

ÖLFLEX®

UNITRONIC®

HITRONIC®

SKINTOP®

EPIC®

SILVYN®

FLEXIMARK®

ETHERLINE®

AVS Stuttgart



**Power, Light & Sound 2006**  
**Cables, Connectors, Accessories**



 **LAPP KABEL**

**U.I. Lapp GmbH**  
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A Lapp Group Company

03/06.2000.91110199



 **LAPP KABEL**

**General conditions of sale:**  
Our general conditions of sale can be downloaded from our website [www.lappkabel.de](http://www.lappkabel.de) under the menu "Service".



# Lapp Kabel in Germany

Lapp Kabel is one of the foremost suppliers of cables and cable accessories worldwide. In 1957, company founder Oskar Lapp developed **ÖLFLEX®**, the first industrially manufactured control cable in the world. Today, cables are available for mechanical engineering, the automotive industry, measurement and control technology, electrical and installation engineering, EDP and many other fields of applications.

Lapp Kabel products are mainly manufactured at the Lapp Group production units. As a result, at present more than 40.000 different standard items are ready ex-works.

For customer-related solutions, special cables and conduits are designed and manufactured separately.

Short distances and proximity to our customers ensure a closely meshed distribution network, even outside Germany.

Technically competent company representatives, who have been trained at our company headquarters in Stuttgart, impart their expertise on site. Country-specific approvals and certifications permit problem free use of our products worldwide.



The Lapp Kabel headquarter in Stuttgart-Vaihingen.



The Lapp Center in Stuttgart-Vaihingen

## Our headquarter

**U. I. Lapp GmbH**  
 Schulze-Delitzsch-Straße 25  
 D-70565 Stuttgart  
 Tel. 0049 (0)711/7838-3140  
 Fax 0049 (0)711/7838-4920  
 Internet: [www.lappgroup.com](http://www.lappgroup.com)

**Hanover branch**  
 Wiesenauer Straße 2  
 D-30179 Hannover  
 Tel. 0049 (0)511/37293-0  
 Fax 0049 (0)511/37293-30

## Our business hours

**Sales/Germany:**  
 Mon - Thu 7.00 - 18.00 h  
 Fri 7.00 - 16.00 h

**Self collection:**  
 Mon - Fri 7.00 - 19.00 h

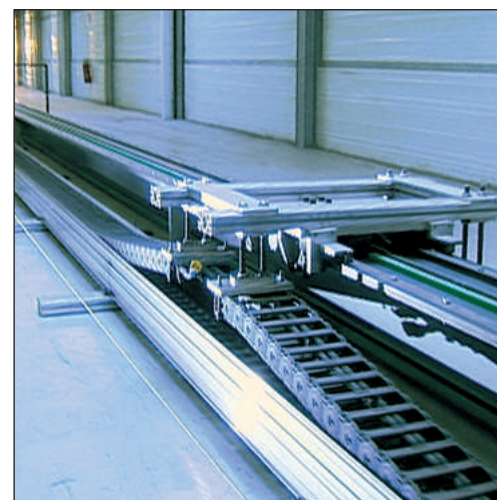
**Export:**  
 Mon - Thu 7.00 - 18.00 h  
 Fri 7.00 - 17.00 h

**Call-Center:**  
 Mon - Fri 7.00 - 20.00 h  
 Sat 8.00 - 12.00 h

## The Lapp Test Centre

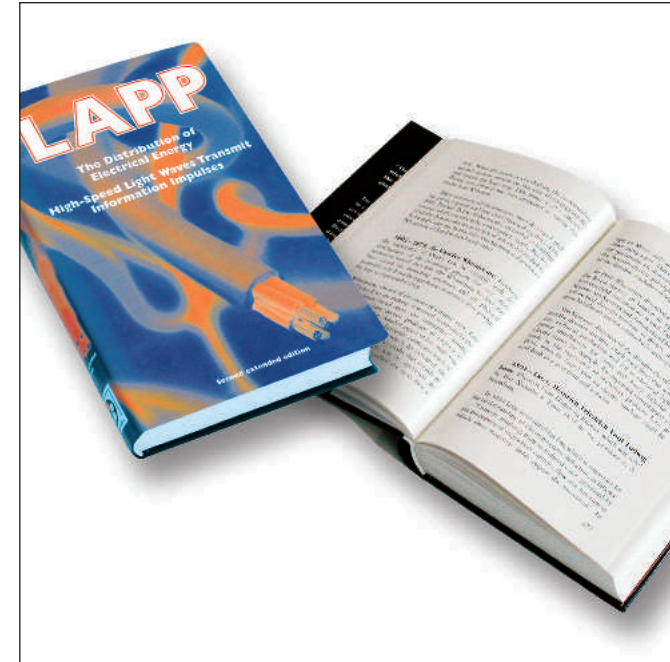
Our Test Centre with its extremely high demands on material testing and quality assurance is another surety of the crucial headstart of our products. The capability of all Lapp Group developments is tested here in hard endurance

tests. For example, we subject our highly flexible cables to millionfold bending cycles at different speeds and with extreme bending radii. Only what the "torture chamber" survives is good enough to be accepted in the program.



55 m endurance test unit for testing highly flexible power chain cables.

Cover photo: Euro Mir roller coaster at the Europa Park in Rust, Germany. Use of ÖLFLEX® connection and control cables and EPIC® industrial connectors.



## The Lapp Book

Second expanded edition with over 640 pages. Reference work and orientation tool with tips and advices for hobbyists and professionals. The book includes interesting articles, illustrations, tables and expert terminology about electricity, the development of copper cabling and modern fiber optic cabling technology.

The Lapp book, the Lapp Cable Guide, the main catalogue and the CD-ROM can be ordered from regional sales representatives. See catalogue pages 12-13. Visit our website: [www.lappgroup.com](http://www.lappgroup.com)

## The Lapp Cable Guide

In our "Lapp Cable Guide" you will find many of the technical terms used in the electrical industry. From A as in "absorption" to Z as in "zinc", the terms are listed

in alphabetical order and accompanied by a short but concise explanation. The "Lapp Cable Guide" also contains a large number of useful tables and charts.



## The complete 2006 catalogue on CD-ROM

### Safety

Without exception our products are tested for application safety in accordance with laid down standards and our own regulations, which complement the standards. Relevant legal requirements and safety regulations are also observed. Provided due care and attention is paid, the possibility of product-specific danger to the user may thus reasonably be excluded. Where products are used carelessly or incorrectly, however, considerable danger to persons and

the environment may arise. For this reason, our cables must only be processed and /or used responsibly by trained electricians or specialists. This catalogue contains general information for the application of each product. Independent of such information, the application standards DIN VDE 0298 and DIN VDE 001 for cables will apply. Excerpts from these standards, as well as complementary selection and application tables, design and installation guidelines, are contained

in the tables in the appendix to this catalogue. Our machines and installation tools are - where necessary - designed in accordance with the machine guidelines and display the CE identification mark. It must be noted, however, that our machines and installation tools must only be used by trained specialized personnel and for the purpose for which they were designed.

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# Lapp Kabel in Germany

## Powerful brands in a powerful program

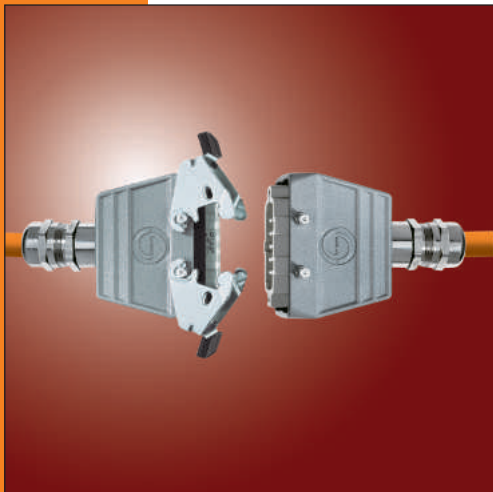
- Pioneering market leaders
- Expertise and solutions for many industries and markets
- Innovative technologies
- Highest quality
- Extensive product range for standard and tailor-made solutions
- Over more than 45 years of manufacturing experience

## Perfect products, complete systems

- Tailor-made for excellent fit
- Perfectly matching cables and connectors
- System solutions for immediate deployment
- Effective with fast assembly
- Economical with simplified warehouse storage

## The Lapp Group offers more than cabling

- Wires and cables
- Cable glands
- Cable accessories
- Industrial connectors
- Cable marking systems
- Cable systems
- Machines for cable and cable handling
- Communication technology
- Comprehensive range of services



## Fast delivery, state-of-the-art logistics

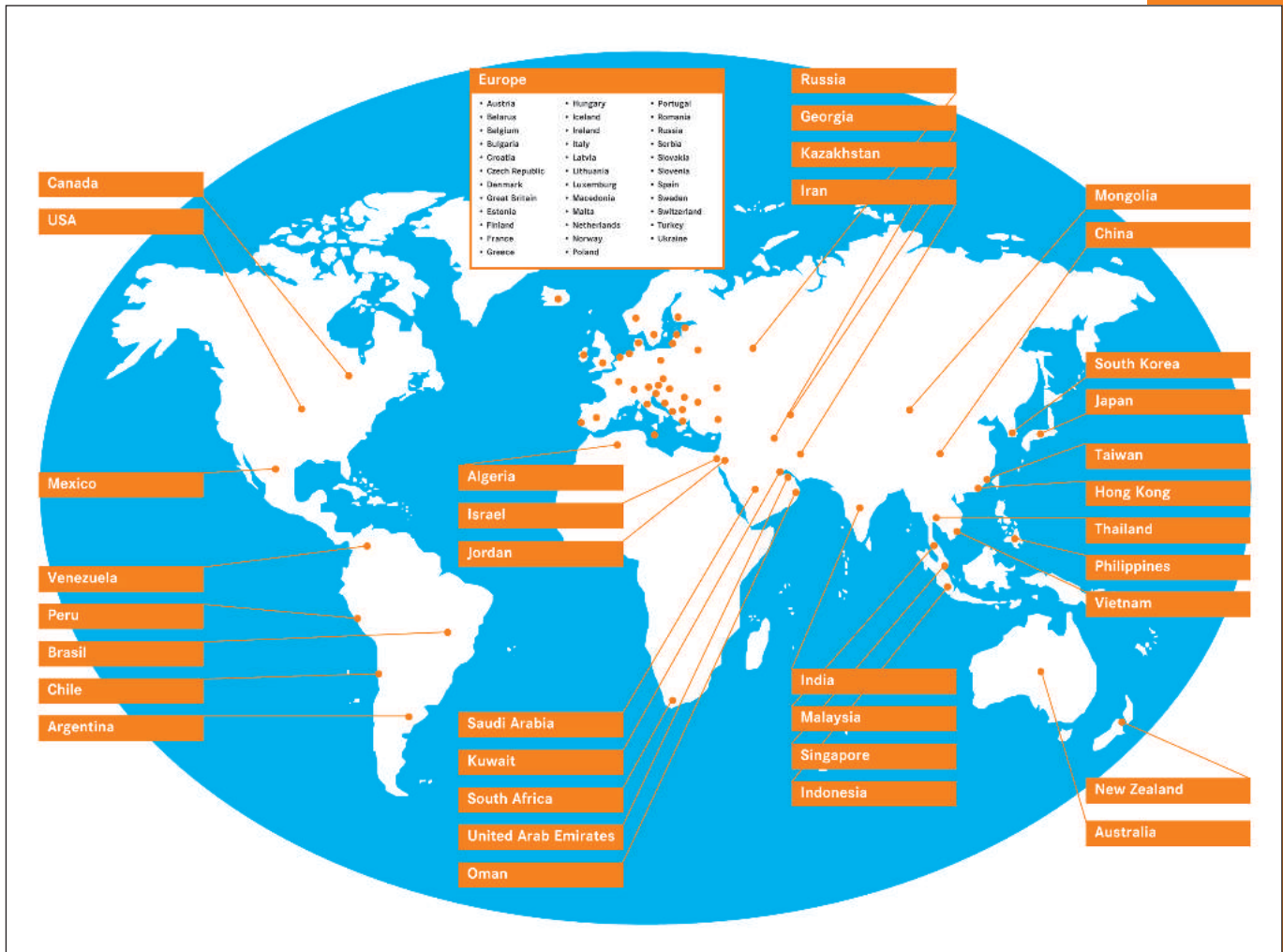
- Constant availability, owing one of the industry's largest warehouses
- Delivery within 24 hours
- Worldwide sales network
- Innovative customer services

## Everything from a single source

- Convenient and time-saving
- Full range of products and services
- Direct contacts for your solutions
- One group, one number, one call







**15 production sites worldwide in America, Europe and Asia**

- Global market competence
- range of products and services unique worldwide
- Highest quality standards worldwide
- Perfectly adapted to the relevant market



Head quarter in Stuttgart-Vaihingen



USA



Singapore



India



France



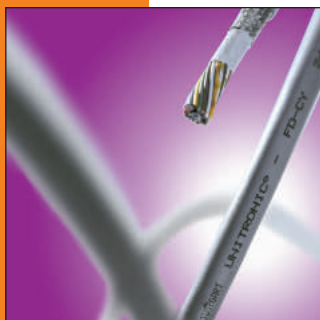
Austria

## Our international brands



### ÖLFLEX® connection and control cables

ÖLFLEX® is used in machinery, machine tools, system and appliance engineering, measuring, control, heating and air conditioning technologies. For permanent connections or in cable chains, halogen-free or internationally certified, you can choose from our comprehensive range of standard products.



