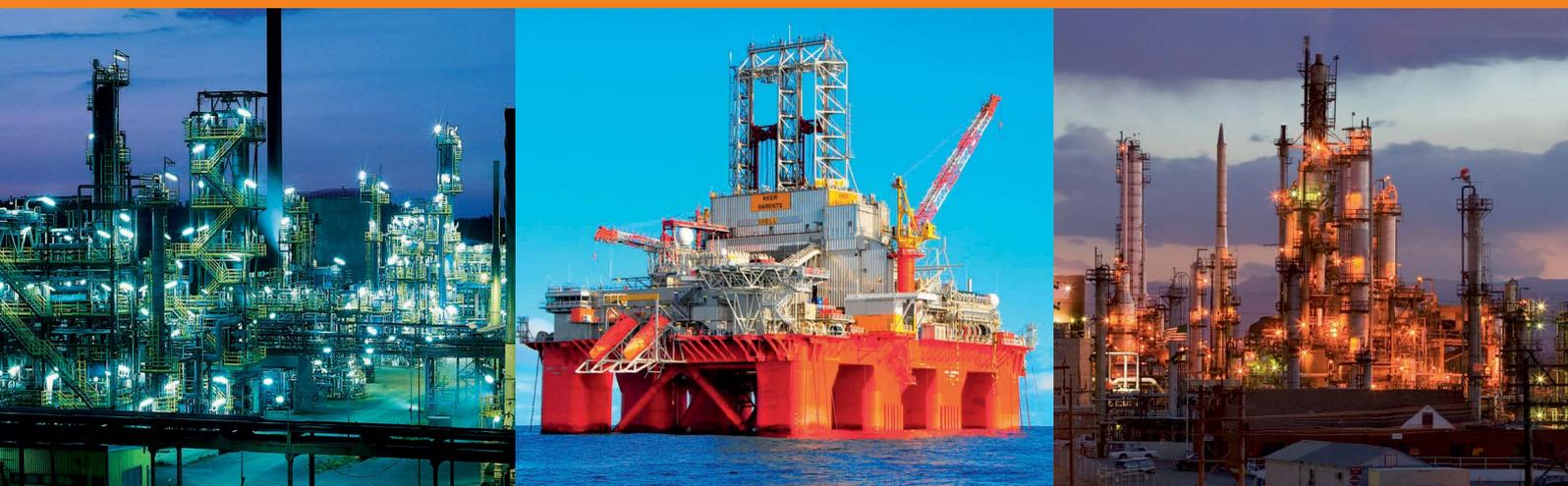


# THE WORLD OF LAPP

CAMUNA CAVI CATALOGUE



**CAMUNACAVI**

 **LAPP GROUP**

# Finding everything easily – the new navigation

## Cable's identification code

**Info**  
RRXHHRFR 300 V  
EN 50288-7

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

## Product selection tables

## Legend for pictograms

- FIRE BEHAVIOUR
- OIL RESISTANT
- HYDROCARBON AND CHEMICAL
- SUNLIGHT RESISTANT
- HALOGEN FREE
- LOW SMOKE
- DNV
- RINA
- BV
- LLOYD'S REGISTER

## Legend for pictograms

- SWB: STEEL WIRE BRAID
- SWA: STEEL WIRE ARMOUR
- LEAD: LEAD SHEATH
- AL/HDPE/PA: MULTI LAYER SHEATH
- F90: FIRE RESISTANT 90 MINUTES
- NF: FRENCH NORM
- STA: STEEL TAPE ARMOUR
- H: HALOGEN FREE
- IS: INTRINSECALLY SAFE
- ST: ALUMINIUM FOIL SCREEN
- iST: INDIVIDUAL STATIC ALUMINIUM FOIL SCREEN
- oST: OVERALL STATIC ALUMINIUM FOIL SCREEN
- TT: THERMO COUPLE CONDUCTOR TYPE
- TCWB: TINNED COPPER WIRE BRAID
- XLPO: CROSSLINKED POLYOLEFIN
- LSZH: LOW SMOKE ZERO HALOGEN

## How we help you:

- In the appedix section detailed information is given and the relevant standards are referred to, such as: Assembly and cable laying guidelines, rating tables, colour codes and an overview about chemical resistance.

## Our global corporate network



Find other sales partners in your location:

[www.lappgroup.com](http://www.lappgroup.com)

[www.camunacavi.it](http://www.camunacavi.it)

### America

Brazil	Cabos Lapp Brasil Ltda.
Canada	Lapp Canada Inc.
Mexico	Lapp Mexico S. de R.L. de C.V.
Panama	Lapp Latinamerica Support Corp.
USA	Lapp USA Inc. Lapp Cable Works Inc. Lapp Tannehill Inc.

### Europe

Austria	Lapp Austria GmbH
Benelux	Lapp Benelux B.V.
Czech Republic	Lapp Kabel s.r.o.
France	Lapp France S.a.r.l. Cableries Lapp S.a.r.l. Lapp Muller S.A.S.
Germany	U.I. Lapp GmbH Lapp GmbH Kabelwerke Lapp Systems GmbH Contact GmbH Elektrische Bauelemente

Great Britain	Lapp Ltd.
Hungary	Lapp Hungária KFT
Italy	Lapp Italia s.r.l. Camuna Cavi s.r.l. Lapp Sistemi Italia s.r.l.
Kazakhstan	Lapp Kazakhstan LLP
Latvia	Lapp Miltronic SIA
Norway	Miltronic AS
Poland	Lapp Kabel Sp. z o.o.
Portugal	Policabos S.A.
Romania	Lapp Kabel Romania SRL.
Russia	Lapp Russia OOO
Slovakia	Lapp Slovensko s.r.o.
Slovenia	Lapp, d.o.o.
Spain	Lapp Kabel España S.L.U.
Sweden	Miltronic AB Fleximark AB
Switzerland	Lapp Tec AG
Turkey	Lapp Kablo SAN.VE TIC. LTD.STI
Ukraine	Lapp Ukraine LLC
United Arab Emirates	Lapp Cables Middle East F.Z.E.

### Africa

South Africa	Lapp Southern Africa Pty. Ltd.
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### Asia

China	Lapp Kabel Shanghai Co. Ltd. Lapp Cable Works Shanghai Co. Ltd.
India	Lapp India Pvt. Ltd.
Indonesia	JPT JJ-Lapp Cable SMI
Japan	Lapp Japan KK
Malaysia	JJ Lapp Cable (M) Sdn Bhd
Philippines	JJ Lapp Cable (P) Inc
Singapore	JJ-Lapp Cable (S) Pte. Ltd. Lapp Logistics Pte. Ltd.
South Korea	Lapp Korea LLC.
Thailand	JJ-Lapp Cable (T) Ltd.
Vietnam	JJ-Lapp Cable Vietnam Co Ltd.

# CONTENT



Company information



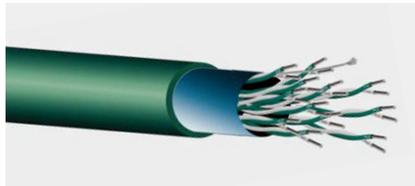
ÖLFLEX® INSTRUM  
Instrumentation cables

12



ÖLFLEX® CONTROL  
Control cables

59



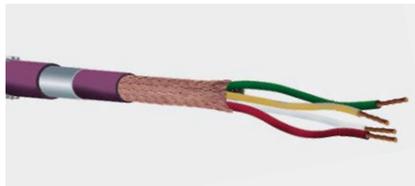
THERMOCOUPLE CABLES

77



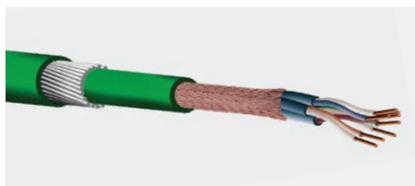
ÖLFLEX® POWER  
Power cables

94



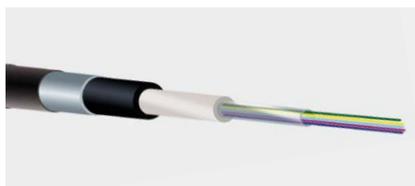
UNITRONIC®  
Data communication systems

116



ETHERLINE®  
Data communication systems  
for ETHERNET technology

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HITRONIC®  
Optical transmission systems

124



Appendix: technical tables  
The Lapp Group worldwide  
Index

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## Camuna Cavi all over the world

Camuna Cavi is an Italian industrial Cable manufacturer, ISO 9001:2008, ISO 14001:2004, ISO 50001:2011, certified. The company operates since 20 years on the international market and is a Lapp Group Company.

Lapp Group is a global supplier of cable technology well present worldwide with 41 own sales companies, 17 production plants and more than 100 partner companies.

Camuna Cavi is listed on the vendor lists of the major EPC, Operators and End-Users.

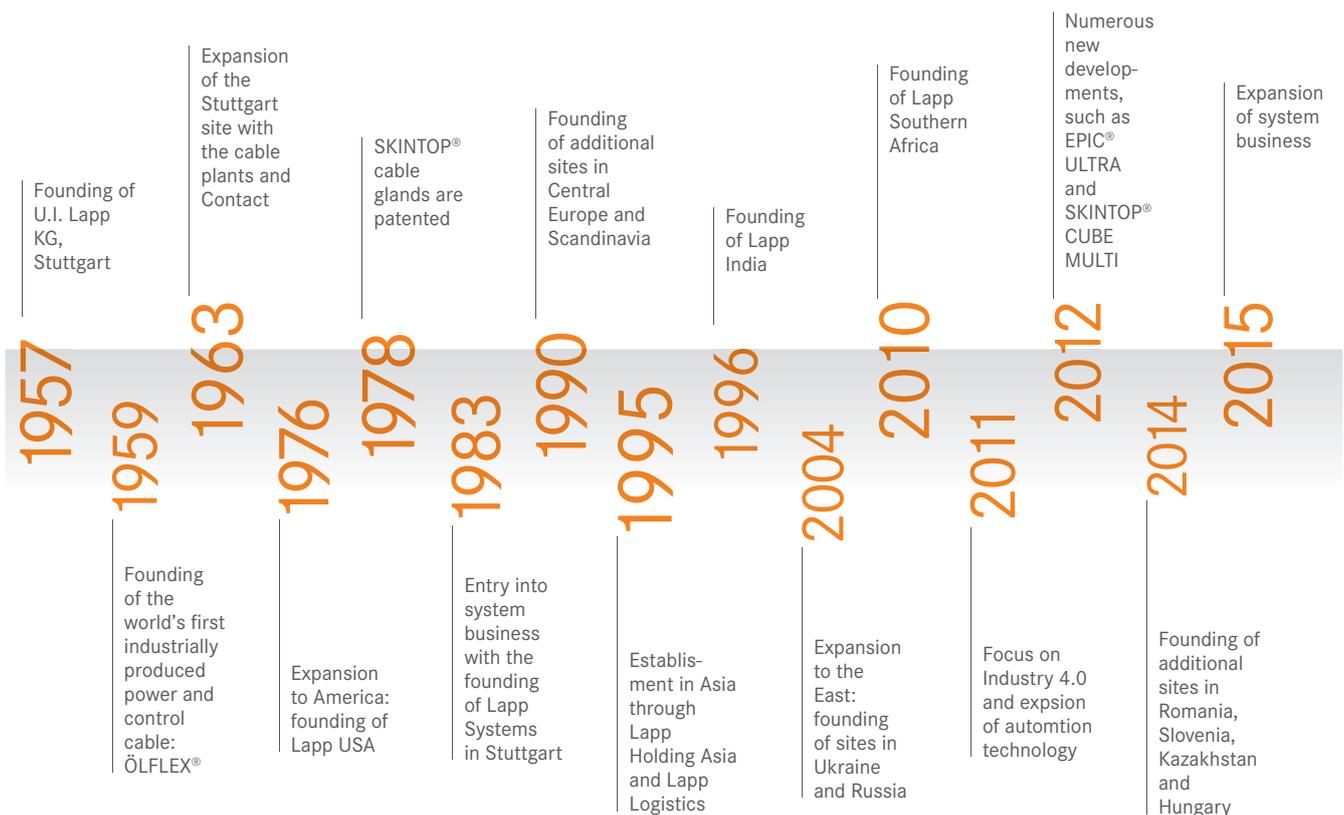
The industrial Project Business Unit supplies products in full compliance with our customers' technical specifications to meet applications whenever durability, quality and reliability are mandatory.

# FROM SMALL START - UP TO GLOBAL PLAYER

The name Lapp not only stands for innovative strength and quality, it also stands for continuity. The Lapp company was founded by Ursula Ida and Oskar Lapp in 1957 as an ambitious family company – and to this day has remained as such.

The desire to actively shape the future and the courage to embrace change and to think in a visionary way that is focused on solutions and customers are what make the company great. Our relationships with our employees, suppliers and customers which are based on partnership have always played a central role here. In less than 50 years, the small Stuttgart-based family business has evolved into a global player with around 3,200 employees – and into an international market leader for cable technology.

All the signs are pointing towards the future. This has not only become clear at Lapp's new, state-of-the-art European headquarters in Stuttgart-Vaihingen. The third generation of the Lapp family has now taken on responsibilities within the company. Thinking and acting in a value-oriented way is and remains an important component of the company philosophy. After all, the name Lapp also stands for this.





Andreas Lapp,  
Matthias Lapp,  
Ursula Ida Lapp,  
Alexander Lapp,  
Siegbert E. Lapp.

## Know how

KNOW HOW and INNOVATION are pur drivers to move from engineering to the cable.

Our LABORATORY CENTER executes tests during every step of the production process.

We develope cables with high RELIABILTY, QUALITY and DURABILITY.



CUSTOMERS and our TECHNICAL DEPARTMENT create solutions together to meet the project requirements.

We can design and manufacture the AL/HDPE/PA technology as alternative to the lead jacket cable.

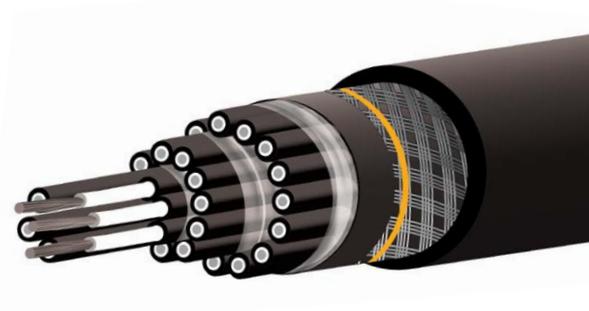
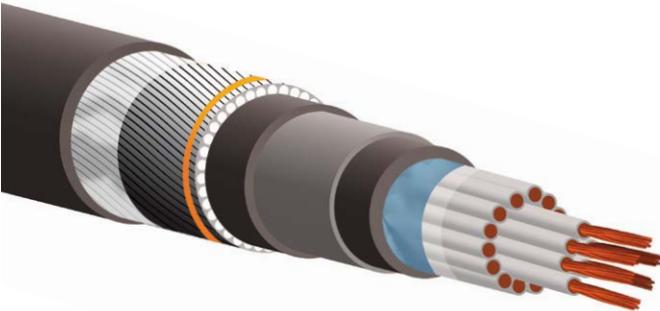
We offer our high FLEXIBILITY in design and production to satisfy your project needs.

## Product range

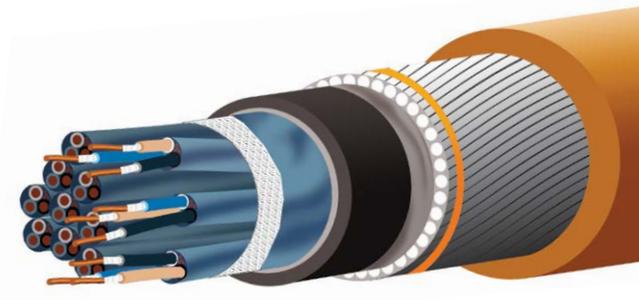
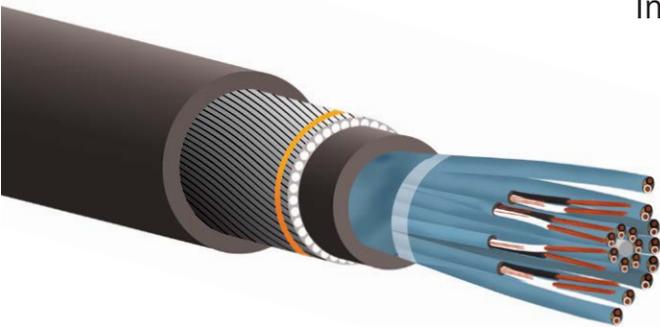
Data & Bus  
copper and fiber optic



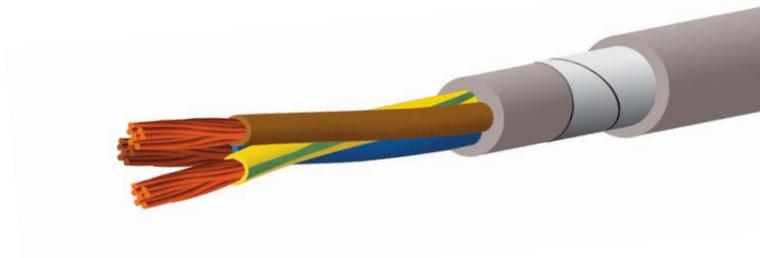
Control cables



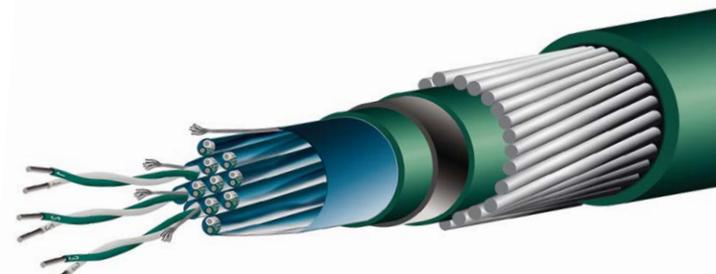
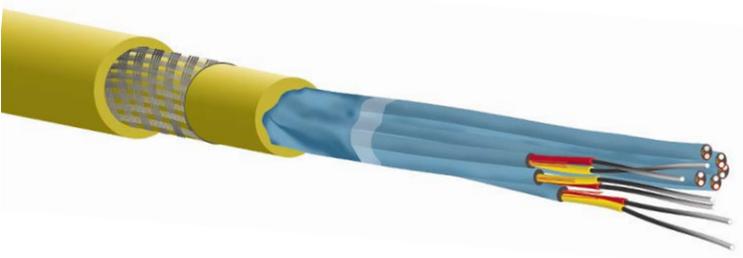
Instrumentation cables



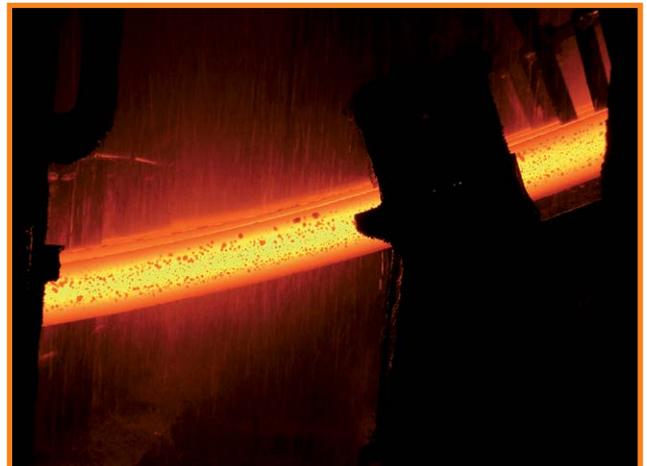
Power cables



Thermocouple cables



## Applications Fields

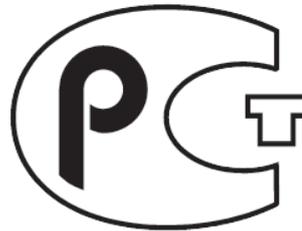


Camuna Cavi is listed on the vendor lists of the major EPC, Operators and End-Users. The Industrial Project Business Unit supplies products in full compliance with our costumers' technical specifications to meet applications whenever durability, quality and reliability are mandatory.

- Oil & Gas
- Offshore
- Onshore
- Chemical & Petrochemical
- Process industries
- Water treatment
- Power plant
- Iron & Steel
- Mining
- Ship building

**Trademark approvals**

Thanks to their outstanding characteristics, many of our products have been tested and approved by the following approval associations. You will find certification marks on the individual product pages, if applicable.



**Cable's identification code  
GEN to CEI-UNEL 35011**

**Conductors**

- U Solid Conductor
- R Stranded conductor
- F Flexible Conductor
- FF Extra Flexible Conductor

**Insulations**

- R PVC
- R2 PVC Type R2
- R3 PVC 105°C
- R7 PVC 90°C
- E Polyethylene
- E4 Cross-linked Polyethylene (XLPE)
- G4 Silicon Rubber
- G7 High Module Ethylene Propylene Rubber (HEPR)
- G10 Low Smoke Cross-Linked Polyolefin (XLPO)
- T Mica Glass Tape

**Cable's shape**

- O Round shape cable
- D Flat Cable
- X Cores twisted in pairs, triad, quad

**Shields**

- C Copper Concentric conductor
- H Aluminium Polyester Tape
- H1 Copper tape or Copper wires shield
- H2 Copper Braid Shield
- H3 Double Copper Braid Shield
- H5 Longitudinal Aluminium Tape

**Armours**

- A Steel Wire Braid
- F Steel Wires
- N Steel Tape
- Z Steel Stripes
- L Lead Jacket
- H4 Longitudinal Corrugated Steel Tape

**Jackets**

- R PVC
- R4 Polyamide (nylon)
- E Polyethylene
- E4 Cross-linked Polyethylene (XLPE)
- G Cross-linked Elastomer
- M1 Low Smoke Halogen Free Thermoplastic Material
- M2 Low Smoke Halogen Free cross-linked Material
- T Textile Braid
- T1 Glass Type
- T2 Special Textile
- P Polyetherane
- Tpe Thermoplastic Elastomer

**CONDUCTORS**

**INSULATIONS**

**CABLE'S SHAPE**

**SHIELDS**

**ARMOURS**

**JACKETS**



CABLES	PAG	NOMENCLATURE	CORE INSULATION	SCREEN	CHEMICAL BARRIER
ÖLFLEX® INSTRUM 160	14	REXOHR 300 V, EN 50288 - 7	PE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 161	15	REXHOHR 300 V, EN 50288 - 7	PE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SWA 162	16	REXOHRFR 300 V, EN 50288 - 7	PE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SWA 163	17	REXHOHRFR 300 V, EN 50288 - 7	PE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 164 H	18	RM9XOHM1 300 V, EN 50288 - 7	LSZH	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 165 H	19	RM9XHOHM1 300 V, EN 50288 - 7	LSZH	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 166 H	20	RM9XOHM1FM1 300 V, EN 50288 - 7	LSZH	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 167 H	21	RM9XHOHM1FM1 300 V, EN 50288 - 7	LSZH	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 170	22	RRXOHR 300 V, EN 50288-7	PVC	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 171	23	RRXHOHR 300 V, EN 50288-7	PVC	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SWA 172	24	RRXOHRFR 300 V, EN 50288-7	PVC, black	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SWA 173	25	RRXHOHRFR 300 V, EN 50288-7	PVC	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 174 IS	26	RE4XOHR 300 V, EN 50288-7	XLPE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 175 IS	27	RE4XHOHR 300 V, EN 50288-7	XLPE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SWA 176 IS	28	RE4XOHRFR 300 V, EN 50288-7	XLPE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SWA 177 IS	29	RE4XHOHRFR 300 V, EN 50288-7	XLPE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SWA LEAD 180	30	RE4XOHRFR 300 V, EN 50288-7	XLPE	OS Aluminum/PET + TC Drain wire	Lead sheath
ÖLFLEX® INSTRUM SWA LEAD 181	31	RE4XHOHRFR 300 V, EN 50288-7	XLPE	IS/OS Aluminum/PET + TC Drain wire	Lead sheath
ÖLFLEX® INSTRUM SWA AL/HDPE/PA 182	32	RE4XOH5ER4FR 300 V, EN 50288-7	XLPE	OS Aluminum/PET + TC Drain wire	AL/HDPE/PA
ÖLFLEX® INSTRUM SWA AL/HDPE/PA 183	33	RE4XOH5ER4FR 300 V, EN 50288-7	XLPE	IS Aluminum/PET + TC Drain wire, OS Aluminum longitudinal tape (AL) + TC Drain wire	AL/HDPE/PA
ÖLFLEX® INSTRUM 278 H	34	RE4XOHM1 300 V, EN 50288-7	XLPE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 279 H	35	RE4XHOHM1 300 V, EN 50288-7	XLPE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 280 H	36	RE4XOHM1FM1 300 V, EN 50288-7	XLPE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM 281 H	37	RE4XHOHM1FM1 300 V, EN 50288-7	XLPE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM F90 378 H	38	RTE4XOHM1 300 V, EN 50288-7 IEC 60331-23	XLPE, over MICA-tape wrapped conductor	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM F90 379 H	39	RTE4XHOHM1 300 V, EN 50288-7 IEC 60331-23	XLPE, over MICA-tape wrapped conductor	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SWA F90 380 H	40	RTE4XOHM1FM1 300 V, EN 50288-7 IEC 60331-23	XLPE, over MICA-tape wrapped conductor	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SWA F90 381 H	41	RTE4XHOHM1FM1 300 V, EN 50288-7 IEC 60331-23	XLPE, over MICA-tape wrapped conductor	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM NF 670	42	U/RRXOHR 300/500 V, NF M 87-202	PVC	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM NF 671	43	U/RXHROHR 300/500 V, NF M 87-202	PVC	PVC pair jacket over IS Aluminum/PET + TC Drain wire. OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM NF 672	44	U/RXOHRNR 300/500 V, NF M 87-202	PVC	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM STA NF 673	45	U/RXHROHRNR 300/500 V NF M 87-202	PVC	PVC pair jacket over IS Aluminum/PET + TC Drain wire. OS Aluminum/PET + TC Drain wire	-
I 304	46	RRXHOHR 300 V, PLTC per UL 13, ITC per UL 2250, CMG per UL 444, AWM 2464, CMG FT4, AWM I/II A/B FT4, CSA C22.2 No. 214, CSA C22.2 No. 210	PVC	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC 701 H	47	RE4XOHM1 150/250 V, IEC 60092-376	XLPE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC 702 H	48	RE4XHOHM1 150/250 V, IEC 60092-376	XLPE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC SWB 703 H	49	RE4XOHAM1 150/250 V, IEC 60092-376	XLPE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC SWB 704 H	50	RE4XHOHAM1 150/250 V, IEC 60092-376	XLPE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC SWB F90 705 H	51	RTE4XOHAM1 150/250 V IEC 60092-376, IEC 60331-21	XLPE, over MICA-tape wrapped conductor	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC SWB F90 706 H	52	RTE4XHOHAM1 150/250 V IEC 60092-376, IEC 60331-21	XLPE, over MICA-tape wrapped conductor	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC 707 H	53	FE4XOHM1 150/250 V, IEC 60092-376	XLPE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC 708 H	54	FE4XHOHM1 150/250 V, IEC 60092-376	XLPE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC SWB 709 H	55	FE4XOHAM1 150/250 V, IEC 60092-376	XLPE	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC SWB 710 H	56	FE4XHOHAM1 150/250 V, IEC 60092-376	XLPE	IS/OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC SWB F90 711 H	57	FTE4XOHAM1 150/250 V IEC 60092-376, IEC 60331-21	XLPE, over MICA-tape wrapped conductor	OS Aluminum/PET + TC Drain wire	-
ÖLFLEX® INSTRUM SC SWB F90 712 H	58	FTE4XHOAM1 150/250 V IEC 60092-376, IEC 60331-21	XLPE, over MICA-tape wrapped conductor	IS/OS Aluminum/PET + TC Drain wire	-





## ÖLFLEX® INSTRUM 160

Overall screened instrumentation cable  
CU/PE/OS/PVC



Info

**REXOHR 300 V**  
**EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, overall screened, PE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>o</sub>/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 160</b>			
1x2x0,5	5,1	15,1	36
2x2x0,5	7,5	25,4	68
6x2x0,5	10,5	66,7	142
10x2x0,5	13,4	108,0	216
12x2x0,5	13,9	128,7	239
16x2x0,5	15,6	170,0	313
20x2x0,5	17,5	211,3	396
24x2x0,5	19,4	252,6	456
30x2x0,5	20,7	314,6	550
1x3x0,5	5,4	20,2	44
3x3x0,5	9,0	51,2	106
6x3x0,5	11,8	97,7	196
10x3x0,5	15,2	159,7	301
12x3x0,5	15,7	190,6	337
1x2x0,75	5,9	20,2	47
2x2x0,75	8,4	35,7	87
6x2x0,75	12,1	97,5	193
10x2x0,75	15,5	159,4	295
12x2x0,75	16,0	190,3	329
16x2x0,75	18,0	252,2	431
20x2x0,75	20,2	314,0	546
24x2x0,75	22,4	375,9	630
30x2x0,75	23,9	468,7	760
1x3x0,75	6,2	27,9	58
3x3x0,75	10,1	74,3	139
6x3x0,75	13,4	143,9	261
10x3x0,75	17,5	236,7	414
12x3x0,75	18,1	283,1	466

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 160</b>			
1x2x1	6,4	25,6	55
2x2x1	9,4	46,5	109
6x2x1	13,2	130,1	238
10x2x1	17,2	213,6	375
12x2x1	17,8	255,4	419
16x2x1	19,7	338,9	540
20x2x1	22,2	422,5	684
24x2x1	24,8	506,0	804
30x2x1	26,5	631,4	972
1x3x1	6,7	36,1	69
3x3x1	11,0	98,7	170
6x3x1	14,9	192,7	333
10x3x1	19,2	318,0	518
12x3x1	20,1	380,7	595
1x2x1,5	7,2	36,5	71
2x2x1,5	10,8	68,2	145
6x2x1,5	15,5	195,1	336
10x2x1,5	20,2	322,1	529
12x2x1,5	20,9	385,5	594
16x2x1,5	23,4	512,5	782
20x2x1,5	26,3	639,4	989
24x2x1,5	29,4	766,3	1.161
30x2x1,5	31,4	956,7	1.404
1x3x1,5	7,6	52,3	92
3x3x1,5	13,0	147,5	240
6x3x1,5	17,5	290,3	472
10x3x1,5	22,6	480,7	738
12x3x1,5	23,6	575,9	850

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, other colors



## ÖLFLEX® INSTRUM 161

Individual and overall screened instrumentation cable  
CU/PE/IS/OS/PVC



**Info**

**REXHOHR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, individual and overall screened, PE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 161</b>			
2x2x0,5	8,3	35,7	86
6x2x0,5	11,8	97,7	195
10x2x0,5	15,2	159,7	300
12x2x0,5	15,7	190,6	337
16x2x0,5	17,6	252,6	442
20x2x0,5	19,5	314,6	547
24x2x0,5	21,9	376,6	646
30x2x0,5	23,3	469,5	783
3x3x0,5	9,9	66,7	132
6x3x0,5	13,1	128,7	246
10x3x0,5	16,9	211,3	382
12x3x0,5	17,7	252,6	440
2x2x0,75	9,5	46,0	110
6x2x0,75	13,3	128,5	244
10x2x0,75	17,4	211,0	386
12x2x0,75	18,0	252,3	434
16x2x0,75	20,1	334,8	569
20x2x0,75	22,4	417,3	706
24x2x0,75	25,1	499,8	832
30x2x0,75	26,8	623,6	1.008
3x3x0,75	11,1	89,8	166
6x3x0,75	15,0	174,9	321
10x3x0,75	19,4	288,3	501
12x3x0,75	20,3	345,1	577

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 161</b>			
2x2x1	10,3	56,8	130
6x2x1	14,8	161,0	299
10x2x1	19,0	265,3	462
12x2x1	19,7	317,4	520
16x2x1	22,1	421,6	684
20x2x1	24,8	525,8	864
24x2x1	27,8	630,0	1.017
30x2x1	29,6	786,3	1.233
3x3x1	12,4	114,2	205
6x3x1	16,4	223,7	389
10x3x1	21,5	369,7	619
12x3x1	22,2	442,7	702
2x2x1,5	12,0	78,5	173
6x2x1,5	17,2	226,1	403
10x2x1,5	22,2	373,7	625
12x2x1,5	23,2	447,5	716
16x2x1,5	26,0	595,1	940
20x2x1,5	29,2	742,7	1.186
24x2x1,5	32,7	890,3	1.394
30x2x1,5	34,8	1111,6	1.689
3x3x1,5	14,4	163,0	279
6x3x1,5	19,2	321,3	534
10x3x1,5	25,1	532,4	849
12x3x1,5	26,2	637,9	979

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor class 5, timed conductor, other colors



## ÖLFLEX® INSTRUM SWA 162

Armoured, Overall screened instrumentation cable  
CU/PE/OS/PVC/SWA/PVC



Info

**REXOHRFR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, twisted pair or triad signal cable, overall screened, PE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 162</b>			
1x2x0,5	9,8	15,1	179
2x2x0,5	12,3	25,4	267
6x2x0,5	15,3	66,7	405
10x2x0,5	18,5	108,0	552
12x2x0,5	18,9	128,7	585
16x2x0,5	20,8	170,0	706
20x2x0,5	23,5	211,3	954
24x2x0,5	25,5	252,6	1.079
30x2x0,5	26,9	314,6	1.211
1x3x0,5	10,0	20,2	193
3x3x0,5	13,8	51,2	337
6x3x0,5	16,9	97,7	496
10x3x0,5	20,4	159,7	685
12x3x0,5	20,9	190,6	733
1x2x0,75	10,5	20,2	206
2x2x0,75	13,3	35,7	306
6x2x0,75	17,1	97,5	499
10x2x0,75	20,7	159,4	687
12x2x0,75	22,0	190,3	844
16x2x0,75	23,9	252,2	1.002
20x2x0,75	26,4	314,0	1.192
24x2x0,75	28,8	375,9	1.353
30x2x0,75	30,3	468,7	1.528
1x3x0,75	10,8	27,9	224
3x3x0,75	14,9	74,3	394
6x3x0,75	18,4	143,9	597
10x3x0,75	23,5	236,7	972
12x3x0,75	24,3	283,1	1.052

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 162</b>			
1x2x1	11,0	25,6	224
2x2x1	14,2	46,5	349
6x2x1	18,2	130,1	569
10x2x1	23,2	213,6	925
12x2x1	23,8	255,4	985
16x2x1	25,9	338,9	1.174
20x2x1	28,6	422,5	1.403
24x2x1	31,2	506,0	1.599
30x2x1	33,9	631,4	2.012
1x3x1	11,3	36,1	246
3x3x1	15,9	98,7	446
6x3x1	20,0	192,7	701
10x3x1	25,4	318,0	1.137
12x3x1	26,3	380,7	1.239
1x2x1,5	11,8	36,5	258
2x2x1,5	15,6	68,2	415
6x2x1,5	20,7	195,1	727
10x2x1,5	26,4	322,1	1.176
12x2x1,5	27,1	385,5	1.260
16x2x1,5	29,8	512,5	1.535
20x2x1,5	33,7	639,4	2.022
24x2x1,5	36,9	766,3	2.320
30x2x1,5	38,9	956,7	2.634
1x3x1,5	12,5	52,3	294
3x3x1,5	18,0	147,5	566
6x3x1,5	23,5	290,3	1.029
10x3x1,5	29,0	480,7	1.467
12x3x1,5	30,0	575,9	1.608

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



## ÖLFLEX® INSTRUM SWA 163

Armoured, Individual and Overall screened instrumentation cable  
CU/PE/IS/OS/PVC/SWA/PVC



### Info

**REXHOHRFR 300 V  
EN 50288-7**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

### Product features

Armoured, twisted pair or triad signal cable, individual and overall screened, PE insulated and PVC jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2

### Design

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PE
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

### Technical data



**Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers



**Insulation resistance:**  
5000 MOhm x km



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U<sub>o</sub>/U:**  
300/300 V



**Test voltage:**  
C/C 1500 V x 1 minute



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 163</b>			
2x2x0,5	13,1	35,7	302
6x2x0,5	16,9	97,7	495
10x2x0,5	20,4	159,7	684
12x2x0,5	20,9	190,6	732
16x2x0,5	23,5	252,6	1.001
20x2x0,5	25,7	314,6	1.175
24x2x0,5	28,3	376,6	1.354
30x2x0,5	29,8	469,5	1.534
3x3x0,5	14,7	66,7	383
6x3x0,5	18,1	128,7	574
10x3x0,5	22,9	211,3	922
12x3x0,5	23,6	252,6	1.003
2x2x0,75	14,3	46,0	352
6x2x0,75	18,4	128,5	578
10x2x0,75	23,4	211,0	941
12x2x0,75	24,0	252,3	1.005
16x2x0,75	26,3	334,8	1.214
20x2x0,75	28,8	417,3	1.431
24x2x0,75	31,5	499,8	1.635
30x2x0,75	34,1	623,6	2.058
3x3x0,75	16,0	89,8	444
6x3x0,75	20,3	174,9	702
10x3x0,75	25,6	288,3	1.124
12x3x0,75	26,5	345,1	1.225

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 163</b>			
2x2x1	15,1	56,8	389
6x2x1	19,8	161,0	664
10x2x1	25,2	265,3	1.075
12x2x1	25,9	317,4	1.152
16x2x1	28,5	421,6	1.399
20x2x1	31,2	525,8	1.659
24x2x1	35,1	630,0	2.101
30x2x1	37,2	786,3	2.401
3x3x1	17,4	114,2	517
6x3x1	22,4	223,7	917
10x3x1	27,7	369,7	1.303
12x3x1	28,6	442,7	1.421
2x2x1,5	17,0	78,5	478
6x2x1,5	23,2	226,1	953
10x2x1,5	28,6	373,7	1.344
12x2x1,5	29,6	447,5	1.463
16x2x1,5	32,6	595,1	1.785
20x2x1,5	36,8	742,7	2.340
24x2x1,5	40,4	890,3	2.691
30x2x1,5	42,6	1111,6	3.065
3x3x1,5	19,4	163,0	636
6x3x1,5	25,4	321,3	1.152
10x3x1,5	31,5	532,4	1.652
12x3x1,5	32,8	637,9	1.828

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



## ÖLFLEX® INSTRUM 164 H

Overall screened instrumentation cable  
CU/LSZH/OS/LSZH



Info

**RM9XOHM 1 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Halogen free
- Low smoke
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, overall screened, LSZH insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** LSZH
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**

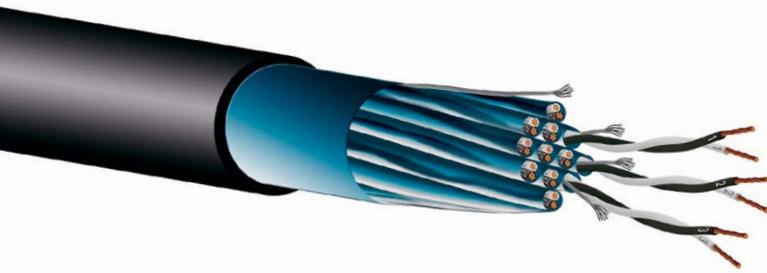
- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 164 H</b>			
1x2x0,5	5,1	15,1	36
2x2x0,5	7,5	25,4	68
6x2x0,5	10,5	66,7	142
10x2x0,5	13,4	108,0	216
12x2x0,5	13,9	128,7	239
16x2x0,5	15,6	170,0	313
20x2x0,5	17,5	211,3	396
24x2x0,5	19,4	252,6	456
30x2x0,5	20,7	314,6	550
1x3x0,5	5,4	20,2	44
3x3x0,5	9,0	51,2	106
6x3x0,5	11,8	97,7	196
10x3x0,5	15,2	159,7	301
12x3x0,5	15,7	190,6	337
1x2x0,75	5,9	20,2	47
2x2x0,75	8,4	35,7	87
6x2x0,75	12,1	97,5	193
10x2x0,75	15,5	159,4	295
12x2x0,75	16,0	190,3	329
16x2x0,75	18,0	252,2	431
20x2x0,75	20,2	314,0	546
24x2x0,75	22,4	375,9	630
30x2x0,75	23,9	468,7	760
1x3x0,75	6,2	27,9	58
3x3x0,75	10,1	74,3	139
6x3x0,75	13,4	143,9	261
10x3x0,75	17,5	236,7	414
12x3x0,75	18,1	283,1	466

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 164 H</b>			
1x2x1	6,4	25,6	55
2x2x1	9,4	46,5	109
6x2x1	13,2	130,1	238
10x2x1	17,2	213,6	375
12x2x1	17,8	255,4	419
16x2x1	19,7	338,9	540
20x2x1	22,2	422,5	684
24x2x1	24,8	506,0	804
30x2x1	26,5	631,4	972
1x3x1	6,7	36,1	69
3x3x1	11,0	98,7	170
6x3x1	14,9	192,7	333
10x3x1	19,2	318,0	518
12x3x1	20,1	380,7	595
1x2x1,5	7,2	36,5	71
2x2x1,5	10,8	68,2	145
6x2x1,5	15,5	195,1	336
10x2x1,5	20,2	322,1	529
12x2x1,5	20,9	385,5	594
16x2x1,5	23,4	512,5	782
20x2x1,5	26,3	639,4	989
24x2x1,5	29,4	766,3	1.161
30x2x1,5	31,4	956,7	1.404
1x3x1,5	7,6	52,3	92
3x3x1,5	13,0	147,5	240
6x3x1,5	17,5	290,3	472
10x3x1,5	22,6	480,7	738
12x3x1,5	23,6	575,9	850

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, other colors



## ÖLFLEX® INSTRUM 165 H

Individual and overall screened instrumentation cable  
CU/LSZH/IS/OS/LSZH



**Info**

**RM9XHOHM 1 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Halogen free
- Low smoke
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, individual and overall screened, LSZH insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** LSZH
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 165 H</b>			
2x2x0,5	8,3	35,7	86
6x2x0,5	11,8	97,7	195
10x2x0,5	15,2	159,7	300
12x2x0,5	15,7	190,6	337
16x2x0,5	17,6	252,6	442
20x2x0,5	19,5	314,6	547
24x2x0,5	21,9	376,6	646
30x2x0,5	23,3	469,5	783
3x3x0,5	9,9	66,7	132
6x3x0,5	13,1	128,7	246
10x3x0,5	16,9	211,3	382
12x3x0,5	17,7	252,6	440
2x2x0,75	9,5	46,0	110
6x2x0,75	13,3	128,5	244
10x2x0,75	17,4	211,0	386
12x2x0,75	18,0	252,3	434
16x2x0,75	20,1	334,8	569
20x2x0,75	22,4	417,3	706
24x2x0,75	25,1	499,8	832
30x2x0,75	26,8	623,6	1.008
3x3x0,75	11,1	89,8	166
6x3x0,75	15,0	174,9	321
10x3x0,75	19,4	288,3	501
12x3x0,75	20,3	345,1	577

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 165 H</b>			
2x2x1	10,3	56,8	130
6x2x1	14,8	161,0	299
10x2x1	19,0	265,3	462
12x2x1	19,7	317,4	520
16x2x1	22,1	421,6	684
20x2x1	24,8	525,8	864
24x2x1	27,8	630,0	1.017
30x2x1	29,6	786,3	1.233
3x3x1	12,4	114,2	205
6x3x1	16,4	223,7	389
10x3x1	21,5	369,7	619
12x3x1	22,2	442,7	702
2x2x1,5	12,0	78,5	173
6x2x1,5	17,2	226,1	403
10x2x1,5	22,2	373,7	625
12x2x1,5	23,2	447,5	716
16x2x1,5	26,0	595,1	940
20x2x1,5	29,2	742,7	1.186
24x2x1,5	32,7	890,3	1.394
30x2x1,5	34,8	1111,6	1.689
3x3x1,5	14,4	163,0	279
6x3x1,5	19,2	321,3	534
10x3x1,5	25,1	532,4	849
12x3x1,5	26,2	637,9	979

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor class 5, tinned conductor, other colors



## ÖLFLEX® INSTRUM 166 H

Overall screened instrumentation cable  
CU/LSZH/OS/LSZH



Info

**RM9XOHM 1 300 V  
EN 50288-7**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Halogen free
- Low smoke
- Fire behaviour
- Oil resistant

### Product features

Twisted pair or triad signal cable, overall screened, LSZH insulated and LSZH jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

### Design

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** LSZH
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

### Technical data

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 166 H</b>			
1x2x0,5	5,1	15,1	36
2x2x0,5	7,5	25,4	68
6x2x0,5	10,5	66,7	142
10x2x0,5	13,4	108,0	216
12x2x0,5	13,9	128,7	239
16x2x0,5	15,6	170,0	313
20x2x0,5	17,5	211,3	396
24x2x0,5	19,4	252,6	456
30x2x0,5	20,7	314,6	550
1x3x0,5	5,4	20,2	44
3x3x0,5	9,0	51,2	106
6x3x0,5	11,8	97,7	196
10x3x0,5	15,2	159,7	301
12x3x0,5	15,7	190,6	337
1x2x0,75	5,9	20,2	47
2x2x0,75	8,4	35,7	87
6x2x0,75	12,1	97,5	193
10x2x0,75	15,5	159,4	295
12x2x0,75	16,0	190,3	329
16x2x0,75	18,0	252,2	431
20x2x0,75	20,2	314,0	546
24x2x0,75	22,4	375,9	630
30x2x0,75	23,9	468,7	760
1x3x0,75	6,2	27,9	58
3x3x0,75	10,1	74,3	139
6x3x0,75	13,4	143,9	261
10x3x0,75	17,5	236,7	414
12x3x0,75	18,1	283,1	466

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 166 H</b>			
1x2x1	6,4	25,6	55
2x2x1	9,4	46,5	109
6x2x1	13,2	130,1	238
10x2x1	17,2	213,6	375
12x2x1	17,8	255,4	419
16x2x1	19,7	338,9	540
20x2x1	22,2	422,5	684
24x2x1	24,8	506,0	804
30x2x1	26,5	631,4	972
1x3x1	6,7	36,1	69
3x3x1	11,0	98,7	170
6x3x1	14,9	192,7	333
10x3x1	19,2	318,0	518
12x3x1	20,1	380,7	595
1x2x1,5	7,2	36,5	71
2x2x1,5	10,8	68,2	145
6x2x1,5	15,5	195,1	336
10x2x1,5	20,2	322,1	529
12x2x1,5	20,9	385,5	594
16x2x1,5	23,4	512,5	782
20x2x1,5	26,3	639,4	989
24x2x1,5	29,4	766,3	1.161
30x2x1,5	31,4	956,7	1.404
1x3x1,5	7,6	52,3	92
3x3x1,5	13,0	147,5	240
6x3x1,5	17,5	290,3	472
10x3x1,5	22,6	480,7	738
12x3x1,5	23,6	575,9	850

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



## ÖLFLEX® INSTRUM SWA 167 H

Armoured, Individual and Overall screened instrumentation cable  
CU/LSZH/IS/OS/LSZH/SWA/LSZH



**Info**

**RM9XHOHM1FM1 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Halogen free
- Low smoke
- Fire behaviour
- Oil resistant

**Product features**

Armoured, twisted pair or triad signal cable, individual and overall screened, LSZH insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** LSZH
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 167 H</b>			
2x2x0,5	13,1	35,7	302
6x2x0,5	16,9	97,7	495
10x2x0,5	20,4	159,7	684
12x2x0,5	20,9	190,6	732
16x2x0,5	23,5	252,6	1.001
20x2x0,5	25,7	314,6	1.175
24x2x0,5	28,3	376,6	1.354
30x2x0,5	29,8	469,5	1.534
3x3x0,5	14,7	66,7	383
6x3x0,5	18,1	128,7	574
10x3x0,5	22,9	211,3	922
12x3x0,5	23,6	252,6	1.003
2x2x0,75	14,3	46,0	352
6x2x0,75	18,4	128,5	578
10x2x0,75	23,4	211,0	941
12x2x0,75	24,0	252,3	1.005
16x2x0,75	26,3	334,8	1.214
20x2x0,75	28,8	417,3	1.431
24x2x0,75	31,5	499,8	1.635
30x2x0,75	34,1	623,6	2.058
3x3x0,75	16,0	89,8	444
6x3x0,75	20,3	174,9	702
10x3x0,75	25,6	288,3	1.124
12x3x0,75	26,5	345,1	1.225

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 167 H</b>			
2x2x1	15,1	56,8	389
6x2x1	19,8	161,0	664
10x2x1	25,2	265,3	1.075
12x2x1	25,9	317,4	1.152
16x2x1	28,5	421,6	1.399
20x2x1	31,2	525,8	1.659
24x2x1	35,1	630,0	2.101
30x2x1	37,2	786,3	2.401
3x3x1	17,4	114,2	517
6x3x1	22,4	223,7	917
10x3x1	27,7	369,7	1.303
12x3x1	28,6	442,7	1.421
2x2x1,5	17,0	78,5	478
6x2x1,5	23,2	226,1	953
10x2x1,5	28,6	373,7	1.344
12x2x1,5	29,6	447,5	1.463
16x2x1,5	32,6	595,1	1.785
20x2x1,5	36,8	742,7	2.340
24x2x1,5	40,4	890,3	2.691
30x2x1,5	42,6	1111,6	3.065
3x3x1,5	19,4	163,0	636
6x3x1,5	25,4	321,3	1.152
10x3x1,5	31,5	532,4	1.652
12x3x1,5	32,8	637,9	1.828

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



**ÖLFLEX® INSTRUM 170**  
Overall screened instrumentation cable  
CU/PVC/OS/PVC



Info

**RRXOHR 300 V**  
**EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, overall screened, PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 170</b>			
1x2x0,5	5,1	15,1	36
2x2x0,5	7,5	25,4	68
6x2x0,5	10,5	66,7	142
10x2x0,5	13,4	108,0	216
12x2x0,5	13,9	128,7	239
16x2x0,5	15,6	170,0	313
20x2x0,5	17,5	211,3	396
24x2x0,5	19,4	252,6	456
30x2x0,5	20,7	314,6	550
1x3x0,5	5,4	20,2	44
3x3x0,5	9,0	51,2	106
6x3x0,5	11,8	97,7	196
10x3x0,5	15,2	159,7	301
12x3x0,5	15,7	190,6	337
1x2x0,75	5,9	20,2	47
2x2x0,75	8,4	35,7	87
6x2x0,75	12,1	97,5	193
10x2x0,75	15,5	159,4	295
12x2x0,75	16,0	190,3	329
16x2x0,75	18,0	252,2	431
20x2x0,75	20,2	314,0	546
24x2x0,75	22,4	375,9	630
30x2x0,75	23,9	468,7	760
1x3x0,75	6,2	27,9	58
3x3x0,75	10,1	74,3	139
6x3x0,75	13,4	143,9	261
10x3x0,75	17,5	236,7	414
12x3x0,75	18,1	283,1	466

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 170</b>			
1x2x1	6,4	25,6	55
2x2x1	9,4	46,5	109
6x2x1	13,2	130,1	238
10x2x1	17,2	213,6	375
12x2x1	17,8	255,4	419
16x2x1	19,7	338,9	540
20x2x1	22,2	422,5	684
24x2x1	24,8	506,0	804
30x2x1	26,5	631,4	972
1x3x1	6,7	36,1	69
3x3x1	11,0	98,7	170
6x3x1	14,9	192,7	333
10x3x1	19,2	318,0	518
12x3x1	20,1	380,7	595
1x2x1,5	7,2	36,5	71
2x2x1,5	10,8	68,2	145
6x2x1,5	15,5	195,1	336
10x2x1,5	20,2	322,1	529
12x2x1,5	20,9	385,5	594
16x2x1,5	23,4	512,5	782
20x2x1,5	26,3	639,4	989
24x2x1,5	29,4	766,3	1.161
30x2x1,5	31,4	956,7	1.404
1x3x1,5	7,6	52,3	92
3x3x1,5	13,0	147,5	240
6x3x1,5	17,5	290,3	472
10x3x1,5	22,6	480,7	738
12x3x1,5	23,6	575,9	850

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, other colors



## ÖLFLEX® INSTRUM 171

Individual and overall screened instrumentation cable  
CU/PVC/IS/OS/PVC



**Info**

**RRXHOHR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, individual and overall screened, PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, black

**Technical data**



**Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers



**Insulation resistance:**  
100 MOhm x km



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage Uo/U:**  
300/300 V



**Test voltage:**  
C/C 1500 V x 1 minute



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 171</b>			
2x2x0,5	8,3	35,7	86
6x2x0,5	11,8	97,7	195
10x2x0,5	15,2	159,7	300
12x2x0,5	15,7	190,6	337
16x2x0,5	17,6	252,6	442
20x2x0,5	19,5	314,6	547
24x2x0,5	21,9	376,6	646
30x2x0,5	23,3	469,5	783
3x3x0,5	9,9	66,7	132
6x3x0,5	13,1	128,7	246
10x3x0,5	16,9	211,3	382
12x3x0,5	17,7	252,6	440
2x2x0,75	9,5	46,0	110
6x2x0,75	13,3	128,5	244
10x2x0,75	17,4	211,0	386
12x2x0,75	18,0	252,3	434
16x2x0,75	20,1	334,8	569
20x2x0,75	22,4	417,3	706
24x2x0,75	25,1	499,8	832
30x2x0,75	26,8	623,6	1.008
3x3x0,75	11,1	89,8	166
6x3x0,75	15,0	174,9	321
10x3x0,75	19,4	288,3	501
12x3x0,75	20,3	345,1	577

