,6	19,2	25	1.120
8	x 3	x 1	1,4	0,6	20,6	27	1.270
12	x 3	x 1	1,4	0,6	24,6	31	1.750
16	x 3	x 1	1,4	0,6	27,9	35	2.210
19	x 3	x 1	1,4	0,6	30,1	38	2.660
24	x 3	x 1	1,4	0,6	33,9	42	3.260
32	x 3	x 1	1,4	0,6	38,6	47	4.160

150 / 250 V

CONSTRUCTION					CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n		pair		[m m ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	2	x	1,5	1,6	0,7	8,3	12	250
2	x	2	x	1,5	1,6	0,7	13,3	18	550
4	x	2	x	1,5	1,6	0,7	15,5	21	760
7	x	2	x	1,5	1,6	0,7	18,6	25	1.070
8	x	2	x	1,5	1,6	0,7	19,9	26	1.220
12	x	2	x	1,5	1,6	0,7	24,2	31	1.720
16	x	2	x	1,5	1,6	0,7	27,5	34	2.190
19	x	2	x	1,5	1,6	0,7	29,7	37	2.500
24	x	2	x	1,5	1,6	0,7	33,3	41	3.220
32	x	2	x	1,5	1,6	0,7	38,0	46	4.080
1	x	3	x	1,5	1,6	0,7	8,8	13	280
2	x	3	x	1,5	1,6	0,7	14,6	20	650
4	x	3	x	1,5	1,6	0,7	17,0	23	900
7	x	3	x	1,5	1,6	0,7	21,4	28	1.360
8	x	3	x	1,5	1,6	0,7	22,9	29	1.540
12	x	3	x	1,5	1,6	0,7	27,4	34	2.180
16	x	3	x	1,5	1,6	0,7	31,1	39	2.840
19	x	3	x	1,5	1,6	0,7	33,6	42	3.280
24	x	3	x	1,5	1,6	0,7	37,8	46	4.090
32	x	3	x	1,5	1,6	0,7	43,1	52	5.200

instrumentation 150/250 V

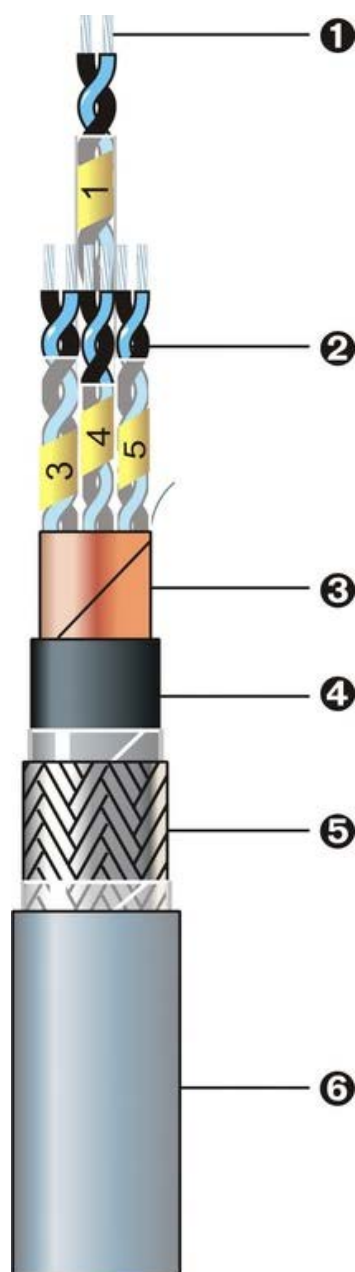
halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

common screen - armoured

operating temperature over 100 °C

(see page 6)



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U₀ / U	150 / 250 V	
Maximum voltage U_{max}	300 V	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092.360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction		
1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60092-376	
2 INSULATION	EPR HF compound IEC 60092-360	
CORES TWISTING	in pairs / triples	
3 COMMON SCREEN	Cu/PE tape (*) + tinned copper drain wire	
4 INNER SHEATH	HF extruded compound	
5 ARMOUR	tinned copper wire braid	
6 OUTER SHEATH	SHF2 H-M compound NEK 606:2016	
	separator PE tapes (*) where necessary	
	(*) tape overlapping ≥ 50 %	

Cores identification		
pair	black	light blue
triple	black	light blue brown
multi pairs/triples	identified by progressively numbered tapes	

Sheath colour	grey
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Minimal sheath marking

CCI S102 BFOU(c) H-M	150/250 V	n x (pair/triple) x sect	mm ²	IEC 60092-376
NEK 606	IEC 60332-3-22 Cat A	meter marking	year	QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

150/250 V

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair triple	[m m ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x 2	x 0,75	1,1	0,6	7,0	11	190
2	x 2	x 0,75	1,1	0,6	11,0	15	390
4	x 2	x 0,75	1,1	0,6	12,6	17	500
7	x 2	x 0,75	1,1	0,6	15,0	21	680
8	x 2	x 0,75	1,1	0,6	16,0	22	760
12	x 2	x 0,75	1,1	0,6	18,0	25	1.025
16	x 2	x 0,75	1,1	0,6	21,0	28	1.300
19	x 2	x 0,75	1,1	0,6	23,5	30	1.500
24	x 2	x 0,75	1,1	0,6	26,1	33	1.830
32	x 2	x 0,75	1,1	0,6	29,6	37	2.320

1	x 3	x 0,75	1,1	0,6	7,4	11	210
2	x 3	x 0,75	1,1	0,6	12,0	17	460
4	x 3	x 0,75	1,1	0,6	13,8	19	590
7	x 3	x 0,75	1,1	0,6	17,1	23	850
8	x 3	x 0,75	1,1	0,6	18,3	24	960
12	x 3	x 0,75	1,1	0,6	21,4	28	1.270
16	x 3	x 0,75	1,1	0,6	24,7	31	1.640
19	x 3	x 0,75	1,1	0,6	26,6	34	1.880
24	x 3	x 0,75	1,1	0,6	29,5	37	2.320
32	x 3	x 0,75	1,1	0,6	34,0	42	3.090

1	x 2	x 1	1,4	0,6	7,6	11	220
2	x 2	x 1	1,4	0,6	12,0	17	450
4	x 2	x 1	1,4	0,6	13,8	19	580
7	x 2	x 1	1,4	0,6	16,5	22	800
8	x 2	x 1	1,4	0,6	17,6	24	890
12	x 2	x 1	1,4	0,6	20,9	27	1.200
16	x 2	x 1	1,4	0,6	24,1	31	1.540
19	x 2	x 1	1,4	0,6	26,0	33	1.770
24	x 2	x 1	1,4	0,6	28,8	36	2.205
32	x 2	x 1	1,4	0,6	33,2	41	2.920

1	x 3	x 1	1,4	0,6	8,0	12	240
2	x 3	x 1	1,4	0,6	13,1	18	525
4	x 3	x 1	1,4	0,6	15,2	21	700
7	x 3	x 1	1,4	0,6	18,9	25	1.010
8	x 3	x 1	1,4	0,6	20,2	27	1.140
12	x 3	x 1	1,4	0,6	24,1	31	1.560
16	x 3	x 1	1,4	0,6	27,3	34	1.970
19	x 3	x 1	1,4	0,6	29,4	37	2.280
24	x 3	x 1	1,4	0,6	33,1	41	2.920
32	x 3	x 1	1,4	0,6	37,7	46	3.720

150 / 250 V

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair triple	[m m ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x 2	x 1,5	1,6	0,7	8,3	12	250
2	x 2	x 1,5	1,6	0,7	13,2	18	530
4	x 2	x 1,5	1,6	0,7	15,3	21	710
7	x 2	x 1,5	1,6	0,7	18,3	24	970
8	x 2	x 1,5	1,6	0,7	19,5	26	1.100
12	x 2	x 1,5	1,6	0,7	23,7	30	1.540
16	x 2	x 1,5	1,6	0,7	26,9	34	1.940
19	x 2	x 1,5	1,6	0,7	29,0	37	2.220
24	x 2	x 1,5	1,6	0,7	32,7	41	2.890
32	x 2	x 1,5	1,6	0,7	37,1	45	3.650
1	x 3	x 1,5	1,6	0,7	8,8	13	280
2	x 3	x 1,5	1,6	0,7	14,4	20	620
4	x 3	x 1,5	1,6	0,7	16,8	22	840
7	x 3	x 1,5	1,6	0,7	21,0	27	1.250
8	x 3	x 1,5	1,6	0,7	22,5	29	1.410
12	x 3	x 1,5	1,6	0,7	26,9	34	1.970
16	x 3	x 1,5	1,6	0,7	30,5	38	2.570
19	x 3	x 1,5	1,6	0,7	32,9	41	2.960
24	x 3	x 1,5	1,6	0,7	37,1	46	3.720
32	x 3	x 1,5	1,6	0,7	42,3	51	4.720

instrumentation 150/250 V

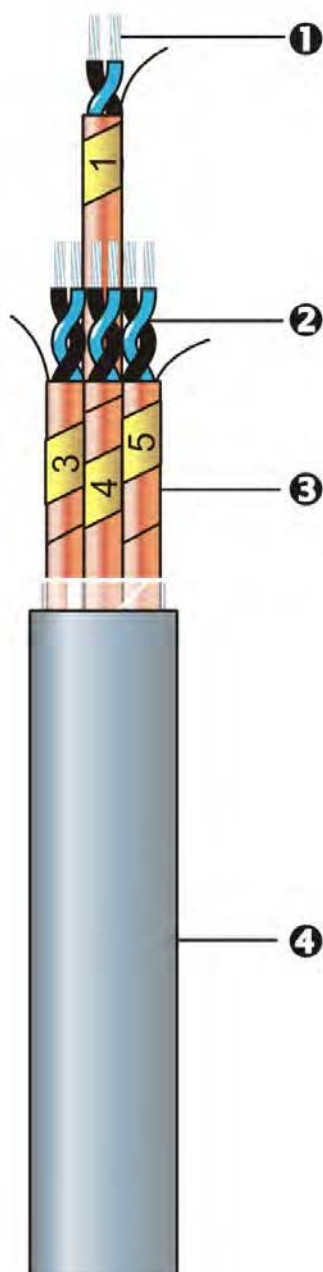
halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

individual screen - unarmoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U_0 / U	150 / 250 V	
Maximum voltage U_{max}	300 V	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
Toxicity & smoke density	IMO RESOLUTION MSC 41(64)	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092.360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5	IEC 60092-376
2 INSULATION	EPR HF compound	IEC 60092-360
CORES TWISTING	in pairs / triples	
3 INDIVIDUAL SCREEN	Cu/PE tape (*) + tinned copper drain wire	
4 OUTER SHEATH	SHF2 H-M compound	NEK 606:2016
	separator PE tapes (*) where necessary	
	(*) tape overlapping $\geq 50 \%$	

Cores identification

pair	black light blue
triple	black light blue brown
multi pairs/triples	identified by progressively numbered tapes

Sheath colour

grey

Minimal sheath marking

CCI S105 RU(i) H-M	150/250 V	n x (pair/triple) x sect	mm ²	IEC 60092-376
NEK 606	IEC 60332-3-22 Cat A	meter marking	year	QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

150 / 250 V

CONSTRUCTION					CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair		triple	[m m ²]	[mm]	[mm]	[mm]	[kg/km]
1	x	2	x	0,75	1,1	0,6	8	80
2	x	2	x	0,75	1,1	0,6	11	140
4	x	2	x	0,75	1,1	0,6	14	210
7	x	2	x	0,75	1,1	0,6	16	310
8	x	2	x	0,75	1,1	0,6	17	350
12	x	2	x	0,75	1,1	0,6	20	490
16	x	2	x	0,75	1,1	0,6	23	630
19	x	2	x	0,75	1,1	0,6	25	730
24	x	2	x	0,75	1,1	0,6	28	890
32	x	2	x	0,75	1,1	0,6	32	1.160

1	x	3	x	0,75	1,1	0,6	8	100
2	x	3	x	0,75	1,1	0,6	12	180
4	x	3	x	0,75	1,1	0,6	15	270
7	x	3	x	0,75	1,1	0,6	18	420
8	x	3	x	0,75	1,1	0,6	20	480
12	x	3	x	0,75	1,1	0,6	23	670
16	x	3	x	0,75	1,1	0,6	26	864
19	x	3	x	0,75	1,1	0,6	28	1.000
24	x	3	x	0,75	1,1	0,6	32	1.250
32	x	3	x	0,75	1,1	0,6	36	1.630

1	x	2	x	1	1,4	0,6	8	90
2	x	2	x	1	1,4	0,6	12	170
4	x	2	x	1	1,4	0,6	14	240
7	x	2	x	1	1,4	0,6	17	380
8	x	2	x	1	1,4	0,6	19	430
12	x	2	x	1	1,4	0,6	22	600
16	x	2	x	1	1,4	0,6	25	760
19	x	2	x	1	1,4	0,6	27	890
24	x	2	x	1	1,4	0,6	31	1.120
32	x	2	x	1	1,4	0,6	35	1.440

1	x	3	x	1	1,4	0,6	9	110
2	x	3	x	1	1,4	0,6	14	210
4	x	3	x	1	1,4	0,6	16	330
7	x	3	x	1	1,4	0,6	20	520
8	x	3	x	1	1,4	0,6	22	590
12	x	3	x	1	1,4	0,6	25	820
16	x	3	x	1	1,4	0,6	29	1.070
19	x	3	x	1	1,4	0,6	32	1.270
24	x	3	x	1	1,4	0,6	35	1.560
32	x	3	x	1	1,4	0,6	40	2.030

150 / 250 V

CONSTRUCTION					CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair			[m m ²]	[mm]	[mm]	[mm]	[kg/km]
	triple							
1	x	2	x	1,5	1,6	0,7	9	110
2	x	2	x	1,5	1,6	0,7	14	200
4	x	2	x	1,5	1,6	0,7	16	320
7	x	2	x	1,5	1,6	0,7	19	480
8	x	2	x	1,5	1,6	0,7	21	560
12	x	2	x	1,5	1,6	0,7	25	780
16	x	2	x	1,5	1,6	0,7	29	1.020
19	x	2	x	1,5	1,6	0,7	31	1.170
24	x	2	x	1,5	1,6	0,7	35	1.480
32	x	2	x	1,5	1,6	0,7	39	1.910
1	x	3	x	1,5	1,6	0,7	9	140
2	x	3	x	1,5	1,6	0,7	15	260
4	x	3	x	1,5	1,6	0,7	18	420
7	x	3	x	1,5	1,6	0,7	22	670
8	x	3	x	1,5	1,6	0,7	24	760
12	x	3	x	1,5	1,6	0,7	29	1.100
16	x	3	x	1,5	1,6	0,7	32	1.430
19	x	3	x	1,5	1,6	0,7	35	1.660
24	x	3	x	1,5	1,6	0,7	39	2.100
32	x	3	x	1,5	1,6	0,7	45	2.710

instrumentation 150/250 V

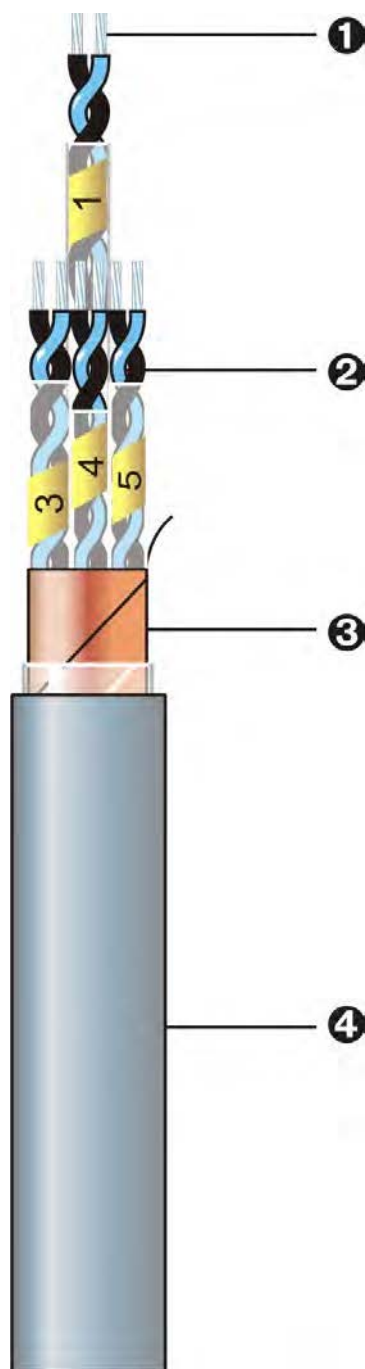
halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

common screen - unarmoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U₀ / U	150 / 250 V	
Maximum voltage U_{max}	300 V	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092.360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5	IEC 60092-376
2 INSULATION	EPR HF compound	IEC 60092-360
CORES TWISTING	in pairs / triples	
3 COMMON SCREEN	Cu/PE tape (*) + tinned copper drain wire	
4 OUTER SHEATH	SHF2 H-M compound	NEK 606:2016
	separator PE tapes (*) where necessary	
	(*) tape overlapping ≥ 50 %	

Cores identification

pair	black light blue
triple	black light blue brown
multi pairs/triples	identified by progressively numbered tapes

Sheath colour	grey
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Minimal sheath marking

CCI S106 RU(c) H-M 150/250 V	n x (pair/triple) x sect	mm ²	IEC 60092-376
NEK 606 IEC 60332-3-22 Cat A	meter marking	year	QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

150 / 250 V

CONSTRUCTION					CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair			[m m ²]	[mm]	[mm]	[mm]	[kg/km]
1	x	2	x	0,75	1,1	0,6	8	80
2	x	2	x	0,75	1,1	0,6	11	140
4	x	2	x	0,75	1,1	0,6	13	210
7	x	2	x	0,75	1,1	0,6	16	310
8	x	2	x	0,75	1,1	0,6	17	350
12	x	2	x	0,75	1,1	0,6	20	500
16	x	2	x	0,75	1,1	0,6	23	640
19	x	2	x	0,75	1,1	0,6	25	740
24	x	2	x	0,75	1,1	0,6	28	910
32	x	2	x	0,75	1,1	0,6	31	1.180

1	x	3	x	0,75	1,1	0,6	8	100
2	x	3	x	0,75	1,1	0,6	12	180
4	x	3	x	0,75	1,1	0,6	15	270
7	x	3	x	0,75	1,1	0,6	18	420
8	x	3	x	0,75	1,1	0,6	19	480
12	x	3	x	0,75	1,1	0,6	23	680
16	x	3	x	0,75	1,1	0,6	26	870
19	x	3	x	0,75	1,1	0,6	28	1.020
24	x	3	x	0,75	1,1	0,6	31	1.270
32	x	3	x	0,75	1,1	0,6	36	1.650

1	x	2	x	1	1,4	0,6	8	90
2	x	2	x	1	1,4	0,6	12	170
4	x	2	x	1	1,4	0,6	14	250
7	x	2	x	1	1,4	0,6	17	380
8	x	2	x	1	1,4	0,6	19	430
12	x	2	x	1	1,4	0,6	22	600
16	x	2	x	1	1,4	0,6	25	770
19	x	2	x	1	1,4	0,6	27	900
24	x	2	x	1	1,4	0,6	31	1.150
32	x	2	x	1	1,4	0,6	35	1.470