### UNITRONIC® Data cables

Lapp produces a full range of data cables for fast and secure transfers of large volumes of data. From machine electronics and bus systems to super-fast LAN data networks or highly-versatile applications: We have the data cables you need for virtually any situation.



### HITRONIC® Fibre optic cables

HITRONIC® fibre optic cables are designed to transfer large volumes of data. Communications media via fibre optics are fast, efficient, and secure. Not even electromagnetic interference can affect HITRONIC® fibre optic cable. The HITRONIC® range of products includes cables for office communications, industrial applications, simplex, duplex, hybrid wiring, or cable chain applications.

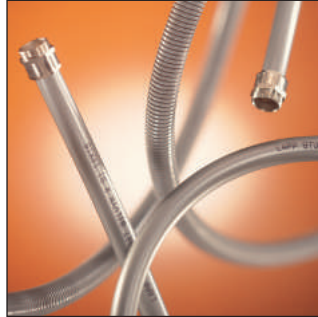


### SKINTOP® Cable glands

SKINTOP® cable glands guarantee secure connections every time. Simply thread the cable and twist. That's all! Your cables are perfectly centered, secured, hermetically sealed, and ready for action. Choose from a wide range of models in plastic or brass, for EX and EMC applications, halogen-free types or anti-kink protection, metric, PG or NPT.

## SILVYN® cable protection and guiding systems

In many applications cables have to be additionally protected against mechanical and chemical stress. For this type of application, Lapp Kabel can supply the universal **SILVYN®** protective cable conduit program. Cable conduits manufactured from metal or plastic material, which can be used with matching glands to form a perfect system connection. The complete system results in all round protection for cables in indoor and outdoor installations. With **SILVYN® CHAIN**, Lapp Kabel's widely variable programme of power chains we offer both cable protection and guidance for highly dynamic applications.



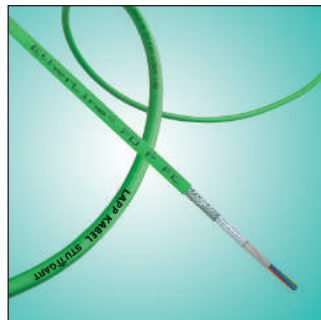
## FLEXIMARK® marking systems

Labels on single cores, cables, and control cabinets need to remain legible for years to come. This is the best way to keep things well organized and avoid potential problems. From plastic to durable stainless steel, manual or electronic identification, with **FLEXIMARK®** you can be sure that your labels will last a lifetime.



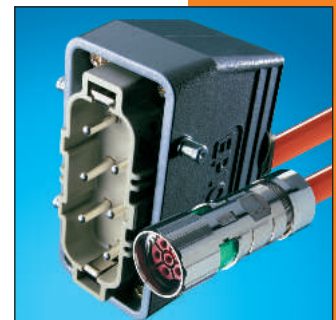
## ETHERLINE® Industrial Ethernet components

The Lapp Group is now in a position to offer comprehensive system solutions in the field of industrial networking. Its Factory Automation division supplies active network components that are used to supplement existing cable and plug technologies. These include services and security systems incorporating firewall solutions, in addition to distribution components such as switches, routers, cables and plug connectors. For its industrial customers, all of this means that a solution from the Lapp Group represents a considerable step forward in terms of security, safety and availability.



## EPIC® industrial connectors

When we talk about secure connections, you can take us at our word. **EPIC®** industrial connectors produce an absolutely secure connection in combination with **ÖLFLEX®** cables. We provide the right contact for all your needs: From rectangular or circular connectors, to housings, inserts, contacts and accessories, bus or fibre optic cable applications.



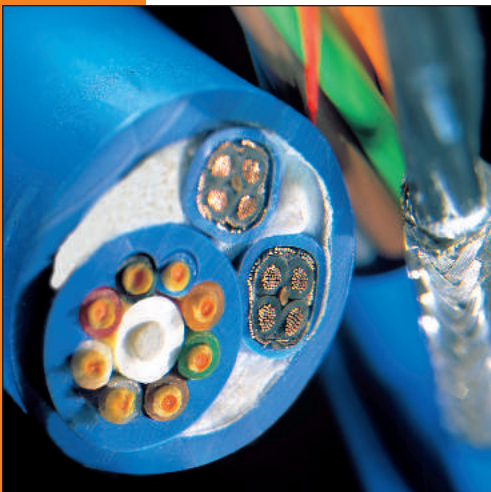
# Customized cables

## Special cables for complex applications

You don't find the right cable within the 40.000 standard products in the Lapp cable range for your specific application problem? No Problem! We are specialists for superior individual solutions in the range of special cables. With our own research and development centre we are prepared to meet even the most sophisticated requirements. Our experts are able to advise you on site and create together with you the optimized solution. Our cables are made of different materials (PVC, PUR, TPE, FEP, PTFE etc.)

and base on our high technical know-how. In co-operation with our test-centre the products are tested in an extended way to make sure that the performance meets your demand.

For inquiries to customized products please contact our specialists.



## Production according to customer requirement

We develop and produce cables with different cross-sections and twisting technique. We optimize your cable in outer diameter and design for high numbers of bending cycles or small bending radii, for high tensile or pressing stress, or for usage in highly aggressive chemicals, water or oils. Also for the screening technique we are flexible – e.g if foil, screen or spiral shield.

Our product portfolio includes:

- Control cables
- Data cables
- Bus cables
- Computer cables
- Servo cables
- Cables for high temperature
- Flame retardant cables
- Hybrid cables
- International approved cables
- Extension- and compensating cables
- Cables for robotics
- Cables for drum reeling
- For high mechanical stress
- Lift cables
- Highly flexible cables for power chains
- Screened cables
- Combined cables with compressed air-hose or data cables

## Certification

Our production and tests strictly comply with national and international standards. Certifications are available on request.



# Request for customized development

## Special cable

light-sound@lappgroup.com

Fax 0711/7838 - 2640

### Application

- indoor
- outdoor
- fixed installation
- flexible
- highly flexible
- min. bending radii: \_\_\_\_ x  $\varnothing$
- resistant against:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Temperature range

- permanent temp. \_\_\_\_°C
- short-time temp. \_\_\_\_°C

### Stranding

- copper - bare
- copper - tinned
- copper - \_\_\_\_\_
- solid
- flexible
- highly flexible

### Core insulation

- PVC
- PUR
- TPE-E
- TPE-O
- TPE-S
- rubber
- silicone
- PTFE
- ETFE
- \_\_\_\_\_

### Strain relief

- no
- core
- filling elements betw.the cores
- screen
- kevlar
- hemp
- steel
- \_\_\_\_\_

### Twisting

- in layer
- in pairs
- unit
- \_\_\_\_\_

### Part - screening

- no
- copper - tinned
- copper - bare
- layer of copper wires
- copper braid
- aluminium - foil

### Inner-sheath

- no
- PVC
- PUR
- TPE-E
- TPE-O
- TPE-S
- rubber
- silicone
- PTFE
- ETFE
- \_\_\_\_\_

### Core identification

- bk with wh no.
- with gn/ye
- without gn/ye
- DIN 47100
- colour code: \_\_\_\_\_

### Overall screening

- no
- copper - tinned
- copper - bare
- layer of copper wires
- copper braid
- aluminium - foil

### Dimension

(No. of cores x  $\varnothing$ ) \_\_\_\_\_

### Outer sheath

- PVC
  - PUR
  - TPE-E
  - TPE-O
  - TPE-S
  - rubber
  - silicone
  - PTFE
  - ETFE
  - \_\_\_\_\_
- colour of sheath: \_\_\_\_\_  
similar to RAL: \_\_\_\_\_  
outer diameter- $\varnothing$ : \_\_\_\_mm  
printing: \_\_\_\_\_

### Halogen-free

- yes
- no

### Flame retardant according

\_\_\_\_\_

Date \_\_\_\_\_

Company/Department \_\_\_\_\_

Name \_\_\_\_\_

Street/City/State/Zip \_\_\_\_\_

Phone/Fax \_\_\_\_\_

E-Mail \_\_\_\_\_

Customer code \_\_\_\_\_

### Electrical features

- operating voltage \_\_\_\_\_
- test voltage \_\_\_\_\_
- impedance \_\_\_\_\_
- capacity \_\_\_\_\_

### Approval

- VDE
- UL/CSA
- other \_\_\_\_\_

### Demand

\_\_\_\_\_ km

### Pricing:

\_\_\_\_\_ /km



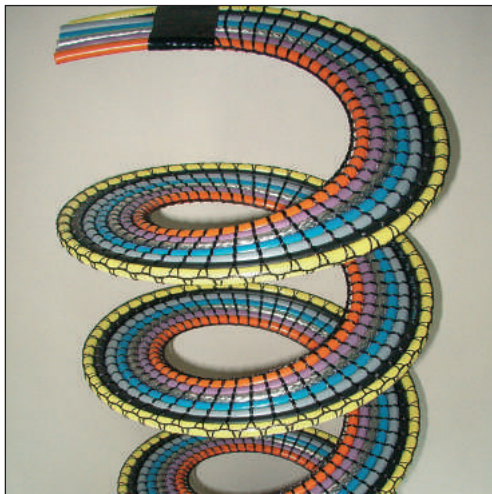
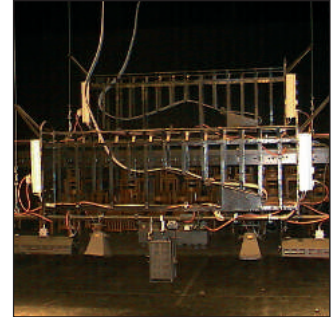
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Tel. 0711/7838-01 · Fax 0711/7838-2640 · www.lappkabel.de  
Ein Unternehmen der Lapp Gruppe

# Woven cables

## Woven cables supplying applications of moving equipment on stage, e.g. lighting and technique (acc. DIN VDE 0250 part 802)

Operas, theatres or convention centres needs many cables for on stage application like lighting, data and communication transmission. Woven flat cable is a structured band. Most part of physical stress can be absorbed. Thereby the flexibility of the woven cable remains constant. A permanent

linear filing of the band into a cable basket is guaranteed. It is possible to produce 800 mm (width) woven cables. Additional to flat structured woven cables it is realisable to produce bands in spiral design with a maximal width of 80 mm.