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 171</b>			
2x2x1	10,3	56,8	130
6x2x1	14,8	161,0	299
10x2x1	19,0	265,3	462
12x2x1	19,7	317,4	520
16x2x1	22,1	421,6	684
20x2x1	24,8	525,8	864
24x2x1	27,8	630,0	1.017
30x2x1	29,6	786,3	1.233
3x3x1	12,4	114,2	205
6x3x1	16,4	223,7	389
10x3x1	21,5	369,7	619
12x3x1	22,2	442,7	702
2x2x1,5	12,0	78,5	173
6x2x1,5	17,2	226,1	403
10x2x1,5	22,2	373,7	625
12x2x1,5	23,2	447,5	716
16x2x1,5	26,0	595,1	940
20x2x1,5	29,2	742,7	1.186
24x2x1,5	32,7	890,3	1.394
30x2x1,5	34,8	1111,6	1.689
3x3x1,5	14,4	163,0	279
6x3x1,5	19,2	321,3	534
10x3x1,5	25,1	532,4	849
12x3x1,5	26,2	637,9	979

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor class 5, timed conductor, other colors



## ÖLFLEX® INSTRUM SWA 172

Armoured, Overall screened instrumentation cable  
CU/PVC/OS/PVC/SWA/PVC



Info

**RRXOHRFR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, twisted pair or triad signal cable, overall screened, PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 172</b>			
1x2x0,5	9,8	15,1	179
2x2x0,5	12,3	25,4	267
6x2x0,5	15,3	66,7	405
10x2x0,5	18,5	108,0	552
12x2x0,5	18,9	128,7	585
16x2x0,5	20,8	170,0	706
20x2x0,5	23,5	211,3	954
24x2x0,5	25,5	252,6	1.079
30x2x0,5	26,9	314,6	1.211
1x3x0,5	10,0	20,2	193
3x3x0,5	13,8	51,2	337
6x3x0,5	16,9	97,7	496
10x3x0,5	20,4	159,7	685
12x3x0,5	20,9	190,6	733
1x2x0,75	10,5	20,2	206
2x2x0,75	13,3	35,7	306
6x2x0,75	17,1	97,5	499
10x2x0,75	20,7	159,4	687
12x2x0,75	22,0	190,3	844
16x2x0,75	23,9	252,2	1.002
20x2x0,75	26,4	314,0	1.192
24x2x0,75	28,8	375,9	1.353
30x2x0,75	30,3	468,7	1.528
1x3x0,75	10,8	27,9	224
3x3x0,75	14,9	74,3	394
6x3x0,75	18,4	143,9	597
10x3x0,75	23,5	236,7	972
12x3x0,75	24,3	283,1	1.052

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 172</b>			
1x2x1	11,0	25,6	224
2x2x1	14,2	46,5	349
6x2x1	18,2	130,1	569
10x2x1	23,2	213,6	925
12x2x1	23,8	255,4	985
16x2x1	25,9	338,9	1.174
20x2x1	28,6	422,5	1.403
24x2x1	31,2	506,0	1.599
30x2x1	33,9	631,4	2.012
1x3x1	11,3	36,1	246
3x3x1	15,9	98,7	446
6x3x1	20,0	192,7	701
10x3x1	25,4	318,0	1.137
12x3x1	26,3	380,7	1.239
1x2x1,5	11,8	36,5	258
2x2x1,5	15,6	68,2	415
6x2x1,5	20,7	195,1	727
10x2x1,5	26,4	322,1	1.176
12x2x1,5	27,1	385,5	1.260
16x2x1,5	29,8	512,5	1.535
20x2x1,5	33,7	639,4	2.022
24x2x1,5	36,9	766,3	2.320
30x2x1,5	38,9	956,7	2.634
1x3x1,5	12,5	52,3	294
3x3x1,5	18,0	147,5	566
6x3x1,5	23,5	290,3	1.029
10x3x1,5	29,0	480,7	1.467
12x3x1,5	30,0	575,9	1.608

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



## ÖLFLEX® INSTRUM SWA 173

Armoured, Individual and Overall screened instrumentation cable  
 CU/PVC/IS/OS/PVC/SWA/PVC



**Info**

**RRXHOHRFR 300 V  
 EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, twisted pair or triad signal cable, individual and overall screened, PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
 CEI 20-34/0
- **Halogen acid gas**  
 IEC 60754-1 (max 20%)
- **Fire behaviour**  
 IEC 60332-1-2  
 IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

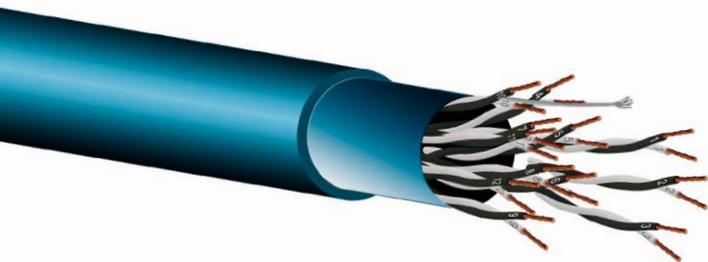
- Core identification code:**  
 Pairs are black & white with printed numbers  
 Triads are black, white, red with printed numbers
- Insulation resistance:**  
 100 MOhm x km
- Conductor stranding:**  
 Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
 300/300 V
- Test voltage:**  
 C/C 1500 V x 1 minute
- Temperature range:**  
 during operation: -30° to +70°C  
 during installation: -5° to +50°C
- Minimum Bending Radius:**  
 10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 173</b>			
2x2x0,5	13,1	35,7	302
6x2x0,5	16,9	97,7	495
10x2x0,5	20,4	159,7	684
12x2x0,5	20,9	190,6	732
16x2x0,5	23,5	252,6	1.001
20x2x0,5	25,7	314,6	1.175
24x2x0,5	28,3	376,6	1.354
30x2x0,5	29,8	469,5	1.534
3x3x0,5	14,7	66,7	383
6x3x0,5	18,1	128,7	574
10x3x0,5	22,9	211,3	922
12x3x0,5	23,6	252,6	1.003
2x2x0,75	14,3	46,0	352
6x2x0,75	18,4	128,5	578
10x2x0,75	23,4	211,0	941
12x2x0,75	24,0	252,3	1.005
16x2x0,75	26,3	334,8	1.214
20x2x0,75	28,8	417,3	1.431
24x2x0,75	31,5	499,8	1.635
30x2x0,75	34,1	623,6	2.058
3x3x0,75	16,0	89,8	444
6x3x0,75	20,3	174,9	702
10x3x0,75	25,6	288,3	1.124
12x3x0,75	26,5	345,1	1.225

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 173</b>			
2x2x1	15,1	56,8	389
6x2x1	19,8	161,0	664
10x2x1	25,2	265,3	1.075
12x2x1	25,9	317,4	1.152
16x2x1	28,5	421,6	1.399
20x2x1	31,2	525,8	1.659
24x2x1	35,1	630,0	2.101
30x2x1	37,2	786,3	2.401
3x3x1	17,4	114,2	517
6x3x1	22,4	223,7	917
10x3x1	27,7	369,7	1.303
12x3x1	28,6	442,7	1.421
2x2x1,5	17,0	78,5	478
6x2x1,5	23,2	226,1	953
10x2x1,5	28,6	373,7	1.344
12x2x1,5	29,6	447,5	1.463
16x2x1,5	32,6	595,1	1.785
20x2x1,5	36,8	742,7	2.340
24x2x1,5	40,4	890,3	2.691
30x2x1,5	42,6	1111,6	3.065
3x3x1,5	19,4	163,0	636
6x3x1,5	25,4	321,3	1.152
10x3x1,5	31,5	532,4	1.652
12x3x1,5	32,8	637,9	1.828

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



## ÖLFLEX® INSTRUM 174 IS

Overall screened instrumentation cable  
for intrinsically safe circuits  
CU/XLPE/OS/PVC



Info

**RE4XOHR 300 V  
EN 50288-7**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

### Product features

Twisted pair or triad signal cable, overall screened, XLPE insulated and PVC jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

### Design

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, blue RAL 5015

### Technical data

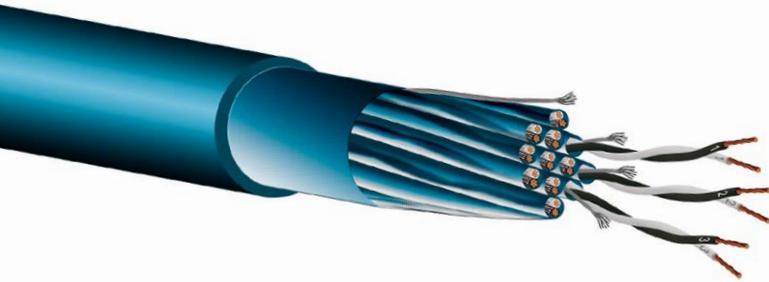
- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 174 IS</b>			
1x2x0,5	5,1	15,1	34
2x2x0,5	7,5	25,4	65
6x2x0,5	10,5	66,7	132
10x2x0,5	13,4	108,0	199
12x2x0,5	13,9	128,7	219
16x2x0,5	15,6	170,0	286
20x2x0,5	17,5	211,3	363
24x2x0,5	19,4	252,6	416
30x2x0,5	20,7	314,6	500
1x3x0,5	5,4	20,2	41
3x3x0,5	9,0	51,2	99
6x3x0,5	11,8	97,7	181
10x3x0,5	15,2	159,7	276
12x3x0,5	15,7	190,6	307
1x2x0,75	5,9	20,2	45
2x2x0,75	8,4	35,7	83
6x2x0,75	12,1	97,5	180
10x2x0,75	15,5	159,4	274
12x2x0,75	16,0	190,3	303
16x2x0,75	18,0	252,2	396
20x2x0,75	20,2	314,0	502
24x2x0,75	22,4	375,9	578
30x2x0,75	23,9	468,7	695
1x3x0,75	6,2	27,9	55
3x3x0,75	10,1	74,3	129
6x3x0,75	13,4	143,9	242
10x3x0,75	17,5	236,7	381
12x3x0,75	18,1	283,1	427

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 174 IS</b>			
1x2x1	6,4	25,6	52
2x2x1	9,4	46,5	104
6x2x1	13,2	130,1	223
10x2x1	17,2	213,6	349
12x2x1	17,8	255,4	388
16x2x1	19,7	338,9	499
20x2x1	22,2	422,5	633
24x2x1	24,8	506,0	742
30x2x1	26,5	631,4	894
1x3x1	6,7	36,1	65
3x3x1	11,0	98,7	159
6x3x1	14,9	192,7	309
10x3x1	19,2	318,0	479
12x3x1	20,1	380,7	549
1x2x1,5	7,2	36,5	67
2x2x1,5	10,8	68,2	138
6x2x1,5	15,5	195,1	315
10x2x1,5	20,2	322,1	494
12x2x1,5	20,9	385,5	552
16x2x1,5	23,4	512,5	725
20x2x1,5	26,3	639,4	919
24x2x1,5	29,4	766,3	1.076
30x2x1,5	31,4	956,7	1.299
1x3x1,5	7,6	52,3	87
3x3x1,5	13,0	147,5	224
6x3x1,5	17,5	290,3	440
10x3x1,5	22,6	480,7	685
12x3x1,5	23,6	575,9	786

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, other colors



## ÖLFLEX® INSTRUM 175 IS

Individual and overall screened instrumentation cable for intrinsically safe circuits  
CU/XLPE/IS/OS/PVC



**Info**

**RE4XHOHR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, individual and overall screened, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, blue RAL 5015

**Technical data**

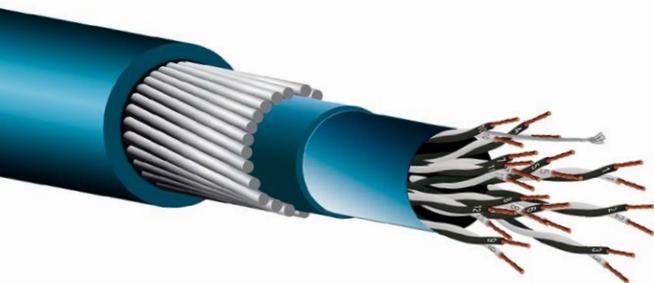
- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 175 IS</b>			
2x2x0,5	8,3	35,7	83
6x2x0,5	11,8	97,7	185
10x2x0,5	15,2	159,7	284
12x2x0,5	15,7	190,6	317
16x2x0,5	17,6	252,6	415
20x2x0,5	19,5	314,6	514
24x2x0,5	21,9	376,6	606
30x2x0,5	23,3	469,5	732
3x3x0,5	9,9	66,7	124
6x3x0,5	13,1	128,7	230
10x3x0,5	16,9	211,3	357
12x3x0,5	17,7	252,6	410
2x2x0,75	9,5	46,0	106
6x2x0,75	13,3	128,5	231
10x2x0,75	17,4	211,0	365
12x2x0,75	18,0	252,3	408
16x2x0,75	20,1	334,8	534
20x2x0,75	22,4	417,3	663
24x2x0,75	25,1	499,8	780
30x2x0,75	26,8	623,6	943
3x3x0,75	11,1	89,8	156
6x3x0,75	15,0	174,9	302
10x3x0,75	19,4	288,3	468
12x3x0,75	20,3	345,1	538

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 175 IS</b>			
2x2x1	10,3	56,8	124
6x2x1	14,8	161,0	283
10x2x1	19,0	265,3	436
12x2x1	19,7	317,4	489
16x2x1	22,1	421,6	643
20x2x1	24,8	525,8	812
24x2x1	27,8	630,0	955
30x2x1	29,6	786,3	1.155
3x3x1	12,4	114,2	193
6x3x1	16,4	223,7	366
10x3x1	21,5	369,7	580
12x3x1	22,2	442,7	656
2x2x1,5	12,0	78,5	166
6x2x1,5	17,2	226,1	382
10x2x1,5	22,2	373,7	589
12x2x1,5	23,2	447,5	673
16x2x1,5	26,0	595,1	884
20x2x1,5	29,2	742,7	1.116
24x2x1,5	32,7	890,3	1.310
30x2x1,5	34,8	1111,6	1.583
3x3x1,5	14,4	163,0	263
6x3x1,5	19,2	321,3	502
10x3x1,5	25,1	532,4	797
12x3x1,5	26,2	637,9	915

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, other colors



## ÖLFLEX® INSTRUM SWA 176 IS

Armoured overall screened instrumentation cable  
for intrinsically safe circuits  
CU/XLPE/OS/PVC/SWA/PVC



Info

**RE4XOHRFR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured twisted pair or triad signal cable,  
overall screened, XLPE insulated and PVC  
jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, blue RAL 5015
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, blue RAL 5015

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 176 IS</b>			
1x2x0,5	9,8	15,1	177
2x2x0,5	12,3	25,4	264
6x2x0,5	15,3	66,7	395
10x2x0,5	18,5	108,0	535
12x2x0,5	18,9	128,7	565
16x2x0,5	20,8	170,0	679
20x2x0,5	23,5	211,3	921
24x2x0,5	25,5	252,6	1.039
30x2x0,5	26,9	314,6	1.161
1x3x0,5	10,0	20,2	190
3x3x0,5	13,8	51,2	330
6x3x0,5	16,9	97,7	481
10x3x0,5	20,4	159,7	660
12x3x0,5	20,9	190,6	703
1x2x0,75	10,5	20,2	204
2x2x0,75	13,3	35,7	302
6x2x0,75	17,1	97,5	486
10x2x0,75	20,7	159,4	665
12x2x0,75	22,0	190,3	818
16x2x0,75	23,9	252,2	967
20x2x0,75	26,4	314,0	1.149
24x2x0,75	28,8	375,9	1.300
30x2x0,75	30,3	468,7	1.463
1x3x0,75	10,8	27,9	221
3x3x0,75	14,9	74,3	385
6x3x0,75	18,4	143,9	577
10x3x0,75	23,5	236,7	939
12x3x0,75	24,3	283,1	1.013

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 176 IS</b>			
1x2x1	11,0	25,6	222
2x2x1	14,2	46,5	344
6x2x1	18,2	130,1	554
10x2x1	23,2	213,6	899
12x2x1	23,8	255,4	954
16x2x1	25,9	338,9	1.132
20x2x1	28,6	422,5	1.351
24x2x1	31,2	506,0	1.537
30x2x1	33,9	631,4	1.934
1x3x1	11,3	36,1	242
3x3x1	15,9	98,7	435
6x3x1	20,0	192,7	678
10x3x1	25,4	318,0	1.098
12x3x1	26,3	380,7	1.193
1x2x1,5	11,8	36,5	255
2x2x1,5	15,6	68,2	408
6x2x1,5	20,7	195,1	706
10x2x1,5	26,4	322,1	1.141
12x2x1,5	27,1	385,5	1.218
16x2x1,5	29,8	512,5	1.478
20x2x1,5	33,7	639,4	1.951
24x2x1,5	36,9	766,3	2.236
30x2x1,5	38,9	956,7	2.529
1x3x1,5	12,5	52,3	289
3x3x1,5	18,0	147,5	550
6x3x1,5	23,5	290,3	998
10x3x1,5	29,0	480,7	1.414
12x3x1,5	30,0	575,9	1.544

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



## ÖLFLEX® INSTRUM SWA 177 IS

Armoured individual and overall screened instrumentation cable for intrinsically safe circuits  
CU/XLPE/IS/OS/PVC/SWA/PVC



Info

**RE4XHOHRFR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured twisted pair or triad signal cable, individual and overall screened, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, blue RAL 5015
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, blue RAL 5015

**Technical data**



**Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers



**Insulation resistance:**  
5000 MOhm x km



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage Uo/U:**  
300/300 V



**Test voltage:**  
C/C 1500 V x 1 minute



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 177 IS</b>			
2x2x0,5	13,1	35,7	298
6x2x0,5	16,9	97,7	485
10x2x0,5	20,4	159,7	667
12x2x0,5	20,9	190,6	712
16x2x0,5	23,5	252,6	975
20x2x0,5	25,7	314,6	1.142
24x2x0,5	28,3	376,6	1.314
30x2x0,5	29,8	469,5	1.484
3x3x0,5	14,7	66,7	375
6x3x0,5	18,1	128,7	559
10x3x0,5	22,9	211,3	897
12x3x0,5	23,6	252,6	972
2x2x0,75	14,3	46,0	348
6x2x0,75	18,4	128,5	565
10x2x0,75	23,4	211,0	919
12x2x0,75	24,0	252,3	979
16x2x0,75	26,3	334,8	1.179
20x2x0,75	28,8	417,3	1.388
24x2x0,75	31,5	499,8	1.583
30x2x0,75	34,1	623,6	1.993
3x3x0,75	16,0	89,8	434
6x3x0,75	20,3	174,9	683
10x3x0,75	25,6	288,3	1.092
12x3x0,75	26,5	345,1	1.186

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 177 IS</b>			
2x2x1	15,1	56,8	384
6x2x1	19,8	161,0	648
10x2x1	25,2	265,3	1.050
12x2x1	25,9	317,4	1.121
16x2x1	28,5	421,6	1.357
20x2x1	31,2	525,8	1.607
24x2x1	35,1	630,0	2.039
30x2x1	37,2	786,3	2.323
3x3x1	17,4	114,2	506
6x3x1	22,4	223,7	894
10x3x1	27,7	369,7	1.264
12x3x1	28,6	442,7	1.374
2x2x1,5	17,0	78,5	471
6x2x1,5	23,2	226,1	931
10x2x1,5	28,6	373,7	1.308
12x2x1,5	29,6	447,5	1.421
16x2x1,5	32,6	595,1	1.729
20x2x1,5	36,8	742,7	2.270
24x2x1,5	40,4	890,3	2.607
30x2x1,5	42,6	1111,6	2.959
3x3x1,5	19,4	163,0	620
6x3x1,5	25,4	321,3	1.121
10x3x1,5	31,5	532,4	1.599
12x3x1,5	32,8	637,9	1.765

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



## ÖLFLEX® INSTRUM SWA LEAD 180

Armoured, Lead jacketed, Overall screened instrumentation cable  
CU/XLPE/OS/PVC/LC/PVC/SWA/PVC



Info

**RE4XOHLRFR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, lead jacketed, twisted pair or triad signal cable, overall screened, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, black
- **Chemical Barrier:** Lead sheath
- **Inner sheath:** PVC, black
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +90°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
15 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA LEAD 180</b>			
1x2x0,5	13,7	15,1	468
2x2x0,5	16,5	25,4	673
6x2x0,5	19,7	66,7	962
10x2x0,5	23,1	108,0	1.283
12x2x0,5	23,5	128,7	1.332
16x2x0,5	25,4	170,0	1.523
20x2x0,5	28,5	211,3	1.966
24x2x0,5	30,6	252,6	2.244
30x2x0,5	32,1	314,6	2.449
1x3x0,5	14,2	20,2	520
3x3x0,5	18,2	51,2	837
6x3x0,5	21,3	97,7	1.104
10x3x0,5	25,0	159,7	1.486
12x3x0,5	25,5	190,6	1.551
1x2x0,75	14,7	20,2	553
2x2x0,75	17,5	35,7	745
6x2x0,75	21,5	97,5	1.119
10x2x0,75	25,4	159,4	1.506
12x2x0,75	26,8	190,3	1.779
16x2x0,75	29,0	252,2	2.034
20x2x0,75	31,4	314,0	2.397
24x2x0,75	33,8	375,9	2.660
30x2x0,75	36,2	468,7	3.057
1x3x0,75	15,0	27,9	581
3x3x0,75	19,4	74,3	938
6x3x0,75	23,1	143,9	1.325
10x3x0,75	28,5	236,7	1.984
12x3x0,75	29,1	283,1	2.074

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA LEAD 180</b>			
1x2x1	15,2	25,6	588
2x2x1	18,6	46,5	868
6x2x1	22,9	130,1	1.292
10x2x1	28,2	213,6	1.930
12x2x1	28,8	255,4	2.013
16x2x1	31,0	338,9	2.357
20x2x1	33,7	422,5	2.704
24x2x1	37,1	506,0	3.184
30x2x1	39,8	631,4	3.804
1x3x1	15,5	36,1	621
3x3x1	20,5	98,7	1.035
6x3x1	24,8	192,7	1.503
10x3x1	30,2	318,0	2.213
12x3x1	31,3	380,7	2.435
1x2x1,5	16,0	36,5	651
2x2x1,5	20,0	68,2	987
6x2x1,5	25,3	195,1	1.546
10x2x1,5	31,4	322,1	2.388
12x2x1,5	32,3	385,5	2.515
16x2x1,5	35,5	512,5	3.029
20x2x1,5	39,5	639,4	3.809
24x2x1,5	42,8	766,3	4.276
30x2x1,5	45,2	956,7	4.836
1x3x1,5	16,7	52,3	702
3x3x1,5	22,6	147,5	1.278
6x3x1,5	28,5	290,3	2.041
10x3x1,5	34,0	480,7	2.785
12x3x1,5	35,6	575,9	3.104

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned copper conductor, other colors, Armour DSTA



## ÖLFLEX® INSTRUM SWA LEAD 181

Armoured, Lead jacketed,  
Individual and Overall screened instrumentation cable  
CU/XLPE/IS/OS/PVC/LC/PVC/SWA/PVC



**Info**

**RE4XHOHRLRFR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, lead jacketed, twisted pair or triad signal cable, individual and overall screened, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, black
- **Chemical Barrier:** Lead sheath
- **Inner sheath:** PVC, black
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +90°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
15 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA LEAD 181</b>			
2x2x0,5	17,3	35,7	735
6x2x0,5	21,3	97,7	1.108
10x2x0,5	25,0	159,7	1.494
12x2x0,5	25,5	190,6	1.560
16x2x0,5	28,6	252,6	2.022
20x2x0,5	30,8	314,6	2.356
24x2x0,5	33,3	376,6	2.648
30x2x0,5	35,4	469,5	3.032
3x3x0,5	19,1	66,7	919
6x3x0,5	22,8	128,7	1.293
10x3x0,5	27,7	211,3	1.899
12x3x0,5	28,7	252,6	2.025
2x2x0,75	18,7	46,0	875
6x2x0,75	23,0	128,5	1.309
10x2x0,75	28,4	211,0	1.958
12x2x0,75	29,0	252,3	2.046
16x2x0,75	31,4	334,8	2.424
20x2x0,75	33,9	417,3	2.752
24x2x0,75	37,4	499,8	3.244
30x2x0,75	40,2	623,6	3.898
3x3x0,75	20,6	89,8	1.038
6x3x0,75	24,9	174,9	1.504
10x3x0,75	30,6	288,3	2.298
12x3x0,75	31,5	345,1	2.437

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA LEAD 181</b>			
2x2x1	19,5	56,8	944
6x2x1	24,6	161,0	1.467
10x2x1	30,1	265,3	2.155
12x2x1	30,9	317,4	2.343
16x2x1	33,5	421,6	2.702
20x2x1	37,1	525,8	3.255
24x2x1	41,2	630,0	4.001
30x2x1	43,1	786,3	4.378
3x3x1	22,0	114,2	1.207
6x3x1	27,3	223,7	1.875
10x3x1	32,9	369,7	2.591
12x3x1	33,6	442,7	2.726
2x2x1,5	21,4	78,5	1.101
6x2x1,5	28,2	226,1	1.963
10x2x1,5	33,7	373,7	2.661
12x2x1,5	34,9	447,5	2.922
16x2x1,5	38,3	595,1	3.425
20x2x1,5	42,7	742,7	4.302
24x2x1,5	46,5	890,3	4.976
30x2x1,5	49,5	1111,6	5.685
3x3x1,5	24,3	163,0	1.423
6x3x1,5	30,2	321,3	2.235
10x3x1,5	37,4	532,4	3.260
12x3x1,5	38,5	637,9	3.471

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned copper conductor, other colors, Armour DSTA



## ÖLFLEX® INSTRUM SWA AL/HDPE/PA 182

Armoured, AL/HDPE/PA jacketed, Overall screened instrumentation cable CU/XLPE/AL/HDPE/PA/SWA/PVC



Info

**RE4XOH5ER4FR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, AL/HDPE/PA jacketed, twisted pair or triad signal cable, overall screened, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum longitudinal tape (AL) + TC Drain wire
- **Chemical Barrier:** AL/HDPE/PA
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA AL/HDPE/PA 182</b>			
1x2x0,5	11,6	15,1	229
2x2x0,5	13,9	25,4	313
6x2x0,5	16,9	66,7	447
10x2x0,5	19,8	108,0	581
12x2x0,5	20,5	128,7	621
16x2x0,5	22,9	170,0	844
20x2x0,5	25,1	211,3	986
24x2x0,5	26,9	252,6	1.094
30x2x0,5	28,5	314,6	1.227
1x3x0,5	11,8	20,2	242
3x3x0,5	15,2	51,2	372
6x3x0,5	18,2	97,7	526
10x3x0,5	21,8	159,7	706
12x3x0,5	23,0	190,6	868
1x2x0,75	12,3	20,2	256
2x2x0,75	14,8	35,7	352
6x2x0,75	18,5	97,5	531
10x2x0,75	22,9	159,4	829
12x2x0,75	23,4	190,3	873
16x2x0,75	25,5	252,2	1.033
20x2x0,75	27,8	314,0	1.202
24x2x0,75	30,1	375,9	1.355
30x2x0,75	31,7	468,7	1.514
1x3x0,75	12,6	27,9	273
3x3x0,75	16,5	74,3	436
6x3x0,75	19,8	143,9	623
10x3x0,75	25,1	236,7	1.005
12x3x0,75	25,7	283,1	1.068

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA AL/HDPE/PA 182</b>			
1x2x1	12,8	25,6	274
2x2x1	15,6	46,5	387
6x2x1	19,6	130,1	600
10x2x1	24,8	213,6	964
12x2x1	25,4	255,4	1.020
16x2x1	27,3	338,9	1.188
20x2x1	30,0	422,5	1.406
24x2x1	32,8	506,0	1.604
30x2x1	35,3	631,4	1.990
1x3x1	13,1	36,1	296
3x3x1	17,5	98,7	488
6x3x1	21,5	192,7	734
10x3x1	26,8	318,0	1.153
12x3x1	27,7	380,7	1.245
1x2x1,5	13,6	36,5	309
2x2x1,5	17,2	68,2	461
6x2x1,5	22,8	195,1	870
10x2x1,5	27,8	322,1	1.193
12x2x1,5	28,7	385,5	1.285
16x2x1,5	31,2	512,5	1.529
20x2x1,5	35,0	639,4	2.008
24x2x1,5	38,3	766,3	2.288
30x2x1,5	40,3	956,7	2.578
1x3x1,5	14,1	52,3	338
3x3x1,5	19,4	147,5	596
6x3x1,5	25,1	290,3	1.063
10x3x1,5	30,4	480,7	1.469
12x3x1,5	31,4	575,9	1.595

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned copper conductor, other colors



## ÖLFLEX® INSTRUM SWA AL/HDPE/PA 183

Armoured, AL/HDPE/PA jacketed,  
Individual and Overall screened instrumentation cable  
CU/XLPE/IS/AL/HDPE/PA/SWA/PVC



**Info**

**RE4XHOH5ER4FR 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, AL/HDPE/PA jacketed, twisted pair or triad signal cable, individual and overall screened, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS Aluminum/PET + TC Drain wire, OS Aluminum longitudinal tape (AL) + TC Drain wire
- **Chemical Barrier:** AL/HDPE/PA
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA AL/HDPE/PA 183</b>			
2x2x0,5	14,7	35,7	349
6x2x0,5	18,2	97,7	530
10x2x0,5	21,8	159,7	714
12x2x0,5	23,0	190,6	878
16x2x0,5	25,1	252,6	1.040
20x2x0,5	27,1	314,6	1.197
24x2x0,5	29,6	376,6	1.368
30x2x0,5	31,1	469,5	1.535
3x3x0,5	16,3	66,7	426
6x3x0,5	19,5	128,7	605
10x3x0,5	24,5	211,3	964
12x3x0,5	25,2	252,6	1.038
2x2x0,75	15,7	46,0	391
6x2x0,75	19,7	128,5	611
10x2x0,75	25,0	211,0	984
12x2x0,75	25,5	252,3	1.045
16x2x0,75	27,7	334,8	1.232
20x2x0,75	30,2	417,3	1.442
24x2x0,75	33,1	499,8	1.650
30x2x0,75	35,5	623,6	2.049
3x3x0,75	17,6	89,8	487
6x3x0,75	21,7	174,9	729
10x3x0,75	27,0	288,3	1.147
12x3x0,75	27,8	345,1	1.239

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA AL/HDPE/PA 183</b>			
2x2x1	16,7	56,8	436
6x2x1	21,4	161,0	704
10x2x1	26,6	265,3	1.105
12x2x1	27,3	317,4	1.177
16x2x1	29,9	421,6	1.411
20x2x1	32,8	525,8	1.674
24x2x1	36,7	630,0	2.113
30x2x1	38,6	786,3	2.376
3x3x1	18,8	114,2	551
6x3x1	23,8	223,7	949
10x3x1	29,3	369,7	1.331
12x3x1	30,0	442,7	1.428
2x2x1,5	18,4	78,5	515
6x2x1,5	24,8	226,1	996
10x2x1,5	30,0	373,7	1.363
12x2x1,5	31,0	447,5	1.472
16x2x1,5	34,7	595,1	1.962
20x2x1,5	38,2	742,7	2.323
24x2x1,5	41,8	890,3	2.654
30x2x1,5	44,2	1111,6	3.022
3x3x1,5	21,0	163,0	675
6x3x1,5	26,8	321,3	1.176
10x3x1,5	33,1	532,4	1.666
12x3x1,5	34,9	637,9	1.999

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned copper conductor, other colors



## ÖLFLEX® INSTRUM 278 H

Overall screened instrumentation cable LSZH  
CU/XLPE/OS/LSZH



**Info**

**RE4XOHM 1 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 278 H</b>			
1x2x0,5	5,1	15,1	35
2x2x0,5	7,5	25,4	66
6x2x0,5	10,5	66,7	134
10x2x0,5	13,4	108,0	202
12x2x0,5	13,9	128,7	222
16x2x0,5	15,6	170,0	290
20x2x0,5	17,5	211,3	367
24x2x0,5	19,4	252,6	421
30x2x0,5	20,7	314,6	505
1x3x0,5	5,4	20,2	42
3x3x0,5	9,0	51,2	100
6x3x0,5	11,8	97,7	183
10x3x0,5	15,2	159,7	279
12x3x0,5	15,7	190,6	311
1x2x0,75	5,9	20,2	45
2x2x0,75	8,4	35,7	84
6x2x0,75	12,1	97,5	183
10x2x0,75	15,5	159,4	277
12x2x0,75	16,0	190,3	306
16x2x0,75	18,0	252,2	401
20x2x0,75	20,2	314,0	507
24x2x0,75	22,4	375,9	583
30x2x0,75	23,9	468,7	702
1x3x0,75	6,2	27,9	56
3x3x0,75	10,1	74,3	131
6x3x0,75	13,4	143,9	244
10x3x0,75	17,5	236,7	386
12x3x0,75	18,1	283,1	431

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 278 H</b>			
1x2x1	6,4	25,6	53
2x2x1	9,4	46,5	106
6x2x1	13,2	130,1	225
10x2x1	17,2	213,6	353
12x2x1	17,8	255,4	392
16x2x1	19,7	338,9	503
20x2x1	22,2	422,5	638
24x2x1	24,8	506,0	749
30x2x1	26,5	631,4	902
1x3x1	6,7	36,1	66
3x3x1	11,0	98,7	161
6x3x1	14,9	192,7	313
10x3x1	19,2	318,0	484
12x3x1	20,1	380,7	554
1x2x1,5	7,2	36,5	69
2x2x1,5	10,8	68,2	140
6x2x1,5	15,5	195,1	318
10x2x1,5	20,2	322,1	499
12x2x1,5	20,9	385,5	557
16x2x1,5	23,4	512,5	732
20x2x1,5	26,3	639,4	927
24x2x1,5	29,4	766,3	1.086
30x2x1,5	31,4	956,7	1.309
1x3x1,5	7,6	52,3	88
3x3x1,5	13,0	147,5	227
6x3x1,5	17,5	290,3	444
10x3x1,5	22,6	480,7	691
12x3x1,5	23,6	575,9	793

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned copper conductor, other colors



## ÖLFLEX® INSTRUM 279 H

Individual and overall screened instrumentation cable LSZH  
CU/XLPE/IS/OS/LSZH



**Info**

**RE4XHOHM1 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, individual and overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 279 H</b>			
2x2x0,5	8,3	35,7	84
6x2x0,5	11,8	97,7	187
10x2x0,5	15,2	159,7	287
12x2x0,5	15,7	190,6	321
16x2x0,5	17,6	252,6	419
20x2x0,5	19,5	314,6	518
24x2x0,5	21,9	376,6	611
30x2x0,5	23,3	469,5	739
3x3x0,5	9,9	66,7	126
6x3x0,5	13,1	128,7	233
10x3x0,5	16,9	211,3	361
12x3x0,5	17,7	252,6	414
2x2x0,75	9,5	46,0	108
6x2x0,75	13,3	128,5	234
10x2x0,75	17,4	211,0	369
12x2x0,75	18,0	252,3	412
16x2x0,75	20,1	334,8	539
20x2x0,75	22,4	417,3	669
24x2x0,75	25,1	499,8	787
30x2x0,75	26,8	623,6	951
3x3x0,75	11,1	89,8	158
6x3x0,75	15,0	174,9	305
10x3x0,75	19,4	288,3	473
12x3x0,75	20,3	345,1	543

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM 279 H</b>			
2x2x1	10,3	56,8	126
6x2x1	14,8	161,0	286
10x2x1	19,0	265,3	441
12x2x1	19,7	317,4	494
16x2x1	22,1	421,6	648
20x2x1	24,8	525,8	819
24x2x1	27,8	630,0	963
30x2x1	29,6	786,3	1.164
3x3x1	12,4	114,2	196
6x3x1	16,4	223,7	369
10x3x1	21,5	369,7	586
12x3x1	22,2	442,7	661
2x2x1,5	12,0	78,5	168
6x2x1,5	17,2	226,1	386
10x2x1,5	22,2	373,7	595
12x2x1,5	23,2	447,5	680
16x2x1,5	26,0	595,1	891
20x2x1,5	29,2	742,7	1.125
24x2x1,5	32,7	890,3	1.321
30x2x1,5	34,8	1111,6	1.596
3x3x1,5	14,4	163,0	266
6x3x1,5	19,2	321,3	507
10x3x1,5	25,1	532,4	804
12x3x1,5	26,2	637,9	923

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned copper conductor, other colors



## ÖLFLEX® INSTRUM SWA 280 H

Armoured overall screened instrumentation cable LSZH  
CU/XLPE/OS/LSZH/SWA/LSZH



Info

**RE4XOHM1FM1 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured twisted pair or triad signal cable, overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 280 H</b>			
1x2x0,5	9,8	15,1	179
2x2x0,5	12,3	25,4	266
6x2x0,5	15,3	66,7	398
10x2x0,5	18,5	108,0	538
12x2x0,5	18,9	128,7	568
16x2x0,5	20,8	170,0	683
20x2x0,5	23,5	211,3	925
24x2x0,5	25,5	252,6	1.044
30x2x0,5	26,9	314,6	1.166
1x3x0,5	10,0	20,2	192
3x3x0,5	13,8	51,2	332
6x3x0,5	16,9	97,7	484
10x3x0,5	20,4	159,7	664
12x3x0,5	20,9	190,6	707
1x2x0,75	10,5	20,2	206
2x2x0,75	13,3	35,7	304
6x2x0,75	17,1	97,5	489
10x2x0,75	20,7	159,4	669
12x2x0,75	22,0	190,3	823
16x2x0,75	23,9	252,2	972
20x2x0,75	26,4	314,0	1.154
24x2x0,75	28,8	375,9	1.307
30x2x0,75	30,3	468,7	1.469
1x3x0,75	10,8	27,9	223
3x3x0,75	14,9	74,3	387
6x3x0,75	18,4	143,9	581
10x3x0,75	23,5	236,7	944
12x3x0,75	24,3	283,1	1.018

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 280 H</b>			
1x2x1	11,0	25,6	224
2x2x1	14,2	46,5	346
6x2x1	18,2	130,1	557
10x2x1	23,2	213,6	903
12x2x1	23,8	255,4	958
16x2x1	25,9	338,9	1.138
20x2x1	28,6	422,5	1.357
24x2x1	31,2	506,0	1.543
30x2x1	33,9	631,4	1.941
1x3x1	11,3	36,1	244
3x3x1	15,9	98,7	437
6x3x1	20,0	192,7	682
10x3x1	25,4	318,0	1.103
12x3x1	26,3	380,7	1.198
1x2x1,5	11,8	36,5	257
2x2x1,5	15,6	68,2	411
6x2x1,5	20,7	195,1	710
10x2x1,5	26,4	322,1	1.146
12x2x1,5	27,1	385,5	1.223
16x2x1,5	29,8	512,5	1.484
20x2x1,5	33,7	639,4	1.959
24x2x1,5	36,9	766,3	2.244
30x2x1,5	38,9	956,7	2.537
1x3x1,5	12,5	52,3	291
3x3x1,5	18,0	147,5	553
6x3x1,5	23,5	290,3	1.002
10x3x1,5	29,0	480,7	1.420
12x3x1,5	30,0	575,9	1.550

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, other colors



## ÖLFLEX® INSTRUM SWA 281 H

Armoured individual and overall screened instrumentation cable LSZH CU/XLPE/IS/OS/LSZH/SWA/LSZH



**Info**

**RE4XHOHM1FM1 300 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured twisted pair or triad signal cable, individual and overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 281 H</b>			
2x2x0,5	13,1	35,7	301
6x2x0,5	16,9	97,7	488
10x2x0,5	20,4	159,7	671
12x2x0,5	20,9	190,6	716
16x2x0,5	23,5	252,6	979
20x2x0,5	25,7	314,6	1.147
24x2x0,5	28,3	376,6	1.320
30x2x0,5	29,8	469,5	1.490
3x3x0,5	14,7	66,7	378
6x3x0,5	18,1	128,7	562
10x3x0,5	22,9	211,3	902
12x3x0,5	23,6	252,6	977
2x2x0,75	14,3	46,0	350
6x2x0,75	18,4	128,5	568
10x2x0,75	23,4	211,0	923
12x2x0,75	24,0	252,3	983
16x2x0,75	26,3	334,8	1.184
20x2x0,75	28,8	417,3	1.394
24x2x0,75	31,5	499,8	1.589
30x2x0,75	34,1	623,6	2.000
3x3x0,75	16,0	89,8	437
6x3x0,75	20,3	174,9	687
10x3x0,75	25,6	288,3	1.097
12x3x0,75	26,5	345,1	1.191

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA 281 H</b>			
2x2x1	15,1	56,8	387
6x2x1	19,8	161,0	652
10x2x1	25,2	265,3	1.055
12x2x1	25,9	317,4	1.127
16x2x1	28,5	421,6	1.363
20x2x1	31,2	525,8	1.614
24x2x1	35,1	630,0	2.047
30x2x1	37,2	786,3	2.331
3x3x1	17,4	114,2	509
6x3x1	22,4	223,7	898
10x3x1	27,7	369,7	1.269
12x3x1	28,6	442,7	1.380
2x2x1,5	17,0	78,5	474
6x2x1,5	23,2	226,1	936
10x2x1,5	28,6	373,7	1.314
12x2x1,5	29,6	447,5	1.427
16x2x1,5	32,6	595,1	1.735
20x2x1,5	36,8	742,7	2.278
24x2x1,5	40,4	890,3	2.616
30x2x1,5	42,6	1111,6	2.969
3x3x1,5	19,4	163,0	624
6x3x1,5	25,4	321,3	1.126
10x3x1,5	31,5	532,4	1.606
12x3x1,5	32,8	637,9	1.772

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned copper conductor, Armour SWB, other colors



## ÖLFLEX® INSTRUM F90 378 H

Fire resistant, overall screened instrumentation cable LSZH CU/MT/XLPE/OS/LSZH



**Info**

RTE4XOHM 1 300 V  
EN 50288-7  
IEC 60331-23

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, overall screened, XLPE over MICA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-23 (90 min./750°C)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM F90 378 H</b>			
1x2x0,5	6,6	15,1	47
2x2x0,5	9,7	25,4	93
6x2x0,5	13,7	66,7	185
10x2x0,5	17,8	108,0	285
12x2x0,5	18,4	128,7	308
16x2x0,5	20,7	170,0	401
20x2x0,5	23,3	211,3	511
24x2x0,5	26,0	252,6	593
30x2x0,5	27,5	314,6	690
1x3x0,5	6,9	20,2	56
3x3x0,5	11,6	51,2	135
6x3x0,5	15,4	97,7	251
10x3x0,5	20,1	159,7	389
12x3x0,5	20,8	190,6	427
1x2x0,75	7,0	20,2	54
2x2x0,75	10,4	35,7	111
6x2x0,75	15,0	97,5	235
10x2x0,75	19,3	159,4	352
12x2x0,75	20,2	190,3	395
16x2x0,75	22,4	252,2	504
20x2x0,75	25,2	314,0	642
24x2x0,75	28,1	375,9	747
30x2x0,75	30,0	468,7	890
1x3x0,75	7,4	27,9	67
3x3x0,75	12,5	74,3	166
6x3x0,75	16,7	143,9	312
10x3x0,75	21,8	236,7	487
12x3x0,75	22,5	283,1	539

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM F90 378 H</b>			
1x2x1	7,4	25,6	62
2x2x1	11,0	46,5	128
6x2x1	15,9	130,1	278
10x2x1	20,7	213,6	430
12x2x1	21,4	255,4	472
16x2x1	24,0	338,9	619
20x2x1	27,0	422,5	786
24x2x1	30,2	506,0	915
30x2x1	32,2	631,4	1,094
1x3x1	7,8	36,1	77
3x3x1	13,3	98,7	196
6x3x1	17,9	192,7	382
10x3x1	23,4	318,0	597
12x3x1	24,2	380,7	664
1x2x1,5	8,2	36,5	78
2x2x1,5	12,6	68,2	171
6x2x1,5	18,2	195,1	378
10x2x1,5	23,7	322,1	587
12x2x1,5	24,5	385,5	649
16x2x1,5	27,5	512,5	852
20x2x1,5	30,9	639,4	1,083
24x2x1,5	34,8	766,3	1,279
30x2x1,5	37,1	956,7	1,532
1x3x1,5	8,9	52,3	104
3x3x1,5	15,2	147,5	267
6x3x1,5	20,5	290,3	524
10x3x1,5	26,8	480,7	821
12x3x1,5	27,7	575,9	919

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned copper conductor, other colors



## ÖLFLEX® INSTRUM F90 379 H

Fire resistant, individual and overall screened instrumentation cable LSZH CU/MT/XLPE/IS/OS/LSZH



**Info**

**RTE4XHOHM 1 300 V  
EN 50288-7  
IEC 60331-23**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair or triad signal cable, individual and overall screened, XLPE over MICA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-23 (90 min./750°C)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**



**Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers



**Insulation resistance:**  
5000 MOhm x km



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U<sub>0</sub>/U:**  
300/300 V



**Test voltage:**  
C/C 1500 V x 1 minute



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM F90 379 H</b>			
2x2x0,5	10,6	35,7	114
6x2x0,5	15,3	97,7	247
10x2x0,5	19,7	159,7	374
12x2x0,5	20,6	190,6	422
16x2x0,5	23,1	252,6	550
20x2x0,5	25,9	314,6	696
24x2x0,5	29,0	376,6	813
30x2x0,5	30,7	469,5	957
3x3x0,5	12,8	66,7	165
6x3x0,5	17,2	128,7	318
10x3x0,5	22,2	211,3	483
12x3x0,5	23,2	252,6	548
2x2x0,75	11,6	46,0	139
6x2x0,75	16,4	128,5	293
10x2x0,75	21,5	211,0	456
12x2x0,75	22,2	252,3	504
16x2x0,75	24,9	334,8	659
20x2x0,75	28,0	417,3	835
24x2x0,75	31,5	499,8	991
30x2x0,75	33,4	623,6	1.170
3x3x0,75	13,7	89,8	197
6x3x0,75	18,6	174,9	382
10x3x0,75	24,2	288,3	597
12x3x0,75	25,1	345,1	666

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM F90 379 H</b>			
2x2x1	12,3	56,8	157
6x2x1	17,7	161,0	346
10x2x1	23,0	265,3	539
12x2x1	23,8	317,4	597
16x2x1	26,7	421,6	781
20x2x1	30,0	525,8	988
24x2x1	33,6	630,0	1.154
30x2x1	35,8	786,3	1.386
3x3x1	14,8	114,2	235
6x3x1	19,7	223,7	446
10x3x1	26,0	369,7	713
12x3x1	26,9	442,7	797
2x2x1,5	13,8	78,5	196
6x2x1,5	20,1	226,1	453
10x2x1,5	26,2	373,7	706
12x2x1,5	27,1	447,5	784
16x2x1,5	30,4	595,1	1.028
20x2x1,5	34,4	742,7	1.319
24x2x1,5	38,5	890,3	1.539
30x2x1,5	41,0	1111,6	1.849
3x3x1,5	16,6	163,0	302
6x3x1,5	22,5	321,3	594
10x3x1,5	29,6	532,4	947
12x3x1,5	30,6	637,9	1.063

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned COPPER conductor, other colors



## ÖLFLEX® INSTRUM SWA F90 380 H

Fire resistant, armoured overall screened instrumentation cable LSZH CU/MT/XLPE/OS/LSZH/SWA/LSZH



Info

RTE4XOHM1FM1 300 V  
EN 50288-7  
IEC 60331-23

Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

Product features

Armoured twisted pair or triad signal cable, overall screened, XLPE over MICA-tape insulated and LSZH jacketed

Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2, IEC 60332-3-22 (Cat. A)  
IEC 60331-23 (90 min./750°C)

Design

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** LSZH, black

Technical data

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>o</sub>/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA F90 380 H</b>			
1x2x0,5	11,2	15,1	221
2x2x0,5	14,5	25,4	341
6x2x0,5	18,7	66,7	527
10x2x0,5	23,8	108,0	852
12x2x0,5	24,6	128,7	905
16x2x0,5	26,9	170,0	1.062
20x2x0,5	29,7	211,3	1.259
24x2x0,5	32,6	252,6	1.436
30x2x0,5	34,9	314,6	1.764
1x3x0,5	11,5	20,2	238
3x3x0,5	16,7	51,2	433
6x3x0,5	20,7	97,7	642
10x3x0,5	26,3	159,7	1.034
12x3x0,5	27,0	190,6	1.092
1x2x0,75	11,6	20,2	238
2x2x0,75	15,3	35,7	374
6x2x0,75	20,0	97,5	605
10x2x0,75	25,5	159,4	974
12x2x0,75	26,3	190,3	1.040
16x2x0,75	28,8	252,2	1.228
20x2x0,75	31,6	314,0	1.446
24x2x0,75	35,5	375,9	1.844
30x2x0,75	37,6	468,7	2.072
1x3x0,75	12,0	27,9	259
3x3x0,75	17,6	74,3	482
6x3x0,75	22,7	143,9	848
10x3x0,75	28,2	236,7	1.194
12x3x0,75	28,9	283,1	1.268

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA F90 380 H</b>			
1x2x1	12,0	25,6	254
2x2x1	15,9	46,5	404
6x2x1	21,9	130,1	791
10x2x1	26,9	213,6	1.092
12x2x1	27,6	255,4	1.155
16x2x1	30,4	338,9	1.390
20x2x1	34,4	422,5	1.844
24x2x1	37,8	506,0	2.104
30x2x1	39,8	631,4	2.354
1x3x1	12,6	36,1	285
3x3x1	18,3	98,7	529
6x3x1	23,9	192,7	953
10x3x1	29,8	318,0	1.350
12x3x1	30,6	380,7	1.441
1x2x1,5	13,0	36,5	294
2x2x1,5	17,7	68,2	490
6x2x1,5	24,4	195,1	967
10x2x1,5	30,1	322,1	1.349
12x2x1,5	30,9	385,5	1.434
16x2x1,5	34,8	512,5	1.926
20x2x1,5	38,5	639,4	2.297
24x2x1,5	42,5	766,3	2.650
30x2x1,5	45,9	956,7	3.291
1x3x1,5	13,8	52,3	335
3x3x1,5	20,4	147,5	652
6x3x1,5	26,7	290,3	1.180
10x3x1,5	34,1	480,7	1.869
12x3x1,5	35,0	575,9	2.000

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

AVAILABLE ALSO IN: Conductor Class 5, Tinned conductor, Armour SWB, other colors



## ÖLFLEX® INSTRUM SWA F90 381 H

Fire resistant, armoured individual and overall screened instrumentation cable LSZH CU/MT/XLPE/IS/OS/LSZH/SWA/LSZH



**Info**

**RTE4XHOHM1FM1 300 V  
EN 50288-7  
IEC 60331-23**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured twisted pair or triad signal cable, individual and overall screened, XLPE over MICA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-23 (90 min./750°C)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** LSZH, black

**Technical data**

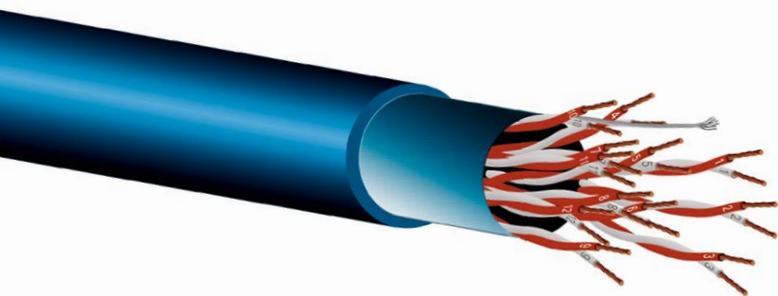
- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA F90 381 H</b>			
2x2x0,5	15,5	35,7	382
6x2x0,5	20,5	97,7	634
10x2x0,5	25,9	159,7	1.007
12x2x0,5	26,8	190,6	1.080
16x2x0,5	29,5	252,6	1.294
20x2x0,5	32,6	314,6	1.538
24x2x0,5	36,5	376,6	1.957
30x2x0,5	38,3	469,5	2.163
3x3x0,5	17,8	66,7	488
6x3x0,5	23,2	128,7	868
10x3x0,5	28,6	211,3	1.203
12x3x0,5	29,6	252,6	1.295
2x2x0,75	16,7	46,0	435
6x2x0,75	22,4	128,5	822
10x2x0,75	27,7	211,0	1.140
12x2x0,75	28,6	252,3	1.223
16x2x0,75	31,3	334,8	1.456
20x2x0,75	35,4	417,3	1.928
24x2x0,75	39,1	499,8	2.226
30x2x0,75	41,2	623,6	2.493
3x3x0,75	18,8	89,8	540
6x3x0,75	24,8	174,9	982
10x3x0,75	30,6	288,3	1.375
12x3x0,75	31,5	345,1	1.467

