

# On the right track with solar energy

## Brands for photovoltaics



**LAPP GROUP**

# The Lapp Group

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The Lapp Group 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.

Our 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.



The Lapp Center in Stuttgart.

To contact your local Lapp Group representative please go to **[www.lappgroup.com/worldwide](http://www.lappgroup.com/worldwide)**



Photovoltaic unit on the roof of the Lapp Group Logistics Centre 1 in Stuttgart.

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„Nothing is more environment-friendly than receiving energy directly from the sun. This is our confession to the solar technology.“

Siegbert Lapp – Chairman technical management board.

As an environmental-orientated company and one of the leading suppliers for the wind

and solar industry, Lapp Group also wants to take part in this trend. In July 2005 the new photovoltaic plant on the roof of the logistic centrum 1 of the company headquarter in Stuttgart was inaugurated. With this we want to express our philosophy and to promote the rethinking regarding renewable energies.



## The key data speak for themselves!

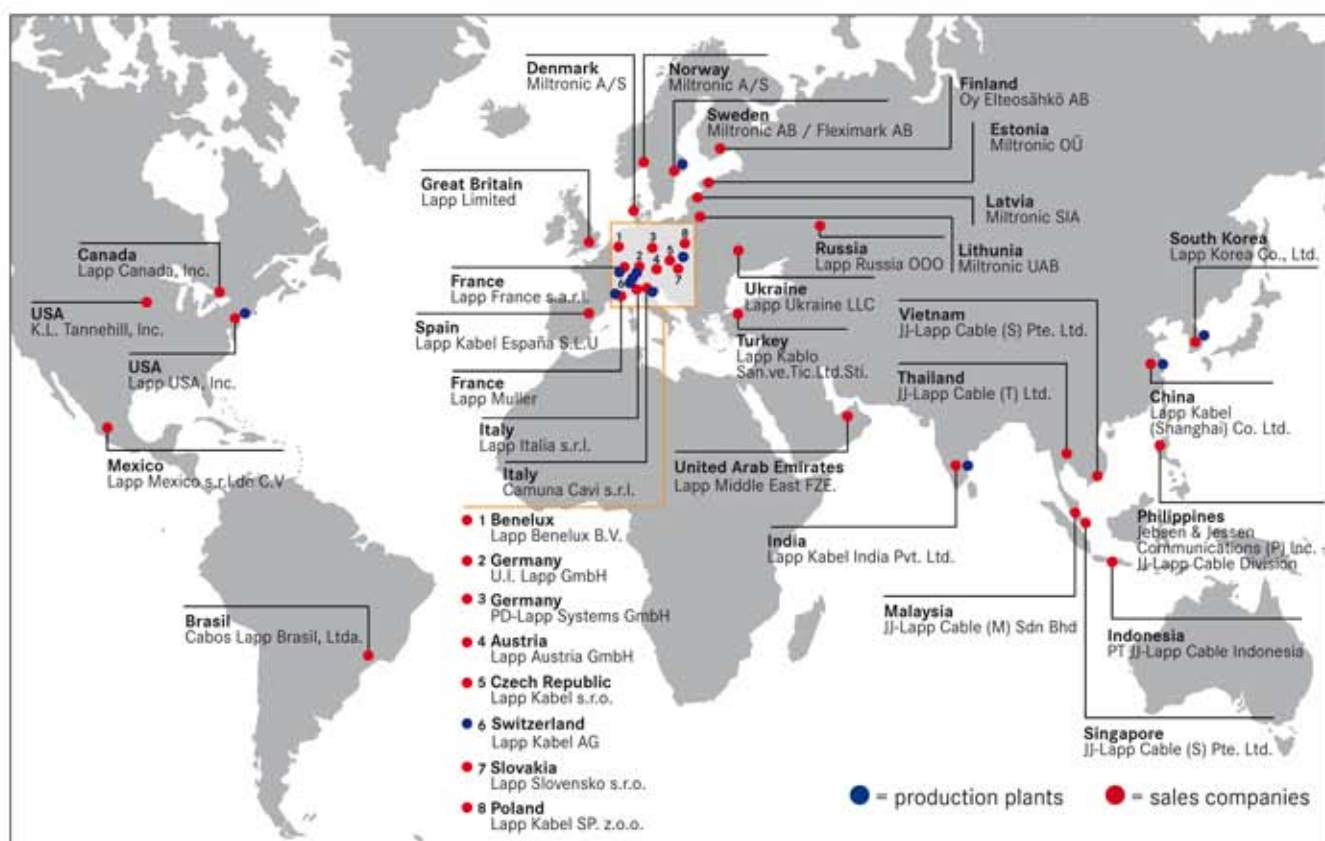
The 1092 solar modules which are installed on a roof area of 4.500 m<sup>2</sup> have an output of 168 kWp and nearly 160.000 kWh of energy per year. Additionally the annual saving of toxic carbon dioxide (CO<sub>2</sub>) amounts to approximately 94.000 kg.

All PV-components are connected and installed with Lapp brands like **SKINTOP**<sup>®</sup> cable glands, **EPIC**<sup>®</sup> connectors, **SILVYN**<sup>®</sup> conduits and **ÖLFLEX**<sup>®</sup> SOLAR cables – a longtime use and a safe function of the photovoltaic plant is guaranteed at any season.

## Clear solutions around the solar panel!

On the following pages we want to introduce products which were especially developed in co-operation with users from the photovoltaic branch. Let it be weather resistant cable installations, safe cable entries or the interconnection

of single solar modules – the brands **ÖLFLEX**<sup>®</sup> – **SKINTOP**<sup>®</sup> – **EPIC**<sup>®</sup> – **SILVYN**<sup>®</sup> and **FLEXIMARK**<sup>®</sup> from Lapp Group offer solutions for all applications from the roof down to the basement.



## The Lapp Group around the world

The Lapp Group is an internationally active family business with headquarters in Stuttgart. Around the world, 3,000 employees in 17 production sites, 39 distribution companies and more than 100 agencies are involved in production, marketing and providing advice and service to customers.

„Think global, act local“ is seen less as a slogan, but more as part of the company philosophy. After all, a strong customer focus is something we achieve all the time. This by no means contradicts our clear commit-

ment to Stuttgart and to Germany. In addition to Germany, there are six other production sites in Europe.

With the acquisition of other business skills, the Lapp Group intends to expand its range of products and to open up new markets.

Three other production sites in Asia – with the emphasis on the boom country of India – and two in the USA support the export industry in Germany and Europe and help our customers exploit these markets.

On the one hand this provides the greatest possible proximity to customers, while on the other enables local requirements and regulations to be taken into account. Further benefits ensue, e.g. the elimination of transportation costs without having to sacrifice the high quality reputation of „Made by Lapp“.

Lapp's own Centers of Competence for the advanced training of employees and customers, e.g. in India, Thailand and Russia, round off our range of services.

Larger companies, such as those in Russia, India, China, Canada and Mexico, have their own warehouses. The other companies are quickly and reliably supplied from the relevant central stores.

To contact your local Lapp Group representative please go to [www.lappgroup.com/worldwide](http://www.lappgroup.com/worldwide)





## 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

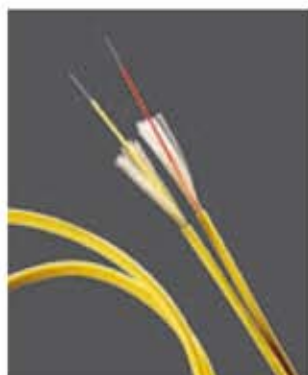
cable chains, halogen-free or internationally certified, you can choose from our comprehensive range of standard products.



## 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 Group 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 Group's widely variable programme of power chains 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.



## 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.



## 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.





Regarding all application demands Lapp Group offers a complete product range for photovoltaic systems which is especially designed for the wiring from the roof down to the basement. In cooperation with users, the TÜV and the north american UL testing committee for approval our **ÖLFLEX® SOLAR** cables, **SKINTOP®**

cable glands and **EPIC® SOLAR** connectors are tested by numerous tests and ensure highest quality. Our products can be used worldwide and are also conform according to the EEC directive RoHS.

### 1. ÖLFLEX® SOLAR Cables



UV-resistant cables for longtime weather- and temperature resistant wiring of solar panels resp. photovoltaic components. Durable best performance in all events.

Use our Universal Strip SOLAR, the proper stripping tool for solar cables, applicable for cross sections from 1,5 mm<sup>2</sup> up to 6 mm<sup>2</sup>.



### 2. SKINTOP® Cable Glands

Safe cable entries for panel junction box, inverter and control cabinet.

#### SKINTOP® ST-M / ST-M XL / ST-M ISO

Metric polyamide cable glands. With only one turn the cables are fixed, centered, completely strain-relieved and hermetically sealed according protection class IP 68.



#### SKINTOP® GMP-GL-M

Hexagonal glassfibre reinforced polyamide counter nuts with metric thread.



#### SKINDICHT® SM-M

Brass counter nuts with metric thread according EN 50262.



### 3. FLEXIMARK® Marking Systems

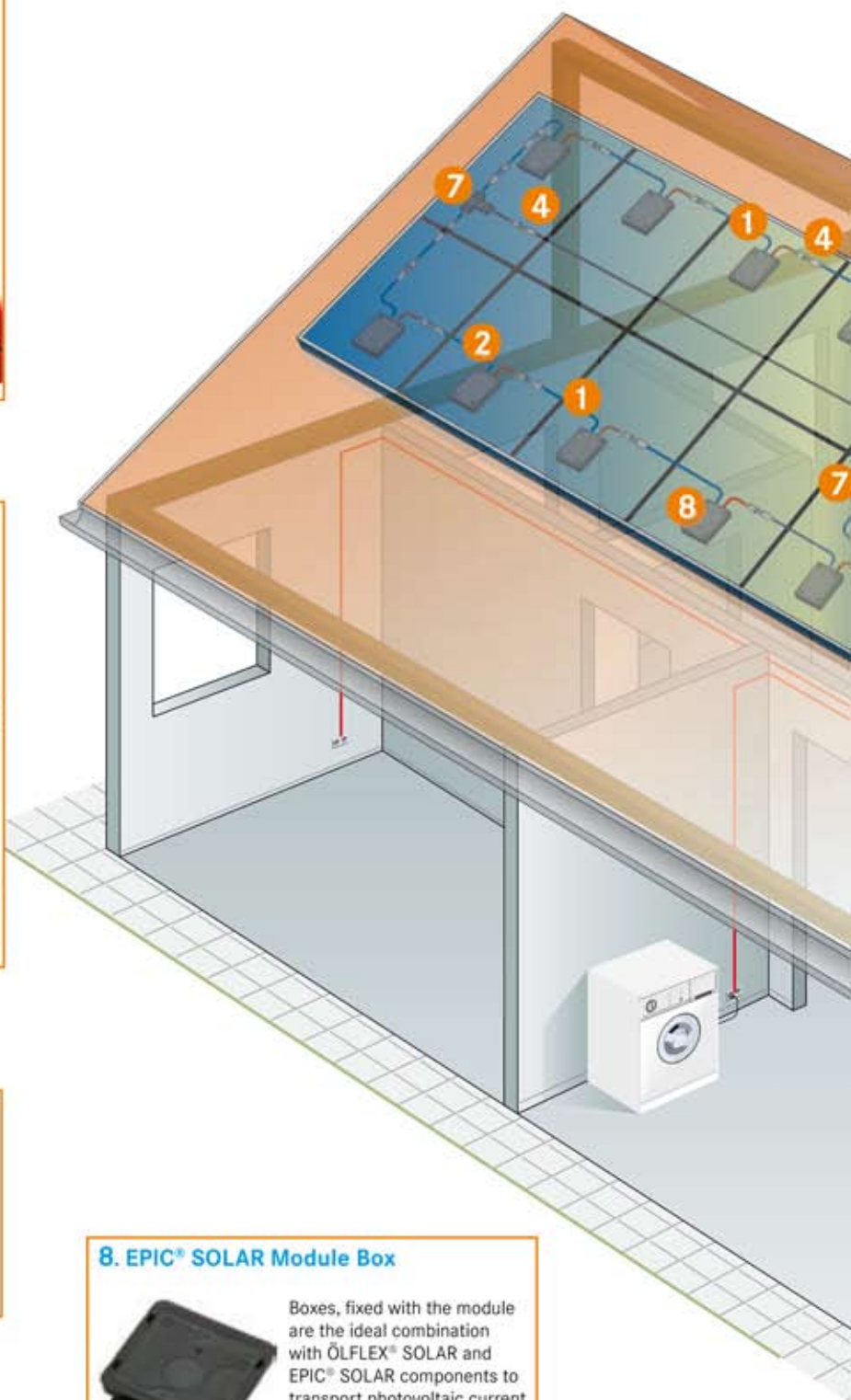


Labels for marking of wires and components. For outdoor use especially character holders made of transparent and UV-filtered material are applicable.

### 8. EPIC® SOLAR Module Box



Boxes, fixed with the module are the ideal combination with ÖLFLEX® SOLAR and EPIC® SOLAR components to transport photovoltaic current a long time and reliable.





#### 4. EPIC® SOLAR Connectors



Injection moulded assembled and field mountable **EPIC® SOLAR** connectors and **EPIC® SOLAR** built in receptacles for the quick and safe connection of solar modules. Due to highly robustness, UV-resistance, protection class and the touch protection a high grade connection is guaranteed for many years.

#### 5. SILVYN® RILL PA 6 SINUS



The black, UV-resistant polyamide protection conduit with sinusoidal opening for quick cable bundeling and installation. Additional protection for solar cables and solar connectors. The Cable Eater spare tool for **SILVYN® RILL PA 6 SINUS** enables easy and trouble-free cable installation into the protection conduit.