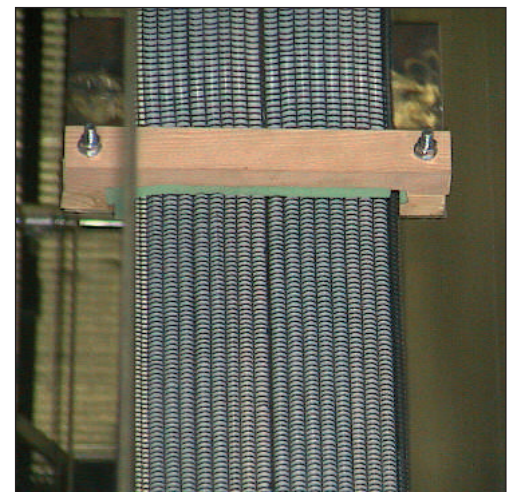


## Features

- individual configurable with different materials, also for pneumatics and fluids
- highly flexible
- space saving
- compact structure
- absorption of physical stress due to woven structure even for long elevating distances on stage
- noiseless filing
- burning test according DIN EN 50 266-2-4:2001 on request
- Smoke density according EN 50268-2 on request

## References

e.g. State Opera Munich, Lettish National Theatre Riga, Opera Bruges, Opera Helsinki, Theatre of Linz, Hallenstadion Zurich





## HITRONIC® POF SIMPLEX PE

Polymer Optical Fibre (POF) in simplex version without an outer sheath



## HITRONIC® POF SIMPLEX PE-PUR

Polymer Optical Fibre (POF) in SIMPLEX version with an outer sheath



## HITRONIC® POF DUPLEX PE

Polymer Optical Fibre in duplex version without outer sheath



## HITRONIC® POF FD PE-PUR

Polymer Optical Fibre (POF) with outer sheath. For highly flexible industrial application.

### Application

#### HITRONIC® POF SIMPLEX PE / POF DUPLEX PE

HITRONIC® cables are especially suitable for fixed laying in switch gear cabinets, cable ducts or tubes at simple mechanical stresses. Transmission length up to 60 m at 600 nm wavelength.

#### HITRONIC® POF SIMPLEX PE-PUR / POF FD PE-PUR

For higher mechanical stresses (SIMPLEX) or highly flexible use (POF FD).

### Special feature

#### HITRONIC® POF SIMPLEX PE / POF DUPLEX PE

PE is halogen-free.

#### HITRONIC® POF SIMPLEX PE-PUR / POF FD PE-PUR

Both cables are made of a adhesion free PUR outer-sheath, halogen-free, flame-retardant highly resistant.

### Note

Data sheet on request. Complementary accessories please find on page 13 in this catalogue.

### Cable Make-up

The fibre material of all HITRONIC® POF – versions is Polymethylmethacrylate (PMMA). The FD-Version consists of 217 single cores and is well known as Multicore-Stepindex-POF. The protective cover above the fibre is black polyethylene (PE). The two fibres of the DUPLEX style are connected with a strap.

## Technical Data

Temperature range:  
SIMPLEX PE  
-50 °C up to +70 °C  
SIMPLEX PE-PUR  
-40 °C up to +70 °C  
POF FD PE-PUR  
-20 °C up to +70 °C

Minimum bedding radius  
DUPLEX PE  
Short-term: min. 25 mm  
Fixed: min. 25 mm  
Permitted bending radius:  
SIMPLEX PE  
Fixed: 25 mm

SIMPLEX PE PUR  
Short-term: 30 mm  
Fixed: 50 mm  
FD PE-PUR  
Short-term: 50mm  
Fixed: 80mm

Permitted towing strain:  
SIMPLEX PE  
short time: max. 15 N  
fixed: max. 5 N  
DUPLEX PE  
Short term: max. 30 N  
Fixed: max. 10 N

SIMPLEX PE-PUR  
Short-term: max. 350 N  
Fixed: max. 100 N  
FD PE-PUR  
Short term: max. 400 N  
Fixed: max. 100 N

Dimensions:  
POF 980/1000 micrometer  
Fibre Type:  
Step Index Fibre of Polymethyl-  
methacrylate (PMMA)

SIMPLEX PE  
Standard designation: J-V2Y1P  
980/1000 200A 10  
DUPLEX PE  
Standard designation: J-V2Y2P  
980/1000 200A 10  
SIMPLEX PE-PUR  
Standard designation: J-V2Y11Y1P  
980/1000 220A 10  
FD PE-PUR  
Standard designation: J-V2Y11Y1P  
980/1000 400A 10

Part number	Type	Fibre Type	No. of Fibres	Approx. outside diameter in mm	Approx. weight kg/km
2185 001	HITRONIC® POF SIMPLEX PE	POF	1	2,2	4,2
2185 010	HITRONIC® POF DUPLEX PE	POF	2	2,2 x 4,4	8,4
2185 030	HITRONIC® POF SIMPLEX PE-PUR	POF	1	5,5	25,0
2185 207	HITRONIC® POF SIMPLEX FD PE-PUR	POF	1	6,0	33,2
2185 213	HITRONIC® POF DUPLEX PE-PUR	POF	2	7,4	60,0

Standard lengths without surplus for cutting: 100 m, 500 m



# HITRONIC® F.O. Cable for outdoor and indoor

Central loose tube construction

A-DQ (ZN) B2Y...



## Application

The longitudinal impermeability ensured by water blocking tapes and the abrasion-resistant PE outer sheath makes this cable highly suitable for pulling into empty and cable ducts as well as for industrial applications.

## Special Feature

Due to the small external diameter, the HQ- and HQN-series cables are also suitable for indoor use.

## Note

These cables are also available in flame retardant and non corrosive (FRNC) version. In the N-version, glass-fibre yarns over the buffered fibre ensure protection against rodents and transverse compression resistance. The address, telephone and telefax can be found at the begin of the catalogue.

## Cable Make-up

Up to 24 glass fibres with primary coating are enclosed in a centrally guided filled buffered tube. The glass-fibre yarns with water blocking tapes provide strain relief and longitudinal impermeability. The outer sheath is of PE.

## Technical Data

Temperature range:  
flexible: -20 °C to +60 °C  
static: 0 °C to +50 °C

Permitted towing strain:  
1500 N / 2500 N

Permitted bending radius:  
static: 20 x cable diameter

Part number	Part designation	Fibre Type	Number of Fibres	Approx. outside diameter in mm
276 004	HITRONIC® cable HQ 8 G 50 / 125	50 / 125	8	7,5
276 008	HITRONIC® cable HQ 4 G 50 / 125	50 / 125	4	7,5
276 012	HITRONIC® cable HQ 12 G 50 / 125	50 / 125	12	7,5
276 024	HITRONIC® cable HQ 24 G 50 / 125	50 / 125	24	7,8
On request also special multimode fibers (50 / 125 OM3) for 10 Gigabit-Ethernet are delivered.				
276 208	HITRONIC® cable HQ 8 E 9 / 125	9 / 125	8	7,5
276 212	HITRONIC® cable HQ 12 E 9 / 125	9 / 125	12	7,5
276 224	HITRONIC® cable HQ 24 E 9 / 125	9 / 125	24	7,8
276 304	HITRONIC® cable HQN 4 G 50 / 125	50 / 125	4	9,6
276 308	HITRONIC® cable HQN 8 G 50 / 125	50 / 125	8	9,6
276 312	HITRONIC® cable HQN 12 G 50 / 125	50 / 125	12	9,6
276 324	HITRONIC® cable HQN 24 G 50 / 125	50 / 125	24	9,8
276 508	HITRONIC® cable HQN 24 G 50 / 125	9 / 125	8	9,6
276 512	HITRONIC® cable HQN 12 E 9 / 125	9 / 125	12	9,6
276 524	HITRONIC® cable HQN 24 E 9 / 125	9 / 125	24	9,9



To produce harnessed and customized trunk-system, we need following information:

- Length of distance (effective distance + 3 to 5 m reserve per side)
- kind of fibres (9 µ, 50 µ or 62,5 µ)
- Number of fibres (2, 4, 6, 8 ... up to 48 fibres)
- Kind of connector (ST, SC, DIN, E-2000 ... also mixed)
- cable type (indoor, outdoor, rodents protection ...)

## Glass optical fiber GOF-Toolbox for handling of Multimode.

With the GOF-toolbox you are able to produce your own GOF-connection or to repair damaged fiber optic cables. All tools and implements are clearly arranged and placed safe. Very important

is the possibility to produce professional results without electrical power at building site. A independent gas heater is also included within this set. We like to show you the toolbox personally. Don't hesitate to contact our specialists of department network engineering/optical fiber.



Part number	Part designation	Unit (Piece)
910002	<b>GOF-toolbox</b>	
	<b>Connector Multimode</b>	
9307	ST connector for 50 µm or 62,5 µm	50
93071	GOF crimping ring 3 mm	50
93072	GOF-bending security black	50
CE9406	SC Duplex connector for 50 µm or 62,5 µm	20

## Polymer Optical Fiber All you need for processing POF ...

To process POF and our portfolio of connectors with the appropriate tools – NOTHING IS EASIER !!!

We offer also HFBR or F-05 connectors as well as connectors for thicker cable diameters (3,6 and 6,0 mm), coupling elements for F-SMA and B-FOC (ST) or POF measure equipment on demand.

Part number	Article	Unit
	<b>F-SMA connectors</b>	
21900178	POF 2,2 Crimp-SMA-R Metal with spout (knurled nut)	4
21900174	POF 2,2 Crimp-SMA-S Metal with spout (hex nut)	4
21900179	POF 2,2 Clamp-SMA with spout (knurled nut)	4
	<b>B-FOC (ST) connector</b>	
21900172	POF 2,2 Crimp-ST with spout (knurled nut)	4
21900170	POF 2,2 Clamp-ST with spout (knurled nut)	4
	<b>Processing tools for POF</b>	
21920051	Cutter	1
21920030	Stripping tool small 2,2	1
21920040	Kevlar scissors	1
21920017	Fiber crimp: four indent crimping pliers *	1
61813800	Insulation crimp: Crimping tool PEW 12 (without insert) *	1
61813815	Insert PEW 12.120 for crimping tool PEW 12 *	1
21920050	Polishing wheel F-SMA	1
21920055	Polishing wheel B-FOC (ST)	1
21920060	Polishing paper 600	4
21920001	Fiber cutter 2,2 Plus (cutting and stripping without polishing) **	1

\* Required only for crimp connectors.

\*\* Due to the usage of HITRONIC® Fiber cutter 2,2 Plus the polishing wheel and paper is not required.

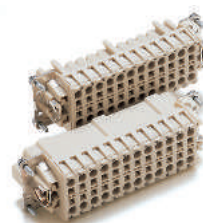
# EPIC® – robust connectors for stage technologie

## Inserts and Contacts

**H-BE 24 screw**  
24 contacts  
500V/16A



**H-B24 wire spring**  
24 contacts  
500V/16A



**H-D 64 crimp**  
64 contacts  
250V/10A



**H-DD 108 crimp**  
108 contacts  
250V/10A



Part number	version	packing unit
<b>Inserts and Contacts</b>		
10196000	Male insert	5
10197000	Female insert	5
10400300	Male insert	5
10401300	Female insert	5
11272000	Male insert	10
11273000	Female insert	10
11285300	Male insert	5
11286300	Female insert	5

H-BE inserts come with contacts included

Part number	Part number	part	packing unit	wire gauge (mm <sup>2</sup> )
<b>Male contact</b>	<b>Female contact</b>			
13162500	13163500		100	0,14-0,37 mm <sup>2</sup>
13162600	13163600		100	0,5 mm <sup>2</sup>
13162700	13163700		100	0,75-1,0 mm <sup>2</sup>
13162800	13163800		100	1,5 mm <sup>2</sup>
13162900	13163900		100	2,5 mm <sup>2</sup>
11147000		Crimp tool		
11147100		Crimp dies		
11147200		Locator		
11161000		Removal tool		

## Housing

**hood**  
IP65



**Panel base**  
IP 65



**surface mount base**  
IP 65



**Cable coupler**  
IP 65



Part number	Thread	packing unit	Cable entry
<b>hood</b>			
10121000	PG21	5	top
10111000	PG29	5	top
19121000	M25	5	top
19111000	M32	5	top
10113000	PG21	5	side
10123000	PG29	5	side
19113000	M25	5	side
19123000	M32	5	side
<b>Panel base</b>			
10121000		5	

Part number	Thread	packing unit	Cable entry
<b>Surface mount base</b>			
10104000	PG21	5	right
19104000	M25	5	right
10105000	PG21	5	Right /left
19105000	M25	5	Right /left
<b>Cable coupler</b>			
10127000	PG21	5	top
10117000	PG29	5	top
19127000	M25	5	top
19117000	M32	5	top



# EPIC® – robust connectors for stage technologie

To achieve a clear audible sound the multipin inserts are plated with high quality gold plating.