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SWA F90 381 H</b>			
2x2x1	17,3	56,8	468
6x2x1	23,6	161,0	909
10x2x1	29,4	265,3	1.281
12x2x1	30,2	317,4	1.362
16x2x1	34,1	421,6	1.827
20x2x1	37,6	525,8	2.170
24x2x1	41,3	630,0	2.482
30x2x1	43,6	786,3	2.793
3x3x1	19,8	114,2	601
6x3x1	25,9	223,7	1.079
10x3x1	32,6	369,7	1.556
12x3x1	34,2	442,7	1.849
2x2x1,5	18,8	78,5	541
6x2x1,5	26,3	226,1	1.098
10x2x1,5	32,8	373,7	1.556
12x2x1,5	34,5	447,5	1.846
16x2x1,5	38,0	595,1	2.224
20x2x1,5	42,2	742,7	2.677
24x2x1,5	47,3	890,3	3.358
30x2x1,5	50,0	1111,6	3.801
3x3x1,5	22,6	163,0	836
6x3x1,5	28,9	321,3	1.320
10x3x1,5	37,2	532,4	2.113
12x3x1,5	38,2	637,9	2.267

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, other colors



## ÖLFLEX® INSTRUM NF 670

Overall screened instrumentation cable  
CU/PVC/OS/PVC



**Info**

**U/RRXOHR 300/500 V  
NF M 87-202**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair, triad or quad signal cable, overall screened, PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0  
NF M 87-202
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

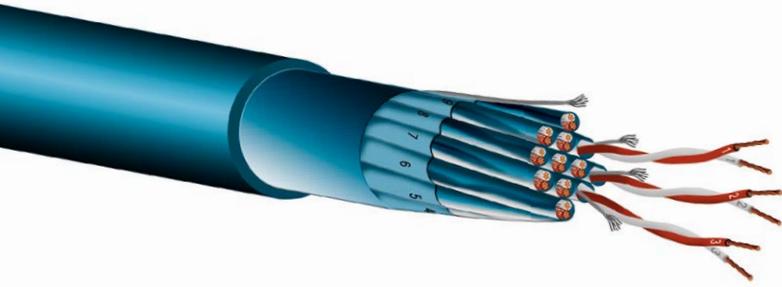
- **Conductor:** Stranded or solid Annealed Copper
- **Core insulation:** PVC
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, blue
- **Armour:** Double Steel tape
- **Outer sheath:** PVC, blue (RAL 5015)

**Technical data**

- Core identification code:**  
according to NF M 87-202
- Insulation resistance:**  
500 MOhm x km
- Conductor stranding:**  
according to NF M 87-202
- Nominal Voltage U<sub>0</sub>/U:**  
300/500 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM NF 670</b>			
3x2x0,5	8,2	31,7	79
7x2x0,5	10,5	70,8	146
12x2x0,5	13,9	119,8	237
19x2x0,5	16,5	188,3	353
27x2x0,5	19,7	266,6	482
7x3x0,5	11,7	105,1	200
12x3x0,5	15,5	178,5	328
2x0,9	6,8	20,4	56
3x0,9	7,2	29,4	70
4x0,9	7,8	38,5	86
3x2x0,9	10,4	56,5	124
7x2x0,9	13,8	128,8	246
12x2x0,9	18,4	219,2	403
19x2x0,9	21,8	345,7	606
27x2x0,9	26,5	490,3	857
7x3x0,9	15,4	192,1	341
12x3x0,9	20,8	327,7	575

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## ÖLFLEX® INSTRUM NF 671

Individual and Overall screened instrumentation cable  
CU/PVC/IS/PVC/OS/PVC



### Info

**U/RXHROHR 300/500 V  
NF M 87-202**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

### Product features

Twisted pair or triad signal cable, individual and overall screened, PVC insulated and PVC jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0  
NF M 87-202
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

### Design

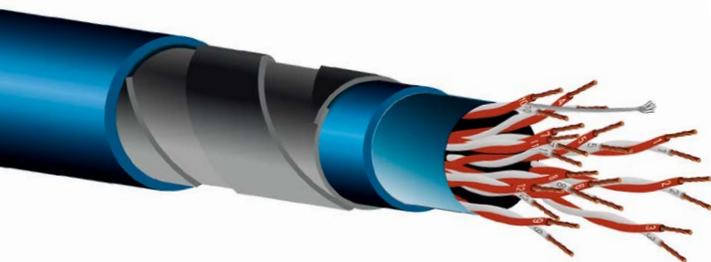
- **Conductor:** Stranded or solid Annealed Copper
- **Core insulation:** PVC
- **Screen:** PVC pair jacket over IS Aluminum/PET + TC Drain wire. OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, blue (RAL 5015)

### Technical data

- Core identification code:**  
according to NF M 87-202
- Insulation resistance:**  
500 MOhm x km
- Conductor stranding:**  
according to NF M 87-202
- Nominal Voltage U<sub>0</sub>/U:**  
300/500 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM NF 671</b>			
3x2x0,5	12,9	38,6	152
7x2x0,5	17,5	87,0	310
12x2x0,5	23,4	147,5	506
19x2x0,5	28,0	232,2	769
27x2x0,5	33,7	329,0	1.051
7x3x0,5	18,3	121,3	369
12x3x0,5	24,5	206,3	606
3x2x0,9	15,8	63,5	220
7x2x0,9	21,4	145,0	450
12x2x0,9	29,0	246,9	751
19x2x0,9	34,2	389,6	1.107
27x2x0,9	41,7	552,7	1.563
7x3x0,9	22,5	208,3	553
12x3x0,9	30,5	355,4	927

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Photographs are not to scale and do not represent detailed images of the respective products



## ÖLFLEX® INSTRUM NF 672

Armoured and Overall screened instrumentation cable  
CU/PVC/OS/PVC/STA/PVC



### Info

**U/RXOHRNR 300/500 V  
NF M 87-202**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

### Product features

Armoured twisted pair, triad or quad signal cable overall screened, PVC insulated and PVC jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0  
NF M 87-202
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

### Design

- **Conductor:** Stranded or solid Annealed Copper
- **Core insulation:** PVC
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, blue
- **Armour:** Double Steel tape
- **Outer sheath:** PVC, blue (RAL 5015)

### Technical data

-  **Core identification code:**  
according to NF M 87-202
-  **Insulation resistance:**  
500 MOhm x km
-  **Conductor stranding:**  
according to NF M 87-202
-  **Nominal Voltage U<sub>0</sub>/U:**  
300/500 V
-  **Test voltage:**  
C/C 1500 V x 1 minute
-  **Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
-  **Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM NF 672</b>			
3x2x0,5	11,1	31,7	192
7x2x0,5	13,5	70,8	286
12x2x0,5	17,3	119,8	435
19x2x0,5	19,8	188,3	584
27x2x0,5	23,2	266,6	765
7x3x0,5	14,8	105,1	361
12x3x0,5	18,9	178,5	547
2x0,9	9,8	20,4	152
3x0,9	10,1	29,4	171
4x0,9	10,7	38,5	193
3x2x0,9	13,3	56,5	263
7x2x0,9	17,1	128,8	442
12x2x0,9	21,9	219,2	669
19x2x0,9	25,3	345,7	916
27x2x0,9	30,5	490,3	1.259
7x3x0,9	18,7	192,1	558
12x3x0,9	24,4	327,7	872

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
Photographs are not to scale and do not represent detailed images of the respective products



## ÖLFLEX® INSTRUM STA NF 673

Armoured, Individual and Overall screened instrumentation cable  
CU/PVC/IS/PVC/OS/PVC/STA/PVC



### Info

**U/RXHROHRNR 300/500 V  
NF M 87-202**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

### Product features

Armoured twisted pair or triad signal cable, individual and overall screened, PVC insulated and PVC jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0, NF M 87-202
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

### Design

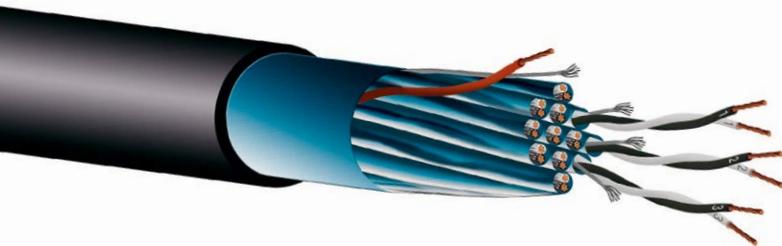
- **Conductor:** Stranded or solid Annealed Copper
- **Core insulation:** PVC
- **Screen:** PVC pair jacket over IS Aluminum/PET + TC Drain wire.  
OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, blue
- **Armour:** Double Steel tape
- **Outer sheath:** PVC, blue (RAL 5015)

### Technical data

- Core identification code:**  
according to NF M 87-202
- Insulation resistance:**  
500 MOhm x km
- Conductor stranding:**  
according to NF M 87-202
- Nominal Voltage U<sub>0</sub>/U:**  
300/500 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM STA NF 673</b>			
3x2x0,5	16,2	38,6	337
7x2x0,5	21,0	87,0	563
12x2x0,5	27,4	147,5	864
19x2x0,5	32,0	232,2	1.191
27x2x0,5	37,9	329,0	1.572
7x3x0,5	21,8	121,3	633
12x3x0,5	28,5	206,3	981
3x2x0,9	19,1	63,5	442
7x2x0,9	25,0	145,0	756
12x2x0,9	33,0	246,9	1.188
19x2x0,9	38,4	389,6	1.636
27x2x0,9	46,1	552,7	2.222
7x3x0,9	26,5	208,3	898
12x3x0,9	34,5	355,4	1.385

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Photographs are not to scale and do not represent detailed images of the respective products



**I 304**  
 UL/CSA 300 V PLTC ITC  
 Instrumentation Cable with Individually  
 Shielded Pairs/Triads and an Overall Shield (ISOS)  
 CU/PVC/IS/OS/PVC



**Info**

**RRXHOHR 300 V**  
 PLTC per UL 13, ITC per UL 2250,  
 CMG per UL 444, AWM 2464  
 CMG FT4, AWM I/II A/B FT4, CSA  
 C22.2 No. 214, CSA C22.2 No. 210

**Benefits**

- Sunlight resistant
- Fire behaviour
- Oil resistant

**Product features**

Stranded bare copper conductors; PVC insulation (cabled pairs or triads); individually foil-shielded pairs or triads with a tinned copper drain wire; orange PVC communication wire; overall foil shield with a tinned copper drain wire (100% coverage); specially blended black PVC jacket

**Norm references / Approvals**

- **Oil resistance**  
OR-01
- **Fire behaviour**  
FR-03
- **Motion Type**  
FL-01
- **Mechanical Properties**  
MP-02

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Conductor stranding:**  
Class B
- Nominal Voltage U<sub>0</sub>/U:**  
300 V
- Temperature range:**  
during operation: -30° to +105°C
- Minimum Bending Radius:**  
8 x Outer Diameter

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, black

Number cores and AWG per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>I304</b>			
1x2x20 AWG	5,0	13,4	37
2x2x20 AWG	8,1	35,7	81
8x2x20 AWG	13,0	117,6	210
12x2x20 AWG	16,0	171,1	308
1x2x18 AWG	5,1	20,8	53
2x2x18 AWG	10,0	53,6	121
4x2x18 AWG	11,1	98,2	186
6x2x18 AWG	13,1	141,4	242
8x2x18 AWG	15,0	184,5	293
12x2x18 AWG	18,1	272,3	421
16x2x18 AWG	21,0	358,6	522
1x2x16 AWG	6,1	31,3	69
2x2x16 AWG	11,0	77,4	169
3x2x16 AWG	11,1	116,1	206
4x2x16 AWG	13,0	141,4	245
6x2x16 AWG	15,0	205,4	325
8x2x16 AWG	16,1	269,4	419
12x2x16 AWG	20,1	395,9	575
16x2x16 AWG	23,1	523,8	756
24x2x16 AWG	28,5	778,3	1.064
1x3x18 AWG	6,0	29,8	67
2x3x18 AWG	11,0	71,4	173
4x3x18 AWG	13,1	131,0	249
6x3x18 AWG	15,0	190,5	330
8x3x18 AWG	16,1	251,5	423
1x3x16 AWG	6,1	43,2	89
2x3x16 AWG	12,1	98,2	224
4x3x16 AWG	14,1	189,0	334
6x3x16 AWG	17,1	276,8	471
8x3x16 AWG	19,0	363,1	579
12x3x16 AWG	25,4	537,2	839

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
 Photographs are not to scale and do not represent detailed images of the respective products



## ÖLFLEX® INSTRUM SC 701 H

Overall screened ship board instrumentation cable LSZH CU/XLPE/OS/LSZH



**Info**

**RE4XOHM 1 150/250 V  
IEC 60092-376**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV, RINA, BV, LR Type Approval

**Product features**

Twisted pair or triad signal cable, overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**

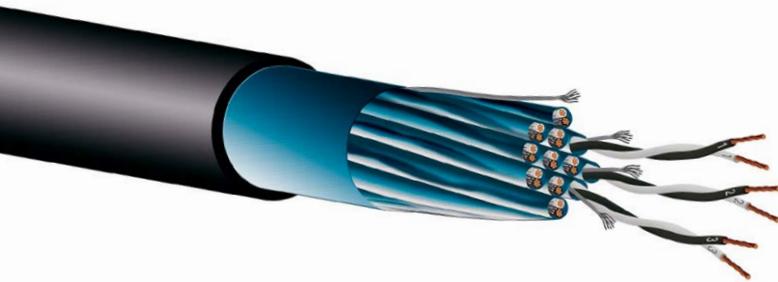
- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
150/250 V
- Test voltage:**  
C/C 1500 V x 5 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC 701 H</b>			
2 x 0,5	5,8	13,9	40
3 x 2 x 0,5	8,5	34,5	80
7 x 2 x 0,5	11,2	75,8	149
12 x 2 x 0,5	15,0	127,5	245
19 x 2 x 0,5	17,7	199,8	358
3 x 0,5	6,0	19,0	48
3 x 3 x 0,5	9,6	50,0	108
7 x 3 x 0,5	12,7	112,0	206
12 x 3 x 0,5	16,8	189,4	332
2 x 0,75	6,6	20,6	53
3 x 2 x 0,75	10,3	51,6	114
7 x 2 x 0,75	13,5	113,4	214
12 x 2 x 0,75	18,1	190,7	352
19 x 2 x 0,75	21,4	299,0	517
3 x 0,75	7,0	28,4	64
3 x 3 x 0,75	11,4	74,8	149
7 x 3 x 0,75	15,3	167,5	297
12 x 3 x 0,75	20,6	283,5	491

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC 701 H</b>			
2 x 1	7,0	28,6	63
3 x 2 x 1	10,9	70,4	136
7 x 2 x 1	14,7	153,9	267
12 x 2 x 1	19,4	258,4	430
19 x 2 x 1	23,2	404,6	647
3 x 1	7,4	39,1	77
3 x 3 x 1	12,4	101,7	186
7 x 3 x 1	16,4	227,1	364
12 x 3 x 1	22,0	383,7	604
2 x 1,5	8,1	39,5	81
3 x 2 x 1,5	13,0	102,9	191
7 x 2 x 1,5	17,4	229,9	380
12 x 2 x 1,5	23,4	388,5	627
19 x 2 x 1,5	27,7	610,7	930
3 x 1,5	8,5	55,3	101
3 x 3 x 1,5	14,7	150,5	263
7 x 3 x 1,5	19,5	340,9	523
12 x 3 x 1,5	26,6	578,9	884

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Tinned copper conductors (but without BV Type Approval)



## ÖLFLEX® INSTRUM SC 702 H

Individual and overall screened ship board instrumentation cable LSZH CU/XLPE/IS/OS/LSZH



**Info**

**RE4XHOHM1 150/250 V  
IEC 60092-376**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

**Product features**

Twisted pair or triad signal cable, Individual and overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
150/250 V
- Test voltage:**  
C/C 1500 V x 5 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC 702 H</b>			
3 x 2 x 0,5	9,6	45,1	106
7 x 2 x 0,5	12,6	100,5	200
12 x 2 x 0,5	16,7	169,8	322
19 x 2 x 0,5	19,7	266,8	477
3 x 3 x 0,5	10,6	60,6	131
7 x 3 x 0,5	14,0	136,7	254
12 x 3 x 0,5	18,8	231,8	421
3 x 2 x 0,75	11,2	67,1	142
7 x 2 x 0,75	15,1	149,6	282
12 x 2 x 0,75	20,3	252,7	466
19 x 2 x 0,75	23,9	397,1	689
3 x 3 x 0,75	12,7	90,2	184
7 x 3 x 0,75	16,8	203,7	361
12 x 3 x 0,75	22,6	345,5	600

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC 702 H</b>			
3 x 2 x 1	12,2	93,6	179
7 x 2 x 1	16,1	208,1	348
12 x 2 x 1	21,7	351,2	576
19 x 2 x 1	25,6	551,5	858
3 x 3 x 1	13,5	124,9	224
7 x 3 x 1	18,2	281,2	456
12 x 3 x 1	24,4	476,5	756
3 x 2 x 1,5	14,2	126,1	230
7 x 2 x 1,5	19,1	284,0	467
12 x 2 x 1,5	26,0	481,3	787
19 x 2 x 1,5	30,7	757,6	1.173
3 x 3 x 1,5	16,0	173,7	304
7 x 3 x 1,5	21,6	395,1	624
12 x 3 x 1,5	29,3	671,7	1.052

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**AVAILABLE ALSO IN:** Tinned copper conductors



## ÖLFLEX® INSTRUM SC SWB 703 H

Armoured overall screened ship board instrumentation cable LSZH CU/XLPE/OS/LSZH/SWB/LSZH



**Info**

**RE4XOHAM 1 150/250 V  
IEC 60092-376**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

**Product features**

Armoured twisted pair or triad signal cable, overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
 Pairs are black & white with printed numbers  
 Triads are black, white, red with printed numbers
- Insulation resistance:**  
 5000 MOhm x km
- Conductor stranding:**  
 Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
 150/250 V
- Test voltage:**  
 C/C 1500 V x 5 minute
- Temperature range:**  
 during operation: -30° to +70°C  
 during installation: -5° to +50°C
- Minimum Bending Radius:**  
 8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB 703 H</b>			
2 x 0,5	8,9	13,9	109
3 x 2 x 0,5	11,9	34,5	181
7 x 2 x 0,5	15,0	75,8	306
12 x 2 x 0,5	18,6	127,5	440
19 x 2 x 0,5	21,2	199,8	584
3 x 0,5	9,2	19,0	119
3 x 3 x 0,5	12,8	50,0	214
7 x 3 x 0,5	16,2	112,0	373
12 x 3 x 0,5	20,6	189,4	558
2 x 0,75	9,8	20,6	130
3 x 2 x 0,75	13,4	51,6	225
7 x 2 x 0,75	17,1	113,4	391
12 x 2 x 0,75	21,7	190,7	584
19 x 2 x 0,75	25,0	299,0	787
3 x 0,75	10,1	28,4	144
3 x 3 x 0,75	15,2	74,8	309
7 x 3 x 0,75	18,9	167,5	495
12 x 3 x 0,75	24,1	283,5	751

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB 703 H</b>			
2 x 1	10,2	28,6	143
3 x 2 x 1	14,7	70,4	290
7 x 2 x 1	18,2	153,9	457
12 x 2 x 1	23,2	258,4	688
19 x 2 x 1	26,7	404,6	937
3 x 1	10,5	39,1	161
3 x 3 x 1	15,9	101,7	350
7 x 3 x 1	19,9	227,1	575
12 x 3 x 1	25,6	383,7	881
2 x 1,5	11,2	39,5	171
3 x 2 x 1,5	16,6	102,9	362
7 x 2 x 1,5	21,0	229,9	603
12 x 2 x 1,5	27,0	388,5	921
19 x 2 x 1,5	31,3	610,7	1.275
3 x 1,5	11,9	55,3	202
3 x 3 x 1,5	18,3	150,5	453
7 x 3 x 1,5	23,3	340,9	783
12 x 3 x 1,5	30,1	578,9	1.215

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid armour



## ÖLFLEX® INSTRUM SC SWB 704 H

Armoured individual and overall screened ship board instrumentation cable LSZH CU/XLPE/IS/OS/LSZH/SWB/LSZH



**Info**

**RE4XHOHAM 1 150/250 V  
IEC 60092-376**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

**Product features**

Armoured twisted pair or triad signal cable, Individual and overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

**Technical data**

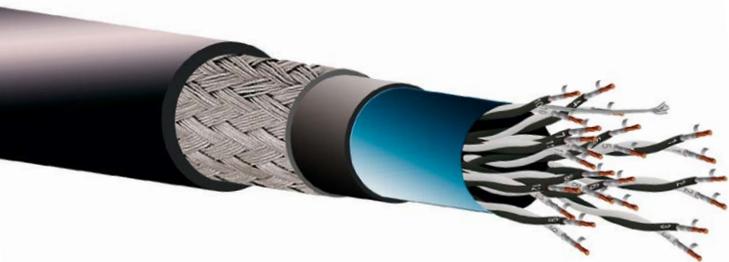
- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
150/250 V
- Test voltage:**  
C/C 1500 V x 5 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB 704 H</b>			
3 x 2 x 0,5	12,7	45,1	211
7 x 2 x 0,5	16,2	100,5	366
12 x 2 x 0,5	20,4	169,8	547
19 x 2 x 0,5	23,4	266,8	738
3 x 3 x 0,5	13,7	60,6	245
7 x 3 x 0,5	17,7	136,7	445
12 x 3 x 0,5	22,3	231,8	660
3 x 2 x 0,75	15,0	67,1	300
7 x 2 x 0,75	18,7	149,6	478
12 x 2 x 0,75	23,8	252,7	722
19 x 2 x 0,75	27,5	397,1	988
3 x 3 x 0,75	16,2	90,2	351
7 x 3 x 0,75	20,6	203,7	587
12 x 3 x 0,75	26,4	345,5	897

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB 704 H</b>			
3 x 2 x 1	15,8	93,6	340
7 x 2 x 1	19,7	208,1	555
12 x 2 x 1	25,2	351,2	849
19 x 2 x 1	29,4	551,5	1.192
3 x 3 x 1	17,1	124,9	401
7 x 3 x 1	21,7	281,2	687
12 x 3 x 1	28,0	476,5	1.061
3 x 2 x 1,5	18,0	126,1	425
7 x 2 x 1,5	22,7	284,0	710
12 x 2 x 1,5	29,5	481,3	1.111
19 x 2 x 1,5	34,9	757,6	1.603
3 x 3 x 1,5	19,6	173,7	511
7 x 3 x 1,5	25,1	395,1	896
12 x 3 x 1,5	32,8	671,7	1.415

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid armour



## ÖLFLEX® INSTRUM SC SWB F90 705 H

Fire resistant, armoured overall screened ship board instrumentation cable LSZH CU/MT/XLPE/OS/LSZH/SWB/LSZH



**Info**

**RTE4XOHAM 1 150/250 V**  
**IEC 60092-376**  
**IEC 60331-21**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

**Product features**

Twisted pair or triad signal cable, overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21 (90 min./750 °C)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
150/250 V
- Test voltage:**  
C/C 1500 V x 5 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB F90 705 H</b>			
2 x 0,5	9,9	13,9	127
3 x 2 x 0,5	13,7	34,5	218
7 x 2 x 0,5	17,7	75,8	382
12 x 2 x 0,5	22,2	127,5	554
19 x 2 x 0,5	25,6	199,8	737
3 x 0,5	10,3	19,0	140
3 x 3 x 0,5	15,5	50,0	298
7 x 3 x 0,5	19,3	112,0	468
12 x 3 x 0,5	24,7	189,4	704
2 x 0,75	10,8	20,6	149
3 x 2 x 0,75	15,8	51,6	304
7 x 2 x 0,75	19,8	113,4	473
12 x 2 x 0,75	25,4	190,7	709
19 x 2 x 0,75	29,5	299,0	971
3 x 0,75	11,2	28,4	166
3 x 3 x 0,75	17,4	74,8	372
7 x 3 x 0,75	21,9	167,5	600
12 x 3 x 0,75	28,3	283,5	912

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB F90 705 H</b>			
2 x 1	11,2	28,6	162
3 x 2 x 1	16,5	70,4	336
7 x 2 x 1	20,9	153,9	544
12 x 2 x 1	26,9	258,4	819
19 x 2 x 1	31,1	404,6	1.115
3 x 1	11,8	39,1	189
3 x 3 x 1	18,2	101,7	415
7 x 3 x 1	23,2	227,1	695
12 x 3 x 1	30,0	383,7	1.064
2 x 1,5	12,4	39,5	197
3 x 2 x 1,5	18,6	102,9	418
7 x 2 x 1,5	23,7	229,9	697
12 x 2 x 1,5	30,7	388,5	1.065
19 x 2 x 1,5	36,2	610,7	1.525
3 x 1,5	13,0	55,3	227
3 x 3 x 1,5	20,5	150,5	524
7 x 3 x 1,5	26,4	340,9	905
12 x 3 x 1,5	34,9	578,9	1.454

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid armour



## ÖLFLEX® INSTRUM SC SWB F90 706 H

Fire resistant, armoured individual and overall screened ship board instrumentation cable LSZH CU/MT/XLPE/IS/OS/LSZH/SWB/LSZH



**Info**

**RTE4XHOHAM1 150/250 V**  
**IEC 60092-376**  
**IEC 60331-21**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

**Product features**

Armoured twisted pair or triad signal cable, Individual and overall screened, XLPE over MICA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21 (90 min./750 °C)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

**Technical data**

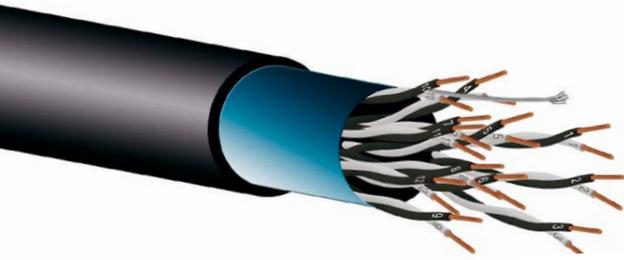
- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage Uo/U:**  
150/250 V
- Test voltage:**  
C/C 1500 V x 5 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB F90 706 H</b>			
3 x 2 x 0,5	15,3	45,1	290
7 x 2 x 0,5	19,1	100,5	451
12 x 2 x 0,5	24,4	169,8	676
19 x 2 x 0,5	28,1	266,8	913
3 x 3 x 0,5	16,6	60,6	337
7 x 3 x 0,5	21,0	136,7	551
12 x 3 x 0,5	27,0	231,8	834
3 x 2 x 0,75	17,0	67,1	349
7 x 2 x 0,75	21,6	149,6	570
12 x 2 x 0,75	27,8	252,7	863
19 x 2 x 0,75	32,4	397,1	1.196
3 x 3 x 0,75	18,7	90,2	420
7 x 3 x 0,75	23,9	203,7	703
12 x 3 x 0,75	30,9	345,5	1.076

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB F90 706 H</b>			
3 x 2 x 1	17,9	93,6	399
7 x 2 x 1	22,6	208,1	650
12 x 2 x 1	29,4	351,2	1.009
19 x 2 x 1	34,7	551,5	1.443
3 x 3 x 1	19,5	124,9	472
7 x 3 x 1	25,0	281,2	807
12 x 3 x 1	32,7	476,5	1.263
3 x 2 x 1,5	19,9	126,1	478
7 x 2 x 1,5	25,6	284,0	814
12 x 2 x 1,5	33,5	481,3	1.272
19 x 2 x 1,5	40,2	757,6	1.937
3 x 3 x 1,5	22,0	173,7	588
7 x 3 x 1,5	28,4	395,1	1.028
12 x 3 x 1,5	38,4	671,7	1.758

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid armour



## ÖLFLEX® INSTRUM SC 707 H

Overall screened ship board instrumentation cable LSZH  
CU/XLPE/OS/LSZH



### Info

**FE4XOHM 1 150/250 V**  
**IEC 60092-376**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV, RINA, BV, LR Type Approval

### Product features

Twisted pair or triad signal cable, overall screened, XLPE insulated and LSZH jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

### Design

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

### Technical data

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 5 IEC 60228
- Nominal Voltage U<sub>o</sub>/U:**  
150/250 V
- Test voltage:**  
C/C 1500 V x 5 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC 707 H</b>			
3 x 3 x 0,75	11,4	74,9	148
7 x 3 x 0,75	15,3	167,8	297
12 x 3 x 0,75	20,5	284,0	491
2 x 1	7,1	28,4	63
3 x 2 x 1	11,1	69,7	137
7 x 2 x 1	14,9	152,3	269
12 x 2 x 1	19,8	255,6	431
19 x 2 x 1	23,6	400,2	649
3 x 1	7,5	38,7	77
3 x 3 x 1	12,6	100,7	187
7 x 3 x 1	16,7	224,6	365
12 x 3 x 1	22,4	379,6	606
2 x 1,5	8,1	36,0	78
3 x 2 x 1,5	13,0	92,5	182
7 x 2 x 1,5	17,5	205,4	358
12 x 2 x 1,5	23,5	346,6	590
19 x 2 x 1,5	27,8	544,3	872
3 x 1,5	8,5	50,1	97
3 x 3 x 1,5	14,8	134,8	249
7 x 3 x 1,5	19,6	304,3	491
12 x 3 x 1,5	26,7	516,1	829

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**AVAILABLE ALSO IN:** Tinned copper conductors (but without BV Type Approval)



## ÖLFLEX® INSTRUM SC 708 H

Individual and overall screened ship board instrumentation cable LSZH CU/XLPE/IS/OS/LSZH



**Info**

**FE4XHOHM1 150/250 V  
IEC 60092-376**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

**Product features**

Twisted pair or triad signal cable, Individual and overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

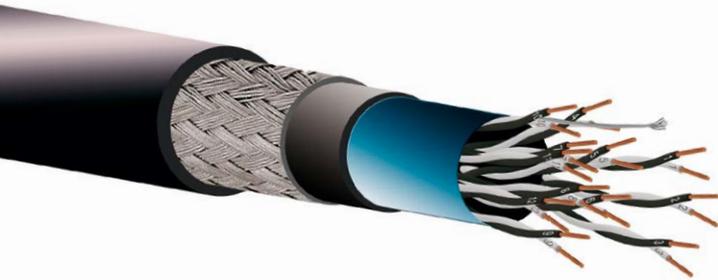
**Technical data**

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 5 IEC 60228
- Nominal Voltage Uo/U:**  
150/250 V
- Test voltage:**  
C/C 1500 V x 5 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC 708 H</b>			
3 x 2 x 0,75	11,2	67,1	142
7 x 2 x 0,75	15,0	149,8	282
12 x 2 x 0,75	20,0	253,1	455
19 x 2 x 0,75	23,8	397,7	688
3 x 3 x 0,75	12,6	90,4	184
7 x 3 x 0,75	16,7	204,0	360
12 x 3 x 0,75	22,5	346,0	599
3 x 2 x 1	12,4	92,9	180
7 x 2 x 1	16,4	206,5	349
12 x 2 x 1	22,1	348,4	579
19 x 2 x 1	26,3	547,1	875
3 x 3 x 1	13,7	123,9	226
7 x 3 x 1	18,5	278,8	458
12 x 3 x 1	24,9	472,4	759
3 x 2 x 1,5	14,2	115,7	221
7 x 2 x 1,5	19,2	259,5	446
12 x 2 x 1,5	26,1	439,4	751
19 x 2 x 1,5	30,8	691,2	1.115
3 x 3 x 1,5	16,1	158,0	291
7 x 3 x 1,5	21,6	358,4	592
12 x 3 x 1,5	29,4	608,9	997

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**AVAILABLE ALSO IN:** Tinned copper conductors



## ÖLFLEX® INSTRUM SC SWB 709 H

Armoured overall screened ship board instrumentation cable LSZH CU/XLPE/OS/LSZH/SWB/LSZH



### Info

**FE4XOHAM 1 150/250 V**  
**IEC 60092-376**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

### Product features

Armoured twisted pair or triad signal cable, overall screened, XLPE insulated and LSZH jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

### Design

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

### Technical data

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 5 IEC 60228
- Nominal Voltage Uo/U:**  
150/250 V
- Test voltage:**  
C/C 1500 V x 5 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB 709 H</b>			
3 x 3 x 0,75	15,1	74,9	308
7 x 3 x 0,75	18,8	167,8	494
12 x 3 x 0,75	24,0	284,0	749
2 x 1	10,3	28,4	145
3 x 2 x 1	14,9	69,7	294
7 x 2 x 1	18,5	152,3	462
12 x 2 x 1	23,6	255,6	694
19 x 2 x 1	27,2	400,2	945
3 x 1	10,6	38,7	163
3 x 3 x 1	16,2	100,7	353
7 x 3 x 1	20,5	224,6	590
12 x 3 x 1	26,2	379,6	901
2 x 1,5	11,2	36,0	168
3 x 2 x 1,5	16,6	92,5	353
7 x 2 x 1,5	21,1	205,4	582
12 x 2 x 1,5	27,1	346,6	885
19 x 2 x 1,5	31,6	544,3	1.233
3 x 1,5	11,9	50,1	198
3 x 3 x 1,5	18,3	134,8	440
7 x 3 x 1,5	23,4	304,3	752
12 x 3 x 1,5	30,2	516,1	1.160

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**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid armour



## ÖLFLEX® INSTRUM SC SWB 710 H

Armoured individual and overall screened ship board instrumentation cable LSZH CU/XLPE/IS/OS/LSZH/SWB/LSZH



### Info

**FE4XHOHAM 1 150/250 V**  
**IEC 60092-376**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

### Product features

Armoured twisted pair or triad signal cable,  
Individual and overall screened, XLPE insulated  
and LSZH jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

### Design

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

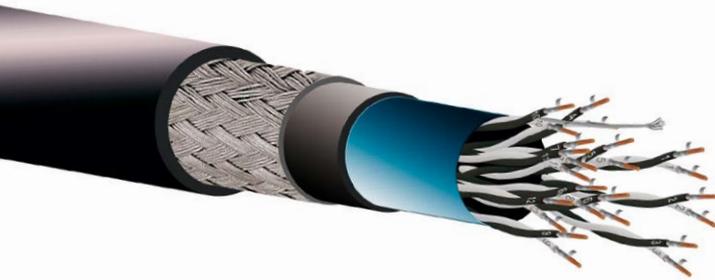
### Technical data

- Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 5 IEC 60228
- Nominal Voltage Uo/U:**  
150/250 V
- Test voltage:**  
C/C 1500 V x 5 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB 710 H</b>			
3 x 2 x 0,75	15,0	67,1	299
7 x 2 x 0,75	18,6	149,8	476
12 x 2 x 0,75	23,8	253,1	720
19 x 2 x 0,75	27,4	397,7	986
3 x 3 x 0,75	16,2	90,4	350
7 x 3 x 0,75	20,5	204,0	586
12 x 3 x 0,75	26,3	346,0	895
3 x 2 x 1	16,0	92,9	344
7 x 2 x 1	20,0	206,5	560
12 x 2 x 1	25,6	348,4	856
19 x 2 x 1	29,8	547,1	1.202
3 x 3 x 1	17,5	123,9	414
7 x 3 x 1	22,0	278,8	693
12 x 3 x 1	28,4	472,4	1.070
3 x 2 x 1,5	18,0	115,7	416
7 x 2 x 1,5	22,8	259,5	690
12 x 2 x 1,5	29,6	439,4	1.075
19 x 2 x 1,5	35,0	691,2	1.547
3 x 3 x 1,5	19,6	158,0	498
7 x 3 x 1,5	25,2	358,4	865
12 x 3 x 1,5	32,9	608,9	1.361

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Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid armour



## ÖLFLEX® INSTRUM SC SWB F90 711 H

Fire resistant, armoured overall  
screened ship board instrumentation cable LSZH  
CU/MT/XLPE/OS/LSZH/SWB/LSZH



### Info

**FTE4XOHAM 1 150/250 V**  
**IEC 60092-376**  
**IEC 60331-21**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

### Product features

Armoured twisted pair or triad signal cable,  
overall screened, XLPE over MICA-tape insulated  
and LSZH jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21 (90 min./750 °C)

### Design

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

### Technical data



**Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers



**Insulation resistance:**  
5000 MOhm x km



**Conductor stranding:**  
Class 5 IEC 60228



**Nominal Voltage U<sub>o</sub>/U:**  
150/250 V



**Test voltage:**  
C/C 1500 V x 5 minute



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB F90 711 H</b>			
3 x 3 x 0,75	17,4	74,9	371
7 x 3 x 0,75	21,9	167,8	598
12 x 3 x 0,75	28,2	284,0	910
2 x 1	11,3	28,4	164
3 x 2 x 1	16,7	69,7	339
7 x 2 x 1	21,2	152,3	549
12 x 2 x 1	27,2	255,6	827
19 x 2 x 1	31,7	400,2	1.140
3 x 1	11,9	38,7	191
3 x 3 x 1	18,4	100,7	419
7 x 3 x 1	23,5	224,6	701
12 x 3 x 1	30,4	379,6	1.073
2 x 1,5	12,4	36,0	195
3 x 2 x 1,5	18,6	92,5	410
7 x 2 x 1,5	23,8	205,4	677
12 x 2 x 1,5	30,7	346,6	1.030
19 x 2 x 1,5	36,3	544,3	1.468
3 x 1,5	13,0	50,1	222
3 x 3 x 1,5	20,6	134,8	511
7 x 3 x 1,5	26,5	304,3	874
12 x 3 x 1,5	35,0	516,1	1.400

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
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**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid armour



## ÖLFLEX® INSTRUM SC SWB F90 712 H

Fire resistant, armoured individual and overall screened ship board instrumentation cable LSZH CU/MT/XLPE/IS/LSZH/SWB/LSZH



### Info

**FTE4XHOHAM1 150/250 V**  
IEC 60092-376  
IEC 60331-21

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Halogen free
- Low smoke
- Oil resistant
- DNV Type Approval

### Product features

Armoured twisted pair or triad signal cable, Individual and overall screened, XLPE over MICA-tape insulated and LSZH jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21 (90 min./750 °C)

### Design

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

### Technical data



**Core identification code:**  
Pairs are black & white with printed numbers  
Triads are black, white, red with printed numbers



**Insulation resistance:**  
5000 MOhm x km



**Conductor stranding:**  
Class 5 IEC 60228



**Nominal Voltage U<sub>o</sub>/U:**  
150/250 V



**Test voltage:**  
C/C 1500 V x 5 minute



**Temperature range:**  
during operation: -30° to +70 °C  
during installation: -5° to +50 °C



**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® INSTRUM SC SWB F90 712 H</b>			
12 x 2 x 0,75	27,7	253,1	861
19 x 2 x 0,75	32,3	397,7	1.193
3 x 3 x 0,75	18,6	90,4	419
7 x 3 x 0,75	23,8	204,0	702
12 x 3 x 0,75	30,8	346,0	1.074
3 x 2 x 1	18,1	92,9	403
7 x 2 x 1	23,1	206,5	668
12 x 2 x 1	29,8	348,4	1.018
19 x 2 x 1	35,2	547,1	1.455
3 x 3 x 1	19,7	123,9	477
7 x 3 x 1	25,3	278,8	814
12 x 3 x 1	33,1	472,4	1.274
3 x 2 x 1,5	20,0	115,7	470
7 x 2 x 1,5	25,7	259,5	794
12 x 2 x 1,5	33,6	439,4	1.237
19 x 2 x 1,5	40,3	691,2	1.881
3 x 3 x 1,5	22,1	158,0	575
7 x 3 x 1,5	28,5	358,4	997
12 x 3 x 1,5	38,5	608,9	1.705

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**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid armour



CABLES	PAG	NOMENCLATURE	CORE INSULATION	SCREEN	CHEMICAL BARRIER	
ÖLFLEX® CONTROL 133	62	RROHR 500 V, EN 50288-7	PVC	OS Aluminum/PET + TC Drain wire	-	
ÖLFLEX® CONTROL SWA 135	63	RROHRFR 500 V, EN 50288-7	PVC	OS Aluminum/PET + TC Drain wire	-	
ÖLFLEX® CONTROL SWA LEAD 185	64	RE4OHLRFR 500 V, EN 50288-7	XLPE	OS Aluminum/PET + TC Drain wire	Lead sheath	
ÖLFLEX® INSTRUM SWA AL/HDPE/PA 186	65	RE4OH5ER4FR 500 V, EN 50288-7	XLPE	OS Aluminum longitudinal tape (AL) + TC Drain wire	AL/HDPE/PA	
ÖLFLEX® CONTROL 232 H	66	FG7OM1 0,6/1 kV, IEC 60502-1	HEPR	-	-	
ÖLFLEX® CONTROL 234 H	67	RE4OHM1 500 V, EN 50288-7	XLPE	OS Aluminum/PET + TC Drain wire	-	
ÖLFLEX® CONTROL SWA 235 H	68	RE4OHM1FM1 500 V, EN 50288-7	XLPE	OS Aluminum/PET + TC Drain wire	-	
ÖLFLEX® CONTROL F90 339 H	69	RTE4OHM1 500 V EN 50288-7, IEC 60331-23	XLPE, over MICA-tape wrapped conductor	OS Aluminum/PET + TC Drain wire	-	
ÖLFLEX® CONTROL SWA F90 341 H	70	RTE4OHM1FM1 500 V EN 50288-7, IEC 60331-23	XLPE, over MICA-tape wrapped conductor	OS Aluminum/PET + TC Drain wire	-	
ÖLFLEX® CONTROL STA NF 601	71	U/RE4ORNR 0,6/1 Kv, NF C 32-322	XLPE	-	-	
SERIES 602	72	RE4OR 600 V, UL 1277 tray cable (Type TC), UL44, Type TC-ER 90°C, 600 V cable, c(UL)type CIC/TC - 40°C outdoor FT4, CSA 22.2 No 38, CSA 22.22 No 239, CSA 22.2 No 230	XLPE	-	-	
ÖLFLEX® CONTROL NAVAL SWB 713 H	73	RE4OAM1 0,6/1 Kv, IEC 60092-353	XLPE	-	-	
ÖLFLEX® CONTROL NAVAL SWB F90 714 H	74	RTE4OAM1 0,6/1 Kv IEC 60092-353, IEC 60331-21	XLPE, over MICA-tape wrapped conductor	-	-	
ÖLFLEX® CONTROL NAVAL SWB 715 H	75	FE4OAM1 0,6/1 Kv, IEC 60092-353	XLPE	-	-	
ÖLFLEX® CONTROL NAVAL SWB F90 716 H	76	FTE4OAM1 0,6/1 Kv IEC 60092-353, IEC 60331-21	XLPE, over MICA-tape wrapped conductor	-	-	

	CONDUCTOR STRANDING	ARMOUR	NOMINAL VOLTAGE U <sub>0</sub> /U	OPERATING TEMP. MIN. °C	OPERATING TEMP. MAX °C	REFERENCE NORMS
	Class 2 IEC 60228	-	500 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Class 2 IEC 60228	Galvanized steel wires	500 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Class 2 IEC 60228	-	500 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	Galvanized Steel Wire	500 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	Galvanized Steel Wire	500 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	-	500 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	Galvanized steel wire braid	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	Galvanized steel wire braid	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 5 IEC 60228	Galvanized steel wire braid	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 5 IEC 60228	Galvanized steel wire braid	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%), NF C 32-322
	Class 2 IEC 60228	Galvanized Steel Wire	500 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Class 2 IEC 60228	Galvanized Steel Wire	500 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60754-1 (max 20%)
	according to NF C 32-322	Double Steel tape	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Class 5 IEC 60228	-	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class B	-	600 V	-40	+90	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2, IEC 60331-21



## ÖLFLEX® CONTROL 133

Overall screened control cable  
CU/PVC/OS/PVC



**Info**

**RROHR 500 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Multi-core cable, overall screened, PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
500 V
- Test voltage:**  
C/C 2000 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL 133</b>			
2 x 1	7,0	25,6	61
3 x 1	7,4	36,1	77
4 x 1	8,1	46,5	97
5 x 1	9,0	57,0	117
7 x 1	9,7	77,8	150
10 x 1	12,4	109,2	215
12 x 1	12,8	130,1	243
14 x 1	13,5	151,0	276
16 x 1	14,4	171,8	317
19 x 1	15,2	203,2	363
20 x 1	16,0	213,6	389
24 x 1	17,9	255,4	462
25 x 1	17,9	265,8	473
27 x 1	18,3	286,7	504
30 x 1	18,9	318,1	552
37 x 1	20,6	391,2	672
2 x 1,5	7,8	36,5	78
3 x 1,5	8,3	52,3	101
4 x 1,5	9,3	68,2	132
5 x 1,5	10,1	84,1	155
7 x 1,5	11,0	115,8	201
10 x 1,5	14,1	163,4	290
12 x 1,5	14,8	195,1	336
14 x 1,5	15,5	226,9	383

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL 133</b>			
16 x 1,5	16,4	258,6	432
19 x 1,5	17,5	306,2	505
20 x 1,5	18,4	322,1	543
24 x 1,5	20,6	385,5	644
25 x 1,5	20,6	401,4	659
27 x 1,5	21,0	433,1	704
30 x 1,5	21,8	480,7	773
37 x 1,5	23,7	591,8	941
2 x 2,5	9,4	55,4	111
3 x 2,5	9,9	80,8	146
4 x 2,5	10,9	106,2	188
5 x 2,5	12,1	131,5	228
7 x 2,5	13,1	182,2	297
10 x 2,5	16,9	258,3	430
12 x 2,5	17,7	309,0	499
14 x 2,5	18,6	359,7	570
16 x 2,5	19,7	410,4	645
19 x 2,5	20,9	486,5	755
20 x 2,5	22,1	511,9	810
24 x 2,5	24,7	613,3	960
25 x 2,5	24,7	638,6	985
27 x 2,5	25,3	689,3	1.054
30 x 2,5	26,4	765,4	1.172
37 x 2,5	28,7	942,9	1.427

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Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, other colors



## ÖLFLEX® CONTROL SWA 135

Armoured overall screened control cable  
CU/PVC/OS/PVC/SWA/PVC



**Info**

**RROHRFR 500 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured multi-core cable, overall screened,  
PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, black
- **Armour:** Galvanized steel wires
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
500 V
- Test voltage:**  
C/C 2000 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA 135</b>			
2 x 1	11,6	25,6	244
3 x 1	12,0	36,1	269
4 x 1	12,9	46,5	308
5 x 1	13,8	57,0	348
7 x 1	14,6	77,8	397
10 x 1	17,5	109,2	529
12 x 1	17,9	130,1	566
14 x 1	18,5	151,0	612
16 x 1	19,4	171,8	674
19 x 1	20,4	203,2	746
20 x 1	22,0	213,6	905
24 x 1	23,9	255,4	1.031
25 x 1	23,9	265,8	1.042
27 x 1	24,5	286,7	1.095
30 x 1	25,1	318,1	1.162
37 x 1	26,8	391,2	1.331
2 x 1,5	12,7	36,5	284
3 x 1,5	13,1	52,3	318
4 x 1,5	14,1	68,2	370
5 x 1,5	14,9	84,1	411
7 x 1,5	15,8	115,8	475
10 x 1,5	19,2	163,4	641
12 x 1,5	19,8	195,1	702
14 x 1,5	20,8	226,9	775

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA 135</b>			
16 x 1,5	22,4	258,6	958
19 x 1,5	23,5	306,2	1.062
20 x 1,5	24,6	322,1	1.139
24 x 1,5	26,8	385,5	1.302
25 x 1,5	26,8	401,4	1.318
27 x 1,5	27,2	433,1	1.376
30 x 1,5	28,2	480,7	1.480
37 x 1,5	30,2	591,8	1.705
2 x 2,5	14,2	55,4	350
3 x 2,5	14,8	80,8	398
4 x 2,5	15,7	106,2	459
5 x 2,5	17,1	131,5	534
7 x 2,5	18,2	182,2	627
10 x 2,5	22,9	258,3	972
12 x 2,5	23,7	309,0	1.063
14 x 2,5	24,8	359,7	1.172
16 x 2,5	25,8	410,4	1.276
19 x 2,5	27,1	486,5	1.423
20 x 2,5	28,5	511,9	1.526
24 x 2,5	31,1	613,3	1.753
25 x 2,5	31,1	638,6	1.777
27 x 2,5	31,7	689,3	1.862
30 x 2,5	33,8	765,4	2.207
37 x 2,5	36,3	942,9	2.563

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



## ÖLFLEX® CONTROL SWA LEAD 185

Armoured, Lead jacketed, Overall screened control cable  
CU/XLPE/OS/PVC/LC/PVC/SWA/PVC



**Info**

**RE4OHRLRFR 500 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, lead jacketed, multi-core cable, overall screened, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, black
- **Chemical Barrier:** Lead sheath
- **Inner sheath:** PVC, black
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
500 V
- Test voltage:**  
C/C 2000 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
15 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA LEAD 185</b>			
2 x 1	15,8	25,6	629
3 x 1	16,4	36,1	674
4 x 1	17,1	46,5	730
5 x 1	18,2	57,0	845
7 x 1	19,0	77,8	920
10 x 1	22,1	109,2	1.215
12 x 1	22,5	130,1	1.265
14 x 1	23,1	151,0	1.336
16 x 1	24,3	171,8	1.446
19 x 1	25,0	203,2	1.536
20 x 1	26,8	213,6	1.826
24 x 1	28,9	255,4	2.047
25 x 1	28,9	265,8	2.056
27 x 1	29,3	286,7	2.112
30 x 1	29,9	318,1	2.204
37 x 1	31,8	391,2	2.527
2 x 1,5	16,9	36,5	701
3 x 1,5	17,3	52,3	749
4 x 1,5	18,5	68,2	879
5 x 1,5	19,3	84,1	951
7 x 1,5	20,4	115,8	1.055
10 x 1,5	23,8	163,4	1.395
12 x 1,5	24,7	195,1	1.492
14 x 1,5	25,4	226,9	1.583

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA LEAD 185</b>			
16 x 1,5	27,2	258,6	1.897
19 x 1,5	28,5	306,2	2.058
20 x 1,5	29,5	322,1	2.166
24 x 1,5	31,8	385,5	2.511
25 x 1,5	31,8	401,4	2.524
27 x 1,5	32,5	433,1	2.614
30 x 1,5	33,3	480,7	2.736
37 x 1,5	35,8	591,8	3.181
2 x 2,5	18,6	55,4	866
3 x 2,5	19,2	80,8	933
4 x 2,5	20,3	106,2	1.037
5 x 2,5	21,5	131,5	1.149
7 x 2,5	22,8	182,2	1.338
10 x 2,5	27,7	258,3	1.940
12 x 2,5	28,7	309,0	2.075
14 x 2,5	29,6	359,7	2.207
16 x 2,5	30,9	410,4	2.438
19 x 2,5	32,4	486,5	2.654
20 x 2,5	33,6	511,9	2.801
24 x 2,5	37,0	613,3	3.307
25 x 2,5	37,0	638,6	3.328
27 x 2,5	37,5	689,3	3.435
30 x 2,5	39,6	765,4	3.961
37 x 2,5	42,2	942,9	4.430

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour DSTA, other colors



## ÖLFLEX® CONTROL SWA AL/HDPE/PA 186

Armoured, AL/HDPE/PA jacketed, Overall screened control cable  
CU/XLPE/AL/HDPE/PA/SWA/PVC



**Info**

**RE4OH5ER4FR 500 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, AL/HDPE/PA jacketed, multi-core cable, overall screened, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum longitudinal tape (AL) + TC Drain wire
- **Chemical Barrier:** AL/HDPE/PA
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
500 V
- Test voltage:**  
C/C 2000 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
15 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA AL/HDPE/PA 186</b>			
2 x 1	13,4	25,6	294
3 x 1	13,8	36,1	318
4 x 1	14,5	46,5	350
5 x 1	15,2	57,0	381
7 x 1	15,9	77,8	426
10 x 1	18,9	109,2	555
12 x 1	19,3	130,1	588
14 x 1	19,9	151,0	632
16 x 1	21,0	171,8	698
19 x 1	21,8	203,2	756
20 x 1	23,4	213,6	921
24 x 1	25,5	255,4	1.050
25 x 1	25,5	265,8	1.059
27 x 1	25,8	286,7	1.098
30 x 1	26,5	318,1	1.159
37 x 1	28,4	391,2	1.325
2 x 1,5	14,3	36,5	329
3 x 1,5	14,7	52,3	360
4 x 1,5	15,5	68,2	403
5 x 1,5	16,5	84,1	450
7 x 1,5	17,4	115,8	511
10 x 1,5	20,8	163,4	673
12 x 1,5	21,4	195,1	728
14 x 1,5	22,9	226,9	905