1	x	3	x	1	1,4	0,6	9	110
2	x	3	x	1	1,4	0,6	14	210
4	x	3	x	1	1,4	0,6	16	330
7	x	3	x	1	1,4	0,6	20	520
8	x	3	x	1	1,4	0,6	21	590
12	x	3	x	1	1,4	0,6	25	830
16	x	3	x	1	1,4	0,6	29	1.090
19	x	3	x	1	1,4	0,6	31	1.280
24	x	3	x	1	1,4	0,6	35	1.590
32	x	3	x	1	1,4	0,6	40	2.060

150 / 250 V

CONSTRUCTION					CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair			[m m ²]	[mm]	[mm]	[mm]	[kg/km]
	triple							
1	x	2	x	1,5	1,6	0,7	9	110
2	x	2	x	1,5	1,6	0,7	14	210
4	x	2	x	1,5	1,6	0,7	16	320
7	x	2	x	1,5	1,6	0,7	19	490
8	x	2	x	1,5	1,6	0,7	21	560
12	x	2	x	1,5	1,6	0,7	25	790
16	x	2	x	1,5	1,6	0,7	28	1.040
19	x	2	x	1,5	1,6	0,7	30	1.190
24	x	2	x	1,5	1,6	0,7	34	1.510
32	x	2	x	1,5	1,6	0,7	39	1.940
1	x	3	x	1,5	1,6	0,7	9	140
2	x	3	x	1,5	1,6	0,7	15	260
4	x	3	x	1,5	1,6	0,7	18	420
7	x	3	x	1,5	1,6	0,7	22	680
8	x	3	x	1,5	1,6	0,7	24	770
12	x	3	x	1,5	1,6	0,7	28	1.120
16	x	3	x	1,5	1,6	0,7	32	1.440
19	x	3	x	1,5	1,6	0,7	35	1.680
24	x	3	x	1,5	1,6	0,7	39	2.130
32	x	3	x	1,5	1,6	0,7	44	2.750

Low voltage Power & Control

**Fire resistant
Oils & MUDs resistant**

Fire resistance tests according to IEC 60331-1 & 2

IEC 60331-2

overall diameter not exceeding 20 mm

830 °C x 120 min.

with mechanical shocks every 5 minutes

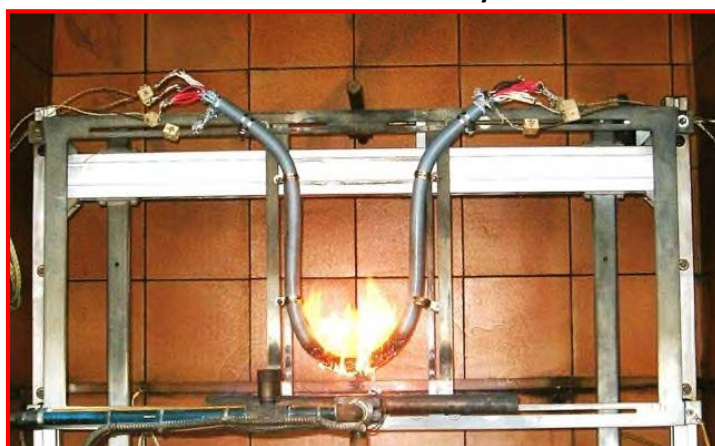


IEC 60331-1

overall diameter exceeding 20 mm

830°C x 120 min.

with mechanical shocks every 5 minutes



mechanical shocks device

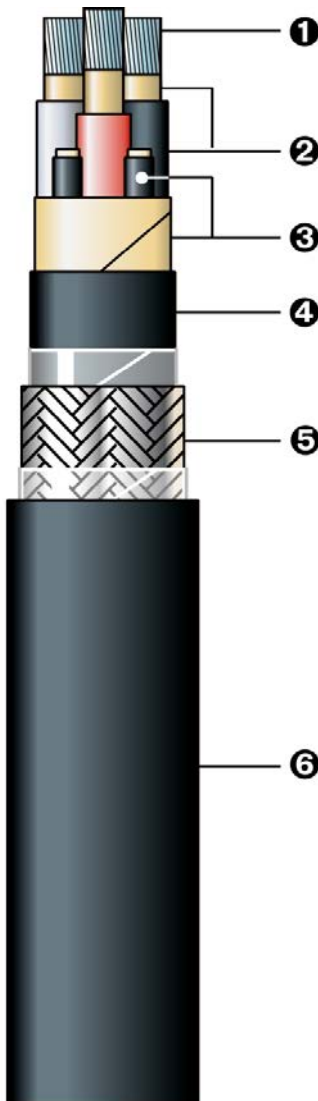


power & control 0,6/1 kV
halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant

fire resistant

armoured

operating temperature over 100 °C
 (see page 7)



Design and construction	IEC 60092-353	NEK 606:2016
Nominal voltage U₀ / U	0,6/1 kV	
Maximum Voltage U_{max}	1,2 kV	
Maximum conductor temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	IEC 60331-1 or 2 (120 minutes)	
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 INSULATION	mica tape + EPR HF compound IEC 60092-360
3 BEDDING & FILLERS	FLAMEBAR® fiberglass tape(s) (*) + fiberglass ropes, EPR sheathed (when sect. ≥ 16 mm ²)
4 INNER SHEATH	HF extruded compound
5 ARMOUR	tinned copper wire braid
6 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white	4 cores	off-white	black	red	blue
2 cores	off-white	black	5 cores and above	white & numbered		
3 cores	off-white	black	red			

Sheath colour

black

Minimal sheath marking

CCI	P105 BFOU H-M	0,6/1 kV	n x sect mm ²	IEC 60092-353	NEK 606
IEC 60332-3-22 Cat A	IEC 60331-1 or 2	meter marking	year	QA n°	

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

0,6/1 kV

			CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
			nominal	nominal	nominal	approx	approx.
n	[mm²]		[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	16	5,2	1,0	11,0	15	450
1	x	25	6,5	1,2	12,7	17	610
1	x	35	7,5	1,2	13,7	19	740
1	x	50	8,3	1,4	14,8	20	900
1	x	70	10,0	1,4	16,5	22	1.150
1	x	95	11,8	1,6	18,7	25	1.500
1	x	120	13,2	1,6	20,1	26	1.770
1	x	150	14,6	1,8	21,9	28	2.120
1	x	185	16,5	2,0	24,2	31	2.610
1	x	240	19,0	2,2	27,5	34	3.310
1	x	300	21,8	2,4	30,7	38	4.030
2	x	1,5	1,6	1,0	10,3	15	360
2	x	2,5	2,0	1,0	11,3	16	420
2	x	4	2,8	1,0	13,1	18	510
2	x	6	3,3	1,0	14,3	19	620
2	x	10	4,1	1,0	16,5	22	810
2	x	16	5,2	1,0	18,9	25	1.070
3	x	1,5	1,6	1,0	10,9	16	400
3	x	2,5	2,0	1,0	12,0	17	470
3	x	4	2,8	1,0	14,0	19	560
3	x	6	3,3	1,0	15,3	21	700
3	x	10	4,1	1,0	17,6	23	910
3	x	16	5,2	1,0	20,2	26	1.230
3	x	25	6,5	1,2	24,1	30	1.680
3	x	35	7,5	1,2	26,1	33	2.110
3	x	50	8,3	1,4	28,7	36	2.640
3	x	70	10,0	1,4	32,4	40	3.540
3	x	95	11,8	1,6	37,1	45	4.720
3	x	120	13,2	1,6	40,6	49	5.690
3	x	150	14,6	1,8	44,9	54	6.830
3	x	185	16,5	2,0	49,8	59	8.440
3	x	240	19,0	2,2	56,5	66	10.760
3	x	300	21,8	2,4	63,4	74	12.960

0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
			nominal	nominal	nominal	approx	approx
n		[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
4	x	1,5	1,6	1,0	11,9	17	440
4	x	2,5	2,0	1,0	13,1	18	520
4	x	4	2,8	1,0	15,3	21	670
4	x	6	3,3	1,0	16,8	22	830
4	x	10	4,1	1,0	19,3	25	1.090
4	x	16	5,2	1,0	22,2	28	1.510
4	x	25	6,5	1,2	26,5	33	2.070
4	x	35	7,5	1,2	28,8	35	2.610
4	x	50	8,3	1,4	31,6	39	3.380
4	x	70	10,0	1,4	35,7	44	4.430
4	x	95	11,8	1,6	41	49	5.940
4	x	120	13,2	1,6	44,8	54	7.150
4	x	150	14,6	1,8	49,5	59	8.780
4	x	185	16,5	2,0	55,5	65	11.050
4	x	240	19,0	2,2	62,5	73	14.050
4	x	300	21,8	2,4	70,2	80	16.780
5	x	1,5	1,6	1,0	13,3	18	540
7	x	1,5	1,6	1,0	14,5	20	630
12	x	1,5	1,6	1,0	19,1	25	990
19	x	1,5	1,6	1,0	22,6	29	1.330
27	x	1,5	1,6	1,0	27,4	34	1.870
37	x	1,5	1,6	1,0	31	38	2.450
5	x	2,5	2,0	1,0	14,4	19	640
7	x	2,5	2,0	1,0	15,7	21	740
12	x	2,5	2,0	1,0	20,9	27	1.190
19	x	2,5	2,0	1,0	24,8	31	1.650
27	x	2,5	2,0	1,0	28,8	36	2.320
37	x	2,5	2,0	1,0	34	41	3.030

power & control 0,6/1 kV

halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

fire resistant

unarmoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-353	NEK 606:2016
Nominal voltage U₀/U	0,6 / 1 kV	
Maximum Voltage U_{max}	1,2 kV	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	IEC 60331-1 or 2 (120 minutes)	
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 INSULATION	mica tape (*) + EPR HF compound IEC 60092-360
3 BEDDING & FILLERS	FLAMEBAR® fiberglass tape(s) + fiberglass ropes, EPR sheathed (when sect. ≥ 16 mm²)
4 OUTER SHEATH	SHF2 H-M compound NEK 606:2016 separator PE tapes (*) where necessary (*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white	4 cores	off-white	black	red	blue
2 cores	off-white	black	5 cores and above	white & numbered		
3 cores	off-white	black	red			

Sheath colour

black

Minimal sheath marking

CCI	P110 BU H-M	0,6/1 kV	n x sect	mm²	IEC 60092-353	NEK 606
IEC 60332-3-22 Cat A	IEC 60331-1 or 2	meter marking	year	QA n°		

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER	INSULATION THICKNESS	OVERALL DIAMETER	WEIGHT
			nominal	nominal	approx	approx
n		[mm ²]	[mm]	[mm]	[mm]	[kg/km]
1	x	16	5,2	1,0	10	310
1	x	25	6,5	1,2	13	460
1	x	35	7,5	1,2	14	580
1	x	50	8,3	1,4	15	730
1	x	70	10,0	1,4	17	970
1	x	95	11,8	1,6	19	1.320
1	x	120	13,2	1,6	21	1.580
1	x	150	14,6	1,8	23	1.940
1	x	185	16,5	2,0	26	2.430
1	x	240	19,0	2,2	29	3.120
1	x	300	21,8	2,4	32	3.770
2	x	1,5	1,6	1,0	11	160
2	x	2,5	2,0	1,0	12	180
2	x	4	2,8	1,0	14	230
2	x	6	3,3	1,0	15	300
2	x	10	4,1	1,0	17	390
2	x	16	5,2	1,0	19	570
3	x	1,5	1,6	1,0	12	190
3	x	2,5	2,0	1,0	13	230
3	x	4	2,8	1,0	14	300
3	x	6	3,3	1,0	16	390
3	x	10	4,1	1,0	18	520
3	x	16	5,2	1,0	21	760
3	x	25	6,5	1,2	24	1.070
3	x	35	7,5	1,2	27	1.410
3	x	50	8,3	1,4	30	1.830
3	x	70	10,0	1,4	34	2.480
3	x	95	11,8	1,6	39	3.430
3	x	120	13,2	1,6	42	4.170
3	x	150	14,6	1,8	46	5.080
3	x	185	16,5	2,0	51	5.260
3	x	240	19,0	2,2	58	6.870
3	x	300	21,8	2,4	66	10.020

0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER	INSULATION THICKNESS	OVERALL DIAMETER	WEIGHT
n		[mm ²]	nominal [mm]	nominal [mm]	approx [mm]	approx [kg/km]
4	x	1,5	1,6	1,0	13	210
4	x	2,5	2,0	1,0	14	260
4	x	4	2,8	1,0	16	340
4	x	6	3,3	1,0	17	460
4	x	10	4,1	1,0	19	630
4	x	16	5,2	1,0	23	930
4	x	25	6,5	1,2	27	1.340
4	x	35	7,5	1,2	29	1.770
4	x	50	8,3	1,4	33	2.300
4	x	70	10,0	1,4	37	3.150
4	x	95	11,8	1,6	43	4.370
4	x	120	13,2	1,6	47	5.320
4	x	150	14,6	1,8	51	6.770
4	x	185	16,5	2,0	57	8.600
4	x	240	19,0	2,2	65	11.070
4	x	300	21,8	2,4	73	13.340
5	x	1,5	1,6	1,0	14	230
7	x	1,5	1,6	1,0	15	340
12	x	1,5	1,6	1,0	20	540
19	x	1,5	1,6	1,0	24	780
27	x	1,5	1,6	1,0	29	1.080
37	x	1,5	1,6	1,0	33	1.430
5	x	2,5	2,0	1,0	15	290
7	x	2,5	2,0	1,0	16	430
12	x	2,5	2,0	1,0	22	680
19	x	2,5	2,0	1,0	26	1.000
27	x	2,5	2,0	1,0	32	1.390
37	x	2,5	2,0	1,0	36	1.840

Instrumentation & Telecommunication

**Fire resistant
Oils & MUDs resistant**

instrumentation 150/250 V

halogen free - flame retardant

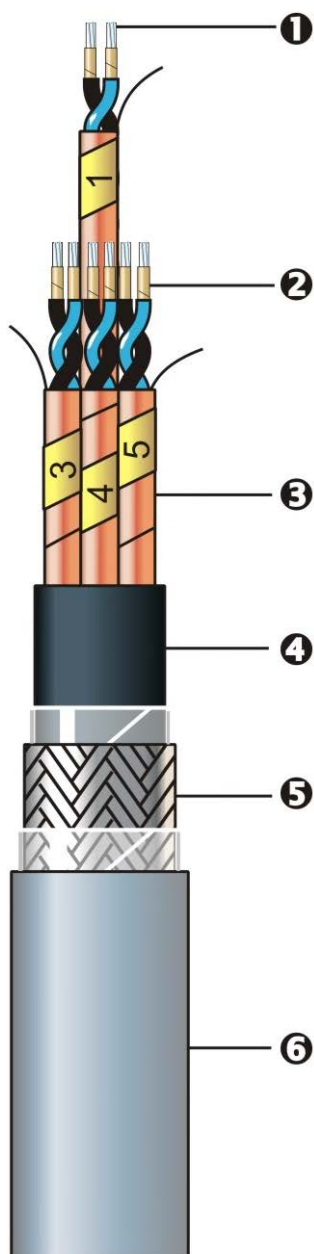
mineral - hydraulic oils & MUDs resistant

fire resistant

individual screen - armoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U₀ / U	150 / 250 V	
Maximum voltage U_{max}	300 V	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	IEC 60331-1 or 2	
Corrosivity	IEC 60754-1 / 2	
Smoke density	IEC 61034-1 / 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60092-376
2 INSULATION	mica tape (*) + EPR HF compound IEC 60092-360
CORES TWISTING	in pairs / triples
3 INDIVIDUAL SCREEN	Cu/PE tape (*) + tinned copper drain wire
4 INNER SHEATH	HF extruded compound
5 ARMOUR	tinned copper braid
6 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

pair	black light blue
triple	black light blue brown
multi pairs/triples	identified by progressively numbered tapes

Sheath colour	grey
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Minimal sheath marking

CCI S103 BFOU(i) H-M	150/250 V	n x (pair/triple) x sect	mm ²	IEC 60092-376
NEK 606	IEC 60332-3-22 Cat A	IEC 60331-1 or 2	meter marking	year QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

150 / 250 V

CONSTRUCTION					CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
					nominal	nominal	nominal	approx	approx
n	pair			[m m²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	2	x	0,75	1,1	0,6	7,5	11	220
2	x	2	x	0,75	1,1	0,6	12,0	16	460
4	x	2	x	0,75	1,1	0,6	13,9	19	620
7	x	2	x	0,75	1,1	0,6	16,6	22	880
8	x	2	x	0,75	1,1	0,6	17,7	24	990
12	x	2	x	0,75	1,1	0,6	21,2	27	1.370
16	x	2	x	0,75	1,1	0,6	24,4	31	1.760
19	x	2	x	0,75	1,1	0,6	26,3	33	2.030
24	x	2	x	0,75	1,1	0,6	29,2	36	2.460
32	x	2	x	0,75	1,1	0,6	33,3	41	3.240

1	x	3	x 0,75	1,1	0,6	7,9	12	240
2	x	3	x 0,75	1,1	0,6	13,1	18	540
4	x	3	x 0,75	1,1	0,6	15,2	21	750
7	x	3	x 0,75	1,1	0,6	19,0	25	110
8	x	3	x 0,75	1,1	0,6	20,4	27	1.250
12	x	3	x 0,75	1,1	0,6	23,9	30	1.710
16	x	3	x 0,75	1,1	0,6	27,6	34	2.200
19	x	3	x 0,75	1,1	0,6	29,8	37	2.540
24	x	3	x 0,75	1,1	0,6	33,1	41	3.200
32	x	3	x 0,75	1,1	0,6	38,2	46	4.140

1	x	2	x 1	1,4	0,6	7,9	12	230
2	x	2	x 1	1,4	0,6	12,7	17	510
4	x	2	x 1	1,4	0,6	14,7	20	690
7	x	2	x 1	1,4	0,6	17,7	24	990
8	x	2	x 1	1,4	0,6	18,8	25	1.110
12	x	2	x 1	1,4	0,6	22,5	29	1.520
16	x	2	x 1	1,4	0,6	26,0	33	1.970
19	x	2	x 1	1,4	0,6	28,0	35	2.270
24	x	2	x 1	1,4	0,6	31,1	39	2.890
32	x	2	x 1	1,4	0,6	35,9	44	3.700

1	x	3	x 1	1,4	0,6	8,4	12	260
2	x	3	x 1	1,4	0,6	13,9	19	590
4	x	3	x 1	1,4	0,6	16,2	22	820
7	x	3	x 1	1,4	0,6	20,2	26	1.230
8	x	3	x 1	1,4	0,6	21,7	28	1.400
12	x	3	x 1	1,4	0,6	25,9	32	1.930
16	x	3	x 1	1,4	0,6	29,4	36	2.460
19	x	3	x 1	1,4	0,6	31,8	40	2.960
24	x	3	x 1	1,4	0,6	35,7	44	3.630
32	x	3	x 1	1,4	0,6	40,7	49	4.640

