The Quality Connection
**ICON Pro for the green world of tomorrow**

All ICON PRO products are generally to EN 50288-7 with special project applications.

**ICON Base**

ICON Base comprises instrumentation and control cables according to the recognized standards EN 50288-7, UL 13/2250 and UL 1277. This catalogue covers ICON Base products acc. to EN 50288-7. UL products are described in a separate catalogue.

ICON Base cables are extremely reliable, tried and tested quality products which have proven their practical worth for many years now. ICON Base products form a comprehensive range providing suitable cables for all standard industrial applications. On the solid basis of many years of experience in international business (either project-oriented or geared to the site requirements of the customer) in conjunction with the above mentioned standards, we have defined a very wide product range designed to meet all field-driven product requirements. We have selected and elaborated a product programme designed to cover all usual applications. As a matter of course, ICON Base includes a large number of products with various forms of certification such as UL or EAC. Project requirements can thus generally be met with short delivery times and without the necessity of further certification.

For example, ICON Base is the ideal product for conventional analog 4 … 20 ma technology and for systems using the HART protocol. The typical feature of ICON Base is the rapid availability of most types as they are available from stock worldwide.

**Cable design & materials**

All ICON Base cables and materials used meet or exceed the requirements of EN 50288-7 and of the material standards cited there. All design options fulfill these requirements. This ensures state-of-the-art cable design and avoids use of low quality or recycled materials. For insulation most common materials today are cross-linked polyethylene (XLPE), polyethylene (PE) and polyvinyl chloride (PVC). Due to their superior electrical properties XLPE and PE are the best suited insulation materials. They have a lower dielectric constant compared to PVC, thus allowing lower mutual capacitance values. Main difference is the allowed 90 °C maximum operating temperature for XLPE compared to 70 °C for normal PE. For ICON Base only XLPE is used to benefit of its higher maximum operating temperature range.

Beside XLPE and PE, PVC is a common insulation material. The type of PVC is selected depending on the operating temperature. Due to its minor electrical properties the use of PVC is decreasing compared to XLPE. Today, the most common cable sheath material in industrial environments is polyvinyl chloride (PVC). Its major benefits are good flame retardancy, environmental and mechanical stability.

The PVC compounds used for ICON Base are highly stabilized, UV protected and suitable for all normal conditions, which cover more than 80 % of worldwide applications in oil & gas refineries and other environments.

**Saving the environment & cutting costs**

Our ICON product family offers instrument cables conforming to EN 50288-7; UL 13/2250 and UL 1277.

Do you need an applications-based, cost- and environmentally-optimised solution? If so, our ICON Pro products are the right choice, and can be customised to your individual requirements. For the manufacture of our ICON products, we have significantly reduced energy consumption by optimising material usage – while naturally making no compromises on quality.

We reduce today …

- ... less CO₂, reduced material consumption and lower energy requirements.
- ... in detail: 15 t less CO₂, at approx. 200 km of cable.
- ... in a nutshell: 15 t of CO₂ at approx. 113,000 km driven in a medium-sized passenger car.
LEONI is a leading supplier of cable systems and related services for the automotive industry and many other industrial sectors. Our group of companies employs over 77,000 people in 32 countries. Entrepreneurial insight, first-class quality and the power to innovate have secured us our position as one of Europe’s leading cable manufacturers. LEONI not only develops and manufactures a portfolio of technically sophisticated products that extends from wire and optical fiber to cables, cable systems and services, but also offers its customers a range of bespoke services.

Our full range of products and services also includes strands, standardised cables, hybrid/ optical fiber and special cables, cable harnesses and wiring system components, as well as turnkey, assembled systems for applications in various industrial markets.

The breadth of LEONI’s spectrum of products and services is matched by the markets and segments we supply. We focus our activities on customers in the sectors Automotive & Commercial Vehicles, Industrial Solutions, Electrical Appliances and Conductors & Copper Solutions.

In the Industrial Solutions market, we are one of Europe’s leading providers. Acting as both a cable manufacturer and a dedicated solution provider, we work in fields as diverse as telecommunications systems, fiber optic cable, data communications, manufacturing projects, solar and wind power, energy infrastructure, building services, bespoke product and robotics solutions, healthcare, traffic systems and automation technologies. Customers worldwide benefit from our innovative, high-quality products that are both reliable and long-lasting. LEONI – we create the best connection for your future.

LEONI’s core markets

- Automotive & Commercial Vehicles
- Industrial Solutions
- Electrical Appliances
- Conductors & Copper Solutions

Your markets – our strength.

Relied on worldwide

We are your specialist manufacturer of choice for standardised, preassembled cable systems used in instrumentation and control technology. We are one of the leading companies in this market, with over 40 years of experience. Customers rely on our solutions the world over – from Chile to Japan and from South Africa to Scandinavia. Support is provided by a network that spans 49 countries throughout the world – to guarantee maximum availability.

Our maxim: first the customer, then the cable

Bespoke solutions are standard at LEONI and therefore always cost-optimised. Of the cables that leave our factories, 70% are individually designed, manufactured and assembled. To date, we have manufactured over 40,000 cable designs, carefully tailored both to our company-internal guidelines and applicable international standards. Our strength is tailor-made customer service.

Every cable is a promise

The durability – even under adverse conditions - the reliability and the quality of our products form the cornerstones of our success as a company. As a customer, you naturally expect to see a return on your valuable investment. Which is why we make every effort to offer you guaranteed quality every step of the way. For systems in use all day, every day.

Perfection – but only with the right compounds

Compounds are the final touch that makes an ideal cable even possible. The combination of our expertise as a compounder and our technical know-how in cable manufacturing creates synergy effects that directly benefit our customers.

For us, reliability means delivering the right product at the right point in time. Our solutions are used in these industries to ensure 24/7 service reliability:

- Oil and gas (onshore/offshore)
- Petrochemicals
- Chemicals
- Iron and steel
- Paper and cellulose
- Generating station construction
- Pharmaceuticals
- Food and beverages
- Water/wastewater management
- Waste incineration
- Cement
- Mining
**Introduction**

**Locations**

**LEONI Kerpen GmbH**, Germany
Stolberg is situated between Cologne and Aix-la-Chapelle.
110 km departed from Antwerp harbour.

**LEONI Cable Solutions PV**, India
Industrial Park, Pune, 150 km South East of Mumbai.

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**Headquarter & Production facility**
**LEONI Kerpen GmbH**
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Germany
Phone +49 (0)24 02-17-307
Fax +49 (0)24 02-7 55 90
E-mail industrial-projects@leoni.com

**Production facility**
**LEONI Cable Solutions Private Limited**
Indospace Rohan Industrial Park
Gut No-428, Village Mhalunge,
Off Chakan Talegaon Road,
410501 Taluka-Khed,
Pune, Maharashtra
India
Phone +91 2135-391600
Fax +91 2135-391650
E-mail industrial-projects@leoni.com

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**Explanation of used pictograms & abbreviations in data sheets**

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<td>Diameter over inner sheath</td>
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<td>UV protection (UV)</td>
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<td>Low smoke, zero halogen (LSZH)</td>
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<td>Vapour tight outer sheath</td>
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The ICON brands

**ICON Base**
... ensures reliable performance in all usual conditions.

ICON Base comprises instrumentation and control cables according to the recognized standards EN 50288-7, UL 13/2250 and UL 1277. ICON Base cables are extremely reliable, tried and tested quality products which have proven their practical worth for many years now. Our products form a comprehensive range providing suitable cables for all standard industrial applications.

**ICON Safe**
... offers protection for saving lives and safeguarding investments.

In case of fire, your applications require, i.e. the protection of human life and high-value material assets as well as the maintenance of functionality. ICON Safe quality products guarantee these requirements with a high degree of reliability thanks to well-tested designs and high-tech LSZH (low smoke zero halogen) compounds especially developed by the Industrial Projects Business Unit.

**ICON Bus**
... meets or exceeds the increased requirements of state-of-the-art automation technology.

ICON Bus offers a wide range of bus cable types designed for various bus systems and is available in standard and special designs which meet ICON Base, ICON Safe, ICON Chem and ICON Arctic requirements. The ICON Bus product family includes all bus cables used in automation technology such as Foundation Fieldbus, Profinet DP and PA, CAN and Modbus.

**ICON Chem**
... ensures the safety and functionality of your plant in aggressive environments.

ICON Chem instrumentation cables for applications involving aggressive media such as oil and chemicals reliably protect the functioning of a system, even (and in particular) under extreme conditions. ICON Chem quality products can be equipped with the tried and tested lead sheath and with the ecologically sound laminated ALNYC sheath consisting of aluminium tape in conjunction with a PE and polyamide sheath.

**ICON Arctic**
... offers excellent properties for applications in extremely cold environments.

The range of ICON Arctic instrumentation cables includes cables dedicated to arctic conditions. FRILON is a PVC compound specially developed by LEONI. Among other outstanding properties ICON Arctic cables are suited for installation down to -30 °C and permanent operating temperatures down to -60 °C.

**ICON Flex**
... ensures reliable function in usual conditions.

ICON Flex cables comprise of flexible control cables for all kinds of control applications of machines and tools. Their design is based on the recognized standard EN 50525-2-51. The cables are reliable, tried and tested quality products, which have proven their suitability for this application since many years. The range of these flexible control cables covers all common industry applications for such products.
Introduction

Generating station & power distribution
Stability and reliability
Stability and reliability around the clock is what your customers expect. For us, these aspects start with optimal cable solutions – flame-retardant and halogen-free – that guarantee the uninterrupted operation of your stations.

Our programme offers you the products you need: class 1 power distribution cables up to 30 kV in accordance with international standards, and IEC 60502 in particular.

Oil & gas
Keeping pace with market growth and costs
Innovations power the engine of growth in the oil and gas industry. Today, fossil fuels are being harvested that would have been thought inaccessible just 20 years ago. For cable solutions, costs are a top priority, alongside safety and efficiency. Requirements for which we have the perfect answer, after 40 years in cable production.

Measure, control and calibrate in extreme conditions
Major fluctuations in temperature, oil-based compounds and acids all require safe solutions – and cables that offer 100% performance 24/7 even under these harsh conditions. All this is offered by our ICON series, developed for onshore and offshore energy production and produced according to national and international standards.

Chemical industry
Aggressive media require stringent safety standards
In the chemicals industry, the be-all and end-all is chemical and thermal stability. Aggressive media mean cable characteristics have to meet stringent safety standards.

Apart from these specialised requirements, electrical parameters are another key priority. Our ICON products – and specifically our ICON Chem cable solutions – guarantee the functionality of plant in this challenging environment while assuring stable operation 24/7.

Minning
Safe solutions for surface and sub-surface mining
Nature is unpredictable. Unlike our cable solutions. Requirements for safety management are a priority here. Which is why many mining sector companies source their cables from LEONI.

Our mission: keeping functionality functional. Our pit and telecommunications cables fully meet your requirements for electrical systems quality and mechanical robustness, as well as your individual criteria for cable routing.

Thanks to our long-standing experience, we can offer special cables for roadways and shafts – customised to your specifications.

Other applications
Our wiring solutions for industrial applications
From semiconductors to water purification, cement and metal production to mechanical engineering or metalworking, we have the right cable solution for your requirements in the field of instrument and control engineering.

We work with you to identify the best, most cost-effective solution for your needs: after all, it’s what we’ve been doing for the last 40 years.

Compound
Perfection – but only with the right compounds
Compounds are the final touch that makes an ideal cable even possible. The combination of our expertise as a compounding expert and our technical know-how in cable manufacturing creates synergy effects that directly benefit our customers. We don’t simply develop and produce tailor-made insulation and jacket materials but are also seasoned experts in their industrial deployment. Draw on our comprehensive wealth of experience to optimise your own cable production.

Our compounds are designed and tested in our internal chemicals lab in accordance with the latest standards. We manufacture around 150 separate compounds at present. Our ultra-modern production facilities enable us to respond quickly and flexibly to customer requirements.

From small quantities to silo deliveries – we make it all possible.

Comprehensive quality management ensures a consistently high level of quality. Our company is of course certified according to ISO 9001, ISO 14001 and OHSAS 18001.

Our markets
Instrumentation cables 300 V

Instrumentation cables of this section consist of conductors grouped in pairs, screened pairs, triples or screened triples.

All cables have an overall screen, a PVC sheath and are rated 300 V.

Constructions rated for 500 V, as well as cables with blue outer sheath for intrinsically safe applications are available on request.

Regarding direct burial installation please note possible additional local and legal requirements.
**ICON Instrumentation Cable** EN 50288-7

Single & Multi-Pair, PVC-Insulation, Collective Screen, PVC-Sheath

**Characteristics**
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- not for direct burial
- blue for intrinsically safe systems available

**Electrical Properties at 20 °C**

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**Construction**
- Conductor: plain annealed copper wire, stranded, size: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- Insulation: polyvinyl chloride PVC
- Colour code: black / white, continuously numbered
- Outer sheath: polyvinyl chloride PVC, black, blue for intrinsically safe systems

**Technical data**
- **Conductor resistance:**
  - Test on single cable IEC 60332-1-2
  - Test on bunched cables IEC 60332-3-24 (Cat. C)
- **Insulation resistance:** 100 MΩ x km
- **Mutual capacitance:** max. 250 nF/km
- **Inductance:** max. 1 nH/km
- **Test voltage (core : screen):** 1500 V
- **Test voltage (core : core):** 1500 V
- **Operating voltage:** 300 V

**Best Base**
- **Instrumentation cable**
- **Construction:** Single & Multi-Pair, PVC-Insulation, Collective Screen, PVC-Sheath
- **Conductor:** plain annealed copper wire, stranded
- **Insulation:** polyvinyl chloride PVC
- **Outer sheath:** polyvinyl chloride PVC, black, blue for intrinsically safe systems

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## Technical data

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### Construction

**Conductor**
- plain annealed copper wire, stranded, size:
  - 0.5 mm²: 0.75 mm², 1.0 mm², 1.3 mm²
  - 1.5 mm²: 2.5 mm²
- Outer sheath: polyvinyl chloride PVC
- Colour code: black, blue, continuously numbered on white core (1, 2, 3...) for multi-element
- Individual screen:
  - aluminum / PETP tape over tinned copper drain wire, plastic tape under and above screen
- Wrapping:
  - at least 1 layer of plastic tape
- Collective screen:
  - aluminum / PETP tape over tinned copper drain wire
- Outer sheath:
  - polyvinyl chloride PVC, black, blue for intrinsically safe systems

### Electrical Properties at 20 °C

<table>
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<tr>
<th>Conductor size</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
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### Characteristics
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- not for direct burial
- blue for intrinsically safe systems available