#### 6. ÖLFLEX® STATIC/NYY-O/H07RN-F

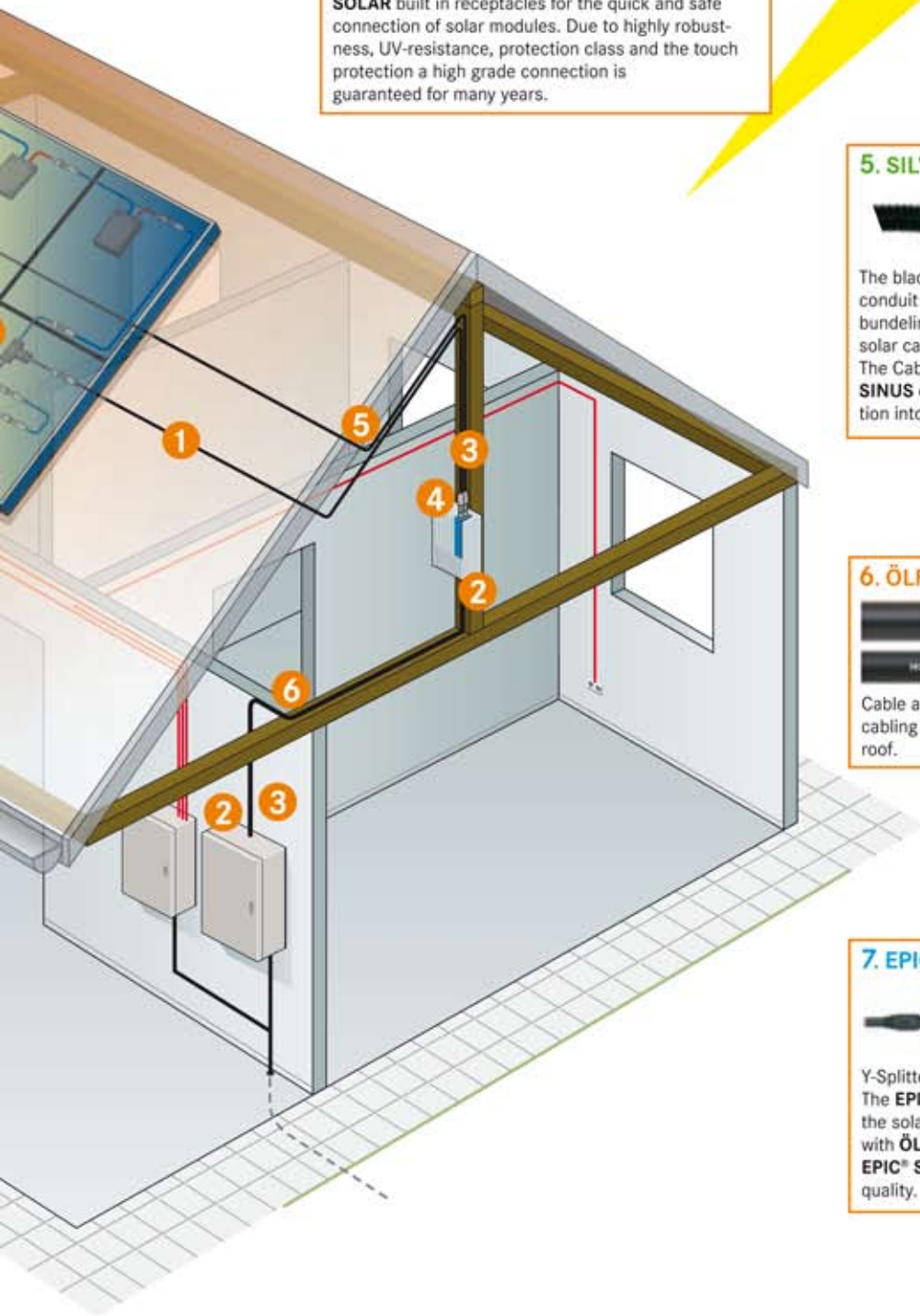


Cable alternatives for cost-effective fixed installed cabling of inverter and power distributor below the roof.

#### 7. EPIC® SOLAR Y-Splitter



Y-Splitter enable the parallel coupling of solar panels. The **EPIC® SOLAR** Splitter is installed flexible behind the solar modules resp. the facade. In combination with **ÖLFLEX® SOLAR** cables the injection moulded **EPIC® SOLAR** Splitter ensures highest reliability and quality.



## Hot mission in Asia.



Source: Korea Kotrel Inc., Solar module: Suntechnics

Solar system in Korea – wired with high temperature resistant **ÖLFLEX® SOLAR XL** cables.

## Moved application for optimal performance.



Photo: Solon

Solarmover power plant – safe function due to **SKINTOP®** cable glands with protection class IP 68.

## Technology „Made in Germany“ under South-East Asian sun.



Photo: Lapp Kabel

Part of the PV system of the German European School in Singapore. High demands – no problem for UV-resistant **ÖLFLEX® SOLAR** cables.

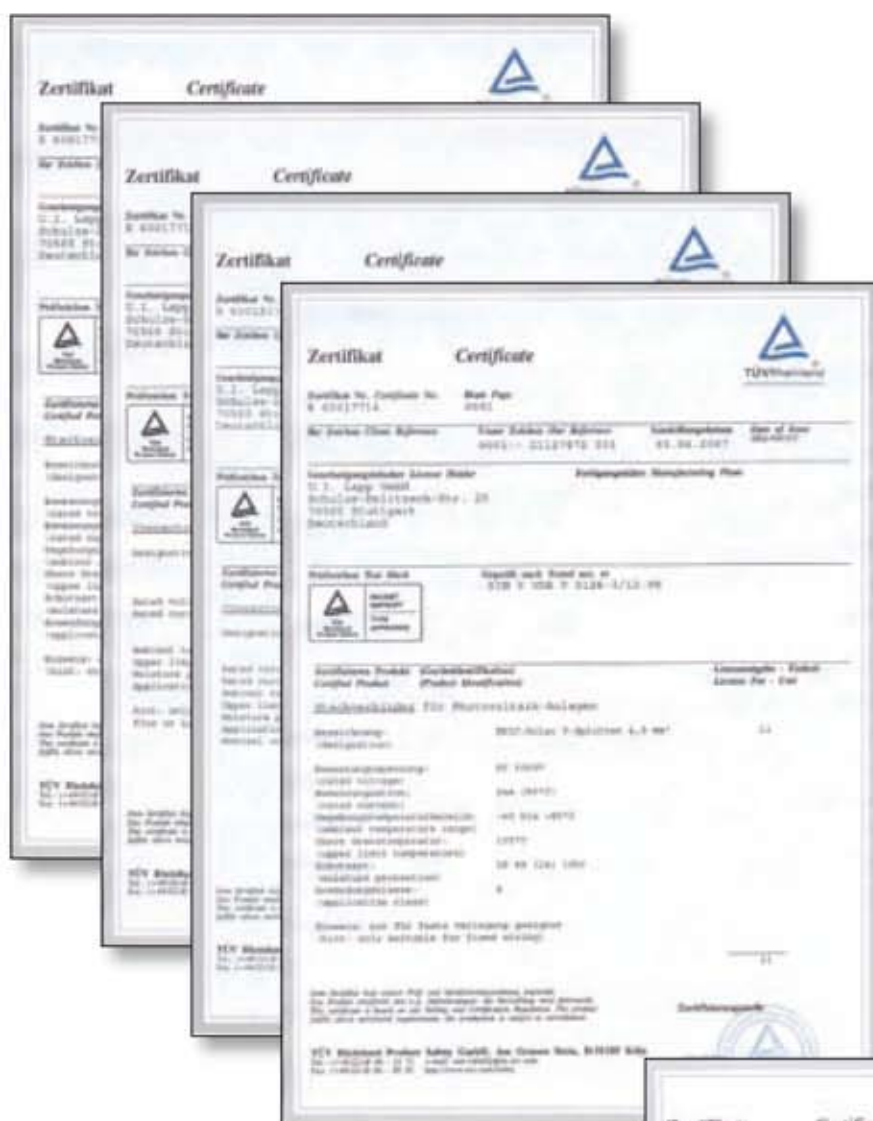
## LaSolana.



Photo: Lapp Kabel

Module strings in LaSolana, Spain with Lapp brands for photovoltaics.





## EPIC® SOLAR PV-Connectors

TÜV Rheinland Type Approved according  
DIN VDE 0126-3 / TÜV 2 Pfg 1161

- EPIC® SOLAR pre-assembled
- EPIC® SOLAR field mountable
- EPIC® SOLAR built in plugs
- EPIC® SOLAR Y-Splitter



## ÖLFLEX® SOLAR PV-Cables

TÜV Rheinland Type Approved according  
2 Pfg 1169

- ÖLFLEX® SOLAR plus
- ÖLFLEX® SOLAR XL multi

UL and CSA listed according  
USE-2 „SUNLIGHT RESISTANT“ for USA  
RWU90 „SR“ for Canada

- ÖLFLEX® SOLAR XL multi

(The certifications can be viewed at  
[www.ul.com](http://www.ul.com) „Certifications“ under  
File-No. E258283 resp. E258246)





# With best connections to the sun!

Energy generation by using the power of sunlight is a global issue. Photovoltaic systems are installed in different climatic zones all over the world. Due to the quite different environmental conditions, especially regarding on the temperature- and UV exposure,

Lapp Group uses only high quality insulation- and outer sheath compounds for the **ÖLFLEX® SOLAR** product range which is manufactured according the latest processing technology.

- They are always highly
- **weather resistant**
  - **UV- and ozone resistant**
  - **temperature resistant**
  - **heat-ageing resistant**
  - **hydrolysis resistant**

In the below mentioned table you find an overview of some properties allocated to our **ÖLFLEX® SOLAR** cables. For more advantages and special features please see the following catalogue pages.

	ÖLFLEX® SOLAR plus	ÖLFLEX® SOLAR XL multi	ÖLFLEX® SOLAR XL	ÖLFLEX® SOLAR XLv	ÖLFLEX® SOLAR V4A
suitable for Protection Class II applications	•	•	•	•	•
flame retardant	•	•	•	•	•
halogen free		•	•	•	
ammonia gas resistant	•	•	•	•	•
jacket with meter marking					•
marten- resp. rodent armouring		•	•	•	
suitable for direct burial				•	
complies with RoHS and CE directive	•	•	•	•	•
available with overmoulded EPIC® SOLAR	•	•			
approval/certification	TÜV	TÜV/UL/CSA			
max. conductor temperature	+120°C	+120°C	+120°C	+120°C	+120°C
rated voltage DC U0/U	0,9/1,5 kV	0,9/1,5 kV	0,9/1,5 kV	0,9/1,5 kV	0,9/1,5 kV

# The right approvals – that counts!

Our **ÖLFLEX® SOLAR** cables are tested and certified regarding their use in the course of national and international approvals by our own laboratory and by independent testing institutes. Our international all-rounder **ÖLFLEX® SOLAR XL multi** combines for instance the TÜV type approval and further UL/CSA approvals in just one cable. All of them are

„UL-listed“ according NEC (USA/Canada). Due to that the number of applications increase and storage costs reduce. Not every UL approval suits to photovoltaic applications!

What does „UL-listed“ mean? Some cables offered on the market are only „AWM-recognized“. This limits the use to in-

door electrical equipment and machines, which are completely factory wired. Our UL-/CSA-listed cables include outdoor use to cover residential-, commercial- and industrial building wiring.

This ensures the trouble-free use of **ÖLFLEX® SOLAR XL multi** throughout North America!



# ÖLFLEX® SOLAR plus

TÜV type approved solar cables



## Info

- The classic one with TÜV approval !

## Benefits

- High thermal capacity for long lasting operation of the PV system at all seasons
- Good flexibility - easy installation with tight space requirements

## Application range

- For the cabling of the solar modules among themselves and as extension cable between the individual solar panel strings or DC/AC inverter
- Gable and flat roof photovoltaic systems
- Open land solarfield plants

## Product specifications

- Excellent weather- and UV resistance tested in accordance to ISO 4892-2
- Flame retardant according IEC 60332-1-2

- Good resistance against ammonia- and biogases
- Detergent and natural oil resistant

## Norm references



- TÜV type approved

## Cable Make-Up

- Conductor: fine wired tinned copper strands
- Core insulation: cross-linked elastomere, Colour: black
- Outer sheath: special TPE
- Available sheath colours: black, red resp. blue

## Technical data

- Core identification code**  
Outer sheath colours: black, red or blue
- Approvals**  
TÜV - Type Approved acc. 2 PFG 1169/10.04
- Conductor stranding**  
fine wire in acc. to VDE 0295 Class 5/IEC 60228 Cl. 5
- Minimum bending radius**  
fixed installation: 4 x cable diameter  
occasional flexing: 15 x cable diameter
- Rated voltage**  
U<sub>c</sub>/U  
AC 600/1000 V  
DC 900/1500 V
- Test voltage**  
4000 V
- Range of temperature**  
fixed installation: -50°C up to +120°C  
(+85°C according TÜV)  
short-circuit temperature: +250°C

Part number	Conductor cross-section in mm²	Outer diameter in mm approx.	Copper index kg/km	Weight kg/km approx.
<b>ÖLFLEX® SOLAR plus black</b>				
0026085	2.5	5.4	24.0	50.0
0026086	4.0	6.5	38.4	76.0
0026087	6.0	7.3	57.6	107.0
0026095	10.0	9.4	96.0	165.0
<b>ÖLFLEX® SOLAR plus red</b>				
0026088	2.5	5.4	24.0	50.0
0026089	4.0	6.5	38.4	76.0
0026090	6.0	7.3	57.6	107.0
<b>ÖLFLEX® SOLAR plus blue</b>				
0026091	2.5	5.4	24.0	50.0
0026092	4.0	6.5	38.4	76.0
0026093	6.0	7.3	57.6	107.0

Copper price basis: EUR 150 / 100 kg  
 Standard lengths: (500; 1000) m  
 Packaging size: Drum

## Accessories

- Universal Strip see page 37
- EPIC® SOLAR - Industrially injection overmoulded and field mountable solar connectors for safe connection of PV modules
- SKINTOP® ST / SKINTOP® CLICK - Approved cable glands used for PV junction boxes, electric meters and DC/AC converters

## Special applications

Cables for photovoltaics

## ÖLFLEX® SOLAR XL multi

Multiple type approved solar cables



Info

• The international allrounder !

## ■ Benefits

- Only 1 cable with 3 approvals expands the number of applications and reduces the storage costs
- The UL/CSA certification enables the problem-free use of the cable for the wiring of PV systems in whole North America. According to the NEC (National Electrical Code) only especially for outdoor purposes listed cables are permitted in the USA for PV installations
- High thermal capacity for long lasting operation of the PV system at all seasons
- No spreading of fire source and formation of toxic combustion gases in the event of fire
- Exact quantity control during installation by meter marking on the cable sheath

## ■ Application range

- For the cabling of the solar modules among themselves and as extension cable between the individual solar panel strings or DC/AC inverter
- Gable and flat roof photovoltaic systems
- Open land solarfield plants

## ■ Product specifications

- Excellent weather-, abrasion-, temperature- and UV resistance
- Weatherproof according ISO 4892-2 resp. UL 1581 Section 1200
- Halogen free and flame retardant (IEC 60332-1-2)
- Resistant against ammonia- resp. biogases and other aggressive media

## ■ Norm references



- TÜV Type Approved (black, red and blue sheathed versions)
- UL and CSA listed (only black sheathed versions)

## ■ Cable Make-Up

- Conductor: fine wired tinned copper strands
- Core insulation: special polyolefin, cross-linked, black
- Outer sheath: cross-linked Copolymer
- Available sheath colours: black, red resp. blue

## ■ Technical data



## Approvals

TÜV Type Approved 2 PFG/1169 (all sheath colour versions)  
c(UL) listed according UL USE-2 "SUNLIGHT RESISTANT" CSA RWU90 "SR" (only black sheathed versions)



## Conductor stranding

fine wire in acc. to VDE 0295 Class 5 / IEC 60228 Cl.5 5



## Minimum bending radius

fixed installation:  
4 x cable diameter  
flexing:  
15 x cable diameter



## Rated voltage

In accordance with VDE  
AC U<sub>0</sub>/U : 600/1000 V  
DC U<sub>0</sub>/U : 900/1500 V  
conforms to UL/CSA standard:  
600 V



## Test voltage

4000 V



## Range of temperature

fixed installation:  
-40°C up to +120°C  
(+85°C according TÜV)  
short-circuit temperature:  
+250°C

Part number	Conductor cross-section in mm <sup>2</sup>	Outer diameter in mm approx.	Copper index kg/km	Weight kg/km approx.
<b>ÖLFLEX® SOLAR XL multi - TÜV / UL / CSA approved</b>				
<b>Outer sheath colour black</b>				
0026585	2.5	5.6	24.0	45.0
0026586	4.0	6.0	38.4	72.0
0026587	6.0	7.1	57.6	102.0
0026588	10.0	8.5	96.0	159.0
0026589	16.0	9.9	153.6	247.0
<b>Outer sheath colour black - coded</b>				
0026590	2.5	5.6	24.0	45.0
0026591	4.0	6.0	38.4	72.0
0026592	6.0	7.1	57.6	102.0
0026593	10.0	8.5	96.0	159.0
0026594	16.0	9.9	153.6	247.0
<b>ÖLFLEX® SOLAR XL multi - TÜV approved</b>				
<b>Outer sheath colour red</b>				
0026574A	2.5	5.6	24.0	45.0
0026575A	4.0	6.0	38.4	72.0
0026576A	6.0	7.1	57.6	102.0
0026577A	10.0	8.5	96.0	159.0
0026578A	16.0	9.9	153.6	247.0
<b>Outer sheath colour blue</b>				
0026579A	2.5	5.6	24.0	45.0
0026595A	4.0	6.0	38.4	72.0
0026597A	6.0	7.1	57.6	102.0
0026598A	10.0	8.5	96.0	159.0
0026599A	16.0	9.9	153.6	247.0

Copper price basis: EUR 150 / 100 kg

Standard lengths: (100; 500; 1000) m

Packaging size: 100mtr = coil / 500mtr u. 1000mtr = drum

## ■ Accessories

- EPIC® SOLAR - Industrially injection overmoulded and field mountable solar connectors for safe connection of PV modules
- SKINTOP® ST / SKINTOP® CLICK - Approved cable glands used for PV junction boxes, electric meters and DC/AC converters



## ÖLFLEX® SOLAR XL

Solar cables with big conductor cross-section



### Info

- For high electrical power transmission !