150 / 250 V

CONSTRUCTION			CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
			nominal	nominal	nominal	approx	approx
n	pair	[m m²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
triple							
1	x 2	x 1,5	1,6	0,7	9,1	13	280
2	x 2	x 1,5	1,6	0,7	14,7	20	640
4	x 2	x 1,5	1,6	0,7	17,2	23	870
7	x 2	x 1,5	1,6	0,7	20,7	27	1.230
8	x 2	x 1,5	1,6	0,7	22,1	28	1.400
12	x 2	x 1,5	1,6	0,7	27,0	34	1.990
16	x 2	x 1,5	1,6	0,7	30,7	38	2.610
19	x 2	x 1,5	1,6	0,7	33,1	41	2.995
24	x 2	x 1,5	1,6	0,7	37,3	45	3.730
32	x 2	x 1,5	1,6	0,7	42,5	51	4.740
1	x 3	x 1,5	1,6	0,7	9,7	13	315
2	x 3	x 1,5	1,6	0,7	16,2	22	745
4	x 3	x 1,5	1,6	0,7	18,9	25	1.030
7	x 3	x 1,5	1,6	0,7	23,8	30	1.590
8	x 3	x 1,5	1,6	0,7	25,6	32	1.800
12	x 3	x 1,5	1,6	0,7	30,6	38	2.610
16	x 3	x 1,5	1,6	0,7	34,8	43	3.300
19	x 3	x 1,5	1,6	0,7	37,7	46	3.815
24	x 3	x 1,5	1,6	0,7	42,3	51	4.760
32	x 3	x 1,5	1,6	0,7	48,4	57	6.060

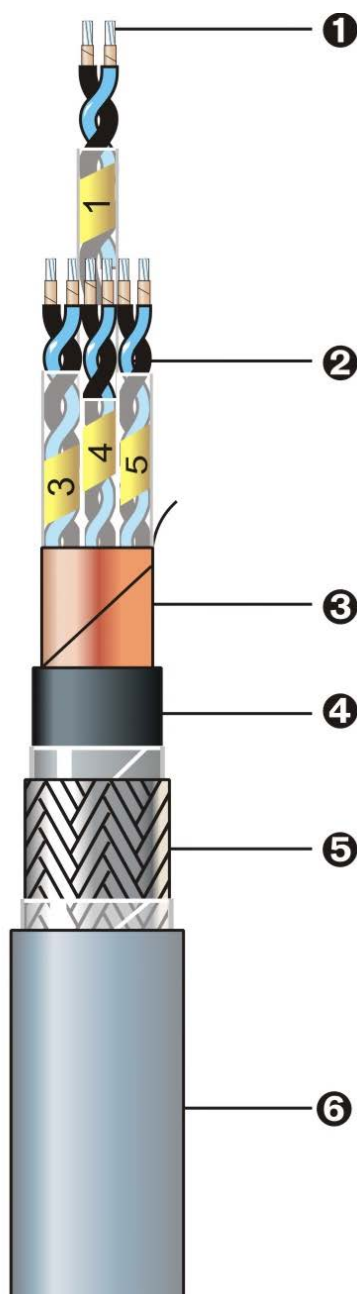
Instrumentation 150/250 V

halogen free - flame retardant
mineral - hydraulic oils & MUDs resistant

fire resistant

common screen – armoured

operating temperature over 100 °C
(see page 7)



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U₀ / U	150 / 250 V	
Maximum voltage U_{max}	300 V	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	IEC 60331-1 or 2	
Corrosivity	IEC 60754-1 / 2	
Smoke density	IEC 61034-1 / 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60092-376
2 INSULATION	mica tape (*) + EPR HF compound IEC 60092-360
CORES TWISTING	in pairs / triples
3 COMMON SCREEN	Cu/PE tape (*) + tinned copper drain wire
4 INNER SHEATH	HF extruded compound
5 ARMOUR	tinned copper braid
6 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

pair	black light blue
triple	black light blue brown
multi pairs/triples	identified by progressively numbered tapes

Sheath colour	grey
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Minimal sheath marking

CCI S104 BFOU(c) H-M	150/250 V	n x (pair/triple) x sect mm ²	IEC 60092-376
NEK 606	IEC 60332-3-22 Cat A	IEC 60331-1 or 2	meter marking year QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

150 / 250 V

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair triple	[m m ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x 2	x 0,75	1,1	0,6	7,5	11	220
2	x 2	x 0,75	1,1	0,6	11,9	16	450
4	x 2	x 0,75	1,1	0,6	13,7	18	580
7	x 2	x 0,75	1,1	0,6	16,3	22	800
8	x 2	x 0,75	1,1	0,6	17,4	23	900
12	x 2	x 0,75	1,1	0,6	20,7	27	1.230
16	x 2	x 0,75	1,1	0,6	23,9	30	1.580
19	x 2	x 0,75	1,1	0,6	25,7	32	1.810
24	x 2	x 0,75	1,1	0,6	28,6	35	2.210
32	x 2	x 0,75	1,1	0,6	32,4	40	2.920

1	x 3	x 0,75	1,1	0,6	7,9	12	240
2	x 3	x 0,75	1,1	0,6	13,0	18	520
4	x 3	x 0,75	1,1	0,6	15,0	21	710
7	x 3	x 0,75	1,1	0,6	18,7	25	1.020
8	x 3	x 0,75	1,1	0,6	20,0	26	1.150
12	x 3	x 0,75	1,1	0,6	23,4	30	1.565
16	x 3	x 0,75	1,1	0,6	27,0	34	2.000
19	x 3	x 0,75	1,1	0,6	29,1	36	2.310
24	x 3	x 0,75	1,1	0,6	32,4	40	2.940
32	x 3	x 0,75	1,1	0,6	37,3	46	3.800

1	x 2	x 1	1,4	0,6	7,9	12	230
2	x 2	x 1	1,4	0,6	12,5	17	495
4	x 2	x 1	1,4	0,6	14,5	20	645
7	x 2	x 1	1,4	0,6	17,4	23	900
8	x 2	x 1	1,4	0,6	18,5	25	1.010
12	x 2	x 1	1,4	0,6	22,1	38	1.360
16	x 2	x 1	1,4	0,6	25,4	32	1.760
19	x 2	x 1	1,4	0,6	27,4	34	2.030
24	x 2	x 1	1,4	0,6	30,5	38	2.600
32	x 2	x 1	1,4	0,6	35,1	43	3.340

1	x 3	x 1	1,4	0,6	8,4	12	260
2	x 3	x 1	1,4	0,6	13,7	18	570
4	x 3	x 1	1,4	0,6	15,9	22	780
7	x 3	x 1	1,4	0,6	19,9	26	1.150
8	x 3	x 1	1,4	0,6	21,3	28	1.300
12	x 3	x 1	1,4	0,6	25,4	32	1.790
16	x 3	x 1	1,4	0,6	28,8	36	2.270
19	x 3	x 1	1,4	0,6	31,1	39	2.720
24	x 3	x 1	1,4	0,6	35,0	43	3.370
32	x 3	x 1	1,4	0,6	39,8	48	4.300

150 / 250 V

CONSTRUCTION				CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
				nominal	nominal	nominal	approx	approx
n	pair	triple	[m m²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	2	x 1,5	1,6	0,7	9,1	13	280
2	x	2	x 1,5	1,6	0,7	14,6	20	620
4	x	2	x 1,5	1,6	0,7	17,0	23	830
7	x	2	x 1,5	1,6	0,7	20,4	26	1.150
8	x	2	x 1,5	1,6	0,7	21,8	28	1.300
12	x	2	x 1,5	1,6	0,7	26,5	33	1.840
16	x	2	x 1,5	1,6	0,7	30,1	37	2.330
19	x	2	x 1,5	1,6	0,7	32,5	40	2.750
24	x	2	x 1,5	1,6	0,7	36,6	45	3.460
32	x	2	x 1,5	1,6	0,7	41,7	50	4.390
1	x	3	x 1,5	1,6	0,7	9,7	13	310
2	x	3	x 1,5	1,6	0,7	16,0	22	730
4	x	3	x 1,5	1,6	0,7	18,7	24	990
7	x	3	x 1,5	1,6	0,7	23,5	30	1.500
8	x	3	x 1,5	1,6	0,7	25,2	32	1.700
12	x	3	x 1,5	1,6	0,7	30,1	37	2.370
16	x	3	x 1,5	1,6	0,7	34,3	42	3.120
19	x	3	x 1,5	1,6	0,7	37,0	45	3.600
24	x	3	x 1,5	1,6	0,7	41,6	50	4.490
32	x	3	x 1,5	1,6	0,7	47,5	56	5.710

instrumentation 150/250 V

halogen free - flame retardant

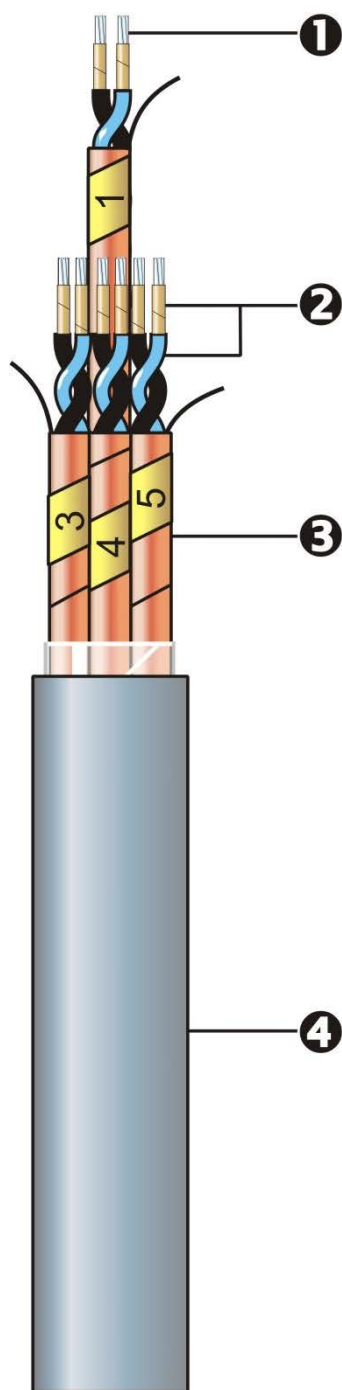
mineral - hydraulic oils & MUDs resistant

fire resistant

individual screen - unarmoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U₀ / U	150 / 250 V	
Maximum voltage U_{max}	300 V	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	IEC 60331-1 or 2	
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60092-376
2 INSULATION	mica tape (*) + EPR HF compound IEC 60092-360
CORES TWISTING	in pairs / triples
3 INDIVIDUAL SCREEN	Cu/PE tape (*) + tinned copper drain wire
4 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

pair	black light blue
triple	black light blue brown
multi pairs/triples	identified by progressively numbered tapes

Sheath colour

grey

Minimal sheath marking

CCI S107 BU(i) H-M	150/250 V	n x (pair/triple) x sect mm ²	IEC 60092-376
NEK 606	IEC 60332-3-22 Cat A	IEC 60331-1 or 2	meter marking year QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

150 / 250 V

CONSTRUCTION					CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair	triple		[m m ²]	[mm]	[mm]	[mm]	[kg/km]
1	x	2	x	0,75	1,1	0,6	8	90
2	x	2	x	0,75	1,1	0,6	12	150
4	x	2	x	0,75	1,1	0,6	14	220
7	x	2	x	0,75	1,1	0,6	17	330
8	x	2	x	0,75	1,1	0,6	18	370
12	x	2	x	0,75	1,1	0,6	22	530
16	x	2	x	0,75	1,1	0,6	25	670
19	x	2	x	0,75	1,1	0,6	27	780
24	x	2	x	0,75	1,1	0,6	30	960
32	x	2	x	0,75	1,1	0,6	35	1.240

1	x	3	x	0,75	1,1	0,6	8	100
2	x	3	x	0,75	1,1	0,6	13	190
4	x	3	x	0,75	1,1	0,6	16	290
7	x	3	x	0,75	1,1	0,6	20	450
8	x	3	x	0,75	1,1	0,6	21	510
12	x	3	x	0,75	1,1	0,6	25	720
16	x	3	x	0,75	1,1	0,6	29	930
19	x	3	x	0,75	1,1	0,6	31	1.080
24	x	3	x	0,75	1,1	0,6	35	1.340
32	x	3	x	0,75	1,1	0,6	40	1.740

1	x	2	x	1	1,4	0,6	8	100
2	x	2	x	1	1,4	0,6	13	180
4	x	2	x	1	1,4	0,6	15	250
7	x	2	x	1	1,4	0,6	18	390
8	x	2	x	1	1,4	0,6	20	450
12	x	2	x	1	1,4	0,6	24	620
16	x	2	x	1	1,4	0,6	27	800
19	x	2	x	1	1,4	0,6	29	920
24	x	2	x	1	1,4	0,6	33	1.170
32	x	2	x	1	1,4	0,6	37	1.500

1	x	3	x	1	1,4	0,6	9	120
2	x	3	x	1	1,4	0,6	14	220
4	x	3	x	1	1,4	0,6	17	340
7	x	3	x	1	1,4	0,6	21	540
8	x	3	x	1	1,4	0,6	23	610
12	x	3	x	1	1,4	0,6	27	850
16	x	3	x	1	1,4	0,6	31	1.120
19	x	3	x	1	1,4	0,6	33	1.320
24	x	3	x	1	1,4	0,6	37	1.620
32	x	3	x	1	1,4	0,6	42	2.110

150 / 250 V

CONSTRUCTION					CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair	triple		[m m ²]	[mm]	[mm]	[mm]	[kg/km]
1	x	2	x	1,5	1,6	0,7	10	120
2	x	2	x	1,5	1,6	0,7	15	220
4	x	2	x	1,5	1,6	0,7	18	340
7	x	2	x	1,5	1,6	0,7	21	520
8	x	2	x	1,5	1,6	0,7	23	600
12	x	2	x	1,5	1,6	0,7	28	840
16	x	2	x	1,5	1,6	0,7	32	1.110
19	x	2	x	1,5	1,6	0,7	34	1.270
24	x	2	x	1,5	1,6	0,7	39	1.600
32	x	2	x	1,5	1,6	0,7	44	2.060

1	x	3	x	1,5	1,6	0,7	10	150
2	x	3	x	1,5	1,6	0,7	16	280
4	x	3	x	1,5	1,6	0,7	19	450
7	x	3	x	1,5	1,6	0,7	25	720
8	x	3	x	1,5	1,6	0,7	27	820
12	x	3	x	1,5	1,6	0,7	32	1.190
16	x	3	x	1,5	1,6	0,7	36	1.540
19	x	3	x	1,5	1,6	0,7	39	1.790
24	x	3	x	1,5	1,6	0,7	44	2.260
32	x	3	x	1,5	1,6	0,7	50	2.920

instrumentation 150/250 V

halogen free - flame retardant

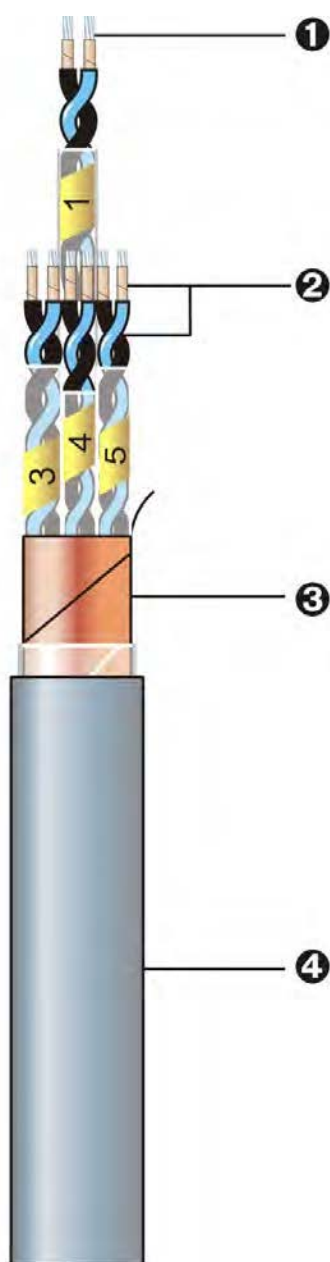
mineral - hydraulic oils & MUDs resistant

fire resistant

common screen - unarmoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U₀ / U	150 / 250 V	
Maximum voltage U_{max}	300 V	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	IEC 60331-1 or 2	
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60092-376
2 INSULATION	mica tape (*) + EPR HF compound IEC 60092-360
CORES TWISTING	in pairs / triples
3 COMMON SCREEN	Cu/PE tape (*) + tinned copper drain wire
4 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping ≥ 50 %

Cores identification

pair	black light blue
triple	black light blue brown
multi pairs/triples	identified by progressively numbered tapes

Sheath colour	grey
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Minimal sheath marking

CCI S108 BU(c) H-M 150/250 V	n x (pair/triple) x sect mm ²	IEC 60092-376
NEK 606 IEC 60332-3-22 Cat A	IEC 60331-1 or 2 meter marking	year QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

150 / 250 V

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair triple	[m m²]	[mm]	[mm]	[mm]	[kg/km]
1	x 2	x 0,75	1,1	0,6	8	90
2	x 2	x 0,75	1,1	0,6	12	150
4	x 2	x 0,75	1,1	0,6	14	220
7	x 2	x 0,75	1,1	0,6	17	330
8	x 2	x 0,75	1,1	0,6	18	380
12	x 2	x 0,75	1,1	0,6	22	540
16	x 2	x 0,75	1,1	0,6	25	680
19	x 2	x 0,75	1,1	0,6	27	790
24	x 2	x 0,75	1,1	0,6	30	980
32	x 2	x 0,75	1,1	0,6	34	1.270

1	x 3	x 0,75	1,1	0,6	8	100
2	x 3	x 0,75	1,1	0,6	13	190
4	x 3	x 0,75	1,1	0,6	16	300
7	x 3	x 0,75	1,1	0,6	20	450
8	x 3	x 0,75	1,1	0,6	21	520
12	x 3	x 0,75	1,1	0,6	25	730
16	x 3	x 0,75	1,1	0,6	28	940
19	x 3	x 0,75	1,1	0,6	31	1.090
24	x 3	x 0,75	1,1	0,6	34	1.370
32	x 3	x 0,75	1,1	0,6	39	1.770

1	x 2	x 1	1,4	0,6	8	100
2	x 2	x 1	1,4	0,6	13	180
4	x 2	x 1	1,4	0,6	15	260
7	x 2	x 1	1,4	0,6	18	400
8	x 2	x 1	1,4	0,6	20	450
12	x 2	x 1	1,4	0,6	23	630
16	x 2	x 1	1,4	0,6	26	808
19	x 2	x 1	1,4	0,6	29	930
24	x 2	x 1	1,4	0,6	32	1.190
32	x 2	x 1	1,4	0,6	37	1.520

1	x 3	x 1	1,4	0,6	9	120
2	x 3	x 1	1,4	0,6	14	220
4	x 3	x 1	1,4	0,6	17	340
7	x 3	x 1	1,4	0,6	21	540
8	x 3	x 1	1,4	0,6	23	620
12	x 3	x 1	1,4	0,6	26	870
16	x 3	x 1	1,4	0,6	30	1.130
19	x 3	x 1	1,4	0,6	33	1.330
24	x 3	x 1	1,4	0,6	37	1.650
32	x 3	x 1	1,4	0,6	42	2.140