### Components
- **Electrical Properties at 20 °C**
  - Conductor resistance
  - Insulation resistance
  - Mutual capacitance
  - Inductance
  - Test voltage U_{rms} (core : core)
  - Test voltage U_{rms} (core : screen)
  - Operating voltage

### Cable marking
- LEONI KERPEN ICON BASE 10200 M0 IS/OS SIZE 300 V RP 70 °C / 300 V 70 °C / 300 V
ICON Instrumentation Cable
EN 50288-7
Single & Multi-Triple, PVC-Insulation, Collective Screen, PVC-Sheath

Technical data
- Flame propagation (IEC 60332-1-2 and 60332-3-24)
- Test on single cable
- Test on bunched cables
- Conductor length mm
- Insulation resistance MΩ
- Mutual capacitance nF/km
- Inductance μH/m
- Test voltage U rms (core: screen)
- Test voltage U rms (core: core)
- L/R ratio μH/Ω
- insulation resistance MΩ x km
- Temperature range °C
- Conductor resistance mΩ/km
- Conductor cross-section mm²
- Minimum bending radius mm
- Insulation thickness mm
- Maximum bending radius mm
- Test voltage U cm (test end)
- Test voltage U cm (test end)
- Operating voltage V

- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- Not for direct burial
- Blue for intrinsically safe systems available

<table>
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<td>7</td>
<td>5180</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td>10</td>
<td>5180</td>
</tr>
<tr>
<td>1.3</td>
<td>12</td>
<td>12</td>
<td>5180</td>
</tr>
<tr>
<td>1.5</td>
<td>14</td>
<td>14</td>
<td>5180</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>20</td>
<td>5180</td>
</tr>
<tr>
<td>2.5</td>
<td>28</td>
<td>28</td>
<td>5180</td>
</tr>
<tr>
<td>3</td>
<td>35</td>
<td>35</td>
<td>5180</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>50</td>
<td>5180</td>
</tr>
<tr>
<td>5</td>
<td>65</td>
<td>65</td>
<td>5180</td>
</tr>
</tbody>
</table>

- Characteristics

- Base
- EOL
- 10200 M0 OS
- 70 °C / 300 V
- Oil
- Intrinsically safe systems
ICON Instrumentation Cable
EN 50288-7
Multi-Trip, PVC-insulation, Individual & Collective Screen, PVC-Sheath

**Technical data**

- **Flame propagation**
  - Test on single cable: IEC 60332-1-2
  - Test on bundled cables: IEC 60332-3-24 (Cat. C)

- **Limiting Oxygen Index (LOI)**: ASTM D 2863 (min. 30 %)
- **Flammability temperature (FT)**: ISO 4589-3:ann. A (min. > 250 °C)
- **Amount of halogen acid gas**: IEC 60754-1 (max. 17 %)
- **Oil resistance**: ICEA S-73-532
- **Sunlight resistance**: UL 1581 section 1200
- **Temperature range**
  - -30 °C up to +70 °C (during operation)
  - -5 °C up to +50 °C (during installation)
- **Minimum bending radius**: 7.5 x cable diameter

**Cable marking**
LEONI KERKEN ICON BASE 10200 M0 IS/OS SIZE 300 V RP
EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

**Conductor cross-section**

<table>
<thead>
<tr>
<th>mm²</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm²</td>
<td>0.35</td>
<td>0.45</td>
<td>0.60</td>
<td>0.75</td>
<td>1.00</td>
</tr>
<tr>
<td>mm²</td>
<td>0.35</td>
<td>0.45</td>
<td>0.60</td>
<td>0.75</td>
<td>1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>mm²</th>
<th>0.35</th>
<th>0.45</th>
<th>0.60</th>
<th>0.75</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm²</td>
<td>0.35</td>
<td>0.45</td>
<td>0.60</td>
<td>0.75</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Conductor resistance**

<table>
<thead>
<tr>
<th>max.</th>
<th>36.7 Ohm/km</th>
<th>25.0 Ohm/km</th>
<th>16.5 Ohm/km</th>
<th>14.2 Ohm/km</th>
<th>12.3 Ohm/km</th>
<th>7.6 Ohm/km</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.</td>
<td>100 kOhm/km</td>
<td>250 kOhm/km</td>
<td>100 kOhm/km</td>
<td>75 kOhm/km</td>
<td>60 kOhm/km</td>
<td></td>
</tr>
</tbody>
</table>

**Mutual capacitance**

<table>
<thead>
<tr>
<th>max.</th>
<th>550 nF/km</th>
</tr>
</thead>
</table>

**Inductance**

<table>
<thead>
<tr>
<th>max.</th>
<th>1 nH/km</th>
</tr>
</thead>
</table>

**Test voltage U_{test, base-cable}**

<table>
<thead>
<tr>
<th>max.</th>
<th>1100 V</th>
</tr>
</thead>
</table>

**Test voltage U_{test, base-screen}**

<table>
<thead>
<tr>
<th>max.</th>
<th>1500 V</th>
</tr>
</thead>
</table>

**Operating voltage**

| max. | 390 V |
ICON Instrumentation Cable

**EN 50288-7**

Single & Multi-Pair, XLPE-Insulation, Collective Screen, PVC-Sheath

**Characteristics**

- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- not for direct burial
- blue for intrinsically safe systems available

**Construction**

Conductor: plain annealed copper wire, stranded: 0.5 mm², 0.75 mm², 1 mm², 1.5 mm², 2.5 mm².

Insulation: cross-linked polyethylene XLPE.

**Colour code** black / white, continuously numbered on.

**Wrapping** at least 1 layer of plastic tape.

**Collective screen** aluminum / PETP tape over tinned copper.

**Outer sheath** polyvinyl chloride PVC, black, blue for intrinsically safe systems.

**Technical data**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation cross-linked polyethylene XLPE</td>
<td>60.0°C / 300 V</td>
</tr>
<tr>
<td>Outer sheath</td>
<td>black / white</td>
</tr>
<tr>
<td>Sunlight resistance</td>
<td>UL 1581 section 1200</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-30 °C up to +90 °C</td>
</tr>
<tr>
<td>(during operation)</td>
<td>-5 °C up to +50 °C</td>
</tr>
<tr>
<td>(during installation)</td>
<td></td>
</tr>
<tr>
<td>Minimum bending radius</td>
<td>7.5 x cable diameter</td>
</tr>
</tbody>
</table>

**Cable marking**

LEONI KEREN Icon BASE 10100 M1 OS SIZE 300 V RP

EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

**Electrical Properties at 20 °C**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor cross-section</td>
<td></td>
</tr>
<tr>
<td>max.</td>
<td>3.5 mm²</td>
</tr>
<tr>
<td>0.75 mm²</td>
<td></td>
</tr>
<tr>
<td>1 mm²</td>
<td></td>
</tr>
<tr>
<td>1.5 mm²</td>
<td></td>
</tr>
<tr>
<td>2.5 mm²</td>
<td></td>
</tr>
<tr>
<td>Conductor resistance</td>
<td>max.</td>
</tr>
<tr>
<td>16.7 Ohm/km</td>
<td></td>
</tr>
<tr>
<td>25.0 Ohm/km</td>
<td></td>
</tr>
<tr>
<td>14.2 Ohm/km</td>
<td></td>
</tr>
<tr>
<td>12.0 Ohm/km</td>
<td></td>
</tr>
<tr>
<td>7.6 Ohm/km</td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>max.</td>
</tr>
<tr>
<td>50.0 Ohm/km</td>
<td></td>
</tr>
<tr>
<td>55.0 Ohm/km</td>
<td></td>
</tr>
<tr>
<td>Mechanical resistance</td>
<td>max.</td>
</tr>
<tr>
<td>150 N/mm²</td>
<td></td>
</tr>
<tr>
<td>Inductance</td>
<td>max.</td>
</tr>
<tr>
<td>1 mH/km</td>
<td></td>
</tr>
<tr>
<td>Capacitance per unit length</td>
<td>max.</td>
</tr>
<tr>
<td>500 pF/100 m²</td>
<td></td>
</tr>
<tr>
<td>% change</td>
<td>max.</td>
</tr>
<tr>
<td>25 µF/km</td>
<td></td>
</tr>
<tr>
<td>40 pF/km</td>
<td></td>
</tr>
<tr>
<td>60 µF/km</td>
<td></td>
</tr>
<tr>
<td>Test voltage Lx - base (core)</td>
<td>1000 V</td>
</tr>
<tr>
<td>Test voltage Lx - base (screen)</td>
<td>1550 V</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>300 V</td>
</tr>
</tbody>
</table>
ICON Instrumentation Cable EN 50288-7
Multi-Pair, XLPE-Insulation, Individual & Collective Screen, PVC-Sheath

Base 10100 M1 IS/OS 90 °C / 300 V

### Electrical Properties at 20 °C

<table>
<thead>
<tr>
<th>Current</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1.0 mm²</th>
<th>1.25 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown</td>
<td>0.26</td>
<td>0.25</td>
<td>0.27</td>
<td>0.32</td>
<td>0.39</td>
<td>0.50</td>
</tr>
<tr>
<td>Blue</td>
<td>0.24</td>
<td>0.23</td>
<td>0.25</td>
<td>0.30</td>
<td>0.36</td>
<td>0.45</td>
</tr>
<tr>
<td>White</td>
<td>0.22</td>
<td>0.21</td>
<td>0.23</td>
<td>0.28</td>
<td>0.34</td>
<td>0.43</td>
</tr>
<tr>
<td>Black</td>
<td>0.20</td>
<td>0.19</td>
<td>0.21</td>
<td>0.26</td>
<td>0.32</td>
<td>0.40</td>
</tr>
<tr>
<td>Approx.</td>
<td>16</td>
<td>16</td>
<td>18</td>
<td>18</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>Approx.</td>
<td>12</td>
<td>12</td>
<td>15</td>
<td>16</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>Part number</td>
<td>7 128 E116 0000</td>
<td>7 128 E116 0000</td>
<td>7 128 E116 0000</td>
<td>7 128 E116 0000</td>
<td>7 128 E116 0000</td>
<td>7 128 E116 0000</td>
</tr>
</tbody>
</table>

### Characteristics
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- not for direct burial
- blue for intrinsically safe systems available

### Technical data

- **Conductor**: plain annealed copper wire, stranded:
  - 0.5 mm², 0.75 mm², 1.0 mm², 1.25 mm², 1.5 mm², 2.5 mm²

- **Insulation**: cross-linked polyethylene XLPE

- **Colour code**: black / white, continuously numbered on white core (1, 2, 3, ...) for multi-element

- **Individual screen**: aluminium / PETP tape over tinned copper
drain wire, plastic tape under and above screen

- **Wrapping**: at least 1 layer of plastic tape

- **Collective screen**: aluminium / PETP tape over tinned copper
drain wire

- **Outer sheath**: polyvinyl chloride PVC, black, blue for
  intrinsically safe systems

- **Minimum bending radius**: 7.5 x cable diameter

### Cable marking Base

- **LEONI KERPEN ICON BASE 10100 M1 IS/OS SIZE 300 V RP**
- **EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING**

### Testing

- **Test voltage (U_rms : core - screen)**: 1500 V
- **Test voltage (U_rms : base - screen)**: 1500 V
- **Operating voltage**: 300 V
### ICON Instrumentation Cable EN 50288-7

**Single & Multi-Triple, XLPE-Insulation, Collective Screen, PVC-Sheath**

#### Construction
- **Conductor**: plain annealed copper wire, stranded, size: 0.5 mm², 0.75 mm², 1.0 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- **Insulation**: cross-linked polyethylene XLPE
- **Colour code**: black / white / red, continuously numbered
- **Wrapping**: on 1 layer of plastic tape
- **Collective screen**: aluminium / PETP tape over tinned copper drain wire
- **Outer sheath**: polyvinyl chloride PVC, black, blue for intrinsically safe systems

#### Technical data
- **Flame propagation**
  - IEC 60332-3-24 (Cat. C)
  - IEC 60332-1-2
- **Limiting Oxygen Index (LOI)**
  - ASTM D 2863 (min. 30 %)
- **Flammability temperature (FT)**
  - ISO 4589-3 ann. A (min. +250 °C)
- **Limiting smoke development**
  - EN 50288-7
- **Fire Test**
  - Bunched cables: IEC 60332-3-24
  - Single cable: IEC 60332-1-2
- **Oxygen index**
  - IEC 60754-1 (max. 23 %)
- **Flame propagation**
  - ICEA S-73-532

#### Operating voltage
- 300 V

#### Test voltage (U rms: core - screen)
- 1500 V

#### Inductance
- max. 1 mH/km

#### Mutual capacitance
- max. 150 nF/km

#### Insulation resistance
- min. 5000 MΩ x km

#### L/R ratio
- max. 25 μH/Ω - 150 μH/Ω

#### Test voltage (U rms: core - core)
- 1500 V

#### Part number
- BASE 10100 M1 OS
- 90 °C / 300 V
- RP

#### Characteristics
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- not for direct burial
- blue for intrinsically safe systems available

#### Materials
- Base
- Oil
- 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm², 10 mm², 15 mm², 20 mm²
- intrinsically safe systems
- drain wire
- on white core (1, 2, 3...) for multi-element
- 1.5 mm², 2.5 mm²

#### EN 50288-7
- CE PRODUCTION LOT CODE YEAR LENGTH MARKING

#### Flammability temperature (FT)
- ISO 4589-3 ann. A (min. +250 °C)

#### Limiting Oxygen Index (LOI)
- ASTM D 2863 (min. 30 %)

#### Test on bunched cables
- IEC 60332-3-24 (Cat. C)

#### Test on single cable
- IEC 60332-1-2

#### Amount of halogen acid gas
- IEC 60754-1 (max. 23 %)

#### www.leoni-industrial-projects.com
**ICON Instrumentation Cable**  
EN 50288-7

**Multi-Triple, XLPE-Insulation, Individual & Collective Screen, PVC-Sheath**

**Electrical Properties at 20 °C**

- **Conductor plain annealed copper wire, stranded, size:**
  - 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²

- **Insulation**
  - Cross-linked polyethylene XLPE

- **Colour code** black / white / red, continuously numbered on white core (1, 2, 3...) for multi-element

- **Individual screen**
  - Aluminium / PETP tape over tinned copper drain wire, plastic tape under and above screen

- **Collective screen**
  - Aluminium / PETP tape over tinned copper drain wire (during operation)

- **Outer sheath**
  - Polynyl chloride PVC, black, blue for intrinsically safe systems