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA AL/HDPE/PA 186</b>			
16 x 1,5	23,7	258,6	973
19 x 1,5	25,0	306,2	1.080
20 x 1,5	26,0	322,1	1.143
24 x 1,5	28,4	385,5	1.308
25 x 1,5	28,4	401,4	1.321
27 x 1,5	28,8	433,1	1.374
30 x 1,5	29,6	480,7	1.458
37 x 1,5	31,5	591,8	1.663
2 x 2,5	15,6	55,4	386
3 x 2,5	16,4	80,8	439
4 x 2,5	17,3	106,2	498
5 x 2,5	18,5	131,5	561
7 x 2,5	19,6	182,2	648
10 x 2,5	24,5	258,3	1.003
12 x 2,5	25,3	309,0	1.085
14 x 2,5	26,2	359,7	1.176
16 x 2,5	27,2	410,4	1.273
19 x 2,5	28,7	486,5	1.420
20 x 2,5	29,9	511,9	1.508
24 x 2,5	32,7	613,3	1.732
25 x 2,5	32,7	638,6	1.754
27 x 2,5	33,3	689,3	1.831
30 x 2,5	35,1	765,4	2.155
37 x 2,5	37,7	942,9	2.481

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour DSTA, other colors



## ÖLFLEX® CONTROL 232 H

Control cable LSZH  
CU/HERP/LSZH



**Info**

**FG70M1 0,6/1 kV  
IEC 60502-1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke

**Product features**

Multi-core cable, HEPR insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** HEPR
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
1000 MOhm x km
- Conductor stranding:**  
Class 5 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
0,6/1 Kv
- Test voltage:**  
C/C 3500 V x 5 minutes
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL 232 H</b>			
2 x 1	9,5	20,7	96
3 x 1	10,0	31,0	113
4 x 1	10,7	41,3	136
5 x 1	11,5	51,6	155
7 x 1	12,4	72,3	189
10 x 1	15,3	103,3	260
12 x 1	15,8	123,9	289
14 x 1	16,5	144,6	324
16 x 1	17,4	165,3	360
19 x 1	18,2	196,2	406
20 x 1	19,2	206,6	438
24 x 1	21,1	247,9	505
25 x 1	21,1	258,2	514
27 x 1	21,5	278,9	545
30 x 1	22,3	309,9	593
37 x 1	24,0	382,2	703
2 x 1,5	10,1	28,2	108
3 x 1,5	10,6	42,4	131
4 x 1,5	11,4	56,5	159
5 x 1,5	12,3	70,6	182
7 x 1,5	13,2	98,8	224
10 x 1,5	16,4	141,2	311
12 x 1,5	16,9	169,4	347
14 x 1,5	17,7	197,7	391

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL 232 H</b>			
16 x 1,5	18,6	225,9	436
19 x 1,5	19,6	268,3	495
20 x 1,5	20,6	282,4	533
24 x 1,5	22,7	338,9	617
25 x 1,5	22,7	353,0	629
27 x 1,5	23,2	381,3	668
30 x 1,5	24,0	423,6	729
37 x 1,5	25,9	522,5	868
2 x 2,5	11,1	48,4	138
3 x 2,5	11,7	72,6	171
4 x 2,5	12,7	96,8	212
5 x 2,5	13,7	121,0	246
7 x 2,5	14,8	169,5	310
10 x 2,5	18,5	242,1	434
12 x 2,5	19,1	290,5	490
14 x 2,5	20,0	338,9	555
16 x 2,5	21,1	387,3	623
19 x 2,5	22,2	459,9	712
20 x 2,5	23,4	484,2	767
24 x 2,5	25,9	581,0	892
25 x 2,5	25,9	605,2	912
27 x 2,5	26,4	653,6	973
30 x 2,5	27,4	726,2	1.066
37 x 2,5	29,8	895,7	1.293

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** XLPE Insulation, Conductor Class 2, other colors



## ÖLFLEX® CONTROL 234 H

Overall screened control cable, LSZH  
CU/XLPE/OS/LSZH



**Info**

**RE4OHM1 500 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke

**Product features**

Multi-core cable, overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
500 V
- Test voltage:**  
C/C 2000 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL 234 H</b>			
2 x 1	7,0	25,6	58
3 x 1	7,4	36,1	73
4 x 1	8,1	46,5	90
5 x 1	9,0	57,0	109
7 x 1	9,7	77,8	138
10 x 1	12,4	109,2	198
12 x 1	12,8	130,1	222
14 x 1	13,5	151,0	251
16 x 1	14,4	171,8	289
19 x 1	15,2	203,2	329
20 x 1	16,0	213,6	354
24 x 1	17,9	255,4	420
25 x 1	17,9	265,8	429
27 x 1	18,3	286,7	456
30 x 1	18,9	318,1	499
37 x 1	20,6	391,2	606
2 x 1,5	7,8	36,5	74
3 x 1,5	8,3	52,3	95
4 x 1,5	9,3	68,2	124
5 x 1,5	10,1	84,1	145
7 x 1,5	11,0	115,8	185
10 x 1,5	14,1	163,4	268
12 x 1,5	14,8	195,1	309
14 x 1,5	15,5	226,9	351

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL 234 H</b>			
16 x 1,5	23,7	258,6	973
19 x 1,5	25,0	306,2	1.080
20 x 1,5	26,0	322,1	1.143
24 x 1,5	28,4	385,5	1.308
25 x 1,5	28,4	401,4	1.321
27 x 1,5	28,8	433,1	1.374
30 x 1,5	29,6	480,7	1.458
37 x 1,5	31,5	591,8	1.663
2 x 2,5	15,6	55,4	386
3 x 2,5	16,4	80,8	439
4 x 2,5	17,3	106,2	498
5 x 2,5	18,5	131,5	561
7 x 2,5	19,6	182,2	648
10 x 2,5	24,5	258,3	1.003
12 x 2,5	25,3	309,0	1.085
14 x 2,5	26,2	359,7	1.176
16 x 2,5	27,2	410,4	1.273
19 x 2,5	28,7	486,5	1.420
20 x 2,5	29,9	511,9	1.508
24 x 2,5	32,7	613,3	1.732
25 x 2,5	32,7	638,6	1.754
27 x 2,5	33,3	689,3	1.831
30 x 2,5	35,1	765,4	2.155
37 x 2,5	37,7	942,9	2.481

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, other colors



## ÖLFLEX® CONTROL SWA 235 H

Armoured overall screened control cable LSZH  
CU/XLPE/OS/SWA/LSZH



**Info**

**RE4OHM1 FM1 500 V  
EN 50288-7**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke

**Product features**

Armoured multi-core cable, overall screened, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wires
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
500 V
- Test voltage:**  
C/C 2000 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA 235 H</b>			
2 x 1	11,6	25,6	242
3 x 1	12,0	36,1	265
4 x 1	12,9	46,5	303
5 x 1	13,8	57,0	341
7 x 1	14,6	77,8	386
10 x 1	17,5	109,2	513
12 x 1	17,9	130,1	546
14 x 1	18,5	151,0	589
16 x 1	19,4	171,8	647
19 x 1	20,4	203,2	714
20 x 1	22,0	213,6	870
24 x 1	23,9	255,4	989
25 x 1	23,9	265,8	998
27 x 1	24,5	286,7	1.048
30 x 1	25,1	318,1	1.109
37 x 1	26,8	391,2	1.264
2 x 1,5	12,7	36,5	282
3 x 1,5	13,1	52,3	312
4 x 1,5	14,1	68,2	362
5 x 1,5	14,9	84,1	401
7 x 1,5	15,8	115,8	460
10 x 1,5	19,2	163,4	620
12 x 1,5	19,8	195,1	676
14 x 1,5	20,8	226,9	744

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA 235 H</b>			
16 x 1,5	22,4	258,6	922
19 x 1,5	23,5	306,2	1.019
20 x 1,5	24,6	322,1	1.093
24 x 1,5	26,8	385,5	1.247
25 x 1,5	26,8	401,4	1.260
27 x 1,5	27,2	433,1	1.313
30 x 1,5	28,2	480,7	1.410
37 x 1,5	30,2	591,8	1.618
2 x 2,5	14,2	55,4	346
3 x 2,5	14,8	80,8	390
4 x 2,5	15,7	106,2	448
5 x 2,5	17,1	131,5	519
7 x 2,5	18,2	182,2	605
10 x 2,5	22,9	258,3	940
12 x 2,5	23,7	309,0	1.024
14 x 2,5	24,8	359,7	1.126
16 x 2,5	25,8	410,4	1.223
19 x 2,5	27,1	486,5	1.359
20 x 2,5	28,5	511,9	1.459
24 x 2,5	31,1	613,3	1.672
25 x 2,5	31,1	638,6	1.693
27 x 2,5	31,7	689,3	1.770
30 x 2,5	33,8	765,4	2.106
37 x 2,5	36,3	942,9	2.436

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



**ÖLFLEX® CONTROL F90 339 H**  
 Fire resistant, overall screened control cable LSZH  
 CU/MT/XLPE/OS/LSZH



**Info**

**RTE4OHM 1 500 V**  
**EN 50288-7 IEC**  
**60331-23**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke

**Product features**

Multi-core cable, overall screened, XLPE over MICA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-23 (90 min. /750°C)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE over MICA-tape wrapped conductor
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
500 V
- Test voltage:**  
C/C 2000 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL F90 339 H</b>			
2 x 1	8,0	25,6	67
3 x 1	8,7	36,1	89
4 x 1	9,5	46,5	110
5 x 1	10,3	57,0	127
7 x 1	11,2	77,8	161
10 x 1	14,7	109,2	240
12 x 1	15,1	130,1	267
14 x 1	15,9	151,0	302
16 x 1	16,8	171,8	339
19 x 1	17,9	203,2	395
20 x 1	18,9	213,6	427
24 x 1	21,1	255,4	504
25 x 1	21,1	265,8	513
27 x 1	21,6	286,7	546
30 x 1	22,3	318,1	596
37 x 1	24,3	391,2	723
2 x 1,5	9,1	36,5	88
3 x 1,5	9,6	52,3	112
4 x 1,5	10,5	68,2	141
5 x 1,5	11,7	84,1	170
7 x 1,5	12,7	115,8	217
10 x 1,5	16,3	163,4	314
12 x 1,5	16,9	195,1	352
14 x 1,5	18,0	226,9	409

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL F90 339 H</b>			
16 x 1,5	19,0	258,6	460
19 x 1,5	20,2	306,2	536
20 x 1,5	21,3	322,1	579
24 x 1,5	23,8	385,5	684
25 x 1,5	23,8	401,4	698
27 x 1,5	24,4	433,1	743
30 x 1,5	25,3	480,7	814
37 x 1,5	27,5	591,8	988
2 x 2,5	10,4	55,4	117
3 x 2,5	11,0	80,8	152
4 x 2,5	12,3	106,2	201
5 x 2,5	13,4	131,5	235
7 x 2,5	14,9	182,2	312
10 x 2,5	19,2	258,3	452
12 x 2,5	20,0	309,0	520
14 x 2,5	21,0	359,7	592
16 x 2,5	22,2	410,4	668
19 x 2,5	23,7	486,5	778
20 x 2,5	25,0	511,9	840
24 x 2,5	28,0	613,3	992
25 x 2,5	28,0	638,6	1.014
27 x 2,5	28,8	689,3	1.096
30 x 2,5	29,8	765,4	1.202
37 x 2,5	32,5	942,9	1.460

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, other colors



## ÖLFLEX® CONTROL SWA F90 341 H

Fire resistant, armoured overall screened control cable LSZH  
CU/MT/OS/LSZH/SWA/LSZH



**Info**

**RTE4OHM1FM1 500 V  
EN 50288-7  
IEC 60331-23**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke

**Product features**

Armoured multi-core cable, overall screened, XLPE over MICA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-23 (90 min. /750°C)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE over MICA-tape wrapped conductor
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wires
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
500 V
- Test voltage:**  
C/C 2000 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA F90 341 H</b>			
2 x 1	12,8	25,6	279
3 x 1	13,5	36,1	315
4 x 1	14,3	46,5	353
5 x 1	15,2	57,0	389
7 x 1	16,1	77,8	441
10 x 1	19,7	109,2	604
12 x 1	20,4	130,1	652
14 x 1	21,9	151,0	816
16 x 1	22,8	171,8	877
19 x 1	23,9	203,2	964
20 x 1	25,1	213,6	1.036
24 x 1	27,3	255,4	1.177
25 x 1	27,3	265,8	1.187
27 x 1	27,8	286,7	1.232
30 x 1	28,8	318,1	1.319
37 x 1	30,7	391,2	1.503
2 x 1,5	13,9	36,5	322
3 x 1,5	14,4	52,3	358
4 x 1,5	15,3	68,2	406
5 x 1,5	16,7	84,1	468
7 x 1,5	17,7	115,8	538
10 x 1,5	22,3	163,4	840
12 x 1,5	22,9	195,1	894
14 x 1,5	23,9	226,9	981

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SWA F90 341 H</b>			
16 x 1,5	25,2	258,6	1.072
19 x 1,5	26,4	306,2	1.183
20 x 1,5	27,5	322,1	1.258
24 x 1,5	30,2	385,5	1.449
25 x 1,5	30,2	401,4	1.463
27 x 1,5	30,8	433,1	1.524
30 x 1,5	31,7	480,7	1.621
37 x 1,5	34,8	591,8	2.061
2 x 2,5	15,2	55,4	379
3 x 2,5	15,8	80,8	428
4 x 2,5	17,3	106,2	512
5 x 2,5	18,5	131,5	572
7 x 2,5	19,9	182,2	679
10 x 2,5	25,4	258,3	1.069
12 x 2,5	26,2	309,0	1.161
14 x 2,5	27,2	359,7	1.263
16 x 2,5	28,6	410,4	1.387
19 x 2,5	30,1	486,5	1.539
20 x 2,5	31,4	511,9	1.640
24 x 2,5	35,3	613,3	2.082
25 x 2,5	35,3	638,6	2.104
27 x 2,5	36,3	689,3	2.233
30 x 2,5	37,4	765,4	2.377
37 x 2,5	40,2	942,9	2.747

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA, other colors



## ÖLFLEX® CONTROL STA NF 601

Armoured control cable  
CU/XLPE/PVC/STA/PVC



### Info

**RE4ORNR 0,6/1 Kv  
NF C 32-322**

### Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

### Product features

Armoured multi-core cable, XLPE insulated and PVC jacketed

### Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0  
NF C 32-322
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

### Design

- **Conductor:** Stranded or solid Annealed Copper
- **Core insulation:** XLPE
- **Inner sheath:** PVC, black
- **Armour:** Double Steel tape
- **Outer sheath:** PVC, black

### Technical data

-  **Core identification code:**  
according to NF C 32-322
-  **Insulation resistance:**  
5000 MOhm x km
-  **Conductor stranding:**  
according to NF C 32-322
-  **Nominal Voltage U<sub>0</sub>/U:**  
0,6/1 Kv
-  **Test voltage:**  
C/C 3500 V x 5 minutes
-  **Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
-  **Minimum Bending Radius:**  
10 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL STA NF 601</b>			
7 x 1,5	15,3	111,1	365
10 x 1,5	18,4	158,7	487
12 x 1,5	19,2	190,4	542
14 x 1,5	20,0	222,1	596
19 x 1,5	21,8	301,5	727
24 x 1,5	25,2	380,8	901
30 x 1,5	26,7	476,0	1.050
37 x 1,5	28,5	587,1	1.221
7 x 2,5	16,6	177,5	457
10 x 2,5	20,4	253,6	627
12 x 2,5	21,0	304,3	691
14 x 2,5	21,9	355,0	767
19 x 2,5	24,3	481,8	962
24 x 2,5	28,0	608,5	1.197
30 x 2,5	29,7	760,7	1.407
37 x 2,5	31,8	938,2	1.650

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**AVAILABLE ALSO IN:** Conductor Class 1 IEC 60228, other colors



**SERIES 602**  
UL/CSA Tray cable XLPE/PVC  
CU/XLPE/PVC



**Info**

**RE4OR 600 V**  
UL 1277 tray cable (Type TC),  
UL44, Type TC-ER 90°C, 600 V cable  
c(UL)type CIC/TC - 40°C out-  
door FT4, CSA 22.2 No 38, CSA  
22.22 No 239, CSA 22.2 No 230

**Benefits**

- Sunlight resistant
- Fire behaviour
- Oil resistant
- UL/CSA

**Product features**

Stranded bare copper conductors; XLPE insulation; uninsulated grounding conductor, specially blended black PVC jacket

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
OR-01
- **Motion Type**  
FL-01
- **Mechanical Properties**  
MP-03
- **Fire behaviour**  
FR-03

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Bonding conductor:** uninsulated bonded conductor included in every cable in accordance to Table 16 of the Canadian Electrical Code
- **Outer sheath:** PVC, black

**Technical data**

- Core identification code:**  
2 Black & White  
3 Black, Red, White  
4 Black, Red, Blue, White  
5 and above Black with numbers
- Conductor stranding:**  
Class B
- Nominal Voltage U<sub>0</sub>/U:**  
600 V
- Temperature range:**  
during operation: -40° to +90°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number of cores and AWG per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>SERIES 602</b>			
16 x 16 AWG	18,3	215,8	454,0
24 x 16 AWG	22,9	318,5	688,0
30 x 16 AWG	24,3	382,5	821,0
40 x 16 AWG	27,2	506,0	1.045,0
2 x 14 AWG	9,2	59,5	119,0
3 x 14 AWG	10	80,4	152,0
4 x 14 AWG	10,8	99,7	185,0
5 x 14 AWG	11,8	120,5	219,0
6 x 14 AWG	12,9	139,9	255,0
7 x 14 AWG	13,3	159,2	292,0
8 x 14 AWG	15	180,1	343,0
10 x 14 AWG	17,2	220,2	417,0
12 x 14 AWG	17,7	258,9	470,0
14 x 14 AWG	18,7	299,1	540,0
15 x 14 AWG	19,5	320,0	540,0
20 x 14 AWG	22,2	419,7	782,0

Number of cores and AWG per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>SERIES 602</b>			
25 x 14 AWG	25,1	519,4	941,0
30 x 14 AWG	26,4	559,5	1.057,0
40 x 14 AWG	29,6	741,1	1.353,0
50 x 14 AWG	33,1	921,2	1.656,0
2 x 12 AWG	9,8	83,3	149,0
3 x 12 AWG	10,7	114,6	195,0
4 x 12 AWG	11,7	147,3	241,0
5 x 12 AWG	12,7	178,6	289,0
6 x 12 AWG	14,3	209,8	367,0
10 x 12 AWG	18,8	336,3	561,0
12 x 12 AWG	19,1	400,3	635,0
15 x 12 AWG	21,9	495,6	837,0
20 x 12 AWG	24,3	653,3	1.065,0
25 x 12 AWG	28	754,5	1.268,0
30 x 12 AWG	29,6	903,3	1.488

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:**



## ÖLFLEX® CONTROL SC SWB 713 H

Armoured ship board control cable LSZH  
CU/XLPE/LSZH/SWB/LSZH



**Info**

**RE4OAM 1 0,6/1 Kv**  
IEC 60092-353

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke
- DNV

**Product features**

Armoured multi-core cable, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
0,6/1 Kv
- Test voltage:**  
C/C 3500 V x 5 minutes
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SC SWB 713 H</b>			
4 x 1	12,3	41,8	201
5 x 1	13,1	52,2	225
7 x 1	14,6	73,1	300
10 x 1	17,6	104,4	405
12 x 1	18,0	125,3	436
14 x 1	18,8	146,2	480
16 x 1	19,6	167,1	524
19 x 1	20,7	198,4	588
20 x 1	21,6	208,9	629
24 x 1	23,7	250,7	727
25 x 1	23,7	261,1	736
27 x 1	24,1	282,0	771
30 x 1	24,9	313,3	827
37 x 1	26,7	386,4	968
2 x 1,5	11,7	31,7	174
3 x 1,5	12,2	47,6	201
4 x 1,5	13,1	63,5	236
5 x 1,5	14,6	79,3	302
7 x 1,5	15,5	111,1	356
10 x 1,5	18,9	158,7	485
12 x 1,5	19,4	190,4	527
14 x 1,5	20,4	222,1	594
16 x 1,5	21,3	253,9	652

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SC SWB 713 H</b>			
19 x 1,5	22,3	301,5	724
20 x 1,5	23,5	317,3	786
24 x 1,5	25,6	380,8	898
25 x 1,5	25,6	396,7	912
27 x 1,5	26,3	428,4	972
30 x 1,5	27,1	476,0	1.047
37 x 1,5	29,2	587,1	1.232
2 x 2,5	12,6	50,7	207
3 x 2,5	13,2	76,1	244
4 x 2,5	14,8	101,4	327
5 x 2,5	15,8	126,8	371
7 x 2,5	16,8	177,5	446
10 x 2,5	20,8	253,6	625
12 x 2,5	21,4	304,3	685
14 x 2,5	22,3	355,0	764
16 x 2,5	23,6	405,7	856
19 x 2,5	24,7	481,8	959
20 x 2,5	26,1	507,1	1.039
24 x 2,5	28,5	608,5	1.194
25 x 2,5	28,5	633,9	1.215
27 x 2,5	29,2	684,6	1.298
30 x 2,5	30,1	760,7	1.404
37 x 2,5	32,5	938,2	1.663

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid



## ÖLFLEX® CONTROL SC SWB F90 714 H

Fire resistant, armoured ship board control cable LSZH  
CU/MT/XLPE/LSZH/SWB/LSZH



**Info**

RTE4OAM1 0,6/1 Kv  
IEC 60092-353  
IEC 60331-21

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke
- DNV

**Product features**

Armoured multi-core cable, XLPE over MICA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21 (90min./750°C)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 2 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
0,6/1 Kv
- Test voltage:**  
C/C 3500 V x 5 minutes
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SC SWB F90 714 H</b>			
4 x 1	15,4	41,8	299
5 x 1	16,4	52,2	334
7 x 1	17,8	73,1	399
10 x 1	21,8	104,4	546
12 x 1	22,5	125,3	586
14 x 1	23,7	146,2	659
16 x 1	24,8	167,1	721
19 x 1	26,1	198,4	808
20 x 1	27,4	208,9	870
24 x 1	30,2	250,7	1.003
25 x 1	30,2	261,1	1.013
27 x 1	30,8	282,0	1.062
30 x 1	32,0	313,3	1.156
37 x 1	34,9	386,4	1.384
2 x 1,5	13,8	31,7	216
3 x 1,5	15,0	47,6	288
4 x 1,5	16,1	63,5	338
5 x 1,5	17,5	79,3	388
7 x 1,5	18,7	111,1	459
10 x 1,5	23,3	158,7	643
12 x 1,5	24,0	190,4	696
14 x 1,5	25,1	222,1	771
16 x 1,5	26,5	253,9	862

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SC SWB F90 714 H</b>			
19 x 1,5	27,7	301,5	956
20 x 1,5	29,3	317,3	1.043
24 x 1,5	32,3	380,8	1.205
25 x 1,5	32,3	396,7	1.220
27 x 1,5	32,9	428,4	1.283
30 x 1,5	34,6	476,0	1.432
37 x 1,5	37,7	587,1	1.758
2 x 2,5	15,3	50,7	288
3 x 2,5	16,0	76,1	336
4 x 2,5	17,4	101,4	408
5 x 2,5	18,7	126,8	462
7 x 2,5	20,3	177,5	566
10 x 2,5	25,1	253,6	782
12 x 2,5	26,0	304,3	868
14 x 2,5	27,2	355,0	967
16 x 2,5	28,8	405,7	1.083
19 x 2,5	30,1	481,8	1.210
20 x 2,5	31,9	507,1	1.317
24 x 2,5	35,6	608,5	1.561
25 x 2,5	35,6	633,9	1.584
27 x 2,5	36,2	684,6	1.669
30 x 2,5	38,1	760,7	1.903
37 x 2,5	41,0	938,2	2.235

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid



## ÖLFLEX® CONTROL SC SWB 715 H

Armoured ship board control cable LSZH  
CU/XLPE/LSZH/SWB/LSZH



**Info**

**FE4OAM1 0,6/1 Kv  
IEC 60092-353**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke
- DNV

**Product features**

Armoured multi-core cable, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** XLPE
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 5 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
0,6/1 Kv
- Test voltage:**  
C/C 3500 V x 5 minutes
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SC SWB F90 715 H</b>			
4 x 1	12,4	41,3	203
5 x 1	13,2	51,6	227
7 x 1	14,7	72,3	303
10 x 1	17,8	103,3	409
12 x 1	18,3	123,9	440
14 x 1	19,0	144,6	484
16 x 1	19,9	165,3	529
19 x 1	20,9	196,2	593
20 x 1	21,9	206,6	635
24 x 1	24,0	247,9	733
25 x 1	24,0	258,2	742
27 x 1	24,5	278,9	778
30 x 1	25,2	309,9	834
37 x 1	27,1	382,2	975
2 x 1,5	11,8	28,2	171
3 x 1,5	12,3	42,4	197
4 x 1,5	13,1	56,5	230
5 x 1,5	14,6	70,6	294
7 x 1,5	15,5	98,8	346
10 x 1,5	18,9	141,2	470
12 x 1,5	19,4	169,4	509
14 x 1,5	20,5	197,7	573
16 x 1,5	21,4	225,9	628

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SC SWB F90 715 H</b>			
19 x 1,5	22,3	268,3	696
20 x 1,5	23,6	282,4	756
24 x 1,5	25,9	338,9	875
25 x 1,5	25,9	353,0	887
27 x 1,5	26,4	381,3	932
30 x 1,5	27,2	423,6	1.002
37 x 1,5	29,3	522,5	1.176
2 x 2,5	12,8	48,4	208
3 x 2,5	13,4	72,6	244
4 x 2,5	15,0	96,8	328
5 x 2,5	16,0	121,0	371
7 x 2,5	17,1	169,5	445
10 x 2,5	21,2	242,1	624
12 x 2,5	21,8	290,5	683
14 x 2,5	22,8	338,9	760
16 x 2,5	24,0	387,3	851
19 x 2,5	25,1	459,9	952
20 x 2,5	26,6	484,2	1.033
24 x 2,5	29,2	581,0	1.200
25 x 2,5	29,2	605,2	1.220
27 x 2,5	29,8	653,6	1.287
30 x 2,5	30,7	726,2	1.391
37 x 2,5	33,1	895,7	1.646

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**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid



## ÖLFLEX® CONTROL SC SWB F90 716 H

Fire resistant, armoured ship board control cable LSZH  
CU/MT/XLPE/LSZH/SWB/LSZH



**Info**

**FTE4OAM1 0,6/1 Kv**  
**IEC 60092-353**  
**IEC 60331-21**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke
- DNV

**Product features**

Armoured multi-core cable, XLPE over MICA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21 (90 min./750°C)

**Design**

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** XLPE, over MICA-tape wrapped conductor
- **Inner sheath:** LSZH, black
- **Armour:** Galvanized steel wire braid
- **Outer sheath:** LSZH, black

**Technical data**

- Core identification code:**  
Black with printed numbers
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Class 5 IEC 60228
- Nominal Voltage U<sub>0</sub>/U:**  
0,6/1 Kv
- Test voltage:**  
C/C 3500 V x 5 minutes
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SC SWB F90 716 H</b>			
4 x 1	15,5	41,3	302
5 x 1	16,6	51,6	337
7 x 1	18,0	72,3	403
10 x 1	22,1	103,3	551
12 x 1	22,7	123,9	592
14 x 1	23,9	144,6	664
16 x 1	25,0	165,3	728
19 x 1	26,4	196,2	815
20 x 1	27,7	206,6	878
24 x 1	30,5	247,9	1.011
25 x 1	30,5	258,2	1.022
27 x 1	31,1	278,9	1.071
30 x 1	32,3	309,9	1.166
37 x 1	35,2	382,2	1.396
2 x 1,5	13,8	28,2	213
3 x 1,5	15,1	42,4	284
4 x 1,5	16,2	56,5	332
5 x 1,5	17,5	70,6	381
7 x 1,5	18,8	98,8	449
10 x 1,5	23,4	141,2	629
12 x 1,5	24,0	169,4	679
14 x 1,5	25,1	197,7	751
16 x 1,5	26,5	225,9	838

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® CONTROL SC SWB F90 716 H</b>			
19 x 1,5	27,8	268,3	928
20 x 1,5	29,4	282,4	1.014
24 x 1,5	32,4	338,9	1.170
25 x 1,5	32,4	353,0	1.183
27 x 1,5	33,0	381,3	1.243
30 x 1,5	34,7	423,6	1.388
37 x 1,5	37,8	522,5	1.703
2 x 2,5	15,5	48,4	290
3 x 2,5	16,2	72,6	337
4 x 2,5	17,6	96,8	410
5 x 2,5	18,9	121,0	463
7 x 2,5	20,6	169,5	566
10 x 2,5	25,5	242,1	783
12 x 2,5	26,4	290,5	867
14 x 2,5	27,6	338,9	965
16 x 2,5	29,2	387,3	1.081
19 x 2,5	30,6	459,9	1.206
20 x 2,5	32,4	484,2	1.314
24 x 2,5	36,1	581,0	1.557
25 x 2,5	36,1	605,2	1.579
27 x 2,5	36,8	653,6	1.663
30 x 2,5	38,7	726,2	1.898
37 x 2,5	41,6	895,7	2.227

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Tinned copper conductors, tinned copper wire braid



CABLES	PAG	NOMENCLATUE	CORE INSULATION	SCREEN	CHEMICAL BARRIER	
TT PVC-oST-PVC	80	TT URXOHR 300 V, EN 50288-7 IEC 60584-3, ISA MC 96.1	PVC	OS Aluminum/PET + TC Drain wire	-	
TT PVC-iST-oST-PVC	81	TT URXHOHR 300 V, EN 50288-7 IEC 60584-3, ISA MC 96.1	PVC	IS/OS Aluminum/PET + TC Drain wire	-	
TT PVC-oST-PVC-SWA-PVC	82	TT URXOHRFR 300 V, EN 50288-7 IEC 60584-3, ISA MC 96.1	PVC	OS Aluminum/PET + TC Drain wire	-	
TT PVC-iST-oST-PVC-SWA-PVC	83	TT URXHOHRFR 300 V, EN 50288-7 IEC 60584-3, ISA MC 96.1	PVC	IS/OS Aluminum/PET + TC Drain wire	-	
TT XLPE-oST-LSZH	84	TT UE4XOHM1 300 V, EN 50288-7 IEC 60584-3, ISA MC 96.1	XLPE	OS Aluminum/PET + TC Drain wire	-	
TT XLPE-iST-oST-LSZH	85	TT UE4XHOHM1 300 V, EN 50288-7 IEC 60584-3, ISA MC 96.1	XLPE	IS/OS Aluminum/PET + TC Drain wire	-	
TT XLPE-oST-LSZH-SWA-LSZH	86	TT UE4XOHM1FM1 300 V EN 50288-7, IEC 60584-3, ISA MC 96.1	XLPE	OS Aluminum/PET + TC Drain wire	-	
TT XLPE-iST-oST-LSZH-SWA-LSZH	87	TT UE4XHOHM1FM1 300 V EN 50288-7, IEC 60584-3, ISA MC 96.1	XLPE	IS/OS Aluminum/PET + TC Drain wire	-	
TT XLPO-oST-XLPO	88	TT UG10XOHM2 300 V EN 50288-7, IEC 60584-3, ISA MC 96.1	XLPO	OS Aluminum/PET + TC Drain wire	-	
TT XLPO-iST-oST-XLPO	89	TT UG10XHOHM2 300 V EN 50288-7, IEC 60584-3, ISA MC 96.1	XLPO	IS/OS Aluminum/PET + TC Drain wire	-	
TT XLPO-oST-XLPO-SWA-XLPO	90	TT UG10XOHM2FM2 300 V EN 50288-7, IEC 60584-3, ISA MC 96.1	XLPO	OS Aluminum/PET + TC Drain wire	-	
TT XLPO-iST-oST-XLPO-SWA-XLPO	91	TT UG10XHOHM2FM2 300 V EN 50288-7, IEC 60584-3, ISA MC 96.1	XLPO	IS/OS Aluminum/PET + TC Drain wire	-	
TT XLPE-iST-oST-PVC-LEAD-PVC-SWA-PVC	92	TT UE4XHOHRLRFR 300 V EN 50288-7, IEC 60584-3, ISA MC 96.1	XLPE	IS/OS Aluminum/PET + TC Drain wire	Lead sheath	
TT XLPE-iST-oST-AL/HDPE/PA-SWA-PVC	93	TT UE4XHOH5ER4FR 300 V EN 50288-7, IEC 60584-3, ISA MC 96.1	XLPE	IS Aluminum/PET + TC Drain wire, OS Aluminum longitudinal tape (AL) + TC Drain wire	AL/HDPE/PA	

	CONDUCTOR STRANDING	ARMOUR	NOMINAL VOLTAGE U <sub>0</sub> /U	OPERATING TEMP. MIN. °C	OPERATING TEMP. MAX. °C	REFERENCE NORMS
	Solid alloys	-	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Solid alloys	-	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Solid alloys	Galvanized Steel Wire	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Solid alloys	Galvanized Steel Wire	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Solid alloys	-	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Solid alloys	-	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Solid alloys	Galvanized Steel Wire	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Solid alloys	Galvanized Steel Wire	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Solid alloys	-	300/300 V	-40	+125	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Solid alloys	-	300/300 V	-40	+125	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Solid alloys	Galvanized Steel Wire	300/300 V	-40	+125	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Solid alloys	Galvanized Steel Wire	300/300 V	-40	+125	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Solid alloys	Galvanized Steel Wire	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Solid alloys	Galvanized Steel Wire	300/300 V	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60754-1 (max 20%)



### TT PVC-oST-PVC

Overall screened extension or compensating  
TT\*/PVC/OS/PVC  
(\*Thermocouple Type Conductor)



Info

**TT URXOHR 300 V**  
**EN 50288-7**  
**IEC 60584-3**  
**ISA MC 96.1**

Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

Product features

Twisted pair overall screened cable, PVC insulated and PVC jacketed

Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max. 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

Design

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** PVC
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, color in accordance with IEC 60584-3, or ISA MC 96.1

Technical data

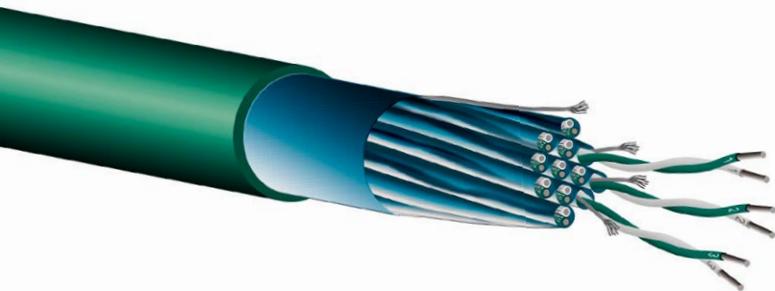
- **Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- **Insulation resistance:**  
100 MOhm x km
- **Conductor stranding:**  
Solid alloys
- **Nominal Voltage U0/U:**  
300/300 V
- **Test voltage:**  
C/C 1500 V x 1 minute
- **Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- **Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Alloy index kg/km	Approx. Weight kg/km
<b>TT PVC-oST-PVC</b>			
1x2x0,5 (20 AWG)	4,9	14,8	34
2x2x0,5 (20 AWG)	7,2	24,9	65
6x2x0,5 (20 AWG)	10,0	65,2	135
10x2x0,5 (20 AWG)	12,8	105,6	206
12x2x0,5 (20 AWG)	13,2	125,7	229
16x2x0,5 (20 AWG)	14,8	166,1	300
20x2x0,5 (20 AWG)	16,5	206,4	371
24x2x0,5 (20 AWG)	18,4	246,7	437
1x2x0,8 (18 AWG)	5,5	20,1	43
2x2x0,8 (18 AWG)	8,1	35,5	84
6x2x0,8 (18 AWG)	11,6	97,1	187
10x2x0,8 (18 AWG)	14,9	158,7	287
12x2x0,8 (18 AWG)	15,4	189,5	320
16x2x0,8 (18 AWG)	17,2	251,1	420
20x2x0,8 (18 AWG)	19,2	312,7	521
24x2x0,8 (18 AWG)	21,4	374,3	613
1x2x1,3 (16 AWG)	6,6	29,6	60
2x2x1,3 (16 AWG)	9,7	54,5	121
6x2x1,3 (16 AWG)	13,7	153,9	270
10x2x1,3 (16 AWG)	17,9	253,3	427
12x2x1,3 (16 AWG)	18,5	303,1	479
16x2x1,3 (16 AWG)	20,8	402,5	630
20x2x1,3 (16 AWG)	23,3	501,9	797
24x2x1,3 (16 AWG)	26,1	601,4	937

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding



### TT PVC-iST-oST-PVC

Individual and overall screened extension or compensating TT\*/PVC/IS/OS/PVC (\*Thermocouple Type Conductor)



Info

**TT URXHOHR 300 V**  
**EN 50288-7**  
**IEC 60584-3**  
**ISA MC 96.1**

Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

Product features

Twisted pair individual and overall screened cable, PVC insulated and PVC jacketed

Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

Design

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** PVC
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** PVC, color in accordance with IEC 60584-3, or ISA MC 96.1

Technical data

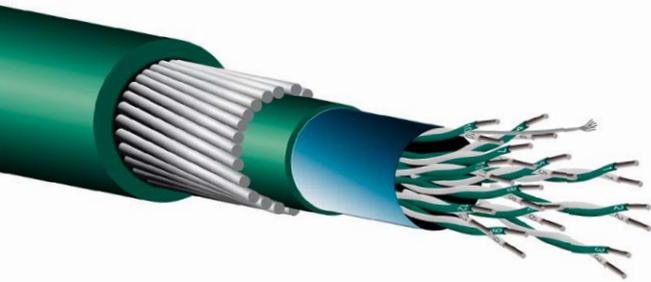
- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT PVC-iST-oST-PVC</b>			
2x2x0,5 (20 AWG)	7,9	35,2	83
6x2x0,5 (20 AWG)	11,1	96,2	182
10x2x0,5 (20 AWG)	14,5	157,2	289
12x2x0,5 (20 AWG)	15,0	187,7	325
16x2x0,5 (20 AWG)	16,6	248,7	418
20x2x0,5 (20 AWG)	18,6	309,7	527
24x2x0,5 (20 AWG)	20,8	370,7	623
2x2x0,8 (18 AWG)	9,1	45,9	107
6x2x0,8 (18 AWG)	12,8	128,1	237
10x2x0,8 (18 AWG)	16,5	210,4	368
12x2x0,8 (18 AWG)	17,3	251,5	423
16x2x0,8 (18 AWG)	19,1	333,8	545
20x2x0,8 (18 AWG)	21,5	416,0	688
24x2x0,8 (18 AWG)	24,1	498,3	811
2x2x1,3 (16 AWG)	10,7	64,8	142
6x2x1,3 (16 AWG)	15,3	184,9	332
10x2x1,3 (16 AWG)	19,8	305,0	516
12x2x1,3 (16 AWG)	20,7	365,0	593
16x2x1,3 (16 AWG)	23,2	485,1	778
20x2x1,3 (16 AWG)	26,0	605,2	982
24x2x1,3 (16 AWG)	29,1	725,3	1.156

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding



## TT PVC-oST-PVC-SWA-PVC

Armoured overall screened extension or compensating  
TT\*/PVC/OS/PVC/SWA/PVC  
(\* Thermocouple Type Conductor)



**Info**

**TT URXOHRFR 300 V**  
**EN 50288-7**  
**IEC 60584-3**  
**ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured twisted pair overall screened cable,  
PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** PVC
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, color in accordance with IEC 60584-3, or ISA MC 96.1
- **Armour:** Galvanized steel wire
- **Outer sheath:** PVC, color in accordance with IEC 60584-3, or ISA MC 96.1

**Technical data**

- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT PVC-oST-PVC-SWA-PVC</b>			
1x2x0,5 (20 AWG)	9,6	14,8	174
2x2x0,5 (20 AWG)	11,8	24,9	252
6x2x0,5 (20 AWG)	14,8	65,2	388
10x2x0,5 (20 AWG)	17,8	105,6	529
12x2x0,5 (20 AWG)	18,3	125,7	561
16x2x0,5 (20 AWG)	19,9	166,1	667
20x2x0,5 (20 AWG)	22,5	206,4	900
24x2x0,5 (20 AWG)	24,6	246,7	1.033
1x2x0,8 (18 AWG)	10,1	20,1	194
2x2x0,8 (18 AWG)	12,9	35,5	296
6x2x0,8 (18 AWG)	16,6	97,1	483
10x2x0,8 (18 AWG)	19,9	158,7	655
12x2x0,8 (18 AWG)	20,6	189,5	708
16x2x0,8 (18 AWG)	23,2	251,1	970
20x2x0,8 (18 AWG)	25,4	312,7	1.138
24x2x0,8 (18 AWG)	27,6	374,3	1.295
1x2x1,3 (16 AWG)	11,2	29,6	234
2x2x1,3 (16 AWG)	14,6	54,5	369
6x2x1,3 (16 AWG)	18,8	153,9	613
10x2x1,3 (16 AWG)	23,9	253,3	997
12x2x1,3 (16 AWG)	24,7	303,1	1.078
16x2x1,3 (16 AWG)	27,0	402,5	1.293
20x2x1,3 (16 AWG)	29,7	501,9	1.549
24x2x1,3 (16 AWG)	32,7	601,4	1.784

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.  
Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding, Armour SWB, DSTA



## TT PVC-iST-oST-PVC-SWA-PVC

Armoured individual and overall screened extension or compensating TT\*/PVC/IS/OS/PVC/SWA/PVC (\*Thermocouple Type Conductor)



**Info**

**TT URXHOHRFR 300 V  
EN 50288-7  
IEC 60584-3  
ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured twisted pair individual and overall screened cable, PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** PVC
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, color in accordance with IEC 60584-3, or ISA MC 96.1
- **Armour:** Galvanized steel wire
- **Outer sheath:** PVC, color in accordance with IEC 60584-3, or ISA MC 96.1

**Technical data**

- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
100 MOhm x km
- Conductor stranding:**  
Solid alloys according to IEC 60584-3, ISA MC 96.1
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT PVC-iST-oST-PVC-SWA-PVC</b>			
2x2x0,5 (20 AWG)	12,7	35,2	291
6x2x0,5 (20 AWG)	15,9	96,2	459
10x2x0,5 (20 AWG)	19,5	157,2	648
12x2x0,5 (20 AWG)	20,0	187,7	695
16x2x0,5 (20 AWG)	22,5	248,7	949
20x2x0,5 (20 AWG)	24,8	309,7	1.129
24x2x0,5 (20 AWG)	27,0	370,7	1.288
2x2x0,8 (18 AWG)	14,0	45,9	341
6x2x0,8 (18 AWG)	17,9	128,1	560
10x2x0,8 (18 AWG)	22,5	210,4	898
12x2x0,8 (18 AWG)	23,3	251,5	974
16x2x0,8 (18 AWG)	25,3	333,8	1.162
20x2x0,8 (18 AWG)	27,7	416,0	1.374
24x2x0,8 (18 AWG)	30,5	498,3	1.585
2x2x1,3 (16 AWG)	15,5	64,8	410
6x2x1,3 (16 AWG)	20,6	184,9	720
10x2x1,3 (16 AWG)	26,0	305,0	1.151
12x2x1,3 (16 AWG)	26,9	365,0	1.253
16x2x1,3 (16 AWG)	29,6	485,1	1.525
20x2x1,3 (16 AWG)	32,7	605,2	1.828
24x2x1,3 (16 AWG)	36,6	725,3	2.305

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding, Armour SWB, DSTA



## TT XLPE- $\sigma$ ST-LSZH

Overall screened extension or compensating, LSZH  
TT\*/XLPE/OS/LSZH  
(\*Thermocouple Type Conductor)



Info

**TT UE4XOHM 1 300 V**  
**EN 50288-7**  
**IEC 60584-3**  
**ISA MC 96.1**

Benefits

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

Product features

Twisted pair, overall screened cable, XLPE insulated and LSZH jacketed

Norm references / Approvals

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

Design

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1

Technical data

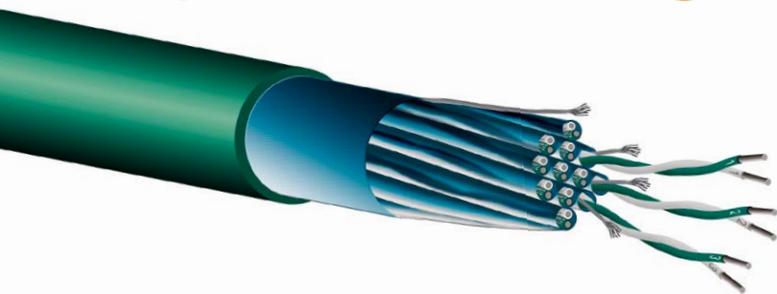
- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Alloy index kg/km	Approx. Weight kg/km
<b>TT XLPE-<math>\sigma</math>ST-LSZH</b>			
20x2x0,5 (20 AWG)	16,5	206,4	343
24x2x0,5 (20 AWG)	18,4	246,7	404
1x2x0,8 (18 AWG)	5,5	20,1	41
2x2x0,8 (18 AWG)	8,1	35,5	81
6x2x0,8 (18 AWG)	11,6	97,1	177
10x2x0,8 (18 AWG)	14,9	158,7	270
12x2x0,8 (18 AWG)	15,4	189,5	299
16x2x0,8 (18 AWG)	17,2	251,1	391
20x2x0,8 (18 AWG)	19,2	312,7	485
24x2x0,8 (18 AWG)	21,4	374,3	570
1x2x1,3 (16 AWG)	6,6	29,6	58
2x2x1,3 (16 AWG)	9,7	54,5	117
6x2x1,3 (16 AWG)	13,7	153,9	255
10x2x1,3 (16 AWG)	17,9	253,3	401
12x2x1,3 (16 AWG)	18,5	303,1	448
16x2x1,3 (16 AWG)	20,8	402,5	588
20x2x1,3 (16 AWG)	23,3	501,9	744
24x2x1,3 (16 AWG)	26,1	601,4	872

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding



## TT XLPE-iST-oST-LSZH

Individual and overall screened extension or compensating, LSZH TT\*/XLPE/IS/OS/LSZH (\*Thermocouple Type Conductor)



**Info**

**TT UE4XHOHM1 300 V  
EN 50288-7  
IEC 60584-3  
ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

ATwisted pair, individual and overall screened cable, XLPE insulated and LSZH jacketed,

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1

**Technical data**

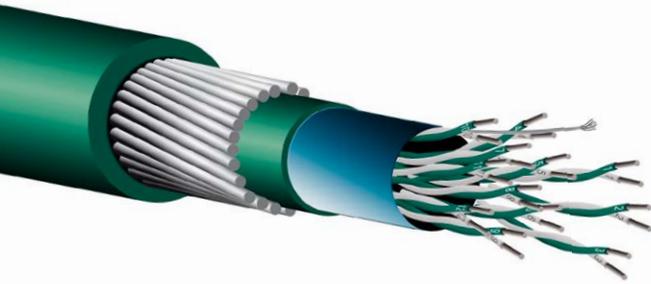
- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT XLPE-iST-oST-LSZH</b>			
2x2x0,5 (20 AWG)	7,9	35,2	81
6x2x0,5 (20 AWG)	11,1	96,2	175
10x2x0,5 (20 AWG)	14,5	157,2	277
12x2x0,5 (20 AWG)	15,0	187,7	310
16x2x0,5 (20 AWG)	16,6	248,7	397
20x2x0,5 (20 AWG)	18,6	309,7	500
24x2x0,5 (20 AWG)	20,8	370,7	591
2x2x0,8 (18 AWG)	9,1	45,9	104
6x2x0,8 (18 AWG)	12,8	128,1	228
10x2x0,8 (18 AWG)	16,5	210,4	351
12x2x0,8 (18 AWG)	17,3	251,5	403
16x2x0,8 (18 AWG)	19,1	333,8	517
20x2x0,8 (18 AWG)	21,5	416,0	653
24x2x0,8 (18 AWG)	24,1	498,3	769
2x2x1,3 (16 AWG)	10,7	64,8	138
6x2x1,3 (16 AWG)	15,3	184,9	317
10x2x1,3 (16 AWG)	19,8	305,0	491
12x2x1,3 (16 AWG)	20,7	365,0	562
16x2x1,3 (16 AWG)	23,2	485,1	737
20x2x1,3 (16 AWG)	26,0	605,2	929
24x2x1,3 (16 AWG)	29,1	725,3	1.093

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding



## TT XLPE- $\sigma$ ST-LSZH-SWA-LSZH

Armoured overall screened extension or compensating, LSZH TT\*/XLPE/OS/LSZH/SWA/LSZH (\*Thermocouple Type Conductor)



**Info**

**TT UE4XOHM1FM1 300 V  
EN 50288-7  
IEC 60584-3  
ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured twisted pair, overall screened cable, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPE
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1
- **Armour:** Galvanized steel wire
- **Outer sheath:** LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1

**Technical data**

- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT XLPE-<math>\sigma</math>ST-LSZH-SWA-LSZH</b>			
1x2x0,5 (20 AWG)	9,6	14,8	174
2x2x0,5 (20 AWG)	11,8	24,9	251
6x2x0,5 (20 AWG)	14,8	65,2	382
10x2x0,5 (20 AWG)	17,8	105,6	516
12x2x0,5 (20 AWG)	18,3	125,7	545
16x2x0,5 (20 AWG)	19,9	166,1	645
20x2x0,5 (20 AWG)	22,5	206,4	873
24x2x0,5 (20 AWG)	24,6	246,7	1.000
1x2x0,8 (18 AWG)	10,1	20,1	194
2x2x0,8 (18 AWG)	12,9	35,5	295
6x2x0,8 (18 AWG)	16,6	97,1	474
10x2x0,8 (18 AWG)	19,9	158,7	638
12x2x0,8 (18 AWG)	20,6	189,5	688
16x2x0,8 (18 AWG)	23,2	251,1	941
20x2x0,8 (18 AWG)	25,4	312,7	1.102
24x2x0,8 (18 AWG)	27,6	374,3	1.252
1x2x1,3 (16 AWG)	11,2	29,6	233
2x2x1,3 (16 AWG)	14,6	54,5	365
6x2x1,3 (16 AWG)	18,8	153,9	598
10x2x1,3 (16 AWG)	23,9	253,3	971
12x2x1,3 (16 AWG)	24,7	303,1	1.047
16x2x1,3 (16 AWG)	27,0	402,5	1.251
20x2x1,3 (16 AWG)	29,7	501,9	1.495
24x2x1,3 (16 AWG)	32,7	601,4	1.719

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding, Armour SWB, DSTA



## TT XLPE-iST-oST-LSZH-SWA-LSZH

Armoured individual and overall screened extension or compensating, LSZH TT\*/XLPE/IS/OS/LSZH/SWA/LSZH (\*Thermocouple Type Conductor)



**Info**

**TT UE4XHOHM1FM1 300 V  
EN 50288-7  
IEC 60584-3  
ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured twisted pair individual and overall screened cable, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1
- **Armour:** Galvanized steel wire
- **Outer sheath:** LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1

**Technical data**

- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

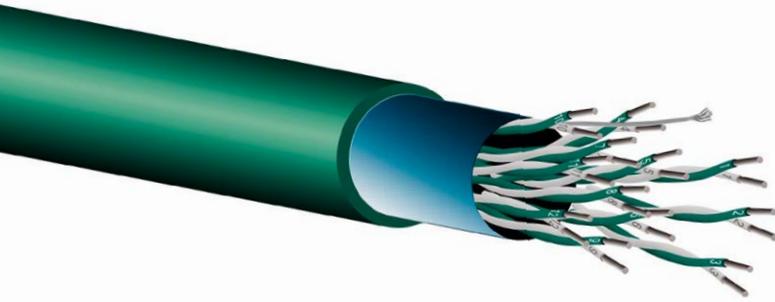
Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT XLPE-iST-oST-LSZH-SWA-LSZH</b>			
2x2x0,5 (20 AWG)	12,7	35,2	290
6x2x0,5 (20 AWG)	15,9	96,2	452
10x2x0,5 (20 AWG)	19,5	157,2	636
12x2x0,5 (20 AWG)	20,0	187,7	680
16x2x0,5 (20 AWG)	22,5	248,7	929
20x2x0,5 (20 AWG)	24,8	309,7	1.103
24x2x0,5 (20 AWG)	27,0	370,7	1.256
2x2x0,8 (18 AWG)	14,0	45,9	340
6x2x0,8 (18 AWG)	17,9	128,1	551
10x2x0,8 (18 AWG)	22,5	210,4	882
12x2x0,8 (18 AWG)	23,3	251,5	954
16x2x0,8 (18 AWG)	25,3	333,8	1.134
20x2x0,8 (18 AWG)	27,7	416,0	1.338
24x2x0,8 (18 AWG)	30,5	498,3	1.542
2x2x1,3 (16 AWG)	15,5	64,8	407
6x2x1,3 (16 AWG)	20,6	184,9	706
10x2x1,3 (16 AWG)	26,0	305,0	1.126
12x2x1,3 (16 AWG)	26,9	365,0	1.222
16x2x1,3 (16 AWG)	29,6	485,1	1.483
20x2x1,3 (16 AWG)	32,7	605,2	1.775
24x2x1,3 (16 AWG)	36,6	725,3	2.241