### Benefits

- High thermal capacity for long lasting operation of the PV system at all seasons
- Exact quantity control during installation by meter marking on the cable sheath

### Application range

- The big conductor cross-sections mainly are needed to transmit high power loads between the individual panel-strings and as connection to the DC/AC inverter of huge PV plants resp. solar fields
- Gable and flat roof photovoltaic systems
- Open land solarfield plants

### Product specifications

- Excellent weather-, abrasion-, temperature- and UV resistance

- Halogen free and flame retardant (IEC 60332-1-2)
- Good resistance against ammonia- and biogases

### Norm references



### Cable Make-Up

- Conductor: fine wired tinned copper strands
- Core insulation: special polyolefin, cross-linked, black
- Outer sheath: modified copolymer, cross-linked
- Colour: black

### Technical data

- Core identification code: black
- Conductor stranding: fine wire in acc. to VDE 0295 Class 5/IEC 60228 Cl. 5
- Minimum bending radius: fixed installation: 4 x cable diameter; occasional flexing: 15 x cable diameter
- Rated voltage:  $U_0/U$ : AC 600/1000 V; DC 900/1500 V
- Test voltage: 4000 V
- Range of temperature: fixed installation: -40°C up to +120°C; short-circuit temperature: +250°C

Part number	Conductor cross-section in mm²	Outer diameter in mm approx.	Copper index kg/km	Weight kg/km approx.
<b>ÖLFLEX® SOLAR XL power cable - black</b>				
0026988	25.0	11.3	240.0	334.0
0026984	35.0	12.6	336.0	470.0
0026985	50.0	15.2	480.0	642.0
0026986	70.0	17.3	672.0	852.0
0026987	95.0	19.9	912.0	1,120.0
0026988	120.0	22.0	1,152.0	1,480.0

Copper price basis: EUR 150 / 100 kg  
 Standard lengths: (500; 1000) m  
 Packaging size: Drum

### Accessories

- EPIC® SOLAR - Industrially injection overmoulded and field mountable solar connectors for safe connection of PV modules
- SKINTOP® ST / SKINTOP® CLICK - Approved cable glands used for PV junction boxes, electric meters and DC/AC converters

## Hot mission in Asia.



Source: Korea Korrel Inc., Solar module: Suntechnics

Solar system in Korea - wired with high temperature resistant ÖLFLEX® SOLAR XL cables.

## Special applications

Cables for photovoltaics

## ÖLFLEX® SOLAR XLv

Robust solar cables for direct burial in earth

LAPP KABEL GUTENBERG ÖLFLEX® SOLAR XLv - CE



## Info

- The heavy-duty version with reinforced outer sheath!

## Benefits

- Cost-, time- and material savings - The cable is due to a reinforced outer sheath largely resistant against mechanical influences and may be installed considering universally valid installation guidelines directly in earth (e.g. for use in solar field plants)
- High thermal capacity for long lasting operation of the PV system at all seasons
- No spreading of fire source and formation of toxic combustion gases in the event of fire
- Exact quantity control during installation by meter marking on the cable sheath

## Application range

- For the cabling of individual solar panel strings resp. fixed and moved module scaffolds
- Open land solarfield plants

## Product specifications

- Excellent weather-, abrasion-, temperature- and UV resistance
- Weatherproof according ISO 4892-2 resp. UL 1581 Section 1200
- Halogen free and flame retardant (IEC 60332-1-2)
- Good resistance against ammonia- and biogases

## Norm references



## Cable Make-Up

- Conductor: fine wired tinned copper strands
- Core insulation: special polyolefin, cross-linked, black
- Outer sheath: modified copolymer, cross-linked
- Colour: black

## Technical data

- Core identification code: black
- Conductor stranding: fine wire in acc. to VDE 0295 Class 5/IEC 60228 Cl. 5
- Minimum bending radius: fixed installation: 4 x cable diameter; occasional flexing: 15 x cable diameter
- Rated voltage:  $U_0/U$ : AC 600/1000 V; DC 900/1500 V
- Test voltage: 4000 V
- Range of temperature: fixed installation: -40°C up to +120°C; short-circuit temperature: +250°C

Part number	Conductor cross-section in mm <sup>2</sup>	Outer diameter in mm approx.	Copper index kg/km	Weight kg/km approx.
<b>ÖLFLEX® SOLAR XLv black</b>				
0027080	4.0	8.0	38.4	97.0
0027081	6.0	9.1	57.6	135.0
0027082	10.0	10.5	96.0	206.0
0027083	16.0	11.9	153.6	315.0
0027084	25.0	13.2	240.0	460.0
0027085	35.0	14.5	336.0	570.0
0027086	50.0	17.7	480.0	763.0
0027087	70.0	19.7	672.0	987.0
0027088	95.0	21.8	912.0	1,276.0

Copper price basis: EUR 150 / 100 kg

Standard lengths: (500; 1000) m

Packaging size: Drum

Considering economic minimum lengths we produce on request versions with red resp. blue core insulation colour or an imprinted code stripe on the black outer sheath as distinctive feature

## Accessories

- EPIC® SOLAR - Industrially injection overmoulded and field mountable solar connectors for safe connection of PV modules
- SKINTOP® ST / SKINTOP® CLICK - Approved cable glands for use for PV junction boxes, electric meters and DC/AC converters

# ÖLFLEX® SOLAR V4A

High-grade steel armoured solar cables



## Info

- Protected against martens, rodents and termites !

## Benefits

- The stainless high-grade (class V4A) steel wire braiding protects very effectively against attacks of martens, rodents and even termites
- High thermal capacity for long lasting operation of the PV system at all seasons

## Application range

- Especially for the use in PV roof systems on stables and barns in afforested areas resp. farmsteads  
mainly developed for the use in afforested areas and farms where photovoltaic systems often are installed on the roofs of barns and stables.
- Gable and flat roof photovoltaic systems
- Open land solarfield plants

## Product specifications

- Excellent weather- and UV resistance tested in accordance to ISO 4892-2
- Good resistance against ammonia- and biogases
- Flame retardant according IEC 60332-1-2

## Norm references



## Cable Make-Up

- Conductor: fine wired tinned copper strands
- Core insulation: cross linked polymer, Colour: black
- Outer sheath: special polymer
- Armouring: high-grade stainless steel wire braiding (V4A)

## Technical data

- Core identification code**  
black
- Conductor stranding**  
fine wire in acc. to VDE 0295  
Class 5/IEC 60228 Cl. 5
- Minimum bending radius**  
Fixed installation:  
5 x outer diameter  
occasional flexing:  
15 x cable diameter
- Rated voltage**  
U<sub>0</sub>/U  
AC 600/1000 V  
DC 900/1500 V
- Test voltage**  
4000 V
- Range of temperature**  
fixed installation:  
-50°C up to +120°C  
short-circuit temperature:  
+250°C

Part number	Conductor cross-section in mm²	Outer diameter in mm approx.	Copper index kg/km	Weight kg/km approx.
<b>ÖLFLEX® SOLAR V4A stainless steel</b>				
0026079	4.0	7.3	38.4	98.0
0025997	6.0	8.1	57.6	158.0

Copper price basis: EUR 150 / 100 kg

Standard lengths: (500; 1000) m

Packaging size: Drum

## Accessories

- EPIC® SOLAR - Industrially injection overmoulded and field mountable solar connectors for safe connection of PV modules
- SKINTOP® ST / SKINTOP® CLICK - Approved cable glands used for PV junction boxes, electric meters and DC/AC converters



## Power and Control Cables

PVC cables with numbered cores

## ÖLFLEX® CLASSIC 110 Black 0,6/1kV



## Info

- Wide range of application opportunities

## Benefits

- Space-saving installation due to reduced cable diameter at simultaneously improved properties
- High electrical performance due to 4kV test voltage
- Outdoor use suitable considering the temperature range
- Suitable for direct burial

## Application range

- Mainly in dry, damp or wet interiors under medium mechanical load conditions
- For fixed installation as well as for occasional flexing at free, non-continuously recurring movement
- Plant engineering and construction
  - Industrial machinery
  - Air conditioning installations
  - Paint-spray lines

## Product specifications

- UV- and weather resistant
- Flame-retardant acc. to IEC 60332-1-2
- Manufactured free of substances harmful to lacquer (silicone free) and therefore suitable for use in paint shops

## Norm references



## Cable Make-Up

- Fine strands of bare copper wires
- PVC insulation LAPP P8 / 1
- Black cores with white numbers
- Special PVC outer sheath black (RAL 9005)

## Technical data



**Core identification code**  
black with white numbers  
acc. to VDE 0293



**Based on**  
Cores acc. to VDE 0281 (H07V-K)  
Sheath acc. to Italian standard  
CEI-UNEL 35755 + 35756



**Specific insulation resistance**  
> 20 GΩm x cm



**Conductor stranding**  
fine wire acc. to:  
VDE 0295 KL5  
IEC 60228 CL5



**Minimum bending radius**  
occasional flexing:  
15 x cable diameter  
fixed installation:  
4 x cable diameter



**Rated voltage**  
U<sub>0</sub>/U: 600/1000 V



**Test voltage**  
4000 V



**Protective conductor**  
G = with protective conductor GN/YE  
X = without protective conductor



**Range of temperature**  
occasional flexing:  
-5 °C to +70 °C  
fixed installation:  
-40 °C to +80 °C

Part number	Number of cores and mm² per conductor	Outer diameter in mm approx.	Copper index kg/km approx.	Weight kg/km approx.
<b>ÖLFLEX® CLASSIC 110 Black; U<sub>0</sub>/U: 600/1000 V</b>				
1120232	2 X 0,75	8,3	14,4	81
1120233	3 G 0,75	8,7	21,6	93
1120234	3 X 0,75	8,7	21,6	93
1120235	4 G 0,75	9,2	29,0	108
1120237	5 G 0,75	9,9	36,0	126
1120241	7 G 0,75	10,7	51,0	162
1120248	12 G 0,75	13,4	86,0	236
1120251	18 G 0,75	15,4	130,0	334
1120254	25 G 0,75	17,7	180,0	469
1120256	34 G 0,75	20,2	245,0	610
1120259	41 G 0,75	21,6	296,0	713
1120266	2 X 1	8,6	19,2	98
1120267	3 G 1	9,0	29,0	112
1120268	3 X 1	9,0	29,0	112
1120269	4 G 1	9,6	38,4	131
1120270	4 X 1	9,6	38,4	131
1120271	5 G 1	10,4	48,0	152
1120274	7 G 1	11,1	67,0	196
1120280	12 G 1	14,0	115,0	286
1120284	18 G 1	16,1	173,0	419
1120290	25 G 1	18,6	240,0	572
1120294	34 G 1	21,3	326,0	764
1120298	41 G 1	23,2	394,0	891
1120306	2 X 1,5	9,6	29,0	123
1120307	3 G 1,5	10,1	43,0	144
1120308	3 X 1,5	10,1	43,0	144
1120309	4 G 1,5	10,8	58,0	170
1120311	5 G 1,5	11,7	72,0	199
1120314	7 G 1,5	12,6	101,0	261
1120320	12 G 1,5	16,1	173,0	399
1120322	14 G 1,5	17,0	202,0	372
1120324	18 G 1,5	18,8	259,0	547
1120328	25 G 1,5	21,7	360,0	770

G = with Protective Conductor GNYE; X = without Protective Conductor

Copper price basis: EUR 150 / 100 kg

Standard lengths: (50; 100; 500; 1000) m

Packaging size: Coil &lt; 30 kg, above automatically drum

Please specify the desired make-up (e.g. 1 x 500 m drum or 5 x 100 m coils)

## Comparable products

- ÖLFLEX® CLASSIC 100 BK Power 0,6/1kV
- ÖLFLEX® ROBUST 210

Part number	Number of cores and mm² per conductor	Outer diameter in mm approx.	Copper index kg/km approx.	Weight kg/km approx.
1120330	34 G 1,5	24,9	490,0	996
1120333	50 G 1,5	29,8	720,0	1,427
1120339	2 X 2,5	10,8	48,0	147
1120340	3 G 2,5	11,3	72,0	182
1120342	4 G 2,5	12,2	96,0	225
1120343	4 X 2,5	12,2	96,0	225
1120344	5 G 2,5	13,3	120,0	266
1120346	7 G 2,5	14,4	168,0	354
1120349	12 G 2,5	18,7	288,0	540
1120350	14 G 2,5	19,8	336,0	542
1120351	18 G 2,5	22,0	432,0	788
1120353	25 G 2,5	25,8	600,0	1,094
1120360	4 G 4	13,8	154,0	324
1120361	5 G 4	15,1	192,0	385
1120362	7 G 4	16,4	269,0	513
1120366	4 G 6	15,1	230,0	442
1120367	5 G 6	16,8	288,0	526
1120368	7 G 6	18,2	403,0	705
1120370	4 G 10	18,7	384,0	707
1120371	5 G 10	20,7	480,0	881
1120372	7 G 10	22,8	672,0	1,300
1120374	4 G 16	21,3	614,0	1,100
1120375	5 G 16	23,6	768,0	1,600
1120376	7 G 16	26,2	1,075,0	1,890
1120378	4 G 25	26,2	960,0	1,600
1120379	5 G 25	29,0	1,200,0	2,050
1120380	7 G 25	31,9	1,680,0	2,900
1120382	4 G 35	29,1	1,344,0	2,400
1120383	5 G 35	32,5	1,680,0	2,900
1120385	4 G 50	35,6	1,920,0	3,400
1120387	4 G 70	40,7	2,688,0	5,050
1120389	4 G 95	46,8	3,648,0	6,010
1120390	4 G 120	53,5	4,608,0	7,500

## Accessories

- SKINTOP® ST-M black cable gland

# ÖLFLEX® CLASSIC 110 CY Black 0,6/1 kV

EMC compliant



## Info

- Wide range of application opportunities

## Benefits

- Space-saving installation due to reduced cable diameter at simultaneously improved properties
- High electrical performance due to 4kV test voltage
- Outdoor use suitable considering the temperature range
- Suitable for direct burial