**Technical data**

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor resistance max.</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
</tr>
<tr>
<td>Insulation resistance min.</td>
<td>5000 MΩ/km</td>
<td>5000 MΩ/km</td>
<td>5000 MΩ/km</td>
<td>5000 MΩ/km</td>
<td>5000 MΩ/km</td>
<td>5000 MΩ/km</td>
</tr>
<tr>
<td>Inductance max.</td>
<td>0.1 mH/km</td>
<td>0.1 mH/km</td>
<td>0.1 mH/km</td>
<td>0.1 mH/km</td>
<td>0.1 mH/km</td>
<td>0.1 mH/km</td>
</tr>
<tr>
<td>L/R ratio max.</td>
<td>25 µH/Ω</td>
<td>25 µH/Ω</td>
<td>25 µH/Ω</td>
<td>25 µH/Ω</td>
<td>25 µH/Ω</td>
<td>25 µH/Ω</td>
</tr>
<tr>
<td>Test voltage U L_base – screen</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
</tr>
</tbody>
</table>

**Characteristics**

- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- Not for direct burial
- Blue for intrinsically safe systems available

**Construction**

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum bending radius</td>
<td>7.5 x cable diameter</td>
<td>7.5 x cable diameter</td>
<td>7.5 x cable diameter</td>
<td>7.5 x cable diameter</td>
<td>7.5 x cable diameter</td>
<td>7.5 x cable diameter</td>
</tr>
</tbody>
</table>

**Operating voltage**

- 300 V

**Flammability temperature (FT) ISO 4589-3 ann. A (min. +250 °C)**

**Limiting Oxygen Index (LOI) ASTM D 2863 (min. 30 %)**

**Test on bunched cables IEC 60332-3-24 (Cat. C)**

**Test on single cable IEC 60332-1-2**

**Flame propagation**

**Sunlight resistance UL 1581 section 1200**

**Oil resistance ICEA S-73-532**

**Amount of halogen acid gas IEC 60754-1 (max. 23 %)**

**www.leoni-industrial-projects.com**
**ICON Instrumentation Cable**  
**EN 50288-7**  
Single & Multi-Pair, XLPE-Insulation, Collective Screen, PVC-Sheath

### Characteristics
- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- Direct burial possible
- Blue for intrinsically safe systems available
- Reinforced

### Technical Data

#### Electrical Properties at 20 °C

- **Conductor:**
  - Plain annealed copper wire, stranded, size: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²

- **Insulation:**
  - Cross-linked polyethylene XLPE

- **Collective Screen:**
  - Aluminium / PETP tape over tinned copper

- **Outer Sheath:**
  - Polyvinyl chloride PVC, reinforced, black

- **Wrapping:**
  - At least 1 layer of plastic tape

- **Conductor Resistance:**
  - Maximum: 36.7 Ω/km, 25.0 Ω/km, 18.5 Ω/km, 14.2 Ω/km, 12.3 Ω/km, 7.6 Ω/km

- **Conductor Cross-Section:**
  - Nominal: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²

- **Operating Voltage:**
  - 300 V

- **Test Voltage (Core : Screen):**
  - 1500 V

- **L/R Ratio:**
  - Maximum: 25 μH/Ω, 40 μH/Ω, 60 μH/Ω

- **Inductance:**
  - Maximum: 1 mH/km

- **Mutual Inductance:**
  - Maximum: 150 μH/m

- **Capacitance Unbalance:**
  - Minimum: 5000 MΩ x km

- **Capacitance:**
  - Maximum: 500 pF/500 m

- **Test Voltage (Core : Core):**
  - 1500 V

- **Flammability Temperature:**
  - ISO 4589-3 ann. A (min. +250 °C)

- **Limiting Oxygen Index (LOI):**
  - ASTM D 2863 (min. 30 %)

- **Sunlight Resistance:**
  - UL 1581 section 1200

- **Amount of Halogen Acid Gas:**
  - IEC 60754-1 (max. 23 %)

### Construction

- **Conductor:**
  - Plain annealed copper wire, stranded
  - Sizes: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²

- **Insulation:**
  - Cross-linked polyethylene XLPE

- **Collective Screen:**
  - Aluminium / PETP tape over tinned copper wire

- **Outer Sheath:**
  - Polyvinyl chloride PVC, reinforced, black

- **Wrapping:**
  - At least 1 layer of plastic tape

- **Temperature Range:**
  - -30 °C up to +90 °C

- **Operating Temperature:**
  - 300 V

- **Test Voltage:**
  - 1500 V

### Cable Marking

- **LEONI KERPEN ICON BASE 10104 M1 OS SIZE 300 V RP EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING**

### Table

<table>
<thead>
<tr>
<th>Conductor Cross-Section</th>
<th>mm²</th>
<th>mm²</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 mm²/7</td>
<td>20</td>
<td>0.26</td>
<td>1.8</td>
<td>7.7</td>
<td>77</td>
<td>72850891</td>
<td>72850892</td>
<td>72850893</td>
<td>72850894</td>
<td>72850895</td>
<td>72850896</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.75 mm²/7</td>
<td>20</td>
<td>0.35</td>
<td>1.8</td>
<td>7.7</td>
<td>78</td>
<td>72850899</td>
<td>72850900</td>
<td>72850901</td>
<td>72850902</td>
<td>72850903</td>
<td>72850904</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 mm²/7</td>
<td>10</td>
<td>0.26</td>
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</tr>
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### Additional Information

- **Base 10104 M1 OS**
  - 90 °C / 300 V

- **LEONI KERPEN ICON BASE 10104 M1 OS SIZE 300 V RP**
  - 90 °C / 300 V

- **Technical Data**
  - EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

- **Minimum Bending Radius:**
  - 7.5 x cable diameter

- **Temperature Range:**
  - -5 °C up to +50 °C

- **Flammability Temperature (FT):**
  - ISO 4589-3 ann. A (min. +250 °C)

- **Limiting Oxygen Index (LOI):**
  - ASTM D 2863 (min. 30 %)

- **Sunlight Resistance:**
  - UL 1581 section 1200

- **Amount of Halogen Acid Gas:**
  - IEC 60754-1 (max. 23 %)
Icon Instrumentation Cable

EN 50288-7

Multi-Pair, XLPE-Insulation, Individual & Collective Screen, PVC-Sheath

Characteristics
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- for direct burial
- blue for intrinsically safe systems available
- reinforced

Electrical Properties at 20 °C

<table>
<thead>
<tr>
<th>Conductors</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1.0 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
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<td>16.7 Ω/km</td>
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<td>18.5 Ω/km</td>
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<td>min.</td>
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<td>21.0 Ω/km</td>
<td>18.0 Ω/km</td>
<td>14.0 Ω/km</td>
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<td></td>
<td>max.</td>
<td>10000 MΩ x km</td>
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<td>Load cap.</td>
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<td>min.</td>
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<tr>
<td></td>
<td>min.</td>
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<td>Test voltage (core - core)</td>
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<td></td>
</tr>
<tr>
<td>Test voltage (core - screen)</td>
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<th>1.5 mm²</th>
<th>2.5 mm²</th>
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Technical data
- Test on single cable
- Test on bunched cables

<table>
<thead>
<tr>
<th>Cond.</th>
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<th>1.0 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
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</tr>
<tr>
<td></td>
<td>min.</td>
<td>7.6 Ω/km</td>
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<tr>
<td>Mutual capacitance</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>min.</td>
<td>150 nF/km</td>
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</tr>
<tr>
<td>L/R ratio</td>
<td>max.</td>
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</tr>
<tr>
<td></td>
<td>min.</td>
<td>25 μH/Ω</td>
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</tbody>
</table>

Minimum bending radius 7.5 x cable diameter

Temperature range
-5 °C up to +50 °C
during operation
-5 °C up to +50 °C
during installation

Collective screen
- aluminium / PET tape over tinned copper
- drain wire, plastic tape under and above screen

Supporting screen
- reinforced
- blue for intrinsically safe systems
**ICON Instrumentation Cable**

**EN 50288-7**

Single & Multi-Triple, XLPE-Insulation, Collective Screen, PVC-Sheath

**Characteristics**
- reduced flame propagation
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- for direct burial
- blue for intrinsically safe systems available
- reinforced

**Technical data**

**Conductor**
- plain annealed copper wire, stranded, size:
  - 0.5 mm², 0.75 mm², 1 mm², 1.3 mm²,
  - cross-linked polyethylene XLPE

**Insulation**
- cross-linked polyethylene XLPE

**Collective screen**
- aluminium / PETP tape over tinned copper

**Outer sheath**
- polyvinyl chloride PVC, reinforced, black,
  - blue for intrinsically safe systems

**Amount of halogen acid gas**
- IEC 60754-1 (max. 23 %)

**Technical data**

<table>
<thead>
<tr>
<th>Part number</th>
<th>mm²</th>
<th>min. approx.</th>
<th>approx.</th>
<th>kg/km</th>
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<td>2</td>
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**1 mm²**

<table>
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<td>Base 10104 M1 OS 90 °C / 300 V</td>
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<td>7.9</td>
<td>92</td>
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<tr>
<td>0.26</td>
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<td>2</td>
<td>24.5</td>
<td>882</td>
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**Electrical Properties at 20 °C**

<table>
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<tr>
<th>Conductor cross-section</th>
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<th>mm²</th>
<th>mm²</th>
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<td>2.3</td>
<td>1.8</td>
<td>24.5</td>
<td>10</td>
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**Ambient resistance**
- 10500 MΩ/1 km

**Mutual capacitance**
- 100 nF/km

**U/R ratio**
- Max. 25 μF/O
- 49 μF/O
- 60 μF/O

**Technical data**

**Flammability temperature (FT)**
- ISO 4589-3 ann. A (min. +250 °C)

**Limiting Oxygen Index (LOI)**
- ASTM D 2863 (min. 30 %)

**Flame propagation**
- IEC 60332-1-2

**Sunlight resistance**
- UL 1581 section 1200

**Oil resistance**
- ICEA S-73-532

**www.leoni-industrial-projects.com**
ICON Instrumentation Cable  EN 50288-7
Multi-Triple, XLPE-Insulation, Individual & Collective Screen, PVC-Sheath

Characteristics
- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- For direct burial
- Blue for intrinsically safe systems available
- Reinforced

Specifications
- Base CONDUCTOR:
  - Plain annealed copper wire, stranded
  - Size: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm²
  - Cross-section: nom. 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm²

- Insulation:
  - Cross-linked polyethylene XLPE

- Colour code:
  - Black/white/ red, continuously numbered on white core (1, 2, 3, ...)

- Operating temperature:
  - -5 °C up to +50 °C (during installation)
  - -30 °C up to +90 °C (during operation)

- Minimum bending radius:
  - 7.5 x cable diameter

- Test voltage:
  - Core:Core 1500 V (IEC 60332-3-24 (Cat. C))
  - Single cable 1250 V (IEC 60332-1-2)

- BX flame propagation test:
  - ISO 4589-3 ann. A (min. +250 °C)

- Oil resistance test:
  - ICEA S-73-532

- Amount of halogen acid gas:
  - IEC 60754-1 (max. 23 %)

- Part number:
  - 7328 044 1/7 (50.26 12.6 140)
  - 7328 048 1/7 (50.26 18.7 200)
  - 7328 049 1/7 (50.26 19.4 240)
  - 7328 047 1/7 (50.26 19.1 230)
  - 7328 045 1/7 (50.26 18.2 190)
  - 7328 046 1/7 (50.26 18.0 180)
  - 7328 050 1/7 (50.26 21.2 350)
  - 7328 053 1/7 (50.26 21.1 340)
  - 7328 052 1/7 (50.26 19.9 310)
  - 7328 051 1/7 (50.26 19.7 300)

- Cable marking:
  - EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

Technical data
- Flame propagation:
  - Test on single cable IEC 60332-1-2
  - Test on bunched cables IEC 60332-3-24 (Cat. C)

- Limiting Oxygen Index (LOI):
  - ASTM D 2863 (min. 30 %)

- Flammability temperature (FT):
  - ISO 4589-3 ann. A (min. +250 °C)

- Amount of halogen acid gas:
  - IEC 60754-1 (max. 23 %)

- Oil resistance:
  - IEC 60617-3-532

- Sunlight resistance:
  - UL 1581 section 1200

- Temperature range:
  - -30 °C up to +90 °C (during operation)
  - -5 °C up to +50 °C (during installation)

- Minimum bending radius:
  - 7.5 x cable diameter
ICON Instrumentation Cable  EN 50288-7
Single & Multi-Pair, PVC-Insulation, Collective Screen, Armour, PVC-Sheath

**Technical data**

- **Conductor:** plain annealed copper wire, stranded, size: 1.0 mm², 0.75 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- **Flame propagation:** IEC 60332-1-2
- **Limiting Oxygen Index (LOI):** ASTM D 2863 (min. 30 %)
- **Flammability temperature (FT):** ISO 4589-3 ann. A (min. +250 °C)
- **Oil resistance:** ICAE S-73-532
- **Sunlight resistance:** UL 1581 section 1200
- **Temperature range:** -30 °C up to +70 °C (during installation)
- **-5 °C up to +50 °C (during operation)**
- **Conductor resistance max.:** 36.7 Ω/km 25.0 Ω/km 18.5 Ω/km 14.2 Ω/km 12.3 Ω/km 7.6 Ω/km
- **Conductor cross-section nom.:** 0.5 mm² 0.75 mm² 1 mm² 1.3 mm² 1.5 mm² 2.5 mm²
- **Operating voltage:** 300 V
- **Test voltage U rms (core : screen):** 1500 V
- **Insulation resistance min.:** 100 MΩ x km
- **L/R ratio max.:** 25 μH/Ω 40 μH/Ω 60 μH/Ω

**个交易日**

- **Construction:**
  - **Conductor:** plain annealed copper wire, stranded, size: 1.0 mm², 0.75 mm², 1.3 mm², 1.5 mm², 2.5 mm²
  - **Insulation:** polyvinyl chloride (PVC)
  - **Colour code:** black / white, continuously numbered
  - **Collective screen:** aluminum / PETP tape over tinned copper wire
  - **Inner sheath:** polyvinyl chloride PVC, black
  - **Armour:** galvanised round steel wires
  - **Outer sheath:** polyvinyl chloride PVC, black, blue for intrinsically safe systems

**Minimum bending radius:** 10 x cable diameter

** Characteristics**

- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- for direct burial
- blue for intrinsically safe systems available

**Technical data**

- **Conductor resistance max.:**
  1.0 mm²: 0.25, 0.26
  1.3 mm²: 0.31, 0.32
  1.5 mm²: 0.24, 0.25
  2.5 mm²: 0.36, 0.37

- **Insulation resistance min.:**
  183 MΩ x km

- **Inductance max.:** 250 μH/km

- **L/R ratio max.:** 25 μH/Ω

- **Test voltage U rms bare - core:** 1500 V
- **Test voltage U rms bare - screen:** 1500 V