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding, Armour SWB, DSTA



## TT XLPO- $\sigma$ ST-XLPO

Overall screened extension or compensating, LSZH 125 °C  
TT\*/XLPO/OS/LSZH  
(\*Thermocouple Type Conductor)



**Info**

**TT UG10XOHM2 300 V**  
**EN 50288-7**  
**IEC 60584-3**  
**ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair, overall screened cable, XLPO insulated and LSZH jacketed 125 °C

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPO
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Outer sheath:** XLPO, LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1

**Technical data**

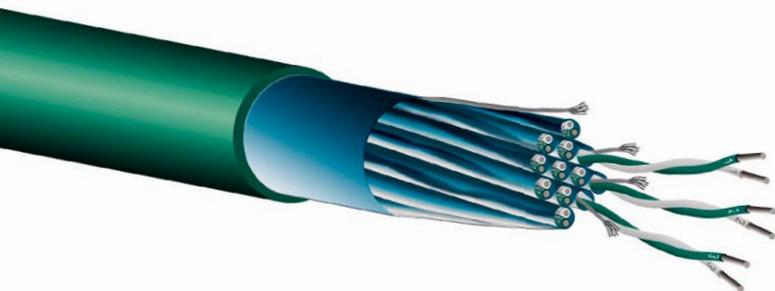
- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
1000 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -40° to +125°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Alloy index kg/km	Approx. Weight kg/km
<b>TT XLPO-<math>\sigma</math>ST-XLPO</b>			
20x2x0,5 (20 AWG)	16,5	206,4	363
24x2x0,5 (20 AWG)	18,4	246,7	428
1x2x0,8 (18 AWG)	5,5	20,1	42
2x2x0,8 (18 AWG)	8,1	35,5	82
6x2x0,8 (18 AWG)	11,6	97,1	184
10x2x0,8 (18 AWG)	14,9	158,7	281
12x2x0,8 (18 AWG)	15,4	189,5	314
16x2x0,8 (18 AWG)	17,2	251,1	411
20x2x0,8 (18 AWG)	19,2	312,7	511
24x2x0,8 (18 AWG)	21,4	374,3	601
1x2x1,3 (16 AWG)	6,6	29,6	59
2x2x1,3 (16 AWG)	9,7	54,5	119
6x2x1,3 (16 AWG)	13,7	153,9	266
10x2x1,3 (16 AWG)	17,9	253,3	419
12x2x1,3 (16 AWG)	18,5	303,1	470
16x2x1,3 (16 AWG)	20,8	402,5	619
20x2x1,3 (16 AWG)	23,3	501,9	783
24x2x1,3 (16 AWG)	26,1	601,4	920

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding



## TT XLPO-iST-oST-XLPO

Individual and overall screened extension or compensating, LSZH 125 °C  
TT\*/XLPO/IS/OS/LSZH  
(\* Thermocouple Type Conductor)



**Info**

**TT UG 10XHOHM2 300 V**  
**EN 50288-7**  
**IEC 60584-3**  
**ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Twisted pair, individual and overall screened cable, XLPO insulated and LSZH jacketed 125 °C

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPO
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Outer sheath:** XLPO, LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1

**Technical data**

- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
1000 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -40° to +125°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
8 x Outer Diameter

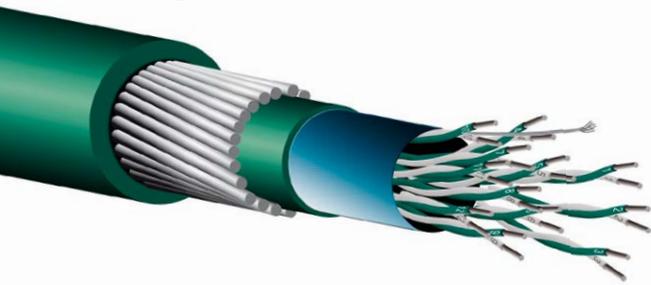
Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT XLPO-IST-oST-XLPO</b>			
2x2x0,5 (20 AWG)	7,9	35,2	81
6x2x0,5 (20 AWG)	11,1	96,2	179
10x2x0,5 (20 AWG)	14,5	157,2	285
12x2x0,5 (20 AWG)	15,0	187,7	320
16x2x0,5 (20 AWG)	16,6	248,7	411
20x2x0,5 (20 AWG)	18,6	309,7	519
24x2x0,5 (20 AWG)	20,8	370,7	613
2x2x0,8 (18 AWG)	9,1	45,9	105
6x2x0,8 (18 AWG)	12,8	128,1	234
10x2x0,8 (18 AWG)	16,5	210,4	362
12x2x0,8 (18 AWG)	17,3	251,5	416
16x2x0,8 (18 AWG)	19,1	333,8	537
20x2x0,8 (18 AWG)	21,5	416,0	677
24x2x0,8 (18 AWG)	24,1	498,3	799
2x2x1,3 (16 AWG)	10,7	64,8	140
6x2x1,3 (16 AWG)	15,3	184,9	327
10x2x1,3 (16 AWG)	19,8	305,0	508
12x2x1,3 (16 AWG)	20,7	365,0	583
16x2x1,3 (16 AWG)	23,2	485,1	766
20x2x1,3 (16 AWG)	26,0	605,2	967
24x2x1,3 (16 AWG)	29,1	725,3	1.138

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

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**AVAILABLE ALSO IN:** Other conductor sizes and stranding



## TT XLPO-*o*ST-XLPO-SWA-XLPO

Armoured, overall screened extension or compensating, LSZH 125 °C TT\*/XLPO/OS/LSZH/SWA/LSZH (\*Thermocouple Type Conductor)



**Info**

**TT UG10XOHM2FM2 300 V  
EN 50288-7  
IEC 60584-3  
ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, twisted pair, overall screened cable, XLPO insulated and LSZH jacketed 125 °C

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPO
- **Screen:** OS Aluminum/PET + TC Drain wire
- **Inner sheath:** XLPO LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1
- **Armour:** Galvanized steel wire
- **Outer sheath:** XLPO LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1

**Technical data**

- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
1000 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -40° to +125°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT XLPO-<i>o</i>ST-XLPO-SWA-XLPO</b>			
1x2x0,5 (20 AWG)	9,6	14,8	171
2x2x0,5 (20 AWG)	11,8	24,9	247
6x2x0,5 (20 AWG)	14,8	65,2	381
10x2x0,5 (20 AWG)	17,8	105,6	517
12x2x0,5 (20 AWG)	18,3	125,7	549
16x2x0,5 (20 AWG)	19,9	166,1	652
20x2x0,5 (20 AWG)	22,5	206,4	883
24x2x0,5 (20 AWG)	24,6	246,7	1.012
1x2x0,8 (18 AWG)	10,1	20,1	191
2x2x0,8 (18 AWG)	12,9	35,5	291
6x2x0,8 (18 AWG)	16,6	97,1	473
10x2x0,8 (18 AWG)	19,9	158,7	641
12x2x0,8 (18 AWG)	20,6	189,5	693
16x2x0,8 (18 AWG)	23,2	251,1	951
20x2x0,8 (18 AWG)	25,4	312,7	1.116
24x2x0,8 (18 AWG)	27,6	374,3	1.270
1x2x1,3 (16 AWG)	11,2	29,6	230
2x2x1,3 (16 AWG)	14,6	54,5	362
6x2x1,3 (16 AWG)	18,8	153,9	601
10x2x1,3 (16 AWG)	23,9	253,3	978
12x2x1,3 (16 AWG)	24,7	303,1	1.057
16x2x1,3 (16 AWG)	27,0	402,5	1.268
20x2x1,3 (16 AWG)	29,7	501,9	1.519
24x2x1,3 (16 AWG)	32,7	601,4	1.748

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding, Armour SWB, DSTA



## TT XLPO-iST-oST-XLPO-SWA-XLPO

Armoured, individual and overall screened extension or compensating, LSZH 125 °C TT\*/XLPO/IS/OS/LSZH/SWA/LSZH (\*Thermocouple Type Conductor)



**Info**

**TT UG10XHOHM2FM2 300 V  
EN 50288-7  
IEC 60584-3  
ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, twisted pair, individual and overall screened cable, XLPO insulated and LSZH jacketed 125 °C

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPO
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** XLPO LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1
- **Armour:** Galvanized steel wire
- **Outer sheath:** XLPO LSZH, color in accordance with IEC 60584-3, or ISA MC 96.1

**Technical data**

- **Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- **Insulation resistance:**  
1000 MOhm x km
- **Conductor stranding:**  
Solid alloys
- **Nominal Voltage U0/U:**  
300/300 V
- **Test voltage:**  
C/C 1500 V x 1 minute
- **Temperature range:**  
during operation: -40° to +125°C  
during installation: -5° to +50°C
- **Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT XLPO-IST-oST-XLPO-SWA-XLPO</b>			
2x2x0,5 (20 AWG)	12,7	35,2	286
6x2x0,5 (20 AWG)	15,9	96,2	451
10x2x0,5 (20 AWG)	19,5	157,2	636
12x2x0,5 (20 AWG)	20,0	187,7	681
16x2x0,5 (20 AWG)	22,5	248,7	933
20x2x0,5 (20 AWG)	24,8	309,7	1.109
24x2x0,5 (20 AWG)	27,0	370,7	1.265
2x2x0,8 (18 AWG)	14,0	45,9	335
6x2x0,8 (18 AWG)	17,9	128,1	549
10x2x0,8 (18 AWG)	22,5	210,4	882
12x2x0,8 (18 AWG)	23,3	251,5	957
16x2x0,8 (18 AWG)	25,3	333,8	1.142
20x2x0,8 (18 AWG)	27,7	416,0	1.349
24x2x0,8 (18 AWG)	30,5	498,3	1.556
2x2x1,3 (16 AWG)	15,5	64,8	402
6x2x1,3 (16 AWG)	20,6	184,9	706
10x2x1,3 (16 AWG)	26,0	305,0	1.131
12x2x1,3 (16 AWG)	26,9	365,0	1.230
16x2x1,3 (16 AWG)	29,6	485,1	1.497
20x2x1,3 (16 AWG)	32,7	605,2	1.794
24x2x1,3 (16 AWG)	36,6	725,3	2.264

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding, Armour SWB, DSTA



## TT XLPE-IST-OST-PVC-LEAD-PVC-SWA-PVC

Armoured, lead jacketed, individual and overall screened extension or compensating TT\*/XLPE/IS/OS/PVC/LC/PVC/SWA/PVC (\*Thermocouple Type Conductor)



**Info**

**TT UE4XHOHRLRFR 300 V  
EN 50288-7  
IEC 60584-3  
ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, lead jacketed, twisted pair individual and overall screened cable, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPE
- **Screen:** IS/OS Aluminum/PET + TC Drain wire
- **Inner sheath:** PVC, color in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- **Chemical Barrier:** Lead sheath
- **Inner sheath:** PVC
- **Armour:** Galvanized steel wire
- **Outer sheath:** PVC, color in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)

**Technical data**

- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
15 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT XLPE-IST-OST-PVC-LEAD-PVC-SWA-PVC</b>			
2x2x0,5 (20 AWG)	16,9	35,2	712
6x2x0,5 (20 AWG)	20,5	96,2	1.052
10x2x0,5 (20 AWG)	24,4	157,2	1.439
12x2x0,5 (20 AWG)	24,8	187,7	1.503
16x2x0,5 (20 AWG)	27,4	248,7	1.912
20x2x0,5 (20 AWG)	29,7	309,7	2.185
24x2x0,5 (20 AWG)	32,3	370,7	2.546
2x2x0,8 (18 AWG)	18,4	45,9	851
6x2x0,8 (18 AWG)	22,5	128,1	1.269
10x2x0,8 (18 AWG)	27,3	210,4	1.862
12x2x0,8 (18 AWG)	28,3	251,5	1.984
16x2x0,8 (18 AWG)	30,2	333,8	2.240
20x2x0,8 (18 AWG)	33,0	416,0	2.664
24x2x0,8 (18 AWG)	36,4	498,3	3.141
2x2x1,3 (16 AWG)	19,9	64,8	979
6x2x1,3 (16 AWG)	25,2	184,9	1.535
10x2x1,3 (16 AWG)	31,0	305,0	2.347
12x2x1,3 (16 AWG)	31,9	365,0	2.488
16x2x1,3 (16 AWG)	34,8	485,1	2.975
20x2x1,3 (16 AWG)	38,3	605,2	3.466
24x2x1,3 (16 AWG)	42,5	725,3	4.256

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding



## TT XLPE-iST-oST-AL/HDPE/PA-SWA-PVC

Armoured, AL/HDPE/PA jacketed, individual and overall screened extension or compensating TT\*/XLPE/IS/OS/AL/HDPE/PA/SWA/PVC (\*Thermocouple Type Conductor)



**Info**

**TT UE4XHOH5ER4FR 300 V  
EN 50288-7  
IEC 60584-3  
ISA MC 96.1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, AL/HDPE/PA jacketed, twisted pair individual and overall screened cable, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Solid alloys according to IEC 60584-3, ISA MC 96.1
- **Core insulation:** XLPE
- **Screen:** IS Aluminum/PET + TC Drain wire, OS Aluminum longitudinal tape (AL) + TC Drain wire
- **Chemical Barrier:** AL/HDPE/PA
- **Armour:** Galvanized steel wire
- **Outer sheath:** PVC, color in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)

**Technical data**

- Core identification code:**  
in accordance with IEC 60584-3, or ISA MC 96.1 (SEE TT)
- Insulation resistance:**  
5000 MOhm x km
- Conductor stranding:**  
Solid alloys
- Nominal Voltage U0/U:**  
300/300 V
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
15 x Outer Diameter

Number cores and mm <sup>2</sup> (AWG) per conductor	Approx. Outer Diameter mm	Copper index kg/km	Approx. Weight kg/km
<b>TT XLPE-iST-oST-AL/HDPE/PA-SWA-PVC</b>			
2x2x0,5 (20 AWG)	14,3	35,2	338
6x2x0,5 (20 AWG)	17,5	96,2	503
10x2x0,5 (20 AWG)	21,1	157,2	688
12x2x0,5 (20 AWG)	21,6	187,7	732
16x2x0,5 (20 AWG)	23,9	248,7	980
20x2x0,5 (20 AWG)	26,2	309,7	1.153
24x2x0,5 (20 AWG)	28,6	370,7	1.317
2x2x0,8 (18 AWG)	15,4	45,9	380
6x2x0,8 (18 AWG)	19,2	128,1	593
10x2x0,8 (18 AWG)	23,9	210,4	933
12x2x0,8 (18 AWG)	24,8	251,5	1.015
16x2x0,8 (18 AWG)	26,7	333,8	1.184
20x2x0,8 (18 AWG)	29,3	416,0	1.400
24x2x0,8 (18 AWG)	31,9	498,3	1.587
2x2x1,3 (16 AWG)	17,1	64,8	456
6x2x1,3 (16 AWG)	22,0	184,9	748
10x2x1,3 (16 AWG)	27,4	305,0	1.176
12x2x1,3 (16 AWG)	28,5	365,0	1.283
16x2x1,3 (16 AWG)	30,9	485,1	1.528
20x2x1,3 (16 AWG)	34,8	605,2	2.001
24x2x1,3 (16 AWG)	38,0	725,3	2.285

Where X=0 for KX, X=1 for KCA, X=2 for KCB, X=3 for EX, X=4 for TX, X=5 for JX, X=6 for BX, X=7 for RCA/SCA RCB/SCB, X=8 for NX, X=9 for NC

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Other conductor sizes and stranding



CABLES	PAG	NOMENCLATURE	CORE INSULATION	SCREEN	CHEMICAL BARRIER
N07V-K	96	FR 450/750 V, CEI 20-20 CEI UNEL 357523, CEI 20-22 II	PVC, Type R2	-	-
H07V-K	97	FR 450/750 V CEI 20-20/3	PVC	-	-
H07V-R	98	RR 450/750 V CEI 20-20/3	PVC	-	-
ÖLFLEX® POWER 106	99	RE4OR 0,6/1 kV IEC 60502-1	XLPE	-	-
ÖLFLEX® POWER SWA 108	100	RE4OFR 0,6/1 kV IEC 60502-1	XLPE	-	-
ÖLFLEX® POWER 110	101	RROR 0,6/1 kV IEC 60502-1	PVC	-	-
ÖLFLEX® POWER SWA 111	102	RROFR 0,6/1 kV IEC 60502-1	PVC	-	-
ÖLFLEX® POWER SWA LEAD 187	103	RE4ORLFR 0,6/1 kV IEC 60502-1	XLPE	-	Lead sheath
ÖLFLEX® POWER SWA AL/HDPE/PA 188	104	RE4OH5ER4FR 0,6/1 kV Gen. to IEC 60502-1, EN 50288-7	XLPE	-	AL/HDPE/PA
ÖLFLEX® POWER 190 H	105	RG100M2 0,6/1 kV IEC 60092-353	XLPO	-	-
ÖLFLEX® POWER SWB 191 H	106	RG100M2AM2 0,6/1 kV IEC 60092-353	XLPO	-	-
ÖLFLEX® POWER F90 192 H	107	RTG100M2 0,6/1 kV IEC 60092-353, IEC 60331-21	XLPO, over MICA-tape wrapped conductor	-	-
ÖLFLEX® POWER SWB F90 193 H	108	RTG100M2AM2 0,6/1 kV IEC 60092-353, IEC 60331-21	XLPO, over MICA-tape wrapped conductor	-	-
ÖLFLEX® POWER 204 H	109	RE4OM1 0,6/1 kV IEC 60502-1	XLPE	-	-
ÖLFLEX® POWER SWA 205 H	110	RE4OFM1 0,6/1 kV IEC 60502-1	XLPE	-	-
ÖLFLEX® POWER F90 304 H	111	RTE4OM1 0,6/1 kV IEC 60502-1, IEC 60331-21	XLPE, over MICA-tape wrapped conductor	-	-
ÖLFLEX® POWER SWA F90 306 H	112	RTE4OFM1 0,6/1 kV IEC 60502-1, IEC 60331-21	XLPE, over MICA-tape wrapped conductor	-	-



	CONDUCTOR STRANDING	ARMOUR	NOMINAL VOLTAGE U <sub>0</sub> /U	TEMP. MIN. °C	TEMP. MAX °C	REFERENCE NORMS
	Class 5 IEC 60228	-	450/750 V	-10	+70	IEC 60332-1-2, CEI 20-22 II
	Class 5 IEC 60228	-	450/750 V	-10	+70	IEC 60332-1-2
	Class 2 IEC 60228	-	450/750 V	-10	+70	IEC 60332-1-2
	Class 2 IEC 60228	-	0,6/1 kV	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Class 2 IEC 60228	Galvanized Steel Wire	0,6/1 kV	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Class 2 IEC 60228	-	0,6/1 kV	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Class 2 IEC 60228	Galvanized Steel Wire	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Class 2 IEC 60228	Galvanized Steel Wire	0,6/1 Kv	-30	+90	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60754-1 (max 20%)
	Class 2 IEC 60228	Galvanized Steel Wire	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60754-1 (max 20%)
	Class 2 IEC 60228	-	0,6/1 Kv	-40	+125	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	Galvanized steel wire braid	0,6/1 Kv	-40	+125	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	-	0,6/1 Kv	-40	+125	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60331-21 IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	Galvanized steel wire braid	0,6/1 Kv	-40	+125	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60331-21 IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	Galvanized Steel Wire	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	Galvanized Steel Wire	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	-	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60331-21 IEC 61034-1 and 2, IEC 60754-1 and 2
	Class 2 IEC 60228	Galvanized Steel Wire	0,6/1 Kv	-30	+70	CEI 20-34/0, IEC 60332-1-2, IEC 60332-3-22 (Cat. A), IEC 60331-21 IEC 61034-1 and 2, IEC 60754-1 and 2



**N07V-K**  
Single-core cable  
CU/PVC



**Info**

FR 450/750 V  
CEI 20-20  
CEI UNEL 357523  
CEI 20-22 II

**Benefits**

- Fire behaviour
- IMQ

**Product features**

Single-core cable, PVC insulated

**Norm references / Approvals**

- **Fire behaviour**  
IEC 60332-1-2  
CEI 20-22 II

**Design**

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** PVC, Type R2

**Technical data**

- Core identification code:**  
Green/Yellow - Brown - Black - Grey - Blue etc...
- Conductor stranding:**  
Class 5 IEC 60228
- Nominal Voltage U0/U:**  
450/750 V
- Test voltage:**  
3000 V
- Temperature range:**  
during operation: -10° to +70°C  
during installation: -5° to +50°C
- Minimum Bending Radius:**  
4 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>N07V-K</b>			
1 x 1,5	3,2	14,1	21
1 x 2,5	3,8	24,2	33
1 x 4	4,4	38,7	48
1 x 6	5,0	56,1	67
1 x 10	6,5	93,5	110
1 x 16	7,6	156,2	172
1 x 25	9,3	246,4	269
1 x 35	10,6	322,3	345
1 x 50	13,1	465,3	499
1 x 70	14,9	674,3	700
1 x 95	17,4	895,4	931
1 x 120	20,2	1.148,4	1.181
1 x 150	21,6	1.431,1	1.466
1 x 185	23,6	1.828,2	1.862
1 x 240	27,7	2.213,2	2.271

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products



## H07V-K

Single-core cable  
CU/PVC



**Info**

**FR 450/750 V**  
**CEI 20-20/3**

**Benefits**

- Fire behaviour
- IMQ

**Product features**

Single-core cable, PVC insulated

**Norm references / Approvals**

- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Flexible Annealed Copper
- **Core insulation:** PVC

**Technical data**

**Core identification code:**  
Green/Yellow - Brown - Black - Grey - Blue etc...

**Conductor stranding:**  
Class 5 IEC 60228

**Nominal Voltage U0/U:**  
450/750 V

**Test voltage:**  
2500 V

**Temperature range:**  
during operation: -10° to +70°C  
during installation: -5° to +50°C

**Minimum Bending Radius:**  
4 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>H07V-K</b>			
1 x 1,5	3,2	14,1	21
1 x 2,5	3,8	24,2	33
1 x 4	4,4	38,7	48
1 x 6	5,0	56,1	67
1 x 10	6,5	93,5	110
1 x 16	7,6	156,2	172
1 x 25	9,3	246,4	269
1 x 35	10,6	322,3	345
1 x 50	13,1	465,3	499
1 x 70	14,9	674,3	700
1 x 95	17,4	895,4	931
1 x 120	20,2	1.148,4	1.181
1 x 150	21,6	1.431,1	1.466
1 x 185	23,6	1.828,2	1.862
1 x 240	27,7	2.213,2	2.271

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**H07V-R**  
Single-core cable  
CU/PVC



**Info**

**RR 450/750 V**  
**CEI 20-20/3**

**Benefits**

- Fire behaviour
- IMQ

**Product features**

Single-core cable, PVC insulated

**Norm references / Approvals**

- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC

**Technical data**

**Core identification code:**  
Green/Yellow - Brown - Black - Grey - Blue etc...

**Conductor stranding:**  
Class 2 IEC 60228

**Nominal Voltage U0/U:**  
450/750 V

**Test voltage:**  
2500 V

**Temperature range:**  
during operation: -10° to +70°C  
during installation: -5° to +50°C

**Minimum Bending Radius:**  
7 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>H07V-R</b>			
1 x 1,5	3,2	15,9	22
1 x 2,5	3,8	25,4	34
1 x 4	4,4	40,8	50
1 x 6	5,0	59,4	69
1 x 10	6,4	99,0	115
1 x 16	7,5	161,7	177
1 x 25	9,3	258,5	280
1 x 35	10,5	349,8	369
1 x 50	12,3	485,8	512
1 x 70	14,3	698,5	718
1 x 95	16,6	962,5	986
1 x 120	18,3	1.155,0	1.173
1 x 150	20,3	1.479,5	1.498
1 x 185	22,7	1.896,4	1.915
1 x 240	25,8	2.491,5	2.505

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## ÖLFLEX® POWER 106

Low voltage power cable  
CU/XLPE/PVC



**Info**

**RE4OR 0,6/1 kV  
IEC 60502-1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Multi-core, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Outer sheath:** PVC, black

**Technical data**



**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/  
yellow; 3 cores green/yellow, blue,  
brown; 4 cores green/yellow, brown,  
black, grey; 5 cores green/yellow,  
blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black;  
2-cores blue, brown - 3 cores brown,  
black, grey; 4 cores blue, brown,  
black, grey; 5 cores blue, brown,  
black, grey, black.



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U0/U:**  
0,6/1 kV



**Test voltage:**  
C/C 3500 V x 5 minutes



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER 106</b>			
3 x 1,5	10,6	47,6	156
3 x 2,5	11,5	76,1	198
3 x 4	12,7	122,4	263
3 x 6	14,1	178,2	340
3 x 10	16,1	297,0	489
3 x 16	18,5	485,1	713
3 x 25	22,4	775,5	1.084
3 x 35	25,0	1.049,4	1.404
3 x 50	28,5	1.457,3	1.887
3 x 70	33,7	2.095,5	2.670
3 x 95	38,0	2.887,5	3.565
3 x 120	42,5	3.465,0	4.316
3 x 150	47,0	4.438,5	5.452
3 x 185	52,6	5.689,2	6.940
3 x 240	59,4	7.474,5	9.004
4 x 1,5	11,4	63,4	186
4 x 2,5	12,4	101,4	239
4 x 4	13,8	163,2	322
4 x 6	15,3	237,6	420
4 x 10	17,6	396,0	613
4 x 16	20,3	646,8	902
4 x 25	24,7	1.034,0	1.382
4 x 35	27,6	1.399,2	1.797

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER 106</b>			
4 x 50	31,7	1.943,1	2.442
4 x 70	37,4	2.794,0	3.456
4 x 95	42,4	3.850,0	4.645
4 x 120	47,2	4.620,0	5.591
4 x 150	52,5	5.918,0	7.099
4 x 185	58,7	7.585,6	9.036
4 x 240	66,3	9.966,0	11.727
5 x 1,5	12,3	79,3	220
5 x 2,5	13,4	126,8	286
5 x 4	15,0	204,1	388
5 x 6	16,7	297,0	510
5 x 10	19,2	495,0	750
5 x 16	22,2	808,5	1.111
5 x 25	27,1	1.292,5	1.709
5 x 35	30,5	1.749,0	2.245
5 x 50	35,1	2.428,9	3.052
5 x 70	41,5	3.492,5	4.320
5 x 95	47,0	4.812,5	5.806
5 x 120	52,5	5.775,0	7.018
5 x 150	58,1	7.397,5	8.876
5 x 185	65,3	9.482,0	11.334
5 x 240	73,6	12.457,5	14.706

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA



## ÖLFLEX® POWER SWA 108

Armoured Low voltage power cable  
CU/XLPE/PVC/SWA/PVC



**Info**

**RE4OFR 0,6/1 kV**  
**IEC 60502-1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured multi-core, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Bedding:** PVC
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**



**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/  
yellow; 3 cores green/yellow, blue,  
brown; 4 cores green/yellow, brown,  
black, grey; 5 cores green/yellow,  
blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black;  
2-cores blue, brown - 3 cores brown,  
black, grey; 4 cores blue, brown,  
black, grey; 5 cores blue, brown,  
black, grey, black.



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U0/U:**  
0,6/1 kV



**Test voltage:**  
C/C 3500 V x 5 minutes



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA 108</b>			
3 x 1,5	14,4	47,6	342
3 x 2,5	15,3	76,1	395
3 x 4	17,5	122,4	583
3 x 6	18,8	178,2	685
3 x 10	20,9	297,0	870
3 x 16	24,0	485,1	1.254
3 x 25	27,9	775,5	1.700
3 x 35	30,7	1.049,4	2.079
3 x 50	35,2	1.457,3	2.847
3 x 70	40,8	2.095,5	3.777
3 x 95	45,1	2.887,5	4.744
3 x 120	51,1	3.465,0	6.010
3 x 150	55,8	4.438,5	7.266
3 x 185	61,2	5.689,2	8.820
3 x 240	68,6	7.474,5	11.084
4 x 1,5	15,2	63,4	384
4 x 2,5	17,2	101,4	557
4 x 4	18,5	163,2	666
4 x 6	20,1	237,6	793
4 x 10	23,1	396,0	1.143
4 x 16	25,8	646,8	1.490
4 x 25	30,3	1.034,0	2.069
4 x 35	33,4	1.399,2	2.552

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA 108</b>			
4 x 50	38,8	1.943,1	3.542
4 x 70	44,6	2.794,0	4.672
4 x 95	51,0	3.850,0	6.396
4 x 120	56,0	4.620,0	7.482
4 x 150	61,1	5.918,0	9.067
4 x 185	67,8	7.585,6	11.188
4 x 240	76,9	9.966,0	14.801
5 x 1,5	17,0	79,3	535
5 x 2,5	18,2	126,8	624
5 x 4	19,7	204,1	754
5 x 6	21,4	297,0	907
5 x 10	24,7	495,0	1.316
5 x 16	27,7	808,5	1.738
5 x 25	33,0	1.292,5	2.458
5 x 35	37,7	1.749,0	3.322
5 x 50	42,5	2.428,9	4.247
5 x 70	50,3	3.492,5	6.078
5 x 95	55,8	4.812,5	7.697
5 x 120	61,1	5.775,0	8.994
5 x 150	67,4	7.397,5	11.060
5 x 185	74,5	9.482,0	13.628
5 x 240	84,9	12.457,5	18.084

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor



## ÖLFLEX® POWER 110

Low voltage power cable  
CU/PVC/PVC



**Info**

**RROR 0,6/1 kV**  
**IEC 60502-1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Multi-core, PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC
- **Outer sheath:** PVC, black

**Technical data**



**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/  
yellow; 3 cores green/yellow, blue,  
brown; 4 cores green/yellow, brown,  
black, grey; 5 cores green/yellow,  
blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black;  
2-cores blue, brown - 3 cores brown,  
black, grey; 4 cores blue, brown,  
black, grey; 5 cores blue, brown,  
black, grey, black.



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U0/U:**  
0,6/1 kV



**Test voltage:**  
C/C 3500 V x 5 minutes



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER 110</b>			
3 x 1,5	11,0	47,6	176
3 x 2,5	12,0	76,1	221
3 x 4	14,1	122,4	317
3 x 6	15,5	178,2	400
3 x 10	17,5	297,0	559
3 x 16	19,9	485,1	794
3 x 25	23,8	775,5	1.191
3 x 35	26,4	1.049,4	1.525
3 x 50	30,5	1.457,3	2.077
3 x 70	35,0	2.095,5	2.848
3 x 95	40,5	2.887,5	3.867
3 x 120	44,3	3.465,0	4.595
3 x 150	49,0	4.438,5	5.806
3 x 185	54,4	5.689,2	7.330
3 x 240	61,9	7.474,5	9.551
4 x 1,5	11,9	63,4	212
4 x 2,5	13,0	101,4	269
4 x 4	15,3	163,2	390
4 x 6	16,9	237,6	496
4 x 10	19,2	396,0	701
4 x 16	21,8	646,8	1.006
4 x 25	26,2	1.034,0	1.519
4 x 35	29,1	1.399,2	1.952

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER 110</b>			
4 x 50	33,9	1.943,1	2.683
4 x 70	39,2	2.794,0	3.707
4 x 95	45,0	3.850,0	5.008
4 x 120	49,5	4.620,0	5.976
4 x 150	54,5	5.918,0	7.524
4 x 185	60,8	7.585,6	9.542
4 x 240	69,0	9.966,0	12.430
5 x 1,5	12,9	79,3	252
5 x 2,5	14,0	126,8	322
5 x 4	16,7	204,1	472
5 x 6	18,4	297,0	604
5 x 10	20,9	495,0	860
5 x 16	23,9	808,5	1.240
5 x 25	28,8	1.292,5	1.881
5 x 35	32,2	1.749,0	2.440
5 x 50	37,6	2.428,9	3.353
5 x 70	43,4	3.492,5	4.632
5 x 95	50,0	4.812,5	6.289
5 x 120	54,8	5.775,0	7.473
5 x 150	60,6	7.397,5	9.443
5 x 185	67,5	9.482,0	11.971
5 x 240	76,7	12.457,5	15.587

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA



## ÖLFLEX® POWER SWA 111

Armoured Low voltage power cable  
CU/PVC/PVC/SWA/PVC



**Info**

**RROFR 0,6/1 kV  
IEC 60502-1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, multi-core, PVC insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** PVC
- **Bedding:** PVC
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

 **Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/  
yellow; 3 cores green/yellow, blue,  
brown; 4 cores green/yellow, brown,  
black, grey; 5 cores green/yellow,  
blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black;  
2-cores blue, brown - 3 cores brown,  
black, grey; 4 cores blue, brown,  
black, grey; 5 cores blue, brown,  
black, grey, black.

 **Conductor stranding:**  
Class 2 IEC 60228

 **Nominal Voltage U0/U:**  
0,6/1 kV

 **Test voltage:**  
C/C 3500 V x 5 minutes

 **Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C

 **Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA 111</b>			
3 x 1,5	14,8	47,6	357
3 x 2,5	15,7	76,1	413
3 x 4	18,8	122,4	649
3 x 6	20,2	178,2	755
3 x 10	23,0	297,0	1.062
3 x 16	25,3	485,1	1.344
3 x 25	29,2	775,5	1.809
3 x 35	32,0	1.049,4	2.196
3 x 50	37,7	1.457,3	3.089
3 x 70	42,4	2.095,5	3.960
3 x 95	48,9	2.887,5	5.431
3 x 120	53,1	3.465,0	6.296
3 x 150	57,6	4.438,5	7.561
3 x 185	63,7	5.689,2	9.261
3 x 240	70,9	7.474,5	11.529
4 x 1,5	15,7	63,4	405
4 x 2,5	17,7	101,4	584
4 x 4	20,1	163,2	748
4 x 6	21,6	237,6	880
4 x 10	24,6	396,0	1.247
4 x 16	27,3	646,8	1.604
4 x 25	31,9	1.034,0	2.208
4 x 35	36,0	1.399,2	2.937

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA 111</b>			
4 x 50	41,1	1.943,1	3.793
4 x 70	47,4	2.794,0	5.269
4 x 95	53,8	3.850,0	6.789
4 x 120	58,1	4.620,0	7.819
4 x 150	63,7	5.918,0	9.556
4 x 185	70,0	7.585,6	11.668
4 x 240	79,6	9.966,0	15.449
5 x 1,5	17,6	79,3	565
5 x 2,5	18,7	126,8	657
5 x 4	21,4	204,1	853
5 x 6	23,8	297,0	1.134
5 x 10	26,4	495,0	1.442
5 x 16	29,6	808,5	1.891
5 x 25	35,5	1.292,5	2.844
5 x 35	39,6	1.749,0	3.538
5 x 50	44,7	2.428,9	4.531
5 x 70	52,2	3.492,5	6.381
5 x 95	58,9	4.812,5	8.177
5 x 120	64,0	5.775,0	9.517
5 x 150	69,8	7.397,5	11.576
5 x 185	78,4	9.482,0	15.012
5 x 240	87,9	12.457,5	18.886

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**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor



## ÖLFLEX® POWER SWA LEAD 187

Armoured, Lead jacketed, Low voltage power cable  
CU/XLPE/PVC/LC/PVC/SWA/PVC



**Info**

**RE4ORLRF 0,6/1 kV  
IEC 60502-1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, lead jacketed, multi-core cable, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Bedding:** PVC
- **Inner sheath:** PVC, black
- **Chemical Barrier:** Lead sheath
- **Inner sheath:** PVC, black
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**

**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/yellow; 3 cores green/yellow, blue, brown; 4 cores green/yellow, brown, black, grey; 5 cores green/yellow, blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black; 2-cores blue, brown - 3 cores brown, black, grey; 4 cores blue, brown, black, grey; 5 cores blue, brown, black, grey, black.

**Conductor stranding:**  
Class 2 IEC 60228

**Nominal Voltage U0/U:**  
0,6/1 kV

**Test voltage:**  
C/C 3500 V x 5 minutes

**Temperature range:**  
during operation: -30° to +90°C  
during installation: -5° to +50°C

**Minimum Bending Radius:**  
15 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA LEAD 187</b>			
3 x 1,5	18,1	47,6	807
3 x 2,5	19,1	76,1	897
3 x 4	21,5	122,4	1.172
3 x 6	23,0	178,2	1.384
3 x 10	25,1	297,0	1.655
3 x 16	28,6	485,1	2.255
3 x 25	33,1	775,5	3.002
3 x 35	36,3	1.049,4	3.634
3 x 50	41,3	1.457,3	4.766
3 x 70	47,3	2.095,5	6.161
3 x 95	52,3	2.887,5	7.586
3 x 120	58,6	3.465,0	9.545
3 x 150	63,6	4.438,5	11.310
3 x 185	69,6	5.689,2	13.541
3 x 240	77,9	7.474,5	16.901
4 x 1,5	19,0	63,4	881
4 x 2,5	20,9	101,4	1.121
4 x 4	22,5	163,2	1.296
4 x 6	24,3	237,6	1.544
4 x 10	27,7	396,0	2.103
4 x 16	30,6	646,8	2.587
4 x 25	36,0	1.034,0	3.605
4 x 35	38,9	1.399,2	4.228

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA LEAD 187</b>			
4 x 50	45,1	1.943,1	5.788
4 x 70	51,3	2.794,0	7.425
4 x 95	58,6	3.850,0	9.928
4 x 120	63,8	4.620,0	11.543
4 x 150	69,5	5.918,0	13.775
4 x 185	77,0	7.585,6	16.943
4 x 240	86,7	9.966,0	21.847
5 x 1,5	20,8	79,3	1.093
5 x 2,5	22,2	126,8	1.239
5 x 4	23,9	204,1	1.490
5 x 6	25,6	297,0	1.714
5 x 10	29,5	495,0	2.364
5 x 16	32,9	808,5	3.029
5 x 25	38,4	1.292,5	4.108
5 x 35	43,8	1.749,0	5.372
5 x 50	49,2	2.428,9	6.861
5 x 70	57,4	3.492,5	9.362
5 x 95	63,6	4.812,5	11.741
5 x 120	69,5	5.775,0	13.706
5 x 150	76,6	7.397,5	16.779
5 x 185	84,4	9.482,0	20.477
5 x 240	95,6	12.457,5	26.514

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour, DSTA



## ÖLFLEX® POWER SWA AL/HDPE/PA 188

Armoured, AL/HDPE/PA jacketed, Low voltage power cable  
CU/XLPE/AL/HDPE/PA/SWA/PVC



**Info**

**RE4OH5ER4FR 0,6/1 kV**  
Gen. to IEC 60502-1  
EN 50288-7

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant

**Product features**

Armoured, AL/HDPE/PA jacketed, multi-core cable, XLPE insulated and PVC jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Halogen acid gas**  
IEC 60754-1 (max 20%)
- **Fire behaviour**  
IEC 60332-1-2

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Chemical Barrier:** AL/HDPE/PA
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** PVC, black

**Technical data**



**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/  
yellow; 3 cores green/yellow, blue,  
brown; 4 cores green/yellow, brown,  
black, grey; 5 cores green/yellow,  
blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black;  
2-cores blue, brown - 3 cores brown,  
black, grey; 4 cores blue, brown,  
black, grey; 5 cores blue, brown,  
black, grey, black.



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U0/U:**  
0,6/1 kV



**Test voltage:**  
C/C 3500 V x 5 minutes



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
15 x Outer Diameter

Number of cores and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>ÖLFLEX® POWER SWA AL/HDPE/PA 188</b>			
3 x 1,5	15,8	47,6	391
3 x 2,5	16,7	76,1	446
3 x 4	18,9	122,4	646
3 x 6	20,5	178,2	761
3 x 10	22,7	297,0	961
3 x 16	26,0	485,1	1.373
3 x 25	30,4	775,5	1.858
3 x 35	33,4	1.049,4	2.261
4 x 1,5	16,6	63,4	435
4 x 2,5	18,6	101,4	619
4 x 4	20,2	163,2	741
4 x 6	21,7	237,6	870
4 x 10	24,9	396,0	1.247
4 x 16	27,8	646,8	1.614
4 x 25	33,0	1.034,0	2.249
4 x 35	37,2	1.399,2	2.984
5 x 1,5	18,4	79,3	597
5 x 2,5	19,8	126,8	698
5 x 4	21,3	204,1	832
5 x 6	24,0	297,0	1.121
5 x 10	26,7	495,0	1.437
5 x 16	30,1	808,5	1.895
5 x 25	36,7	1.292,5	2.885
5 x 35	40,4	1.749,0	3.529

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Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour TCWB, SWB



## ÖLFLEX® POWER 190 H

Low voltage power cable LSZH 125 °C  
CU/XLPO/LSZH



**Info**

**RG 100M2 0,6/1 kV**  
**IEC 60092-353**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Temperature resistant
- Halogen free
- Low Smoke

**Product features**

Multi-core cable, XLPO insulated and LSZH jacketed 125 °C

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPO
- **Outer sheath:** XLPO LSZH, black

**Technical data**



**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/yellow; 3 cores green/yellow, blue, brown; 4 cores green/yellow, brown, black, grey; 5 cores green/yellow, blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black; 2-cores blue, brown - 3 cores brown, black, grey; 4 cores blue, brown, black, grey; 5 cores blue, brown, black, grey, black.



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U0/U:**  
0,6/1 kV



**Test voltage:**  
C/C 3500 V x 5 minutes



**Temperature range:**  
during operation: -40° to +125°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER 190 H</b>			
3 x 1,5	10,6	47,6	161
3 x 2,5	11,5	76,1	204
3 x 4	12,7	122,4	270
3 x 6	14,1	178,2	348
3 x 10	16,1	297,0	500
3 x 16	18,5	485,1	726
3 x 25	22,4	775,5	1.107
3 x 35	25,0	1.049,4	1.430
3 x 50	28,5	1.457,3	1.922
3 x 70	33,7	2.095,5	2.715
3 x 95	38,0	2.887,5	3.615
3 x 120	42,5	3.465,0	4.377
3 x 150	47,0	4.438,5	5.534
3 x 185	52,6	5.689,2	7.047
3 x 240	59,4	7.474,5	9.131
4 x 1,5	11,4	63,4	193
4 x 2,5	12,4	101,4	248
4 x 4	13,8	163,2	332
4 x 6	15,3	237,6	432
4 x 10	17,6	396,0	628
4 x 16	20,3	646,8	921
4 x 25	24,7	1.034,0	1.414
4 x 35	27,6	1.399,2	1.834

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER 190 H</b>			
4 x 50	31,7	1.943,1	2.490
4 x 70	37,4	2.794,0	3.520
4 x 95	42,4	3.850,0	4.716
4 x 120	47,2	4.620,0	5.678
4 x 150	52,5	5.918,0	7.213
4 x 185	58,7	7.585,6	9.185
4 x 240	66,3	9.966,0	11.906
5 x 1,5	12,3	79,3	229
5 x 2,5	13,4	126,8	297
5 x 4	15,0	204,1	402
5 x 6	16,7	297,0	526
5 x 10	19,2	495,0	770
5 x 16	22,2	808,5	1.135
5 x 25	27,1	1.292,5	1.751
5 x 35	30,5	1.749,0	2.292
5 x 50	35,1	2.428,9	3.113
5 x 70	41,5	3.492,5	4.401
5 x 95	47,0	4.812,5	5.896
5 x 120	52,5	5.775,0	7.128
5 x 150	58,1	7.397,5	9.021
5 x 185	65,3	9.482,0	11.522
5 x 240	73,6	12.457,5	14.932

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour TCWB, SWB



## ÖLFLEX® POWER SWB 191 H

Armoured, Low voltage power cable LSZH 125 °C  
CU/XLPO/LSZH/SWB/LSZH



**Info**

**RG 100M2AM2 0,6/1 kV  
IEC 60092-353**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Temperature resistant
- Halogen free
- Low Smoke

**Product features**

Armoured multi-core cable, XLPO insulated and LSZH jacketed 125 °C

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPO
- **Bedding:** XLPO LSZH
- **Armour:** Galvanized Steel Wire Braid
- **Outer sheath:** XLPO LSZH, black

**Technical data**



**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/yellow; 3 cores green/yellow, blue, brown; 4 cores green/yellow, brown, black, grey; 5 cores green/yellow, blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black; 2-cores blue, brown - 3 cores brown, black, grey; 4 cores blue, brown, black, grey; 5 cores blue, brown, black, grey, black.



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U0/U:**  
0,6/1 kV



**Test voltage:**  
C/C 3500 V x 5 minutes



**Temperature range:**  
during operation: -40° to +125°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWB 191 H</b>			
3 x 1,5	13,1	47,6	234
3 x 2,5	14,0	76,1	280
3 x 4	15,5	122,4	371
3 x 6	16,8	178,2	453
3 x 10	18,9	297,0	608
3 x 16	21,3	485,1	834
3 x 25	24,9	775,5	1.194
3 x 35	27,7	1.049,4	1.518
3 x 50	31,4	1.457,3	2.002
3 x 70	37,3	2.095,5	2.851
3 x 95	41,5	2.887,5	3.713
3 x 120	46,5	3.465,0	4.469
3 x 150	51,0	4.438,5	5.564
3 x 185	56,6	5.689,2	6.986
3 x 240	63,8	7.474,5	8.990
4 x 1,5	13,9	63,4	271
4 x 2,5	15,2	101,4	351
4 x 4	16,5	163,2	441
4 x 6	18,1	237,6	545
4 x 10	20,4	396,0	745
4 x 16	23,0	646,8	1.038
4 x 25	27,4	1.034,0	1.521
4 x 35	30,5	1.399,2	1.944

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWB 191 H</b>			
4 x 50	35,0	1.943,1	2.609
4 x 70	41,0	2.794,0	3.667
4 x 95	46,4	3.850,0	4.865
4 x 120	51,2	4.620,0	5.776
4 x 150	56,5	5.918,0	7.245
4 x 185	63,1	7.585,6	9.172
4 x 240	70,7	9.966,0	11.745
5 x 1,5	15,0	79,3	332
5 x 2,5	16,2	126,8	405
5 x 4	17,7	204,1	514
5 x 6	19,4	297,0	642
5 x 10	22,0	495,0	888
5 x 16	24,7	808,5	1.237
5 x 25	30,0	1.292,5	1.864
5 x 35	33,9	1.749,0	2.420
5 x 50	38,7	2.428,9	3.277
5 x 70	45,7	3.492,5	4.582
5 x 95	51,0	4.812,5	6.002
5 x 120	56,5	5.775,0	7.165
5 x 150	62,7	7.397,5	9.053
5 x 185	69,7	9.482,0	11.395
5 x 240	78,7	12.457,5	14.720

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour TCWB, SWB



## ÖLFLEX® POWER F90 192 H

Fire resistant, Low voltage power cable LSZH 125 °C  
CU/MT/XLPO/LSZH



**Info**

**RTG 100M2 0,6/1 kV**  
**IEC 60092-353**  
**IEC 60331-21**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Temperature resistant
- Halogen free
- Low Smoke

**Product features**

Multi-core cable, XLPO over MICA-tape insulated and LSZH jacketed 125 °C

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPO over MICA-tape wrapped conductor
- **Outer sheath:** XLPO LSZH, black

**Technical data**



**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/  
yellow; 3 cores green/yellow, blue,  
brown; 4 cores green/yellow, brown,  
black, grey; 5 cores green/yellow,  
blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black;  
2-cores blue, brown - 3 cores brown,  
black, grey; 4 cores blue, brown,  
black, grey; 5 cores blue, brown,  
black, grey, black.



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U0/U:**  
0,6/1 kV



**Test voltage:**  
C/C 3500 V x 5 minutes



**Temperature range:**  
during operation: -40° to +125°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER F90 192 H</b>			
3 x 1,5	11,7	47,6	186
3 x 2,5	12,6	76,1	231
3 x 4	13,8	122,4	299
3 x 6	15,2	178,2	380
3 x 10	17,2	297,0	536
3 x 16	19,6	485,1	767
3 x 25	23,5	775,5	1.155
3 x 35	26,1	1.049,4	1.484
3 x 50	29,8	1.457,3	1.997
3 x 70	34,8	2.095,5	2.787
3 x 95	39,3	2.887,5	3.715
3 x 120	43,6	3.465,0	4.466
3 x 150	48,1	4.438,5	5.632
3 x 185	53,7	5.689,2	7.156
3 x 240	60,5	7.474,5	9.255
4 x 1,5	12,6	63,4	224
4 x 2,5	13,7	101,4	281
4 x 4	15,0	163,2	368
4 x 6	16,6	237,6	472
4 x 10	18,8	396,0	673
4 x 16	21,5	646,8	971
4 x 25	25,9	1.034,0	1.474
4 x 35	28,8	1.399,2	1.901

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER F90 192 H</b>			
4 x 50	33,1	1.943,1	2.583
4 x 70	38,7	2.794,0	3.609
4 x 95	43,7	3.850,0	4.816
4 x 120	48,4	4.620,0	5.789
4 x 150	53,7	5.918,0	7.337
4 x 185	60,0	7.585,6	9.324
4 x 240	67,5	9.966,0	12.062
5 x 1,5	13,6	79,3	267
5 x 2,5	14,8	126,8	338
5 x 4	16,3	204,1	446
5 x 6	18,0	297,0	575
5 x 10	20,6	495,0	825
5 x 16	23,6	808,5	1.198
5 x 25	28,4	1.292,5	1.826
5 x 35	31,9	1.749,0	2.377
5 x 50	36,7	2.428,9	3.228
5 x 70	43,0	3.492,5	4.536
5 x 95	48,4	4.812,5	6.023
5 x 120	53,9	5.775,0	7.270
5 x 150	59,7	7.397,5	9.209
5 x 185	66,6	9.482,0	11.698
5 x 240	75,2	12.457,5	15.168

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour TCWB, SWB



## ÖLFLEX® POWER SWB F90 193 H

Fire resistant, armoured, Low voltage power cable LSZH 125 °C  
CU/MT/XLPO/LSZH/SWB/LSZH



**Info**

**RTG 100M2AM2 0,6/1 kV**  
**IEC 60092-353**  
**IEC 60331-21**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Temperature resistant
- Halogen free
- Low Smoke

**Product features**

Armoured multi-core cable, XLPO over MI-CA-tape insulated and LSZH jacketed 125 °C

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPO over MICA-tape wrapped conductor
- **Bedding:** XLPO LSZH
- **Armour:** Galvanized Steel Wire Braid
- **Outer sheath:** XLPO LSZH, black

**Technical data**

**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/yellow; 3 cores green/yellow, blue, brown; 4 cores green/yellow, brown, black, grey; 5 cores green/yellow, blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black; 2-cores blue, brown - 3 cores brown, black, grey; 4 cores blue, brown, black, grey; 5 cores blue, brown, black, grey, black.

**Conductor stranding:**  
Class 2 IEC 60228

**Nominal Voltage U0/U:**  
0,6/1 kV

**Test voltage:**  
C/C 3500 V x 5 minutes

**Temperature range:**  
during operation: -40° to +125°C  
during installation: -5° to +50°C

**Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWB F90 193 H</b>			
3 x 1,5	14,2	47,6	262
3 x 2,5	15,3	76,1	332
3 x 4	16,6	122,4	404
3 x 6	17,9	178,2	487
3 x 10	20,0	297,0	645
3 x 16	22,3	485,1	874
3 x 25	26,0	775,5	1.237
3 x 35	28,8	1.049,4	1.565
3 x 50	32,7	1.457,3	2.070
3 x 70	38,3	2.095,5	2.913
3 x 95	42,8	2.887,5	3.802
3 x 120	47,6	3.465,0	4.543
3 x 150	52,3	4.438,5	5.671
3 x 185	58,1	5.689,2	7.126
3 x 240	65,1	7.474,5	9.120
4 x 1,5	15,4	63,4	327
4 x 2,5	16,4	101,4	389
4 x 4	17,8	163,2	480
4 x 6	19,3	237,6	587
4 x 10	21,6	396,0	790
4 x 16	24,2	646,8	1.087
4 x 25	28,6	1.034,0	1.577
4 x 35	31,7	1.399,2	2.004

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWB F90 193 H</b>			
4 x 50	36,5	1.943,1	2.695
4 x 70	42,4	2.794,0	3.767
4 x 95	47,6	3.850,0	4.953
4 x 120	52,6	4.620,0	5.898
4 x 150	58,1	5.918,0	7.401
4 x 185	64,4	7.585,6	9.287
4 x 240	72,1	9.966,0	11.909
5 x 1,5	16,4	79,3	375
5 x 2,5	17,5	126,8	449
5 x 4	19,1	204,1	561
5 x 6	20,8	297,0	692
5 x 10	23,3	495,0	942
5 x 16	26,3	808,5	1.309
5 x 25	31,4	1.292,5	1.933
5 x 35	35,2	1.749,0	2.496
5 x 50	40,2	2.428,9	3.384
5 x 70	47,0	3.492,5	4.683
5 x 95	52,6	4.812,5	6.138
5 x 120	58,5	5.775,0	7.367
5 x 150	64,1	7.397,5	9.186
5 x 185	71,2	9.482,0	11.576
5 x 240	80,0	12.457,5	14.882

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour TCWB, SWB



## ÖLFLEX® POWER 204 H

Low voltage power cable LSZH  
CU/XLPE/LSZH



**Info**

**RE4OM1 0,6/1 kV  
IEC 60502-1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke

**Product features**

Multi-core cable, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Outer sheath:** LSZH, black

**Technical data**

**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/  
yellow; 3 cores green/yellow, blue,  
brown; 4 cores green/yellow, brown,  
black, grey; 5 cores green/yellow,  
blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black;  
2-cores blue, brown - 3 cores brown,  
black, grey; 4 cores blue, brown,  
black, grey; 5 cores blue, brown,  
black, grey, black.