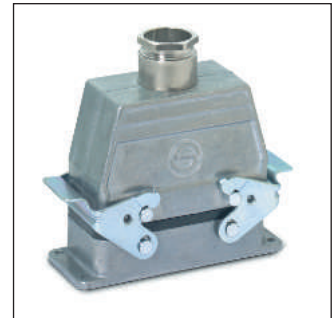
To transmit high currents low-loss the massive H-BE contacts are plated with passivated silver



The connectors are tested according to the fall test according to EN 61984. This ensures high safety when mounting. This is due to a special impact resistant insert and the robust aluminium housings.



EPIC® housings can be supplied with fixed extra sturdy metal levers on request.



The solid metal housings complete with SKINTOP® cable glands provide high protection against the intrusion of dust and splashed water.

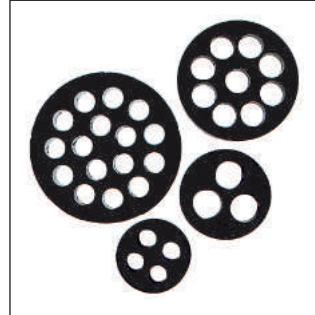
Used with Lapp Kabel the connector system has sophisticated long term transmission properties.

# SKINTOP®, SKINDICHT®, FLEXIMARK®, SILVYN® and accessories



## SKINTOP® ST-M, STR-M

Cable gland for fastest installation.  
Full description you will find within the main catalogue 2006 on page 10.8.



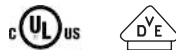
## SKINTOP® DIX-M

Multi sealing insert for SKINTOP® cable glands.  
Full description you will find within the main catalogue 2006 on page 10.28.



## SKINTOP® MS-M, MSR-M

Versatile brass cable glands.  
Full description you will find within the main catalogue 2006 on page 10.17.



## SKINTOP® ST-HF-M

Halogen free, extreme flame retardant cable gland.  
Full description you will find within the main catalogue 2006 on page 10.10.



## SKINTOP® MS-SC-M

Easy-to-assemble EMC-safe cable gland.  
Full description you will find within the main catalogue 2006 on page 10.25.



## SKINTOP® BS-M

Cable gland with bending protection.  
Full description you will find within the main catalogue 2006 on page 10.11.



## Stripping Tool EASY STRIP 2

Extended stripping range up 0,02 to 16 mm<sup>2</sup>; suitable for various insulations e.g. PVC and PTFE.  
Full description you will find within the main catalogue 2006 on page 12.9.



## Crimping Tool MOBILE CRIMP TOOL

Only one tool for a lot of different crimping demand e.g. end sleeves, cable lug etc.; crimping inserts can be easily exchanged without using additional tool, crimping inserts are delivered in a handy box, parallel crimping.  
Full description you will find within the main catalogue 2006 on page 12.44.

# SKINTOP<sup>®</sup>, SKINDICHT<sup>®</sup>, FLEXIMARK<sup>®</sup>, SILVYN<sup>®</sup> and accessories

## Shrinking tubes made of polyolefin – HSB BOX

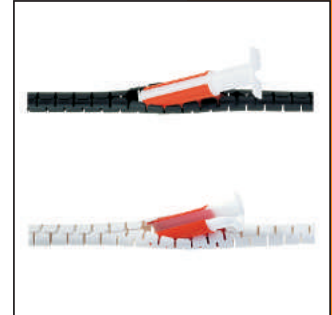
Flexible and quick shrinking tube is used everywhere for bundling, insulations and as marking. Full description you will find within the main catalogue 2006 on page 12.70.



## Cable bundling tube CABLE EATER

Halogen free, Temperature range -30°C up to +90°C; self-extinguishing according to UL94HB.

Full description you will find within the main catalogue 2006 on page 12.78.



# FLEXIMARK<sup>®</sup> Cable Marking

## Thermal Transfer Printer TH-303 E

Ideal for industrial marking, for printing of many different labels such as cable markers.

Full description you will find within the main catalogue 2006 on page 13.40.



## Stainless steel marking systems - customized

One or two-line printing, for fastening with cable ties or screws.

Full description you will find within the main catalogue 2006 on page 13.29.



## Stainless steel marking systems– Do it yourself

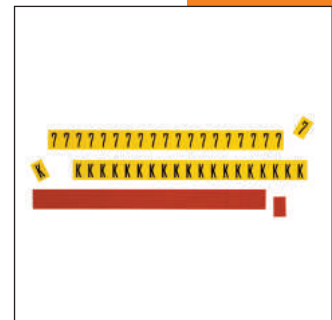
Any number of characters (numbers, symbols etc.), pushed in the stainless steel character holder, different fastening options e.g. with cable ties or screws. Full description you will find within the main catalogue 2006 on page 13.25.



## Plastic marking system MINI/ MAXI

Any number of characters (numbers, symbols etc.), character holders are transparent, UV-Filter protects the marking and guarantees long durability.

Full description you will find within the main catalogue 2006 on page 13.20.



# SILVYN<sup>®</sup> Protective Cable Conduit Systems

you will find within the main catalogue 2006 starting on page 11.1  
or on internet web page: [www.lappkabel.de](http://www.lappkabel.de).



# ÖLFLEX® connecting and control cable



## ÖLFLEX® CLASSIC 100 YELLOW

The connection cable with signalling effect: Impossible to overlook!

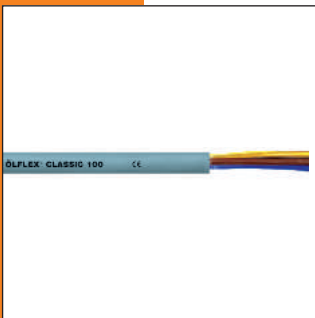
Full description you will find within the main catalogue 2006 on page 1.4.



## ÖLFLEX® CLASSIC 100 CY

The EMC conforming colour coded, copperbraided connection cable with transparent outer sheath.

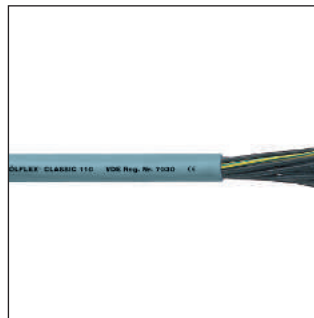
Full description you will find within the main catalogue 2006 on page 1.5.



## ÖLFLEX® CLASSIC 100

The classic from Lapp Kabel with VDE-registration and ÖLFLEX® colour code.

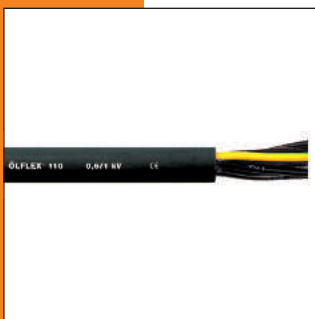
Full description you will find within the main catalogue 2006 on page 1.2.



## ÖLFLEX® CLASSIC 110

The classic from Lapp Kabel with VDE-registration and number code.

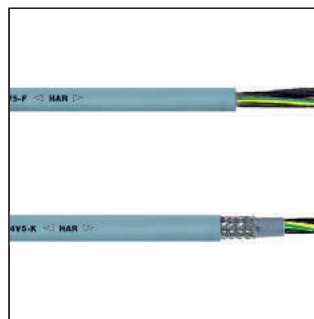
Full description you will find within the main catalogue 2006 on page 1.8.



## ÖLFLEX® CLASSIC 110 BK 0,6/1kV

The UV-resistant control cable with numbered cores - especially for Open-Air-Events.

Full description you will find within the main catalogue 2006 on page 1.10.



## ÖLFLEX® 140/140 CY

The control cable with (HAR) approval for Europe, H05VV5-F and H05VVC4V5-K.

Full description you will find within the main catalogue 2006 on page 1.23.



## ÖLFLEX® CLASSIC 400 P/CP

PUR control cable with numbered cores, mechanical + chemical and UV-resistant.

Full description you will find within the main catalogue 2006 on page 1.47.



## ÖLFLEX® 540 P/CP

The universal PUR-cable for Europe with VDE-registration, screened and unscreened.

Full description you will find within the main catalogue 2006 on page 1.57.

# ÖLFLEX®, SPIREX®, SILFLEX® and more

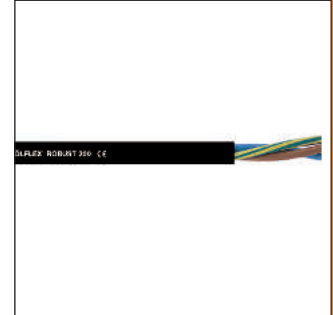
## ÖLFLEX® 550 P

PUR connection cable with European HAR Approval. Full description you will find within the main catalogue 2006 on page 1.59.



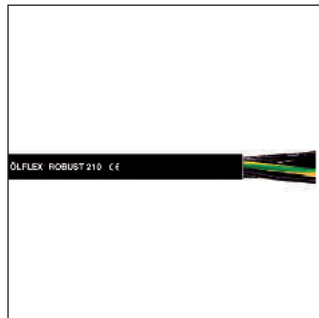
## ÖLFLEX® ROBUST 200

The extra robust flexible all-weather service cord. Full description you will find within the main catalogue 2006 on page 1.41.



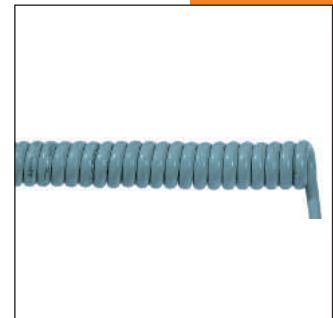
## ÖLFLEX® ROBUST 210

The extra robust flexible all-weather control cable. Full description you will find within the main catalogue 2006 on page 1.43.



## SPIREX® Spiral Cable 400 P

High strength recoiling and length extension up to 3 times of the original length. Full description you will find within the main catalogue 2006 on page 1.60.



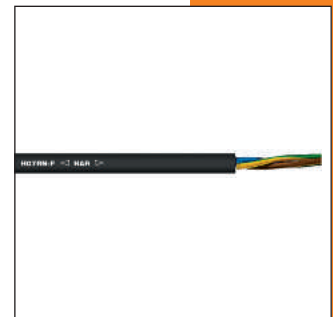
## SPIREX® Spiral cable 540 P

The colour yellow (RAL 1016) and approval by VDE ensure a higher degree of safety. Full description you will find within the main catalogue 2006 on page 1.62.



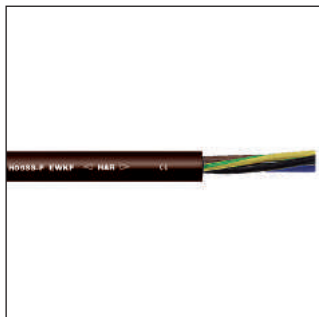
## Rubber sheathed cable H07RN-F

Extremely robust – usable indoor as well as outdoor. Full description you will find within the main catalogue 2006 on page 1.68 and on page 1-72 – 1.75 (harnessing).