- **Operating voltage:** 300 V
**Icon Instrumentation Cable**  
**EN 50288-7**  
Multi-Pair, PVC-Insulation, Individual & Collective Screen, Armour, PVC-Sheath

### Technical Data

**Conductor**
- plain annealed copper wire, stranded, size: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm²
- Test on single cable: IEC 60332-1-2  
- Test on bunched cables: IEC 60332-3-24 (Cat. C)

**Insulation**
- polyvinyl chloride PVC

**Colour Code**
- black / white, continuously numbered on core

**Individual Screen**
- aluminium / PETP tape over tinned copper drain wire, plastic tape under and above screen

**Wrapping**
- at least 1 layer of plastic tape

**Collective Screen**
- aluminium / PETP tape over tinned copper drain wire
- (during installation)

**Armour**
- polyvinyl chloride PVC, black

**Outer Sheath**
- polyvinyl chloride PVC, black, blue for intrinsically safe systems

**Cable Marking**
- LEONI KERPEN ICON Instrumentation cable  
- BASE 10210 M0 IS/OS SIZE 300 V RP  
- EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

### Electrical Properties at 20 °C

<table>
<thead>
<tr>
<th>Conductor cross section</th>
<th>mm²</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor resistance max</td>
<td>mm</td>
<td>16.7 Ohm/km</td>
<td>15.0 Ohm/km</td>
<td>14.2 Ohm/km</td>
<td>13.5 Ohm/km</td>
<td>12.8 Ohm/km</td>
<td>7.6 Ohm/km</td>
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<td>Insulation resistance min</td>
<td>mm</td>
<td>102 MD</td>
<td>115 MD</td>
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<td>Shield capacitance max</td>
<td>mm</td>
<td>19.3 pF/m</td>
<td>18.8 pF/m</td>
<td>18.5 pF/m</td>
<td>18.3 pF/m</td>
<td>18.1 pF/m</td>
<td>15.1 pF/m</td>
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<tr>
<td>Shield resistance min</td>
<td>mm</td>
<td>112 Ohm</td>
<td>108 Ohm</td>
<td>105 Ohm</td>
<td>102 Ohm</td>
<td>99.7 Ohm</td>
<td>75.5 Ohm</td>
</tr>
<tr>
<td>L/R ratio max</td>
<td>mm</td>
<td>25 μH/Ω</td>
<td>25 μH/Ω</td>
<td>25 μH/Ω</td>
<td>25 μH/Ω</td>
<td>25 μH/Ω</td>
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<tr>
<td>Test voltage Uₘ₉ (core : core)</td>
<td>mm</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
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<tr>
<td>Test voltage Uₘ₉ (core : screen)</td>
<td>mm</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
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<tr>
<td>Operating voltage</td>
<td>mm</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
</tr>
</tbody>
</table>

**Limiting Oxygen Index (LOI)**
- ASTM D 2863 (min. 30 %)

**Flammability temperature (FT)**
- ISO 4589-3 ann. A (min. +250 °C)

**Oil Resistance**
- EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

**Technical data**

- reduced flame propagation  
- oil resistant  
- sunlight resistant  
- indoor and outdoor installations  
- on racks, trays, in conduits  
- for direct burial  
- blue for intrinsically safe systems available

**Dimensions**

- ICON Base 10210 M0 IS/OS  
- 70 °C / 300 V
ICON Instrumentation Cable

EN 50288-7

Single & Multi-Triple, PVC-Insulation, Collective Screen, Armour, PVC-Sheath

Construction

Conductor
- plain annealed copper wire, stranded, size:
  - 0.5 mm² / 0.75 mm²
diameter
  - 1.3 mm²

Flame propagation
- Test on single cable
  - IEC 60332-1-2
- Test on bunched cables
  - IEC 60332-3-24 (Cat. C)

Insulation
- polyvinyl chloride PVC

Colour code
- black / white / red, continuously numbered
- for direct burial
- for indoor and outdoor installation

Collective screen
- aluminium / PETP tape over tinned copper

Inner sheath
- polyvinyl chloride PVC, black

Armour
- galvanised round steel wires

Outer sheath
- polyvinyl chloride PVC, black, blue for intrinsically safe systems

Collective screen on white core (1, 2, 3...) for multi-element
- 1.5 mm², 2.5 mm²

Technical data

Conductor cross-section
- nom. 0.5 mm²
- 0.75 mm²
- 1 mm²
- 1.3 mm²
- 1.5 mm²
- 1.75 mm²
- 2.5 mm²

Test voltage U rms (core : screen)
- 1500 V

Test voltage U rms (core : core)
- 1500 V

Conductor resistance
- max. 20 °C
  - 36.7 Ω/km
  - 25.0 Ω/km
  - 18.5 Ω/km
  - 14.2 Ω/km
  - 12.3 Ω/km
  - 7.6 Ω/km

Conductor cross-section
- 0.5 mm²
- 0.75 mm²
- 1 mm²
- 1.3 mm²
- 1.5 mm²
- 2.5 mm²

Conductor cross-section
- approx. 10 m x cable diameter

Base

70 °C / 300 V

Minimum bending radius
- 10 x cable diameter

Specimen marking

LEONI KERVEN ICON BASE 10210 M0 OS 70 °C / 300 V RP
EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

Electrical Properties at 20 °C

 conductor resistance
- max. 16.7 O/km
- 21.6 O/km
- 16.5 O/km
- 14.2 O/km
- 12.0 O/km
- 7.6 O/km

Insulation resistance
- min. 100 MΩ x km

Rohdichte
- max. 1.2 g/cm³
- 1.5 g/cm³
- 1.25 g/cm³
- 1.35 g/cm³
- 1.7 g/cm³
- 1.5 g/cm³

LWR ratio
- 1 mm²
- 0.75 mm²
- 1.0 mm²
- 1.3 mm²
- 1.5 mm²
- 2.5 mm²

Test voltage (Uc, base - core)
- 1500 V

Test voltage (Uc, base - screen)
- 1500 V

Operating voltage
- 300 V
## ICON Instrumentation Cable EN 50288-7

**Multi-Trip, PVC-insulation, Individual & Collective Screen, Armour, PVC Sheath**

### Construction
- **Conductor:** plain annealed copper wire, stranded, size:
  - 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- **Insulation:** polyvinyl chloride PVC
- **Colour code:** black / white / red, continuously numbered on white core (1, 2, 3...) for multi-element
- **Individual screen:** aluminium / PETF tape over tinned copper drain wire, plastic tape under and above screen
- **Wrapping:** at least 1 layer of plastic tape
- **Collective screen:** aluminium / PETF tape over tinned copper drain wire (during installation)
- **Inner sheath:** polyvinyl chloride PVC, black
- **Armour:** galvanised round steel wires (during installation)
- **Outer sheath:** polyvinyl chloride PVC, black, for intrinsically safe systems

### Technical Data
- **Flame propagation:** IEC 60332-1-2
- **Test on single cable:** IEC 60332-2-24 (Cat. C)
- **Flammability temperature (FT):** ISO 4589-3 ann. A (min. +250 °C)
- **Limiting Oxygen Index (LOI):** ASTM D 2863 (min. 30 %)
- **Amount of halogen acid gas:** IEC 60754-1 (max. 17 %)
- **Oil resistance:** IEC A 5-73-532
- **Sunlight resistance:** UL 1581 section 1200

### Minimum bending radius
- 10 x cable diameter

### Temperature range
- -30 °C up to +70 °C (during installation)
- -5 °C up to +50 °C (during operation)

### Minimum bending radius
- 10 x cable diameter

### Cable marking
- LEONI KEREN ICON BASE 10210 M0 IS/OS SIZE 300 V RP
- EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

### Electrical Properties at 20 °C

<table>
<thead>
<tr>
<th>Current</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor resistance</td>
<td>20.7 Ohm/km</td>
<td>23.5 Ohm/km</td>
<td>26.0 Ohm/km</td>
<td>29.2 Ohm/km</td>
<td>32.6 Ohm/km</td>
<td>40.8 Ohm/km</td>
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<tr>
<td>Insulation resistance</td>
<td>100 MΩ x km</td>
<td>100 MΩ x km</td>
<td>100 MΩ x km</td>
<td>100 MΩ x km</td>
<td>100 MΩ x km</td>
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</tr>
<tr>
<td>Min. capacitance</td>
<td>250 pF/m</td>
<td>250 pF/m</td>
<td>250 pF/m</td>
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<tr>
<td>I/R ratio</td>
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<td>600 µΩ/m</td>
<td>600 µΩ/m</td>
<td>600 µΩ/m</td>
<td>600 µΩ/m</td>
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</tr>
<tr>
<td>Test voltage (Uc), bare-core</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
</tr>
<tr>
<td>Test voltage (Uc), bare-screen</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
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<td>Operating voltage</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
</tr>
</tbody>
</table>
**ICON Instrumentation Cable**

**EN 50288-7**

Single & Multi-Pair, XLPE-Insulation, Collective Screen, Armour, PVC-Sheath

### Characteristics
- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- For direct burial
- Blue for intrinsically safe systems available

### Technical data

#### Conductors
- **Conductor**: plain annealed copper wire, stranded, size:
  - 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- **Insulation**: cross-linked polyethylene XLPE

#### Colour Code
- Black / white, continuously numbered on tape core (1, 2, 3, ...)

#### Armouring
- ** Armour**: galvanized round steel wires (for direct burial)

#### Collective Screen
- **Screen**: aluminium / PETP tape over tinned copper

#### Inner Sheath
- **Sheath**: polyvinyl chloride, black

#### Outer Sheath
- **Sheath**: polyvinyl chloride, black, for blue for intrinsically safe systems

#### Operating temperature
- **Temperature range**: -30 °C up to +90°C
- **Drain wire temperature**: -5 °C up to +50°C

#### Minimum bending radius
- 10 x cable diameter

#### Cable marking
- **LEONI KERPEN ICON BASE 10110 M1 OS SIZE 300 V RP**
- **EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING**

### Electrical Properties at 20 °C

#### Conductor cross-section (mm²)
<table>
<thead>
<tr>
<th>mm²</th>
<th>0.5</th>
<th>0.75</th>
<th>1.0</th>
<th>1.3</th>
<th>1.5</th>
<th>2.5</th>
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<tbody>
<tr>
<td>0.5</td>
<td>0.26</td>
<td>0.26</td>
<td>0.35</td>
<td>0.40</td>
<td>0.55</td>
<td>0.60</td>
</tr>
</tbody>
</table>

#### Conductor resistance (mΩ/km)
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<thead>
<tr>
<th>mm²</th>
<th>0.5</th>
<th>0.75</th>
<th>1.0</th>
<th>1.3</th>
<th>1.5</th>
<th>2.5</th>
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<td>21.1</td>
<td>24.0</td>
<td>26.7</td>
<td>29.0</td>
<td>31.1</td>
</tr>
</tbody>
</table>

#### Mutual inductance (μH/m)
<table>
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<tr>
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<th>0.75</th>
<th>1.0</th>
<th>1.3</th>
<th>1.5</th>
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<td>0.5</td>
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#### Capacitance unbalance (μF/km)
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<th>0.75</th>
<th>1.0</th>
<th>1.3</th>
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<td>13.3</td>
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<td>13.3</td>
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</table>

#### Test voltage (Un / Ue / us / uc / uc):
- 1000 V
- 1500 V
- 1050 V
- 1000 V
- 500 V

#### Test voltage (Un / Ue / us / uc / uc, bare):
- 1000 V
- 1500 V
- 1050 V
- 1000 V
- 500 V

### Test limits

#### Inductive test
- **Test voltage**: 1500 V
- **Voltage limit**: 1000 V

### Standard compliance

#### IEC 60332-3-24 (Cat. C)

#### Oil resistance
- **ICEA S-73-532**

#### Amount of halogen acid gas
- **IEC 60754-1 (max. 23 %)**

#### Characteristic (**during installation**)
- **Temperature range**: -5 °C up to +50°C

#### Flammability temperature (**FT**) (ISO 4589-3 ann. A (min. +250 °C))
- **Test on bunched cables**: IEC 60332-3-24 (Cat. C)

#### Minimum bending radius
- 10 x cable diameter

#### Part number

### Table: Technical data

<table>
<thead>
<tr>
<th>mm²</th>
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<th>0.75</th>
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#### mm mm mm mm mm kg/km

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</tr>
</thead>
<tbody>
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<td>21.1</td>
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<td>24.0</td>
<td>26.7</td>
<td>29.0</td>
<td>31.1</td>
</tr>
</tbody>
</table>

### www.leoni-industrial-projects.com
### Electrical Properties at 20 °C

**Conductor**
- 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm², 3.5 mm², 5.0 mm²

**Conductor resistance**
- 16.7 Ω/km
- 21.0 Ω/km
- 29.2 Ω/km
- 37.2 Ω/km
- 47.0 Ω/km
- 63.3 Ω/km
- 76.6 Ω/km

**Insulation resistance**
- 5000 MΩ x km

**Thermal expansion**
- 100 μm/°C

**Insulation thickness**
- 0.1 mm

**Insulation density**
- 1.4 g/cm³

**Insulation weight**
- 4.0 g/m

**Test voltage (Uₜᵢₑₜ, line line)**
- 1500 V

**Test voltage (Uₜᵢₑₜ, line neutral)**
- 1500 V

**Operating voltage**
- 300 V

---

### Characteristics
- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- For direct burial
- Blue for intrinsically safe systems available

### Base 10110 M1 IS/OS

#### 90 °C / 300 V

- **Technical data**
  - Minimum bending radius: 10 x cable diameter
  - Temperature range:
    - During installation (during installation):
      - -5 °C up to +50 °C
  - **Limiting Oxygen Index (LOI)**
    - ASTM D 2863 (min. 30 %)
  - **Flame propagation**
    - Test on bunched cables: IEC 60332-3-24 (Cat. C)
    - Test on single cable: IEC 60332-1-2
  - **Oil resistance**
    - ICEA S-73-532
  - **Cable marking**
    - Technical data
      - Minimum bending radius: 10 x cable diameter
      - Temperature range:
        - -5 °C up to +50 °C (during installation)
        - -5 °C up to +50 °C (during operation)

---

### Table: Conductor and Cable Data

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</tbody>
</table>

---

### Note

- **Construction**
  - Multi-Pair, XLPE-Insulation, Individual & Collective Screen, Armour, PVC-Sheath

- **ICON Instrumentation Cable**
  - Full electrical properties and construction details are available in the document.
ICON Instrumentation Cable  
EN 50288-7