**Conductor stranding:**  
Class 2 IEC 60228

**Nominal Voltage U0/U:**  
0,6/1 kV

**Test voltage:**  
C/C 3500 V x 5 minutes

**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C

**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER 204 H</b>			
3 x 1,5	10,6	47,6	162
3 x 2,5	11,5	76,1	205
3 x 4	12,7	122,4	271
3 x 6	14,1	178,2	349
3 x 10	16,1	297,0	501
3 x 16	18,5	485,1	728
3 x 25	22,4	775,5	1.104
3 x 35	25,0	1.049,4	1.428
3 x 50	28,5	1.457,3	1.917
3 x 70	33,7	2.095,5	2.711
3 x 95	38,0	2.887,5	3.615
3 x 120	42,5	3.465,0	4.378
3 x 150	47,0	4.438,5	5.527
3 x 185	52,6	5.689,2	7.033
3 x 240	59,4	7.474,5	9.121
4 x 1,5	11,4	63,4	192
4 x 2,5	12,4	101,4	247
4 x 4	13,8	163,2	331
4 x 6	15,3	237,6	430
4 x 10	17,6	396,0	626
4 x 16	20,3	646,8	919
4 x 25	24,7	1.034,0	1.404
4 x 35	27,6	1.399,2	1.824

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER 204 H</b>			
4 x 50	31,7	1.943,1	2.475
4 x 70	37,4	2.794,0	3.502
4 x 95	42,4	3.850,0	4.704
4 x 120	47,2	4.620,0	5.661
4 x 150	52,5	5.918,0	7.185
4 x 185	58,7	7.585,6	9.143
4 x 240	66,3	9.966,0	11.861
5 x 1,5	12,3	79,3	227
5 x 2,5	13,4	126,8	295
5 x 4	15,0	204,1	398
5 x 6	16,7	297,0	522
5 x 10	19,2	495,0	765
5 x 16	22,2	808,5	1.130
5 x 25	27,1	1.292,5	1.735
5 x 35	30,5	1.749,0	2.277
5 x 50	35,1	2.428,9	3.092
5 x 70	41,5	3.492,5	4.375
5 x 95	47,0	4.812,5	5.876
5 x 120	52,5	5.775,0	7.105
5 x 150	58,1	7.397,5	8.979
5 x 185	65,3	9.482,0	11.464
5 x 240	73,6	12.457,5	14.869

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA



## ÖLFLEX® POWER SWA 205 H

Armoured Low voltage power cable LSZH  
CU/XLPE/LSZH/SWA/LSZH



**Info**

**RE4OFM1 0,6/1 kV  
IEC 60502-1**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke

**Product features**

Armoured multi-core cable, XLPE insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE
- **Bedding:** LSZH
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** LSZH, black

**Technical data**

 **Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/  
yellow; 3 cores green/yellow, blue,  
brown; 4 cores green/yellow, brown,  
black, grey; 5 cores green/yellow,  
blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black;  
2-cores blue, brown - 3 cores brown,  
black, grey; 4 cores blue, brown,  
black, grey; 5 cores blue, brown,  
black, grey, black.

 **Conductor stranding:**  
Class 2 IEC 60228

 **Nominal Voltage U0/U:**  
0,6/1 kV

 **Test voltage:**  
C/C 3500 V x 5 minutes

 **Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C

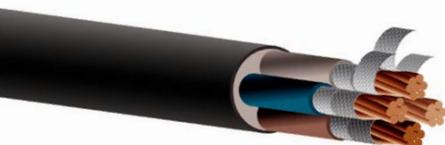
 **Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA 205 H</b>			
3 x 1,5	14,4	47,6	349
3 x 2,5	15,3	76,1	403
3 x 4	17,5	122,4	592
3 x 6	18,8	178,2	695
3 x 10	20,9	297,0	881
3 x 16	24,0	485,1	1.266
3 x 25	27,9	775,5	1.714
3 x 35	30,7	1.049,4	2.096
3 x 50	35,2	1.457,3	2.867
3 x 70	40,8	2.095,5	3.803
3 x 95	45,1	2.887,5	4.774
3 x 120	51,1	3.465,0	6.047
3 x 150	55,8	4.438,5	7.310
3 x 185	61,2	5.689,2	8.871
3 x 240	68,6	7.474,5	11.147
4 x 1,5	15,2	63,4	392
4 x 2,5	17,2	101,4	566
4 x 4	18,5	163,2	676
4 x 6	20,1	237,6	803
4 x 10	23,1	396,0	1.155
4 x 16	25,8	646,8	1.503
4 x 25	30,3	1.034,0	2.086
4 x 35	33,4	1.399,2	2.572

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA 205 H</b>			
4 x 50	38,8	1.943,1	3.566
4 x 70	44,6	2.794,0	4.702
4 x 95	51,0	3.850,0	6.434
4 x 120	56,0	4.620,0	7.526
4 x 150	61,1	5.918,0	9.118
4 x 185	67,8	7.585,6	11.248
4 x 240	76,9	9.966,0	14.876
5 x 1,5	17,0	79,3	543
5 x 2,5	18,2	126,8	633
5 x 4	19,7	204,1	764
5 x 6	21,4	297,0	917
5 x 10	24,7	495,0	1.329
5 x 16	27,7	808,5	1.752
5 x 25	33,0	1.292,5	2.477
5 x 35	37,7	1.749,0	3.345
5 x 50	42,5	2.428,9	4.276
5 x 70	50,3	3.492,5	6.115
5 x 95	55,8	4.812,5	7.742
5 x 120	61,1	5.775,0	9.045
5 x 150	67,4	7.397,5	11.119
5 x 185	74,5	9.482,0	13.701
5 x 240	84,9	12.457,5	18.175

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor



## ÖLFLEX® POWER F90 304 H

Fire resistant, Low voltage power cable LSZH  
CU/MT/XLPE/LSZH

**Info**

**RTE4OM1 0,6/1 kV**  
**IEC 60502-1**  
**IEC 60331-21**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke

**Product features**

Multi-core cable, XLPE over MICA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE over MICA-tape wrapped conductor
- **Outer sheath:** LSZH, black

**Technical data**

**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/yellow; 3 cores green/yellow, blue, brown; 4 cores green/yellow, brown, black, grey; 5 cores green/yellow, blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black; 2-cores blue, brown - 3 cores brown, black, grey; 4 cores blue, brown, black, grey; 5 cores blue, brown, black, grey, black.

**Conductor stranding:**  
Class 2 IEC 60228

**Nominal Voltage U0/U:**  
0,6/1 kV

**Test voltage:**  
C/C 3500 V x 5 minutes

**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C

**Minimum Bending Radius:**  
8 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER F90 304 H</b>			
3 x 1,5	12,8	47,6	214
3 x 2,5	13,7	76,1	261
3 x 4	14,9	122,4	332
3 x 6	16,3	178,2	416
3 x 10	18,3	297,0	576
3 x 16	20,7	485,1	812
3 x 25	24,6	775,5	1.204
3 x 35	27,2	1.049,4	1.538
3 x 50	30,9	1.457,3	2.058
3 x 70	36,1	2.095,5	2.876
3 x 95	40,4	2.887,5	3.801
3 x 120	44,7	3.465,0	4.561
3 x 150	49,4	4.438,5	5.755
3 x 185	54,8	5.689,2	7.257
3 x 240	61,8	7.474,5	9.407
4 x 1,5	13,8	63,4	255
4 x 2,5	14,9	101,4	314
4 x 4	16,3	163,2	404
4 x 6	17,8	237,6	511
4 x 10	20,1	396,0	717
4 x 16	22,7	646,8	1.022
4 x 25	27,1	1.034,0	1.527
4 x 35	30,2	1.399,2	1.977

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER F90 304 H</b>			
4 x 50	34,3	1.943,1	2.650
4 x 70	40,1	2.794,0	3.707
4 x 95	44,9	3.850,0	4.909
4 x 120	49,9	4.620,0	5.917
4 x 150	54,9	5.918,0	7.437
4 x 185	61,2	7.585,6	9.424
4 x 240	68,9	9.966,0	12.215
5 x 1,5	15,0	79,3	304
5 x 2,5	16,2	126,8	377
5 x 4	17,7	204,1	489
5 x 6	19,4	297,0	621
5 x 10	22,0	495,0	878
5 x 16	24,9	808,5	1.258
5 x 25	30,0	1.292,5	1.905
5 x 35	33,5	1.749,0	2.468
5 x 50	38,0	2.428,9	3.309
5 x 70	44,4	3.492,5	4.630
5 x 95	49,9	4.812,5	6.164
5 x 120	55,5	5.775,0	7.425
5 x 150	61,0	7.397,5	9.332
5 x 185	68,2	9.482,0	11.859
5 x 240	76,6	12.457,5	15.313

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor, Armour SWB, DSTA



## ÖLFLEX® POWER SWA F90 306 H

Fire resistant, armoured, Low voltage power cable LSZH  
CU/MT/XLPE/LSZH/SWA/LSZH



**Info**

**RTE4OFM1 0,6/1 kV**  
**IEC 60502-1**  
**IEC 60331-21**

**Benefits**

- Sunlight resistant
- Hydrocarbon and Chemical resistant
- Fire behaviour
- Oil resistant
- Halogen free
- Low Smoke

**Product features**

Armoured multi-core cable, XLPE over MI-CA-tape insulated and LSZH jacketed

**Norm references / Approvals**

- **Hydrocarbon & Oil resistance**  
CEI 20-34/0
- **Smoke**  
IEC 61034-1 and 2
- **Halogen acid gas**  
IEC 60754-1 and 2
- **Fire behaviour**  
IEC 60332-1-2  
IEC 60332-3-22 (Cat. A)  
IEC 60331-21

**Design**

- **Conductor:** Stranded Annealed Copper
- **Core insulation:** XLPE over MICA-tape wrapped conductor
- **Bedding:** LSZH
- **Armour:** Galvanized Steel Wire
- **Outer sheath:** LSZH, black

**Technical data**



**Core identification code:**  
WITH PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core green/  
yellow; 3 cores green/yellow, blue,  
brown; 4 cores green/yellow, brown,  
black, grey; 5 cores green/yellow,  
blue, brown, black, grey.

WITHOUT PROTECTIVE CONDUCTOR:  
according to HD 308 - 1 core black;  
2-cores blue, brown - 3 cores brown,  
black, grey; 4 cores blue, brown,  
black, grey; 5 cores blue, brown,  
black, grey, black.



**Conductor stranding:**  
Class 2 IEC 60228



**Nominal Voltage U0/U:**  
0,6/1 kV



**Test voltage:**  
C/C 3500 V x 5 minutes



**Temperature range:**  
during operation: -30° to +70°C  
during installation: -5° to +50°C



**Minimum Bending Radius:**  
10 x Outer Diameter

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA F90 306 H</b>			
3 x 1,5	17,5	47,6	536
3 x 2,5	18,4	76,1	599
3 x 4	19,6	122,4	691
3 x 6	21,0	178,2	797
3 x 10	23,8	297,0	1.111
3 x 16	26,2	485,1	1.392
3 x 25	30,3	775,5	1.866
3 x 35	33,1	1.049,4	2.256
3 x 50	38,0	1.457,3	3.100
3 x 70	43,2	2.095,5	4.008
3 x 95	48,8	2.887,5	5.394
3 x 120	53,5	3.465,0	6.301
3 x 150	58,0	4.438,5	7.546
3 x 185	64,1	5.689,2	9.228
3 x 240	70,8	7.474,5	11.416
4 x 1,5	18,6	63,4	601
4 x 2,5	19,6	101,4	679
4 x 4	21,0	163,2	793
4 x 6	23,2	237,6	1.044
4 x 10	25,5	396,0	1.297
4 x 16	28,2	646,8	1.654
4 x 25	33,0	1.034,0	2.267
4 x 35	36,9	1.399,2	2.990

Number cores and mm <sup>2</sup> per conductor	Approx. Outer Diameter (mm)	Copper index (kg/km)	Approx. Weight (kg/km)
<b>ÖLFLEX® POWER SWA F90 306 H</b>			
4 x 50	41,5	1.943,1	3.793
4 x 70	48,3	2.794,0	5.322
4 x 95	53,7	3.850,0	6.724
4 x 120	58,7	4.620,0	7.835
4 x 150	64,1	5.918,0	9.517
4 x 185	70,4	7.585,6	11.599
4 x 240	79,5	9.966,0	15.283
5 x 1,5	19,7	79,3	671
5 x 2,5	20,9	126,8	764
5 x 4	23,2	204,1	1.020
5 x 6	24,9	297,0	1.189
5 x 10	27,4	495,0	1.496
5 x 16	30,6	808,5	1.946
5 x 25	36,7	1.292,5	2.916
5 x 35	40,6	1.749,0	3.596
5 x 50	45,2	2.428,9	4.523
5 x 70	53,2	3.492,5	6.439
5 x 95	58,7	4.812,5	8.089
5 x 120	64,5	5.775,0	9.487
5 x 150	70,3	7.397,5	11.515
5 x 185	78,8	9.482,0	14.925
5 x 240	87,8	12.457,5	18.669

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Conductor Class 5, Tinned conductor



CABLES	PAG	NOMENCLATURE	CORE INSULATION	SCREEN	CHEMICAL BARRIER	
UNITRONIC® BUS PA	116	PA = Process Automation Variant with UL/CSA CMG	foam - skin PE	TCWB	UPON REQUEST	
UNITRONIC® BUS LD	118	LD is a LAPP abbreviation for long distance	special PE	TCWB	UPON REQUEST	
UNITRONIC® BUS PB	120	Lapp Kabel is a member of the PROFIBUS User Organisation (PNO) A for Advanced here: UL and CSA approvals	foam - skin PE	Aluminum/PET + TCWB	UPON REQUEST	
ETHERLINE® CAT.6A + CAT.7	122	Industrial Ethernet cable For PROFINET applications with 4 pairs CAT.6Aand Cat.7 qualified for 10Gbit/s	foam - skin PE	Aluminum/PET + TCWB	UPON REQUEST	
HITRONIC® HUN UNIVERSAL CABLE	124	A/J-DQ(ZN)BH or U-DQ(ZN)BH Universal cable with central loose tube and non-metallic strain relief	LSZH outer sheath			
HITRONIC® HQN OUTDOOR CABLE	125	A-DQ(ZN)B2Y Outdoor cable with central loose tube and non-metallic strain relief	PE outer sheath		UPON REQUEST	
HITRONIC® FIRE	126	A/J-DQ(ZN)BH(SR)H or U-DQ(ZN)BH(SR)H Fire-resistant cable designed according to IEC 60331-25 System integrity for at least 90 minutes in the event of ire	LSZH inner and outer sheaths			

	CONDUCTOR STRANDING	ARMOUR	NOMINAL VOLTAGE U <sub>0</sub> /U	OPERATING TEMP. MIN. °C	OPERATING TEMP. MAX °C	REFERENCE NORMS
	Class 2 IEC 60228	UPON REQUEST	250 V	-40	+80	IEC 60332-1-2, IEC 61158-2
	Class 2 IEC 60228	UPON REQUEST	250 V	-40	+80	IEC 60332-1-2
	Class 2 IEC 60228	UPON REQUEST	250 V	-40	+80	IEC 60332-1-2, DIN 19245, EN 50170
	Class 1 IEC 60228	UPON REQUEST	125 V	-25	+80	IEC 60332-2-3-25, IEC 60754, EN 50173-3 ISO/IEC 24702
		UPON REQUEST		-30	+70	
		UPON REQUEST		-40	+70	IEC 60754-1, Environmental and mechanical tests comply to EN 187000 and IEC 60794
		UPON REQUEST		-30	+70	IEC 60754-1, IEC 61034-2, EC 60331-25, IEC 60332-1-1



## UNITRONIC® BUS PA

Cables for bus system PROFIBUS-PA



**Info**

**PA = Process Automation Variant with UL/CSA CMG**

**Benefits**

- FC (Fast Connect) version is oil and UV-resistant

**Application range**

- Process-automation application for connecting sensors and actuators - including areas with risks of explosion.
- Fixed installation

**Product features**

- Bit rate = 31.25 kbit/s. Transmission technology RS485 also possible but bit rate is limited to 1.5 Mbit/s
- Maximum cable length is dependent on several factors (e.g. supply voltage, current demand).
- Technical Data: refer to the overview on "UNITRONIC® Bus Cables"
- Flame-retardant according IEC 60332-1-2

**Norm references / Approvals**

- PROFIBUS® PA is standardised in EN 50170 as PROFIBUS® DP and PROFIBUS® FMS
- Transmission technology for PROFIBUS-PA in accordance with international standard IEC 61158-2
- FC variant with UL/CSA approval (CMG / PLTC)

**Design**

- UNITRONIC® BUS PA (BU/BK)  
Stranded conductor, core colours: red and green, copper braiding, PVC sheath, colour: blue (intrinsically safe area), colour: black (non-intrinsically safe area)
- UNITRONIC® BUS PA FC (BU/BK)  
Solid core, UL/CSA CMG approval and "Fast Connect" cable design, which enables rapid connection of the IDC connector (Insulation Displacement Connection).

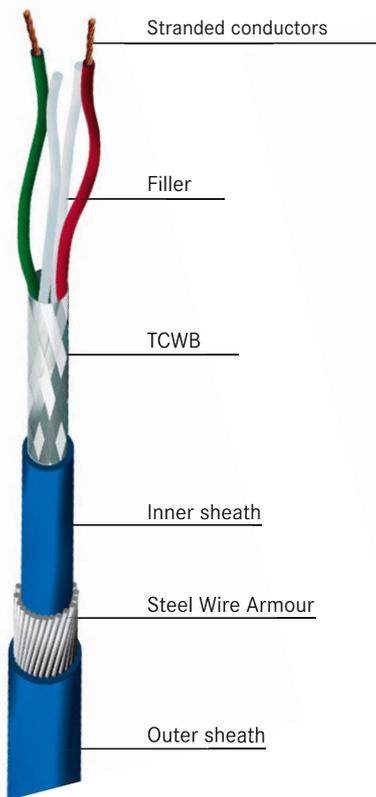
**Technical data**

- Peak operating voltage:**  
(not for power applications) 250 V
- Conductor resistance:**  
(loop): max. 44 ohm/km
- Minimum Bending Radius:**  
10 x outer diameter
- Test voltage:**  
C/C 1500 V x 1 minute
- Temperature range:**  
Fixed installation: -30°C to +80°C  
During installation: -5°C to +50°C
- Characteristic impedance:**  
100 ± 20 Ohm

Article Number	Number of pairs and cable diameter per conductor in mm	Outer diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>For fixed installation - conventional cable assembly</b>				
2170234	1 x 2 x 1,3	8,0	45,0	84
2170235	1 x 2 x 1,3	8,0	45,0	84
<b>For fixed installation - "Fast Connect" cable assembly - UL/CSA CMG approval</b>				
2170334	1 x 2 x 1.00	8,0	45,5	103
2170335	1 x 2 x 1.00	8,0	45,5	103

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Special armouring



### UNITRONIC® ARMOUR SWA BUS PA

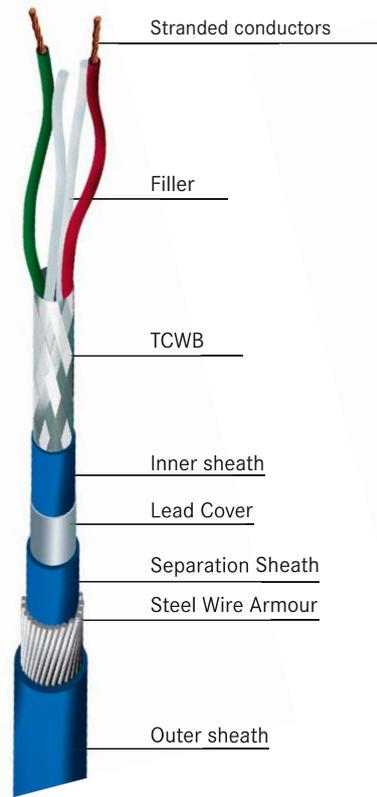
Cables for bus systems profibus -PA with steel wire armouring (SWA)

#### ■ Benefits

- High mechanical protection against accidental impacts
- Excellent rodent protection
- Suitable for direct burial
- UV and water-resistant

#### ■ Application range

- Heavy industrial areas
- For indoor or outdoor use
- Methods of deployment: empty plastic pipes, ducts and trays



### UNITRONIC® ARMOUR SWA LEAD BUS PA

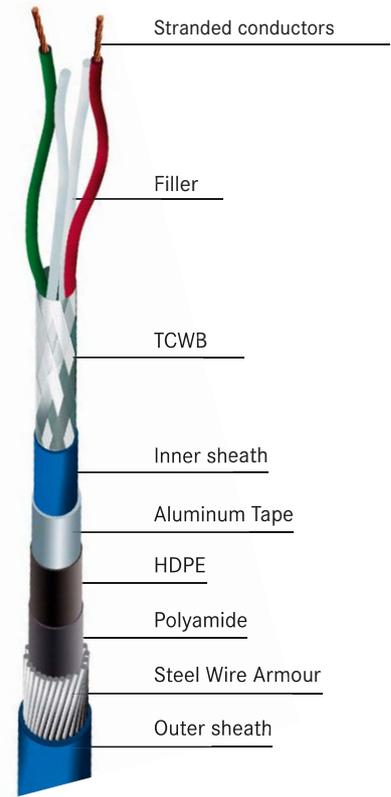
Cables for bus systems profibus -PA with extruded lead armouring for chemical protection

#### ■ Benefits

- Protection against hydrocarbons and other chemicals
- Excellent rodent protection
- High mechanical protection against accidental impacts

#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances



### UNITRONIC® ARMOUR SWA AL/HDPE/PA BUS PA

Cables for bus systems profibus -PA with aluminum tape and additional HDPE and PA sheaths for water and chemical protection

#### ■ Benefits

- Aluminum tape acts as a barrier to prevent water penetration
- Cost-effective protection against hydrocarbons and other aggressive chemicals (EN 50288-7)
- High mechanical protection

#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances

Inner and outer sheath materials are based on the area of installation:

- For outdoors, PE or PVC is used
- For indoor use, where flame retardance is required, LSZH material is used

Photographs are not to scale and do not represent detailed images of the respective products.



## UNITRONIC® BUS LD

Cables for bus systems RS485/RS422



**Info**

**LD is a LAPP abbreviation for long distance**

**Benefits**

- Suitable for multiple Bus systems based on RS485 / RS422

**Application range**

- For fixed installation  
Maximum electromagnetic screening
- Bus cables for bus systems such as e.g. Modbus, SUCOnet P, Modulink P, VariNet-P)
- Dry or damp rooms

**Product features**

- The stated bit rates result in the following cable lengths (maximum) of one bus segment:
- 9.6-93.75 kbit/s = 1200m
- 187.5 kbit/s = max. 1,000 m
- 500 kBit/s = max. 400 m
- Flame-retardant according IEC 60332-1-2

**Norm references / Approvals**

- UL variant has approval: UL/CSA type CMX acc. to UL 444 and CSA C22.2 no. 214-02

**Design**

- Stranded bare 7-wire conductor, colour-coded according to DIN 47100
- Copper braid
- PVC sheath
- Colour: violet (RAL 4001)
- UNITRONIC® BUS LD A as UNITRONIC® BUS LD, but with UL/CSA approval

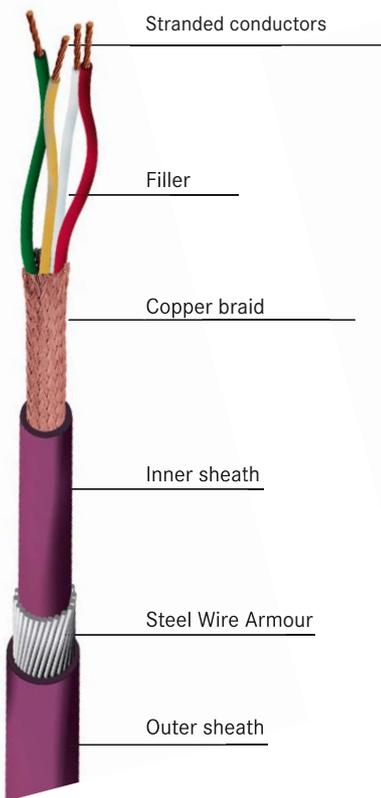
**Technical data**

- Mutual capacitance**  
(800 Hz): max. 60 nF/km
- Peak operating voltage**  
(not for power applications) 250 V
- Conductor resistance**  
(loop): max. 186 ohm/km
- Minimum bending radius**  
8 x outer diameter
- Test voltage**  
Core/core: 1500 V rms
- Temperature range**  
Fixed installation: -40°C to +80°C  
Flexing: -5°C to +70°C
- Characteristic impedance**  
100 - 120 Ohm

Article Number	Number of pairs and mm <sup>2</sup> per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>for fixed installation</b>				
2170203	1 x 2 x 0,22	5,7	18,0	37
2170204	2 x 2 x 0,22	7,1	28,0	45
2170205	3 x 2 x 0,22	7,2	37,0	72
<b>For fixed installation - UL/CSA CMX approval</b>				
2170803	1 x 2 x 0,22	5,7	18,0	39

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Special armouring



### UNITRONIC® ARMOUR SWA BUS LD

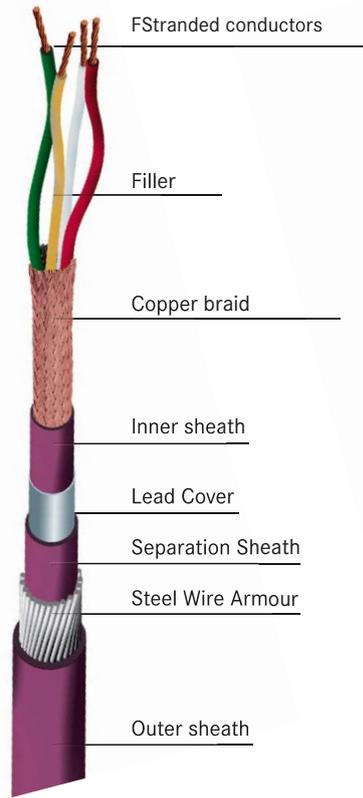
Cable for bus systems RS485/RS422 with steel wire armouring (SWA)

#### ■ Benefits

- High mechanical protection against accidental impacts
- Excellent rodent protection
- Suitable for direct burial
- UV and water-resistant

#### ■ Application range

- Heavy industrial areas
- For indoor or outdoor use
- Methods of deployment: empty plastic pipes, ducts and trays



### UNITRONIC® ARMOUR SWA LEAD BUS LD

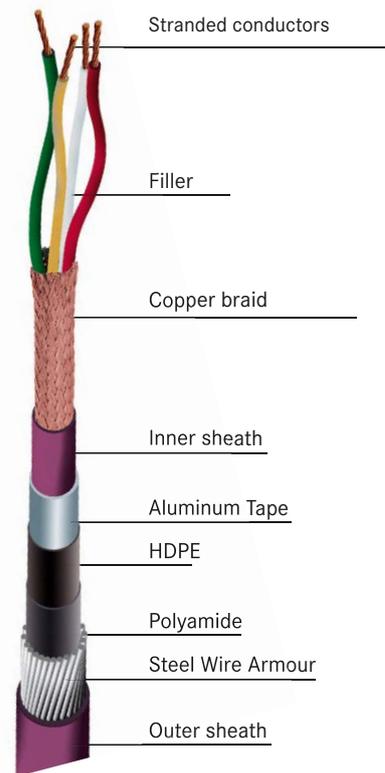
Cable for bus systems RS485/RS422 with extruded lead armouring for chemical protection

#### ■ Benefits

- Protection against hydrocarbons and other chemicals
- Excellent rodent protection
- High mechanical protection against accidental impacts

#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances



### UNITRONIC® ARMOUR SWA AL/HDPE/PA BUS LD

Cable for bus systems RS485/RS422 with aluminum tape and additional HDPE and PA sheaths for water and chemical protection

#### ■ Benefits

- Aluminum tape acts as a barrier to prevent water penetration
- Cost-effective protection against hydrocarbons and other aggressive chemicals (EN 50288-7)
- High mechanical protection

#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances

Inner and outer sheath materials are based on the area of installation:

- For outdoors, PE or PVC is used
- For indoor use, where flame retardance is required, LSZH material is used

Photographs are not to scale and do not represent detailed images of the respective products.



## UNITRONIC® BUS PB

Cables for bus systems PROFIBUS-DP/FMS/FIP



**Info**

- Lapp Kabel is a member of the PROFIBUS User Organisation (PNO)
- A for Advanced here: UL and CSA approvals

**Application range**

- For fixed installation
- Maximum electromagnetic screening
- Dry or damp rooms
- Item nos. 2170233, 2170333, 2170820, 2170824, 2170826 are all UV-resistant

**Product features**

- These bus cables can be used for PROFIBUS-DP as well as for PROFIBUS-FMS and FIP
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply (cable type A, PROFIBUS-DP):

- 93.75 kbit/s = 1200 m
- 187.5 kbit/s = 1000 m
- 500 kbit/s = 400 m
- 1.5 Mbit/s = 200 m
- 12.0 Mbit/s = 100 m

**Norm references / Approvals**

- In accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC NET, also suitable for FIP (Factory Instrumentation Protocol)

**Design**

- FC: "Fast Connect" cable design
- P: Polyurethane
- H: Halogen-free
- PE: polyethylene, black Outer sheath, e.g. for the food and beverage industry
- 7-W: 7-wire, e.g. for applications where vibrations occur
- COMBI: Data transmission and power supply in one cable

**Technical data**



**Norm references / Approvals**  
See below for UL approval type

**Resistant**  
UV-resistant products  
Item nos. 2170233, 2170333, 2170820, 2170824, 2170826 are all UV-resistant



**Mutual capacitance**  
(800 Hz): max. 30 nF/km



**Peak operating voltage**  
(not for power applications) 250 V



**Conductor resistance**  
(loop): max. 133 ohm/km



**Minimum bending radius**  
Fixed installation: see data sheet



**Test voltage**  
Core/core: 1500 V rms

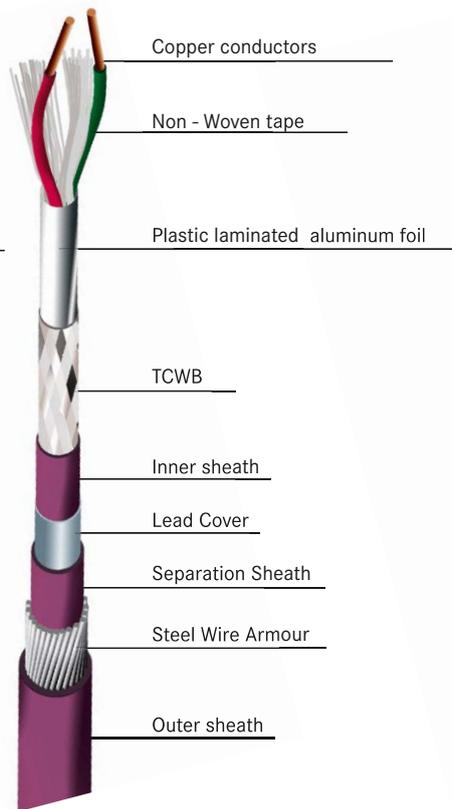
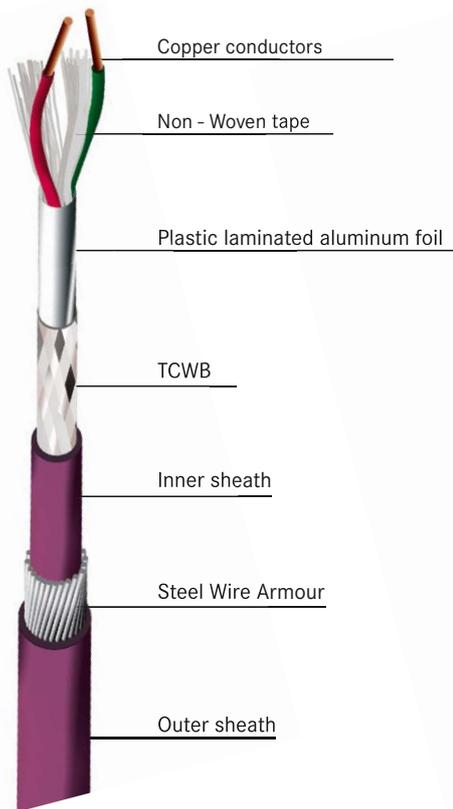


**Characteristic impedance**  
150 ± 15 Ohm

Article Number	Number of pairs and conductor diameter (mm)	Outer diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>For fixed installation - conventional cable assembly</b>				
2170220	1 x 2 x 0.64	8,0	30,1	74
2170233	1 x 2 x 0.64	8,0	30,1	57
2170226	1 x 2 x 0.64	8,0	30,1	55
2170225	1 x 2 x 0,64 Ø + 3 x 1,0 mm <sup>2</sup>	9,8	59,0	92
<b>For fixed installation - UL/CSA CMX approval</b>				
2170219	1 x 2 x 0.64	8,0	30,1	57
<b>For fixed installation - UL/CSA CMG approval</b>				
2170824	1 x 2 x 0.64	8,0	30,1	55
<b>For fixed installation - "Fast Connect" cable assembly</b>				
2170333	1 x 2 x 0.64	8,0	26,0	67
<b>For fixed installation - UL/CSA CMX approval</b>				
2170330	1 x 2 x 0.64	8,0	26,0	71
<b>For fixed installation - "Fast Connect" cable assembly - UL/CSA CMG approval</b>				
2170820	1 x 2 x 0.64	8,0	26,0	84
2170826	1 x 2 x 0.64	8,0	26,0	67
2170326	1 x 2 x 0.64	8,0	26,0	72

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request. Photographs are not to scale and do not represent detailed images of the respective products

**AVAILABLE ALSO IN:** Special armoring



### UNITRONIC® ARMOUR SWA BUS PB

Cable for bus systems profibus - DP/FMS/FIP with steel wire armoring (SWA)

#### ■ Benefits

- High mechanical protection against accidental impacts
- Excellent rodent protection
- Suitable for direct burial
- UV and water-resistant

#### ■ Application range

- Heavy industrial areas
- For indoor or outdoor use
- Methods of deployment: empty plastic pipes, ducts and trays

### UNITRONIC® ARMOUR SWA LEAD BUS PB

Cable for bus systems profibus - DP/FMS/FIP with extruded lead armoring for chemical protection

#### ■ Benefits

- Protection against hydrocarbons and other chemicals
- Excellent rodent protection
- High mechanical protection against accidental impacts

#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances

### UNITRONIC® ARMOUR SWA AL/HDPE/PA BUS PB

Cable for bus systems profibus - DP/FMS/FIP with aluminum tape and additional HDPE and PA sheaths for water and chemical protection

#### ■ Benefits

- Aluminum tape acts as a barrier to prevent water penetration
- Cost-effective protection against hydrocarbons and other aggressive chemicals (EN 50288-7)
- High mechanical protection

#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances

Inner and outer sheath materials are based on the area of installation:

- For outdoors, PE or PVC is used
- For indoor use, where flame retardance is required, LSZH material is used

Photographs are not to scale and do not represent detailed images of the respective products.



## ETHERLINE® CAT.6A + CAT.7

LAN cables for structured industrial cabling



**Info**

**Industrial Ethernet cable  
For PROFINET applications  
with 4 pairs  
CAT.6A and Cat.7 qualified  
for 10Gbit/s**

**Benefits**

- Screened against interference
- Industrial use
- Can be used for Industrial Ethernet in harsh industrial environments

**Benefits**

- for industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Fixed installation
- Can be used in dry or damp rooms
- For PROFINET applications type A

**Product features**

- PUR outer sheath is highly resistant to mineral oils and abrasion
- Robust, halogen-free outer sheath
- PVC sheath
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference

**Design**

- Solid bare copper wire AWG22
- Core insulation made of polyethylene (PE)
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Colour: green (based on RAL 6018)

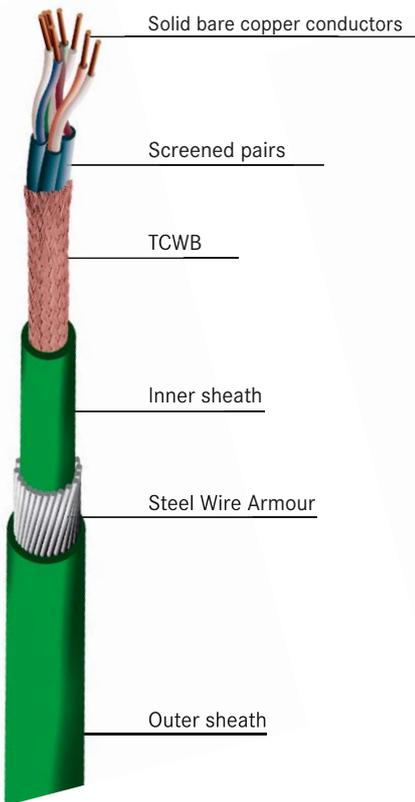
**Technical data**

- Peak operating voltage**  
(not for power applications) 125 V
- Minimum bending radius**  
Fixed installation: see data sheet
- Temperature range**  
See data sheet
- Characteristic impedance**  
100 ohm at 1 - 100 MHz

Article Number	Number of pairs and AWG per conductor	Approx Outer Diameter (mm)	Copper index (kg/km)	Approx Weight (kg/km)
<b>Outer sheath: halogen-free, flame-retardant compound</b>				
2170466	4 x 2 x AWG22/1	8.7	53.0	99
2170476	4 x 2 x AWG22/1	8.7	53.0	99
<b>Outer sheath: PUR, halogen-free</b>				
2170465	4 x 2 x AWG22/1	8.7	53.0	91
2170475	4 x 2 x AWG22/1	8.7	53.0	91
<b>Outer sheath: PVC</b>				
2170464	4 x 2 x AWG22/1	8.7	53.0	98
2170474	4 x 2 x AWG22/1	8.7	53.0	98

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**AVAILABLE ALSO IN:** Special armoring



### ETHERLINE® ARMOUR SWA CAT. 7

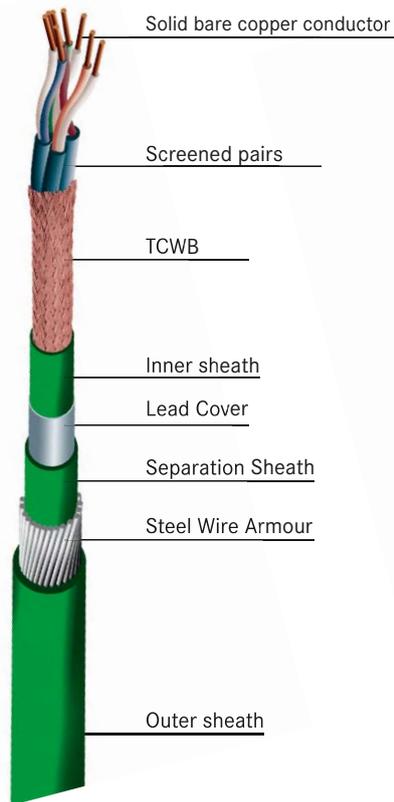
Lan cables with steel wire armouring (SWA)

#### ■ Benefits

- High mechanical protection against accidental impacts
- Excellent rodent protection
- Suitable for direct burial
- UV and water-resistant

#### ■ Application range

- Heavy industrial areas
- For indoor or outdoor use
- Methods of deployment: empty plastic pipes, ducts and trays



### ETHERLINE® ARMOUR SWA LEAD CAT. 7

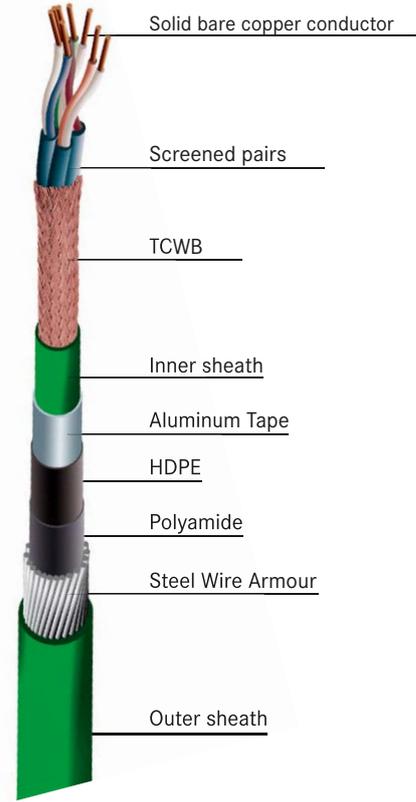
Lan cables with extruded lead armouring for chemical protection

#### ■ Benefits

- Protection against hydrocarbons and other chemicals
- Excellent rodent protection
- High mechanical protection against accidental impacts

#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances



### ETHERLINE® ARMOUR SWA AL/HDPE/PA CAT. 7

Lan cables with aluminum tape and additional HDPE and PA sheaths for water and chemical protection

#### ■ Benefits

- Aluminum tape acts as a barrier to prevent water penetration
- Cost-effective protection against hydrocarbons and other aggressive chemicals (EN 50288-7)
- High mechanical protection

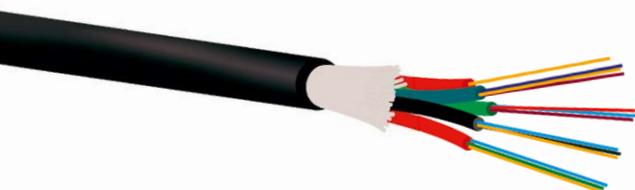
#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances

Inner and outer sheath materials are based on the area of installation:

- For outdoors, PE or PVC is used
- For indoor use, where flame retardance is required, LSZH material is used

Photographs are not to scale and do not represent detailed images of the respective products.



## HITRONIC® HUN UNIVERSAL CABLE

GOF - Glass Optical Fibre



**Info**

**A/J-DQ(ZN)BH or U-DQ(ZN)BH**  
**Universal cable with central loose tube and non-metallic strain relief**

**Benefits**

- Flame retardance makes it suitable for indoor and outdoor installations
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- UV and water-resistant
- Zero electromagnetic interference as the cable contains no metal

**Application range**

- For indoor and outdoor use
- Campus backbone
- Industrial environments
- Methods of Deployment: empty plastic pipes, ducts and trays

**Product features**

- Flame-retardant and halogen-free outer sheath
- Central loose tube with up to 24 fibres
- Colour-coded fibres
- Longitudinal watertight
- Rodent-protection

**Design**

- Glass fibres with primary coating
- Gel-filled loose tube
- Water-blocking reinforced glass yarn strain relief
- LSZH outer sheath
- Colour: dark grey

**Technical data**

- Optical fibre type:**  
Core material: glass  
Cladding material: glass
- Temperature range:**  
Fixed installation: -30°C to +70°C
- Permissible bending radius:**  
Static: ≥ 15 x outer diameter  
Dynamic: ≥ 20 x outer diameter
- Permissible tensile force:**  
Fixed installation: 1500 N  
Short-term: 2000 N

Article Number	Fibre type	Number of fibres	Outer diameter (mm)	Approx Weight (kg/km)
<b>Multimode G 50 OM3</b>				
27400304	50/125 OM3	4	7,3	53
27400308	50/125 OM3	8	7,3	53
27400312	50/125 OM3	12	7,3	53
27400324	50/125 OM3	24	8,3	60
26400324	50/125 OM3	24	9,3	84
26400348	50/125 OM3	48	11,0	109
<b>Multimode G 50 OM2</b>				
27400204	50/125 OM2	4	7,3	53
27400208	50/125 OM2	8	7,3	53
27400212	50/125 OM2	12	7,3	53
27400224	50/125 OM2	24	8,3	60
<b>Multimode G 62.5 OM1</b>				
27400104	62.5/125 OM1	4	7,3	53
27400108	62.5/125 OM1	8	7,3	53
27400112	62.5/125 OM1	12	7,3	53
27400124	62.5/125 OM1	24	8,3	60
<b>Single-mode E 9 OS2</b>				
27400904	9/125 OS2	4	7,3	53
27400908	9/125 OS2	8	7,3	53
27400912	9/125 OS2	12	7,3	53
27400924	9/125 OS2	24	8,3	60
26400924	9/125 OS2	24	9,3	84
26400948	9/125 OS2	48	11,0	109
26400972	9/125 OS2	72	12,6	148
26400996	9/125 OS2	96	14,3	190
26400944	9/125 OS2	144	17,0	221

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## HITRONIC® HQN OUTDOOR CABLE

GOF - Glass Optical Fibre



### Info

**A-DQ(ZN)B2Y**  
Outdoor cable with central loose tube and non-metallic strain relief

### Benefits

- Suitable for direct burial
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- UV and water-resistant
- Zero electromagnetic interference as the cable contains no metal

### Application range

- For outdoor use
- Campus backbone
- WAN applications
- Industrial environments
- Methods of Deployment: empty plastic pipes, ducts and trays

### Product features

- Central loose tube with up to 24 fibres
- Colour-coded fibres
- Longitudinal watertight
- Rodent-protection
- Robust, halogen-free outer sheath

### Design

- Glass fibres with primary coating
- Gel-filled loose tube
- Water-blocking reinforced glass yarn strain relief
- PE outer sheath
- Colour: black (RAL 9005)

### Technical data



#### Optical fibre type:

Core material: glass  
Cladding material: glass



#### Temperature range:

Fixed installation: -40°C to +70°C



#### Permissible bending radius:

Static:  $\geq 15 \times$  outer diameter  
Dynamic:  $\geq 20 \times$  outer diameter



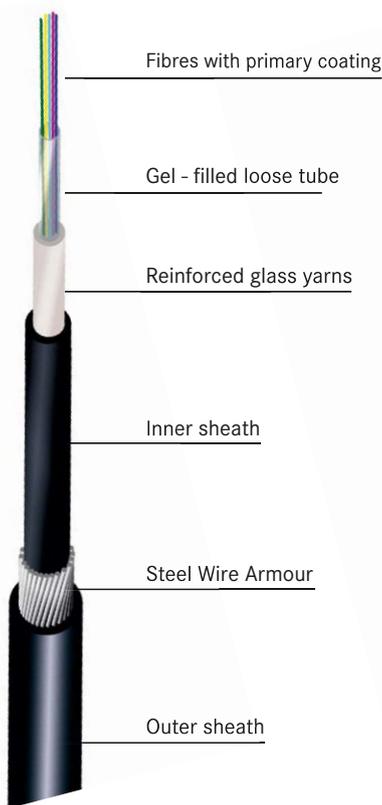
#### Permissible tensile force:

Fixed installation: 1500 N  
Short-term: 2000 N

Article Number	Fibre type	Number of fibres	Outer diameter (mm)	Approx Weight (kg/km)
<b>Multimode G 50 OM3</b>				
27600304	50/125 OM3	4	7,3	40
27600304	50/125 OM3	8	7,3	40
27600312	50/125 OM3	12	7,3	40
27600324	50/125 OM3	24	8,3	65
<b>Multimode G 50 OM2</b>				
27600204	50/125 OM2	4	7,3	40
27600208	50/125 OM2	8	7,3	40
27600212	50/125 OM2	12	7,3	40
27600224	50/125 OM2	24	8,3	65
<b>Multimode G 62.5 OM1</b>				
27600104	62.5/125 OM1	4	7,3	40
27600108	62.5/125 OM1	8	7,3	40
27600112	62.5/125 OM1	12	7,3	40
27600124	62.5/125 OM1	24	8,3	65
<b>Single-mode E 9 OS2</b>				
27600904	9/125 OS2	4	7,3	40
27600908	9/125 OS2	8	7,3	40
27600912	9/125 OS2	12	7,3	40
27600924	9/125 OS2	24	8,3	65

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**AVAILABLE ALSO IN:** Special armouring



### HITRONIC® ARMOUR SWA

Fibre optic cable with steel wire armouring (SWA)

#### ■ Benefits

- High mechanical protection against accidental impacts
- Excellent rodent protection
- Suitable for direct burial
- UV and water-resistant

#### ■ Application range

- Heavy industrial areas
- For indoor or outdoor use
- Methods of deployment: empty plastic pipes, ducts and trays

#### ■ Technical data

**Fibre**  
 Core/Cladding material: Glass/Glass  
 Type of fibre: Singlemode 9/125 OS2;  
 Multimode 50/125 OM4, 50/125 OM3,  
 50/125 OM2, and 62.5/125 OM1  
 No. of fibres: 4-144

**Temperature range**  
 -40 °C to + 70 °C

**Tensile force (maximum)**  
 3000 N



### HITRONIC® ARMOUR SWA LEAD

Fibre optic cable with extruded lead armouring for chemical protection

#### ■ Benefits

- Protection against hydrocarbons and other chemicals
- Excellent rodent protection
- High mechanical protection against accidental impacts

#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances



### HITRONIC® ARMOUR SWA AL/HDPE/PA

Fibre optic cable with aluminum tape and additional HDPE and PA sheaths for water and chemical protection

#### ■ Benefits

- Aluminum tape acts as a barrier to prevent water penetration
- Cost-effective protection against hydrocarbons and other aggressive chemicals (EN 50288-7)
- High mechanical protection

#### ■ Application range

- Harsh oil and chemical environments
- Heavy industrial areas
- For direct burial, especially in the presence of oil and aggressive chemical substances

Inner and outer sheath materials are based on the area of installation:  
 • For outdoors, PE or PVC is used  
 • For indoor use, where flame retardance is required, LSZH material is used

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## HITRONIC® FIRE

Special Applications



**Info**

**A/J-DQ(ZN)BH(SR)H or  
U-DQ(ZN)BH(SR)H**  
Fire-resistant cable designed  
according to IEC 60331-25  
System integrity for at least  
90 minutes in the event of fire

**Benefits**

- Ensures that the fibres can still transmit data during and after a fire (according to IEC 60331-25)
- Suitable for installation in underground tunnels where fire safety is critical
- Additional sheath protects the fibres for use in harsh environments
- Armouring provides excellent protection against high mechanical stress and rodents
- UV-resistant longitudinally and laterally watertight

**Application range**

- In industrial areas that use fire as a tool
- Highly combustible or fire-prone areas
- For indoor and outdoor use
- Methods of Deployment: empty plastic pipes, ducts and trays

**Product features**

- Fire behaviour:
  - Halogen-free (IEC 60754-1)
  - Flame-retardant (IEC 60332-3)
  - Low smoke density (IEC 61034-1/2)
  - Circuit integrity (IEC 60331-25); 90 min Optical fibre cables
- Central loose tube with up to 24 fibres
- Colour-coded fibres
- Longitudinal watertight
- Flame-retardant and halogen-free outer sheath

**Technical data**



**Optical fibre type:**  
Core material: glass  
Cladding material: glass



**Temperature range:**  
Fixed installation: -30°C to +70°C



**Permissible bending radius:**  
Static: ≥ 15 x outer diameter  
Dynamic: ≥ 20 x outer diameter



**Permissible tensile force:**  
Fixed installation: 1500 N  
Short-term: 2200 N

**Design**

- Gel-filled loose tube
- Water-blocking reinforced glass yarn strain relief
- Corrugated steel tape armour
- LSZH inner and outer sheaths
- Colour: black (RAL 9005)

Article Number	Fibre type	Number of fibres	Outer diameter (mm)	Approx Weight (kg/km)
<b>Multimode G 50 OM3</b>				
27560304	50/125 OM3	4	9,8	123
27560308	50/125 OM3	8	9,8	123
27560312	50/125 OM3	12	12,8	188
27560324	50/125 OM3	24	12,8	188
<b>Multimode G 50 OM2</b>				
27560204	50/125 OM2	4	9,8	123
27560208	50/125 OM2	8	9,8	123
27560212	50/125 OM2	12	12,8	188
27560224	50/125 OM2	24	12,8	188
<b>Multimode G 62.5 OM1</b>				
27560104	62.5/125 OM1	4	9,8	123
27560108	62.5/125 OM1	8	9,8	123
27560112	62.5/125 OM1	12	12,8	188
27560124	62.5/125 OM1	24	12,8	188
<b>Single-mode E 9 OS2</b>				
27560904	9/125 OS2	4	9,8	123
27560908	9/125 OS2	8	9,8	123
27560912	9/125 OS2	12	12,8	188
27560924	9/125 OS2	24	12,8	188

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## General

The **resistance** of the product materials in the application environment, correct product assembly and subjected load in the context of permitted limit values (technical data) have a significant impact on the safety and durability of our products. Notes on product usage and technical data can primarily be found on the catalogue product pages, both in the text sections and the tables provided.

This and the following information on special product groups/topics represent guidelines on the use and application of our products, but do not cover the competent project planning of electrical equipment in all its aspects.