## SILFLEX® H05SS-F EKWF

Silicone cable with HAR-approval and increased mechanical strength. Full description you will find within the main catalogue 2006 on page 3.12.



## H00V3-D Copper Earthing Cable

Cable for portable earthing and short circuiting equipment. Full description you will find within the main catalogue 2006 on page 1.132.



# ÖLFLEX® CLASSIC 100 BK POWER 0,6/1 kV / 100 CY

The cold-flexible connecting cable for audio- and house installation, for in- and outdoor use

Cold-flexible up to  
-40 °C



LAPP KABEL STUTTGART ÖLFLEX® CLASSIC 100 BK POWER 0,6/1 kV CE

LAPP KABEL STUTTGART ÖLFLEX® CLASSIC 100 CY BK POWER 0,6/1 kV CE

## Application

### ÖLFLEX® CLASSIC 100 BK POWER 0,6/1 kV

Range of application:

- All electrical installations in dry and damp or wet interiors
- Outdoor use without UV protection and in observance of the temperature range (-40 °C)
- Suitable for free not continuously movement appliance without tensile load or compulsory guidance as well as for fixed installation.

Suitable for:

- especially use on stage because of black colour
- connection of lighting technology, dimmer, racks, etc.
- all kinds of power supply

### ÖLFLEX® CLASSIC 100 CY BK POWER 0,6/1 kV

like ÖLFLEX® CLASSIC 100 BK POWER 0,6/1 kV, but especially in EMC-critical environments.

## Advantages

- Cold-flexible up to -40 °C.
- Fulfils the highest electrical and mechanical demands.
- The high test voltage, 4000 V AC, provides high insulation safety.
- High flexibility achieved by fine wire copper strands, short twisting lengths, and powdering of the cores to improve sliding effects and secure separation of cores.
- Highly resistant against many chemical substances at room temperature.

- extremely reliable because of flame retardance according IEC 60332.1.

## Worth knowing

Technical note:

- The product is conform to the EEC directive 73/23 (Low Voltage Directive) CE.
- Flame-retardant (IEC 60332.1).

## Cable Make-up

### ÖLFLEX® CLASSIC 100 BK POWER 0,6/1 kV

- Fine wire strands of plain copper wires (Class 5)
- Special PVC-based core insulation T14, cold flexible
- Cores twisted in layers
- Colour coded according VDE 0293-308

- Outer sheath of special PVC-based compound TM4, cold flexible
- Black (RAL 9005)

### ÖLFLEX® CLASSIC 100 CY BK POWER 0,6/1 kV

- like ÖLFLEX® CLASSIC 100 BK POWER 0,6/1 kV, but
- Inner sheath of a PVC-based compound and
- Screened braid of tinned copper wire

## Technical Data

Minimum bending radius for ÖLFLEX® CLASSIC 100 BK POWER 0,6/1 kV flexing:  
15 x outer diameter  
static:  
4 x outer diameter  
ÖLFLEX® CLASSIC 100 CY BK POWER 0,6/1 kV flexing:

20 x outer diameter  
static:  
6 x outer diameter

Temperature range:  
flexing: -40 °C up to +70 °C  
static: -40 °C up to +80 °C

Conductor stranding:  
fine wire in accordance to VDE 0295, class 5 / IEC 60228 Cl.5

Core ident code:  
up to 5 cores: coloured cores in accord. to VDE 0293-308  
6 and more cores: ÖLFLEX® colour code

Nominal voltage U<sub>0</sub>/U:  
600/1000 V

Test voltage:  
4000 V

Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
<b>ÖLFLEX® CLASSIC 100 BK POWER 0,6/1 kV</b>				
1120450	2 X 0,5	6,4	9,6	56
1120451	3 G 0,5	6,8	14,4	68
1120452	4 G 0,5	7,6	19,2	100
1120453	5 G 0,5	8,2	24,0	117
1120454	7 G 0,5	9,8	34,0	138
1120455	12 G 0,5	12,2	58,0	200
1120456	2 X 1,0	8,6	19,2	98
1120457	3 G 1,0	9,0	29,0	112
1120458	4 G 1,0	9,6	38,0	131
1120459	5 G 1,0	10,4	48,0	152
1120460	7 G 1,0	11,1	67,0	196
1120461	12 G 1,0	14,0	115,0	286
1120462	2 X 1,5	9,6	29,0	123
1120463	3 G 1,5	10,1	43,0	144
1120464	4 G 1,5	10,8	58,0	170
1120465	5 G 1,5	11,7	72,0	199
1120466	7 G 1,5	12,6	101,0	261
1120467	12 G 1,5	16,1	173,0	399
1120468	2 X 2,5	10,8	48,0	147

G = with protective conductor gn/ye; X = without protective conductor. No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.

# ÖLFLEX® CLASSIC 100 BK POWER 0,6/1 kV / 100 CY

New

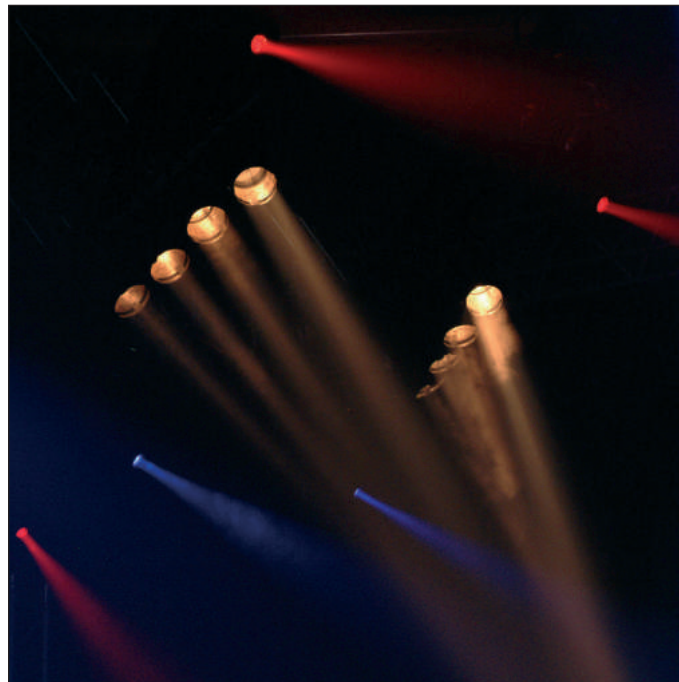
Cold-flexible up to  
-40°C

The cold-flexible connecting cable for audio- and house installation,  
for in- and outdoor use



Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
1120469	3 G 2,5	11,3	72,0	182
1120470	4 G 2,5	12,2	96,0	225
1120471	5 G 2,5	13,3	120,0	266
1120472	7 G 2,5	14,4	168,0	354
1120473	12 G 2,5	18,7	288,0	540
1120474	4 G 4	13,8	154,0	324
1120475	4 G 6	15,1	230,0	442
1120476	4 G 10	18,7	384,0	707
1120477	4 G 16	21,3	614,0	1100
1120478	4 G 25	26,2	960,0	1600
1120479	4 G 35	29,1	1344,4	2400
1120480	4 G 50	35,6	1920,0	3400
1120481	4 G 70	40,7	2688,0	5050
1120482	4 G 95	46,8	3648,0	6010
1120483	4 G 120	53,5	4608,0	7500
<b>ÖLFLEX® CLASSIC 100 CY BK POWER 0,6/1kV</b>				
1120484	2 X 4,0	14,3	208,0	306
1120485	4 G 4,0	16,7	416,0	527
1120486	2 X 6,0	16,0	316,0	420
1120487	4 G 6,0	18,7	621,0	731

G = with protective conductor gn/ye; X = without protective conductor. No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.





# ÖLFLEX® POWER REFLEX TR / RELFLEX P TR

The new ÖLFLEX® connection cable with reflecting foil and transparent outer sheath

Reflecting  
Cold resistant  
Flexible



LAPP KABEL STUTTGART ÖLFLEX® POWER REFLEX TR



LAPP KABEL STUTTGART ÖLFLEX® POWER REFLEX P TR



## Application

Range of application:

- The other service cord with ÖLFLEX®-Quality can be used especially vor energy transportation, where the optical design of the cable is very important. The reflecting foil makes it possible, that the cable is recognised immediately and nobody stumbles on it.
- Because of the extra fine stranding the cable is usable for drum reeling.
- On the other hand it is simply the remarkable design, which is appealing.

Suitable for:

- Power supply for lighting and on stage
- Audio applications, where the optical design should stick out
- mobile use or fixed installation

## Advantages

- Fulfils the highest electrical and mechanical demands.
- The high test voltage, 4000 V AC, provides high insulation safety.
- Highly remarkable because of the reflecting foil.
- usable for drum reeling.
- cold flexible up to -40°C.

## Worth knowing

Technical note:

- The product is conform to the EEC directive 73/23 (Low Voltage Directive) CE.
- Flame-retardant (IEC 60332.1).

## Cable Make-up

### ÖLFLEX® POWER REFLEX TR

- Extra fine wire strands of plain copper wires (Class 6)
- Cold flexible special PVC-based core insulation
- Colour coded according VDE 0293-308
- Cores twisted in layers
- Reflecting foil
- Outer sheath of cold flexible special PVC-based compound
- Transparent

### ÖLFLEX® POWER REFLEX P TR

- Extra fine wire strands of plain copper wires (Class 6)
- Cold flexible special PVC-based core insulation
- Colour coded according VDE 0293-308
- Cores twisted in layers
- Reflecting foil
- Outer sheath of polyurethane
- Transparent

## Technical Data

Minimum bending radius for flexing:  
10 x outer diameter  
static:  
6 x outer diameter

Temperature range:  
flexing: -25 °C up to +80 °C  
static: -40 °C up to +80 °C

Core ident code:  
coloured cores in accord. to VDE 0293-308

Test voltage:  
3500 V

Conductor stranding:  
fine wire in accordance to VDE 0295, class 5 / IEC 228 Cl.5

Nominal voltage U0/U:  
300/500 V

Part number	No. of cores and mm <sup>2</sup> per conductor	Approx. outer diameter in mm	Copper value kg/km	Approx. weight kg/km
<b>ÖLFLEX® POWER REFLEX TR</b>				
3034700	3 G 1,5	8,3	43,2	88
3034701	3 G 2,5	10,3	72,0	121
3034702	3 G 4,0	12,4	115,2	184
<b>ÖLFLEX® POWER REFLEX P TR</b>				
3034113	3 G 1,5	8,3	43,2	86
3034114	3 G 2,5	10,3	72,0	127
3034115	3 G 4,0	12,4	115,2	190

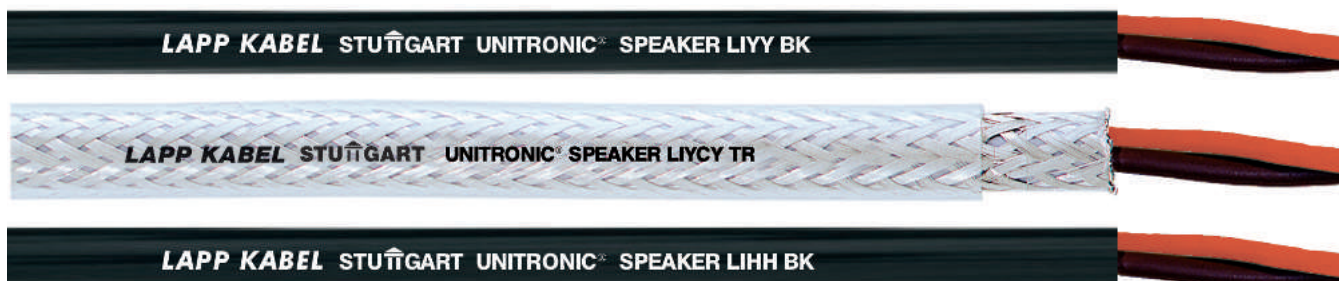
G = with protective conductor gn/ye; X = without protective conductor. No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.