Single & Multi-Triple, XLPE-Insulation, Collective Screen, Armour, PVC-Sheath

**Technical data**

**Construction**
- Conductor: plain annealed copper wire, stranded, size: 0.5 mm², 0.75 mm², 1.0 mm², 1.5 mm², 2.5 mm²

**Insulation**
- XLPE cross-linked polyethylene

**Colour code**
- black / white / red, continuously numbered

**Wrappping**
- at least 1 layer of plastic tape

**Collective screen**
- aluminium / PETP tape over tinned copper drain wire

**Inner sheath**
- polyvinyl chloride PVC, black

**Armour**
- galvanised round steel wires

**Outer sheath**
- polyvinyl chloride PVC, black, for intrinsically safe systems

**Khaki**
- in racks, trays, in conduits

**Technical data**

- Flame propagation: IEC 60332-1-2
- Test on single cable
- Test on bunched cables: IEC 60332-3-24 (Cat. C)
- Test on single cable: IEC 60332-1-2
- Limiting Oxygen Index (LOI): ASTM D 2863 (min. 30 %)
- Flammability temperature (FT): ISO 4589-3 ann. A (min. +250 °C)
- Test on single cables: IEC 60332-3-24 (Cat. C)
- Test on single cable: IEC 60332-1-2
- Sunlight resistance: UL 1581 section 1200
- Amount of halogen acid gas: IEC 60754-1 (max. 23 %)

**Electrical Properties at 20 °C**

- Conductors insulation: mm²
  - 0.5 mm²: 296.05/556.5
  - 0.75 mm²: 169.08/326.3
  - 1.0 mm²: 142.01/276.8
  - 1.5 mm²: 115.00/229.4
  - 2.5 mm²: 88.00/176.6

- Diameter: mm
  - 0.5 mm²: 2.8
  - 0.75 mm²: 3.3
  - 1.0 mm²: 3.7
  - 1.5 mm²: 4.7
  - 2.5 mm²: 6.5

- Weight: kg/km
  - 0.5 mm²: 9.2
  - 0.75 mm²: 11.0
  - 1.0 mm²: 13.3
  - 1.5 mm²: 19.1
  - 2.5 mm²: 24.8

- Test voltage: 1500 V

**Energy Class**
- 300 V

**Flammability**
- Flame propagation: UL 1581 section 1200
- Amount of halogen acid gas: IEC 60754-1 (max. 23 %)

**Characteristics**
- Reduced flame propagation
- Sunlight resistant
- Indoor and outdoor installation
- For direct burial
- Blue for intrinsically safe systems available

**Table**

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**Cable marking**
- LEONI KERPEN ICON BASE 10110 M1 OS SIZE 300 V RP
- EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

**Additional information**
- www.leoni-industrial-projects.com
ICON Instrumentation Cable
EN 50288-7
Multi-Triple, XLPE-Insulation, Individual & Collective Screen, Armour, PVC-Sheath

**Characteristics**
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- for direct burial
- blue for intrinsically safe systems available

**Technical data**

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<th>Conductor resistance</th>
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<th>mm</th>
<th>mm</th>
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**Electrical Properties at 20 °C**

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**Cable marking**
LEONI KERPEN ICON Base 10110 MI 15/OS SIZE 300 V RP
EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

**Construction**
Conductor plain annealed copper wire, stranded, size:
0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²

Insulation black / white / red, continuously numbered
on white core (1, 2, 3...), for multi-element

Individual screen aluminium / PETP tape over tinned copper drain wire, plastic tape under and above screen

Wrapping at least 1 layer of plastic tape

Collective screen aluminium / PETP tape over tinned copper drain wire (during installation)

Inner sheath polyvinyl chloride PVC, black

Armour galvanised round steel wires (during installation)

Outer sheath polyvinyl chloride PVC, black, blue for intrinsically safe systems

Minimum bending radius 10 x cable diameter

**Technical data**
- Test on single cable IEC 60332-1-2
- Test on bunched cables IEC 60332-3-24 (Cat. C)
- Limiting Oxygen Index (LOI) ASTM D 2863 (min. > 250 °C)
- Oil resistance IEC 57-532
- Sunlight resistance UL 1581 section 1200

**Temperature range**
-30 °C up to +90 °C

**Fire resistance**
- FT ISO 4589-3 ann. A (min. +250 °C)
- LOI ASTM D 2863 (min. 30 %)
- Test on single cable IEC 60332-1-2

**Flame propagation**
UL 1581 section 1200

**Halogen acid gas**
IEC 60754-1 (max. 23 %)

**Maximum operating temperature**
90 °C / 300 V

**Test voltage**
Core : core 1500 V
Core : screen 1500 V

**Leoni Industrial Projects**
www.leoni-industrial-projects.com
**ICON Instrumentation Cable**

**EN 50288-7**

Single & Multi-Pair, XLPE-Insulation, Collective Screen, Armour, PVC-Sheath

### Characteristics

- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- For direct burial
- Blue for intrinsically safe systems available

### Technical data

#### Construction

- **Conductor:**
  - Plain annealed copper wire, stranded, size: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²

- **Insulation:**
  - Cross-linked polyethylene XLPE

- **Colour code:**
  - Black / white, continuously numbered on white core (1, 2, 3...) for multi-element

- **Wrapping:**
  - At least 1 layer of plastic tape

- **Collective screen:**
  - Aluminium / PETP tape over tinned copper drain wire

- **Inner sheath:**
  - Polyvinyl chloride PVC, black

- **Armour:**
  - Galvanised steel wire braid, opt. coverage 80% (min.)

- **Outer sheath:**
  - Polyvinyl chloride PVC, black, blue for intrinsically safe systems

#### Flame propagation

- Test on single cable
- IEC 60332-1-2

- Test on bunched cables
- IEC 60332-3-24 (Cat. C)

- Limiting Oxygen Index (LOI)
- ASTM D 2863 (min. 30 %)

- Flammability temperature (FT)
- ISO 4589-3 ann. A (min. +250 °C)

- Amount of halogen acid gas
- IEC 60754-1 (max. 23 %)

- Oil resistance
- ICEA S-73-532

- Sunlight resistance
- UL 1581 section 1200

#### Technical data

- **Temperature range:**
  - -30 °C up to +90 °C (during operation)
  - -5 °C up to +50 °C (during installation)

- **Minimum bending radius:**
  - 10 x cable diameter

### Cable marking

- **LEONI KERPEN ICON BASE 10120 M1 OS SIZE 300 V RP**

### Electrical Properties at 20 °C

#### Conductor cross-section

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<tr>
<th>Conductor cross-section</th>
<th>nom. 0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.3 mm²</th>
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#### Test voltage (U) (core : core)

| Test voltage (U) (core : core) | 1500 V |

#### Test voltage (U) (core : screen)

| Test voltage (U) (core : screen) | 1500 V |

#### Operating voltage

| Operating voltage | 300 V |
**ICON Instrumentation Cable**

**EN 50288-7**

**Multi-Pair, XLPE-Insulation, Individual & Collective Screen, Armour, PVC-Sheath**

**Characteristics**

- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- For direct burial
- Blue for intrinsically safe systems available

**Technical data**

- **Flame propagation**
  - Test on single cable: IEC 60332-1-2
  - Test on bunched cables: IEC 60332-3-24 (Cat. C)

- **Limiting Oxygen Index (LOI)**: ASTM D 2863 (min. 30 %)
- **Flammability temperature (FT)**: ISO 4589-3 ann. A (min. +250 °C)
- **Amount of halogen acid gas**: IEC 60754-1 (max. 23 %)
- **Oil resistance**: ICEA S-73-532
- **Sunlight resistance**: UL 1581 section 1200

**Construction**

- **Conductor**: plain annealed copper wire, stranded, size:
  - 0.5 mm², 0.75 mm², 1 mm², 1.3 mm²,
  - 1.5 mm², 2.5 mm²
- **Insulation**: cross-linked polyethylene XLPE
- **Colour code**: black / white, continuously numbered on white core (1, 2, 3...) for multi-element
- **Individual screen**: aluminium / PETP tape over tinned copper drain wire, plastic tape under and above screen
- **Wrapping**: at least 1 layer of plastic tape
- **Collective screen**: aluminium / PETP tape over tinned copper drain wire
- **Inner sheath**: polyvinyl chloride PVC, black
- **Armour**: galvanized steel wire braid, opt. coverage 80% (min.)
- **Outer sheath**: polyvinyl chloride PVC, black, blue for intrinsically safe systems

**Electrical Properties at 20 °C**

<table>
<thead>
<tr>
<th>Conductor cross-section</th>
<th>nom. 0.5 mm²</th>
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**ICON Instrumentation Cable** EN 50288-7

**Characteristics**

- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- for direct burial
- blue for intrinsically safe systems available.

**Technical data**

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<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
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<td>300 V</td>
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**Construction**

- Conductor: plain annealed copper wire, stranded, size:
  - 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- Insulation: cross-linked polyethylene XLPE
- Colour code: black / white / red, continuously numbered on white core (1, 2, 3, ...) for multi-element
- Collective screen: aluminium / PETP tape over tinned copper drain wire
- Inner sheath: polyvinyl chloride PVC, black
- Armour: galvanised steel wire braid, opt. coverage 80% (min.)
- Outer sheath: polyvinyl chloride PVC, black, blue for intrinsically safe systems

**Electrical Properties at 20 °C**

- Conductor cross-section: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- Conductor resistance: max. 16.7 Ω/km, 13.8 Ω/km, 12.5 Ω/km, 11.2 Ω/km, 10.0 Ω/km, 7.8 Ω/km
- Insulation resistance: max. 5000 MΩ/km, 5000 MΩ/km, 5000 MΩ/km, 5000 MΩ/km, 5000 MΩ/km, 5000 MΩ/km
- Mutual capacitance: max. 150 nF/km, 150 nF/km, 150 nF/km, 150 nF/km, 150 nF/km, 150 nF/km
- Inductance: max. 1 mH/km, 1 mH/km, 1 mH/km, 1 mH/km, 1 mH/km, 1 mH/km
- Test voltage: 1500 V, 1500 V, 1500 V, 1500 V, 1500 V, 1500 V
- Operating voltage: 300 V

**Cable marking**

LEONI KERPEN ICON BASE 10120 M1 OS SIZE 300 V RP
EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING
**ICON Instrumentation Cable**  
**EN 50288-7**  
Multi-Triple, Individual & Collective Screen, Armour, PVC-Sheath

### Characteristics
- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- For direct burial
- Blue for intrinsically safe systems available

### Construction
- **Conductor**: plain annealed copper wire, stranded, size:
  - 0.5 mm², 0.75 mm², 1 mm², 1.3 mm²,
  - 1.5 mm², 2.5 mm²
- **Insulation**: cross-linked polyethylene XLPE
- **Colour code**: black / white / red, continuously numbered on white core (1, 2, 3, …) for multi-element screen
- **Individual screen**: aluminium / PETP tape over tinned copper drain wire, plastic tape under and above screen
- **Wrapping**: at least 1 layer of plastic tape
- **Collective screen**: aluminium / PETP tape over tinned copper drain wire
- **Inner sheath**: polyvinyl chloride PVC, black
- **Armour**: galvanised steel wire braid, opt. coverage 80% (min.)
- **Outer sheath**: polyvinyl chloride PVC, black, blue for intrinsic safe systems

### Technical data
- **Temperature range**:
  - (during operation) -30 °C up to +90 °C
  - (during installation) -5 °C up to +50 °C
- **Minimum bending radius**: 10 x cable diameter

### Cable marking
LEONI KERPEN ICON BASE 10120 M1 IS/OS 90 °C / 300 V RP  
EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

### Electrical Properties at 20 °C

<table>
<thead>
<tr>
<th>Conductor cross-section</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor resistance</td>
<td>max</td>
<td>36.7Ω/km</td>
<td>25.0Ω/km</td>
<td>18.5Ω/km</td>
<td>14.2Ω/km</td>
<td>12.3Ω/km</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>min</td>
<td>5000 MΩ/km</td>
<td>5000 MΩ/km</td>
<td>5000 MΩ/km</td>
<td>5000 MΩ/km</td>
<td>5000 MΩ/km</td>
</tr>
<tr>
<td>Mutual capacitance</td>
<td>max</td>
<td>150 nF/km</td>
<td>150 nF/km</td>
<td>150 nF/km</td>
<td>150 nF/km</td>
<td>150 nF/km</td>
</tr>
<tr>
<td>Inductance</td>
<td>max</td>
<td>1 mH/km</td>
<td>1 mH/km</td>
<td>1 mH/km</td>
<td>1 mH/km</td>
<td>1 mH/km</td>
</tr>
<tr>
<td>DC voltage Uₑₑₑₑₑₑ (core : core)</td>
<td>max</td>
<td>25 µA/Ω</td>
<td>25 µA/Ω</td>
<td>25 µA/Ω</td>
<td>25 µA/Ω</td>
<td>25 µA/Ω</td>
</tr>
<tr>
<td>DC voltage Uₑₑₑₑₑₑ (core : screen)</td>
<td>max</td>
<td>40 µA/Ω</td>
<td>40 µA/Ω</td>
<td>40 µA/Ω</td>
<td>40 µA/Ω</td>
<td>40 µA/Ω</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>max</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
<td>300 V</td>
</tr>
</tbody>
</table>
ICON Instrumentation Cable
EN 50288-7
Single & Multi-Pair, XLPE-Insulation, Collective Screen, Armour, PVC-Sheath

**Characteristics**
- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- For direct burial
- Blue for intrinsically safe systems available

**Construction**
- **Conductor**
  - Plain annealed copper wire, stranded: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- **Insulation**
  - Cross-linked polyethylene XLPE
- **Colour code**
  - Black / white, continuously numbered on white core (1, 2, 3, ...) for multi-element
- **Wrapping**
  - At least 1 layer of plastic tape
- **Collective screen**
  - Aluminium / PETP tape over tinned copper drain wire
- **Inner sheath**
  - Polyvinyl chloride PVC, black
- **Armour**
  - Double layer of galvanised steel tapes
- **Outer sheath**
  - Polyvinyl chloride PVC, black, blue for intrinsically safe systems

**Technical data**
- **Temperature range**
  - -30 °C up to +90 °C (during operation)
  - -5 °C up to +50 °C (during installation)
- **Minimum bending radius**
  - 10 x cable diameter

**Cable marking**
LEONI KERPEN ICON BASE 10130 M1 OS SIZE 300 V RP
EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