## Cables and wires

The applications of cables and wires are extremely diverse and thus governed by a whole range of application standards in the various standard groups (IEC, EN, NEC...). One example is the international standard IEC 60204-1:2009, Electrical equipment of machines – Part 1: General requirements with reference to the requirements of cables and wires as well as their application conditions.

In all cases, meeting these **general** specifications requires the user to perform a professional examination as to the existence of **specific** product standards with other/extended requirements that may take precedence.

In this case, support is provided by the catalogue product pages in form of product and application standards – e.g. “Oil resistance according to VDE 0473-811” or “Railway applications: EN 50306-2”.

In addition, the application information provided in IEC publication 62440:2008-02 Ed. 1.0 must be observed for electrical cables with nominal voltages up to 450/750 V.

A summary of the most important information on cable and wire applications contained in the aforementioned documents is provided below.

### General

Conductors, cables and wires must be selected so that they are suitable for the relevant operating conditions (e.g. voltage, current, protection against electric shock, bundling of cables and wires) and external influences (e.g. ambient temperature, presence of water or corrosive materials, mechanical stress, incl. stress experienced during installation, fire risk).

### Electrical voltage

The control and connecting cables listed in the catalogue are subject to the **"low voltage directive" 2014/35/EU for electrical equipment with a nominal voltage between 50 and 1000 V (alternating current) and between 75 and 1500 V (direct current)**.

The nominal voltage is the reference voltage for which cables and wires are constructed and tested. The nominal voltage of cables and wires used with AC supplies must be greater than or equal to the nominal supply voltage. In the case of a DC supply, the nominal supply voltage must not exceed the nominal voltage of the cable by a factor greater than 1.5. The continuous operating voltage of AC and DC supplies must not exceed the nominal supply voltage by more than 10%.

The nominal voltage of cables and wires is expressed by the ratio  $U/U_0$  in volts, whereby:

- $U_0$  is the effective voltage between a phase conductor and the earth (metal sheath/screening of the cable or surrounding medium)
- $U$  is the effective voltage between two phase conductors of a multi-core cable or a system of single core cables

The dielectric strength of the insulation of cables, conductors and wires must be sufficient for the required test voltage. For cables and wires subjected to voltages over 50 V AC or 120 V DC, the test voltage is a minimum of 2000 V AC for a duration of 5 minutes.

For alternating currents with a maximum of 50 V and direct currents with a maximum of 120 V (typical values for SELV or PELV systems), the test voltage must be a minimum of 500 V AC for a duration of 5 minutes.

The AC test voltages are detailed on the individual product pages in the catalogue under “technical data” and can also be used to make selections in cases where no meaningful  $U/U_0$  ratio can be provided.

### Conductor cross-sections with different measurement systems

IEC 60228 is an important international standard that describes cables with metric cross-sections. North America and other regions currently employ conductor cross-sections according to the AWG (American Wire Gauge) system with kcmil” used for larger cross-sections. A table is provided under T16 to support safe, alternative usage of cables from both these measurement systems.

### Tensile strain

The following applies to **all** conductors up to maximum tensile strain of 1000 N: Max. 15 N per mm<sup>2</sup> conductor cross-section (excl. screening, concentric conductors and divided protective conductors) for static tensile strain when **using** moving/flexible cables and cables for/in fixed installation.

### Transport and storage

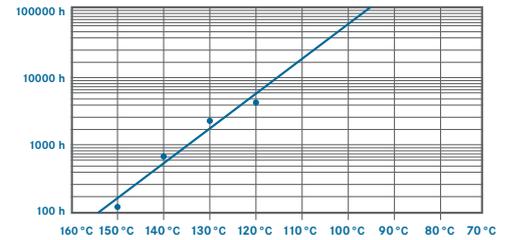
Cables and wires that are **not** designated for outdoor use must be stored indoors, in dry conditions and protected from direct sunlight. If stored outside, all cable and wire ends must be sealed to prevent the ingress of water. The ambient temperature for transport and storage must be between -25 °C and +55 °C (max. +70 °C for no longer than 24 hours). Particularly in the lower temperature ranges, mechanical stress through vibration, shock, bending and twisting must be avoided. This is especially important for PVC-insulated cables and wires. The following guidelines apply for the maximum storage of cables and wires before use and without prior testing:

- One year if stored outdoors
- Two years if stored indoors



## Service life

The average service life of cables is dictated not just by the mechanical and chemical stress, but also by the operating or ambient temperature. As is customary in mechanical engineering, the continuous temperature range of a cable, as specified in our technical data, refers almost exclusively to a period of at least 20,000 h. The adjacent example of an ageing curve according to Arrhenius illustrates the behaviour of an insulating material on the basis of time and temperature. The material tested here has a temperature index of approx. +110 °C at 20,000 h. The material can also be specified with an index of +135 °C, but in this case only for a duration of approx. 3000 h.



## Connection technology

The quality of an electrical connection greatly depends on the choice of suitable components in the relevant nominal cross-sections and the use of recommended tools for processing.

Size differences between the cable and the tubular cable lug/conductor end sleeve are attributable to the fact that class 5 and 6 conductors can be pressed with just one crimp contact – even if the conductors have different structures (bunched, stranded or compressed conductors). Despite the sleeves appearing to be too large for the relevant cross-sections, the correct combination of

conductor, contact and tool will ensure gas-tight crimping. The dimensional accuracy at the aforementioned connection points is governed by standards, incl.:

- DIN EN 60228 (VDE 0295), September 2005 – “Conductors for cables and insulated leads”
- DIN 46228 – 4, September 1990 – “Tubular end-sleeves with plastic sleeve”
- Crimping quality according to DIN 46228-1 and DIN EN 50027



## Testing and inspection

The operator must ensure that the correct functioning and condition of electrical systems and equipment is checked by or under the supervision of a certified electrician. This must occur prior to initial commissioning and before reactivation following any modifications or maintenance work.

Inspection intervals must be set such that any problems that can reasonably be expected are identified in good time. In many cases, the service life can only be established empirically in the relevant applications. Indicators for inspection intervals can be based, for example, on the temperature load (see “Service life”) or the number of permitted alternating bending cycles for drag chains (see information on relevant product pages in the catalogue). As a rule, cables and wires in fixed installations will have a longer service life and will thus also be suitable for longer inspection intervals. Shorter intervals are recommended for cables and wires used at the limit of their permitted parameters. This applies to the following in particular (see also “Technical data” and “Application” on the relevant product pages in the catalogue):

- Minimum bending radius
- Temperature range
- Presence of radiation (e.g. sunlight)
- Existence of tensile strain
- Influence of surrounding chemical substances and unverified resistance
- In the case of water accumulation or condensation in the area of the connection points. Cables and wires should be subjected to a visual inspection to identify any changes to their appearance. This should be done no later than when the cables or wires are likely to have been exposed to excessive loads (be they electrical, thermal, mechanical or chemical).



## Type designations for control cables and harmonised cables (excerpts)

## Control cables

□ □ □ □ □ □ □ x □  
1 2 3 4 5 6 7 8

## 1. Basic type

N VDE standard  
(N) or X in line with VDE

## 2. Insulating material

Y Thermoplastic resins  
X Cross-linked thermoplastic resins  
G Elastomers  
HX Halogen-free materials

## 3. Cable designation

A Core cable  
D Solid wire  
AF Fine-wire core cable  
F Socket core  
L Fluorescent tube cable  
LH Connecting cable,  
light mechanical loads  
MH Connecting cable,  
moderate mechanical loads  
SH Connecting cable,  
heavy mechanical loads  
SSH Connecting cable for special loads  
SL Control cable/welding cable  
S Control cable  
LS Light control cable  
FL Flat cable  
Si Silicone cable  
Z Twin cable  
GL Glass fibre  
Li Braided conductor as per VDE 0812  
LiF Braided conductor as per VDE 0812,  
extra-fine wire

## 4. Special features

T Supporting element  
Ö Enhanced oil resistance  
U Flame-retardant  
w Heat-resistant, weather-resistant  
FE Insulation retained for a limited time  
C Screening braid  
D Screening as Cu wire wrapping  
S Steel wire braiding as mech. protection

## 5. Sheaths

As point 2.  
"Insulating material" P/PUR polyurethane

## 6. Protective conductor

-O Without protective conductor  
-J With protective conductor

## 7. Number of cores

... number of cores

## 8. Conductor cross-section

Figures in mm<sup>2</sup>

## Harmonised cables

□ □ □ □ □ - □ □ □ □ □  
1 2 3 4 5 6 7 8 9

## 1. Basic type

H Harmonised type  
A National type

## 2. Nominal voltage

01 100/100 volts  
03 300/300 volts  
05 300/500 volts  
07 450/750 volts

## 3. Insulating material

V PVC  
V2 PVC +90 °C  
V3 PVC flexible at cold temperatures  
B Ethylene propylene rubber  
E PE polyethylene  
X XPE, cross-linked PE  
R Rubber  
S Silicone rubber

## 4. Outer/inner sheath material

V PVC  
V2 PVC +90 °C  
V3 PVC flexible at cold temperatures  
V5 PVC with enhanced oil resistance  
R Rubber  
N Chloroprene rubber  
Q Polyurethane  
J Glass fibre braiding  
T Textile braiding

## 5. Special features

C4 Copper wire screen braiding  
H Flat cable, divisible  
H2 Flat cable, not divisible  
H6 Flat cable, not divisible,  
for lifts  
H8 Helical/spiral cable

## 6. Conductor type

U Single-wire  
R Multi-wire  
K Fine-wire (fixed installation)  
F Fine-wire (flexible installation)  
H Extra-fine wire  
Y Tinsel wire  
D Fine-wire conductor  
for welding cable  
E Extra-fine wire conductor  
for welding cable

## 7. Number of cores

... number of cores

## 8. Protective conductor

X Without protective conductor  
G With protective conductor

## 9. Conductor cross-section

Figures in mm<sup>2</sup>

## Telecommunications cables

□ □ - □ □ □ □ □ x □ x □ □ □ □  
1 2 3 4 5 6 7 8 9 10

## 1. Basic type

A- Outdoor cable  
G- Mining cable  
J- Installation cable  
Li Hose, flexible cable  
S- Jumper cable

## 2. Additional designation

B Lightning protection design  
J Induction protection  
E Electronics

## 3. Insulating material

Y PVC 11Y PUR  
2Y Polyethylene  
O2Y Cellular PE 9Y PP  
5Y PTFE  
6Y FEP  
7Y ETFE  
P Paper

## 4. Special features

F Petroleum jelly filling  
L Aluminium sheath  
LD Corrugated aluminium sheath  
(L) Aluminium strip  
(ST) Metal foil screening  
(K) Copper strip screening  
C Copper screen braiding  
(Z) Steel wire braiding  
W Corrugated steel sheath  
M Lead sheath  
Mz Special lead sheath  
b Armouring  
c Jute sleeve + ground  
E Ground layer + strip

## 5. Sheathing

(see point 3. "Insulating material")

## 6. Number of elements

... number of stranding elements

## 7. Stranding element

1 Single core  
2 Pair

## 8. Conductor diameter

... in mm

## 9. Stranding element

F Star quad (railway)  
St Star quad (phantom)  
StI Star quad (trunk cable)  
StIII Star quad (local cable)  
TF Star quad for TF  
S Signal cable (railway)  
PiMF Screened pair

## 10. Stranding type

Lg Twisted into layers  
Bd Twisted into bundles

## EXAMPLE: NSHTÖU 24G 1.5

ÖLFLEX® CRANE NSHTÖU cable, 24-core,  
with protective cond., cross-section: 1.5 mm<sup>2</sup>

## EXAMPLE: H05 VV-F 3G 1.5

Medium PVC hose, 3-core,  
with protective cond., cross-section: 1.5 mm<sup>2</sup>

## EXAMPLE: A2Y(L)2Y 6 x 2 x 0.8 Bd

Telephone cable for local network  
with PE insulation and layered sheath



Type designations for telecommunications cables and fibre-optic cables

Fibre-optic cables



1. Basic type

- A Outdoor cable
- AT Outdoor cable, divisible
- J Indoor cable
- J/A or U Indoor/outdoor cable, universal cable

2. Fibres

- B Loose tube, unfilled
- D Loose tube, filled
- V Tight-buffered fibres

3. Design elements

- F Petroleum jelly filling
- Q Swelling tape

4. Further design elements

- S Metal element in cable core

5. Sheath

- 2Y PE sheath
- 11Y PUR sheath
- H Halogen-free sheath
- (ZM) With metallic strain relief elements
- (ZN) With non-metallic strain relief elements
- (ZN)2Y PE sheath with non-metallic strain relief elements

6. Armouring

- B Armouring
- B2Y Armouring with PE casing
- (BN) Glass yarn armouring
- (SG) Steel sheath
- (SR) Corrugated steel sheath
- (SR)2Y Corrugated steel sheath with PE casing

7. Number of fibres

Number of fibres

8. Fibre type

- E Monomode fibre glass/glass (SM GOF)
- G Gradient fibre glass/glass (MM GOF)
- K Stepped fibre glass/plastic (PCF)
- P Polymer optical fibre/plastic (POF)

9. Core diameter/fibre sheath diameter

- 50/125 Multimode glass fibre
- 62,5/125 Multimode glass fibre
- 9/125 Monomode glass fibre
- 200/230 Plastic-coated glass fibre
- 980/1000 Polymer optical fibre

10. Category: fibre quality

- OM3 For 50/125 OM3 multimode fibres
- OM2 For 50/125 OM2 multimode fibres
- OM1 For 62.5/125 OM1 multimode fibres
- OS2 For 9/125 OS2 monomode fibres (G 652D)

EXAMPLE 1: A-DQ(ZN)(SR)2Y 12G 50/125 OM3

Outdoor cable with corrugated steel sheath, central loose tube, non-metallic strain relief made of glass yarn, 12 fibres, 50/125 µm OM3 multimode fibres

EXAMPLE 2: J-V2Y(ZN)11Y 2P 980/1000

Plastic fibre-optic cable, two-fibre (duplex), indoor cable with PE inner sheath, non-metallic strain relief, PUR outer sheath

Cable's identification code GEN to CEI-UNEL 35011

Conductors

- U Solid Conductor
- R Stranded conductor
- F Flexible Conductor
- FF Extra Flexible Conductor

Insulations

- R PVC
- R2 PVC Type R2
- R3 PVC 105°C
- R7 PVC 90°C
- E Polyethylene
- E4 Cross-linked Polyethylene (XLPE)
- G4 Silicon Rubber
- G7 High Module Ethylene Propylene Rubber (HEPR)
- G10 Low Smoke Cross-Linked Polyolefin (XLPO)
- T Mica Glass Tape

Cable's shape

- O Round shape cable
- D Flat Cable
- X Cores twisted in pairs, triad, quad

Shields

- C Copper Concentric conductor
- H Aluminium Polyester Tape
- H1 Copper tape or Copper wires shield
- H2 Copper Braid Shield
- H3 Double Copper Braid Shield
- H5 Longitudinal Aluminium Tape

Armours

- A Steel Wire Braid
- F Steel Wires
- N Steel Tape
- Z Steel Stripes
- L Lead Jacket
- H4 Longitudinal Corrugated Steel Tape

Jackets

- R PVC
- R4 Polyamide (nylon)
- E Polyethylene
- E4 Cross-linked Polyethylene (XLPE)
- G Cross-linked Elastomer
- M1 Low Smoke Halogen Free Thermoplastic Material
- M2 Low Smoke Halogen Free cross-linked Material
- T Textile Braid
- T1 Glass Type
- T2 Special Textile
- P Polyetherane
- Tpe Thermoplastic Elastomer

CONDUCTORS

INSULATIONS

CABLE'S SHAPE

SHIELDS

ARMOURS

JACKETS



**Table 8-1: international colour codes for extension and compensating cables**

Thermo couple											
		IEC 60584-3		DIN 43710*		ANSI MC 96.1		BS 4937		NF C 42-324	
Material ⊕ ⊖	Designation	XC	CC	Designation	CC	Designation	CC	Designation	CC	Designation	CC
U	Cu - CuNi										
J	Fe - CuNi										
L	Fe - CuNi										
E	NiCr - CuNi										
K	NiCr - Ni										
	NiCr - Ni										
	NiCr - Ni										
N	NiCrSi - NiSi										
R S	PtRh13 - Pt										
	PtRh10 - Pt										
B	PtRh30 - PtRh6										

The stated temperature specifies the application temperature range for each type.  
 The application temperature range must be reduced if it is required by the insulation material used for the cable.  
 \*DIN 43710 was withdrawn in April 1994.

XC = extension cables  
 CC = compensating cables



## VDE 0293-308/HD 308 S2

### Core ID code for colour-coded low-voltage cables

For marking cores in multi- and several-core cables for use in electrical systems and distribution systems.

For the supply of permanently secured or portable supplies and for portable equipment cables. 3a and 4a: only suitable for specific applications.

Number of cores	Cables with protective conductor (code J or G)	Cables without protective conductor (code O or X)	Cables with concentric conductor
2	–	BU/BN	BU/BN
3	GNYE/BN/BU	BN/BK/GY	BN/BK/GY
3a	–	BU/BN/BK	BU/BN/BK
4	GNYE/BN/BK/GY	BU/BN/BK/GY	BU/BN/BK/GY
4a	GNYE/BU/BN/BK	–	–
5	GNYE/BU/BN/BK/GY	BU/BN/BK/GY/BK	BU/BN/BK/GY/BK
6 and above	GNYE/BK with printed numbers	BK with printed numbers	BK with printed numbers



**Conductor resistances and conductor stranding (metric)**

**Conductor resistances:** up to 0.38 mm<sup>2</sup> as per DIN VDE 0812 and DIN VDE 0881 for stranded conductors, from 0.5 mm<sup>2</sup> as per IEC 60228/DIN EN 60228 (VDE 0295) for conductors made of soft-annealed copper and single and multi-core cables.

Nominal cross-section in mm <sup>2</sup>	Conductor resistances at 20 °C for 1 km in Ω (max. value)			
	made of wires with metal sheath		made of bare wires	
	Class 2	Class 5 + 6	Class 2	Class 5 + 6
0.08		252.0		243.0
0.14		148.0		138.0
0.25		79.9		79.0
0.34		57.5		57.0
0.38		52.8		48.5
0.5	36.7	40.1	36.0	39.0
0.75	24.8	26.7	24.5	26.0
1	18.2	20.0	18.1	19.5
1.5	12.2	13.7	12.1	13.3
2.5	7.56	8.21	7.41	7.98
4	4.70	5.09	4.61	4.95
6	3.11	3.39	3.08	3.30
10	1.84	1.95	1.83	1.91
16	1.16	1.24	1.15	1.21
25	0.734	0.795	0.727	0.780
35	0.529	0.565	0.524	0.554
50	0.391	0.393	0.387	0.386
70	0.270	0.277	0.268	0.272
95	0.195	0.210	0.193	0.206
120	0.154	0.164	0.153	0.161
150	0.126	0.132	0.124	0.129
185	0.100	0.108	0.0991	0.106
240	0.0762	0.0817	0.0754	0.0801
300	0.0607	0.0654	0.0601	0.0641
400	0.0475		0.0470	
500	0.0369		0.0366	
630	0.0286		0.0283	
800	0.0224		0.0221	
1000	0.0177		0.0176	

**Example conductor stranding (metric)**

Cross-section in mm <sup>2</sup>	Multi-wire conductor	Several-wire conductor	Fine-wire conductor	Extra-fine wire conductor			
0.14				~ 18 x 0.10	~ 18 x 0.1	~ 36 x 0.07	~ 72 x 0.05
0.25			~ 14 x 0.15	~ 32 x 0.10	~ 32 x 0.1	~ 65 x 0.07	~ 128 x 0.05
0.34		7 x 0.25	~ 19 x 0.15	~ 42 x 0.10	~ 42 x 0.1	~ 88 x 0.07	~ 174 x 0.05
0.38		7 x 0.27	~ 19 x 0.16	~ 19 x 0.16	~ 48 x 0.1	~ 100 x 0.07	~ 194 x 0.05
0.5	7 x 0.30	7 x 0.30	~ 16 x 0.20	~ 28 x 0.15	~ 64 x 0.1	~ 131 x 0.07	~ 256 x 0.05
0.75	7 x 0.37	7 x 0.37	~ 24 x 0.20	~ 42 x 0.15	~ 96 x 0.1	~ 195 x 0.07	~ 384 x 0.05
1.0	7 x 0.43	7 x 0.43	~ 32 x 0.20	~ 56 x 0.15	~ 128 x 0.1	~ 260 x 0.07	~ 512 x 0.05
1.5	7 x 0.52	7 x 0.52	~ 30 x 0.25	~ 84 x 0.15	~ 192 x 0.1	~ 392 x 0.07	~ 768 x 0.05
2.5	7 x 0.67	~ 19 x 0.41	~ 50 x 0.25	~ 140 x 0.15	~ 320 x 0.1	~ 651 x 0.07	~ 1280 x 0.05
4	7 x 0.85	~ 19 x 0.52	~ 56 x 0.30	~ 224 x 0.15	~ 512 x 0.1	~ 1040 x 0.07	
6	7 x 1.05	~ 19 x 0.64	~ 84 x 0.30	~ 192 x 0.20	~ 768 x 0.1	~ 1560 x 0.07	
10	7 x 1.35	~ 49 x 0.51	~ 80 x 0.40	~ 320 x 0.20	~ 1280 x 0.1	~ 2600 x 0.07	
16	7 x 1.70	~ 49 x 0.65	~ 128 x 0.40	~ 512 x 0.20	~ 2048 x 0.1		
25	7 x 2.13	~ 84 x 0.62	~ 200 x 0.40	~ 800 x 0.20	~ 3200 x 0.1		
35	7 x 2.52	~ 133 x 0.58	~ 280 x 0.40	~ 1120 x 0.20			
50	~ 19 x 1.83	~ 133 x 0.69	~ 400 x 0.40	~ 705 x 0.30			
70	~ 19 x 2.17	~ 189 x 0.69	~ 356 x 0.50	~ 990 x 0.30			
95	~ 19 x 2.52	~ 259 x 0.69	~ 485 x 0.50	~ 1340 x 0.30			
120	~ 37 x 2.03	~ 336 x 0.67	~ 614 x 0.50	~ 1690 x 0.30			
150	~ 37 x 2.27	~ 392 x 0.69	~ 765 x 0.50	~ 2123 x 0.30			
185	~ 37 x 2.52	~ 494 x 0.69	~ 944 x 0.50	~ 1470 x 0.40			
240	~ 37 x 2.87	~ 627 x 0.70	~ 1225 x 0.50	~ 1905 x 0.40			
300	~ 61 x 2.50	~ 790 x 0.70	~ 1530 x 0.50	~ 2385 x 0.40			
400	~ 61 x 2.89		~ 2035 x 0.50				
500	~ 61 x 3.23		~ 1768 x 0.60				
630	~ 91 x 2.97		~ 2286 x 0.60				

**NOTE ON STANDARDS:**

For single-wire conductors... (class 1), please see DIN EN 60228 (VDE 0295), table 1  
 For multi-wire conductors... (class 2), please see DIN EN 60228 (VDE 0295), table 2  
 For fine-wire conductors... (class 5), please see DIN EN 60228 (VDE 0295), table 3  
 For extra-fine wire conductors... (class 6), please see DIN EN 60228 (VDE 0295), table 4



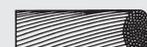
single-wire



multi-/several-wire



fine-wire



extra-fine wire



## Conductor resistances and conductor stranding (metric)

TEMPERATURE COEFFICIENT Kt for the measurement of the ELECTRIC RESISTANCE

Electric resistance at 20°C = Rta x Temperature coefficient (Kt)

Rta = electric resistance at environment temperature

C°	Kt	C°	Kt	C°	Kt
10	1,042	17	1,012	24	0,984
11	1,037	18	1,008	25	0,980
12	1,033	19	1,004	26	0,977
13	1,029	20	1,000	27	0,973
14	1,025	21	0,996	28	0,969
15	1,020	22	0,992	29	0,965
16	1,016	23	0,988	30	0,962



## Properties of cable insulation and sheathing

Applies only to the base materials. Deviations are possible depending on the use/design. Please refer to the relevant page in the catalogue.

Usage criteria	Material					
	Material resistant to org. oils	Polyvinylchloride	Polyethylene	Polyurethane	Polytetrafluoroethylene	Tetrafluoroethylene Hexafluoropropylene copolymer
<b>Parameter</b>						
Abbreviations	Special TPE	PVC	PE	PUR	PTFE	FEP
Code as per VDE	–	Y	2Y	11Y	5Y	6Y
Operating temperature	-50 +120	-30 +70	-50 +70	-50 +90	-190 +260	-100 +200
Dielectric constant (10–3)	2.4	4.0	2.3	4.0 – 6.0	2.1	2.1
Volume resistivity ( $\Omega \times \text{cm}$ )	1015	1012 – 1015	1017	1012	1018	1018
Tensile strength in N/mm <sup>2</sup> (MPa)	5 – 20	10 – 25	15 – 30	15 – 45	15 – 40	20 – 25
Elongation at break in %	400 – 600	150 – 400	400 – 800	300 – 600	240 – 400	250 – 350
Water absorption (20 °C) in %	1 – 2	0.4	0.1	1.5	0.01	0.01
Weather resistance	very good	good	good	very good	very good	very good
Fuel resistance	good	moderate	moderate	good	very good	very good
Oil resistance	Resistance to org. oil: very good	moderate	moderate	good	very good	very good
Flammability	flammable	self-extinguishing	flammable	self-extinguishing*	non-flammable	non-flammable

Usage criteria	Material					
	Ethylene tetrafluoroethylene	Chloroprene rubber	Silicone rubber	Ethylene propylene dien rubber	Thermoplastic elastomer polyolefin based	Thermoplastic elastomer polyester based
<b>Parameter</b>						
Abbreviations	ETFE	CR	SI	EPDM	TPE-O	TPE-E
Code as per VDE	7Y	5G	2G	3G	–	12Y
Operating temperature	-100 +150	-40 +100	-60 +180	-30 +120	-40 +120	-70 +125
Dielectric constant (10–3)	2.6	6.0 – 8.0	2.8 – 3.2	3.2	2.7 – 3.6	3.7 – 5.1
Volume resistivity ( $\Omega \times \text{cm}$ )	$10^{16}$	$10^{13}$	$10^{15}$	$10^{14}$	$5 \times 10^{14}$	$10^{12}$
Tensile strength in N/mm <sup>2</sup> (MPa)	40 – 50	10 – 25	5 – 10	5 – 25	≥ 6	3 – 25
Elongation at break in %	100 – 300	300 – 450	200 – 350	200 – 450	≥ 400	280 – 650
Water absorption (20 °C) in %	0.01	1	1.0	0.02	1.5	0.3 – 0.6
Weather resistance	very good	very good	very good	good	moderate	very good
Fuel resistance	very good	moderate	low	moderate	moderate	good
Oil resistance	very good	good	moderate	moderate	moderate	very good
Flammability	non-flammable	self-extinguishing	hardly flammable	flammable	flammable	flammable



## Common Test Methods for Cables under Fire Conditions

## Reaction to Fire - IEC and corresponding European Standards

IEC Standard CENELEC Standard		CENELEC Standard	
No.	Title	No.	Title
IEC 60332 -1-1 <sup>1)</sup> -1-2 <sup>2)</sup> -1-3	<b>Tests on electric and optical cables under fire conditions</b> Test on a single vertical insulated wire or cable - Apparatus Test on a single vertical insulated wire or cable - Procedure Test on a single vertical insulated wire or cable - Procedure for determination of flaming droplets/particles	EN 50265 -1 -2-1 <sup>1)</sup> -2-2	<b>Test for resistance to vertical flame propagation for a single insulated conductor or cable</b> Apparatus Procedures - 1 kW pre-mixed flame Procedures - Diffusion flame
IEC 60332 -2-1 -2-2	<b>Tests on electric cables under fire conditions</b> Test on a single vertical insulated wire or cable - Apparatus Test on a single vertical insulated wire or cable - Procedure		
IEC 60332-3 <sup>2)</sup> -10 -21 -22 -23 -24 -25	<b>Tests on bunched wires or cables</b> Apparatus Procedures Category A F/R Procedures Category A Procedures Category B Procedures Category C Procedures - small cables	EN 50266 <sup>2)</sup> -1 -2-1 -2-2 -2-3 -2-4 -2-5	<b>Test f. vertical flame spread of vertically mounted bunched wires o.cables</b> Apparatus Procedures Category A F/R Procedures Category A Procedures Category B Procedures Category C Procedures - small cables
IEC 60754 <sup>3)</sup> -1 -2	<b>Tests on gases evolved during combustion of materials from cables</b> Determination of amount of halogen acid gas Determination of degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	EN 50267 <sup>3)</sup> -1 -2-1 -2-2 -2-3	<b>Tests on gases evolved during combustion of materials from cables</b> Apparatus Procedures - Determination of the amount of halogen acid gas Procedures - Determination of degree of acidity of gases for materials by measuring pH and conductivity Procedures - Determination of degree of acidity of gases for cables by determination of the weighted average of pH and conductivity
IEC 61034 <sup>2)</sup> -1 -2	<b>Measurement of smoke density of cables burning u. defined conditions</b> Test apparatus Test procedure and requirements	EN 50268 <sup>2)</sup> -1 -2	<b>Measurement of smoke density of cables burning u. defined conditions</b> Apparatus Procedure

## Resistance to Fire (IEC 60 331)

IEC Standard		CENELEC Standard	
No.	Title	No.	Title
IEC 60331 -11 -21 -22 -23 -25	<b>Tests for electric cables under fire conditions</b> <b>Circuit Integrity</b> Apparatus - Fire alone at temperature of at least 750°C Procedures and requirements - Cables of rated voltage up to and including 0,6/1 kV Procedures Category A Procedures and requirements - Cables of rated voltage greater than 1 kV (under consideration) Proc. and requirements - Electric data cables Proc. and requirements - Optical fibres cables	(under consideration)	(under consideration)

<sup>1)</sup> Tests almost identical

<sup>2)</sup> Tests identical

<sup>3)</sup> The formal structure of the standards differs in some points, but procedure and requirements of tests are identical



US dimension units for cables – comparison with metric dimensions

In North American markets, cable cross-sections are usually stated as AWG (American Wire Gauge) sizes or, for large cable cross-sections (above AWG 4/0), using the unit “kcmil”. You will find these units in the relevant standards for designing cables by current rating.

Multi-standard cables must comply with both the specifications of the metric system (in which the cross-section in mm<sup>2</sup> is stated as the nominal size) as well the requirements of the AWG system. For this reason, both systems are compared below based on the nominal size.

Please note that exact correspondences between the two systems do not exist as the specifications of the two systems differ in terms of the cross-section and conductor resistance. The following table can be used to help you when selecting the correct nominal cross-section.

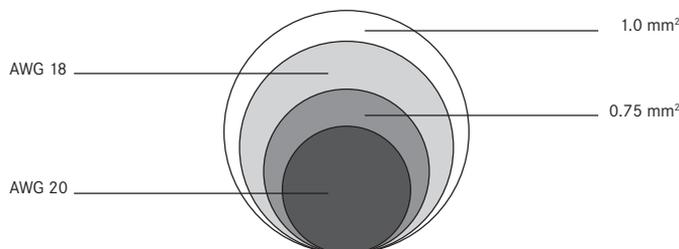
Standards required as part of project planning, such as UL 1581 or IEC 60228 (VDE 0295), must be applied accordingly.

Please note that when selecting appropriate connecting elements such as conductor end sleeves, the **actual** conductor cross-section is decisive. This is stated on the relevant product page.

Column 1a	Column 1b	Column 2	Column 3	Column 4	Column 5a	Column 5b
North American cross-section required	Geometric conversion	Metric nominal cross-section that meets the electrical requirements	Metric nominal cross-section required	North American size that meets the electrical requirements		
AWG	kcmil	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	AWG	kcmil
750	380.03	400	400			800
500	253.35	300	300			750
450	228.02	240	240			500
400	202.68					450
350	177.35	185	185			400
300	152.01					350
250	126.68	150	150			300
4/0	107.22	120	120			250
3/0	85.01	95	95	4/0		
2/0	67.43	70	70	3/0		
1/0	53.49			2/0		
1	42.41	50	50	1/0		
2	33.62	35	35	1		
3	26.67			2		
4	21.15	25	25	3		
5	16.77			4		
6	13.30	16	16	5		
7	10.55			6		
8	8.37	10	10	7		

Column 1a	Column 1b	Column 2	Column 3	Column 4	Column 5a	Column 5b
North American cross-section required	Geometric conversion	Metric nominal cross-section that meets the electrical requirements	Metric nominal cross-section required	North American size that meets the electrical requirements		
AWG	kcmil	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	AWG	kcmil
9		6.63			8	
10		5.26	6	6	9	
11		4.17			10	
12		3.31	4	4	11	
13		2.62			12	
14		2.08	2.5	2.5	13	
15		1.65			14	
16		1.31	1.5	1.5	15	
17		1.04			16	
18		0.82	1	1	17	
19		0.65	0.75	0.75	18	
20		0.52			19	
21		0.41	0.5	0.5	20	
22		0.33	0.34	0.34	21	
23		0.26			22	
24		0.20	0.25	0.25	23	
25		0.16			24	
26		0.13	0.14	0.14	25	

Principle of cross-section figures



EXAMPLE 1:

The electro-technical project planning requirements as per North-American standards stipulate that you require a cable of AWG 20.

The relevant product page in the catalogue does not list any cables with this AWG size. A size of AWG 20 is listed in the above table in column 1a. Column 3 lists the metric nominal cross-section that, as a minimum, meets the electrical requirements of size AWG 20. Thus, you will require a cable with a nominal cross-section of 0.75 mm<sup>2</sup>.

EXAMPLE 2:

The electro-technical project planning requirements as per European standards stipulate that you require a cable of 0.75 mm<sup>2</sup>.

The product page in the catalogue lists only AWG figures or large metric cross-sections. Nominal cross-section 0.75 mm<sup>2</sup> is listed in the above table in column 4. Column 5a lists the AWG size that, at a minimum, meets the electrical requirements of a nominal cross-section of 0.75 mm<sup>2</sup>. Thus, you will require a cable with size AWG 18.



## General dimensions\*:

The base units are as follows:

In the British gravitational system:

**Length (ft) – force (lbf = Lb) – time (s)**

In the British absolute system:

**Length (ft) – mass (lb) – time (s)**

### 1. Measures of length

1 mil	= 0.0254 mm
1 inch (in;")	= 25.4 mm
1 foot (ft;')	= 0.305 m
1 yard (yd)	= 0.914 m
1 chain (ch)	= 20.1 m
1 statute mile	= 1.61 km
1 nautical mile	= 1.835 km
1 statute mile	= 1760 yards

### 2. Measures of volume

1 cubic inch	= 16.39 cm <sup>3</sup>
1 cubic foot	= 0.0283 m <sup>3</sup>
1 cubic yard	= 0.765 m <sup>3</sup>
1 US liquid gallon	= 3.79 l
1 pint	= 0.473 l
1 quart	= 0.946 l
1 brit gallon	= 4.53 l
1 barrel	= 119.2 l

### 3. Measures of area

1 circ. mil (CM)	= 0.507 · 10 <sup>-3</sup> mm <sup>2</sup>
1 kcmil (MCM)	= 0.5067 mm <sup>2</sup>
1 square inch (sq. in.)	= 645.16 mm <sup>2</sup>
1 square foot (sq.ft.)	= 0.0929 m <sup>2</sup>
1 square yard	= 0.836 m <sup>2</sup>
1 acre	= 0.00405 km <sup>2</sup>
1 square mile	= 2.59 km <sup>2</sup>
1 m <sup>2</sup>	= 10.764 sq. ft.

### 4. Units of mass

British gravitational system:

1 slug = 1 lbs · s<sup>2</sup>/ft

British absolute system:

1 pound = 1 lb

1 slug = 32.174 lb, with 32.174 ft/s<sup>2</sup>

as the standard value of gravitational acceleration

1 grain	= 64.80 mg
1 dram	= 1.770 g
1 ounce (oz)	= 16 drams = 28.35 g
1 pound (lb)	= 16 oz = 453.59 g
1 stone	= 14 lbs = 6.35 kg
1 US ton (short ton)	= 0.907 t
1 Brit. ton (long ton)	= 0.016 t

### 5. Units of force

British gravitational system:

pound-force 1 lbf = 1 Lb

British absolute system:

poundal 1 pdl = 1 lb · ft/s<sup>2</sup>

1 lbf = 32.174 pdl = 9.80665 lb · m/s<sup>2</sup>

### 6. Conversion to metric units

1 pound-force (lbf)	= 0.454 kp
1 Brit. ton-force	= 1016 kp
1 poundal (pdl)	= 0.1383 N
1 lbf	= 4.445 N

### 7. Electrical units per unit of length

1µf per mile	= 0.62 µF/km
1 megohm per mile	= 1.61 MΩ · km
1 megohm per 1000 ft	= 3.28 Ω · km
1 ohm per 1000 yd	= 1.0936 Ω/km

### 8. Weights per unit of length

1 lb per foot	= 1.488 kg/m
1 lb per yard	= 0.469 kg/m
1 lb per mile	= 0.282 kg/m

### 9. Density

1 lb/ft<sup>3</sup> = 16.02 kg/m<sup>3</sup>

### 10. Specific weight

1 lbf/ft<sup>3</sup> = 16.02 kp/m<sup>3</sup>

### 11. Copper wire weight per mile

lb/mile	= Ø mm
5	= 0.404
6.5	= 0.51
7.5	= 0.55
10	= 0.64
20	= 0.90
40	= 1.27

### 12. Units of energy

1 horsepower	= 0.746 kW (H.P.)
1 Brit. therm. unit	= 0.252 kcal

Insulation wall thickness is often expressed in n/64 inches with n/64 inch equalling approx. 0.4 mm.

### 13. Further dimensions for wire weights

and electrical field strengths:

lbf pr. MFeet	= 1.488 kg/km
lbf pr. Mile	= 0.282 kg/km
40 V/mil	= 1.6 kV/mm
80 V/mil	= 3.2 kV/mm
100 V/mil	= 4.0 kV/mm
250 V/mil	= 10.0 kV/mm

\* Most of these units are no longer in use and are provided purely for information purposes.



## Laying guidelines for cables and wires

Cables must be selected in accordance with the laying and operating conditions. They must be protected against mechanical, thermal and chemical effects as well against moisture penetrating through the cable ends.

Insulated power cables must not be laid underground. Temporary covering of NSSHÖU rubber-sheathed cables or trailing cables with soil, sand or a similar material, e.g. on building sites, does not constitute underground installation.

Fasteners and fixtures must not cause any damage to fixed wires and cables. Where cables or wires running horizontally along walls or ceilings are fixed using clips, the following guidelines regarding clip spacing must be observed:

For non-reinforced cables and wires, 20 x outside diameter.

These spacing guidelines also apply when laying cables in conduits and racks. When laying cables vertically, the spacing between clips can be increased depending on the type of cable or clip.

When connecting flexible cables (e.g. ÖLFLEX® cables, UNITRONIC® cables) to portable power consumers, there must be no strain or thrust at the insertion points and the cables must be secured against twisting and kinking. Outer cable sheaths must not be damaged at the insertion points or by the strain relief devices. Standard version flexible PVC cables are not designed for outdoor use.

Special cables must be deployed for permanent underwater use.

### Thermal stress

The temperature limits for the respective cable designs can be found in the technical data. The upper temperature limits must not be exceeded as a result of the cable heating up due to current heat and thermal environmental factors.

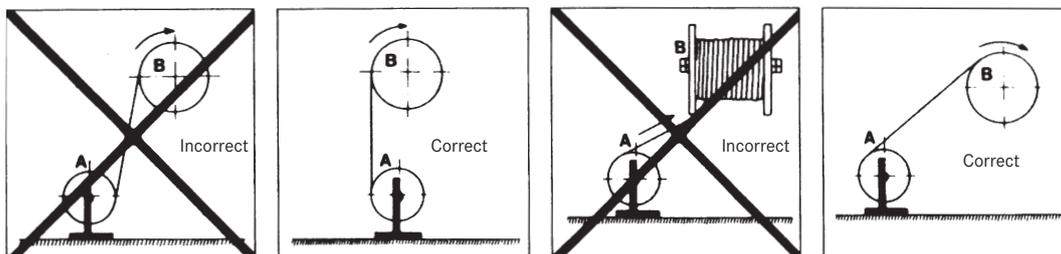
The lower temperature limits denote the lowest permitted ambient temperature.

### Tensile strain

Tensile strain on the conductor should be as low as possible. The following tensile strains for conductors must not be exceeded for cables.

- When laying and operating copper cables for portable equipment: 15 N per mm<sup>2</sup> conductor cross-section; this does not include screening, concentric conductors and divided protective conductors. In the case of cables that are subjected to dynamic stresses, e.g. in crane systems with high acceleration or power chains subject to frequent movement, appropriate measures must be taken, e.g. enlargement of the bending radius in individual cases. A shorter service life may be expected.
- Cables for static installation. When laying permanent cables, 50 N per mm<sup>2</sup> conductor cross-section.
- For fibre optic cables, BUS, LAN, industrial and Ethernet cables, the respective permitted strain must be observed. These values can be found in the product data sheets or are available on request.

For more information on this subject, see tables T3, T4 and T5.



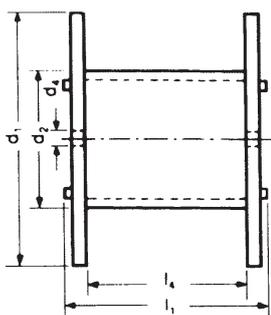
Winding and unwinding cables

**Wooden drums: holding capacity**

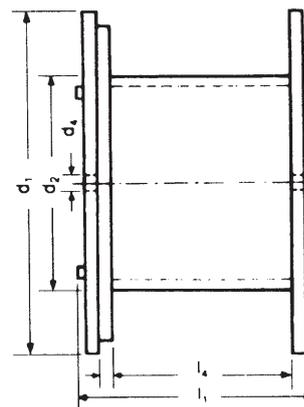


Drum ID number	Cable Ø mm										
	6	9	12	15	20	25	30	40	50	60	80
71	2024	892	468	297	165	-	-	-	-	-	-
81	2755	1152	643	430	219	151	-	-	-	-	-
91	-	2202	1206	749	402	285	162	-	-	-	-
101	-	-	1540	1000	576	365	220	-	-	-	-
121	-	-	-	1991	1139	688	450	249	-	-	-
141	-	-	-	2479	1352	839	564	327	-	-	-
161	-	-	-	-	2435	1608	1028	549	319	-	-
181	-	-	-	-	-	1867	1197	640	373	256	-
201	-	-	-	-	-	2522	1583	812	558	296	163
221	-	-	-	-	-	-	2383	1328	678	566	278
250	-	-	-	-	-	-	-	1892	1107	699	363

Up to drum size 10 with cable bushing



From drum size 12 with spiral



**Wooden drums: dimensions and load-bearing capacity**



Drum ID number	Drum size	Diameter (mm)			Width (mm)		Load-bearing capacity kg	Weight kg
		d <sub>1</sub>	d <sub>2</sub>	d <sub>4</sub>	l <sub>1</sub>	l <sub>4</sub>		
071	07	710	355	80	520	400	250	25
081	08	800	400	80	520	400	400	31
091	09	900	450	80	690	560	750	47
101	10	1000	500	80	710	560	900	71
121	12	1250	630	80	890	670	1700	144
141	14	1400	710	80	890	670	2000	175
161	16/8	1600	800	80	1100	850	3000	280
181	18/10	1800	1000	100	1100	840	4000	380
201	20/12	2000	1250	100	1340	1045	5000	550
221	22/14	2240	1400	125	1450	1140	6000	710
250	25/14	2500	1400	125	1450	1140	7500	875
251	25/16	2500	1600	125	1450	1130	7500	900
281	28/18	2800	1800	140	1635	1280	10000	1175

**T24 Technical tables**

Chemical resistance of plastics



Reagent	Concentration		Polyamide PA 6			Polyamide PA 6.6			Polyamide PA 12			Thermoplastic polyurethane PU	Polypropylene PP	Polyethylene HD-PE	Polyethylene LD-PE	Polystyrene PS	Nitrile butadiene rubber NBR	
	at +°C %																	
Exhaust gases containing carbon dioxide	all	60												⊗	⊗			
Exhaust gases, containing SO <sub>2</sub>	low	60												⊗	⊗			
Acetaldehyde	40%	20	✗	✗	⊗								⊗					20 °C ⊗
Acetone	100%	20	⊗	⊗	⊗	✗						✗	✗	✗	✗			✗
Acrylic acid	100%	> 30	✗	✗	✗													✗
Alums, aqueous	diluted	40											⊗	⊗	⊗	⊗		20 °C ⊗
Allyl alcohol	96%	20	✗	✗	⊗				⊗			⊗	⊗	⊗	20% ⊗			
Aluminium chloride, aqueous	diluted	40											⊗	⊗	⊗	⊗		20 °C ⊗
Aluminium sulphate, aqueous	diluted	40											⊗	⊗	⊗	⊗		20 °C ⊗
Formic acid, aqueous	10%	20	✗	✗	⊗								⊗	⊗		⊗		
Ammonia, aqueous	saturated	20	20% ⊗	20% ⊗	20% ⊗								⊗	⊗	⊗		25% ⊗	
Ammonium chloride, aqueous	saturated	60							3% ✗				⊗	⊗	⊗			20 °C ⊗
Ammonium nitrate, aqueous	diluted	40											⊗	⊗	⊗	⊗		20 °C ⊗
Ammonium sulphate, aqueous	diluted	40											⊗	⊗	⊗			✗
Aniline, pure	100%	20	✗	✗	✗								⊗	⊗	⊗		✗	
Aniline hydrochloride, aqueous	saturated												⊗	✗	✗			
Benzaldehyde, aqueous	saturated	20	pure ✗	pure ✗	pure ✗								⊗				✗	✗
Benzene	100%	20	⊗	⊗	⊗								✗	⊗	✗	✗		⊗
Benzoic acid, aqueous	all	40	20% ✗	20% ✗									⊗	⊗	⊗	⊗		✗
Benzole	100%	20	⊗	⊗	⊗								✗	✗	✗	✗		✗
Bleaching liquor	12.5 Cl	20	✗	✗	✗				3% ✗				⊗	⊗	⊗	⊗		✗
Drilling oil	all	20	✗	✗	✗								✗	✗	✗	✗		✗
Chrome alum, aqueous	diluted	40											⊗	⊗	⊗			20 °C ⊗
Cyclohexanol	-	20	⊗	⊗	⊗								⊗	⊗	⊗	⊗		⊗
Diesel fuel		85	⊗	⊗	⊗				20 °C ⊗				20 °C ⊗	20 °C ⊗	20 °C ⊗			
Ferric chloride, aqueous, neutral	10%	20	⊗	⊗	⊗								⊗	⊗	⊗	⊗		⊗
Glacial acetic acid	100%	20											⊗	⊗	⊗			✗
Acetic acid	10%	20	✗	✗	⊗				3% ✗				⊗	⊗	⊗	⊗		✗
Ethyl alcohol, aqueous	10%	20	40 vol% ⊗	40 vol% ⊗	40 vol% ⊗									⊗			⊗	
Ethylene chloride	100%	20											✗	✗	✗			✗
Ethylene oxide	100%	20											✗					
Ethyl ether	100%	20											✗					✗
Potassium ferrocyanide, aqueous	saturated	60											⊗	⊗	⊗			
Fluorine	50%	40	pure ✗	pure ✗	pure ✗				✗				✗	✗				
Formaldehyde, aqueous	diluted	40	pure ⊗	pure ⊗	pure ✗								40% ⊗	40% ⊗	40% ⊗	30% ⊗		20 °C ✗
Glucose, aqueous	all	50											⊗	⊗	⊗			
Urea, aqueous	to 10%	40	20% ⊗	20% ⊗	20% ⊗								⊗	⊗	⊗	⊗		
Flame-retardant hydraulic fluid		80	⊗	⊗	⊗													
Hydraulic oils H and HL (DIN 51524)		100	⊗	⊗	⊗													
Hydroxylamine sulphate, aqueous	to 12%	30											⊗					
Caustic potash, aqueous	50%	20	⊗	⊗	⊗								⊗	⊗	⊗	⊗		
Potassium bromide, aqueous	all	20	10% ⊗	10% ⊗	10% ⊗								⊗	⊗	⊗	⊗		
Potassium chloride, aqueous	10%	20	⊗	⊗	⊗								⊗	⊗	⊗	⊗		⊗
Potassium dichromate, aqueous	40%	20	5% ✗	5% ✗	5% ✗								⊗	⊗	⊗	⊗		⊗
Potassium nitrate, aqueous	all	20	10% ⊗	10% ⊗	10% ⊗								⊗	⊗	⊗	⊗		⊗
Potassium permanganate, aqueous	saturated	20											⊗				⊗	
Hydrosilicofluoric acid, aqueous	to 30%	20	✗	✗									⊗	⊗	⊗			

- ⊗ Highly resistant
- ✗ Limited resistance
- ✗ Not resistant

The information is given to the best of our knowledge and experience, however, it must be regarded as being for guidance purposes only. In many cases, a final judgement can only be made by performing tests under actual working conditions.

Chemical resistance of plastics

Reagent	Concentration		Polyamide PA 6			Polyamide PA 6.6			Polyamide PA 12			Thermoplastic polyurethane PU	Polypropylene PP	Polyethylene HD-PE	Polyethylene LD-PE	Polystyrene PS	Nitrile butadiene rubber NBR
	at +°C %																
Carbon dioxide, dry	100%	60										⊗	⊗	⊗		50 °C ⊗	20 °C ⊗
Carbonic acid	100%	60	⊗	⊗	⊗												20 °C ⊗
Cresylic acid, aqueous	to 90%	20	pure ⊗	pure ⊗								⊗	⊗	⊗	⊗	⊗	⊗
Coolant DIN 53521		120	⊗	⊗													
Copper chloride, aqueous	saturated	20										⊗	⊗	⊗			⊗
Copper sulphate, aqueous	saturated	60										⊗	⊗	⊗			20 °C ⊗
Magnesium carbonate, aqueous	saturated	100										⊗				50 °C ⊗	
Magnesium chloride, aqueous	saturated	20	10% ⊗	10% ⊗	10% ⊗							⊗	⊗	⊗	⊗	⊗	⊗
Methyl alcohol	100%	20	⊗	⊗	⊗							40 °C ⊗	⊗	⊗	⊗	⊗	⊗
Methylene chloride	100%	20	⊗	⊗	⊗							⊗	⊗	⊗	⊗		
Lactic acid, aqueous	to 90%	20	10% ⊗	10% ⊗	10% ⊗	3% ⊗						⊗	⊗	⊗	⊗	80% ⊗	⊗
Mineral oil			⊗	⊗	⊗							20 °C ⊗	20 °C ⊗	20 °C ⊗			
Sodium chlorate, aqueous	saturated	20	10% ⊗	10% ⊗	10% ⊗							⊗	⊗	⊗	⊗		
Sodium hydroxide, aqueous	10%	20	⊗	⊗	⊗	3% ⊗						⊗	⊗	⊗	⊗	⊗	⊗
Nickel chloride, aqueous	saturated	20	10% ⊗	10% ⊗	10% ⊗							⊗				⊗	⊗
Nickel sulphate, aqueous	saturated	20	10% ⊗	10% ⊗	10% ⊗							⊗	⊗	⊗	⊗		⊗
Nitroglycerin	diluted	20												⊗	⊗		
Oil and grease		20	⊗	⊗	⊗							⊗					
Oleic acid	-	20	⊗	⊗	⊗							⊗	⊗	⊗	⊗	⊗	⊗
Oxalic acid	all	20	10% ⊗	10% ⊗	10% ⊗	3% ⊗						⊗	⊗	⊗	⊗	⊗	⊗
Ozone	pure		⊗	⊗	⊗							⊗	⊗	⊗	⊗		
Petroleum	100%	80	⊗	⊗	⊗							20 °C ⊗	20 °C ⊗	20 °C ⊗	⊗	⊗	⊗
Phosgene, gaseous	100%	20										⊗	⊗	⊗	⊗		
Phosphoric acid, aqueous	diluted	20	10% ⊗	10% ⊗	10% ⊗	3% ⊗						⊗	⊗	⊗	⊗	86% ⊗	⊗
Phosphorus pentoxide	100%	20										⊗					
Mercury	pure	20	⊗	⊗	⊗							⊗	⊗	⊗	⊗	⊗	⊗
Nitric acid, aqueous	50%	20	⊗	⊗	⊗	3% ⊗						⊗	⊗	⊗	⊗	30% ⊗	⊗
Hydrochloric acid, aqueous	30%	20	20% ⊗	20% ⊗	20% ⊗	3% ⊗						⊗	⊗	⊗	⊗	15% ⊗	⊗
Lubricating grease, ester oil base		110	⊗	⊗													
Polyphenyl ester base		110	⊗	⊗	⊗												
Lubricating grease, silicone oil base		110	⊗	⊗	⊗												
Carbon disulphide	100%	20	⊗	⊗	⊗							⊗	⊗	⊗	⊗	⊗	⊗
Sodium sulfide, aqueous	diluted	40										⊗	⊗	⊗			
Sulphuric acid, aqueous	10%	20	⊗	⊗	⊗	3% ⊗						50% ⊗	50% ⊗	50% ⊗	⊗	⊗	⊗
Sea water		40	⊗	⊗	⊗	20 °C ⊗						⊗	⊗	⊗	⊗	⊗	20 °C ⊗
Soap solution, aqueous	all	20	diluted ⊗	diluted ⊗	diluted ⊗	⊗						⊗	⊗	⊗	⊗	⊗	⊗
Carbon tetrachloride	100%	20	⊗	⊗	⊗							⊗	⊗	⊗	⊗	⊗	⊗
Toluene	100%	20	⊗	⊗	⊗	⊗							⊗	⊗	⊗	⊗	⊗
Trichloroethylene	100%	20	⊗	⊗	⊗							⊗	⊗	⊗	⊗		
Vinyl acetate	100%	20										⊗					
Hydrogen	100%	60	20 °C ⊗	20 °C ⊗	20 °C ⊗							⊗	⊗	⊗			20 °C ⊗
Xylene	100%	20	⊗	⊗	⊗							⊗	⊗	⊗	⊗	⊗	⊗
Zinc chloride, aqueous	diluted	60	10% ⊗	10% ⊗								⊗	⊗	⊗	⊗	50 °C ⊗	20 °C ⊗
Zinc sulphate, aqueous	diluted	60										⊗	⊗	⊗			20 °C ⊗
Zinc chloride, aqueous	diluted	40										⊗	⊗	⊗	⊗	⊗	20 °C ⊗
Citric acid	to 10%	40	20 °C ⊗	20 °C ⊗	20 °C ⊗	3% ⊗						⊗	⊗	⊗	⊗	⊗	20 °C ⊗

⊗ Highly resistant  
 ⊗ Limited resistance  
 ⊗ Not resistant

The information is given to the best of our knowledge and experience, however, it must be regarded as being for guidance purposes only. In many cases, a final judgement can only be made by performing tests under actual working conditions.