150 / 250 V

CONSTRUCTION					CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	OVERALL DIAMETER approx	WEIGHT approx
n	pair	triple	[m m²]	[mm]				
1	x	2	x	1,5	1,6	0,7	10	120
2	x	2	x	1,5	1,6	0,7	15	220
4	x	2	x	1,5	1,6	0,7	18	350
7	x	2	x	1,5	1,6	0,7	21	530
8	x	2	x	1,5	1,6	0,7	23	610
12	x	2	x	1,5	1,6	0,7	28	860
16	x	2	x	1,5	1,6	0,7	32	1.120
19	x	2	x	1,5	1,6	0,7	34	1.280
24	x	2	x	1,5	1,6	0,7	38	1.630
32	x	2	x	1,5	1,6	0,7	44	2.090
1	x	3	x	1,5	1,6	0,7	10	150
2	x	3	x	1,5	1,6	0,7	17	280
4	x	3	x	1,5	1,6	0,7	19	450
7	x	3	x	1,5	1,6	0,7	25	730
8	x	3	x	1,5	1,6	0,7	26	830
12	x	3	x	1,5	1,6	0,7	32	1.210
16	x	3	x	1,5	1,6	0,7	36	1.570
19	x	3	x	1,5	1,6	0,7	39	1.830
24	x	3	x	1,5	1,6	0,7	44	2.300
32	x	3	x	1,5	1,6	0,7	50	2.970

FIREBAR®
Medium Voltage
Low Voltage
power & control
Instrumentation

Fire & Water resistant
Oils & MUDs resistant



FIREBAR[®]

TOTAL SAFETY

FIRE RESISTANT CABLE

in accordance with

instrumentation
power low voltage
medium voltage

BS 7846:2000 Cat F3
BS 8491 F120

when submitted to

fire + mechanical shocks + water spray / water jets

followed by

water immersion of burned sample still powered

3,6/6 kV - radial field

halogen free - flame retardant

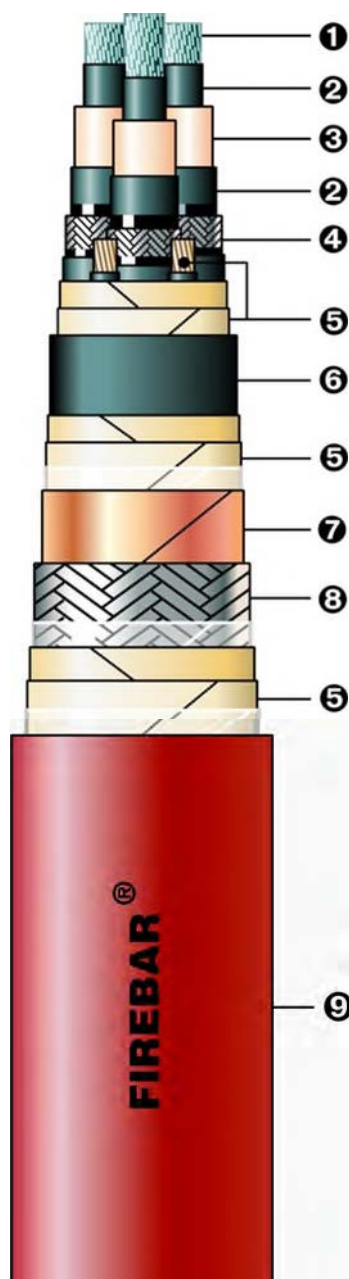
mineral - hydraulic oils & MUDs resistant

fire + mechanical shocks + water jets + water immersion resistant

armoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U_0 / U	3,6/6 kV	
Maximum voltage U_m	7,2 KV	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardance	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	BS 8491:2008 F120	(see NOTE)
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Electromagnetic compatibility	IEC 60533 Annex B	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 SEMICONDUCTIVES	HF extruded compound
3 INSULATION	HEPR HF compound IEC 60092-360 + HF heat resistant rubber compound
4 PHASE SCREEN	tinned copper wire braid
5 FIREBAR® protection	fiberglass tapes(*) + fiberglass ropes, HEPR sheathed
6 INNER SHEATH	HF heat resistant rubber compound
7 ELECTROMAGNETIC SHIELD	plain copper tapes(*)
8 ARMOUR	tinned copper wire braid
9 OUTER SHEATH	SHF2 H-M compound NEK 606:2016 separator PE tapes (*) where necessary (*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white
3 cores	off-white (identification by coloured or numbered tapes)

Sheath colour	red
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Minimal sheath marking

CCI P120 RFOU H-M FIREBAR®	3,6/6 kV	n x sect mm ²	IEC 60092-354
NEK 606 IEC 60332-3-22 Cat A	BS 8491 F120	meter marking	year QA n°

- Minimum Bending Radius: **4/5 D** depending on Overall Diameter - see **Generals** section

FIRE & MECHANICAL SHOCKS



WATER JETS



WATER IMMERSION



NOTE BS 8491 F120 - test parameters

- > **FIRE:** 830 (+40/-0)°C x 120 minutes @ 3,6 kV, while:
 - > **MECHANICAL SHOCKS:** *directly* hitting the sample in bent formation at Minimum Bending Radius
 - > **WATER JETS:** 5 bursts (5 sec. each) @ 12,5 l/min during last 5 min.
- Furthermore, not requested by any fire resistant standard:**
WATER IMMERSION (15 min) of burned sample still powered

3,6/6 kV

CONSTRUCTION			CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
			nominal	nominal	nominal	approx	approx
n		[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	50	8,3	2,5	31,8	42	2.500
1	x	70	10,0	2,5	33,6	44	2.830
1	x	95	11,8	2,5	35,4	46	3.240
1	x	120	13,2	2,5	36,8	48	3.550
1	x	150	14,6	2,5	38,2	49	3.940
1	x	185	16,5	2,5	40,1	51	4.440
1	x	240	19,0	2,5	42,8	54	5.230
1	x	300	21,8	2,5	46,5	58	6.070
3	x	50	8,3	2,5	58,9	72	6.580
3	x	70	10,0	2,5	62,6	76	7.610
3	x	95	11,8	2,5	66,5	80	8.815
3	x	120	13,2	2,5	69,5	83	9.840
3	x	150	14,6	2,5	72,5	86	11.010
3	x	185	16,5	2,5	76,6	91	12.750
3	x	240	19,0	2,5	82,4	97	15.030

6/10 kV - radial field

halogen free - flame retardant

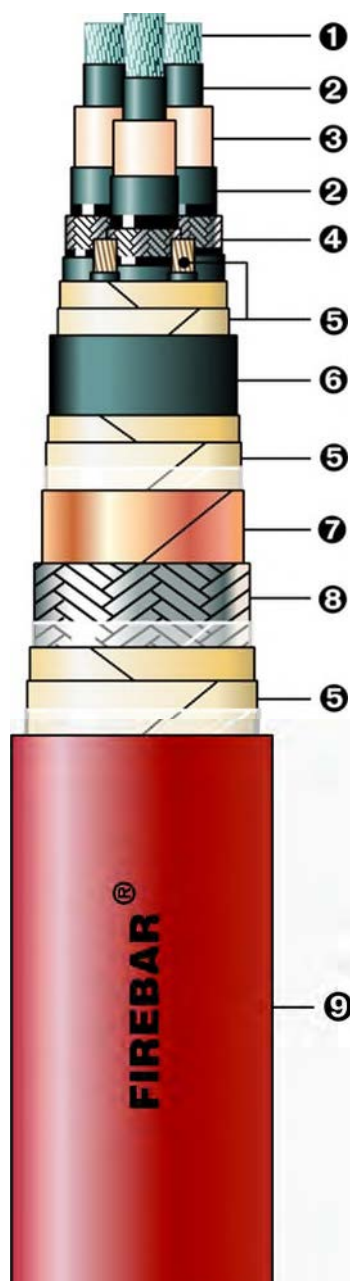
mineral - hydraulic oils & MUDs resistant

fire + mechanical shocks + water jets + water immersion resistant

armoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U_0 / U	6/10 kV	
Maximum voltage U_m	12,5 KV	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardance	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	BS 8491:2008 F120	(see NOTE)
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Electromagnetic compatibility	IEC 60533 Annex B	
Mineral - hydraulic oils & MUD resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 SEMICONDUCTIVES	HF extruded compound
3 INSULATION	HEPR HF compound IEC 60092-360 + HF heat resistant rubber compound
4 PHASE SCREEN	tinned copper wire braid
5 FIREBAR® protection	fiberglass tapes(*) + fiberglass ropes, HEPR sheathed
6 INNER SHEATH	HF heat resistant rubber compound
7 ELECTROMAGNETIC SHIELD	plain copper tapes(*)
8 ARMOUR	tinned copper wire braid
9 OUTER SHEATH	SHF2 H-M compound NEK 606:2016 separator PE tapes (*) where necessary (*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white
3 cores	off-white (identification by coloured or numbered tapes)

Sheath colour	red
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Minimal sheath marking

CCI P121 RFOU H-M FIREBAR®	6/10 kV	n x sect mm²	IEC 60092-354
NEK 606 IEC 60332-3-22 Cat A	BS 8491 F120	meter marking	year QA n°

- Minimum Bending Radius: **4/5 D** depending on Overall Diameter - see **Generals** section

FIRE & MECHANICAL SHOCKS



WATER JETS



WATER IMMERSION



NOTE BS 8491 F120 - test parameters

- > **FIRE:** 830 (+40/-0)°C x 120 minutes @ 6 kV, while:
 - > **MECHANICAL SHOCKS:** *directly* hitting the sample in bent formation at Minimum Bending Radius
 - > **WATER JETS:** 5 bursts (5 sec. each) @ 12,5 l/min during last 5 min.
- Furthermore, not requested by any fire resistant standard:**
WATER IMMERSION (15 min) of burned sample still powered

6/10 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n		[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	50	8,3	3,4	34,3	45	2.750
1	x	70	10,0	3,4	36	47	3.090
1	x	95	11,8	3,4	37,8	49	3.540
1	x	120	13,2	3,4	39,2	50	3.830
1	x	150	14,6	3,4	40,8	52	4.240
1	x	185	16,5	3,4	42,7	54	4.790
1	x	240	19,0	3,4	45	56	5.470
1	x	300	21,8	3,4	48,3	60	6.320
3	x	50	8,3	3,4	62,8	76	7.230
3	x	70	10,0	3,4	66,5	80	8.170
3	x	95	11,8	3,4	70,4	84	9.490
3	x	120	13,2	3,4	73,4	87	10.540
3	x	150	14,6	3,4	76,4	91	11.820
3	x	185	16,5	3,4	80,5	95	13.340

8,7/15 kV - radial field

halogen free - flame retardant

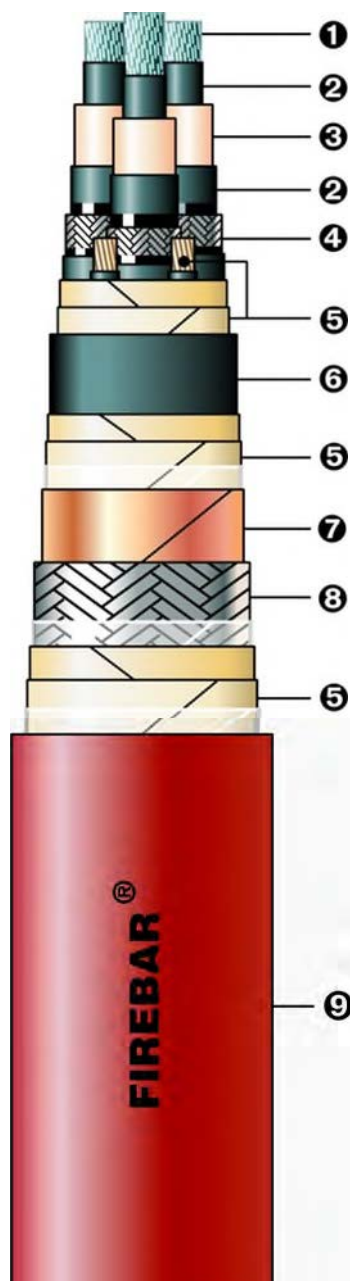
mineral - hydraulic oils & MUDs resistant

fire + mechanical shocks + water jets + water immersion resistant

armoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U_o / U	8,7/15 kV	
Maximum voltage U_m	17,5 KV	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardance	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	BS 8491:2008 F120	(see NOTE)
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Electromagnetic compatibility	IEC 60533 Annex B	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 SEMICONDUCTIVES	HF extruded compound
3 INSULATION	HEPR HF compound IEC 60092-360 + HF heat resistant rubber compound
4 PHASE SCREEN	tinned copper wire braid
5 FIREBAR® protection	fiberglass tapes(*) + fiberglass ropes, HEPR sheathed
6 INNER SHEATH	HF heat resistant rubber compound
7 ELECTROMAGNETIC SHIELD	plain copper tape(s)(*)
8 ARMOUR	tinned copper wire braid
9 OUTER SHEATH	SHF2 H-M compound NEK 606:2016 separator PE tapes (*) where necessary (*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white
3 cores	off-white (identification by coloured or numbered tapes)

Sheath colour	red
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Minimal sheath marking

CCI P122 RFOU H-M FIREBAR®	8,7/15 kV	n x sect mm ²	IEC 60092-354
NEK 606 IEC 60332-3-22 Cat A	BS 8491 F120	meter marking	year QA n°

- Minimum Bending Radius: **4/5 D** depending on Overall Diameter - see **Generals** section

FIRE & MECHANICAL SHOCKS



WATER JETS



WATER IMMERSION



NOTE BS 8491 F120 - test parameters

- > **FIRE:** 830 (+40/-0)°C x 120 minutes @ 8,7 kV, while:
 - > **MECHANICAL SHOCKS:** *directly* hitting the sample in bent formation at Minimum Bending Radius
 - > **WATER JETS:** 5 bursts (5 sec. each) @ 12,5 l/min during last 5 min.
- Furthermore, not requested by any fire resistant standard:**
WATER IMMERSION (15 min) of burned sample still powered

8,7/15 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n		[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	50	8,3	4,5	35,9	47	2.930
1	x	70	10,0	4,5	37,6	48	3.260
1	x	95	11,8	4,5	39,4	50	3.690
1	x	120	13,2	4,5	40,8	42	4.040
1	x	150	14,6	4,5	42,2	53	4.400
1	x	185	16,5	4,5	44,1	55	4.950
1	x	240	19,0	4,5	46,6	58	5.700
1	x	300	21,8	4,5	49,9	62	6.530
3	x	50	8,3	4,5	67,5	81	7.940
3	x	70	10,0	4,5	71,2	85	8.960
3	x	95	11,8	4,5	75,1	89	10.450
3	x	120	13,2	4,5	78,1	93	11.410
3	x	150	14,6	4,5	81,2	96	12.540

12/20 kV - radial field

halogen free - flame retardant

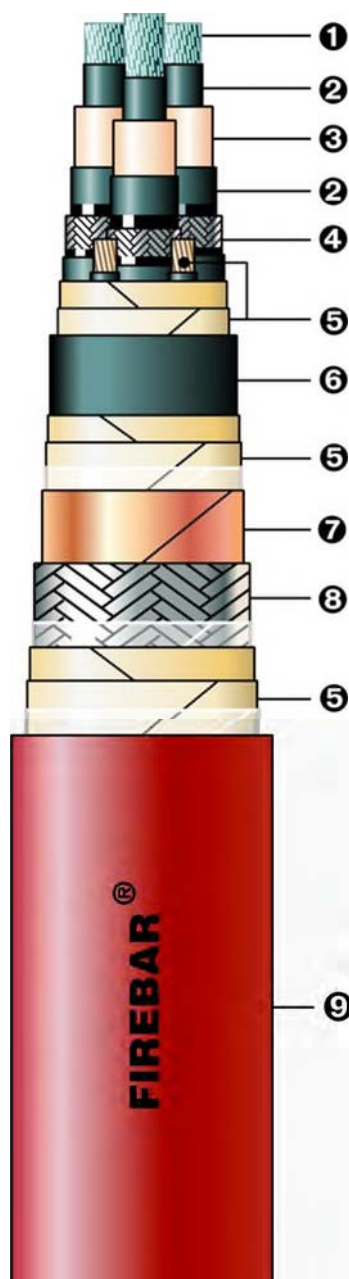
mineral - hydraulic oils & MUDs resistant

fire + mechanical shocks + water jets + water immersion resistant

armoured

operating temperature over 100 °C

(see page 7)



Design and construction	IEC 60092-354	NEK 606:2016
Nominal voltage U_0 / U	12/20 kV	
Maximum voltage U_m	24 KV	
Maximum rated temperature	90 °C	according to IEC 60092-360
Flame retardance	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	BS 8491:2008 F120	(see NOTE)
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Electromagnetic compatibility	IEC 60533 Annex B	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold bend and Impact test (- 40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 SEMICONDUCTIVES	HF extruded compound
3 INSULATION	HEPR HF compound IEC 60092-360 + HF heat resistant rubber compound
4 PHASE SCREEN	tinned copper wire braid
5 FIREBAR® protection	fiberglass tapes(*) + fiberglass ropes, HEPR sheathed
6 INNER SHEATH	HF heat resistant rubber compound
7 ELECTROMAGNETIC SHIELD	plain copper tapes(*)
8 ARMOUR	tinned copper wire braid
9 OUTER SHEATH	SHF2 H-M compound NEK 606:2016 separator PE tapes (*) where necessary (*) tape overlapping ≥ 50 %

Cores identification

1 core	off-white
3 cores	off-white (identification by coloured or numbered tapes)

Sheath colour	red
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Minimal sheath marking

CCI P123 RFOU H-M FIREBAR®	12/20 kV	n x sect mm ²	IEC 60092-354
NEK 606	IEC 60332-3-22 Cat A	BS 8491 F120	meter marking year QA n°

- Minimum Bending Radius: **4/5 D** depending on Overall Diameter - see **Generals** section

FIRE & MECHANICAL SHOCKS



WATER JETS



WATER IMMERSION



NOTE BS 8491 F120 - test parameters

- > **FIRE:** 830 (+40/-0)°C x 120 minutes @ 12 kV, while:
 - > **MECHANICAL SHOCKS:** *directly* hitting the sample in bent formation at Minimum Bending Radius
 - > **WATER JETS:** 5 bursts (5 sec. each) @ 12,5 l/min during last 5 min.
- Furthermore, not requested by any fire resistant standard:**
WATER IMMERSION (15 min) of burned sample still powered

12/20 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n	[mm²]		[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	50	8,3	5,5	37,9	49	3.160
1	x	70	10,0	5,5	39,6	51	3.500
1	x	95	11,8	5,5	41,4	53	3.940
1	x	120	13,2	5,5	42,8	54	4.290
1	x	150	14,6	5,5	44,2	56	4.670
1	x	185	16,5	5,5	46,1	58	5.210
1	x	240	19,0	5,5	48,6	60	5.980
1	x	300	21,8	5,5	51,9	64	6.840
3	x	50	8,3	5,5	71,9	86	8.600
3	x	70	10,0	5,5	75,5	90	9.910
3	x	95	11,8	5,5	79,4	94	11.090
3	x	120	13,2	5,5	82,4	97	12.200
3	x	150	14,6	5,5	85,5	101	13.410