**Electrical Properties at 20 °C**
- **Conductor cross-section**
  - Num. 0.5 mm² 0.75 mm² 1 mm² 1.3 mm² 1.5 mm² 2.5 mm²
  - **Conductor resistance**
    - Max. 36.7 Ω/km 25.0 Ω/km 18.5 Ω/km 14.2 Ω/km 12.3 Ω/km 7.6 Ω/km
  - **Insulation resistance**
    - Min. 5000 MΩ x km
  - **Mutual capacitance**
    - Max. 150 nF/km
  - **Inductance**
    - Max. 1 mH/km
  - **Capacitance unbalance**
    - Max. 500 pF/500 m
  - **L/R ratio**
    - Max. 25 μH/Ω 40 μH/Ω 60 μH/Ω
  - **Test voltage (u₀ - u₀) (core : core)**
    - 1500 V
  - **Test voltage (u₀ - screen)**
    - 1500 V
  - **Operating voltage**
    - 300 V
ICON Instrumentation Cable  EN 50288-7
Multi-Pair, XLPE-Insulation, Individual & Collective Screen, Armour, PVC Sheath

Characteristics
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- for direct burial
- blue for intrinsically safe systems available

ICON Base 10130 M1 IS/OS  90 °C / 300 V

Conductor
plain annealed copper wire, stranded, size:
- 0.5 mm², 0.75 mm², 1 mm², 1.3 mm²,
- 1.5 mm², 2.5 mm²

Insulation
cross-linked polyethylene XLPE

Colour code
black / white, continuously numbered on white core (1, 2, 3...) for multi-element

Individual screen
aluminium / PETP tape over tinned copper drain wire, plastic tape under and above screen

Wrapping
at least 1 layer of plastic tape

Collective screen
aluminium / PETP tape over tinned copper drain wire

Inner sheath
polyvinyl chloride PVC, black

Armour
double layer of galvanized steel tapes

Outer sheath
polyvinyl chloride PVC, black, blue for intrinsically safe systems

Technical data
Flame propagation
- Test on single cable
- Test on bunched cables
Reducing Oxygen Index (LOI) ASTM D 2863 (min. 30 %)
Flammability temperature (FT) ISO 4589-3 ann. A (min. +250 °C)
Amount of halogen acid gas IEC 60754-1 (max. 23 %)
Oil resistance ICEA S-73-532
Sunlight resistance UL 1581 section 1200
Temperature range
-30 °C up to +90 °C (during operation)
-5 °C up to +50 °C (during installation)

Minimum bending radius
10 x cable diameter

Cable marking
LEONI KERPEN ICON BASE 10130 M1 IS/OS SIZE 300 V RP
EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

Electrical Properties at 20 °C
Conductor cross-section nom. 0.5 mm² 0.75 mm² 1 mm² 1.3 mm² 1.5 mm² 2.5 mm²
Conductor resistance max. 10.7 Ω/km 9.0 Ω/km 7.8 Ω/km 14.2 Ω/km 13.0 Ω/km 7.6 Ω/km
Insulation resistance min. 500 MΩ x km
Mutual capacitance max. 150 nF/km
Inductance max. 1 mH/km
D/C ratio max. 1:4
Test voltage U_{L0} (bare - core) 1500 V
Test voltage U_{L0} (bare - screen) 1500 V
Operating voltage 300 V

Part number
Approx. Width Approx. Height Approx. Depth Length Approx. Port number
0.5 mm²/7 0.35 1.0 6.9 0.2 1.4 12.5 245 LKX 7794 E196 0000
0.75 mm²/7 0.35 1.0 7.1 0.2 1.4 13.3 245 LKX 7794 E226 0000
1 mm²/7 0.39 1.0 8.4 0.2 1.4 14.6 272 LKX 7794 E256 0000
1.3 mm²/7 0.35 1.1 11.6 0.2 1.4 15.2 310 LKX 7794 E286 0000
1.5 mm²/7 0.35 1.1 12.0 0.2 1.5 15.8 341 LKX 7794 E316 0000

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ICON Instrumentation Cable  
EN 50288-7
Single & Multi-Triple, XLPE-Insulation, Collective Screen, Armour, PVC Sheath

Characteristics
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- for direct burial
- blue for intrinsically safe systems available

ICON Base 10130 M1 OS  
90 °C / 300 V

Construction
- Conductor: plain annealed copper wire, stranded, size:
  - 0.5 mm², 0.75 mm², 1 mm², 1.3 mm²,
  - 1.5 mm², 2.5 mm²
- Insulation: cross-linked polyethylene XLPE
- Colour code: black / white / red, continuously numbered
- Wrapping: at least 1 layer of plastic tape
- Collective screen: aluminium / PETP tape over tinned copper drain wire
- Armour: double layer of galvanised steel tapes
- Outer sheath: polyvinyl chloride PVC, black, blue for intrinsically safe systems

Technical data
- Flame propagation
  - Test on single cable: IEC 60332-1-2
  - Test on bunched cables: IEC 60332-3-24 (Cat. C)
- Limiting Oxygen Index (LOI): ASTM D 2863 (min. 30 %)
- Flammability temperature (FT): ISO 4589-3 ann. A (min. +250 °C)
- Amount of halogen acid gas: IEC 60754-1 (max. 23 %)
- Oil resistance: ICEA S-73-532
- Sunlight resistance: UL 1581 section 1200
- Temperature range:
  - -30 °C up to +90 °C (during operation)
  - -5 °C up to +50 °C (during installation)
- Minimum bending radius: 10 x cable diameter

Cable marking
LEONI KERPEN ICON BASE 10130 M1 OS SIZE 300 V RP
EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

Electrical Properties at 20 °C
<table>
<thead>
<tr>
<th>Conductor cross-section</th>
<th>nom. 0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
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</thead>
<tbody>
<tr>
<td>Conductor resistance</td>
<td>max. 16.7 Ω/km</td>
<td>25 Ω/km</td>
<td>16.5 Ω/km</td>
<td>14.2 Ω/km</td>
<td>12.5 Ω/km</td>
<td>7.6 Ω/km</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>max. 5000 MΩ x km</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mutual capacitance</td>
<td>max. 150 nF/km</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inductance</td>
<td>max. 1 mH/km</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U0 (core : core)</td>
<td>max. 35 μV/Ω</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Test voltage U0 (core)</td>
<td>1500 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test voltage U0 (screen)</td>
<td>1500 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part number

<table>
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<th>Conductor size</th>
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<tbody>
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<td>0.5 mm²</td>
<td>1</td>
</tr>
<tr>
<td>0.75 mm²</td>
<td>4</td>
</tr>
<tr>
<td>1 mm²</td>
<td>12</td>
</tr>
<tr>
<td>1.3 mm²</td>
<td>10</td>
</tr>
<tr>
<td>1.5 mm²</td>
<td>4</td>
</tr>
<tr>
<td>2.5 mm²</td>
<td>4</td>
</tr>
</tbody>
</table>

LEONI industrial projects
ICON Instrumentation Cable

EN 50288-7

Multi-Triple, XLPE-Insulation, Individual & Collective Screen, Armour, PVC-Sheath

Characteristics

- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- for direct burial
- blue for intrinsically safe systems available

Construction

Conductor: plain annealed copper wire, stranded, size:
- 0.5 mm², 0.75 mm², 1 mm², 1.3 mm²,
- 1.5 mm², 2.5 mm²

Insulation: cross-linked polyethylene XLPE

Colour code:
- black / white / red, continuously numbered
- on white core (1, 2, 3...) for multi-element

Individual screen: aluminium / PETP tape over tinned copper drain wire, plastic tape under and above screen

Wrapping: at least 1 layer of plastic tape

Collective screen: aluminium / PETP tape over tinned copper drain wire

Inner sheath: polyvinyl chloride PVC, black

Armour: double layer of galvanised steel tapes

Outer sheath: polyvinyl chloride PVC, black, blue for intrinsically safe systems

Technical data

Flame propagation
- Test on single cable
  IEC 60332-1-2
- Test on bunched cables
  IEC 60332-3-24 (Cat. C)

Limiting Oxygen Index (LOI): ASTM D 2863 (min. 30 %)

Flammability temperature (FT): ISO 4589-3 ann. A (min. +250 °C)

Amount of halogen acid gas: IEC 60754-1 (max. 23 %)

Oil resistance: ICEA S-73-532

Sunlight resistance: UL 1581 section 1200

Temperature range:
- -30 °C up to +90 °C (during operation)
- -5 °C up to +50 °C (during installation)

Minimum bending radius: 10 x cable diameter

Cable marking

LEONI KERPEN ICON BASE 10130 M1 IS/OS SIZE 300 V RP
EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

Electrical Properties at 20 °C

<table>
<thead>
<tr>
<th>Conductor cross-section</th>
<th>mm²</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor resistance</td>
<td>max.</td>
<td>36.7 Ω/km</td>
<td>25.0 Ω/km</td>
<td>18.5 Ω/km</td>
<td>14.2 Ω/km</td>
<td>12.3 Ω/km</td>
<td>7.6 Ω/km</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>min.</td>
<td>5000 MΩ</td>
<td>5000 MΩ</td>
<td>5000 MΩ</td>
<td>5000 MΩ</td>
<td>5000 MΩ</td>
<td>5000 MΩ</td>
</tr>
<tr>
<td>Mutual capacitance</td>
<td>max.</td>
<td>550 nF/km</td>
<td>550 nF/km</td>
<td>550 nF/km</td>
<td>550 nF/km</td>
<td>550 nF/km</td>
<td>550 nF/km</td>
</tr>
<tr>
<td>Inductance</td>
<td>max.</td>
<td>1 mH/km</td>
<td>1 mH/km</td>
<td>1 mH/km</td>
<td>1 mH/km</td>
<td>1 mH/km</td>
<td>1 mH/km</td>
</tr>
<tr>
<td>Test voltage Uₘₐₓ (core - core)</td>
<td>Max.</td>
<td>3000 V</td>
<td>3000 V</td>
<td>3000 V</td>
<td>3000 V</td>
<td>3000 V</td>
<td>3000 V</td>
</tr>
<tr>
<td>Test voltage Uₘₐₓ (core - screen)</td>
<td>Max.</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
</tr>
<tr>
<td>Operating voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>300 V</td>
</tr>
</tbody>
</table>
Instrumentation control cables

Instrumentation control cables of this section consist of conductors in cores. All cables have an overall screen, a PVC sheath and are rated 500 V.

Constructions with blue outer sheath for intrinsically safe applications are available on request.

Regarding direct burial installation please note possible additional local and legal requirements.
ICON Instrumentation Control Cable
EN 50288-7
Multi-Core, PVC-Insulation, Collective Screen, PVC-Sheath

**Construction**
- Conductor: plain annealed copper wire, stranded, size:
  - 0.5 mm², 0.75 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- Insulation: polyvinyl chloride PVC
- Colour code: black
- Collective screen: aluminium / PETP tape over tinned copper
- Wrapping: at least 1 layer of plastic tape
- Outer sheath: polyvinyl chloride PVC, black, blue for intrinsically safe systems

**Technical data**
- Flame propagation: IEC 60332-1-2
- Test on single cable: IEC 60332-3-24 (Cat. C)
- Limiting Oxygen Index (LOI): ASTM D 2863 (min. 30 %)
- Limiting Oxygen Index (LOI): ISO 4589-3 ann. A (min. +250 °C)
- Temperature range: -30 °C up to +70 °C
- Minimum bending radius: 7.5 x cable diameter
- Flammability temperature (FT): ISO 4589-3 ann. A
- Limiting Oxygen Index (LOI): ASTM D 2863 (min. 30 %)
- Flame propagation: IEC 60332-1-2
- Limiting Oxygen Index (LOI): ASTM D 2863 (min. 30 %)
- Flame propagation: IEC 60332-1-2

**Electrical Properties at 20 °C**
- Operating voltage: 500 V
- Test voltage: 500 V
- Test voltage: 1500 V
- Test voltage: 2000 V
- Test voltage: 2500 V
- Test voltage: 3000 V
- Test voltage: 3500 V
- Test voltage: 4000 V
- Test voltage: 4500 V
- Test voltage: 5000 V

**Characteristics**
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- not for direct burial
- blue for intrinsically safe systems available
ICON Instrumentation Control Cable  
EN 50288-7

Multi-Core, XLPE-Insulation, Collective Screen, PVC-Sheath

**Construction**
- Conductor: plain annealed copper wire, stranded, size:
  - 0.5 mm², 0.75 mm², 1.0 mm², 1.3 mm², 1.5 mm², 2.5 mm²
- Insulation: cross-linked polyethylene XLPE
- Colour code: black, continuously numbered
- Wrapping: at least 1 layer of plastic tape
- Collective screen: aluminium / PETP tape over tinned copper drain wire
- Outer sheath: polyvinyl chloride PVC, black, blue for intrinsically safe systems

**Technical data**
- Flame propagation: IEC 60332-1-2
- Oil resistance: UL 1581 section 1200
- Sunlight resistance: UL 1581 section 1200
- Limiting Oxygen Index: ASTM D 2863 (min. 30 %)
- Inflammability temperature (FT): ISO 4589-3 ann. A (min. +250 °C)
- Reduced flame propagation
- Sunlight resistant
- Indoor and outdoor installation
- Not for direct burial

**Electrical Properties at 20 °C**
- Conductor resistance: max. 0.44 Ω/km 0.44 Ω/km 0.44 Ω/km 0.44 Ω/km 0.44 Ω/km 0.44 Ω/km
- Insulation resistance: min. 5000 MΩ x km
- Inductance: max. 0.09 mH/km
- L/R ratio: max. 21.3 μH/Ω
- Test voltage (U): 2000 V
- Test voltage (U): 2000 V
- Operating voltage: 500 V

**Characteristics**
- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- Not for direct burial
- Blue for intrinsically safe systems available

**Cable marking**
- LEONI KERPEN ICON BASE 10100 M1 OS SIZE 500 V BP
- EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING

**Table**

<table>
<thead>
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<th>min.</th>
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<th>approx.</th>
<th>approx.</th>
<th>approx.</th>
<th>Part number</th>
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<td>1.3 mm²</td>
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<td>2.5 mm²</td>
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<tr>
<td>2</td>
<td>0.44</td>
<td>0.9</td>
<td>1.1</td>
<td>1.3</td>
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<td>1.3</td>
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<td>1.7</td>
<td>2.1</td>
<td>2.5</td>
<td>7128 C090</td>
</tr>
</tbody>
</table>

**Electrical Properties at 20 °C**

<table>
<thead>
<tr>
<th></th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1.0 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductors</td>
<td>0.44 Ω/km</td>
<td>0.44 Ω/km</td>
<td>0.44 Ω/km</td>
<td>0.44 Ω/km</td>
<td>0.44 Ω/km</td>
<td>0.44 Ω/km</td>
</tr>
<tr>
<td>Insulation</td>
<td>5000 MΩ x km</td>
<td>5000 MΩ x km</td>
<td>5000 MΩ x km</td>
<td>5000 MΩ x km</td>
<td>5000 MΩ x km</td>
<td>5000 MΩ x km</td>
</tr>
<tr>
<td>Inductance</td>
<td>0.09 mH/km</td>
<td>0.09 mH/km</td>
<td>0.09 mH/km</td>
<td>0.09 mH/km</td>
<td>0.09 mH/km</td>
<td>0.09 mH/km</td>
</tr>
<tr>
<td>L/R ratio</td>
<td>21.3 μH/Ω</td>
<td>21.3 μH/Ω</td>
<td>21.3 μH/Ω</td>
<td>21.3 μH/Ω</td>
<td>21.3 μH/Ω</td>
<td>21.3 μH/Ω</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>500 V</td>
<td>500 V</td>
<td>500 V</td>
<td>500 V</td>
<td>500 V</td>
<td>500 V</td>
</tr>
</tbody>
</table>
## ICON Instrumentation Control Cable  
**EN 50288-7**  
**Multi-Core, PVC-Insulation, Collective Screen, Armour, PVC-Sheath**

### Construction
- **Conductor**: plain annealed copper wire, stranded, size: 0.5 mm², 0.75 mm², 1.0 mm², 1.5 mm², 2.5 mm².
- **Insulation**: polyvinyl chloride PVC.
- **Colour code**: black, continuously numbered.
- **Wrapping**: at least 1 layer of plastic tape.
- **Collective screen**: aluminium / PETP tape over tinned copper drain wire.
- ** Armour**: galvanised round steel wires.
- **Outer sheath**: polyvinyl chloride PVC, black, for intrinsically safe systems.