## Application range

- Mainly in dry, damp or wet interiors under medium mechanical load conditions
- For fixed installation as well as for occasional flexing at free, non-continuously recurring movement
- Plant engineering and construction  
Industrial machinery  
Air conditioning installations  
Paint-spray lines
- In EMI critical environment (electromagnetic interference)

## Product specifications

- UV- and weather resistant
- Flame-retardant acc. to IEC 60332-1-2
- High screen coverage  
low transfer impedance  
(max. 250  $\Omega$  / km at 30 MHz)
- Manufactured free of substances harmful to lacquer (silicone free) and therefore suitable for use in paint shops

## Norm references



## Cable Make-Up

- Fine strands of bare copper wires
- PVC insulation LAPP P8/1
- Black cores with white numbers
- PVC inner sheath surrounded by tinned copper wire braid
- Special PVC outer sheath black (RAL 9005)

## Technical data

- Core identification code**  
black with white numbers  
acc. to VDE 0293
- Based on**  
Cores acc. to VDE 0281 (H07V-K)  
Sheath acc. to Italian standard  
CEI-UNEL 35755 + 35756
- Specific insulation resistance**  
> 20 G $\Omega$ m x cm
- Conductor stranding**  
fine wire acc. to:  
VDE 0295 Kl.5  
IEC 60228 Cl.5
- Minimum bending radius**  
occasional flexing:  
20 x cable diameter  
fixed installation:  
6 x cable diameter
- Rated voltage**  
U<sub>0</sub>/U: 600/1000 V
- Test voltage**  
4000 V
- Protective conductor**  
G = with protective conductor GN/YE  
X = without protective conductor
- Range of temperature**  
occasional flexing:  
-5 °C to +70 °C  
fixed installation:  
-40 °C to +80 °C

Part number	Number of cores and mm² per conductor	Outer diameter in mm approx.	Copper index kg/km approx.	Weight kg/km approx.
<b>ÖLFLEX® CLASSIC 110 CY Black; U<sub>0</sub>/U: 600/1000 V</b>				
1121200	2 X 0,5	10,1	38,0	165
1121201	3 G 0,5	10,4	45,0	181
1121202	3 X 0,5	10,4	45,0	181
1121203	4 G 0,5	11,0	54,0	210
1121205	5 G 0,5	11,6	62,0	239
1121208	7 G 0,5	12,3	76,0	274
1121209	7 X 0,5	12,3	76,0	274
1121213	12 G 0,5	14,9	131,0	398
1121214	12 X 0,5	14,9	131,0	398
1121217	18 G 0,5	17,0	175,0	522
1121220	25 G 0,5	18,9	223,0	638
1121232	2 X 0,75	10,5	46,0	183
1121233	3 G 0,75	10,9	56,0	210
1121235	4 G 0,75	11,4	67,0	238
1121236	4 X 0,75	11,4	67,0	238
1121237	5 G 0,75	12,1	78,0	272
1121241	7 G 0,75	12,9	97,0	315
1121247	12 G 0,75	15,8	168,0	464
1121251	18 G 0,75	18,0	229,0	616
1121254	25 G 0,75	20,7	296,0	762
1121266	2 X 1	10,8	52,0	198
1121267	3 G 1	11,2	66,0	228
1121268	3 X 1	11,2	66,0	228
1121269	4 G 1	11,8	79,0	261
1121270	4 X 1	11,8	79,0	261
1121271	5 G 1	12,6	93,0	300
1121274	7 G 1	13,3	117,0	335
1121280	12 G 1	16,4	204,0	522
1121284	18 G 1	18,7	280,0	687
1121290	25 G 1	21,6	369,0	884
1121306	2 X 1,5	11,8	69,0	243

Part number	Number of cores and mm² per conductor	Outer diameter in mm approx.	Copper index kg/km approx.	Weight kg/km approx.
1121307	3 G 1,5	12,3	87,0	273
1121308	3 X 1,5	12,3	87,0	273
1121309	4 G 1,5	13,0	102,0	290
1121310	4 X 1,5	13,0	102,0	290
1121311	5 G 1,5	13,9	125,0	352
1121314	7 G 1,5	15,0	180,0	448
1121320	12 G 1,5	18,7	281,0	690
1121324	18 G 1,5	21,8	391,0	938
1121328	25 G 1,5	25,1	518,0	1,180
1121340	3 G 2,5	13,5	123,0	354
1121342	4 G 2,5	14,6	168,0	413
1121344	5 G 2,5	15,7	204,0	515
1121346	7 G 2,5	17,0	265,0	619
1121349	12 G 2,5	21,7	421,0	936
1121360	4 G 4	16,2	238,0	587
1121361	5 G 4	17,7	302,0	689
1121362	7 G 4	19,0	396,0	828
1121367	4 G 6	17,7	318,0	715
1121368	5 G 6	19,2	419,0	862
1121369	7 G 6	21,2	559,0	1,105
1121372	4 G 10	21,7	574,0	1,188
1121373	5 G 10	23,0	612,0	1,020
1121377	4 G 16	24,3	809,0	1,656
1121378	5 G 16	26,7	935,0	1,440
1121381	4 G 25	29,8	1,165,0	2,179
1121382	5 G 25	31,6	1,400,0	2,090
1121385	4 G 35	32,7	1,683,0	2,893
1121388	4 G 50	39,6	2,368,0	4,094
1121391	4 G 70	44,5	3,261,0	5,467
1121394	4 G 95	51,0	4,055,0	5,849
1121397	4 G 120	58,1	5,225,0	7,509

G = with Protective Conductor GNYE; X = without Protective Conductor  
Copper price basis: EUR 150 / 100 kg  
Standard lengths: (50; 100; 500; 1000) m  
Packaging size: Coil < 30 kg, above automatically drum  
Please specify the desired make-up (e.g. 1 x 500 m drum or 5 x 100 m coils)

## Comparable products

- ÖLFLEX® SERVO 2YSLCY
- ÖLFLEX® ROBUST 215 C

## Accessories

- SKINTOP® MS-SC-M BRUSH
- EMI safe cable gland



## Single cores

Stationary application

## ÖLFLEX® STATIC CY black

Screened single core cables for unprotected installation

LAPP KABEL STUTTGART ÖLFLEX® STATIC CY black CE



## Info

- Flexible alternative to NYY-O !  
For EMC applications !

## Benefits

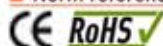
- Low-cost, double-insulated single core for fixed installation indoors and outdoors
- The high degree of the screens coverage offers very good EMC performance
- Due to the double insulation, no additional protection such as a closed cable duct or protective conduit is required in free installation

## Application range

- Especially suitable for power circuits as external connection or for internal wiring of electric and electronic equipment
- In dry and damp rooms at low mechanical stress

- ÖLFLEX® STATIC CY black can be used in the photovoltaic sector for instance indoors as flexible connection to the frequency converter
- Outdoor use is possible under consideration of the temperature range

## Norm references



## Cable Make-Up

- Fine wire strands of plain copper wires
- Core insulation with PVC base, fleece wrapping, tinned copper braid
- PVC based outer sheath
- Colour: black

## Technical data



## Core identification code

Insulation: Black  
Outer sheath: Black



## Specific insulation resistance

> 20 GΩm x cm



## Conductor stranding

Fine wire in acc. with VDE 0295 Cl.5/  
IEC 60228 Cl. 5



## Minimum bending radius

Static:  
6 x outer diameter  
occasional flexing:  
12,5 x outer diameter



## Rated voltage

U<sub>c</sub>/U: 600/1000 V



## Test voltage

core/screen: 2000 V



## Range of temperature

Fixed installation: -30°C up to +80°C

Part number	Conductor cross-section in mm <sup>2</sup>	Outer diameter in mm approx.	Copper index kg/km	Weight kg/km approx.
<b>ÖLFLEX® STATIC CY black</b>				
4600023	16	10.3	177.0	275.0
4600024	25	12.7	267.0	396.0
4600025	35	14.3	384.0	542.0
4600026	50	16.9	537.0	752.0
4600027	70	18.7	763.0	1,004.0
4600028	95	21.7	1,012.0	1,368.0
4600029	120	24.7	1,264.0	1,719.0

Copper price basis: EUR 150 / 100 kg

Standard lengths: (50; 100; 250; 500) m

Packaging size: Coil &lt; 30 kg, above automatically drum

Please specify the desired make-up (e.g. 1 x 500 m drum or 5 x 100 m coils)



# H07RN-F



## Info

- Harmonised (HAR)
- International use

## Benefits

- Heavy-duty, rubber-sheathed cable
- High stresses
- Allowed up to 1000 V (0,6/1 kV) alternating voltage within fixed installation in tubes or devices as well as rotor connection cable for motors and similar
- Arrangements from single core rubber-sheathed cables H07RN-F can be used for short-circuit and short-to-ground proof installation in accordance with VDE 0100 Part 520

## Application range

- Hand-held equipment
- Tools and agricultural machinery
- Photovoltaic industry
- Dry and damp interiors as well as outdoors and in industrial water

## Product specifications

- Flame-retardant acc. to IEC 60332-1-2
- Oil resistant in acc. with EN 60811-2-1
- Ozone-resistant

## Norm references



## Cable Make-Up

- Copper wire acc. to HAR bare or tinned
- Rubber core insulation, cores twisted together
- Various colours or printed numbers on black core in acc. to VDE 0293
- Outer sheath of polychloroprene rubber

## Technical data

- Core identification code**  
Up to 5 cores:  
colour code acc. VDE 0293-308, see table T9  
Starting at 7 cores:  
black cores with white numbers (VDE 0293)
- Approvals**  
VDE 0282 Part 4 / HD 22.4 S4
- Specific insulation resistance**  
1 GOhm x cm
- Conductor stranding**  
Fine wire in acc. with VDE 0295 Cl.5/  
IEC 60228 Cl. 5
- Minimum bending radius**  
Flexing:  
6 x outer diameter
- Rated voltage**  
U<sub>i</sub>/U<sub>s</sub>: 450/750 V  
in protected and fixed installations:  
U<sub>i</sub>/U<sub>s</sub>: 600/1000 V
- Test voltage**  
2500 V
- Protective conductor**  
G = with green/yellow protective conductor  
X = without protective conductor
- Current rating**  
H07RN-F in acc. with VDE 0298 part 4  
Tab. 11 and 13
- Range of temperature**  
Flexible application:  
-25°C to +60°C

Part number	Number of cores and mm <sup>2</sup> per conductor	Outer diameter in mm approx.	Copper index kg/km approx.	Weight kg/km approx.
<b>Multi Core Rubber Cable H07RN-F U<sub>0</sub>/U<sub>s</sub>: 450/750 V</b>				
1600117	3 G 1	8.3 - 10.7	29.0	130
1600199	2 X 1.5	8.5 - 11.0	29.0	135
1600103	3 G 1.5	9.2 - 11.9	43.0	165
16001233	4 G 1.5	10.2 - 13.1	58.0	200
16001043	5 G 1.5	11.2 - 14.4	72.0	240
1600151	7 G 1.5	14.0 - 17.5	101.0	385
1600148	12 G 1.5	17.6 - 22.4	173.0	516
1600259	19 G 1.5	20.7 - 26.3	274.0	800
1600166	24 G 1.5	24.3 - 30.7	346.0	882
1600263	25 G 1.5	25.1 - 25.9	360.0	918
1600187	2 X 2.5	10.2 - 13.1	48.0	195
1600118	3 G 2.5	10.9 - 14.0	72.0	235
16001053	4 G 2.5	12.1 - 15.5	96.0	290
16001293	5 G 2.5	13.3 - 17.0	120.0	345
1600152	7 G 2.5	16.5 - 20.0	168.0	520
1600154	12 G 2.5	20.6 - 26.2	288.0	810
1600156	19 G 2.5	25.5 - 31.0	456.0	1,200
1600157	24 G 2.5	28.8 - 36.4	576.0	1,650
1600186	2 X 4	11.8 - 15.1	77.0	270
1600119	3 G 4	12.7 - 16.2	115.0	320
16001063	4 G 4	14.0 - 17.9	154.0	395
16001303	5 G 4	15.6 - 19.9	192.0	485
1600161	7 G 4	21.0 - 21.8	268.8	681
1600120	3 G 6	14.1 - 18.0	173.0	495
16001073	4 G 6	15.7 - 20.0	230.0	610
16001313	5 G 6	17.5 - 22.2	288.0	760
1600121	3 G 10	19.1 - 24.2	288.0	880
16001083	4 G 10	20.9 - 26.5	384.0	1,060
16001093	5 G 10	22.9 - 29.1	480.0	1,300
1600122	3 G 16	21.8 - 27.6	461.0	1,090
16001103	4 G 16	23.8 - 30.1	614.0	1,345
16001113	5 G 16	26.4 - 33.3	768.0	1,680
16001123	4 G 25	28.9 - 36.6	960.0	1,995
16001133	5 G 25	32.0 - 40.4	1,200.0	2,470
16001143	4 G 35	32.5 - 41.1	1,344.0	2,645
16001363	5 G 35	37.0 - 45.0	1,680.0	2,810
16001153	4 G 50	37.7 - 47.5	1,920.0	3,635
1600126	5 G 50	40.0 - 50.8	2.4	4,050
16001163	4 G 70	42.7 - 54.0	2,688.0	4,830
16001283	4 G 95	48.4 - 61.0	3,648.0	6,320
16001323	4 G 120	53.0 - 66.0	4,608.0	6,830
16000883	4 G 150	58.0 - 73.0	5,760.0	8,320
1600141	4 G 185	64.0 - 80.0	7,104.0	9,800
1600183	4 G 240	72.0 - 91.0	9,216.0	12,100

## Cables for harsh utilisation conditions

## Rubber sheathed cables

Part number	Number of cores and mm <sup>2</sup> per conductor	Outer diameter in mm approx.	Copper index kg/km approx.	Weight kg/km approx.
<b>Single Core Rubber Cable HO7RN-F U0/U: 450/750 V</b>				
1600096	1 X 1.5	5.7 - 7.1	14.4	59
1600099	1 X 2.5	6.3 - 7.9	24.0	72
1600097	1 X 4	7.2 - 9.0	38.0	99
1600098	1 X 6	7.9 - 9.8	58.0	130
1600194	1 X 10	9.5 - 11.9	96.0	230
1600195	1 X 16	10.8 - 13.4	154.0	320
1600196	1 X 25	12.7 - 15.8	240.0	450
1600193	1 X 35	14.3 - 17.9	336.0	605
1600197	1 X 50	16.5 - 20.6	480.0	825
1600189	1 X 70	18.6 - 23.3	672.0	1,090
1600190	1 X 95	20.8 - 26.0	912.0	1,405
1600198	1 X 120	22.8 - 28.6	1,152.0	1,745
1600191	1 X 150	25.2 - 31.4	1,440.0	1,887
1600175	1 X 185	27.6 - 34.4	1,776.0	2,274
1600177	1 X 240	30.6 - 38.3	2,304.0	2,955
30015435	1 X 300	33.5 - 41.9	2,880.0	3,479

G = with Protective Conductor GNYE; X = without Protective Conductor

Copper price basis: EUR 150 / 100 kg

Standard lengths: (50; 100; 500; 1000) m

Packaging size: Coil < 30 kg, above automatically drum

Please specify the desired make-up (e.g. 1 x 500 m drum or 5 x 100 m coils)



Photovoltaic unit on the roof of the Lapp Group Logistics Centre 1 in Stuttgart.