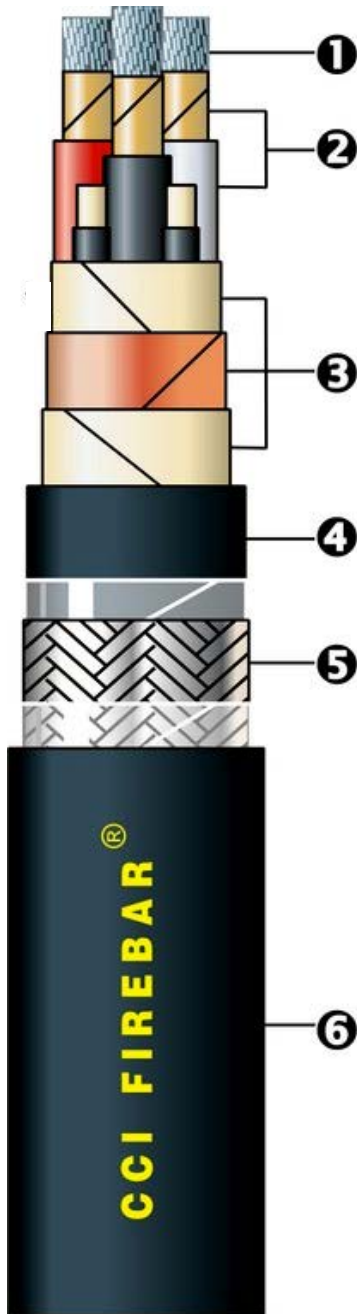
power & control 0,6/1 kV

halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

fire + mechanical shocks + water spray + water immersion resistant

armoured



Design and construction	IEC 60092-353	NEK 606:2016
Nominal voltage U_0/U	0,6 / 1 kV	
Maximum Voltage U_{max}	1,2 kV	
Maximum rated temperature	95 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	BS 7846:2000 Cat F3 (120 min) (see NOTE)	
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60228
2 INSULATION	mica tape (*) + S95 HF comp. IEC 60092-360
3 FIREBAR® protection	• fiberglass tape (*) + fiberglass ropes, S95 sheathed (when sect. $\geq 16 \text{ mm}^2$) • Cu-PET tapes (*) • fiberglass tape (*)
4 INNER SHEATH	HF extruded compound
5 ARMOUR	tinned copper wire braid
6 OUTER SHEATH	SHF2 H-M compound NEK 606:2016
	separator PE tapes (*) where necessary
	(*) tape overlapping $\geq 50 \%$

Cores identification

1 core	off-white	4 cores	off-white	black	red	blue
2 cores	off-white	black	5 cores and above	white & numbered		
3 cores	off-white	black	red			

Sheath colour

black

Minimal sheath marking

CCI P125 SFOU H-M FIREBAR® 0,6/1 kV n x sect mm^2 IEC 60092-353
 NEK 606 IEC 60332-3-22 Cat A BS 7846:2000 Cat F3 meter marking year QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

FIRE & MECHANICAL SHOCKS



WATER SPRAY



WATER IMMERSION



NOTE BS 7846 Cat F3 : 2000 - test parameters

- **FIRE:** 830 (+40/-0)°C x 120 minutes @ 1 kV, while:
 - **MECHANICAL SHOCKS:** every 5 minutes hitting the frame with sample mounted in bent formation at Minim. Bending Radius
 - **WATER SPRAY:** 1 l/m² s⁻¹ (2,4 l/min) during last 15 minutes
- Furthermore, not requested by any fire resistant standard:
WATER IMMERSION (15 min) of burned sample still powered

0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n		[mm ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	16	5,2	1,0	10,9	15	470
1	x	25	6,5	1,2	12,6	17	620
1	x	35	7,5	1,2	13,6	18	745
1	x	50	8,3	1,4	14,7	20	900
1	x	70	10,0	1,4	16,4	21	1.140
1	x	95	11,8	1,6	18,6	24	1.500
1	x	120	13,2	1,6	20,4	26	1.800
1	x	150	14,6	1,8	22,2	28	2.150
1	x	185	16,5	2,0	24,5	30	2.630
1	x	240	19,0	2,2	27,8	34	3.320
1	x	300	21,8	2,4	31	38	4.030
2	x	1,5	1,6	1,0	10,5	15	330
2	x	2,5	2,0	1,0	11,7	16	390
2	x	4	2,6	1,0	13,6	18	490
2	x	6	3,2	1,0	14,9	20	605
2	x	10	4,1	1,0	16,5	21	800
2	x	16	5,2	1,0	18,9	24	1.060
3	x	1,5	1,6	1,0	11,2	15	370
3	x	2,5	2,0	1,0	12,4	17	450
3	x	4	2,8	1,0	14,5	19	570
3	x	6	3,3	1,0	15,8	21	700
3	x	10	4,1	1,0	17,5	23	980
3	x	16	5,2	1,0	20,5	26	1.350
3	x	25	6,5	1,2	24,4	30	1.860
3	x	35	7,5	1,2	26,4	32	2.140
3	x	50	8,3	1,4	29	35	2.670
3	x	70	10,0	1,4	32,7	40	3.540
3	x	95	11,8	1,6	37,4	45	4.710
3	x	120	13,2	1,6	40,8	49	5.640
3	x	150	14,6	1,8	45,1	54	6.930
3	x	185	16,5	2,0	50,1	59	8.550
3	x	240	19,0	2,2	56,8	66	10.830
3	x	300	21,8	2,4	63,7	74	12.980

0,6 / 1 kV

CONSTRUCTION			CONDUCTOR DIAMETER nominal	INSULATION THICKNESS nominal	DIAMETER UNDER ARMOUR nominal	OVERALL DIAMETER approx	WEIGHT approx
n		[mm²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
4	x	1,5	1,6	1,0	12,1	17	430
4	x	2,5	2,0	1,0	13,5	18	510
4	x	4	2,8	1,0	15,8	21	670
4	x	6	3,3	1,0	17,3	22	840
4	x	10	4,1	1,0	19,6	25	1.150
4	x	16	5,2	1,0	22,5	28	1.560
4	x	25	6,5	1,2	26,8	33	2.150
4	x	35	7,5	1,2	29,1	35	2.930
4	x	50	8,3	1,4	31,9	39	3.440
4	x	70	10,0	1,4	36	43	4.460
4	x	95	11,8	1,6	41,3	49	5.960
4	x	120	13,2	1,6	45,1	53	7.180
4	x	150	14,6	1,8	49,8	59	8.770
4	x	185	16,5	2,0	55,8	65	10.850
4	x	240	19,0	2,2	62,7	73	13.880
4	x	300	21,8	2,4	70,5	81	16.650
5	x	1,5	1,6	1,0	13,4	18	500
7	x	1,5	1,6	1,0	14,6	19	590
12	x	1,5	1,6	1,0	19,4	25	930
19	x	1,5	1,6	1,0	22,7	28	1245
27	x	1,5	1,6	1,0	27,3	33	1710
37	x	1,5	1,6	1,0	30,8	37	2240
5	x	2,5	2,0	1,0	14,8	19	600
7	x	2,5	2,0	1,0	16,1	21	720
12	x	2,5	2,0	1,0	21,5	27	1.150
19	x	2,5	2,0	1,0	25,4	31	1.570
27	x	2,5	2,0	1,0	30,6	37	2.270
37	x	2,5	2,0	1,0	34,4	41	2.850

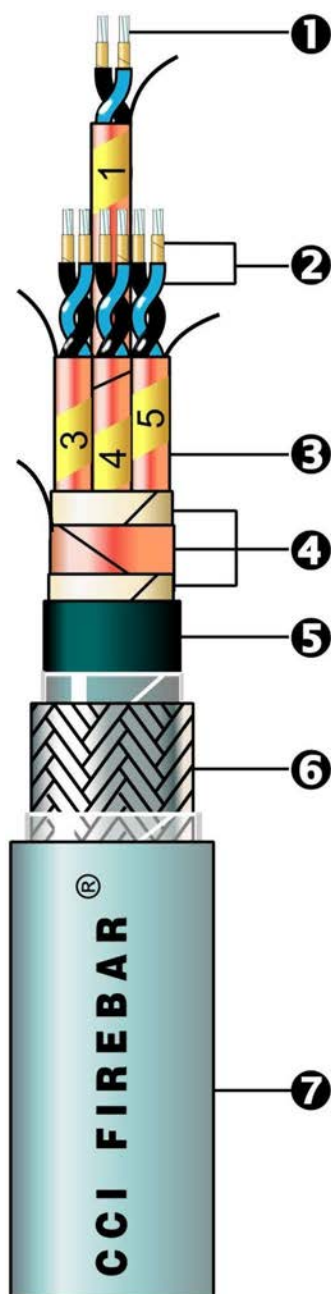
instrumentation 150/250 V

halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

fire + mechanical shocks + water spray + water immersion resistant

individual & common screen - armoured



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U_0/U	150/250 V	
Maximum Voltage U_{max}	300 V	
Maximum rated temperature	95 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	BS 7846:2000 Cat F3 (see NOTE)	
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60092-376
2 INSULATION	mica tape (*) + S95 HF compound IEC 6092-360
3 INDIVIDUAL SCREEN	Cu/PE tape (*) + tinned copper drain wire
4 FIREBAR® protection & COMMON SCREEN	fiberglass tape (*) Cu-Polyester tape + tinned copper drain wire fiberglass tape (*)
5 INNER SHEATH	HF extruded compound
6 ARMOUR	tinned copper wire braid
7 OUTER SHEATH	SHF2 H-M compound NEK 606:2016 separator PE tapes (*) where necessary (*) tape overlapping ≥ 50 %

Cores identification

pair	black light blue
triple	black light blue brown
multi pairs/triples	identified by progressively numbered tapes

Sheath colour

grey

Minimal sheath marking

CCI S112 SFOU (ic) H-M FIREBAR® 150/250 V n x (pair/triple) x sect mm² IEC 60092-376
NEK 606 IEC 60332-3-22 Cat A BS 7846:2000 Cat F3 meter marking year QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

FIRE & MECHANICAL SHOCKS



WATER SPRAY



WATER IMMERSION



NOTE BS 7846 Cat F3 : 2000 - test parameters

- **FIRE:** 830 (+40/-0)°C x 120 minutes @ 250 V, while:
 - **MECHANICAL SHOCKS:** every 5 minutes hitting the frame with sample mounted in bent formation at Minim. Bending Radius
 - **WATER SPRAY:** 1 l/m² s⁻¹ (2,4 l/min) during last 15 minutes
- Furthermore, not requested by any fire resistant standard:**
WATER IMMERSION (15 min) of burned sample still powered

150 / 250 V

CONSTRUCTION				CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
				nominal	nominal	nominal	approx	approx
n	pair	triple	[m m ²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
2	x	2	x 0,75	1,1	0,9	14,6	19	570
4	x	2	x 0,75	1,1	0,9	17,1	22	750
7	x	2	x 0,75	1,1	0,9	20,6	26	1.020
8	x	2	x 0,75	1,1	0,9	22,1	28	1.150
12	x	2	x 0,75	1,1	0,9	26,4	33	1.640
16	x	2	x 0,75	1,1	0,9	30,2	37	2.060
19	x	2	x 0,75	1,1	0,9	32,5	40	2.330
27	x	2	x 0,75	1,1	0,9	38,2	46	3.080
37	x	2	x 0,75	1,1	0,9	44,3	52	3.990
2	x	3	x 0,75	1,1	0,9	16,2	21	660
4	x	3	x 0,75	1,1	0,9	18,9	24	890
7	x	3	x 0,75	1,1	0,9	23,7	29	1.270
12	x	3	x 0,75	1,1	0,9	30,1	37	2.040
2	x	2	x 1	1,4	0,9	15,3	20	610
4	x	2	x 1	1,4	0,9	18,1	23	830
7	x	2	x 1	1,4	0,9	21,8	27	1.150
8	x	2	x 1	1,4	0,9	23,2	29	1.260
12	x	2	x 1	1,4	0,9	27,9	35	1.850
16	x	2	x 1	1,4	0,9	31,8	39	2.310
19	x	2	x 1	1,4	0,9	34,4	42	2.600
27	x	2	x 1	1,4	0,9	40,4	48	3.500
37	x	2	x 1	1,4	0,9	46,8	55	4.530
2	x	3	x 1	1,4	0,9	16,9	22	730
4	x	3	x 1	1,4	0,9	19,8	25	970
7	x	3	x 1	1,4	0,9	25,1	31	1.420
12	x	3	x 1	1,4	0,9	31,7	39	2.290
2	x	2	x 1,5	1,6	1,0	14,7	22	790
4	x	2	x 1,5	1,6	1,0	17,6	25	1.080
7	x	2	x 1,5	1,6	1,0	21,6	29	1.510
8	x	2	x 1,5	1,6	1,0	23,2	31	1.690
12	x	2	x 1,5	1,6	1,0	28,3	38	2.450
16	x	2	x 1,5	1,6	1,0	32,5	42	3.080
19	x	2	x 1,5	1,6	1,0	35,3	45	3.530
24	x	2	x 1,5	1,6	1,0	41,9	53	4.790
32	x	2	x 1,5	1,6	1,0	48,8	57	5.880
2	x	3	x 1,5	1,6	1,0	16,4	24	950
4	x	3	x 1,5	1,6	1,0	19,5	27	1.280
7	x	3	x 1,5	1,6	1,0	25,2	33	1.930
12	x	3	x 1,5	1,6	1,0	32,4	42	3.090
19	x	3	x 1,5	1,6	1,0	40,5	50	4.450

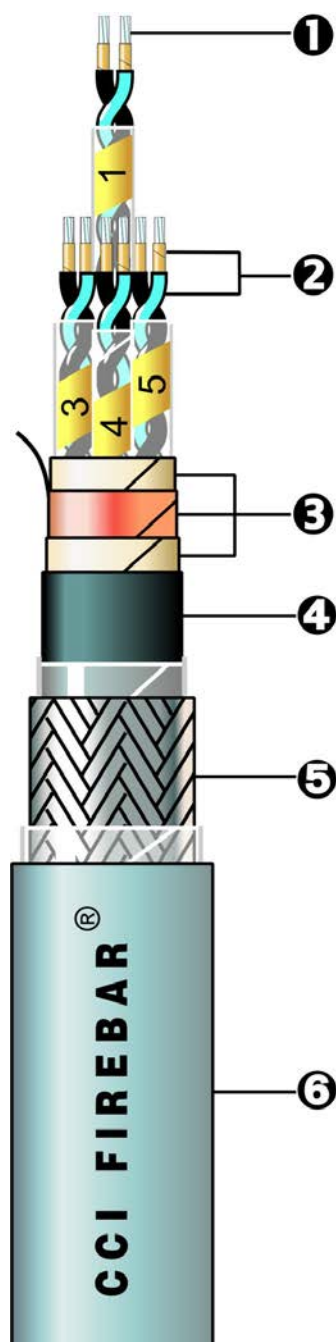
instrumentation 150/250 V

halogen free - flame retardant

mineral - hydraulic oils & MUDs resistant

fire + mechanical shocks + water spray + water immersion resistant

common screen - armoured



Design and construction	IEC 60092-376	NEK 606:2016
Nominal voltage U_0/U	150/250 V	
Maximum Voltage U_{max}	300 V	
Maximum rated temperature	95 °C	according to IEC 60092-360
Flame retardancy	IEC 60332-1-2	IEC 60332-3-22 Cat A
Fire resistance	BS 7846:2000 Cat F3 (see NOTE)	
Halogen content & corrosivity	IEC 60754-1 & 2	IEC 60684-2
Smoke density	IEC 61034-1 & 2	
UV resistance	UL 1581 § 1200	
Ozone resistance	IEC 60092-360	
Mineral - hydraulic oils & MUDs resist.	NEK 606:2016	
on request:		
Cold Bend and Impact test (-40° C)	CSA C 22.2 N° 0.3-01 & N° 38-05	

Construction

1 CONDUCTOR	tinned annealed copper flexible Class 2 or Class 5 IEC 60092-376
2 INSULATION	mica tape (*) + S95 HF compound IEC 6092-360
3 FIREBAR® protection & COMMON SCREEN	fiberglass tape (*) Cu/PE tape + tinned copper drain wire fiberglass tape (*) HF extruded compound tinned copper wire braid SHF2 H-M compound NEK 606:2016 separatorPE tapes (*) where necessary (*) tape overlapping $\geq 50\%$
4 INNER SHEATH	
5 ARMOUR	
6 OUTER SHEATH	

Cores identification

pair	black light blue
triple	black light blue brown
multi pairs/triples	identified by progressively numbered tapes

Sheath colour

grey

Minimal sheath marking

CCI S113 SFOU (c) H-M FIREBAR® 150/250 V n x (pair/triple) x sect mm² IEC 60092-376
NEK 606 IEC 60332-3-22 Cat A BS 7846:2000 Cat F3 meter marking year QA n°

- Minimum Bending Radius: **4D** (Overall Diameter) – see **Generals** section

FIRE & MECHANICAL SHOCKS



WATER SPRAY



WATER IMMERSION



NOTE BS 7846 Cat F3 : 2000 - test parameters

- **FIRE:** 830 (+40/-0)°C x 120 minutes @ 250 V, while:
 - **MECHANICAL SHOCKS:** every 5 minutes hitting the frame with the sample mounted in bent formation at Minim. Bending Radius
 - **WATER SPRAY:** 1 l/m² s⁻¹ (2,4 l/min) during last 15 minutes
- Furthermore, not requested by any fire resistant standard:**
WATER IMMERSION (15 min) of burned sample still powered

150 / 250 V

					CONDUCTOR DIAMETER	INSULATION THICKNESS	DIAMETER UNDER ARMOUR	OVERALL DIAMETER	WEIGHT
CONSTRUCTION					nominal	nominal	nominal	approx	approx
n	pair			[m m²]	[mm]	[mm]	[mm]	[mm]	[kg/km]
1	x	2	x	0,75	1,1	0,9	9,5	14	300
2	x	2	x	0,75	1,1	0,9	14,8	19	550
4	x	2	x	0,75	1,1	0,9	17,1	22	710
7	x	2	x	0,75	1,1	0,9	20,8	26	960
8	x	2	x	0,75	1,1	0,9	22,1	28	1.080
12	x	2	x	0,75	1,1	0,9	26,7	32	1.450
16	x	2	x	0,75	1,1	0,9	30,4	37	1.910
19	x	2	x	0,75	1,1	0,9	32,7	40	2.170
27	x	2	x	0,75	1,1	0,9	38,5	46	2.880
37	x	2	x	0,75	1,1	0,9	44,6	52	3.700

1	x	3	x	0,75	1,1	0,9	10,0	14	330
2	x	3	x	0,75	1,1	0,9	16,2	21	650
4	x	3	x	0,75	1,1	0,9	18,9	24	860
7	x	3	x	0,75	1,1	0,9	23,8	29	1.210
12	x	3	x	0,75	1,1	0,9	30,3	37	1.950