### Technical data
- **Flame propagation**: IEC 60332-1-2
- **Mutual capacitance**: max. 250 nF/km
- **Insulation resistance**: min. 100 MΩ x km
- **Conductor resistance**: max. 36.0 Ω/km, 24.5 Ω/km, 18.1 Ω/km, 13.9 Ω/km, 12.1 Ω/km, 7.4 Ω/km
- **Conductor cross-section**: nom. 0.5 mm², 0.75 mm², 1.0 mm², 1.3 mm², 1.5 mm², 2.5 mm².

### Electrical Properties at 20 °C

<table>
<thead>
<tr>
<th>Conductor cross-section</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1.0 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
<th>2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. Insulation resistance</td>
<td>16.0 Ω/km</td>
<td>24.1 Ω/km</td>
<td>18.1 Ω/km</td>
<td>13.9 Ω/km</td>
<td>12.1 Ω/km</td>
<td>7.4 Ω/km</td>
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<tr>
<td>min. Insulation resistance</td>
<td>16.5 Ω/km</td>
<td>24.5 Ω/km</td>
<td>18.6 Ω/km</td>
<td>14.0 Ω/km</td>
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<td>7.9 Ω/km</td>
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<tr>
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<td>3 nH/m</td>
<td>3 nH/m</td>
<td>3 nH/m</td>
<td>3 nH/m</td>
<td>3 nH/m</td>
<td>3 nH/m</td>
</tr>
<tr>
<td>min. Inductance</td>
<td>3 nH/m</td>
<td>3 nH/m</td>
<td>3 nH/m</td>
<td>3 nH/m</td>
<td>3 nH/m</td>
<td>3 nH/m</td>
</tr>
<tr>
<td>L/R ratio</td>
<td>max. 25 µH/Ω</td>
<td>25 µH/Ω</td>
<td>25 µH/Ω</td>
<td>25 µH/Ω</td>
<td>25 µH/Ω</td>
<td>25 µH/Ω</td>
</tr>
</tbody>
</table>

- **Test voltage Uₕ**: 2000 V
- **Test voltage Uₕ base - screen**: 2000 V
- **Operating voltage**: 500 V

## Characteristics
- reduced flame propagation
- oil resistant
- sunlight resistant
- indoor and outdoor installation
- on racks, trays, in conduits
- for direct burial
- blue for intrinsically safe systems available

## Laboratory Tests
- **FT**: ISO 4589-3 ann. A (min. +250 °C)
- **LOI**: ASTM D 2863 (min. 30 %)
- **Test on bunched cables**: IEC 60332-3-24 (Cat. C)  
  - **Test on single cable**: IEC 60332-1-2
- **Sunlight resistance**: UL 1581 section 1200
- **Oil resistance**: ICEA S-73-532
- **Amount of halogen acid gas**: IEC 60754-1 (max. 17 %)

## Cable marking
**LEONI KERPEN ICON BASE 10210 M0 OS SIZE 500 V RP EN50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING**
ICON Instrumentation Control Cable  
EN 50288-7
Multi-Core, XLPE-Insulation, Collective Screen, Armour, PVC-Sheath

**Technical data**

- **Construction**
  - Conductor: Plain annealed copper wire, stranded: 0.5 mm², 0.75 mm², 1.0 mm², 1.3 mm², 1.5 mm², 2.5 mm²
  - Insulation: Cross-linked polyethylene XLPE
  - Colour code: Black, continuously numbered
  - Armour: Galvanised round steel wires
  - Outer sheath: Polyvinyl chloride, black, for intrinsically safe systems
  - Collective screen: Aluminium / PETP tape over tinned copper wire, Wrapping at least 1 layer of plastic tape

- **Characteristics**
  - Limiting Oxygen Index (LOI): ISO 2883 (min. 30 %)
  - Flammability temperature (FT): ISO 4589-3 ann. A (min. +250 °C)
  - Inertness: UL 1581 section 1200
  - Amount of halogen acid gas: IEC 60754-1 (max. 23 %)

- **Electrical Properties at 20 °C**
  - Conductor cross-section: 0.5 mm², 0.75 mm², 1.0 mm², 1.3 mm², 1.5 mm², 2.5 mm²
  - Conductor resistance: max. 16.0 Ω/km, 18.1 Ω/km, 19.0 Ω/km, 21.3 Ω/km, 27.4 Ω/km
  - Insulation resistance: min. 5000 MΩ x km
  - Inductance: max. 3 mH/km
  - L/R ratio: max. 25 μH/Ω
  - Test voltage Uₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑᵉ 1000 V
  - Test voltage Uₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑᵉ: 2000 V
  - Operating voltage: 500 V

**Cable marking**

- LEONI KEREN: ICON BASE 10110 M1 OS SIZE 500 V RP
- EN 50288-7 CE PRODUCTION LOT CODE YEAR LENGTH MARKING
- Part number

---

**Base 10110 M1 OS**

- **90 °C / 500 V**
- **Inductance max. 1 mH/km**
- **Mutual capacitance max. 150 nF/km**
- **Insulation resistance min. 5000 MΩ x km**
- **L/R ratio max. 25 μH/Ω 40 μH/Ω 60 μH/Ω**
- **Test voltage Uₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑᵉ 1200 V**
- **Test voltage Uₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑᵉ: 2000 V**
- **Operating voltage: 500 V**

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**Base 10110 M1 OS 105 °C / 500 V**

- **Inductance max. 1.3 mH/km**
- **Mutual capacitance max. 200 nF/km**
- **Insulation resistance min. 10000 MΩ x km**
- **L/R ratio max. 35 μH/Ω 50 μH/Ω 70 μH/Ω**
- **Test voltage Uₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑᵉ 1200 V**
- **Test voltage Uₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑᵉ: 2000 V**
- **Operating voltage: 500 V**

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**Base 10110 M1 OS 90 °C / 500 V**

- **Inductance max. 1 mH/km**
- **Mutual capacitance max. 150 nF/km**
- **Insulation resistance min. 5000 MΩ x km**
- **L/R ratio max. 25 μH/Ω 40 μH/Ω 60 μH/Ω**
- **Test voltage Uₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₜ**: 1200 V
- **Test voltage Uₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑₑᵉ: 2000 V
- **Operating voltage: 500 V**
Thermocouple extension & compensating cables

Thermocouple extension & compensating cables of this section consist of conductors grouped in pairs and are based on thermocouple type KX according to IEC 60584.

Cables with other types of thermocouple materials, constructions with screened pairs and cables with blue marked outer sheath for intrinsically safe applications are available on request.

Regarding direct burial installation please note possible additional local and legal requirements.
**ICON Thermocouple Cable EN 50288-7**

**Single & Multi-Pair, XLPE-Insulation, Collective Screen, PVC-Sheath**

### Characteristics
- Reduced flame propagation
- Oil resistant
- Sunlight resistant
- Indoor and outdoor installation
- On racks, trays, in conduits
- Not for direct burial
- Blue for intrinsically safe systems available

### Technical data

#### Construction
- **Conductor**: Thermocouple conductor, solid, size: 0.5 mm², 0.75 mm², 1 mm², 1.3 mm², 1.5 mm².
- **Conductor description**: Type KX, class 2, according to IEC 60584, (+) Nickel/Chromium, (-) Nickel/Aluminium.
- **Tolerance**: ± 100 μV / ± 2.5 °C, -25 °C to +200 °C.
- **Insulation**: Cross-linked polyethylene XLPE.
- **Colour code**: (+) Leg green, (-) Leg white, continuously numbered on + core (1, 2...) for multipairs.
- **Wrapping**: At least 1 layer of plastic tape.
- **Collective screen**: Aluminium / PETP tape over tinned copper drain wire.
- **Outer sheath**: Polyvinyl chloride PVC, green, blue for intrinsically safe systems.

#### Flame propagation
- Test on single cable IEC 60332-1-2
- Test on bunched cables IEC 60332-3-24 (Cat. C)

#### Limiting Oxygen Index (LOI)
ASTM D 2863 (min. 30 %)

#### Flammability temperature (FT)
ISO 4589-3 ann. A (min. +250 °C)

#### Amount of halogen acid gas
IEC 60754-1 (max. 23 %)

#### Oil resistance
ICEA S-73-532

#### Sunlight resistance
UL 1581 section 1200

#### Technical data
- **Temperature range**
  - During operation: -30 °C up to +90 °C
  - During installation: -5 °C up to +50 °C
- **Minimum bending radius**: 7.5 x cable diameter

#### Cable marking
LEONI KERPEN ICON BASE 14100 M1 OS SIZE KX 90 °C / 300 V RP

### Electrical Properties at 20 °C

<table>
<thead>
<tr>
<th>Conductor cross-section</th>
<th>nom.</th>
<th>0.5 mm²</th>
<th>0.75 mm²</th>
<th>1 mm²</th>
<th>1.3 mm²</th>
<th>1.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor resistance (loop)</td>
<td>approx.</td>
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<td>1232</td>
<td>767</td>
<td>469</td>
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<tr>
<td>Insulation resistance</td>
<td>max.</td>
<td>5000 MΩ / km</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mutual capacitance</td>
<td>max.</td>
<td>150 nF/km</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Capacitance unbalance</td>
<td>max.</td>
<td>500 pF/500 m</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Test voltage U_{loop} (base = constant) | 1000 V |
| Test voltage U_{loop} (sine) | 1500 V |
| Operating voltage | 300 V |

### Part numbers and other types of thermocouple cables on request.
ICON Thermocouple Cable

EN 50288-7

Single & Multi-Pair, XLPE-Insulation, Collective Screen, Armour, PVC-Sheath

Technical data

<table>
<thead>
<tr>
<th>Part number</th>
<th>mm</th>
<th>approx.</th>
<th>mm</th>
<th>approx.</th>
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<th>mm</th>
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<tr>
<td></td>
<td>mm</td>
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<tr>
<td>0.5 mm²</td>
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<td>0.26</td>
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<td>0.9</td>
<td>1.3</td>
<td>0.6</td>
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<tr>
<td>1.0 mm²</td>
<td>1</td>
<td>0.26</td>
<td>0.9</td>
<td>1.3</td>
<td>0.9</td>
<td>1.4</td>
<td>1.0</td>
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<td>1.3 mm²</td>
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<td>0.26</td>
<td>1.0</td>
<td>1.4</td>
<td>1.0</td>
<td>1.5</td>
<td>1.1</td>
</tr>
<tr>
<td>1.5 mm²</td>
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<td>0.26</td>
<td>1.0</td>
<td>1.3</td>
<td>1.0</td>
<td>1.3</td>
<td>1.1</td>
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</table>

Electrical Properties at 20 °C

<table>
<thead>
<tr>
<th>Part number</th>
<th>mm</th>
<th>approx.</th>
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<td>mm</td>
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<tr>
<td>1.0 mm²</td>
<td>2</td>
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<td>1.3</td>
<td>1.0</td>
<td>1.3</td>
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<td>1.3</td>
<td>0.9</td>
<td>1.4</td>
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<td>1.3 mm²</td>
<td>3</td>
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<td>1.4</td>
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<td>1.0</td>
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<td>1.0 mm²</td>
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<td>7</td>
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General information

- Thermocouple extension & compensating conductors
- Overview ICON product range
- The EN 50288-7 standard
- Design options and construction details
- Mechanical and chemical protection
- General units
- Stock types list
Table 1: Temperature ranges and tolerances of conductors. Colour codes of insulations and outer sheaths.

<table>
<thead>
<tr>
<th>Type</th>
<th>Thermocouple material</th>
<th>IEC 60584</th>
<th>ASTM E 230</th>
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<tbody>
<tr>
<td>R</td>
<td>Platinum–13 % Rhodium</td>
<td>Copper/Copper-Nickel (Class 1: ±30 μV/±2.5°C)</td>
<td>Copper/Copper-Nickel (±5°C)</td>
</tr>
<tr>
<td>S</td>
<td>Platinum–10 % Rhodium</td>
<td>Copper/Copper-Nickel (Class 1: ±60 μV/±5°C)</td>
<td>Copper/Copper-Nickel</td>
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<tr>
<td>B</td>
<td>Platinum–30 % Rhodium</td>
<td>Copper/Copper-Nickel (±40 μV/±3°C)</td>
<td>Copper-Copper-Copper-Alloy/Nickel-Silicon (±60 μV/±5°C)</td>
</tr>
<tr>
<td>J</td>
<td>Iron–Copper–Nickel</td>
<td>Copper/Copper-Nickel (Class 1: ±85 μV/±5°C)</td>
<td>Copper-Copper-Nickel</td>
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<tr>
<td>T</td>
<td>Copper–Nickel</td>
<td>Copper/Copper-Nickel (Class 1: ±66 μV/±5°C)</td>
<td>Copper-Copper-Nickel</td>
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<tr>
<td>E</td>
<td>Nickel–Chromium–Nickel</td>
<td>Nickel-Chromium/Copper-Nickel (Class 1: ±120 μV/±1.5°C)</td>
<td>Nickel-Chromium/Copper-Nickel</td>
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<tr>
<td>K</td>
<td>Nickel–Chromium–Nickel</td>
<td>Nickel-Chromium/Copper-Nickel (Class 1: ±60 μV/±2.5°C)</td>
<td>Nickel-Chromium/Copper-Nickel</td>
</tr>
<tr>
<td>N</td>
<td>Nickel–Chromium–Silicon</td>
<td>Nickel-Chromium–Silicon (Class 1: ±120 μV/±1.5°C)</td>
<td>Nickel-Chromium–Silicon</td>
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</table>

Table 2: Electrical characteristics of conductors (approx. values).