# UNITRONIC® SPEAKER LIYY BK / LIYCY TR / LIHH BK

New

cold resistant  
robust  
flexible

The new speaker cable with the robust cold-resistant PVC-sheath, screened and unscreened



## Application UNITRONIC® SPEAKER LIYY BK / LIYCY TR

Usable for studio application, on stage or superior Car-Hifi-Systems.

## UNITRONIC® SPEAKER LIHH BK

This halogen-free speaker cable is recommend in all applications, where flame retardance and the toxicity of smoke is important. Especially for protection to people and high property values.

## Advantages UNITRONIC® SPEAKER LIYY BK

- Small cable diameters reducing the amount of space required for the cable.
- The robust outer sheath gives strength to the cable as well as high flexibility.
- cold flexibel up to -40°C.
- LIYY BK is usable for outdoor.

## UNITRONIC® SPEAKER LIYCY TR

- cold flexibel up to -25°C.
- screened against interfering signals.

## UNITRONIC® SPEAKER LIHH BK

- PVC- and halogen-free
- Low corrosion of smoke gases
- Low toxicity
- Low smoke density

## Worth knowing

Technical note:

- Flame-retardant (IEC 60332.1).

## Cable Make-up UNITRONIC® SPEAKER LIYY BK

- Fine strands of plain copper wires
- PVC- based cold flexible core insulation
- cores twisted
- colour code: red, black
- outer sheath of special cold-resistant PVC-based compound, black

## UNITRONIC® SPEAKER LIYCY TR

like UNITRONIC® SPEAKER LIYCY BK plus braid of tinned copper wires and outer sheath of special cold-resistant PVC-based compound, transparent.

## UNITRONIC® SPEAKER LIHH BK

like UNITRONIC® SPEAKER LIYY BK, but with halogen free compounds.

## Technical Data

Minimum bending radius for flexing: 15 x cable diameter  
static: 5 x cable diameter

Temperature range:  
UNITRONIC® SPEAKER LIYY BK  
flexible use: -25°C up to +70 °C  
static: -40°C up to +80 °C  
UNITRONIC® SPEAKER LIHH BK  
flexible use: -5°C up to +70 °C  
static: -30°C up to +80 °C

Conductor stranding:  
fine wire in accordance to VDE  
0295, class 5 / IEC 60228 Cl. 5

Test voltage:  
UNITRONIC® SPEAKER LIYY BK  
1500 V  
UNITRONIC® SPEAKER LIHH BK  
1200 V

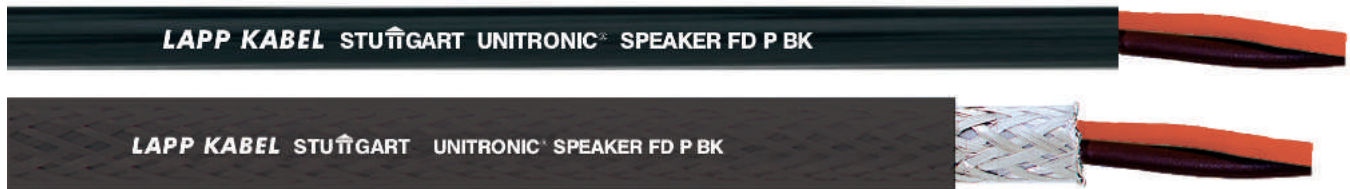
Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
<b>UNITRONIC® SPEAKER LIYY BK</b>				
1233300	2 x 1,5	6,8	28,0	79
1233301	2 x 2,5	8,6	49,0	107
1233302	2 x 4,0	10,4	78,0	162
1233303	2 x 6,0	11,6	118,0	228
<b>UNITRONIC® SPEAKER LIYCY TR</b>				
1233308	2 x 1,5	7,3	46,0	83
1233309	2 x 2,5	8,5	72,0	111
1233310	2 x 4,0	10,2	108,0	159
1233311	2 x 6,0	12,0	164,0	232
<b>UNITRONIC® SPEAKER LIHH BK</b>				
1233304	2 x 1,5	6,8	28,0	86
1233305	2 x 2,5	8,6	49,0	112
1233306	2 x 4,0	10,4	78,0	166
1233307	2 x 6,0	11,6	118,0	235

No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.

# UNITRONIC® SPEAKER FD P H BK / FD CP H BK

The new speaker cable with halogen-free PUR-sheath, highly flexible screened and unscreened

halogen-free  
robust  
highly flexible



## Application

Speaker cable, which has been developed based on proven types of Lapp Kabel data cables and improved by a black, extremely robust black outer sheath to make it “invisible” on stage and highly flexible to improve the handling. Usable for studio application, on stage or superior Car-Hifi-Systems.

## Advantages

- small cable diameters reducing the amount of space required for the cable.
- the extremely robust outer sheath gives strength to the cable as well as high flexibility.
- cold flexibel up to -40 °C.
- usable for outdoor.
- halogen-free
- highly flexible for easy handling.

## Cable Make-up

### UNITRONIC® SPEAKER FD P H BK

- extra fine strands of plain copper wires (Class 6)
- PVC- based cold flexible core insulation
- cores twisted in extremely short lay length
- colour code: red, black
- outer sheath of wear and tear resistant PUR, black

### UNITRONIC® SPEAKER FD CP H BK

- Extra fine strands of plain copper wires (Class 6)
- PVC- based cold flexible core insulation
- cores twisted in extremely short lay length
- colour code: red, black
- Braid of tinned copper wires
- outer sheath of wear and tear resistant PUR, black

## Worth knowing

Technical note:

- Flame-retardant (IEC 60332.1).

## Technical Data



Minimum bending radius for UNITRONIC® SPEAKER FD P H BK flexing: 5 x cable diameter  
UNITRONIC® SPEAKER FD CP H BK flexing: 7,5 x cable diameter



Temperature range: flexible use: -40 °C up to +70 °C



Test voltage: 1500 V



Conductor stranding: fine wire in accordance to VDE 0295, class 6 / IEC 60228 Cl. 6

Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
<b>UNITRONIC® SPEAKER FD P H BK</b>				
1233316	2 x 1,5	6,8	28,0	72
1233317	2 x 2,5	8,6	49,0	101
1233318	2 x 4,0	10,4	78,0	152
1233319	2 x 6,0	11,6	118,0	213
<b>UNITRONIC® SPEAKER FD CP H BK</b>				
1233320	2 x 1,5	7,5	51,0	80
1233321	2 x 2,5	8,5	72,0	105
1233322	2 x 4,0	10,3	110,0	155
1233323	2 x 6,0	12,2	162,0	221

No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.

transparent  
flat  
reflecting

speaker cables in different versions



LAPP KABEL STUÏGART UNITRONIC® SPEAKER FLAT TR

LAPP KABEL STUÏGART SPEAKER REFLEX TR CE

### Application UNITRONIC® SPEAKER TR / REFLEX TR

Usable for superior Phono and Car-Hifi-Systems or home entertainment application for fixed installation.

### UNITRONIC® SPEAKER FLAT TR

The perfect speaker cable, if it is necessary to install the cable "invisible". Due to the height of only 2,0 mm the cable can be hidden under furnitures or carpets and behind of trims or on ceilings.

### Advantages UNITRONIC® SPEAKER TR

Due to the extremely short twisting the losslest data transmission for long distances is possible. Also the flexibility and easy installation is thereby guaranteed. Remarkable design in high quality.

### UNITRONIC® SPEAKER FLAT TR

- extremely flat
- high transmission quality
- remarkable design
- easy conducting due to the red stripe on one core

### UNITRONIC® SPEAKER REFLEX TR

- Recognition of the cable immediately. So no one can stumble across.

### Worth knowing

Technical note:

- Flame-retardant (IEC 60332.1).

### Cable Make-up UNITRONIC® SPEAKER TR

- 1 x copper conductor plain, 1 x copper conductor tinned, acc. VDE 0295 Kl.5
- core insulation PP transparent
- colour code 2 x transparent
- cores and 2 additional elements twisted in extremely short lay length
- outer sheath made of cold-resistant PVC, transparent

### UNITRONIC® SPEAKER FLAT TR

- flat rolled tinned copper
- 2 transparent cores, parallel
- one core signed with a red stripe

### UNITRONIC® SPEAKER REFLEX TR

- extra fine wire strands of plain copper wires (Class 6)
- TPE- based cold resistant core insulation
- cores twisted in layers
- inner sheath made of soft-PVC
- reflecting foil
- outer sheath of cold resistant special PVC-based compound
- transparent

## Technical Data

Minimum bending radius for UNITRONIC® SPEAKER TR static: 5 x cable diameter  
UNITRONIC® SPEAKER REFLEX TR flexing: 15 x cable diameter static: 5 x cable diameter

Temperature range:  
UNITRONIC® SPEAKER TR -40 °C up to +70 °C  
UNITRONIC® SPEAKER FLAT TR -20 up to +70 °C  
UNITRONIC® SPEAKER REFLEX TR flexible use: -25 °C up to +70 °C static: -40 °C up to +80 °C

Conductor stranding:  
fine wire in accordance to VDE 0295, class 6 / IEC 60228 Cl. 6

Test voltage:  
UNITRONIC® SPEAKER TR 1500 V  
UNITRONIC® SPEAKER FLAT TR 3000 V

Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km	Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
<b>UNITRONIC® SPEAKER TR</b>					<b>UNITRONIC® SPEAKER FLAT TR</b>				
3034662	2 X 0,75	6,0	14,4	48	3034110	2 X 1,5	2,0 x 8,4	30,0	48
3034663	2 X 1,0	6,2	19,2	56	3034111	2 X 2,5	2,8 x 11,6	50,0	83
3034664	2 X 1,5	6,8	28,8	70	3034112	2 X 4,0	3,4 x 14,5	80,0	121
3034665	2 X 2,5	8,6	48,0	112	<b>UNITRONIC® SPEAKER REFLEX TR</b>				
3034666	2 X 4,0	10,4	76,8	173	3034107	2 X 1,5	8,5	28,8	93
3034667	2 X 6,0	11,6	115,2	231	3034108	2 X 2,5	9,5	48,0	137
3034668	2 X 10	15,0	192,0	374	3034109	2 X 4,0	12,0	76,8	219

No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.



# UNITRONIC® MICROPHONE BK

100 % screened microphone cable, brilliant electrical values, flexible and “soft”

low capacity  
flexible and  
soft



LAPP KABEL STUTTGART UNITRONIC® MICROPHONE BK

## Application

Microphone cable for professional use for studio, broadcast - TV technique and on stage. Due to the black and robust outer sheath the outdoor usage is also allowed.

## Advantages

- The extremely robust outer sheath gives strength to the cable as well as high flexibility.
- usable for outdoor.
- highly flexible for easy handling.
- low capacity and high transmission quality
- screened against interfering signals.

## Cable Make-up

- fine strands of plain copper wires (0,10 mm)
- PP-based core insulation
- colour code: red, white
- cores twisted to pairs in extremely short lay length
- layer of tinned copper wires: 100 % coverage
- outer sheath made of Soft-PVC, black

## Technical Data

Minimum bending radius for flexing: 5 x cable diameter

Temperature range: -30°C up to +90 °C

Conductor stranding: fine wire in accordance to VDE 0295, class 6 / IEC 60228 Cl. 6

Characteristics:  
Capacity:  
95 pF/m (Core/Core)  
130 pF/m (Core/Shield)

Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
<b>UNITRONIC® MICROPHONE BK</b>				
3034124	1x(2x0,34)	6,4	18,0	50
3034125	2x(2x0,34)	6,5	29,0	60

No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.



# UNITRONIC® AUDIO AES/EBU (TP) PIMF

high transmission  
quality  
low capacity

Perfect for studio- and fixed installation, multiple screening, with black soft PVC, "invisible" on stage.