## Power Cable NYY-J, NYY-O

The robust 0,6/1kV cable for direct burial and use in water



### Info

- According to VDE 0276

### Application range

- As a fixed installation power and control cable for the following applications:
- For indoor- and outdoor use
- Direct burial
- In concrete
- In water

### Norm references



### Conductor configuration

In accordance with VDE 0295 / IEC 60228

- re = round conductor, single wire
- rm = round conductor, multi-wire
- sm = sectorial conductor

### Cable Make-Up

- Single or multi-wire conductors of bare copper wires
- PVC core insulation
- Cores twisted concentrically, common core sheathing
- Outer sheath of PVC, black, flame-retardant

### Technical data

- Core identification code**  
In acc. with VDE 0293-308, see appendix T9
- Approvals**  
VDE 0276, Part 603 (for 1-5 cores)  
Part 627, HD 627 (from 7 cores)
- Minimum bending radius**  
Single core: 15 x outer diameter  
Multi-core: 12 x outer diameter
- Rated voltage**  
U<sub>0</sub>/U: 0,6/1,0 kV
- Test voltage**  
4 kV
- Range of temperature**  
At installation: +5°C to +50°C  
Fixed installation: -40°C to +70°C

Part number	Number of cores and mm <sup>2</sup> per conductor	Outer diameter in mm approx.	copper index kg/km	Weight kg/km approx.
<b>NYJ-J</b>				
1550030	1 x 25,0 rm	13,0	240,0	360,0
1550038	1 x 35,0 rm	14,0	336,0	470,0
1550032	1 x 50,0 rm	15,0	480,0	640,0
1550033	1 x 70,0 rm	17,0	672,0	850,0
15500013	3 x 1,5 re	12,0	43,0	200,0
15500023	4 x 1,5 re	13,0	58,0	230,0
15500033	5 x 1,5 re	14,0	72,0	270,0
1550004	7 x 1,5 re	15,0	101,0	300,0
1550005	10 x 1,5 re	17,0	144,0	420,0
1550006	12 x 1,5 re	18,0	173,0	460,0
1550084	14 x 1,5 re	19,0	202,0	520,0
1550007	16 x 1,5 re	20,0	230,0	570,0
1550008	19 x 1,5 re	21,0	274,0	600,0
1550085	21 x 1,5 re	22,0	302,0	650,0
1550009	24 x 1,5 re	23,0	346,0	750,0
1550086	30 x 1,5 re	25,0	432,0	800,0
1550087	40 x 1,5 re	28,0	576,0	1,050,0
1550088	52 x 1,5 re	31,0	749,0	1,450,0
1550089	61 x 1,5 re	33,0	878,0	1,680,0
15500103	3 x 2,5 re	13,0	72,0	260,0
15500113	4 x 2,5 re	14,0	96,0	300,0
15500123	5 x 2,5 re	15,0	120,0	350,0
1550013	7 x 2,5 re	16,0	168,0	420,0
1550090	10 x 2,5 re	19,0	240,0	600,0
1550091	12 x 2,5 re	21,0	288,0	630,0
1550092	14 x 2,5 re	22,0	336,0	740,0
1550093	16 x 2,5 re	23,0	384,0	810,0
1550094	19 x 2,5 re	24,0	456,0	850,0
1550095	21 x 2,5 re	25,0	504,0	950,0
1550096	24 x 2,5 re	27,0	576,0	1,100,0
1550097	30 x 2,5 re	29,0	720,0	1,300,0
1550098	40 x 2,5 re	32,0	960,0	1,700,0
1550099	52 x 2,5 re	36,0	1,248,0	2,200,0
15500583	3 x 4,0 re	15,0	115,0	330,0
15500203	4 x 4,0 re	16,0	154,0	400,0
15500263	5 x 4,0 re	17,0	192,0	480,0
15500593	3 x 6,0 re	16,0	173,0	430,0
15500213	4 x 6,0 re	17,0	230,0	510,0
15500273	5 x 6,0 re	19,0	288,0	610,0
1550102	7 x 6,0 re	20,0	403,0	845,0
15500603	3 x 10,0 re	18,0	288,0	590,0
15500223	4 x 10,0 re	19,0	384,0	720,0
15500823	5 x 10,0 re	21,0	480,0	880,0
15500613	3 x 16,0 re	20,0	461,0	810,0
15500233	4 x 16,0 re	22,0	614,0	1,050,0
15500833	5 x 16,0 re	24,0	768,0	1,250,0
15500713	3 x 25,0 rm/ 16,0 re	26,0	874,0	1,520,0
15500243	4 x 25,0 rm	28,0	960,0	1,650,0
15500153	3 x 35,0 sm/ 16,0 re	28,0	1,162,0	1,800,0
15500753	4 x 35,0 sm	28,0	1,344,0	2,000,0
15500163	3 x 50,0 sm/ 25,0 rm	31,0	1,680,0	2,500,0
15500253	4 x 50,0 sm	31,0	1,920,0	2,700,0
15500173	3 x 70,0 sm/ 35,0 sm	35,0	2,352,0	3,300,0
15500763	4 x 70,0 sm	35,0	2,688,0	3,600,0
15500183	3 x 95,0 sm/ 50,0 sm	40,0	3,216,0	4,400,0
15500773	4 x 95,0 sm	40,0	3,648,0	4,800,0
15500723	3 x 120,0 sm/ 70,0 sm	43,0	4,128,0	5,400,0
15500783	4 x 120,0 sm	43,0	4,608,0	5,900,0
15500733	3 x 150,0 sm/ 70,0 sm	48,0	4,992,0	6,700,0
15500793	4 x 150,0 sm	48,0	5,760,0	7,300,0



## Power cables

## Underground installation

Part number	Number of cores and mm² per conductor	Outer diameter in mm approx.	copper index kg/km	Weight kg/km approx.
15500743	3 x 185,0 sm / 95,0 sm	52,0	6,240.0	8,000.0
15500803	4 x 185,0 sm	53,0	7,104.0	9,000.0
15500193	3 x 240,0 sm / 120,0 sm	59,0	8,064.0	10,400.0
15500813	4 x 240,0 sm	60,0	9,216.0	11,400.0
15500503	3 x 300,0 sm / 150,0 sm	65,0	10,080.0	13,000.0
<b>NYO</b>				
1550204	1 x 6,0 re	9,0	58.0	140.0
1550205	1 x 10,0 re	10,0	96.0	190.0
1550206	1 x 16,0 re	11,0	154.0	240.0
1550207	1 x 25,0 rm	13,0	240.0	360.0
1550208	1 x 35,0 rm	14,0	336.0	470.0
1550209	1 x 50,0 rm	15,0	480.0	640.0
1550210	1 x 70,0 rm	17,0	672.0	850.0
1550211	1 x 95,0 rm	19,0	912.0	1,120.0
1550212	1 x 120,0 rm	21,0	1,152.0	1,370.0
1550213	1 x 150,0 rm	23,0	1,440.0	1,700.0
1550214	1 x 185,0 rm	25,0	1,776.0	2,100.0
1550215	1 x 240,0 rm	28,0	2,304.0	2,700.0
1550216	1 x 300,0 rm	30,0	2,880.0	3,200.0
1550218	1 x 500,0 rm	39,0	4,800.0	5,400.0
15502003	2 x 1,5 re	11,0	29.0	170.0
15502193	2 x 2,5 re	12,0	48.0	220.0
15502033	4 x 2,5 re	14,0	96.0	300.0
15502203	2 x 4,0 re	14,0	77.0	290.0
15502503	4 x 4,0 re	16,0	154.0	400.0
15502213	2 x 6,0 re	15,0	115.0	360.0
15502513	4 x 6,0 re	17,0	230.0	510.0
15502223	2 x 10,0 re	17,0	192.0	480.0
15502523	4 x 10,0 re	19,0	384.0	720.0
15502233	2 x 16,0 re	19,0	307.0	660.0
15502533	4 x 16,0 re	22,0	614.0	1,050.0
15502543	4 x 25,0 rm	28,0	960.0	1,650.0
15502553	4 x 35,0 sm	28,0	1,344.0	2,000.0
15502563	4 x 50,0 sm	31,0	1,920.0	2,700.0
15502573	4 x 70,0 sm	35,0	2,688.0	3,600.0
15502583	4 x 95,0 sm	40,0	3,648.0	4,800.0

Copper price basis: Excluding Copper

Standard lengths: (50; 100; 500; 1000) m

Packaging size: Coil &lt; 30 kg, above automatically drum

Please specify the desired make-up (e.g. 1 x 500 m drum or 5 x 100 m coils)

# Power Cable NYCY / Power Cable NYCWY

With concentric outer conductor



## Info

- According VDE 0276

## Application range

- As a fixed installation power and control cable for the following applications:
- For indoor- and outdoor use
- Direct burial
- In concrete
- In water

## Norm references



## Conductor configuration

In accordance with VDE 0295 / IEC 60228



re = round conductor, single wire



rm = round conductor, multi-wire



sm = sectorial conductor

## Cable Make-Up

### Power Cable NYCY

- As NYCY, but with concentric outside conductor of bare copper wires, with counter spiral of copper band under the outer sheath

### Power Cable NYCWY

- As NYCY, but with ceander shaped concentric outside conductor of bare copper wires

## Technical data



### Core identification code

in acc. with VDE 0293  
see appendix T9



### Approvals

#### Power Cable NYCY

VDE 0276, Part 603 (for 1-5 cores)  
Part 627, HD 627 (from 7 cores)



### Minimum bending radius

#### Power Cable NYCY

Static:  
12 x outer diameter



### Rated voltage

U<sub>0</sub>/U: 0,6/1,0 kV



### Test voltage

#### Power Cable NYCY

4 kV



### Range of temperature

#### Power Cable NYCY

At installation: +5°C to +50°C  
Fixed installation: -40°C to +70°C

Part number	Number of cores and mm² per conductor	Outer diameter in mm approx.	Copper index kg/km	Weight kg/km approx.
<b>NYCY</b>				
15503003	2 x 1,5 re/ 1,5	14,0	52,0	250,0
15503103	3 x 1,5 re/ 1,5	14,0	66,0	250,0
15503203	4 x 1,5 re/ 1,5	15,0	81,0	280,0
1550330	7 x 1,5 re/ 2,5	16,0	133,0	420,0
1550332	12 x 1,5 re/ 2,5	20,0	205,0	620,0
1550337	24 x 1,5 re/ 6,0	26,0	413,0	1,100,0
15503113	3 x 2,5 re/ 2,5	15,0	104,0	310,0
15503213	4 x 2,5 re/ 2,5	16,0	128,0	350,0
1550350	7 x 2,5 re/ 2,5	18,0	200,0	530,0
1550355	16 x 2,5 re/ 6,0	24,0	451,0	960,0
35000152	19 x 2,5 re/ 6,0	23,5	523,0	1,000,0
15503223	4 x 4,0 re/ 4,0	18,0	200,0	540,0
15503233	4 x 6,0 re/ 6,0	19,0	297,0	675,0
<b>NYCWY</b>				
15505003	2 x 10,0 re/ 10,0	19,0	312,0	690,0
15505263	3 x 10,0 re/ 10,0	20,0	408,0	860,0
15505403	4 x 10,0 re/ 10,0	21,5	504,0	920,0
15505273	3 x 16,0 re/ 16,0	23,0	643,0	1,140,0
15505413	4 x 16,0 re/ 16,0	23,0	796,0	1,230,0
15505283	3 x 25,0 rm/ 25,0	27,0	1,003,0	1,620,0
15505423	4 x 25,0 rm/ 16,0	29,5	1,142,0	1,850,0
15505303	3 x 35,0 sm/ 35,0	28,0	1,402,0	1,910,0
15505433	4 x 35,0 sm/ 16,0	31,0	1,526,0	2,160,0
15505163	3 x 50,0 sm/ 50,0	31,0	2,000,0	2,470,0
15505443	4 x 50,0 sm/ 25,0	35,0	2,203,0	2,860,0
15505453	4 x 70,0 sm/ 35,0	39,5	3,082,0	3,950,0
15505143	3 x 95,0 sm/ 50,0	40,0	3,296,0	4,200,0
15505323	3 x 95,0 sm/ 95,0	41,0	3,791,0	4,700,0
15505463	4 x 95,0 sm/ 50,0	44,5	4,208,0	5,300,0
15505153	3 x 120,0 sm/ 70,0	44,5	4,236,0	5,330,0
15505473	4 x 120,0 sm/ 70,0	50,0	5,388,0	6,720,0
15505353	3 x 150,0 sm/ 70,0	48,0	5,100,0	6,220,0
15505483	4 x 150,0 sm/ 70,0	51,0	6,540,0	7,800,0
15505173	3 x 185,0 sm/ 95,0	50,0	6,383,0	7,650,0

Copper price basis: Excluding Copper

Colour Code acc. to IEC 60757: BK = black, BN = brown, BU = blu, GY = grey, GNYE = green/yellow





## EPIC® SOLAR cabling system

EPIC® SOLAR is a new connector system, optimized for the requirements of photovoltaic technology. EPIC® SOLAR is available as a pre-assembled and industrial injection moulded cord set with connector. It's rugged and durable and available in numerous variants.

The field mountable connectors are optimized for the requirements of the installers. Simple assembly, two manageable parts minimize the possibility of mistakes in the field and the breakdown of the system. Equipped with SKINTOP® cable gland, which has proven its resistance for many years in millions of applications, EPIC® SOLAR is the optimal solution in Photovoltaic-Systems. Built in sockets, Y-Splitter, ÖLFLEX® SOLAR cables, SILVYN® cable conduits and FLEXIMARK® marking systems completes the cabling system.

EPIC® SOLAR plugs together quickly with catch hooks that lock the connector reliably with speed and ease. Based on a new turning mechanism, the connector can be unlocked by an easy turn. This prevents unintentional interruption of the power generation. The EPIC® SOLAR cabling system is continuously extended, new customer needs will become implemented.

- The choice of best plastics with excellent UV resistance, a high degree of weather-proofing and resistance to a wide range of environmental influences makes EPIC® SOLAR extremely rugged in outdoor use
- The industrial injection over moulding technique permanently connects to the cable. The connector is forever inseparable and permanently connected to the cable
- All cord sets are tested. This ensures the lowest transfer resistance for maximum power transmission and a high efficiency of the power plant
- The sealing concept and the production technology offer the maximum dirt and water protection
- Two symmetrical catch eyes engage clearly. They hold EPIC® SOLAR together, protecting against unintentional opening. The connector is unplugged easily by a clockwise rotation
- Many small contact lamellas provide for the best electrical connection with lowest transfer resistance and thus a high plant efficiency.



## International standards

EPIC® SOLAR has been developed according to the latest international standards. The user's safety is the main concern.

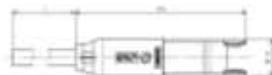
Touch protection class II and the safety requirements for connectors according IEC 61984, as well as special requirements for photovoltaic systems according DIN VDE

0126-3 are considered to the full extent.

Requirements for use in photovoltaic systems like IEC 61215, IEC 61730 and UL 1977 and UL 1703 are complied with accordingly. The conformity to these standards will be confirmed by TÜV Rheinland and the American UL (Underwriter Laboratories Inc.).