1	x	2	x	1	1,4	0,9	9,9	14	320
2	x	2	x	1	1,4	0,9	15,3	20	600
4	x	2	x	1	1,4	0,9	17,9	23	770
7	x	2	x	1	1,4	0,9	21,6	27	1.060
8	x	2	x	1	1,4	0,9	23,2	29	1.170
12	x	2	x	1	1,4	0,9	27,7	34	1.590
16	x	2	x	1	1,4	0,9	31,5	38	2.090
19	x	2	x	1	1,4	0,9	34,2	41	2.370
27	x	2	x	1	1,4	0,9	40,2	48	3.170
37	x	2	x	1	1,4	0,9	46,6	54	4.090

1	x	3	x	1	1,4	0,9	10,6	15	370
2	x	3	x	1	1,4	0,9	16,9	22	700
4	x	3	x	1	1,4	0,9	19,6	25	930
7	x	3	x	1	1,4	0,9	24,9	30	1.340
12	x	3	x	1	1,4	0,9	31,5	39	2.130

1	x	2	x	1,5	1,6	1,0	11,3	16	390
2	x	2	x	1,5	1,6	1,0	17,0	22	700
4	x	2	x	1,5	1,6	1,0	20,0	25	930
7	x	2	x	1,5	1,6	1,0	24,1	30	1.280
8	x	2	x	1,5	1,6	1,0	25,9	32	1.440
12	x	2	x	1,5	1,6	1,0	31,3	38	2.100
16	x	2	x	1,5	1,6	1,0	35,6	43	2.610
19	x	2	x	1,5	1,6	1,0	38,6	46	2.990
27	x	2	x	1,5	1,6	1,0	45,5	53	4.010
37	x	2	x	1,5	1,6	1,0	52,7	61	5.200

1	x	3	x	1,5	1,6	1,0	11,9	16	420
2	x	3	x	1,5	1,6	1,0	18,8	24	850
4	x	3	x	1,5	1,6	1,0	22,1	28	1.120
7	x	3	x	1,5	1,6	1,0	27,9	33	1.650
12	x	3	x	1,5	1,6	1,0	35,6	43	2.640

Electrical data

Flame retardant
and
Fire resistant

Power & Control 0,6/ 1 kV

1 core

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE [Ω/km]		REACTANCE [Ω/km]		CAPACITANCE [μFarad/km]	INDUCTANCE [μHenry/km]	IMPEDANCE				MAXIMUM CURRENT (*) in free air [A]	SHORT CIRCUIT 1 sec [kA]
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	20°C	[Ω/km]		90°C		
								50 Hz	60 Hz	50 Hz	60 Hz		
1 x 16		1,16	1,48	0,105	0,126	0,247	335	1,16	1,17	1,48	1,48	104	2,33
1 x 25		0,734	0,936	0,102	0,123	0,291	325	0,74	0,74	0,94	0,94	140	3,65
1 x 35		0,529	0,675	0,098	0,118	0,328	313	0,54	0,54	0,68	0,68	175	5,11
1 x 50		0,391	0,499	0,096	0,115	0,355	305	0,40	0,41	0,51	0,51	214	7,30
1 x 70		0,27	0,344	0,091	0,109	0,413	290	0,28	0,29	0,36	0,36	277	10,2
1 x 95		0,195	0,249	0,089	0,107	0,470	284	0,21	0,22	0,26	0,27	338	13,9
1 x 120		0,154	0,196	0,086	0,104	0,514	275	0,18	0,18	0,21	0,22	395	17,5
1 x 150		0,126	0,161	0,085	0,102	0,556	272	0,15	0,16	0,18	0,19	458	21,9
1 x 185		0,1	0,128	0,084	0,101	0,610	269	0,13	0,14	0,15	0,16	526	27,0
1 x 240		0,0762	0,0972	0,082	0,099	0,681	262	0,11	0,13	0,13	0,14	626	35,0
1 x 300		0,0607	0,0774	0,080	0,096	0,762	256	0,10	0,11	0,11	0,12	725	43,8

(*) Maximum current rate is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

2 cores

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE [Ω/km]		REACTANCE [Ω/km]		CAPACITANCE [μFarad/km]	INDUCTANCE [μHenry/km]	IMPEDANCE				MAXIMUM CURRENT (*) in free air [A]	SHORT CIRCUIT 1 sec [kA]
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	20°C	[Ω/km]		90°C		
								50 Hz	60 Hz	50 Hz	60 Hz		
2 x 1,5		12,2	15,6	0,115	0,138	0,130	367	12,2	12,2	15,6	15,6	23	0,21
2 x 2,5		7,56	9,64	0,107	0,128	0,143	340	7,56	7,56	9,64	9,64	30	0,35
2 x 4		4,70	5,99	0,098	0,118	0,156	313	4,70	4,70	6,00	6,00	42	0,58
2 x 6		3,11	3,97	0,093	0,112	0,167	297	3,11	3,11	3,97	3,97	54	0,87
2 x 10		1,84	2,35	0,087	0,105	0,182	278	1,84	1,84	2,35	2,35	75	1,46
2 x 16		1,16	1,48	0,082	0,099	0,196	262	1,16	1,16	1,48	1,48	103	2,33

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

3 cores

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE [Ω/km]		REACTANCE [Ω/km]		CAPACITANCE [μFarad/km]	INDUCTANCE [μHenry/km]	IMPEDANCE				MAXIMUM CURRENT (*) in free air [A]	SHORT CIRCUIT 1 sec [kA]
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	20°C	[Ω/km]		90°C		
								50 Hz	60 Hz	50 Hz	60 Hz		
3 x 1,5		12,2	15,6	0,115	0,138	0,130	367	12,2	12,2	15,6	15,6	20	0,21
3 x 2,5		7,56	9,64	0,107	0,128	0,143	340	7,56	7,56	9,64	9,64	28	0,35
3 x 4		4,70	5,99	0,098	0,118	0,156	313	4,70	4,70	6,00	6,00	37	0,58
3 x 6		3,11	3,97	0,093	0,112	0,167	297	3,11	3,11	3,97	3,97	47	0,87
3 x 10		1,84	2,35	0,087	0,105	0,182	278	1,84	1,84	2,35	2,35	65	1,46
3 x 16		1,16	1,48	0,082	0,099	0,196	262	1,16	1,17	1,48	1,48	88	2,33
3 x 25		0,734	0,936	0,081	0,097	0,203	257	0,74	0,74	0,94	0,94	117	3,65
3 x 35		0,529	0,675	0,078	0,093	0,213	248	0,54	0,54	0,68	0,68	147	5,11
3 x 50		0,391	0,499	0,077	0,093	0,218	247	0,40	0,40	0,50	0,51	180	7,30
3 x 70		0,27	0,344	0,075	0,090	0,227	238	0,28	0,28	0,35	0,36	233	10,2
3 x 95		0,195	0,249	0,074	0,089	0,232	236	0,21	0,21	0,26	0,26	285	13,9
3 x 120		0,154	0,196	0,073	0,087	0,238	231	0,17	0,18	0,21	0,21	333	17,5
3 x 150		0,126	0,161	0,072	0,087	0,240	231	0,14	0,15	0,18	0,18	386	21,9
3 x 185		0,1	0,128	0,072	0,086	0,242	229	0,12	0,13	0,15	0,15	444	27,0
3 x 240		0,0762	0,0972	0,071	0,086	0,246	227	0,10	0,11	0,12	0,13	528	35,0
3 x 300		0,0607	0,0774	0,071	0,085	0,249	225	0,09	0,10	0,10	0,11	612	43,8

(*) (*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

Power & Control 0,6/ 1 kV

4 cores

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE [Ω/km]		REACTANCE [Ω/km]		CAPACITANCE [μFarad/km]	INDUCTANCE [μHenry/km]	IMPEDANCE				MAXIMUM CURRENT (*) in free air [A]	SHORT CIRCUIT 1 sec [kA]
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	20°C	[Ω/km]	90°C			
4 x 1,5		12,2	15,6	0,121	0,145	0,122	384	12,2	12,2	15,6	15,6	20	0,21
4 x 2,5		7,56	9,64	0,114	0,137	0,133	357	7,56	7,56	9,64	9,64	28	0,35
4 x 4		4,70	5,99	0,104	0,124	0,144	330	4,70	4,70	6,00	6,00	37	0,58
4 x 6		3,11	3,97	0,099	0,118	0,153	314	3,11	3,11	3,97	3,97	47	0,87
4 x 10		1,84	2,35	0,093	0,111	0,166	295	1,84	1,84	2,35	2,35	65	1,46
4 x 16		1,16	1,48	0,088	0,105	0,177	279	1,16	1,17	1,48	1,48	88	2,33
4 x 25		0,734	0,936	0,086	0,103	0,183	274	0,74	0,74	0,94	0,94	117	3,65
4 x 35		0,529	0,675	0,083	0,100	0,191	265	0,54	0,54	0,68	0,68	147	5,11
4 x 50		0,391	0,499	0,083	0,099	0,196	264	0,40	0,40	0,51	0,51	180	7,30
4 x 70		0,27	0,344	0,080	0,096	0,203	255	0,28	0,29	0,35	0,36	233	10,2
4 x 95		0,195	0,249	0,079	0,095	0,207	253	0,21	0,22	0,26	0,27	285	13,9
4 x 120		0,154	0,196	0,078	0,093	0,211	248	0,17	0,18	0,21	0,22	333	17,5
4 x 150		0,126	0,161	0,078	0,093	0,213	248	0,15	0,16	0,18	0,19	386	21,9
4 x 185		0,1	0,128	0,077	0,093	0,215	246	0,13	0,14	0,15	0,16	444	27,0
4 x 240		0,0762	0,0972	0,077	0,092	0,218	244	0,11	0,12	0,12	0,13	528	35,0
4 x 300		0,0607	0,0774	0,076	0,091	0,220	242	0,10	0,11	0,11	0,12	612	43,8

(*) Maximum current rate in free air is based on **90°C** conductor temperature and **45°C** ambient temperature (IEC 60092-352)

multicore

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE [Ω/km]		REACTANCE [Ω/km]		CAPACITANCE [μFarad/km]	INDUCTANCE [μHenry/km]	IMPEDANCE				MAXIMUM CURRENT (*) in free air [A]	SHORT CIRCUIT 1 sec [kA]
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	20°C	[Ω/km]	90°C			
5 x 1,5		12,2	15,6	0,125	0,150	0,119	399	12,2	12,2	15,6	15,6	12	0,21
7 x 1,5		12,2	15,6	0,159	0,191	0,091	506	12,2	12,2	15,6	15,6	11	0,21
12 x 1,5		12,2	15,6	0,188	0,225	0,076	597	12,2	12,2	15,6	15,6	9	0,21
19 x 1,5		12,2	15,6	0,202	0,243	0,064	645	12,2	12,2	15,6	15,6	8	0,21
27 x 1,5		12,2	15,6	0,221	0,265	0,065	695	12,2	12,2	15,6	15,6	7	0,21
37 x 1,5		12,2	15,6	0,228	0,273	0,062	726	12,2	12,2	15,6	15,6	6	0,21
5 x 2,5		7,56	9,64	0,117	0,140	0,129	372	7,56	7,56	9,64	9,64	17	0,35
7 x 2,5		7,56	9,64	0,150	0,180	0,097	479	7,56	7,56	9,64	9,64	15	0,35
12 x 2,5		7,56	9,64	0,179	0,215	0,081	571	7,56	7,56	9,64	9,64	12	0,35
19 x 2,5		7,56	9,64	0,194	0,233	0,051	618	7,56	7,56	9,64	9,64	11	0,35
27 x 2,5		7,56	9,64	0,210	0,252	0,054	668	7,56	7,56	9,64	9,64	10	0,35
37 x 2,5		7,56	9,64	0,207	0,248	0,066	699	7,56	7,56	9,64	9,64	9	0,35

(*) Maximum current rate in free air is based on **90°C** conductor temperature and **45°C** ambient temperature (IEC 60092-352)

Variable Frequency Drivers 1,8/3 kV

3 cores + 3 earths

CONSTRUCTION				MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE	INDUCTANCE	IMPEDANCE				MAXIMUM CURRENT (*)	SHORT CIRCUIT
CONDUCTORS		EARTHS		20°C	90°C	[Ω/km]		[μFarad/km]	[μHenry/km]	20°C		[Ω/km]		in free air	1 sec
n	[mm²]	n	[mm²]			50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]
3 x 10		3 x 2,5		1,84	2,35	0,105	0,126	0,156	334	1,84	1,84	2,35	2,35	65	1,46
3 x 16		3 x 4		1,16	1,48	0,098	0,117	0,170	311	1,16	1,17	1,48	1,48	88	2,33
3 x 25		3 x 6		0,734	0,936	0,092	0,110	0,184	292	0,74	0,74	0,94	0,94	117	3,65
3 x 35		3 x 6		0,529	0,675	0,088	0,106	0,192	281	0,54	0,54	0,68	0,68	147	5,11
3 x 50		3 x 10		0,391	0,499	0,086	0,103	0,199	274	0,40	0,40	0,51	0,51	180	7,30
3 x 70		3 x 16		0,27	0,344	0,082	0,099	0,210	262	0,28	0,29	0,35	0,36	233	10,2
3 x 95		3 x 16		0,195	0,249	0,081	0,097	0,214	257	0,21	0,22	0,26	0,27	285	13,9
3 x 120		3 x 25		0,154	0,196	0,079	0,095	0,221	251	0,17	0,18	0,21	0,22	333	17,5
3 x 150		3 x 25		0,126	0,161	0,077	0,093	0,227	246	0,15	0,16	0,18	0,19	386	21,9
3 x 185		3 x 35		0,100	0,128	0,075	0,091	0,234	240	0,13	0,13	0,15	0,16	444	27,0

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

P102 3,6/6 kV

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE		INDUCTANCE				IMPEDANCE		MAXIMUM CURRENT (*)	SHORT CIRCUIT
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]		20°C		[Ω/km]		90°C		in free air	1 sec
n	[mm ²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]		
1	x 25	0,734	0,936	0,131	0,157	0,289	416	0,75	0,75	0,95	0,95	140	3,65		
1	x 35	0,529	0,675	0,124	0,149	0,317	395	0,54	0,55	0,69	0,69	175	5,11		
1	x 50	0,391	0,499	0,120	0,144	0,340	382	0,41	0,42	0,51	0,52	214	7,30		
1	x 70	0,270	0,344	0,113	0,135	0,388	358	0,29	0,30	0,36	0,37	277	10,2		
1	x 95	0,195	0,249	0,106	0,127	0,438	338	0,22	0,23	0,27	0,28	338	13,9		
1	x 120	0,154	0,196	0,103	0,124	0,477	328	0,19	0,20	0,22	0,23	395	17,5		
1	x 150	0,126	0,161	0,098	0,118	0,516	313	0,16	0,17	0,19	0,20	458	21,9		
1	x 185	0,100	0,128	0,096	0,115	0,569	305	0,14	0,15	0,16	0,17	526	27,0		
1	x 240	0,0762	0,0972	0,092	0,110	0,617	292	0,12	0,13	0,13	0,15	626	27,0		
1	x 300	0,0607	0,0774	0,089	0,107	0,647	284	0,11	0,12	0,12	0,13	725	35,0		

3	x 25	0,734	0,936	0,111	0,134	0,289	355	0,74	0,75	0,94	0,95	117	3,65
3	x 35	0,529	0,675	0,106	0,128	0,317	339	0,54	0,54	0,68	0,69	147	5,11
3	x 50	0,391	0,499	0,103	0,124	0,340	328	0,40	0,41	0,51	0,51	180	7,30
3	x 70	0,270	0,344	0,098	0,117	0,388	311	0,29	0,29	0,36	0,36	233	10,2
3	x 95	0,195	0,249	0,093	0,112	0,438	296	0,22	0,22	0,27	0,27	285	13,9
3	x 120	0,154	0,196	0,090	0,108	0,477	287	0,18	0,19	0,22	0,22	333	17,5
3	x 150	0,126	0,161	0,088	0,105	0,516	280	0,15	0,16	0,18	0,19	386	21,9
3	x 185	0,100	0,128	0,085	0,102	0,569	271	0,13	0,14	0,15	0,16	444	27,0

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

P103 6/10 kV

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE		INDUCTANCE		IMPEDANCE		MAXIMUM CURRENT(*)	SHORT CIRCUIT
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]		20°C		[Ω/km] 90°C		in free air	1 sec
n	[mm ²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]
1	x 25	0,734	0,936	0,135	0,162	0,228	431	0,75	0,75	0,95	0,95	140	3,65
1	x 35	0,529	0,675	0,128	0,154	0,249	409	0,54	0,55	0,69	0,69	175	5,11
1	x 50	0,391	0,499	0,124	0,149	0,266	396	0,41	0,42	0,51	0,52	214	7,30
1	x 70	0,270	0,344	0,115	0,137	0,301	365	0,29	0,30	0,36	0,37	277	10,2
1	x 95	0,195	0,249	0,108	0,130	0,338	344	0,22	0,23	0,27	0,28	338	13,9
1	x 120	0,154	0,196	0,107	0,128	0,367	339	0,19	0,20	0,22	0,23	395	17,5
1	x 150	0,126	0161	0,102	0,122	0,396	325	0,16	0,18	0,19	0,20	458	21,9
1	x 185	0,100	0,128	0,098	0,117	0,435	311	0,14	0,15	0,16	0,17	526	27,0
1	x 240	0,0762	0,0972	0,093	0,112	0,487	297	0,12	0,14	0,13	0,15	626	27,0
1	x 300	0,0607	0,0774	0,089	0,107	0,544	284	0,11	0,12	0,12	0,13	725	35,0

3	x 25	0,734	0,936	0,118	0,142	0,228	377	0,74	0,75	0,94	0,95	117	3,65
3	x 35	0,529	0,675	0,113	0,136	0,249	360	0,54	0,55	0,68	0,69	147	5,11
3	x 50	0,391	0,499	0,110	0,131	0,266	349	0,41	0,41	0,51	0,52	180	7,30
3	x 70	0,270	0,344	0,103	0,124	0,301	329	0,29	0,30	0,36	0,37	233	10,2
3	x 95	0,195	0,249	0,098	0,118	0,338	313	0,22	0,23	0,27	0,28	285	13,9
3	x 120	0,154	0,196	0,095	0,114	0,367	303	0,18	0,19	0,22	0,23	333	17,5
3	x 150	0,126	0161	0,093	0,111	0,396	295	0,16	0,17	0,19	0,20	386	21,9
3	x 185	0,100	0,128	0,089	0,107	0,435	285	0,13	0,15	0,16	0,17	444	27,0