## Materials of cables and wires exposed to electromagnetic radiation

### Types of radiation and their effects

Electromagnetic radiation is a familiar term in many different areas. It can occur naturally (e.g. solar or natural radioactivity) and can also be produced artificially (e.g. X-ray units, lights or mobile communications). It can be divided up into different types or components – the decisive factor here is the wavelength, or alternatively the frequency, of the radiation. The electromagnetic spectrum is divided up into the following categories, listed here in descending wavelength order, or ascending frequency order:

- alternating currents (e.g. very low frequency broadcasting)
- radio waves (e.g. radio broadcasting)
- microwaves (e.g. microwave ovens, mobile communications, radar)
- infrared radiation (thermal radiation, e.g. thermography, remote control)
- visible light (component of radiation from artificial sources of light and from the sun)
- ultraviolet radiation (UV radiation – component of sunlight, technical applications)
- X-radiation (e.g. image processing within medical technology or material testing)
- gamma radiation (e.g. nuclear energy, technical applications)

Due to the impact they have, gamma rays, x-rays and very short wavelength UV rays are also summarised under “ionising radiation”. This term refers to radiation that carries enough energy to free electrons from atoms or molecules (ionisation).

With organic compounds, such as plastics used for cables and wires, the fundamental factor to consider is the impact of UV radiation and ionising radiation. They have the highest amount of energy and therefore have the greatest impact on the materials out of all the types of electromagnetic radiation.

This influence is used in plastic processing to give materials certain properties – for example using the appropriate radiation conditions to set certain adhesives, coatings, insulation materials and sheath materials of cables and wires, which only in this way achieve the required strength and durability. This is known as “cross-linking” or, to be more precise, “electron beam cross-linking” because there are also other cross-linking processes (e.g. chemical).

When it comes to the practical use of cables and wires, however, UV radiation and ionising radiation tend to have undesired effects. Colours can fade and plastics can become dull or brittle. Ultimately if the plastic becomes brittle or cracks start to form, the cables will no longer be fit for use.

### Use of cables and wires exposed to UV radiation

UV radiation is a component of solar radiation and therefore primarily affects exposed outdoor applications. Here the components which are able to penetrate the ozone layer have an impact: UVA radiation and a proportion of UVB radiation. UVC is filtered by the ozone layer and therefore does not reach the earth's surface.

While UV radiation also occurs indoors, it is considerably less intense than it is outdoors because glass panes, depending on their design, can filter out a considerable proportion. Furthermore, shading is often installed and artificial sources of light usually only emit a small amount of UV radiation.

Since different products are subjected to remarkably different conditions at their respective sites of application, for example regarding the

duration and angle of irradiation, as well as shading and other influencing factors such as ambient temperature, humidity and air quality, it is not possible to make any universal statements about the durability and service life of products (see also technical appendix T0, 7. Service life).

Testing methods complying with UV resistance-related standards (e.g. ISO 4892-2) enable a general evaluation of products that are to be exposed to UV radiation when in use and make it possible to compare different materials and end products.

The plastics used for cables and wires differ in their sensitivity to the impact of UV rays; using appropriate stabilisers, colour pigments or soot can considerably reduce this sensitivity by absorbing the UV radiation and converting it into less critical thermal radiation. This prevents UV rays from penetrating into the molecular chains of the sheath material, splitting them up into highly reactive radicals which attack the molecular chain structure of the plastic and in the process trigger accelerated ageing.

Cables and wires with black sheaths are generally better protected than those with other colours because black surfaces are considerably better at absorbing UV radiation.

This knowledge has also been applied in standards, thus cables with black sheaths are suitable for outdoor use in accordance with EN 50525-1 and VDE 0285-525-1.

Some plastics demonstrate a good level of resistance even without a black colouring, these are:

- cross-linked polyethylene (XLPE)
- elastomers (e.g. CR or Si)
- thermoplastic elastomers (TPE-E, TPE-O, TPE-U, e.g. PUR)
- fluoropolymers (e.g. PTFE or FEP)

However, these plastics also differ in terms of resistance depending on the colour because the aforementioned effect of black sheaths always improves resistance.

With polyurethane cables which are not black (e.g. orange or yellow cables), it is important to note that, despite fading considerably with time, they will continue displaying a good level of flexibility and strength because the base material is able to withstand the UV radiation, just not the colour pigments.

This means that despite the visible damage caused by UV radiation or weather conditions, these types can be technically still fully functional.

### Use of cables and wires exposed to ionising radiation

Ionising radiation normally only occurs in defined applications and when it is supposed to, meaning that materials with the appropriate resistance can be specially adapted to the prevalent conditions of the application in advance.

Cables are therefore normally only tested for radiation resistance if their intended usage includes exposure to ionising radiation. This means that for all other cables, indications can only be made for the radiation resistance of typically used materials. While these indications are not representative of the resistance of the whole cable, the values can still act as a rough guide and make it possible to compare the cables with one another.

The radiation resistance of materials is defined using the Radiation Index (RI) in IEC 60544-4 and refers to the point at which the elongation at break is reduced to  $\geq 50\%$  of the original value.



## Materials of cables and wires exposed to electromagnetic radiation

The table below lists the typical maximum dose of the individual materials in grays (and rad) of a gamma radiation source at which the elongation at break of the test specimen still remains above 50% of its unaged value.

Conversions:

1 Gy = 100 rad; 1Gy = 1J/kg

The resistance of cables, wires and other products for connection technology against ionising radiation plays a particularly crucial role in nuclear plants. In addition to the suitability of the products themselves, all the processes also need to meet the special requirements of such application areas.

This is why U.I. Lapp GmbH proved itself as qualified supplier of cables, wires, cable glands and cable-related accessories to nuclear plants by passing system-related and product-related quality assurance testing – see “Zertifikat KTA 1401” (Acknowledgement of quality assurance in accordance with regulation KTA 1401). The certificate is available in German at:

[www.lappkabel.de/Service/Downloadcenter/Zertifikate](http://www.lappkabel.de/Service/Downloadcenter/Zertifikate)



## Resistance of plastics to ionising radiation

Material-type	Radiation resistance in Gy approx.	Radiation resistance in rad approx
PVC	8 x 10 <sup>5</sup>	8 x 10 <sup>7</sup>
PE LD	1 x 10 <sup>5</sup>	1 x 10 <sup>7</sup>
PE HD	7 x 10 <sup>4</sup>	7 x 10 <sup>6</sup>
VPE (XLPE)	1 x 10 <sup>5</sup>	1 x 10 <sup>7</sup>
PA	1 x 10 <sup>5</sup>	1 x 10 <sup>7</sup>
PP	1 x 10 <sup>3</sup>	1 x 10 <sup>5</sup>
PETP	1 x 10 <sup>7</sup>	1 x 10 <sup>7</sup>
PUR	5 x 10 <sup>5</sup>	5 x 10 <sup>7</sup>
TPE-E	1 x 10 <sup>5</sup>	1 x 10 <sup>7</sup>
TPE-O	1 x 10 <sup>5</sup>	1 x 10 <sup>7</sup>
NR	8 x 10 <sup>5</sup>	8 x 10 <sup>7</sup>
SIR	2 x 10 <sup>5</sup>	2 x 10 <sup>7</sup>
EPR	1 x 10 <sup>6</sup>	1 x 10 <sup>8</sup>
EVA	1 x 10 <sup>5</sup>	1 x 10 <sup>7</sup>
CR	2 x 10 <sup>5</sup>	2 x 10 <sup>7</sup>
ETFE	1 x 10 <sup>5</sup>	1 x 10 <sup>7</sup>
FEP	3 x 10 <sup>3</sup>	3 x 10 <sup>5</sup>
PFA	1 x 10 <sup>3</sup>	1 x 10 <sup>5</sup>
PTFE	1 x 10 <sup>3</sup>	1 x 10 <sup>5</sup>



## Our products – contained substances and legislation

The use of hazardous substances in products is subject to ever stricter international laws and restrictions.

Applies to the editorial deadline:

The products in the catalogue meet the following legal requirements (among others):

- **REACH – Regulation No 1907/2006/EC**
- **RoHS – Directive 2011/65/EU**
- **Regulation No 1005/2009/EC on substances that deplete the ozone layer**

### REACH:

Regulation No 1907/2006/EC represents the EU's standard system concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). The purpose of the regulation is to ensure a high level of protection for human health and the environment.

The Lapp Group sells products within the meaning of REACH. The following requirements of the REACH regulation are therefore particularly significant:

1. Information requirement for the manufacturers and importers of products containing a material on the "candidate list" at a concentration in excess of 0.1% of the mass of the product
2. Observance of substances requiring authorisation in accordance with REACH Annex XIV
3. Observance of the manufacturing, marketing and use restrictions specified in REACH Annex XVII.

The Lapp Group has attributed great importance to the subject of safety and the environment from a very early stage. Our aim is to implement the REACH regulation by keeping our products free from substances of very high concern (SVHC) or to replace such substances with non-hazardous materials.

We therefore keep a very close eye on the Candidate List, in which the European Chemicals Agency lists these dangerous substances, continuously evaluate our products and implement any necessary measures. We observe all registration requirements for materials in accordance with REACH Annex XIV as well as the manufacturing, marketing and use restrictions specified in REACH Annex XVII.

To meet the periodic updates of the Candidate List of Substances of Very High Concern (SVHC), we offer the latest information on REACH on [www.lappgroup.com/rohs-reach](http://www.lappgroup.com/rohs-reach). Please contact our competent REACH experts regarding specific substances.

### RoHS:

Directive 2011/65/EU represents the updated version of the EU's directive on the restriction of the use of hazardous substances in electrical and electronic equipment and supersedes the previous directive 2002/95/EC. Directive 2011/65/EC was published on 1 July 2011, different transitional periods apply for the amendments introduced by the directive. This directive results in national laws (e.g. the German ElektroStoffV).

In addition to the extended scope of the directive, which now also comprises "other" electrical and electronic equipment (EEE), one significant new feature is the obligation to assure compliance with the requirements of the RoHS directive by means of a conformity assessment procedure. LAPP certifies the "RoHS-conformity" of EEE covered by the directive with a product-specific EC declaration of conformity and the application of the CE mark. For products that are not within the scope of the directive, the Lapp Group provides statements declaring the exemption from the conformity assessment procedures.

### Applies to the editorial deadline:

All products in this catalogue meet the substance-specific requirements of the RoHS directive.

**As a general rule:** All information is provided to the best of our knowledge and belief. The information given represents the current state of the art. This is supported through continuous random testing of our products.

Given the vast number of our products, complete verification without exception is not possible. Therefore, the specifications above do not constitute a generally applicable guarantee in a legal or warranty sense.



## Fire Performance Standard

At present, in cable industry, Fire Retardant, Low Smoke Halogen Free (LSZH), Low Smoke Fume (LSF) and Fire Resistant cables are all described as Fire survival Cables.

- **Fire retardant cables** are designed for use in fire situations where the spread of flames along a cable route needs to be retarded. Due to relative low cost, fire retardant cables are widely used as fire survival cables. No matter the cables are installed in single wire or in bundles, during a fire, the flame spread will be retarded and the fire will be confined to a small area, thus reducing the fire hazard due to fire propagation.
- **Low Smoke & Halogen Free & Fire Retardant (LSZH)** LSZH cables are not only characterized by the fire retardant performance but also by the halogen free properties, thus offering low corrosivity and toxicity. During a fire the LSZH cables will emit less smoke and acid gases which may damage the human being and expensive equipment. Compared with normal PVC cables, LSZH cables outperform by their fire retardancy, low corrosivity and low smoke emission properties, however, normal PVC cables have better mechanical and electrical properties.
- **Low Smoke Fume (LSF)** The low halogen content and low corrosivity of low smoke fume cables lies somewhat in between that of fire retardant cables and LSZH cables. LSF cables also contain halogen but the content is much less than that of PVC

cables. LSF cables are designed to reduce the spread of fire toxic gases and smoke during fire. The LSF cables are usually manufactured from flame retardant PVC blended with HCL additive and smoke absorbent. These materials help improve the fire performance of the LSF cables.

- **Fire Resistant (FR)** Fire resistant cables are designed to maintain circuit integrity of those vital emergency services during the fire. The individual conductors are wrapped with a layer of fire resisting mica/glass tape which prevents phase to phase and phase to earth contact even after the insulation has been burnt away. The fire resistant cables exhibit same performance even under fire with water spray or mechanical shock situation.
- **Fire Performance Class** The main concerns for the cables in their fire survival properties are their flame spread, smoke characterization and gas toxicity. In American fire standard, the concern lies more on the first two and it differs from the European standard which concerns all these aspects. In USA, it is believed that the fire hazard is mainly due to CO toxic gas emitted and the heat release during the conversion of CO to CO<sub>2</sub> during the fire. Therefore, to control the heat release is the most important concern for reducing the fire hazard. However, in European countries, halogen content, the corrosivity of the gases, the smoke density and the toxicity of the gas are equally important factors affecting the safety and survival of human during a fire.



## IEC Standard for Flame Retardancy

The European Electrical Committee categorizes the fire performance of the cables into three classes, namely IEC 60332-1, IEC 60332-2, IEC 60332-3. IEC 60332-1 and IEC 60332-2 are used to assess the flame propagation characteristics of a single wire. IEC 60332-3 is used to assess the flame propagation characteristics of bundled cables. Comparatively speaking, IEC 60332-3 for bundled cables is more demanding than IEC 60332-1 for single wires.

- **IEC 60332-1/BS 4066-1 (Flame Test On Single Vertical Insulated Wires/Cables)**

This test details a method of test for the assessment of the flame propagation characteristics of a single wire or cable. In this test, a 60cm cable sample is fixed vertically inside a metallic box and a 175mm long flame is applied at 45°C from a gas burner placed at 450mm from the top at the upper portion.

The specimen is deemed to have passed this test, if after burning has ceased, the charred or affected position does not reach within 50mm of the lower edge of the top clamp which is equivalent to 425mm above the point of flame application. The test method is not suitable for the testing of some small wires due to the melting of the conductors during the time of application of the flame.

- **IEC 60332-3/BS 4066-3 (Flame Test On Bunched Wires/Cables)**

IEC60332-3C describes a method of type approval testing to define the ability of bunched cables to resist fire propagation. In this test, a cable specimen, consisting of number of 3.5m length of cables are fixed to a vertical ladder tray where they are applied with a flame from a gas burner for a specified times under controlled air flow. Four categories (A, B, C & D) are defined and distinguished by test duration and the volume of non metallic material of the sample under test. The cable specimen is deemed to have met the requirements of the standard if, after burning has ceased, the extent of charred or affected portion does not reach a height exceeding 2.5m above the bottom edge of the burner.



## UL Standard for Fire Retardancy

If a cable can pass a specified UL fire standard, an UL performance verification mark can be applied onto the cable jacket illustrating both the UL class and the number. There are five primary fire testing standards as follows.

- **CMP (Plenum Flame Test/ Steiner Tunnel Test)**

Plenum rated cables meet the NFPA -262 standard (formerly known as UL910) which provides the most stringent requirement of all the tests. Cable samples on a horizontal tray in a tunnel type of chamber are burned at 87.9KW (300,000 BTU/Hr) for 20 minutes. To qualify for a plenum rating the cable specimen must have the fame spread of less than 5 feet or 1.5 meters with a smoke density during the test of (a) 0.5 peak and 0.15 maximum average. The CMP cables are usually installed in air ventilation ducts and air returns widely used in Canada and USA. The fire retardant properties of CMP cables are much better than that of normal LSZH cables complying with IEC 60332-1 and IEC 60332-3.

- **CMR (Riser Flame Test)**

Riser rated cables meets UL1666. Cable samples on a vertical shaft are burned at 154.5KW (527,500 BTU/Hr) for 30 minutes. To qualify for a riser rating, cable specimen must have the fame spread of less than 12 feet beyond the ignition point. This test does not look at the smoke density or toxicity. Riser rated cables are suitable for vertical shafts not defined as an environmental air plenum.

- **CM (Vertical Tray Flame Test)**

General purpose cables meet UL 1581. Cable samples on a 8 feet vertical tray are burned at 20KW (70,000 BTU/Hr) for 20

minutes. The cable specimen is deemed to pass the test if the fame spread will not extend to the upper portion and extinguish by itself. UL 1581 is similar to IEC 60332-3C except for that the number of testing samples is different. This test does not look at the smoke density or toxicity. The CMG cables are usually used in runs penetrating single floor. These cables cannot be installed in vertical pathways.

- **CMG (Vertical Tray Flame Test)**

These general purpose cable also meet UL1581. CM and CMG are similar and both are recognized in Canada and USA. This test does not look at the smoke density or toxicity. The CMX cables are usually used in runs penetrating single floor. The cables cannot be installed in vertical pathways.

- **CMX (Vertical Wire Flame Test)**

The restricted cables meet UL1581 Limited-use. The test consists of 25 feet long ventilated tunnel. The cable specimen is placed on a ladder inside the tunnel and the fame of 30,000 BTU/Hr is applied to the cable 15 seconds on and 15 seconds off five times for a total exposure to the fame of 1 minute and 15 seconds. To qualify for this test, after the test fame is removed the cable specimen can fame for not more than 60 seconds and the charred portion will not exceed by 25%. UL 1581 VW-1 is similar to IEC 60332-1 except for the difference in the time for fame applied. This test does not look at the smoke density or toxicity. The CMG cables are suitable for use in dwellings and for use in raceway. These cables cannot be installed in bundles and must be protected in metal conduit. This type of cable is chosen as the minimum requirement for commercial installations.



## Standard for Fire Resistance

Fire resistant cables are designed for maintaining circuit integrity during a fire. The IEC and the BS adopted two different standards, namely the IEC 60331 and BS 6387. Comparatively speaking, the fire performance requirement for BS 6387 is more demanding.

- **IEC60331 Fire Resistance Test**

A cable sample is placed over a gas burner and connected to an electrical supply at its rated voltage. Fire is applied for a period of 3 hours. The temperature on the cable is between 750 °C and 800 °C. After 3 hours, the fire and the power is switched off. 12 hours later, the cable sample is reenergized and must maintain its circuit integrity.

- **BS6387 Fire Resistance Test**

BS6387 specifies the performance requirements for cables required to maintain circuit integrity under fire conditions. It details the following methods to categorize the cables according to cable withstand capacities. Resistance to fire alone - the cables is tested by gas burner fame while passing a current at its rate voltage. Four survival categories are defined Cat A (3

hours at 650°C), Cat B (3 hours at 750°C), Cat C (3 hours at 950°C), and Cat S (20 minutes at 950°C). Resistance to fire with water spray - a new sample of cable is exposed to fame at 650°C for 15 minutes while passing a current at its rated voltage and then the spray is turned on to give exposure to both fire and water for a further 15 minutes. A single survival category W is defined if the cables surpassed the testing requirement. Resistance to fire with mechanical shock - the final requirement is mechanical shock damage. A fresh sample is mounted on a backing panel in an S bend and is exposed to fames while the backing panel is stuck with a steel bar with the same diameter as the cables under test every 30 seconds for 15 minutes. The cables will be tested under the following temperatures: X ( 650°C/15min ), Y( 750°C/15min ) and Z ( 950°C/15min ). The highest standard for BS 6387 is CWZ.



## Standard for Halogen & Smoke Emission, Corrosivity & Toxicity

- **IEC 60754-1/BS6425-1 (Emission of Halogen)**

This specifies a test for determination of the amount of halogen acid gas other than the hydrofluoric acid evolved during combustion of compound based on halogenated polymers and compounds containing halogenated additives taken from cable constructions. Halogen includes Fluorine, Chlorine, Bromine, Iodine and Astatine.

All these elements are toxic by their nature. In this test, when the burner is heated to 800°C, 1g sample is placed inside and the HCL is absorbed into water inside the chamber fed with air flow. The water is then tested with its acidity. If the hydrochloric acid yield is less than 5 mg/g, the cable specimen is categorized as LSZH. If the hydrochloric acid yield lies between 5mg/g to 15mg/g, the cable specimen is categorized as LSF. IEC60754-1 cannot be used for measuring the exact HCL yield if the yield is less than 5mg/g. This test cannot determine if the cable is 100% halogen free or not. To determine if the cable specimen is 100% halogen free or not, IEC60754-2 has to be employed.

- **IEC 60754-2 (Corrosivity)**

This test specifies a method for the determination of degree of acidity of gases evolved during combustion of the cable specimen by measuring its pH and conductivity.

The specimen is deemed to pass this test if the pH value is not less than 4.3 when related to 1 litre of water and conductivity is less than 10µs/min.

When the HCL yield lies between 2mg/g and 5mg/g, a cable specimen can pass IEC 60754-1 but its pH value will likely be less than 4.3 and therefore cannot pass the IEC 60754-2 test.

- **IEC 61034-1/ASTM E662 (Emission of Smoke)**

This specifies a test for determination of smoke density. The 3 metre cube test measures the generation of smoke from electric cables during fire. A light beam emitted from a window is projected across the enclosure to a photo cell connected to a recorder at the opposite window.

The recorder is adjusted to register from 0% for complete obscuration to 100% luminous transmissions. A 1 metre cable sample is placed in the centre of the enclosure and is applied with a fire. The minimum light transmission is recorded. The result is expressed as percentage of light transmitted.

The specimen is deemed to pass this test (IEC61034-1 & 2) if the value is greater than 60%. The higher the light transmittance, the less smoke emitted during a fire.

- **ISO4589-2/BS2863 (Oxygen Index LOI)**

This is a test for assessing the oxygen index of the material in accordance with the test method specified in ASTM D2863-95 (Measuring the minimum oxygen concentration to support candle-like combustion of plastics). At room temperature when

the oxygen content in the air exceeds the oxygen index, the material will burn by itself automatically.

The higher the oxygen index, the more retardant the cable will be.

For example, if the oxygen index of a material is 21%, it means that the material will burn by itself even at room temperature because at room temperature the normal oxygen content is 21%. In general, the oxygen index of a LSZH cables ranges from 33% to 42%.

- **ISO4589-3/BS2782.1 (Temperature Index TI)**

This is a test for assessing the performance of a material when it is tested in accordance with BS2782 Part 1 Method 143A and 143B. The oxygen index of a material will drop when the temperature rises.

When the temperature rises and the oxygen index drops to 21%, the material will burn automatically. This temperature is defined as temperature index. For example, the temperature index of coal is 50%. When the temperature climbs to 150°C, its oxygen index drop to 21% and the coal will burn by itself automatically.

The temperature index of the coal will then be defined as 150. In general, the temperature index of LSZH cables ranges from 250°C to 300.

- **ES713 (Toxicity Index)**

This is a test defined by Naval Engineering Standard which is a directed at the analysis of a specified set of gaseous species which are commonly present in the combustion products of materials used in military application and which may cause lethality at the time of a fire. In this test, a 1g cable specimen is completely burnt inside a sealed chambers of volume 0.7-1m<sup>3</sup> using a burner fed with air and gas to give a non-luminous fame. The resulting chamber atmosphere is quantitatively analysed for a specified set of gases. For each gas, the measured concentration (Ci) is scaled up for 100g and the concentration is recalculated as though the combustion products is diffused into a volume of exactly 1m<sup>3</sup>.

The resulting concentration (C8) is expressed as the ratio of critical factor (Cf) which is equal to the concentration of this gas considered fatal to human for 30 minutes exposure. The ratio C8/Cf is summed for all gases detected to give the toxicity index. The higher the toxicity index, the more toxic the cable materials is. In general, the toxicity index of LSZH materials are less than 5. LSZH cable will also emit toxic CO and if the cable materials contains P, N and S, the toxic gases generated will even be greater. Thus LSZH cables cannot be categorized as toxic free. CM, CMR and CMP cables in general contains halogen elements which are essential for passing the strict fire retardancy testing. For example, CMP cables are made from FEP which contains Fluorine and are much toxic than normal LSZH cables. be defined as 150°C. In general, the temperature index of LSZH cables ranges from 250°C to 300°C.

## The Lapp Group worldwide

**Algeria**

**Cablemat Sarl**  
16 Cité Mimouni Lotissement 18  
Villa N° 14  
Bordj El Kiffan, ALGER  
Tel.: +213 550024331, -661, -404, -331  
Fax: +213 20388220, -212, -010, -39  
www.cablemat.net

**Argentina**

**NAKASE SRL**  
Calle 49 No. 5764  
B1653AOX  
Villa Ballester  
1870 BUENOS AIRES  
Tel.: +54 11 4768 4242  
Fax: +54 11 4768 4242  
ventas@nakase.com.ar  
www.nakase.com.ar

**Armenia**

**Integral design & engineering LLC**  
8 Tumanyan str.  
International Business Center  
0001 YEREVAN  
Tel.: +374 10 520188  
Fax: +374 10 519188  
info@integral.am  
www.integral.am

**Australia**

**DKSH Australia Pty Ltd.**  
14-17 Dansu Court Hallam  
3803 VICTORIA  
Tel.: +61 3 95546666  
Fax: +61 3 95546677  
info@dksh.com.au

**Austria**

**Lapp Austria GmbH**  
Bremenstraße 8  
4030 LINZ  
Tel.: +43 732 781272-444  
Fax: +43 732 781272-34  
sales@lappaustria.at  
www.lappaustria.at

**Belarus**

**PNS - Professional Network Systems**  
Temirjazeva str. 64b, office 308  
220035 MINSK  
Tel.: +375 17 2908372  
Fax: +375 17 2547828  
info@pns.by  
www.pns.by

**Belgium - Luxembourg**

**Lapp Benelux B.V.**  
Van Dijklaan 16, 5581 WG WAALRE  
Postbus 74, 5580 AB WAALRE  
The Netherlands  
Tel.: +32 78 353060  
Fax: +32 78 353065  
sales.lappbenelux@lappgroup.com  
www.lappbenelux.com

**Brazil**

**Cabos Lapp Brasil Ltda.**  
Av. Dr. Mauro Lindemberg  
Monteiro, 628  
Galpao18, Osasco  
CEP 06278-010 SAO PAULO  
Tel.: +55 11 21664166  
Fax: +55 11 21664165  
vendas@lappgroup.com.br  
www.lappgroup.com.br

**Cabos Lapp Brasil Ltda.**

Rodovia BA535 (via Parafuso)  
km 13 e 14 - Sentido Salvador  
Polo Industrial e Logístico Via  
Parafuso - Lote 06  
CEP 42810-200 CAMAÇARI-BA  
Tel.: +55 71 35002400

**Bulgaria**

**V&V Isomatic Ltd.**  
40a, Pirin Str.  
1680 SOFIA  
Tel.: +359 29 583111  
Fax: +359 29 582270  
office@viv-isomatic.com  
www.viv-isomatic.com

**Canada**

**Lapp Canada Inc.**  
3505 Laird Road, Unit 10  
L5L 5Y7 MISSISSAUGA, Ontario  
Tel.: +905 8 205492  
Fax: +905 8 206516  
sales@lappcanada.com  
www.lappcanada.com

**Chile**

**Desimat Chile**  
Av. Puerto Vespuccio 9670  
Parque Industrial Puerto Santiago  
Pudahuel, SANTIAGO  
Tel.: +56 2 25851200  
Fax: +56 2 27470153  
ventaschile@desimat.cl  
www.desimat.cl

**China**

**Lapp Kabel Shanghai Co., Ltd.**  
23A Zhaofeng Universe Building  
1800 Zhongshan Road West  
SHANGHAI 200235  
Tel.: +86 21 64400833  
Fax: +86 21 64400834  
info@lappgroup.com.cn  
www.lappgroup.com.cn

**Lapp Cable Works Shanghai Co., Ltd.**

No. 6 Standard Workshop Lingang  
Industrial Area  
1555 Cenglin Road, Pudong District  
SHANGHAI 201306  
Tel.: +86 21 20955833  
Fax: +86 21 20955834

**Colombia**

**TRANSMISIONES LTDA**  
Cra 69B No. 21A - 24 Bodega UE 28 - 1  
Parque Industrial Montevideo  
BOGOTA, D.C  
Tel.: +57 1 4126898  
Fax: +57 1 2929736  
info@transmisiones.de  
www.transmisiones.de

**Congo**

**Dezatech sarl**  
Av. Kasai no 12  
KINSHASA/Gombe  
Tel.: +243 8211 45963  
dg@dezatech.com

**Costa Rica**

**Elvatron, SA**  
De Repifreno en la Uruca  
400 metros Nte.  
SAN JOSÉ, Costa Rica  
P.O. Box 8-3770 (1000)  
Tel.: +506 2242-9955  
Fax: +506 2520-0697  
elvatron@elvatron.com  
www.elvatron.com

**Croatia**

**TIM KABEL**  
Savska cesta 103  
10360 ZAGREB - Sesvete  
Tel.: +385 1 5555900  
Fax: +385 1 5555901  
zagreb@tim-kabel.hr  
www.tim-kabel.hr

**Cyprus**

**3 BRO Ltd.**  
3 Limmou Str.  
Office 301  
3820 LIMASSOL  
Tel.: +357 25255353  
info@3bro.gr

**Czech Republic**

**LAPP KABEL s.r.o.**  
Bartosova 315, Kvitkovice  
765 02 OTROKOVICE  
Tel.: +420 573 501011  
Fax: +420 573 394650  
info@lappgroup.cz  
www.lappgroup.cz

**Denmark**

**Lapp Danmark**  
Korsklidevej 6  
2670 GREVE  
Tel.: +45 43 950000  
Fax: +45 43 950009  
ordre@lappgroup.dk  
www.lappgroup.dk

**Dominican Republic**

**ING. Rudy Moreno & Asociados, S.R.L.**  
Prolongación 27 de Febrero Esq.  
Cuidad Agraria, Edif. Yarudith  
SANTO DOMINGO OESTE  
Tel.: +809 334 4394  
Fax: +809 334 4454  
www.ingrudymorenoyasoc.com

**Ecuador**

**Elsystec S.A.**  
Electricidad Sistemas y Tecnología  
Vasco de Contreras N35-251 y  
Mañosa  
CÓDIGO POSTAL 170521  
Tel.: +593 2 2456510  
Fax: +593 2 2456598  
elsystec@elsystec.com.ec  
elsystec@uiio.satnet.net  
www.elsystec.com.ec

**Egypt**

**see United Arab Emirates**  
LAPP CABLES MIDDLE EAST FZE

**El Salvador**

**Intek El Salvador S.A. de C.V.**  
Calle Gabriela Mistral No. 373  
Entre Blvd. Los Héroes y 33 Av. Nte.  
SAN SALVADOR, El Salvador CA.  
Tel.: +503 2260-8888  
Fax: +503 2260-8855  
inteksv@intek-ca.com  
www.intek-ca.com

**Estonia**

**Lapp Miltronic SIA Eesti Filiaal**  
Kastani pst 10  
44307 RAKVERE  
Tel.: +372 6 518970  
Fax: +372 6 518971  
orders@lappmiltronic.lv  
www.lappmiltronic.ee

**Finland**

**SKS Automaatio Oy**  
Martinkyläntie 50  
P.O. Box 122  
01721 VANTAA  
Tel.: +358 2 076461  
Fax: +358 2 0764620  
automaatio@sksf.fi  
www.skssf.fi

**France**

**Lapp France s.a.r.l.**  
Technopôle Forbach-Sud BP 50084  
57602 FORBACH CEDEX  
Tel.: +33 387 841929  
Fax: +33 387 841794  
lappfrance@lappgroup.com  
www.lappfrance.fr

**LAPP MULLER SAS**

Z.A. du Grand Pont  
83310 GRIMAUD  
Tel.: +33 494 566500  
Fax: +33 494 43487  
info@mullercables.com  
www.mullercables.com

**Câbleries Lapp Sarl**

Technopôle Forbach Sud  
Rue Avogadro  
57600 Oeting  
Tel.: +33 387 844343  
Fax: +33 387 871641  
accueil@lappgroup.com

**Georgia**

**Insta LLC**  
Sergo Zakariadze str. 8  
0177 TBILISI  
Tel.: +995 32 2202020  
Fax: +995 32 2202022  
sales@insta.ge  
www.insta.ge

**Germany**

**U.I. Lapp GmbH**  
Schulze-Delitzsch-Straße 25  
70565 STUTTGART  
Tel.: +49 711 783801  
Fax: +49 711 78382640  
info@lappkabel.de  
www.lappkabel.de

**Lapp Systems GmbH**

Oskar-Lapp-Str. 5  
70565 STUTTGART  
Tel.: +49 711 783804  
Fax: +49 711 78383520  
info@lappkabel.de  
www.lappkabel.de

**Ghana**

**PROCESS AND PLANT  
AUTOMATION Ltd.**  
No. 3 Becca Villa, behind Cal Bank  
Baatsona, Spintex Road.  
P.O. Box Sr 95  
ACCRA  
Tel.: +233 3 02812680  
ekua@automationghana.com  
www.automationghana.com

**Great Britain**

**Lapp Limited**  
Unit 3 Perivale Park  
Horsenden Lane South  
UB6 7RL GREENFORD MIDDLESEX  
Tel.: +44 20 87587800  
Fax: +44 20 87587880  
sales@lapplimited.com  
www.lappgroup.co.uk

**Greece**

**Dimoulas Special Cables S.A.**  
100-102 Lenorman Str.  
10444 ATHENS  
Tel.: +30 21 05157610  
Fax: +30 21 05157611  
info@dimoulas.gr  
www.dimoulas.gr

**Guatemala****Intek Guatemala S.A.**

4a. Ave. 10 - 31 Zona 9  
GUATEMALA  
Tel.: +502 2507-0500  
Fax: +502 2507-0501  
intekgt@intek-ca.com  
www.intek-ca.com

**Honduras**

**intek Honduras**  
Ofi-Bodegas Premier  
100 mts. antes del Peaje a La Lima  
Edificio PWC-14B  
SAN PEDRO SULA  
Tel.: +504 2559-4748, -50  
Fax: +504 2559-4740  
intekhn@intek-ca.com  
www.intek-ca.com

**Hong Kong**

**Worldtex & Co.**  
Unit 11, 11/F, Tins Enterprises  
Centre  
777 Lai Chi Kok Rd.  
CHEUNG SHA WAN  
KOWLOON  
Tel.: +85 22 7811860  
Fax: +85 22 7814733  
info@worldtex-co.com.hk

**Hungary****Lapp Hungária Kft.**

Neumann János u.1  
2040 BUDAÖRS  
Tel.: +36 23 501-250  
Fax: +36 23 501-259  
sales@lapphungaria.hu  
www.lapphungaria.hu

**India**

**Lapp India Pvt. Ltd.**  
Plot No.98, J & K  
Jigani Industrial Area, II Phase  
BANGALORE SOUTH - 560 105  
Tel.: +91 8110 304800  
Fax: +91 80 27825479  
info@lappindia.com  
www.lappindia.com

**Indonesia**

**PT. JJ-Lapp Cable SMI**  
Graha INTI FAUZI, 7th Floor  
Jl. Buncit Raya No. 22  
JAKARTA 12510  
Tel.: +62 21 27537051  
Fax: +62 21 27537052  
sales\_jji@jjsea.com  
www.jj-lappcable.com

**Iran**

**see United Arab Emirates**  
LAPP CABLES MIDDLE EAST FZE  
www.lappcable.com

**Island****Johan Rönning Ltd.**

Klettgardar 25  
104 REYKJAVIK  
Tel.: +354 5 200800  
Fax: +354 5 200888  
ronning@ronning.is  
www.ronning.is

**Israel****Arrow Control Cables Ltd.**

7, Zaviton street  
49950 NEHALIM  
Tel.: +972 3 9074887  
Fax: +972 3 9074889  
info@arrowcables.com  
www.arrowcables.com

**Italy****LAPP ITALIA S.R.L.**

Via Lavoratori Autobianchi 1  
Building 20  
20832 DESIO (MB)  
Tel.: +39 0362 4871  
Fax: +39 0362 487303-340  
lappitalia@lappitalia.it  
www.lappitalia.it

**Camuna Cavi s.r.l.**

Via Generale Treboldi, 128  
25048 EDOLO (BS)  
Tel.: +39 0364 773411  
Fax: +39 0364 770120  
info@camunacavi.it  
www.camunacavi.it  
**Sales Office**  
Via Lavoratori Autobianchi 1  
Building 20  
20832 DESIO (MB)

**Japan****K.Mecs Co., Ltd.**

Headquarters Yusen Iwamotocho  
Bldg. 3F  
2-3-3 Iwamotocho, Chiyodaku  
101-0032 TOKYO  
Tel.: +81 3 58255333  
Fax: +81 3 58258550  
info@kmecs.co.jp  
www.kmecs.com

**Jordan****see United Arab Emirates**

LAPP CABLES MIDDLE EAST FZE

**Kazakhstan****Lapp Kazakhstan LLP**

Abaya ave. 13, office 703  
010000 ASTANA c.  
Tel.: +7 7172 787365  
sales@lappgroup.kz  
www.lappgroup.kz

**Korea****Lapp Korea LLC.**

42, Jangangongdan 8-gil  
Jangan-myeon, HWASEONG-SI  
Gyeonggi-do, 445-941 Korea  
Tel.: +82 31 1688 1099  
Fax: +82 31 697 4059  
www.lappkorea.com

**Kuwait****see United Arab Emirates**

LAPP CABLES MIDDLE EAST FZE

**Kyrgyzstan**

**MEG Solutions LLC**  
Chuj avenue 265A, office 204  
720071 BISHKEK  
Tel.: +996 312 641946  
Fax: +996 312 641983  
office@meg.kg  
www.meg.kg

**Latvia**

**LAPP MILTRONIC SIA**  
Ulbrokas 44a  
RIGA, 1021  
Tel.: +371 67 501900  
Fax: +371 67 501909  
pasutijum@lappmiltronics.lv  
www.lappmiltronics.lv

**Lebanon**

**see United Arab Emirates**  
LAPP CABLES MIDDLE EAST FZE

**Libya**

**Al Jouda Co.**  
Al Fath - Street  
Al Buraq - Building 3rd floor  
BENHAZI  
Tel.: +218 91 7433363  
ilsharee@yahoo.co.uk

**Lithuania**

**LAPP MILTRONIC filialas**  
Aukštaičių g. 6  
11341 VILNIUS  
Tel.: +370 5 2780390  
info@lappmiltronics.lt  
www.lappmiltronics.lt

**Macedonia**

**Siskon Doel**  
Taskenska 4A  
1000 SKOPIJE  
Tel.: +389 2 3062423  
Fax: +389 2 3061250  
siskon@mt.net.mk  
www.siskon.com.mk

**Malaysia**

**JJ-LAPP Cable (M) sdn. Bhd.**  
16, Jalan 51A/225,  
46100 PETALING JAYA SELANGOR  
Tel.: +603 78 616288  
Fax: +603 78 616299  
sales\_jjm@jjsea.com  
www.jj-lappcable.com

**Malta**

**G & E Electronics Ltd.**  
Genics Bldgs.  
Giov. Papaffy Str.  
B'KARA BKR 4021  
Tel.: +356 21 486816  
Fax: +356 21 497103  
info@gemalta.com  
www.gemalta.com

**Mexico**

**Lapp Mexico S de RL de CV**  
Avenida del bosque 1190 Int. 1  
Parque Industrial del Bosque II  
45619, TLAQUEPAQUE, Jalisco  
Tel.: +52 33 36660250  
Fax: +52 33 36660075  
ventas@lappmexico.com  
www.lappmexico.com

**Republic of Moldova**

**Lapp Kabel Romania SRL**  
A1 Business Park  
(Autostrada Bucuresti - Pitesti, Km 13.5)  
Aleea Camilla nr. 11, Unitatea G2  
Comuna Dragomiresti Vale  
Sat Dragomiresti Deal  
Judet ILFOV, 077096  
Tel.: +40 213 1009-61  
Fax: +40 213 1009-59  
office@lappkabel.ro  
www.lappkabel.ro

**Mongolia**

**EUROCABLE G Co., Ltd.**  
Barun Selbe 5/26  
1st Khoroo, Chingeltei District  
15160 ULAANBAATAR  
Tel.: +976 70 117171  
info@cable.mn  
www.cable.mn

**Morocco**

**Fiabel**  
16 Rue des Dahlias (Beausite)  
Boulevard La Grande Ceinture  
Ain Sebâa, CASABLANCA  
Tel.: +212 522 403301, 522 404616  
Fax: +212 522 403303  
www.fiabel.ma

**Netherlands**

**Lapp Benelux B.V.**  
Van Dijklaan 16,  
5581 WG WAALRE  
Postbus 74, 5580 AB WAALRE  
Tel.: +31 40 2285000  
Fax: +31 40 2285010  
sales.lappbenelux@lappgroup.com  
www.lappbenelux.com

**New Zealand**

**Engineering Computer Services Ltd.**  
Cnr Te-Rapa & Ruffell Rd  
P.O. Box 20204  
HAMILTON, 3288  
Tel.: +64 7 8492211  
Fax: +64 7 8492220  
garry@lappgroup.co.nz  
www.lappgroup.co.nz

**Nicaragua**

**Electronica Tecnica S.A.**  
De la Óptica Nicaraguense  
3C al este, 1/2C al Sur  
Casa #38 Residencial Bolonia  
MANAGUA  
Tel.: +505 2254-4913  
info@ni.elvatron.com  
nicaragua.elvatron.com

**Norway**

**Miltronik AS**  
Eikveien 11  
3036 DRAMMEN  
Tel.: +47 32 261300  
Fax: +47 32 261398  
info@miltronik.no  
www.miltronik.no

**Oman**

**see United Arab Emirates**  
LAPP CABLES MIDDLE EAST FZE

**Pakistan**

**see United Arab Emirates**  
LAPP CABLES MIDDLE EAST FZE

**Panama**

**Lapp Latinamerica Support Corporation**  
Edif. Global Bank Calle 50, piso 38  
Int. 3801-A, PANAMA  
Tel.: +507 3938-565  
soporte.lataam@lappgroup.com

**Peru**

**DIPROSOL PERU SAC**  
Av. Velasco Astete 2371  
Surco LIMA 33  
Tel.: +51 1 2752765  
Fax: +51 1 2752776  
ventas@diprosol.com.pe  
www.diprosol.com.pe

**Philippines**

**JJ-LAPP Cable (P) Inc**  
Unit 704, Philplans Corporate Center  
1012 Triangle Drive  
Bonifacio Global City  
1634 TAGUIG CITY, MANILA  
Tel.: +632 786 7566  
Fax: +632 786 7544  
sales\_jjl@jjsea.com  
www.jj-lappcable.com

**Poland**

**Lapp Kabel Sp. z o.o.**  
Ulica: Profesjonalna 1  
Biskupice Podgórze  
55-040 KOBIERZYCE  
Tel.: +48 71 3306300  
Fax: +48 71 3306306  
info@lapppolska.pl  
www.lapppolska.pl

**Portugal**

**Policabos S.A.**  
Av. Pedro Álvares Cabral  
Lugar da Capa Rota  
2710-144 SINTRA  
Tel.: +351 21 9178640  
Fax: +351 21 9178649  
policabos@policabos.pt  
www.policabos.pt

**Qatar**

**see United Arab Emirates**  
LAPP CABLES MIDDLE EAST FZE

**Romania**

**Lapp Kabel Romania SRL**  
A1 Business Park  
(Autostrada Bucuresti - Pitesti, Km 13.5)  
Aleea Camilla nr. 11, Unitatea G2  
Comuna Dragomiresti Vale  
Sat Dragomiresti Deal  
Judet ILFOV, 077096  
Tel.: +40 213 1009-61  
Fax: +40 213 1009-59  
office@lappkabel.ro  
www.lappkabel.ro

**Russia**

**Lapp Russia OOO**  
Mira st., 7, Krutye Kluchi  
443028 SAMARA  
Tel.: +7 846 2310333  
Fax: +7 846 2310028  
info@lappgroup.ru  
www.lappgroup.ru

**Saudi Arabia**

**see United Arab Emirates**  
LAPP CABLES MIDDLE EAST FZE

**Serbia**

**VESIMPEX d.o.o.**  
Patrijarha Dimitrija 24 (DMB)  
11090 BEOGRAD-RAKOVICA  
Tel.: +381 11 4049-070, -071, -072, -073  
Magacin/warehouse: +381 11 4049-075  
Fax: +381 11 4049-077  
Mob: +381 63 693-373  
info@vesimpex.rs  
www.vesimpex.rs

**Singapore**

**Lapp Logistics Pte. Ltd.**  
No.9 Tuas South St. 3  
SINGAPORE 638017  
Tel.: +65 6558-7176  
Fax: +65 6558-7081  
lappsea.lappgroup.com

**JJ-LAPP Cable (S) Pte. Ltd.**

No.9 Tuas South St 3  
SINGAPORE 638017  
Tel.: +65 6508-6200  
Fax: +65 6863-1271  
sales\_jjls@jjsea.com  
www.jj-lappcable.com

**Slovakia**

**LAPP SLOVENSKO, s.r.o.**  
Piaristicka 2  
949 24 NITRA  
Tel.: +421 376 578095  
Fax: +421 376 578095  
info@lappgroup.sk  
www.lappgroup.sk

**Slovenia**

**Lapp, d. o. o.**  
Limbuška cesta 2  
2341 LIMBUŠ  
Tel.: +386 2 4213550  
Fax: +386 2 4213571  
info@lappslovenia.com  
www.lappslovenia.com

**South Africa**

**Lapp Group Southern Africa**  
51 Brunton Circle  
Founders View South  
Modderfontein  
1645 GAUTENG  
Tel.: +27 11 2013200  
Fax: +27 11 6095850  
info@lappkabel.co.za  
www.lappcable.co.za

**Spain**

**Lapp Group España**  
Avda. de les Garrigues, 34 - 36  
Parque Empresarial Mas Blau II  
08820 EL PRAT DE LLOBREGAT  
(Barcelona)  
Tel.: +34 902 108 669  
Fax: +34 934 796 272  
info@lappgroup.es  
www.lappgroup.es

**Sweden**

**Miltronik AB**  
Kungshagsvägen 7  
Box 1022  
611 29 NYKÖPING  
Tel.: +46 155 77780  
Fax: +46 155 77701  
info@miltronik.se  
www.miltronik.se

**Sales office Denmark**

Korskildeeng 6  
2670 GREVE  
Tel.: +45 43 950000  
Fax: +45 43 950009  
info@miltronik.dk  
www.miltronik.dk

**Switzerland**

**Volland AG**  
Ifangstrasse 103  
8153 RÜMLANG  
Tel.: +41 44 8179797  
Fax: +41 44 8179700  
info@volland.ch  
www.volland.ch

**EPIC®**

**Bachofen AG**  
Ackerstraße 42  
8610 USTER  
Tel.: +41 44 9441111  
Fax: +41 44 9441233  
info@bachofen.ch  
www.bachofen.ch

**Syria**

**see United Arab Emirates**  
LAPP CABLES MIDDLE EAST FZE

**Taiwan**

**DKSH Taiwan Ltd.**  
10th Floor, No. 22, Lane 407  
Tiding Blvd., Sec. 2  
Neihu Technology Park  
TAIPEI CITY 114-93  
Tel.: +886 2 87527597  
Fax: +886 2 87518688  
edmund.foo@dksh.com

**Thailand**

**JJ-LAPP Cable (T) Ltd.**  
23/110-117 Sorachai Building  
25-29th FL  
Soi Sukhumvit 63 (Ekamai),  
Sukhumvit Road, Klongton Nua,  
Wattana, BANGKOK 10110  
Tel.: +66 27 878288  
Fax: +66 27 878299  
sales\_jjlt@jjsea.com  
www.jj-lappcable.com

**Tunisia**

**ELECSA TN, Groupe TTI**  
Zone industrielle  
8030 GROMBALIA  
Tel.: +216 72 255954  
Fax: +216 72 255980  
commercial@elecsa-tn.com  
www.elecsa-tn.com

**Turkey**

**LAPP KABLO San. ve Tic.Ltd.Şti.**  
Atatürk Mah. Şeref Sok. No: 55/1  
34758 ATAŞEHİR-İSTANBUL  
Tel.: +90 216 4565699  
Fax: +90 216 4565687-89  
info@lapp.com.tr  
www.lapp.com.tr

**Ukraine**

**Lapp Ukraine LLC**  
201 - 203, Kharkivske shose  
02121 KIEV  
Tel.: +38 044 495-6000  
Fax: +38 044 490-7630  
sales@lappukraine.com  
www.lappukraine.com

**United Arab Emirates**

**LAPP CABLES MIDDLE EAST FZE**  
Wing A-502, P.O. Box 341223  
Dubai Silicon Oasis  
DUBAI  
Tel.: +971 4 3712905  
Fax: +971 4 3712918  
lappme@lappgroup.com  
www.lappgroup.com

**Uruguay**

**Reprinter LTDA.**  
Avda. Italia 6481  
40 MONTEVIDEO  
Tel.: +598 2600-7343  
Fax: +598 2600-8658  
lapp@reprinter.com.uy  
www.reprinter.com.uy

**USA**

**Lapp USA, Inc.**  
29 Hanover Road  
FLORHAM PARK, NJ 07932  
Tel.: +1 973 6609700  
Fax: +1 973 6609330  
sales@lappusa.com  
www.lappusa.com

**Lapp Tannehill, Inc.**

8675 Eagle Creek Parkway Suite 900  
SAVAGE, MN 55378  
Tel.: +1 952 8816700  
Fax: +1 952 8810743  
sales@lapptannehill.com  
www.lapptannehill.com

**Uzbekistan**

**Elektro Potential LLC**  
Y. Bodomzor str. 2 B, office 311  
Yunusabad area  
100084 TASHKENT  
Tel.: +998 71 1501220  
Fax: +998 71 1501220  
mz1958@yandex.ru

**Venezuela**

**Somerinca, C.A**  
Qta Corazón de Jesus  
4ta Transversal de Montecristo c/  
calle el Carmen, de los Dos Caminos  
1070 CARACAS  
Tel.: +212 235 1081/1696/2748,  
237 3003  
Fax: +212 239 9341  
klocmoeller@cantv.net  
www.somerinca.com

**Vietnam**

**JJ-Lapp Cable Vietnam Co., Ltd**  
12th floor, Unit 1206, Sailing Tower  
111A Pasteur Street, District 1  
HO CHI MINH CITY  
Tel.: +84 8 62887668  
Fax: +84 8 38236776  
sales\_jjlv@jjsea.com  
www.jj-lappcable.com

**Yemen**

**see United Arab Emirates**  
LAPP CABLES MIDDLE EAST FZE

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## Reach us around the world

...or closer to home. To contact your local Lapp Group representative:

### CAMUNA CAVI S.R.L.

Operation: Via General Treboldi 128  
25048 Edolo (BS) Italy

TEL +39 0364 773411  
FAX +39 0364 770120

Sales Office: Via Lavoratori Autobianchi 1  
building 20  
20832 Desio (MB) Italy

TEL +39 0364 773411

www.camunacavi.it  
info@camunacavi.it

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**LAPP GROUP**

**CAMUNA CAVI S.R.L.**

Operation: Via General Treboldi 128 · 25048 · Edolo (BS) · Italy

Sales: Via Lavoratori Autobianchi 1 · 20832 · Desio (MB) · Italy

[www.camunacavi.it](http://www.camunacavi.it) · [info@camunacavi.it](mailto:info@camunacavi.it)

Tel.: +39 0364 773411

**A Lapp Group Company**