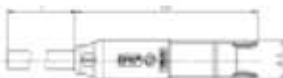
## EPIC® SOLAR M plus



### Info

- TÜV Rheinland: certified

## EPIC® SOLAR M XL multi



### Info

- TÜV Rheinland: certified

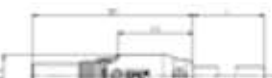
## EPIC® SOLAR F plus



### Info

- TÜV Rheinland: certified

## EPIC® SOLAR F XL multi



### Info

- TÜV Rheinland: certified

### Benefits

- The LAPP GROUP uses its competence here as a cable and connector manufacturer and moulds OLFLEX® SOLAR cables with the EPIC® SOLAR connectors. This distinguishes EPIC® SOLAR from other assembled systems. The injection moulding technology is extraordinarily robust, achieves maximum tensile strength and is unbeatably tight. The injection moulding is made in an industrial process and continuously tested, resulting in products of a consistently high quality.

### Application range

- Pre-assembled injection moulded solar cables for weather proofed cabling of Photovoltaic systems

### Product specification

- These one-side pre-assembled cables with EPIC® SOLAR connectors are available as a male (M) and female (F) version in combination with OLFLEX® SOLAR plus and XL multi in different cross sections.
- Other lengths and cable end versions on request.
- UL: in preparation

### Technical data

**Rated voltage in V**  
1000 V AC/DC  
**Rated impulse Voltage**  
6 kV  
**Rated current in A**  
30 A  
19 A at 85 °C  
**Pollution degree**  
3

**Contact resistance**  
< 2 mΩ  
**Degree of protection**  
IP68 (10h / 1m)  
**Protection class**  
II  
**Range of temperature**  
-40 °C ... +105 °C



Part number	Type	Cross-section in mm²	Length in m	Copper index kg / 1000 pcs.	Pieces / PU
<b>EPIC® SOLAR with cable OLFLEX® Solar plus</b>					
44428011	EPIC® SOLAR M plus 2,5 mm² 1m	2.5	1.0	24.6	100
74280100	EPIC® SOLAR M plus 4 mm² 1m	4.0	1.0	39.4	100
44428012	EPIC® SOLAR M plus 6 mm² 1m	6.0	1.0	59.0	100
<b>EPIC® SOLAR with cable OLFLEX® Solar XL multi</b>					
44428002	EPIC® SOLAR M XL multi 2,5 mm² 1m	2.5	1.0	24.6	100
44428007	EPIC® SOLAR M XL multi 4 mm² 1m	4.0	1.0	39.4	100
44428009	EPIC® SOLAR M XL multi 6 mm² 1m	6.0	1.0	59.0	100
<b>EPIC® SOLAR with cable OLFLEX® Solar plus</b>					
44428004	EPIC® SOLAR F plus 2,5 mm² 1m	2.5	1.0	24.6	100
74281100	EPIC® SOLAR F plus 4 mm² 1m	4.0	1.0	39.4	100
44428005	EPIC® SOLAR F plus 6 mm² 1m	6.0	1.0	59.0	100
<b>EPIC® SOLAR with cable OLFLEX® Solar XL multi</b>					
44428014	EPIC® SOLAR F XL multi 2,5 mm² 1m	2.5	1.0	24.6	100
44428018	EPIC® SOLAR F XL multi 4 mm² 1m	4.0	1.0	39.4	100
44428019	EPIC® SOLAR F XL multi 6 mm² 1m	6.0	1.0	59.0	100

Copper price basis: EUR 150 / 100 kg

Other lengths and cable end versions on request.

Solar connectors

EPIC® SOLAR

New

# EPIC® SOLAR Module Box / EPIC® SOLAR Module Box with cables



EPIC® SOLAR Module Box



EPIC® SOLAR Module Box with cables

## Benefits

- Junction boxes for weather proofed cabling of Photovoltaic systems

## Application range

- The Module Box is used to glue on the back-side of the solar modules. The ribbon bands are terminated in the Module Box
- For further cabling the pre-assembled solar cables, like EPIC® SOLAR XL multi are terminated at the Module Box

## Product specification

### EPIC® SOLAR Module Box

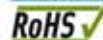
- Rugged junction boxes for cabling of the solar modules with solar cables, like OLFLEX® SOLAR

- Dimensions (WxHxD): 118x28,5x109mm
- Housing material: PPO/PPS
- TÜV Rheinland: in preparation
- UL: in preparation

### EPIC® SOLAR Module Box with cables

- These junction boxes are equipped with pre-assembled cables EPIC® SOLAR XL multi in different cross sections
- Dimensions (WxHxD): 118x28,5x109mm
- Cable length: 1m
- TÜV Rheinland: in preparation
- UL: in preparation

## Norm references



## Technical data

### Rated voltage in V

1000 V AC/DC

### Rated current in A

30 A

### Contact resistance

< 5 mΩ

### Contacts

Copper alloy, tin plated

### Numbers of contacts

2

### Termination methods

terminal clamp for ribbon bands: up to 7mm

wide (folded 10mm)

Plug-in connection for solar cables with multi-lam plug Ø 3mm



### Degree of protection

IP 65

### Protection class

II



### Range of temperature

-40 °C ... +90 °C

Part number	Connection type	Cross-section in mm²	Cable clamping range in mm	Length in m
<b>EPIC® SOLAR Modul Box</b>				
44428043	assembled with 3 Bypass-diodes	max. 6.0	3.7 - 7.1	
44428044	assembled with 6 Bypass-diodes	max. 6.0	3.7 - 7.1	
<b>EPIC® SOLAR Modul Box with cables</b>				
44428045	pre-harnessed with solar cable	4.0		1.0
44428046	pre-harnessed with solar cable	6.0		1.0

Other construction designs/lengths on request

## EPIC® SOLAR M field mountable M 12



### Info

- TÜV Rheinland: certified
- Winner of the benchmark test PHOTON 9/2007
- [www.lappgroup.com/epic-comparativetest](http://www.lappgroup.com/epic-comparativetest)



## EPIC® SOLAR F field mountable M 12



### Info

- TÜV Rheinland: certified
- Winner of the benchmark test PHOTON 9/2007
- [www.lappgroup.com/epic-comparativetest](http://www.lappgroup.com/epic-comparativetest)



### Benefits

- The EPIC® SOLAR connector field mountable is pre-assembled and consists of only two components - the connector part and the SKINTOP® gland. SKINTOP® has proven its stability and robustness for many years in millions of applications and it is in an EPIC® SOLAR connector the first choice for photo-voltaic systems. The contact is crimped and the plastic components are simply screwed together. The cable outlet is suitable for cable diameters from 4,5 mm up to 7,3 mm.

### Application range

- Field mountable connector for easy assembly, SKINTOP® cable gland integrated

### Product specification

- UL: in preparation

### Technical data

**Rated voltage in V**  
1000 V AC/DC

**Rated impulse Voltage**  
6 kV

**Rated current in A**  
30 A  
19 A at 85 °C

**Pollution degree**  
3

**Contact resistance**  
< 2 mΩ

**Degree of protection**  
IP68 (10h / 1m)

**Protection class**  
II

**Range of temperature**  
-40 °C ... +105 °C



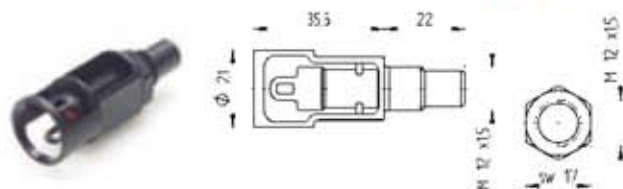
Part number	Type	Cross-section in mm²	Pieces / PU
<b>Plug field mountable male</b>			
44428020	EPIC® SOLAR M 2,5-4,0mm² M12	2.5 - 4.0	50
44428021	EPIC® SOLAR M 6,0mm² M12	6.0	50
<b>Plug field mountable female</b>			
44428022	EPIC® SOLAR F 2,5-4,0mm² M12	2.5 - 4.0	50
44428023	EPIC® SOLAR F 6,0mm² M12	6.0	50



Solar connectors

EPIC® SOLAR

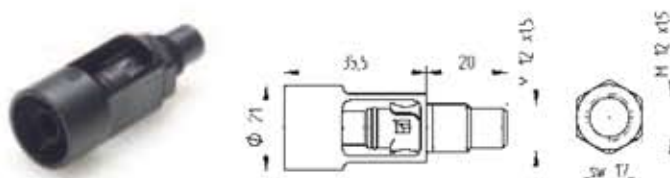
## EPIC® SOLAR M G5 built in plug



Info

- TÜV Rheinland: certified

## EPIC® SOLAR F G5 built-in plug



Info

- TÜV Rheinland: certified

## EPIC® SOLAR protection cap



### Benefits

#### EPIC® SOLAR M G5 built in plug

- Built-in plugs serve for fast, sample connection of cables to inverters and junction boxes. For cables up to 6 mmØ.

#### EPIC® SOLAR protection cap

- The protective cap prevents the penetration of dirt and offers enhanced touch protection (IP65).

### Application range

#### EPIC® SOLAR M G5 built in plug

- Built-in plugs for connection to inverters and junction boxes. M 12-mounting

### Product specification

- Rugged, UV- resistant and weatherproof
- UL: in preparation

### Technical data

Rated voltage in V  
1000 V AC/DC

Rated impulse Voltage  
6 kV

Rated current in A  
30 A  
19 A at 85°C

Pollution degree  
3

Contact resistance  
< 2 mΩ



Degree of protection  
IP68 (10h / 1m)

Protection class  
II



Range of temperature  
-40 °C ... +105 °C

Part number	Type	Cross-section in mm²	Rated current in A	Pieces / PU
<b>Built-in plug Male</b>				
44420505	EPIC® SOLAR M G5	2.5 - 4.0	30.0	100
<b>Built in plug Female</b>				
44420506	EPIC® SOLAR F G5	2.5 - 4.0	30.0	100
<b>Protection cap</b>				
44420507	EPIC® SOLAR protection cap			100



**Info**

- TÜV Rheinland: certified

## EPIC® SOLAR FMM Y-Splitter



**Info**

- TÜV Rheinland: certified

## EPIC® SOLAR MFF Y-Splitter



### Benefits

- Y-splitters makes possible the parallel connection of solar modules. The EPIC® SOLAR Splitter is installed behind solar panels or behind facades. Maximum reliability achieved through industrial injection overmolding of the Y-Splitter with OLFLEX® SOLAR cables.

### Application range

- Y-splitters for fast and simple parallel cabling

### Product specification

- Rugged, UV- resistant and weatherproof
- UL: in preparation
- 100% tested cable sets with lowest transfer resistance for maximum power transmission

### Technical data

**Rated voltage in V**

1000 V AC/DC

**Rated impulse Voltage**

6 kV

**Rated current in A**

30 A

19 A at 85 °C

**Pollution degree**

3



**Degree of protection**

IP68 (10h / 1m)

**Protection class**

II



**Range of temperature**

-40 °C ... +105 °C

Part number	Type	Cross-section in mm²	Length in m	Copper index kg/ 1000 pcs.	Pieces / PU
44428017	EPIC® SOLAR FMM Plus 4mm² 0,5m	4.0	0.5	23.0	10
44428016	EPIC® SOLAR MFF plus 4mm² 0,5m	4.0	0.5	23.0	10

Copper price basis: EUR 150 / 100 kg



## EPIC® SOLAR Crimptool



### ■ Benefits

- The crimping tool serves for a high and reliable crimping of the EPIC® SOLAR products in the field. Different cross sections are possible with the tool in the marked crimping profile. The locator keeps the connector safe, your hand is free to insert the cable into the connector.

### ■ Application range

- Crimping tool for easy assembly of EPIC® SOLAR products

### ■ Product specification

- The crimping tool is delivered in a practical plastic case as well as the operating instructions. The crimping inserts for wire cross sections of 2.5mm<sup>2</sup>, 4mm<sup>2</sup> and 6mm<sup>2</sup> as well as the locator and the top add on for crimping of single contacts belong likewise to the scope of supply.

Part number	Type	Pieces / PU
44428001	EPIC® SOLAR Crimptool	1

## Assembly steps



1. Insert the EPIC® SOLAR connector into the locator. The product is kept safe in the crimping tool.



2. Feed in the stripped ÖLFLEX® SOLAR or similar cable type into the pre-assembled contact.



3. Press the crimping tool completely together to unlock the crimp mechanism. Take out the connector.



4. Fast screw the second component, the SKINTOP® neck.



5. Fast screw the cap nut for cable sealing. Now the EPIC® SOLAR connector is ready assembled for the durable transfer of Energy.

**New**

# SKINTOP® CLICK / SKINTOP® CLICK-R



SKINTOP® CLICK

## Benefits

- Up to 70% time saving due to innovative CLICK system
- UV- and ozone resistant
- Fewer parts, counter nut no longer needed
- IP 68 hermetically sealed
- Simple, free assembly in any position

## Application range

### SKINTOP® CLICK

- The most innovative cable insertion system on the market for very fast, highly flexible assembly with all the proven properties of our SKINTOP® cable glands in use world-wide. Simply click in - turn to left - turn to right - finished. Result: fixed, centred, strain relieved and maximum protection class in seconds.

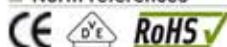
- junction box

- service entrance box
- DC activation point
- counter unit

### SKINTOP® CLICK-R

- The innovative SKINTOP® CLICK-R with reduction sealing insert for sealing smaller cable diameters.
- junction box
- service entrance box
- DC activation point
- counter unit

## Norm references



## Technical data

<b>Approvals</b>	<b>SKINTOP® CLICK</b>
<b>DIN VDE</b>	VDE approval for sizes M12 and M32 in preparation
<b>Colour delivered</b>	RAL 7001 silver-grey RAL 7035 light grey RAL 9005 black / UV resistant
<b>Material</b>	Body: special polyamide Seal: special elastomer
<b>Degree of protection</b>	<b>SKINTOP® CLICK</b> IP 68 - 5 bar
<b>Range of temperature</b>	-20°C up to +100°C