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

P104 8,7/15 kV

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE INDUCTANCE		IMPEDANCE				MAXIMUM CURRENT(*)	SHRT CIRCUIT
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]		20°C		90°C		in free air	1 sec
n	[mm ²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]
1	x 25	0,734	0,936	0,142	0,170	0,186	451	0,75	0,75	0,95	0,95	140	3,65
1	x 35	0,529	0,675	0,135	0,162	0,202	429	0,55	0,55	0,69	0,69	175	5,11
1	x 50	0,391	0,499	0,130	0,156	0,215	415	0,41	0,42	0,52	0,52	214	7,30
1	x 70	0,270	0,344	0,122	0,147	0,242	389	0,30	0,31	0,37	0,37	277	10,2
1	x 95	0,195	0,249	0,115	0,138	0,270	367	0,23	0,24	0,27	0,28	338	13,9
1	x 120	0,154	0,196	0,112	0,134	0,292	355	0,19	0,20	0,23	0,24	395	17,5
1	x 150	0,126	0161	0,107	0,128	0,314	340	0,17	0,18	0,19	0,21	458	21,9
1	x 185	0,100	0,128	0,102	0,123	0,344	325	0,14	0,16	0,16	0,18	526	27,0
1	x 240	0,0762	0,0972	0,098	0,117	0,383	311	0,12	0,14	0,14	0,15	626	27,0
1	x 300	0,0607	0,0774	0,093	0,112	0,427	296	0,11	0,13	0,12	0,14	725	35,0
3	x 25	0,734	0,936	0,126	0,152	0,186	402	0,74	0,75	0,94	0,95	117	3,65
3	x 35	0,529	0,675	0,121	0,145	0,202	384	0,54	0,55	0,69	0,69	147	5,11
3	x 50	0,391	0,499	0,117	0,140	0,215	371	0,41	0,42	0,51	0,52	180	7,30
3	x 70	0,270	0,344	0,110	0,132	0,242	350	0,29	0,30	0,36	0,37	233	10,2
3	x 95	0,195	0,249	0,104	0,125	0,270	332	0,22	0,23	0,27	0,28	285	13,9
3	x 120	0,154	0,196	0,101	0,121	0,292	321	0,18	0,20	0,22	0,23	333	17,5
3	x 150	0,126	0161	0,098	0,117	0,314	312	0,16	0,17	0,19	0,20	386	21,9

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

P112 12/20 kV

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE INDUCTANCE		IMPEDANCE				MAXIMUM CURRENT(*)	SHORT CIRCUIT	
		[Ω/km]		[Ω/km]		[μFarad/km]	[μHenry/km]	20°C		[Ω/km]		90°C	in free air	1 sec
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]	
1	x 35	0,529	0,675	0,138	0,166	0,175	441	0,55	0,55	0,69	0,69	175	3,65	
1	x 50	0,529	0,675	0,134	0,161	0,186	426	0,41	0,42	0,52	0,52	214	2,26	
1	x 70	0,391	0,499	0,126	0,151	0,208	400	0,30	0,31	0,37	0,38	277	7,30	
1	x 95	0,270	0,344	0,119	0,142	0,232	378	0,23	0,24	0,28	0,29	338	10,2	
1	x 120	0,195	0,249	0,115	0,138	0,250	365	0,19	0,21	0,23	0,24	395	13,9	
1	x 150	0,154	0,196	0,111	0,134	0,268	355	0,17	0,18	0,20	0,21	458	17,5	
1	x 185	0,126	0161	0,107	0,128	0,293	339	0,15	0,16	0,17	0,18	526	21,9	
1	x 240	0,100	0,128	0,100	0,120	0,325	320	0,13	0,14	0,14	0,15	626	27,0	
1	x 300	0,0762	0,0972	0,098	0,118	0,360	312	0,12	0,13	0,12	0,14	725	35,0	
3	x 35	0,529	0,675	0,127	0,152	0,175	403	0,54	0,55	0,69	0,69	147	5,11	
3	x 50	0,391	0,499	0,122	0,147	0,186	390	0,41	0,42	0,51	0,52	180	7,30	
3	x 70	0,270	0,344	0,115	0,138	0,208	367	0,29	0,30	0,36	0,37	233	10,2	
3	x 95	0,195	0,249	0,109	0,131	0,232	348	0,22	0,24	0,27	0,28	285	13,9	
3	x 120	0,154	0,196	0,106	0,127	0,250	336	0,19	0,20	0,22	0,23	333	17,5	
3	x 150	0,126	0,161	0,102	0,123	0,268	326	0,16	0,18	0,19	0,20	386	21,9	

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

18/30 kV

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE		INDUCTANCE		IMPEDANCE		MAXIMUM CURRENT(*)	SHORT CIRCUIT
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]						in free air	1 sec
n	[mm ²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	20°C		50 Hz	60 Hz		
1	x 50	0,391	0,499	0,144	0,173	0,144	458	0,42	0,43	0,52	0,53	214	2,26
1	x 70	0,270	0,344	0,135	0,162	0,160	430	0,30	0,31	0,37	0,38	277	7,30
1	x 95	0,195	0,249	0,128	0,153	0,177	406	0,23	0,25	0,28	0,29	338	10,2
1	x 120	0,154	0,196	0,122	0,146	0,190	388	0,20	0,21	0,23	0,24	395	13,9
1	x 150	0,126	0,161	0,118	0,142	0,202	377	0,17	0,19	0,20	0,21	458	17,5
1	x 185	0,100	0,128	0,113	0,136	0,219	360	0,15	0,17	0,17	0,19	526	21,9
1	x 240	0,0762	0,0972	0,108	0,130	0,242	344	0,13	0,15	0,15	0,16	626	27,0
1	x 300	0,0607	0,0774	0,104	0,125	0,267	331	0,12	0,14	0,13	0,15	725	35,0
3	x 50	0,391	0,499	0,135	0,162	0,144	430	0,41	0,42	0,52	0,52	180	7,30
3	x 70	0,270	0,344	0,127	0,152	0,160	404	0,30	0,31	0,37	0,38	233	10,2
3	x 95	0,195	0,249	0,120	0,144	0,177	383	0,23	0,24	0,28	0,29	285	13,9
3	x 120	0,154	0,196	0,116	0,139	0,190	369	0,19	0,21	0,23	0,24	333	17,5
3	x 150	0,126	0,161	0,112	0,135	0,202	358	0,17	0,18	0,20	0,21	386	21,9

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

CONSTRUCTION			MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE	INDUCTANCE	IMPEDANCE @ 50 & 60 Hz		L/R ratio @ 1 kHz
	n	[mm ²]	[Ω/km]		[Ω/km]		[μFarad/km]	[μHenry/km]	[Ω/km]		[μHenry/Ω]
			20°C	90°C	50 Hz	60 Hz	max.	nominal	20°C	90°C	
pair	2	x 0,75	26,3	33,5	0,106	0,127	0,090	336	26,3	33,5	12,8
	2	x 1	19,3	24,6	0,098	0,118	0,095	312	19,3	24,6	16,2
	2	x 1,5	12,9	16,5	0,099	0,118	0,100	314	12,9	16,5	24,3
triple	3	x 0,75	26,0	33,5	0,106	0,127	0,090	336	26,3	33,5	12,8
	3	x 1	19,3	24,6	0,098	0,118	0,095	312	19,3	24,6	16,2
	3	x 1,5	12,9	16,5	0,099	0,118	0,100	314	12,9	16,5	24,3

Electrical data

FIREBAR®
fire and water resistant

Power & Control 0,6/ 1 kV

1 core

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE INDUCTANCE		IMPEDANCE				MAXIMUM CURRENT (*) in free air	SHORT CIRCUIT 1 sec
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]		20°C		[Ω/km] 95°C			
n	[mm²]	20°C	95°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]
1	x 16	1,16	1,503	0,126	0,151	0,172	401	1,17	1,17	1,51	1,51	118	2,33
1	x 25	0,734	0,951	0,123	0,148	0,179	392	0,74	0,75	0,96	0,96	147	3,65
1	x 35	0,529	0,685	0,121	0,145	0,194	385	0,54	0,55	0,70	0,70	183	5,11
1	x 50	0,391	0,506	0,115	0,137	0,212	365	0,41	0,41	0,52	0,52	224	7,30
1	x 70	0,270	0,350	0,109	0,130	0,219	346	0,29	0,30	0,37	0,37	289	10,2
1	x 95	0,195	0,253	0,104	0,125	0,233	331	0,22	0,23	0,27	0,28	354	13,9
1	x 120	0,154	0,199	0,102	0,122	0,245	324	0,18	0,20	0,22	0,23	413	17,5
1	x 150	0,126	0,163	0,100	0,120	0,251	319	0,16	0,17	0,19	0,20	480	21,9
1	x 185	0,100	0,130	0,097	0,116	0,260	308	0,14	0,15	0,16	0,17	551	27,0
1	x 240	0,0762	0,0987	0,096	0,115	0,266	305	0,12	0,14	0,14	0,15	654	35,0
1	x 300	0,0607	0,0786	0,094	0,113	0,280	300	0,11	0,13	0,12	0,14	758	43,8

(*) Maximum current rate is based on 95°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

2 cores

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE INDUCTANCE		IMPEDANCE				MAXIMUM CURRENT (*)	SHORT CIRCUIT		
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]		20°C		[Ω/km]		95°C		in free air	1 sec
n	[mm²]	20°C	95°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]		
2	x 1,5	12,2	15,80	0,110	0,132	0,160	351	12,2	12,2	15,8	15,8	24	0,21		
2	x 2,5	7,56	9,793	0,103	0,123	0,180	327	7,56	7,56	9,79	9,79	30	0,35		
2	x 4	4,70	6,088	0,095	0,114	0,207	303	4,70	4,70	6,09	6,09	40	0,58		
2	x 6	3,11	4,028	0,090	0,108	0,230	286	3,11	3,11	4,03	4,03	52	0,87		
2	x 10	1,84	2,383	0,084	0,101	0,261	268	1,84	1,84	2,38	2,39	75	1,46		
2	x 16	1,16	1,503	0,080	0,096	0,293	254	1,16	1,16	1,50	1,51	106	2,33		

(*) Maximum current rate in free air is based on 95°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

3 cores

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE INDUCTANCE		IMPEDANCE				MAXIMUM CURRENT (*)	SHORT CIRCUIT
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]		20°C	[Ω/km]		95°C	in free air	1 sec
n	[mm²]	20°C	95°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]
3	x 1,5	12,2	15,803	0,110	0,132	0,160	351	12,2	12,2	15,8	15,8	21	0,21
3	x 2,5	7,56	9,793	0,103	0,123	0,180	327	7,56	7,56	9,79	9,79	28	0,35
3	x 4	4,70	6,088	0,095	0,114	0,207	303	4,70	4,70	6,09	6,09	37	0,58
3	x 6	3,11	4,028	0,090	0,108	0,230	286	3,11	3,11	4,03	4,03	47	0,87
3	x 10	1,84	2,383	0,084	0,101	0,261	268	1,84	1,84	2,38	2,39	65	1,46
3	x 16	1,16	1,503	0,080	0,096	0,293	254	1,16	1,16	1,50	1,51	90	2,33
3	x 25	0,734	0,951	0,079	0,095	0,299	251	0,74	0,74	0,95	0,96	123	3,65
3	x 35	0,529	0,685	0,077	0,092	0,319	244	0,53	0,54	0,69	0,69	154	5,11
3	x 50	0,391	0,506	0,077	0,092	0,318	244	0,40	0,40	0,51	0,51	188	7,30
3	x 70	0,270	0,350	0,075	0,090	0,338	238	0,28	0,28	0,36	0,36	244	10,2
3	x 95	0,195	0,253	0,074	0,089	0,343	237	0,21	0,21	0,26	0,27	298	13,9
3	x 120	0,154	0,199	0,073	0,087	0,359	232	0,17	0,18	0,21	0,22	349	17,5
3	x 150	0,126	0,163	0,073	0,088	0,357	233	0,15	0,15	0,18	0,19	404	21,9
3	x 185	0,100	0,130	0,073	0,087	0,359	232	0,12	0,13	0,15	0,16	464	27,0
3	x 240	0,0762	0,0987	0,072	0,087	0,366	230	0,11	0,12	0,12	0,13	552	35,0
3	x 300	0,0607	0,0786	0,072	0,086	0,373	228	0,09	0,11	0,11	0,12	640	43,8

(*) Maximum current rate in free air is based on 95°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

Power & Control 0,6/ 1 kV
4 cores

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE [Ω/km]		REACTANCE [Ω/km]		CAPACITANCE INDUCTANCE [μFarad/km] [μHenry/km]		IMPEDANCE				MAXIMUM CURRENT (*) in free air	SHORT CIRCUIT 1 sec
n	[mm²]	20°C	95°C	50 Hz	60 Hz	nominal	nominal	20°C	[Ω/km]	95°C		[A]	[kA]
4 x 1,5		12,2	15,80	0,117	0,141	0,145	373	12,2	12,2	15,8	15,8	21	0,21
4 x 2,5		7,56	9,793	0,110	0,132	0,161	350	7,56	7,56	9,79	9,79	28	0,35
4 x 4		4,70	6,088	0,102	0,123	0,182	325	4,70	4,70	6,09	6,09	37	0,58
4 x 6		3,11	4,028	0,097	0,116	0,200	308	3,11	3,11	4,03	4,03	47	0,87
4 x 10		1,84	2,383	0,091	0,110	0,223	291	1,84	1,84	2,39	2,39	65	1,46
4 x 16		1,16	1,503	0,087	0,104	0,246	276	1,16	1,16	1,51	1,51	90	2,33
4 x 25		0,734	0,951	0,086	0,103	0,250	274	0,74	0,74	0,95	0,96	123	3,65
4 x 35		0,529	0,685	0,084	0,101	0,264	267	0,54	0,54	0,69	0,69	154	5,11
4 x 50		0,391	0,506	0,084	0,101	0,263	267	0,40	0,40	0,51	0,52	188	7,30
4 x 70		0,270	0,350	0,082	0,098	0,277	261	0,28	0,29	0,36	0,36	244	10,2
4 x 95		0,195	0,253	0,081	0,098	0,280	259	0,21	0,22	0,27	0,27	298	13,9
4 x 120		0,154	0,199	0,080	0,096	0,291	255	0,17	0,18	0,21	0,22	349	17,5
4 x 150		0,126	0,163	0,080	0,096	0,289	255	0,15	0,16	0,18	0,19	404	21,9
4 x 185		0,100	0,130	0,080	0,096	0,291	255	0,13	0,14	0,15	0,16	464	27,0
4 x 240		0,0762	0,0987	0,079	0,095	0,295	253	0,11	0,12	0,13	0,14	552	35,0
4 x 300		0,0607	0,0786	0,079	0,095	0,300	251	0,10	0,11	0,11	0,12	640	43,8

(*) Maximum current rate in free air is based on 95°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

multicore

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE [Ω/km]		REACTANCE [Ω/km]		CAPACITANCE INDUCTANCE [μFarad/km] [μHenry/km]		IMPEDANCE				MAXIMUM CURRENT (*) in free air	SHORT CIRCUIT 1 sec
n	[mm²]	20°C	95°C	50 Hz	60 Hz	nominal	nominal	20°C	[Ω/km]	95°C		[A]	[kA]
5 x 1,5		12,2	15,80	0,120	0,144	0,140	382	12,2	12,2	15,8	15,8	13	0,21
7 x 1,5		12,2	15,80	0,154	0,184	0,097	489	12,2	12,2	15,8	15,8	12	0,21
12 x 1,5		12,2	15,80	0,182	0,219	0,077	581	12,2	12,2	15,8	15,8	10	0,21
19 x 1,5		12,2	15,80	0,197	0,237	0,070	628	12,2	12,2	15,8	15,8	10	0,21
27 x 1,5		12,2	15,80	0,213	0,256	0,063	679	12,2	12,2	15,8	15,8	9	0,21
37 x 1,5		12,2	15,80	0,223	0,267	0,060	709	12,2	12,2	15,8	15,8	7	0,21
5 x 2,5		7,56	9,79	0,113	0,135	0,155	359	7,56	7,56	9,79	9,79	18	0,36
7 x 2,5		7,56	9,79	0,146	0,176	0,104	466	7,56	7,56	9,79	9,79	16	0,36
12 x 2,5		7,56	9,79	0,175	0,210	0,082	557	7,56	7,56	9,79	9,79	13	0,36
19 x 2,5		7,56	9,79	0,204	0,245	0,074	649	7,56	7,56	9,79	9,80	12	0,36
27 x 2,5		7,56	9,79	0,206	0,247	0,066	655	7,56	7,56	9,79	9,80	11	0,36
37 x 2,5		7,56	9,79	0,215	0,258	0,063	686	7,56	7,56	9,80	9,80	9	0,36

(*) Maximum current rate in free air is based on 95°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

P120 - 3,6/6 kV

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE INDUCTANCE		IMPEDANCE				MAXIMUM CURRENT (*)	SHORT CIRCUIT
								20°C		90°C			
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]							
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]
1	x 50	0,391	0,499	0,161	0,193	0,201	513	0,42	0,44	0,72	0,53	214	7,30
1	x 70	0,270	0,344	0,152	0,183	0,229	485	0,31	0,33	0,61	0,39	277	10,2
1	x 95	0,195	0,249	0,145	0,174	0,258	461	0,24	0,26	0,52	0,30	338	13,9
1	x 120	0,154	0,196	0,140	0,168	0,281	447	0,21	0,23	0,46	0,26	395	17,5
1	x 150	0,126	0,161	0,135	0,162	0,304	431	0,18	0,21	0,42	0,23	458	21,9
1	x 185	0,100	0,128	0,130	0,156	0,334	414	0,16	0,19	0,38	0,20	526	27,0
1	x 240	0,0762	0,0972	0,125	0,150	0,374	398	0,15	0,17	0,34	0,18	626	35,0
1	x 300	0,0607	0,0774	0,121	0,145	0,419	384	0,14	0,16	0,30	0,16	725	43,8
3	x 50	0,391	0,499	0,117	0,140	0,201	371	0,41	0,42	0,72	0,52	180	7,30
3	x 70	0,270	0,344	0,110	0,132	0,229	350	0,29	0,30	0,60	0,37	233	10,2
3	x 95	0,195	0,249	0,104	0,125	0,258	332	0,22	0,23	0,51	0,28	285	13,9
3	x 120	0,154	0,196	0,101	0,121	0,281	321	0,18	0,20	0,45	0,23	333	17,5
3	x 150	0,126	0,161	0,098	0,117	0,304	312	0,16	0,17	0,41	0,20	386	21,9
3	x 185	0,100	0,128	0,094	0,113	0,334	301	0,14	0,15	0,37	0,17	444	27,0
3	x 240	0,0762	0,0972	0,091	0,109	0,374	289	0,12	0,13	0,32	0,15	552	35,0