LAPP KABEL STUÏGART UNITRONIC® AUDIO AES/EBU (TP) PIMF CY BK



LAPP KABEL STUÏGART UNITRONIC® AUDIO AES/EBU (TP) PIMF-D BK



LAPP KABEL STUÏGART UNITRONIC® AUDIO AES/EBU (TP) PIMF-D CY BK



## Application

- Usable for Indoor and outdoor installation.
- Ideal for fixed installation in theatre, public buildings, studio, etc.

## Advantages

- extremely high transmission quality especially for long distances due to insulation with low capacity .
- very high flexibility because of the superfine stranding
- code of the pairs is easy and clear. So the handling of the cable is quick and easy.
- AES/EBU 110 Ohm conform

## Cable Make-up

- UNITRONIC® AUDIO AES/EBU (TP) PIMF CY BK**
- tinned copper wires, 7x0,20 mm
  - Core insulation: O2Y(S) Cell-PE
  - colour code per pair: red/white
  - 2 cores and drain wire (7x0,20 tinned) twisted in short lay length
  - covering aluminium foil
  - PVC inner-sheath, black
  - serial numbers printed on each pair, starting with 1 (white)

Overall screening:  
screened elements twisted with soft fillers  
aluminium foil  
tinned copper braid  
outer sheath: Soft-PVC, black

## UNITRONIC® AUDIO AES/EBU (TP) PIMF-D BK

- like UNITRONIC® AUDIO AES/EBU (TP) PIMF CY BK
- additional tinned copper layer over pair-foil, coverage: 100 %
  - without overall copper braid

## UNITRONIC® AUDIO AES/EBU (TP) PIMF-D CY BK

- like UNITRONIC® AUDIO AES/EBU (TP) PIMF CY BK
- additional tinned copper layer over pair-foil, coverage 95 %
  - with overall copper braid

## Technical Data

Minimum bending radius for static: 5 x cable diameter

Temperature range: -30°C up to +70 °C

Conductor stranding: 7x0,22 mm

Test voltage: 500 V eff.

Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
<b>UNITRONIC® AUDIO AES/EBU (TP) PIMF CY BK</b>				
3034097	2 x (2x0,22)	8,6	36,0	63,1
3034098	4 x (2x0,22)	10,0	52,8	83,6
3034099	8 x (2x0,22)	13,3	80,6	151,4
3034100	12 x (2x0,22)	16,7	133,0	205,9
3034101	16 x (2x0,22)	18,0	186,3	273,5
3034102	20 x (2x0,22)	20,0	226,4	323,6
3034103	24 x (2x0,22)	22,3	253,3	379,4
3034690	32 x (2x0,22)	24,7	335,7	447,8
3034691	40 x (2x0,22)	27,3	407,7	584,9
<b>UNITRONIC® AUDIO AES/EBU (TP) PIMF-D BK</b>				
3034672	2 x (2x0,22)	9,1	40,3	65,3
3034673	4 x (2x0,22)	10,5	61,5	111,5
3034674	8 x (2x0,22)	13,8	106,0	213,0
3034675	12 x (2x0,22)	17,3	142,1	323,1
3034676	16 x (2x0,22)	18,6	225,8	427,8
3034677	20 x (2x0,22)	20,6	240,7	524,7
3034678	24 x (2x0,22)	22,9	319,1	645,1
3034679	32 x (2x0,22)	25,3	415,6	841,6
3034680	40 x (2x0,22)	28,0	525,8	1038,8
<b>UNITRONIC® AUDIO AES/EBU (TP) PIMF-D CY BK</b>				
3034681	2 x (2x0,22)	8,7	53,9	96,9
3034682	4 x (2x0,22)	10,0	92,4	150,4
3034683	8 x (2x0,22)	13,2	157,3	283,3
3034684	12 x (2x0,22)	16,4	198,6	400,0
3034685	16 x (2x0,22)	17,7	229,2	535,2
3034686	20 x (2x0,22)	19,5	365,2	650,2
3034687	24 x (2x0,22)	21,8	435,6	771,6

No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.

# UNITRONIC® AUDIO AES/EBU (TP) PIMF

Perfect for studio- and fixed installation, multiple screening, with black soft PVC, “invisible” on stage.

high transmission  
quality  
low capacity



Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
3034688	32 x (2x0,22)	24,0	534,6	996,6
3034689	40 x (2x0,22)	26,4	650,1	1232,1

No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.



especially for high frequency transmission

Coax cable in flat and round version with optimum foil layer and screening



### Application

Connection and link cable for high-resolution colour monitors for electronic information systems and PC user systems. RGB cables are with a low attenuation, for larger transmission lengths and for separate transmission of the red, green and blue colour signals.

### Advantages

High transmission quality due to excellent attenuation. Excellent EMC features because of double screening (foil and copper braid).

### Cable Make-up

#### UNITRONIC® VIDEO FLAT

- 1. Conductor:** plain solid copper conductor, 0,6 mm dielectric: Cell-PE colour neutral aluminium foil copper screen with a red fiber
- 2. Conductor:** with a blue fiber
- 3. Conductor:** with a green fiber

Coax - RGB - elements parallel elements divisible outer sheath: PVC cold resistant, transparent

#### UNITRONIC® VIDEO RL BK

#### 3x(KOAX RGB 0,6/2,8 ST C)Y:

plain solid copper conductor, 0,6 mm dielectric: Cell-PE aluminium foil tinned Copper screen core sheath: PVC cold resistant colour code: red, blue, green

Coax - RGB - elements and fillers twisted together outer sheath: SOFT-PVC black

### Technical Data

Minimum bending radius for flexing: 15 x cable diameter

Temperature range: -25 °C up to +70 °C

Conductor stranding: solid

Characteristic Impedance: 75 Ohm

Part number	Type	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
	<b>UNITRONIC® VIDEO FLAT</b>			
3034116	3x(COAX RGB 0,6/2,8)	4,6x14,8	37,0	88
	<b>UNITRONIC® VIDEO RL BK</b>			
3034117	3x(KOAX RGB 0,6/2,8 ST C)Y	11,2	37,0	122
3034118	5x(KOAX RGB 0,6/2,8 ST C)Y	13,6	59,0	185
3034119	7x(KOAX RGB 0,6/2,8 ST C)Y	15,0	82,0	244

No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.



# UNITRONIC® Combi cable

All-rounder with high flexibility, easy handling and optimum electrical values

Video  
Audio  
and more



## LAPP KABEL STUIGART UNITRONIC® VIDEO/AUDIO/NET



### Application

The combi cables can be used as Audio, Video, BUS and energy cable, e.g. for connection of light or power mixer, LAN- and NET application, DMX-Bus-systems, speaker, etc.

Perfect for studio, on stage for theatre or concert, also for public buildings. Usable indoor and outdoor.

### Advantages

- very flexible and robust.
- Multiple usage.
- Space saving due to hybrid cable make-up.
- Usage indoors and outdoors because of black UV-resistant outer sheath.

### Cable Make-up UNITRONIC® VIDEO/ AUDIO/NET BK (3G2,5 C)Y + 5x0,6/2,8(RGB Coax AL C) + 2x(2x0,14 AL D)Y

Make-up 3G2,5  
Fine strands of plain copper wires (Class 5), PVC-insulation, colour code: VDE 0293-308 with green/yellow, cores twisted, fleece tape, tinned copper braid, sheath: PVC black, diameter: ca. 8,1 mm

Make-up 5 x 0,6/2,8(RGB Coax AL C) :  
solid plain conductor approx. 0,61 mm, Dielectric: Cell-PE white, diameter: approx. 2,9 mm, aluminium foil, tinned copper braid, sheath: Soft-PVC coloured (BK, WH, BU, GN, RD), diameter: approx. 4,5 mm

Make-up 2x(2x0,14 AL D)Y:  
tinned copper stranding, 7x0,16 mm, insulation: PP, colour code per pair: WH/RD, per 2 cores twisted for pairs in short lay length, aluminium foil, tinned drain wire: 7x0,15 mm, layer of tinned copper wires, coverage 100 %, sheath: PVC grey  
Printing: 1. element number 1 black / 2. element number 2 black, diameter: approx. 4,5 mm

Make-up overall:  
all elements twisted, fleece tape, outer sheath: Soft-PVC black

### Cable Make-up UNITRONIC VIDEO/AUDIO/ CONTROL BK 4x1,5 +

7x0,38/1,6(RGB Coax C)Y +  
9x0,14 + (1x0,14 D)Y +  
2x(2x0,14 AL D)Y + 2xPOF

Make-up 4x1,5:  
Fine strands of plain copper wires (CLASS 6), insulation: Soft-PVC, colour code: black with white numbers 1 - 4

Make-up 7x0,38/1,6 (RGB Coax C)Y:  
strands of plain copper wires, dielectric: cell-PE in white, tinned copper braid, coverage: 95 %, sheath: Soft-PVC coloured (YE, OG, GN, BU, VIO, BR, BK), diameter: approx. 1,6 mm

Make-up 9x0,14:  
strands of tinned copper wires, 18x0,10 mm, insulation: PP, colour code: WH, RD, YE, OG, GN, BU, VIO, BN, GY

Make-up (1x0,14 D)Y:  
strands of tinned copper wires, 18x0,10 mm, insulation: PP, layer of tinned copper wires, coverage: 100 %, sheath: Soft-PVC, colour code: BK

Make-up 2x(2x0,14 AL D)Y:  
strands of tinned copper wires, 18x0,10 mm, insulation: PP, colour code per pair: WH/RD, 2 cores twisted for pairs in short lay length, aluminium foil, tinned drain wire, 18x0,10 mm, layer of tinned copper wires: coverage 100 %, sheath: Soft-PVC 1xBL, 1x RD

Make-up 2 x P O F:  
optical fibre: PMMA with step index fibre, core insulation: PE black, one insulation with white points, one insulation without printing

Make-up overall:  
all elements twisted, outer sheath: Soft-PVC black

### Cable Make-up UNITRONIC® VIDEO/ AUDIO/LAN/NET BK (3G2,5 C)Y+8x(RGB Coax AL C)Y+ 2x(2x0,14 AL D)Y + 2x(4x2x26AWG UTP/BS CAT.6)Y + 2xLWL

Make-up 3G2,5:  
Fine strands of plain copper wires (CLASS 5), insulation: Soft-PVC, colour code: VDE 0293-308 with green/yellow, cores twisted with optimum lay length, fleece tape, tinned copper braid, sheath: Soft-PVC black, diameter: approx. 13,8 mm

Make-up 8x0,6/2,8 (RGB Coax AL C)Y:  
strands of plain copper wires, 7x0,34 mm, diameter: approx. 0,6 mm, dielectric: cell-PE white, diameter: approx. 2,8 mm, aluminium foil, tinned copper braid, sheath: Soft-PVC coloured (GY, YE, VIO, BK, WH, BU, GN, RD)

Make-up 2x(2x0,14 AL D)Y:  
strands of tinned copper wires, 18x0,10 mm, insulation: PP, colour code per pair: WH/RD, 2 cores twisted for pairs in short lay length, aluminium foil, tinned drain wire: 18x0,10 mm, layer of tinned copper wires, coverage: 100%, sheath: Soft-PVC grey, printing: 1. element number 1 black / 2. element number 2 black

Make-up 2x(4x2x26AWG UTP/BS CAT.6)Y:  
strands of plain copper wires, 7x0,16 mm, insulation: PE, colour code per pair: white/blue-blue, white/orange-orange, white/green-green, white/brown-brown, twisted pairs, pairs twisted with central cross, aluminium foil, tinned copper braid, sheath: Soft-PVC grey, printing: 1. element number 1 black / 2. element number 2 black, diameter: approx. 6,2 mm

Make-up 2 x P O F:  
optical fibre: PMMA with step index fibre, core insulation: PE black, one insulation with white points, one insulation without printing