Part number	Part designation / size	Clamping range ØF mm	M (hole mm)	Overall length C mm	Thread length D mm	SW 1 / SW 2 mm	S (wall thickness mm)	Pieces / PU
<b>SKINTOP® CLICK light grey</b>								
53112692	CLICK 12	3 - 7	12,3 (-0,2)	40,0	8,0	15,0 / 18,0	1,0 - 4,0	50
53112686	CLICK 16	5 - 9	16,3 (-0,2)	42,0	8,0	19,0 / 22,0	1,0 - 4,0	50
53112687	CLICK 20	7 - 13	20,3 (-0,2)	45,5	8,0	25,0 / 27,0	1,0 - 4,0	25
53112688	CLICK 25	9 - 17	25,3 (-0,2)	48,5	8,0	30,0 / 34,0	1,0 - 4,0	25
53112694	CLICK 32	11 - 21	32,3 (-0,2)	55,0	8,0	36,0 / 40,0	1,0 - 4,0	25
<b>SKINTOP® CLICK silver-grey</b>								
53112921	CLICK 12	3 - 7	12,3 (-0,2)	40,0	8,0	15,0 / 18,0	1,0 - 4,0	50
53112876	CLICK 16	5 - 9	16,3 (-0,2)	42,0	8,0	19,0 / 22,0	1,0 - 4,0	50
53112877	CLICK 20	7 - 13	20,3 (-0,2)	45,5	8,0	25,0 / 27,0	1,0 - 4,0	25
53112878	CLICK 25	9 - 17	25,3 (-0,2)	48,5	8,0	30,0 / 34,0	1,0 - 4,0	25
53112922	CLICK 32	11 - 21	32,3 (-0,2)	55,0	8,0	36,0 / 40,0	1,0 - 4,0	25
<b>SKINTOP® CLICK black</b>								
53112923	CLICK 12	3 - 7	12,3 (-0,2)	40,0	8,0	15,0 / 18,0	1,0 - 4,0	50
53112882	CLICK 16	5 - 9	16,3 (-0,2)	42,0	8,0	19,0 / 22,0	1,0 - 4,0	50
53112883	CLICK 20	7 - 13	20,3 (-0,2)	45,5	8,0	25,0 / 27,0	1,0 - 4,0	25
53112884	CLICK 25	9 - 17	25,3 (-0,2)	48,5	8,0	30,0 / 34,0	1,0 - 4,0	25
53112924	CLICK 32	11 - 21	32,3 (-0,2)	55,0	8,0	36,0 / 40,0	1,0 - 4,0	25
<b>SKINTOP® CLICK-R light grey</b>								
53112925	CLICK-R 12	1 - 5	12,3 (-0,2)	40,0	8,0	15,0 / 18,0	1,0 - 4,0	50
53112689	CLICK-R 16	4 - 7	16,3 (-0,2)	42,0	8,0	19,0 / 22,0	1,0 - 4,0	50
53112690	CLICK-R 20	5 - 10	20,3 (-0,2)	45,5	8,0	25,0 / 27,0	1,0 - 4,0	25
53112691	CLICK-R 25	6 - 13	25,3 (-0,2)	48,5	8,0	30,0 / 34,0	1,0 - 4,0	25
53112926	CLICK-R 32	7 - 15	32,3 (-0,2)	55,0	8,0	36,0 / 40,0	1,0 - 4,0	25
<b>SKINTOP® CLICK-R silver-grey</b>								
53112927	CLICK-R 12	1 - 5	12,3 (-0,2)	40,0	8,0	15,0 / 18,0	1,0 - 4,0	50
53112879	CLICK-R 16	4 - 7	16,3 (-0,2)	42,0	8,0	19,0 / 22,0	1,0 - 4,0	50
53112880	CLICK-R 20	5 - 10	20,3 (-0,2)	45,5	8,0	25,0 / 27,0	1,0 - 4,0	25
53112881	CLICK-R 25	6 - 13	25,3 (-0,2)	48,5	8,0	30,0 / 34,0	1,0 - 4,0	25
53112928	CLICK-R 32	7 - 15	32,3 (-0,2)	55,0	8,0	36,0 / 40,0	1,0 - 4,0	25
<b>SKINTOP® CLICK-R black</b>								
53112929	CLICK-R 12	1 - 5	12,3 (-0,2)	40,0	8,0	15,0 / 18,0	1,0 - 4,0	50
53112885	CLICK-R 16	4 - 7	16,3 (-0,2)	42,0	8,0	19,0 / 22,0	1,0 - 4,0	50
53112886	CLICK-R 20	5 - 10	20,3 (-0,2)	45,5	8,0	25,0 / 27,0	1,0 - 4,0	25
53112887	CLICK-R 25	6 - 13	25,3 (-0,2)	48,5	8,0	30,0 / 34,0	1,0 - 4,0	25
53112931	CLICK-R 32	7 - 15	32,3 (-0,2)	55,0	8,0	36,0 / 40,0	1,0 - 4,0	25



## SKINTOP® ST-M



SKINTOP® ST-M

## ■ Benefits

- fast, easy assembling
- UV- and ozone resistant
- Maximum reliability
- Permanent vibration protection
- IP 68 hermetically sealed

## ■ Application range

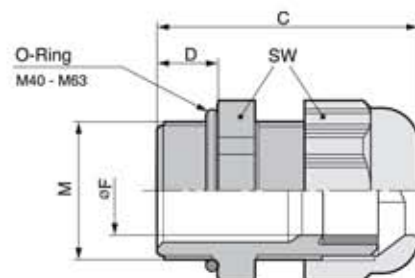
- The metric cable gland made of polyamide, easy to assemble, with the approved properties of the world-renowned SKINTOP® glands. Suitable for use e. g.:
- junction box
- service entrance box
- DC activation point
- counter unit

## ■ Product specifications

## SKINTOP® ST-M

- SKINTOP® ST M ISO types have a **extralong connection thread**
- Versions SKINTOP® ST M ISO with extra long connection thread, see table, have no DNV approval

## ■ Norm references



## ■ Technical data

- Caution**  
Installation dimensions and tightening torques see T21
- Colour delivered**  
RAL 7001 silver-grey  
RAL 7035 light grey  
RAL 9005 black / UV resistant
- Material**  
Body: Polyamide  
Seal: CR
- Tests**  
GGVS: TÜ.EGG.020-95
- Degree of protection**  
IP 68 - 5 bar
- Range of temperature**  
static: -40°C up to +100°C  
dynamic: -20°C up to +100°C

Part number	Part designation / size	Clamping range ØF mm	Overall length C mm	Thread length D mm	SW mm	Pieces / PU
<b>SKINTOP® ST-M silver-grey</b>						
53111000	ST-M 12 x 1,5	3,5-7	30,0	8,0	15,0	100
53111010	ST-M 16 x 1,5	4,5-10	34,0	8,0	19,0	100
53111020	ST-M 20 x 1,5	7-13	37,0	9,0	25,0	100
53111030	ST-M 25 x 1,5	9-17	40,0	10,0	30,0	50
53111040	ST-M 32 x 1,5	11-21	47,0	10,0	36,0	25
53111050	ST-M 40 x 1,5	19-28	52,0	10,0	46,0	10
53111060	ST-M 50 x 1,5	27-35	62,0	12,0	55,0	5
53111070	ST-M 63 x 1,5	34-45	71,0	12,0	66,0	5
<b>SKINTOP® ST-M black</b>						
53111200	ST-M 12 x 1,5	3,5-7	30,0	8,0	15,0	100
53111210	ST-M 16 x 1,5	4,5-10	34,0	8,0	19,0	100
53111220	ST-M 20 x 1,5	7-13	37,0	9,0	25,0	100
53111230	ST-M 25 x 1,5	9-17	40,0	10,0	30,0	50
53111240	ST-M 32 x 1,5	11-21	47,0	10,0	36,0	25
53111250	ST-M 40 x 1,5	19-28	52,0	10,0	46,0	10
53111260	ST-M 50 x 1,5	27-35	62,0	12,0	55,0	5
53111270	ST-M 63 x 1,5	34-45	71,0	12,0	66,0	5
<b>SKINTOP® ST-M light grey</b>						
53111400	ST-M 12 x 1,5	3,5-7	30,0	8,0	15,0	100
53111410	ST-M 16 x 1,5	4,5-10	34,0	8,0	19,0	100
53111420	ST-M 20 x 1,5	7-13	37,0	9,0	25,0	100
53111430	ST-M 25 x 1,5	9-17	40,0	10,0	30,0	50
53111440	ST-M 32 x 1,5	11-21	47,0	10,0	36,0	25
53111450	ST-M 40 x 1,5	19-28	52,0	10,0	46,0	10
53111460	ST-M 50 x 1,5	27-35	62,0	12,0	55,0	5
53111470	ST-M 63 x 1,5	34-45	71,0	12,0	66,0	5
<b>SKINTOP® ST M ISO silver-grey (with long metric connecting thread)</b>						
53017010	ST M 16 x 1,5	3,5-8	40,0	13,0	19,0	100
53017030	ST M 20 x 1,5	5-12	45,0	13,0	24,0	100
53017040	ST M 25 x 1,5	9-14	47,0	13,0	27,0	50
<b>SKINTOP® ST M ISO black (with long metric connecting thread)</b>						
53017210	ST M 16 x 1,5	3,5-8	40,0	13,0	19,0	100
53017230	ST M 20 x 1,5	5-12	45,0	13,0	24,0	100
53017240	ST M 25 x 1,5	9-14	47,0	13,0	27,0	50
<b>SKINTOP® ST-M XL black</b>						
5301001*	ST-M 12 x 1,5	3,7-7	37,0	15,0	15,0	100

\* without approvals



## SKINTOP® GMP-GL-M



SKINTOP® GMP-GL-M

### ■ Benefits

- solid
- metric thread acc. to EN 50 262

### ■ Application range

- Counter nuts are needed wherever a gland has to be countered or thin walled housings only allow through holes.

- DC activation point
- junction box
- counter unit
- service entrance box

### ■ Norm references

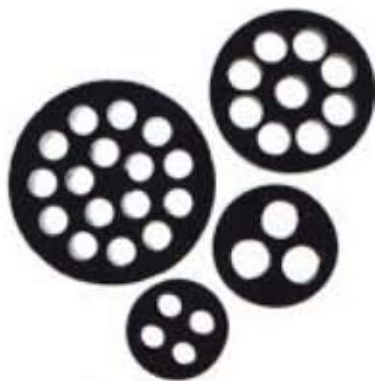


### ■ Technical data

- on request**  
Available without collar
- Colour delivered**  
RAL 7001 silver-grey  
RAL 7035 light grey  
RAL 9005 black / UV resistant
- Material**  
Polyamide, glass fibre reinforced
- Range of temperature**  
-20°C up to +100°C

Part number	Part designation / size	SW mm	Pieces / PU
<b>SKINTOP® GMP-GL-M silver-grey</b>			
53119000	12 x 1,5	17,0	100
53119010	16 x 1,5	22,0	100
53119020	20 x 1,5	27,0	100
53119030	25 x 1,5	34,0	100
53119040	32 x 1,5	41,0	100
53119050	40 x 1,5	50,0	25
53119060	50 x 1,5	60,0	25
53119070	63 x 1,5	75,0	25
<b>SKINTOP® GMP-GL-M black</b>			
53119100	12 x 1,5	17,0	100
53119110	16 x 1,5	22,0	100
53119120	20 x 1,5	27,0	100
53119130	25 x 1,5	34,0	100
53119140	32 x 1,5	41,0	100
53119150	40 x 1,5	50,0	25
53119160	50 x 1,5	60,0	25
53119170	63 x 1,5	75,0	25
<b>SKINTOP® GMP-GL-M light grey</b>			
53119003	12 x 1,5	17,0	100
53119013	16 x 1,5	22,0	100
53119023	20 x 1,5	27,0	100
53119033	25 x 1,5	34,0	100
53119043	32 x 1,5	41,0	100
53119053	40 x 1,5	50,0	25
53119063	50 x 1,5	60,0	25
53119073	63 x 1,5	75,0	25

## SKINTOP® DIX-M



SKINTOP® DIX-M

## ■ Benefits

- space-saving
- high packing density
- less parts
- Simple assembly
- High protection class

## ■ Application range

- Multiple seal insert for SKINTOP® cable glands. Geometry of parts can be decreased by using one gland only for different numbers of cables.

- DC activation point
- counter unit
- junction box
- service entrance box

## ■ Norm references



## ■ Technical data

- on request
- Special shapes
- Note
- Silicone free production
- Material
- NBR
- Degree of protection
- IP 54
- Range of temperature
- 40°C up to +100°C

Part number	Part designation / size	PG size	Number of cables x Cable Ø	Pieces / PU
<b>SKINTOP® DIX-M</b>				
53316220	16220	M 16	2 x 2.0	100
53316230	16230	M 16	2 x 3.0	100
53316240	16240	M 16	2 x 4.0	100
53320250	20250	M 20	2 x 5.0	100
53320260	20260	M 20	2 x 6.0	100
53320340	20340	M 20	3 x 4.0	100
53320353	20353	M 20	3 x 5.3	100
53320440	20440	M 20	4 x 4.0	100
53320920	20920	M 20	9 x 2.0	100
53320430	20430	M 20	4 x 3.0	100
53325260	25260	M 25	2 x 6.0	50
53325350	25350	M 25	3 x 5.0	50
53325360	25360	M 25	3 x 6.0	50
53325370	25370	M 25	3 x 7.0	50
53325450	25450	M 25	4 x 5.0	50
53325540	25540	M 25	5 x 4.0	50
53325640	25640	M 25	6 x 4.0	50
53332270	32270	M 32	2 x 7.0	50
53332280	32280	M 32	2 x 8.0	50
53332290	32290	M 32	2 x 9.0	50
53332370	32370	M 32	3 x 7.0	50
53332380	32380	M 32	3 x 8.0	50
53332460	32460	M 32	4 x 6.0	50
53332470	32470	M 32	4 x 7.0	50
53332560	32560	M 32	5 x 6.0	50
53332650	32650	M 32	6 x 5.0	50
53332840	32840	M 32	8 x 4.0	50
53332850	32850	M 32	8 x 5.0	50
53332940	32940	M 32	9 x 4.0	50
53340290	40290	M 40	2 x 9.0	25
53340310	40310	M 40	3 x 10.0	25
53340480	40480	M 40	4 x 8.0	25
53340490	40490	M 40	4 x 9.0	25
53340580	40580	M 40	5 x 8.0	25
53340590	40590	M 40	5 x 9.0	25
53340670	40670	M 40	6 x 7.0	25
53340860	40860	M 40	8 x 6.0	25
53340969	40969	M 40	9 x 6.9	25
53350680	50680	M 50	6 x 8.0	10
53350780	50780	M 50	7 x 8.0	10
53350870	50870	M 50	8 x 7.0	10
53350164	50164	M 50	16 x 4.0	10
53350166	50166	M 50	16 x 6.0	10

**New**

## SKINDICHT® SM-M



SKINDICHT® SM-M


### ■ Benefits

- space-saving
- solid
- metric thread acc. to EN 50 262

### ■ Application range

- Counter nuts are needed wherever a gland has to be countered or thin walled housings only allow through holes.
- junction box

### ■ Technical data

**Material**  
 Nickel plated brass

### ■ Norm references



Part number	Part designation / size	Thickness mm	SW mm	Outer Ø mm	Pieces / PU
<b>SKINDICHT® SM-M</b>					
52103000	12 x 1,5	3.0	15.0	16.5	100
52103010	16 x 1,5	3.0	19.0	20.9	100
52103020	20 x 1,5	3.5	24.0	26.4	100
52103030	25 x 1,5	4.0	30.0	33.0	100
52103040	32 x 1,5	4.0	36.0	39.6	100
52103050	40 x 1,5	5.0	46.0	50.6	50
52103060	50 x 1,5	5.0	60.0	66.0	50
52103070	63 x 1,5	5.0	70.0	77.0	25
52103071	75 x 1,5	8.0	75.0	95.0	5



## Protective cable conduit systems parallelly corrugated cable protective conduit for preassembling

**New**

### SILVYN® RILL PA6 SINUS



#### SILVYN® RILL PA6 SINUS

##### ■ Benefits

- sinusoidal slit remains closed under torsion for the most part

##### ■ Application range

- Sinusoidal slit ideal for protecting assembled cables or after assembly
- Photovoltaic

##### ■ Product specifications

- UV-resistant and weatherproofed
- high heat resistant up to +140°C

##### ■ Norm references



##### ■ Cable Make-Up

- parallelly corrugated polyamid conduit with sinusoidal cut.