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

P121 - 6/10 kV

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE INDUCTANCE		IMPEDANCE				MAXIMUM CURRENT(*)	SHORT CIRCUIT
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]		20°C		90°C		in free air	1 sec
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]
1	x 50	0,391	0,499	0,165	0,198	0,177	527	0,42	0,44	0,73	0,54	214	7,30
1	x 70	0,270	0,344	0,156	0,188	0,200	498	0,31	0,33	0,61	0,39	277	10,2
1	x 95	0,195	0,249	0,149	0,178	0,225	473	0,25	0,26	0,52	0,31	338	13,9
1	x 120	0,154	0,196	0,143	0,171	0,244	455	0,21	0,23	0,47	0,26	395	17,5
1	x 150	0,126	0,161	0,139	0,167	0,263	443	0,19	0,21	0,42	0,23	458	21,9
1	x 185	0,100	0,128	0,134	0,160	0,288	426	0,17	0,19	0,38	0,20	526	27,0
1	x 240	0,0762	0,0972	0,127	0,153	0,321	405	0,15	0,17	0,34	0,18	626	35,0
1	x 300	0,0607	0,0774	0,123	0,147	0,359	391	0,14	0,16	0,30	0,17	725	43,8
3	x 50	0,391	0,499	0,122	0,146	0,177	388	0,41	0,42	0,72	0,52	180	7,30
3	x 70	0,270	0,344	0,115	0,138	0,200	365	0,29	0,30	0,60	0,37	233	10,2
3	x 95	0,195	0,249	0,109	0,131	0,225	347	0,22	0,23	0,51	0,28	285	13,9
3	x 120	0,154	0,196	0,105	0,126	0,244	335	0,19	0,20	0,46	0,23	333	17,5
3	x 150	0,126	0,161	0,102	0,122	0,263	325	0,16	0,18	0,41	0,20	386	21,9
3	x 185	0,100	0,128	0,098	0,118	0,288	313	0,14	0,15	0,37	0,17	444	27,0

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

P122 - 8,7/15 kV

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE INDUCTANCE		IMPEDANCE				MAXIMUM CURRENT(*)	SHORT CIRCUIT
		[Ω/km]		[Ω/km]		[μFarad/km] [μHenry/km]		20°C		90°C		in free air	1 sec
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]
1	x 50	0,391	0,499	0,168	0,202	0,156	535	0,43	0,44	0,73	0,54	214	7,30
1	x 70	0,270	0,344	0,158	0,189	0,175	502	0,31	0,33	0,61	0,39	277	10,2
1	x 95	0,195	0,249	0,150	0,180	0,196	477	0,25	0,27	0,52	0,31	338	13,9
1	x 120	0,154	0,196	0,132	0,158	0,212	420	0,20	0,22	0,46	0,25	395	17,5
1	x 150	0,126	0,161	0,140	0,168	0,228	446	0,19	0,21	0,42	0,23	458	21,9
1	x 185	0,100	0,128	0,135	0,162	0,249	429	0,17	0,19	0,38	0,21	526	27,0
1	x 240	0,0762	0,0972	0,129	0,155	0,277	412	0,15	0,17	0,34	0,18	626	35,0
1	x 300	0,0607	0,0774	0,125	0,150	0,308	398	0,14	0,16	0,30	0,17	725	43,8
3	x 50	0,391	0,499	0,128	0,153	0,156	407	0,41	0,42	0,72	0,52	180	7,30
3	x 70	0,270	0,344	0,120	0,144	0,175	383	0,30	0,31	0,60	0,37	233	10,2
3	x 95	0,195	0,249	0,114	0,137	0,196	363	0,23	0,24	0,51	0,28	285	13,9
3	x 120	0,154	0,196	0,110	0,132	0,212	350	0,19	0,20	0,46	0,24	333	17,5
3	x 150	0,126	0,161	0,107	0,128	0,228	339	0,16	0,18	0,41	0,21	386	21,9

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

P123 - 12/20 kV

CONSTRUCTION		MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE INDUCTANCE		IMPEDANCE				MAXIMUM CURRENT(*)	SHORT CIRCUIT
		[Ω/km]		[Ω/km]		[μFarad/km]	[μHenry/km]	20°C		90°C		in free air	1 sec
n	[mm²]	20°C	90°C	50 Hz	60 Hz	nominal	nominal	50 Hz	60 Hz	50 Hz	60 Hz	[A]	[kA]
1	x 70	0,391	0,499	0,171	0,205	0,142	544	0,43	0,44	0,73	0,54	277	10,2
1	x 95	0,270	0,344	0,162	0,194	0,159	514	0,31	0,33	0,61	0,40	338	13,9
1	x 120	0,195	0,249	0,154	0,184	0,177	489	0,25	0,27	0,52	0,31	395	17,5
1	x 150	0,154	0,196	0,148	0,177	0,191	470	0,21	0,23	0,47	0,26	458	21,9
1	x 185	0,126	0,161	0,144	0,172	0,205	457	0,19	0,21	0,43	0,24	526	27,0
1	x 240	0,100	0,128	0,138	0,166	0,223	440	0,17	0,19	0,38	0,21	626	35,0
1	x 300	0,0762	0,0972	0,131	0,158	0,248	419	0,15	0,18	0,34	0,19	725	43,8
3	x 50	0,391	0,499	0,499	0,133	0,142	422	0,41	0,42	0,72	0,52	180	7,30
3	x 70	0,270	0,344	0,344	0,125	0,159	397	0,30	0,31	0,60	0,38	233	10,2
3	x 95	0,195	0,249	0,249	0,118	0,177	377	0,23	0,24	0,51	0,29	285	13,9
3	x 120	0,154	0,196	0,196	0,114	0,191	363	0,19	0,21	0,46	0,24	333	17,5
3	x 150	0,126	0,161	0,161	0,110	0,205	352	0,17	0,18	0,42	0,21	386	21,9

(*) Maximum current rate in free air is based on 90°C conductor temperature and 45°C ambient temperature (IEC 60092-352)

CONSTRUCTION			MAX. CONDUCTOR RESISTANCE		REACTANCE		CAPACITANCE	INDUCTANCE	IMPEDANCE @ 50 & 60 Hz		L/R ratio @ 1 kHz
	n	[mm ²]	[Ω/km]		[Ω/km]		[μFarad/km]	[μHenry/km]	[Ω/km]		[μHenry/Ω]
			20°C	95°C	50 Hz	60 Hz	max.	nominal	20°C	95°C	
pair	2	x 0,75	26,3	34,1	0,120	0,144	0,120	383	26,3	34,1	14,5
	2	x 1	19,3	25,0	0,111	0,133	0,125	354	19,3	25,0	18,3
	2	x 1,5	12,9	16,7	0,110	0,132	0,135	351	12,9	16,7	27,2
triple	3	x 0,75	26,3	34,1	0,120	0,144	0,120	383	26,3	34,0	14,5
	3	x 1	19,3	25,0	0,111	0,133	0,125	354	19,3	25,0	18,3
	3	x 1,5	12,9	16,7	0,110	0,132	0,135	351	12,9	16,7	27,2

Generals

PRELIMINARY

SHF2 H-M outer sheath

This code recognizes the highest level of Oils and MUDs (drilling fluids) resistance of elastomeric outer sheath referred to **NEK 606:2016**. The compound, **SHF2** based as per **IEC 60092-360**, shall satisfies requests in **Table 1 Category d** of a.m. NEK, reported below:

FLUID & TEST PARAMETERS	UNIT	REQUESTED
• IRM 902 mineral oil • IRM 903 mineral oil • Hydraulic/gear oil		
Temperature	°C	100 ±2
Duration	days	7
Tensile strength	%	± 30 max
Elongation	%	
Volume	%	
Weight	%	
CALCIUM BROMIDE drilling fluid		
Temperature	°C	70 ±2
Duration	days	56
Tensile strength	%	± 25 max
Elongation	%	
Volume	%	± 20 max
Weight	%	± 15 max
EDC 95-11 drilling fluid		
Temperature	°C	70 ±2
Duration	days	56
Tensile strngth	%	± 30 max
Elongation	%	
Volume	%	± 25 max
Weight	%	

NOTE : % = parameter variation from natural (before immersion)

ELECTRICAL

CONDUCTOR ELECTRICAL RESISTANCE

It's the most important parameter of the conductor sizing, related to:

ρ	conductor resistivity	$[\Omega \text{ mm}^2 / \text{m}]$
l	conductor length	$[\text{km}]$
A	cross sectional area	$[\text{mm}^2]$

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

$$R = \rho \times l / A \quad [\Omega]$$

Temperature influence is calculated as:

$$R_t = R_{20} (234,5 + t) / 254,5 \quad [\Omega]$$

R_t	conductor resistance	$[\Omega]$
R_{20}	conductor resistance at 20°C	$[\Omega]$
t	conductor temperature	$[\text{°C}]$

Conductor resistance increases with frequency.

INSULATION RESISTANCE

Is the resistance to the passage of direct current between a conductor and the earthed core screen, armour and adjacent conductors.

The measurement values shall be corrected to the reference temperature of 20°C by mean a correction factor

$$R_t = K_i (\log_{10} D/d) \times L/1000 \times C_t \quad [M\Omega \times km]$$

R_t = measured insulation resistance referred to 1 km @ 20°C

K_i = insulation constant

d = nominal value over conductor [mm].

D = diameter over insulation [mm]

L = cable length [m]

C_t = temperature correction factor

Correction factor C_t

10°C	11°C	12°C	13°C	14°C	15°C	16°C	17°C	18°C	19°C	20°C
0.50	0.54	0.57	0.2	0.66	0.71	0.76	0.81	0.87	0.93	1.00
20°C	21°C	22°C	23°C	24°C	25°C	26°C	27°C	28°C	29°C	30°C
1.00	1.07	1.15	1.23	1.32	1.42	1.52	1.62	1.74	1.87	2.00

VOLTAGE RATING

The voltage designation of cables have three characteristic parameters:

- U_o the rated power voltage between conductor and any earth or metallic screen.
- U the rated power frequency voltage between conductors
- U_m the maximum value of the highest system voltage which may be sustained under normal operating conditions at anytime and at any point.

CURRENT RATING

The following formulas are in accordance to IEC 60092-352 standard

Continuous service

It's considered a duration longer than **three times** the **Time Constant** [T] of the cable (with constant load)

$$T = 0,245 d^{1,35}$$

d = cable overall diameter [mm]

The current rating for continuous service in free air @45°C, for the cables mentioned in this brochure, is reported at ELECTRICAL DATA paragraph.

■ Correction factor for half –hour and one hour service

When cables operate for intermittent periods of **half an hour** or **one hour**, the maximum current rating allowed can be increased multiplying the tabulated current rating by the following **correction factor**:

$$\sqrt{\frac{1,12}{1 - \exp(-t_s/T)}}$$

$t_s = 30$ or 60 [min]

T = Time Constant of cable (see above Continuous Service)

■ Correction factor for intermittent service

For cables supplying a single motor or other equipment, operating in an intermittent service, the maximum current rating may be increased multiplying by the a correction factor.

IEC 60092-352 standard reports the calculation of such correction factor over a period of **10 min.** with **4 min.** at maximum current rating and **6 min** unloaded

$$F_i = \sqrt{\frac{1 - \exp(-4/T)}{1 - \exp(-4/T)}}$$

Intermittence period = 10 [min]

Intermittence ratio (duty cycle) = 40 [%]

T = Time Constant of cable (see above Continuous Service)

SHORT CIRCUIT RATING

Short Circuit current can be calculated as :

$$I_{sc} = 0,146 \frac{A}{\sqrt{t}} \quad [kA]$$

A = conductor cross section [mm²]

t = short circuit duration [sec]

CURRENT to power and voltage

In case of three-phase systems, the determination of the current relationship with power and voltage is:

$$I = 722 \text{ kW/V}$$

$$I = 578 \text{ kVA/V}$$

$$I = 531 \text{ HP/V}$$

I = current intensity [A]

V = rated voltage [V]

kW = power(cos φ = 0.8) [kW]

kVA = power [kVA]

HP = horse power [HP]

CURRENT RATING - temperature correction factor

For different operating temperature than **45°C** with the insulation at **90°C**, the maximum permissible cable current rating has to be multiplied by the following correction factor :

35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C	75°C	80°C
1.10	1.05	1.00	0.94	0.88	0.82	0.74	0.67	0.58	0.47

REACTANCE

When the cable operates in A.C., the reactance is related mainly to axial distance between conductors.

For **2 - 3 - 4** conductors the Reactance per phase is calculated as:

$$X = 2 \times \pi \times f \times L \times I \quad [\Omega]$$

f	frequency	[Hz]
L	Inductance	[H/m]
I	core length	[m]

INDUCTANCE

$$L = 0,2 \times [\log_e (2a/d) + 0.25] \quad [\mu H/m]$$

a	axial distance between cores	[mm]
d	core diameter	[mm]

IMPEDANCE

$$Z = \sqrt{R^2 + X^2} \quad [\Omega]$$

Z	impedance per phase	[Ω]
R	electrical resistance @ 20°C	[Ω]
X	reactance per phase	[Ω]

CAPACITANCE

▪ Single core cable

$$C = \epsilon_r / 18 \log_e (D/d) \quad [\mu F/km]$$

ϵ_r	relative permittivity of insulation	
D	diameter over insulation	[m]
d	diameter over conductor	[m]

▪ Multicore belted cable

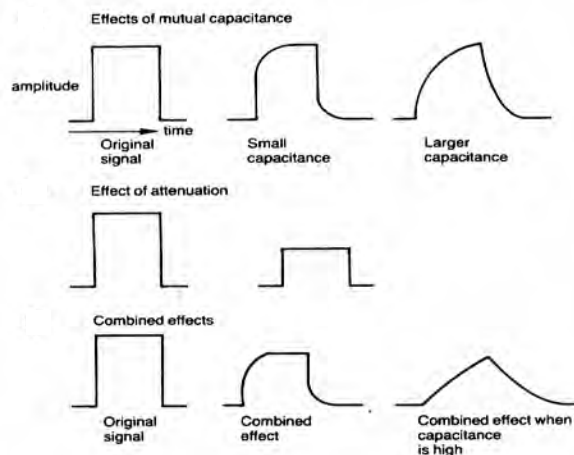
In the above equation:

D = diameter of one conductor + insulation between conductors + thickness of belt between any core and the metal screen or armour

Small and larger capacitance causes distortion of **digital signals**
It depends by:

- conductor construction (increasing of conductor size means larger capacitance)
- insulation thickness (inversely proportional)
- insulation permittivity

In high frequency transmission capacitance rounds or distorts the pulse shape as shown hereafter:



VOLTAGE DROP (up to 1 kV)

$$\Delta V = K \times I \times L / 1000 \quad [V]$$

I rated current

[A]

L cable length

[km]

K correction factor (see table in the next page)

VOLTAGE DROP – CORRECTION FACTOR K

conductor section [mm ²]	K					
	2 cores		3 cores		3 cores (three foil)	
	cosφ = 1	cosφ = 0,8	cosφ = 1	cosφ = 0,8	cosφ = 1	cosφ = 0,8
1	45,0	36,1	39,0	31,3	38,3	30,8
1,5	30,2	24,3	26,1	21,0	25,7	20,7
2,5	18,2	14,7	15,7	12,7	15,4	12,5
4	11,4	9,21	9,85	7,98	9,65	7,87
6	7,56	6,16	6,54	5,34	6,42	5,28
10	4,55	3,73	3,94	3,24	3,87	3,22
16	2,87	2,39	2,48	2,07	2,44	2,07
25	1,81	1,55	1,57	1,34	1,54	1,34
35	1,31	1,14	1,13	0,988	1,11	0,993
50	0,967	0,866	0,838	0,750	0,820	0,760
70	0,669	0,624	0,579	0,541	0,568	0,555
95	0,484	0,476	0,419	0,412	0,410	0,428
120	0,383	0,394	0,332	0,342	0,325	0,358
150	0,314	0,341	0,272	0,295	0,265	0,308
185	0,251	0,289	0,217	0,250	0,213	0,265
240	0,193	0,245	0,167	0,212	0,163	0,224
300	0,156	0,215	0,135	0,186	0,132	0,198

VFD - EMC characteristics

Variable Frequency Drive (VFD) devices control AC motors speed and torque by varying their input frequency and voltage.

EMC (ElectroMagnetic Compatibility) is the ability of the equipment components to minimize the electrical interferences (radio frequency disturbance and electrical surges) produced by such a devices.

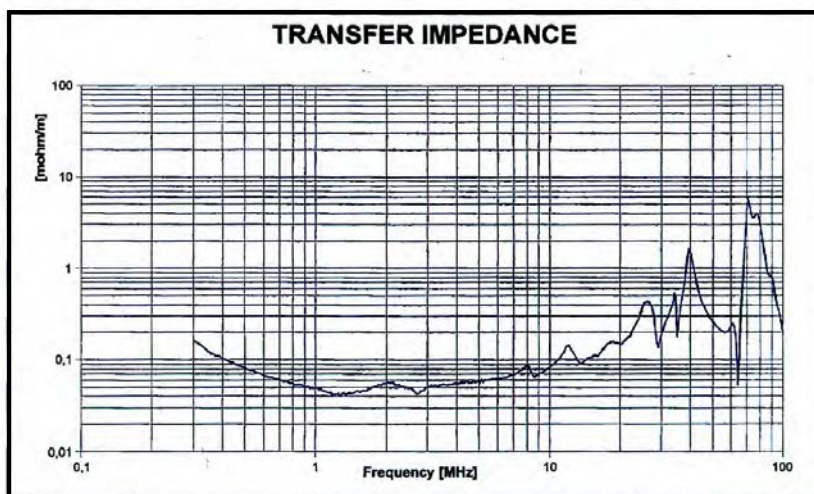
To face electrical surges safely, a working voltage rate of **6/1 kV** implies to adopt **1,8/3 kV (3,6 kV peak)** cable construction.

Furthermore, to minimize **EM** interferences, CCI cables are copper tape shielded as protective hearthing.

The parameter of surface **Transfer Impedance** describes the shielding effectiveness.

Its value must be lower than **100 mΩ/m** in the frequency range up to 100 MHz.

The diagram shows the typical Transfer Impedance (**< 6 mΩ/m**) measured on CCI **VFD EMC** cables.



MECHANICALS

PULLING TENSION DURING INSTALLATION

- unarmoured cables

$$P = 25 \times Sc \quad [N]$$

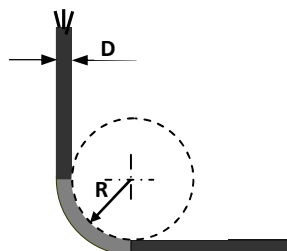
- armoured cables

$$P = 50 \times Sc \quad [N]$$

$$Sc = \text{total cross section of pulled conductors} \quad [mm^2]$$

BENDING RADIUS

The recommended minimum internal Bending Radius of cables in this catalog is related to the their outer diameter (D).



D = cable outer diameter [mm]

R = Bending Radius [mm]

Good practice is to reach the minimum bending radius progressively with suitable round tools to help the correct bending, in particular when the cable installation is performed at low temperature.

- Minimum **installation** temperature - 20°C
- Minimum **operating** temperature - 40°C

CONVERSION TABLE U.S. to METRIC cross sections

AWG (U.S.)	Metric cross-section [mm ²]	Standard metric cross-section [mm ²]
20	0.519	0.75
18	0.823	1,0
16	1.31	1.5
14	2.08	2.5
12	3.31	4,0
10	5.26	6,0
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 (U.S.)	Metric cross-section [mm ²]	Standard metric cross-section [mm ²]
250	126.7	150
300	152.0	150
350	177.3	185
400	202.7	185
450	228.0	240
500	253.4	300
550	278.7	300
600	304.0	300
650	329.4	300
700	354.7	400
750	380,0	400
800	405.4	400
850	430.7	400
900	456.0	500
950	481.4	500
1000	506.7	500



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OFFSHORE CABLES NEK 606:2016 CATALOG - REV 10 12-19

All data mentioned in this catalog may be subject to revision and improved at any time