Make-up overall:  
all elements twisted, outer sheath: Soft-PVC black

Video  
Audio  
and more

All-rounder with high flexibility, easy handling and optimum electrical values



## Technical Data

Minimum bending radius for static:  
10 x outer diameter

Temperature range:  
-25 °C up to +70 °C

Characteristics:  
3034437  
Nominal voltage: 300/500V (NET)  
Test voltage: 3kV (NET)  
Nominal capacity Audio: A/A 57pF/m  
Nominal capacity Video: A/A 55pF/m  
Nominal impedance: 100 Ohm (AUDIO)  
Nominal impedance: 75 Ohm (VIDEO)  
Attenuation (100m +20°C):  
1,0 dB 1MHz  
3,2 dB 10MHz  
10,2 dB 100MHz  
15,3 dB 200MHz  
20,2 dB 270MHz  
26,0 dB 500MHz  
34,0 dB 800MHz

3034438  
Attenuation (100m +20°C):  
0,70 dB 0,1MHz  
1,34 dB 1MHz  
5,8 dB 10MHz  
15,2 dB 100MHz  
24,0 dB 270MHz  
3034439  
Attenuation (100m +20°C):  
2,3 dB 1MHz  
7,2 dB 10MHz  
16,2 dB 50MHz  
24,5 dB 100MHz  
28,3 dB 150MHz

3034440  
Attenuation (100m +20°C):  
0,7 dB 0,1 MHz  
1,6 dB 1 MHz  
4,4 dB 10 MHz  
8,8 dB 50 MHz  
11,6 dB 100 MHz  
14,3 dB 150 MHz  
25,1 dB 270 MHz

Part number	No of cores and mm <sup>2</sup> per conductor	Approx. outside diameter in mm ca.	Copper weight kg/km	Approx. weight kg/km
<b>UNITRONIC® VIDEO/AUDIO/NET BK</b>				
3034437	(3G2,5 C)Y + 5x0,6/2,8(RGB Coax AL C)+2x(2x0,14 AL D)Y	21,6	166,0	510
3034438	(3G1,5C)12Y+3x(RGB Coax AL C)11Y	17,0	205,0	310
<b>UNITRONIC® VIDEO/AUDIO/CONTROL BK</b>				
3034439	4x1,5+7x0,38/1,6(RGB Coax C)Y+9x0,14+(1x0,14 D)Y+2x(2x0,14 AL D)Y+2xLWL	15,0	215,0	323
<b>UNITRONIC® VIDEO/AUDIO/LAN/NET BK</b>				
3034440	(3G2,5 C)Y+8x(RGB Coax AL C)Y+ 2x(2x0,14 AL D)Y + 2x(4x2x26AWG UTP/BS CAT.6)Y + 2xLWL	26,5	235,0	643

No cutting costs are charged for standard lengths (50, 100, 500, 1000 m). Please advise the lengths you require (e.g. 1 x 500 m drum or 5 x 100 m coil). Coils < 30 kg, drums > 30 kg.



## Our customers about power cables

**At the beginning of a power line is the connection to the source unit and if the source unit is not well connected it could not work satisfactory. The source unit will not edit the signals in a good condition. This is one site and the other site is the transportation of Power in a well condition. Here it is useful to choice the correct size for the power cable. It is easy to imagination that a "Standard Power Cable" with a conductor size of 0,75 mm<sup>2</sup> will be not the right cable for a high performance Audio unit.**



We only use power cables from Lapp Kabel, because we are absolutely convinced about the Lapp Quality. Even a lot of other well noted and more expensive competitors use Lapp Kabel. U.I. Lapp GmbH is a cable manufacturer which produces a lot of different cables with a copper shield. A fantastic quality for a favourable price.

The used power cables have got a copper shield, as we already talked about it. This copper shield is only connected on the plug site to the grounding conductor. So we make sure that high frequency disturbance will be guided to earth. It is extremely important that we use a copper shield cable, so a filtered disturbance could not come back via the cable. Further more the copper shield is a protection about next to each other running cables it

is prevention against electrical smoke. Our copper shielded Power Cable will revalorize not only your AUDIO unit on the sound site it even looks good.

power line filters  
for natural sound  
tk-audio®  
and more.....

## High quality power cable

**ÖLFLEX® CLASSIC 110 CY 7G1,5 mm<sup>2</sup> (2 x 3 mm<sup>2</sup> for power and neutral conductor + 1,5 mm<sup>2</sup> for protective conductor ):**



ÖLFLEX® CLASSIC 7G1,5 mm<sup>2</sup> from Lapp is an agile Power Cable with a real better Bass (fullness, deepness) and improves the spatial space in contrast to Lapp ÖLFLEX® CLASSIC 3G2,5 mm<sup>2</sup>. As well the sonority and timing is much better as the 2,5 mm<sup>2</sup>. It is a huge increase as against the "Standard Power Cable"

A well considered selection of material (Plug, Coupling and Cable) we made a Power Cable with an unmatched price performance !

Place of action:  
pre-amplifier, amplifier and power amplifier by consideration of the sound reproduction.

# Why a power line filter?

**A power line filter protects your electronic systems against disturbances in our 230 VAC network of electricity. From where do these disturbances come from?**

**These disturbances may be created by baby phones, dimmers, and irregularities originating in the electricity plant, computers, mobile phones and so on. Also disturbances created by KHz-radio and MHz-radio are serious problem!**

## How a power line filter works:

A power line filter works like a switch of frequency. Frequencies over 50 cycles per second are suppressed or at least muffled. This filtration is achieved by the arrangement of capacitors and the restrictor. The power line filter is composed of a restrictor compensating electricity and of x- and y- compensating elements. By using the very best WIMA capacitors and partly cast restrictors, our power line filter achieves excellent results.

## A power line filter protects our system:

Our power line filter is equipped with a resistor which is independent from tension. This resistor eliminates high tensions over 250V. This way your high quality appliances are protected of too high tension. Resistors are said to have a negative influence on high sounds. Anyway, the improvement of sound by using a power line filter is so evident that the negative effect of the resistor is comparatively so tiny that we can neglect it. Of course you could improve the sound by another 2 or 3% but without resistor you risk that your audio appliances are destroyed e.g. by a lightning. Our experience shows that the most important point is the combination of resistor and discharge resistor.

## Improvement of sound:

- the sound is more calmed, less aggressive
- the existing information of space becomes a considerably higher stability
- the range of median sounds becomes more clear and clean
- (what also increases spatiality)
- voices become more tangible and the position in the sound becomes more clear
- the sound of the single instruments becomes more clear and more easy to pursue
- the high frequency sounds become considerably more clean and free
- the basses become more clear, more deep and more pinpointed
- the power line filter increases musicality (similar to the musicality we know and highly appreciate from LINN )
- you have no loss of dynamics

## Recommendation:

Using a power line filter with too high performance, the inductivity of the restrictor is very low the restrictor is the main part inside the power line filter which determines the maximum flow of electricity. By using a restrictor with high ampere the effect of power line filtering decreases, because of less inductivity. The best filtration will be achieved by using a separate filter for each of the components. Of course you can use one power line filter for several components. But please be advised that components

which need a lot of electricity like final stages and amplifiers need to have their own separate power line filter - also every digital source device (DAT, CD Player, DVD, SACD...). These electrical troubles are created by the digital source itself. In order to guarantee optimal supply of electricity. You should always combine the power line filter with a shielded power line cable in order to prevent high frequency disturbances from breaking into the connection again.





# Power line filter theory



## Power Line Filter

The power line filter is designed to absorb symmetrical and unsymmetrical power line disturbances. This power line filter is bidirectional.

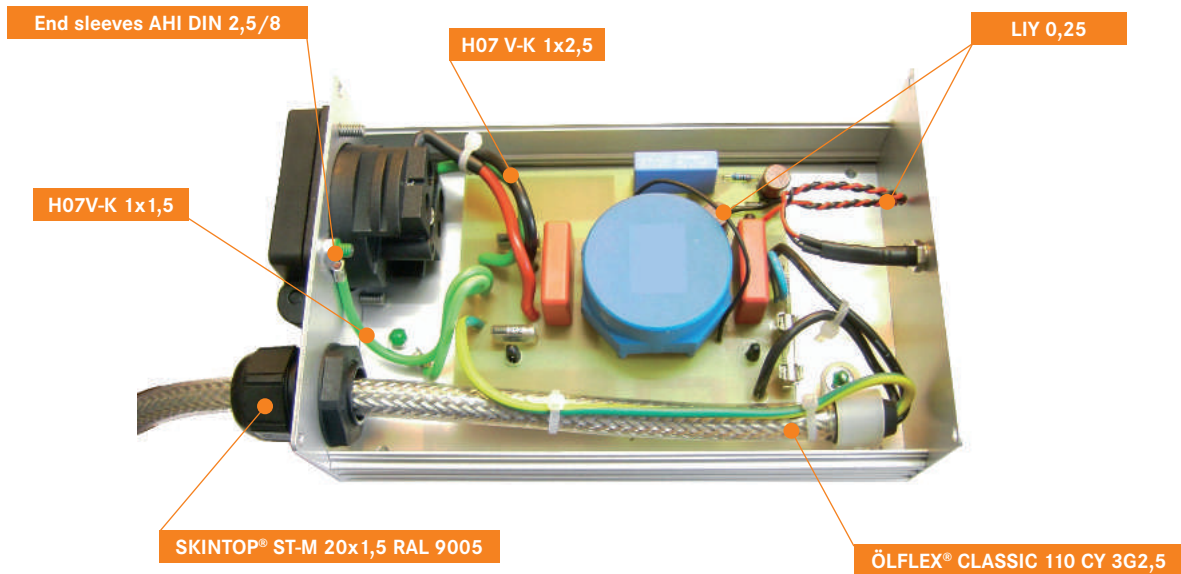
That means that not only the disturbances from the main side will be damped even the disturbances from the audio unit will be damped. This disturbance which will be come trough the

cable has got a typical frequency between 100 KHz and 30 MHz. There do exist other disturbances with more than 30 MHz and we call them radiation energy. This radiation energy will be eliminated with an EMC confirm construction of the case style and cable. Lower interference frequencies fewer than 100 KHz will be easy filtered by a line separating transformation

The principle Construction is an L-C wide band filter. There are two X-capacitors one impedance coil with the inductivities L1 and L2 and also two Y-capacitors. This single stage construction is the best construction to have a brilliant sound on your Hi-Fi set. This was tested by a real high number of tests with our equipment and it was obvious anyone with ears. Multistage constructions have reduced the dynamic dramatically.

power line filters  
for natural sound  
tk-audio®  
and more.....

# Power line filter theory



Power Line Filter for HF-disturbances

The filter performance between a single-stage and a multistage construction has got a damp from max. 10 – 20 dB. This increase of the damp has got the disadvantage that the DC voltage resistance of the filter unit will be double. But exact this is absolutely important for the sound dynamic.

That was the reason that we developed single stage filter units with only 50% of the DC voltage resistance and a damp from approximately 70 dB. That is the optimum for Hi-Fi equipments. A higher damp of a power line filter make the sound tired and heavy.

The torroidal core restrictor is the focus component, both windings

L1 and L2 are placed on the torroidal core. The windings are wired in this way that magnetic fields get compensated. The torroidal core is designed in away that they will not come into the saturation during there maximum permissible load from 2A, 6A, 8A or 10A.

A oversize make no sense because in this case the filter characteristic get more negative. The used torroidal core are optimal designed up to there maximal load. We recommend using the suitable power line filter to your Hi-Fi equipment.

At a asymmetrical disturbance works the complete induction from L1 and L2 and the parasitic

current flow (in teamwork with the y-capacitors) to the earth. This feature will be act by the capacitors because they have high ohmic resistance at nominal frequency and get more low ohmic resistance at higher frequency. The higher frequency disturbances flow to earth during the low ohmic resistance of the capacitor.



# Notices





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