#### Info

- sinusoidal cut for preassembling
- special heat resistant polyamide up to +140°C

#### ■ Technical data



##### Approvals

GGVS, NFR-13-903  
from 8.4 x 11.4



##### Note

Elongation at tear in accordance to DIN 53 455: 50-200%  
Impact resistance in accordance to DIN 53 453: without rupture  
Notched impact resistance in accordance to DIN 53 453: without rupture  
Flammability rating: UL 94 HB



##### Colour delivered

black, UV-resistant



##### Material

PA6 heat modified  
Cadmium free  
Halogen-free



##### Range of temperature

-40°C up to +140°C

Part number	Internal Ø x External Ø in mm	Suitable for holder SILVYN®	PU ring in m
<b>SILVYN® RILL PA6 SINUS</b>			
61806550	6,7 x 10,0	FCL 10 / 5550 6905	50
61806555	8,4 x 11,4		50
61806560	9,9 x 13,0	FCL 13 / 5550 6915	50
61806565	12,2 x 15,7	FCL 16 / 5550 6925	50
61806570	16,6 x 21,2	FCL 21 / 5550 6935	50
61806575	21,3 x 25,4	SPLIT COS 20 / 6180 6710	50
61806580	23,2 x 28,3	FCL 28 / 5550 6945	50

#### ■ Accessories

## Spare tool Cable - Eater



##### ■ Application range

- Cable pull-in tool for SILVYN® RILL PA6 SINUS

Part number	Part description	Bundling area mm	Pieces / PU
<b>Cable Eater tool</b>			
61830340	STKP 8	6.0 - 9.0	1
61830350	STKP 15	10.0 - 16.0	1
61830360	STKP 20	17.0 - 21.0	1
61830370	STKP 25	21.0 - 28.0	1

### SILVYN® CC01



##### ■ Benefits

- proper and safe cutting to length of plastic conduits

##### ■ Application range

- Conduit shears for non-metallic conduit, e.g. parallel corrugated protective conduit.

Part number	Part designation / size	Cutting range Ø mm	Pieces / PU
61722285	CC01	0 - 45	1

## Universal Strip



### Info

- Stripping knife Solar



Universal Strip

### Benefits

- Special stripping tool for high quality dismantling of single cores

### Product specifications

- applicable with a great variety of insulations differing in hardness and dimension

- No pinching/deformation of cable ends

### Scope of delivery:

- Tool and length stop

### Cable Make-Up

- Compact construction, easy to handle
- Model: chrome-plated with plastic handle cover

Part number	Type	for mm²	Pieces / PU
21920120	Universal Strip Solar	1,5 - 6	1

### Accessories

### Benefits

- Cuts copper and aluminium cables up to 20 mm outer diameter
- Low force due to favourable transmission ratio and new blade geometry
- easy, clean cut when operating with one hand

### Product specifications

- for single and multi-wire copper and aluminium cables
- Pre and after cut (1st and 2nd blade) allows cables with an external outer diameter up to 20 mm to be cut
- Not suitable for steel wire and hard-extruded copper wire

## KS 20



Part number	Type	for outer - Ø mm	Weight kg	Length in mm	Pieces / PU
62120045	KS 20	20	0.300	200	1

### Benefits

- fast and easy assembling
- Ergonomic handles

### Application range

- Tightening of cable glands. Small opening for width across flats 14-22 mm (M12 - M16 / PG7 - PG11 / NPT 3/8"). Large opening for width across flats 24-33 mm (M20 - M25 / PG 13,5 - PG 21 / NPT 1/2" - 3/4").

## SKINMATIC® RZ



Part number	Part designation / size	Overall length in mm	Width across flats mm	Pieces / PU
SKINMATIC® RZ 61791260	SKINMATIC® RZ	250.0	14 - 33	1

## Basic Tie



## Benefits

- High resistance to bases, oils, greases, oil derivatives, solvents containing chlorine

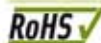
## Application range

- Basic Tie is a multipurpose cable tie for many applications.

## Product specifications

- Flame retardance  
UL 94 class V2.
- Water absorption: 2.5%  
(50% relative humidity)

## Norm references



## Technical data



## General

Dielectric strength:  
50,000 Volt/mm



Melting point: +256 °C



## Material

Polyamide 6.6 - Halogen-free



## Range of temperature

-40 °C up to +85 °C

Max. temperature: +110 °C temporary

Part number	Part description	Length x Width mm	Bundling-Ø, mm	Approvals	Tensile strength (N/mm <sup>2</sup> )	PU
<b>UV-resistant black</b>						
61831041	Basic Tie 98x2,5 sw	98.0 x 2.5	1.0 - 21.0	RU / GL / CE	80	1,000
61831043	Basic Tie 160x2,6 sw	160.0 x 2.6	1.0 - 40.0	RU / CE	80	1,000
61831044	Basic Tie 200x2,6 sw	200.0 x 2.6	1.0 - 52.0	RU / GL / CE	80	1,000
61831045	Basic Tie 140x3,6 sw	140.0 x 3.6	2.0 - 35.0	RU / GL / CE	130	1,000
61831046	Basic Tie 200x3,6 sw	200.0 x 3.6	2.0 - 50.0	RU / GL / CE	130	1,000
61831047	Basic Tie 290x3,6 sw	290.0 x 3.6	2.0 - 80.0	RU / GL / CE	130	500
61831053	Basic Tie 370x3,6 sw	370.0 x 3.6	2.0 - 103.0	RU / CE	130	100
61831049	Basic Tie 160x4,5 sw	160.0 x 4.5	2.5 - 40.0	RU / CE	220	1,000
61831051	Basic Tie 200x4,8 sw	200.0 x 4.8	3.0 - 50.0	RU / CE	220	1,000
61831054	Basic Tie 290x4,8 sw	290.0 x 4.8	3.5 - 79.0	RU / GL / CE	220	100
61831056	Basic Tie 360x4,8 sw	360.0 x 4.8	3.5 - 103.0	RU / GL / CE	220	100
61831060	Basic Tie 240x7,8 sw	240.0 x 7.8	3.5 - 63.0	RU / CE	540	100
61831061	Basic Tie 300x7,8 bk	300.0 x 7.8	4.0 - 80.0	RU / GL / CE	540	100
61831062	Basic Tie 365x7,8 sw	365.0 x 7.8	8.0 - 100.0	RU / GL / CE	540	100
61831063	Basic Tie 450x7,8 sw	450.0 x 7.8	35.0 - 130.0	RU / CE	540	100
61831064	Basic Tie 540x7,8 sw	540.0 x 7.8	35.0 - 158.0	RU / CE	540	100
61831065	Basic Tie 750x7,8 sw	750.0 x 7.8	35.0 - 200.0	RU / CE	540	100
61831066	Basic Tie 780x9,0 sw	780.0 x 9.0	32.0 - 233.0	RU / CE	700	100

## TY-RAP® weather-proof, UV-stabilised



## Benefits

- Weather-resistant, for extreme environmental conditions

## Application range

- The TY-RAP® weather-proof is used outdoors in assembly and commissioning. The steel tongue is anchored firmly in the head and ensures a strong, durable connection.

## Norm references



## Info

- The quality cable ties with the steel blade

## Technical data



## Colour delivered

black, UV-resistant



## Material

Polyamide 6.6 - halogen free

UL 94 class V2

Silicon-free



## Range of temperature

-40 °C up to +85 °C

Part number	Part description	Length x Width mm	Bundling-Ø, mm	Tensile strength (N/mm <sup>2</sup> )	Pieces / PU
<b>TY-RAP® weather-resistant</b>					
61723010	TYB* 23 MX	92.0 x 2.4	2.0 - 16.0	80.0	1,000
61723110	TY 232 MX	200.0 x 2.4	2.0 - 50.0	80.0	1,000
61723120	TY 234 MX	356.0 x 2.4	2.0 - 102.0	80.0	1,000
61723020	TYB* 24 MX	140.0 x 3.6	2.0 - 29.0	180.0	1,000
61723130	TY 242 MX	208.0 x 3.6	2.0 - 50.0	180.0	1,000
61723040	TY 26 MX	281.0 x 3.6	2.0 - 76.0	180.0	1,000
61723140	TY 244 MX	368.0 x 3.6	2.0 - 103.0	180.0	1,000
61723030	TYB* 25 MX	186.0 x 4.8	3.5 - 45.0	220.0	1,000
61723150	TY 253 MX	293.0 x 4.8	3.5 - 78.0	220.0	1,000
61723060	TY 28 MX	360.0 x 4.8	3.5 - 102.0	220.0	1,000
61723160	TY 272 MX	223.0 x 7.6	6.0 - 50.0	540.0	500
61723050	TY 27 MX	340.0 x 7.0	6.0 - 90.0	540.0	500
61723070	TY 29 MX	762.0 x 7.6	6.0 - 229.0	540.0	500

TY-RAP® is a registered trademark of Thomas & Betts

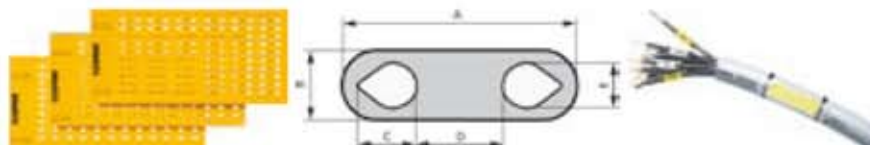


## FLEXIPRINT LF / MF



### Info

- Path to download  
[www.lappgroup.com/en/fleximark](http://www.lappgroup.com/en/fleximark)



**FLEXIPRINT LF / MF**

### Benefits

- FL-SOFT is the marking software that enables you to print all kinds of labels. It is especially suitable for FLEXIMARK® labels, which are already defined in this catalogue. With the FLEXIMARK® software you can use all Microsoft® Windows options to print your labels: graphics, cliparts, fonts and font sizes. Integrated word processing will give you any desired result for your label text quickly and easily. You will be able to import data, store individual logos and apply bar codes easily.

### Application range

- Polyester single-core marking for laser- and matrix printers
- The use of original toner is recommended. Insert sheet in manual paper feed mode.

### Product specifications

- Printable on both sides with standard matrix and laser printers and the FLEXIMARK® FL software (front yellow, rear white)
- fast, easy assembling
- FLEXIPRINT LF for laser printers
- FLEXIPRINT MF for matrix printers

### Norm references



### Cable Make-Up

- Flexiprint consists of single marking cards that contain 20-60 perforated markers, depending on the size (F0/F1/F1L/F1b/F1bL/F2/F3)
- For cable cross-sections over 16.00 mm<sup>2</sup>, cable ties can be used for installing single markers

### Technical data



#### Caution

Resistance: against oil and water; commonly used chemicals, UV light



#### Note

Thickness: 0,175 mm



#### Colour delivered

Front yellow, back white



#### Material

halogen-free polyester



#### Range of temperature

-40°C up to + 125°C

Part number	Part designation / size	for mm <sup>2</sup>	Cards per PU	Marker / PU	PU
<b>Flexiprint for laser printers</b>					
83254400	Flexiprint L-F0	0.25 - 0.75	75	4,500	1
83254420	Flexiprint L-F1	0.75 - 1.5	75	4,500	1
83254440	Flexiprint L-F1L	0.75 - 1.5	75	2,250	1
83254460	Flexiprint L-F1b	1.5 - 2.5	75	4,500	1
83254480	Flexiprint L-F1bL	1.5 - 2.5	75	2,250	1
83254500	Flexiprint L-F2	2.5 - 6	75	4,500	1
83254520	Flexiprint L-F3	6 - 16	75	1,500	1
<b>Flexiprint for matrix printers</b>					
83254820	Flexiprint M-F0	0.25 - 0.75	75	4,500	1
83254821	Flexiprint M-F1	0.75 - 1.5	75	4,500	1
83254822	Flexiprint M-F1b	1.5 - 2.5	75	4,500	1
83254823	Flexiprint M-F2	2.5 - 6	75	4,500	1
83254824	Flexiprint M-F3	6 - 16	75	1,500	1
83254861	Flexiprint M-F1L	0.75 - 1.5	75	2,250	1
83254863	Flexiprint M-F1bL	1.5 - 2.5	75	2,250	1

## Electronic label printers

DYMO® manageable industry printer

New

## DYMO® Industry Rhino Pro 6000 Kit

The mobile label printer for the industrial industry



DYMO® Industry Rhino Pro 6000 Kit

## ■ Benefits

- The new industrial printers simplify labelling of components for installation technicians and tradesmen in the field of electrical engineering and Datacom.

## ■ Application range

- Labelling of cables and wires
- Labelling of terminal blocks
- Labelling of modules and components
- Labelling of patch panels and protective sockets

## ■ Product specifications

- New high-performance labels ID1 with a strong adhesive assure durable, smudge proof and scratch proof lettering. The flexible NYLON- or VINYL straps are especially well-suited for uneven surfaces and cable marking, the permanent POLYESTER straps for reliable marking indoors or outdoors. Heat shrink tubing cartridges are ideal for cable marking.
- With PC interface and software. For instance, E-Plan data can be stored on the memory card and printed on site.
- With direct access to the various label layouts such as cable, patch panel and component designation.



Info

- Inclusive RHINO CONNECT Software

## ■ Technical data



## General

power supply pack and USB cable  
short user manual and registration card



## on request

hard case robust  
two D1 tapes incl.  
- Nylon tape BK/WH 24mm  
- Vinyl tape BK/WH 9 mm



## Note

RHINO 6000 printer  
RHINO CONNECT Software



## Colour delivered

black, yellow and white



## Material

Due to the fact of the thermal transfer printing technology the labels are really durable and indelible.

Li-Ion storage battery

Part number	Part designation / size	Pieces / PU
DYMO® Rhino Pro 6000 Kit		
61800360	RHINO 6000 printer	1

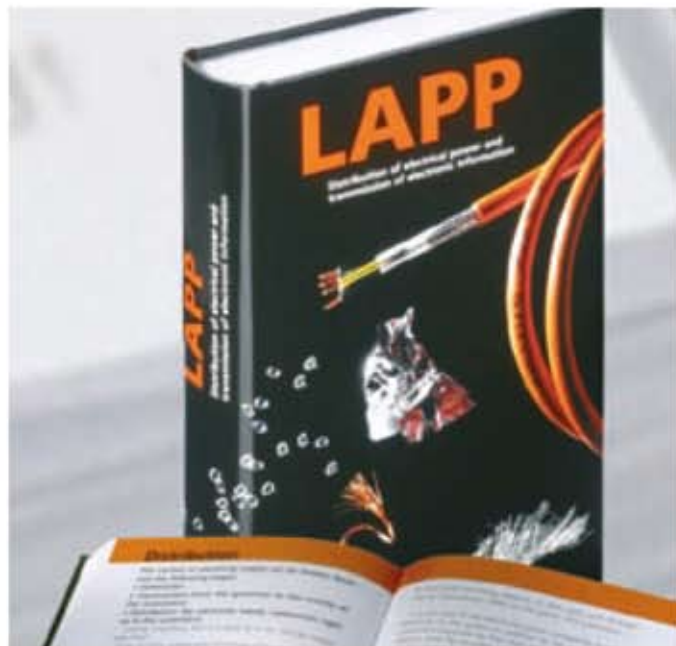
DYMO® is a registered trademark of Sanford GmbH, a Newell Rubbermaid Company

## ■ Comparable products

- DYMO® ILP219 EUR KIT

## ■ Accessories

- ID1 - Industry D1 tape



## Guide, advisor, reference book

In this book, the reader will find all that is worth knowing about the generation, use, and distribution of electricity, as well as the technology of data communication, cables, control cables, and optic fibres. All of these topics are illustratively described and supplemented with articles, tables and specialist terminology.

This is a book both for trainees and experienced practitioners. It is available in German, English or Russian.

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### 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 applica-

tion 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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