<table>
<thead>
<tr>
<th>Standard</th>
<th>Code</th>
<th>Volume resistivity</th>
<th>Loop inductance</th>
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</thead>
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<tr>
<td>IEC</td>
<td>RCPA/SPCA</td>
<td>0.017</td>
<td>0.12</td>
</tr>
<tr>
<td>IEC</td>
<td>RPCP/SPCP</td>
<td>0.017</td>
<td>0.12</td>
</tr>
<tr>
<td>ASTM</td>
<td>SPX</td>
<td>0.017</td>
<td>0.12</td>
</tr>
<tr>
<td>IEC</td>
<td>BPC</td>
<td>0.017</td>
<td>0.12</td>
</tr>
<tr>
<td>ASTM</td>
<td>BPX</td>
<td>0.125</td>
<td>0.017</td>
</tr>
<tr>
<td>IEC</td>
<td>JPX</td>
<td>0.12</td>
<td>0.49</td>
</tr>
<tr>
<td>ASTM</td>
<td>JPK</td>
<td>0.12</td>
<td>0.49</td>
</tr>
<tr>
<td>IEC</td>
<td>TPC</td>
<td>0.017</td>
<td>0.49</td>
</tr>
<tr>
<td>ASTM</td>
<td>TPX</td>
<td>0.017</td>
<td>0.49</td>
</tr>
<tr>
<td>IEC</td>
<td>EPX</td>
<td>0.72</td>
<td>0.49</td>
</tr>
<tr>
<td>ASTM</td>
<td>ENX</td>
<td>0.72</td>
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<tr>
<td>IEC</td>
<td>KPX</td>
<td>0.72</td>
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<td>ISA</td>
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<tr>
<td>IEC</td>
<td>NPX</td>
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<tr>
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<td>NPC</td>
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<tr>
<td>ASTM</td>
<td>NNX</td>
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<td>0.34</td>
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</tbody>
</table>

Table 3: Loop resistance at 20 °C (approx. value in Ω/km).

<table>
<thead>
<tr>
<th>Thermocouple material</th>
<th>Conductor material</th>
<th>Conductor size</th>
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<tbody>
<tr>
<td>IEC 60584</td>
<td>ASTM E 230</td>
<td>0.5 mm²</td>
</tr>
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<td>solid</td>
<td>0.8 mm Ø</td>
<td>1.02 mm Ø</td>
</tr>
<tr>
<td>R/S</td>
<td>R/CSC</td>
<td>SX</td>
</tr>
<tr>
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<td>B/C</td>
<td>BX</td>
</tr>
<tr>
<td>B</td>
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<td>J</td>
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</tr>
<tr>
<td>K</td>
<td>KX</td>
<td>KX</td>
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<tr>
<td>K</td>
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</tr>
<tr>
<td>K</td>
<td>KCA</td>
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<tr>
<td>N</td>
<td>NC</td>
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</table>

1. In all standards the basic EMF values of the same thermocouple type are identical.
2. The following standards are identical with the DIN Standard 60584 (DIN 43723) and JIS C 1610 section 1 (Requirements as ANSI MC 61).
## The ICON® product range

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<tr>
<th>Properties</th>
<th>Sheath</th>
<th>PVC</th>
<th>PVC arctic grade</th>
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<th>PE</th>
<th>LSZH</th>
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<td>ICON Chem 30100 M1</td>
<td>ICON Base 10204 M0</td>
<td>ICON Base 10210 M0</td>
<td>ICON Base Pro 60400 M2</td>
<td>ICON Base Pro 60410 M2</td>
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<td>500 MΩ x km</td>
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<td><strong>Temperature range – operation</strong></td>
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</table>
The EN 50288-7 standard

The European standard EN 50288-7 published in September 2005 is the first ever standard governing instrumentation cables for onshore applications to have been prepared by an established international standardisation body.

The following features distinguish this standard from the wide variety of existing product specifications:

- it is complemented by the relevant standards for materials and testing
- it includes a wide range of design options
- it effectively matches design regulations with test requirements

It thus allows consultants, engineers, manufacturers and others to save time and money when

- preparing specifications
- dealing with inquiries, offers and orders
- organizing product programmes

This standard thus enables the user to convert all demands with regard to systems, security, the environment, climate and installation into appropriate products in an efficient way.

The standard has been implemented in the form of national standards by all Cenelec members (28 countries at present). Its future significance is underlined by the fact that all former national standards which conflict with the EN standard had been withdrawn after a transitional period in April 2008 latest.

The EN 50288-7 standard does not comprise specific products; instead it “merely” describes the individual cable elements and their design (including options and the relevant rules), defines materials, dimensions and test requirements and cites the relevant standards.

On the basis of more than thirty years of experience in the international instrumentation cable business, the Business Unit Industrial Projects has seized the opportunity and defined the EN 50288-7-based ICON product programme, which consists of two sections:

“Standard types” and “Customised types”

The “Standard types” section presents a comprehensive range of products of the main types used in the market. A few thousand products are described in detail complete with geometrical data and design data, information on mechanical, thermal and flame behaviour properties and electrical data.

The “Customised types” section gives an overview of the entire range of design options covered by the standard and adds explanations and selection criteria. It thus provides optimum support for selecting and specifying products required. Product documentations and quotations are available on request.
Design options & construction details according to EN 50288-7

**Conductor**
- Copper, plain or tinned
- Conductor sizes: 0.5 mm² up to 2.5 mm²
- Conductor shape: solid, stranded or flexible
- Thermocouple & extension cables

**Insulation**
- PVC, PE (solid and foam), XLPE, PP (solid and foam), zero halogen, flame-retardant compounds
- Additional materials under preparation

**Cabling elements**
- Conductors: solid, stranded, or tinned
- Insulations: plastic, coated or uncoated
- Sheaths: plastic, metallic, or rubberised

**Assembling**
- Directly or in units in concentric layers
- With or without moisture barrier

**Moisture barriers**
- Dry: swellable tapes, and/or cords, swellable powder
- Wet: petrolally filling compound

**Overall screen**
- Plastic laminated metal foil
- Combination of a braid and a foil

Multi-element metallic cables for analogue and digital communication and control systems

**Inner sheath**
- PVC, PE, zero halogen, flame retardant compounds
- Additional materials under preparation

**Bedding**
- Extruded layer of PVC, PE or zero halogen, flame retardant compounds
- Helically applied tape(s)

**Protection against chemicals**
- A) Lead sheath or
- B) Multi layer sheath

**Bedding**
- According to EN 50290-2-22 and 27
- Thickness: depending on diameter under bedding, min. 1.0 mm

**Armour**
- SWA: acc. to EN 10257-1; min. Ø 0.9 mm
- B: min. thickness of brass tape: 0.2 mm a. 0.075 mm resp.
- Q: Filling factor: min. 0.57, wire Ø min. 0.3 mm

**Voltage rating 300 V or 500 V**

**Inner sheath**
- According to EN 50290-2-32 and 27
- Thickness: 0.04 x Ø + 0.7 mm (min. 0.8 mm)

**Bedding**
- According to EN 50290-2-22, 24 and 27
- Thickness: depending on diameter under bedding, min. 1.0 mm

**Armour**
- SWA, acc. to EN 10257-1; min. Ø 0.9 mm
- B: min. thickness of brass tape: 0.2 mm a. 0.075 mm resp.
- Q: Filling factor: min. 0.57, wire Ø min. 0.3 mm

**Conductors**
- According to EN 60228, classes 1, 2 or 5
- Max. conductor resistance for multi-element cables (beside cores)
- Standard value: 2 %
- Thermocouple & extension cables see to IEC 60584-3

**Insulation**
- Acc. to EN 50290-2-21, 23, 25, 26 a. 29
- Concentricity of insulation: min. 75 %
- Min. insulation thickness depending on voltage rating and conductor size
Mechanical and chemical protection

Mechanical protection
The primary purpose of armour is to protect the cable against mechanical damage during installation and operation. The most common armour designs with their most important features are the following:

Armour of galvanised round steel wires
Very good mechanical protection; reasonably good flexibility; suitable for tensile loads; coverage of over 90%.

Armour of galvanised steel wire braid
Lightweight armour to withstand tensile loads; permits the smallest bending radii of all armour designs; used mainly for small cable diameters; a coverage of at least 80% and a wire diameter of 0.3 mm are recommended to achieve sufficient mechanical protection.

Armour of corrugated steel tape
100% covering of the cable assembly; good protection against rodents.

Armour of galvanized steel tapes
Double layer, lapped steel tapes, 100% covering of the cable assembly. Good protection against pressure, impact loads and rodents, not suitable for tensile loads. Best inductive protection of all armours listed.

Chemical protection
If the risk of oil and chemicals affecting the installed cable cannot be excluded this may affect the operation of the cables in long term.

The extent of the risk is determined by type, aggressive nature, condition and quantity of the medium, the duration of immersion and the temperature.

Lead sheath
The safest, though most expensive protection against aromatic hydrocarbons and active chemicals.

Multilayer sheath
Same as lead protection against aromatic hydrocarbons and active chemicals. This design combining aluminium tape and high density polyethylene HDPE sheath with a covering of polyamide PA (Nylon), represents an excellent barrier against penetrating chemicals and can be used as an alternative to lead sheath. Advantage: lighter, smaller diameter.

Oil resistant PVC sheath
In contrast to standard PVC this compound is more resistant to oils and aliphatic hydrocarbons. It passes the oil resistance test according to IEC 60811-2-1.

General units

<table>
<thead>
<tr>
<th>Length</th>
<th>1 mil ((\text{m}^{\circ})) = 0.0254 mm</th>
<th>1 inch ((\text{in}^{\circ})) = 25.4 mm</th>
<th>1 foot ((\text{ft}^{\circ})) = 0.305 m</th>
<th>1 yard (yd) = 0.914 m</th>
<th>1 mile (mi) = 1.61 km</th>
<th>1 statute mile (mi.) = 1.61 km</th>
<th>1 intern. naut. mile (sm) = 1.85 km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>1 cubic inch ((\text{in}^{3})) = 16.39 cm³</td>
<td>1 cubic foot ((\text{ft}^{3})) = 0.0283 m³</td>
<td>1 cubic yard (yd³) = 0.765 m³</td>
<td>1 barrel = 159 l</td>
<td>1 US gallon (US gal) = 3.79 l</td>
<td>1 UK gallon (UK gal) = 4.55 l</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>1 circ. mil (CM) = 0.0005067 mm²</td>
<td>1 MCM = 0.5067 mm²</td>
<td>1 square inch ((\text{in}^{2})) = 645.16 mm²</td>
<td>1 square foot (ft²) = 0.0929 m²</td>
<td>1 square yard (yd²) = 0.836 m²</td>
<td>1 square mile (sq.mi.) = 2.59 m²</td>
<td></td>
</tr>
<tr>
<td>Electrical Unit per length</td>
<td>1 μF per mile = 0.62 μF/km</td>
<td>1 MΩ per mile = 1.62 MΩ km</td>
<td>1 decibel per mile = 0.62 dB/km</td>
<td>1 pf per foot = 3.28 pf/m</td>
<td>1 decibel per 1000 ft. = 3.28 dB/km</td>
<td>1 Ω per 1000 ft. = 3.28 Ω/km</td>
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</tr>
<tr>
<td>Mass</td>
<td>1 ounce (oz) = 0.0284 kg</td>
<td>1 pound-force (lbf) = 4.448 N</td>
<td>1 Brit. ton-force = 9964 N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>1 horsepower (H.P) = 0.746 kW</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>1 lb/ft² (psi) = 0.00693 bar</td>
<td>1 psi = 6.895 N/m²</td>
<td>1 lbf/ft² = 0.00827 bar</td>
<td>1 N/m² = 42.9 N/m²</td>
<td>1 lbf/in² = 0.0000532 bar</td>
<td>1 kPa = 5.33 N/m²</td>
<td>1 kPa = 0.001013 atm</td>
</tr>
<tr>
<td>Energy</td>
<td>1 Brit. therm. unit (BU) = 1053 J</td>
<td>1 Brit. therm. unit = 0.000293 kWh</td>
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<td></td>
<td></td>
<td></td>
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</table>

Abbreviations for multiples and submultiples

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Abridged</th>
<th>Multiple</th>
<th>Submultiple</th>
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<tbody>
<tr>
<td>mark</td>
<td>power</td>
<td>name</td>
<td>mark</td>
</tr>
<tr>
<td>Tera</td>
<td>T</td>
<td>10¹²</td>
<td>billion</td>
</tr>
<tr>
<td>Giga</td>
<td>G</td>
<td>10⁹</td>
<td>milliard</td>
</tr>
<tr>
<td>Mega</td>
<td>M</td>
<td>10⁶</td>
<td>million</td>
</tr>
<tr>
<td>Kilo</td>
<td>k</td>
<td>10³</td>
<td>thousand</td>
</tr>
<tr>
<td>Hekto</td>
<td>h</td>
<td>10²</td>
<td>hundred</td>
</tr>
<tr>
<td>Deka</td>
<td>da</td>
<td>10¹</td>
<td>ten</td>
</tr>
</tbody>
</table>

*In USA 10³ indicates a thousand and 10⁻³ indicates a thousandth.
### Stock types - part numbers

<table>
<thead>
<tr>
<th>Part number, colour</th>
<th>Type</th>
<th>Size</th>
<th>Overall diameter approx. mm</th>
<th>Cable weight approx. kg/km</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single &amp; multi-pair, Single triple, XLPE insulation, collective screen, PVC sheath</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LKX 7128D001 E000 0000</td>
<td>black</td>
<td>1 x 2 x 0.5 mm²/7</td>
<td>5.2</td>
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<tr>
<td>LKX 7128D031 E000 0000</td>
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<td><strong>Single &amp; multi-pair, Single triple, XLPE insulation, collective screen, PVC sheath reinforced</strong></td>
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<td>121</td>
</tr>
<tr>
<td><strong>Multi-pair, XLPE insulation, individual and collective screen, PVC sheath reinforced</strong></td>
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<td></td>
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</tr>
<tr>
<td>LKX 7282E566 E000 0000</td>
<td>black</td>
<td>2 x 2 x 0.5 mm²/7</td>
<td>10.5</td>
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<tr>
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<td>black</td>
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<tr>
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<td>24 x 2 x 1.0 mm²/7</td>
<td>29.4</td>
<td>1125</td>
</tr>
</tbody>
</table>

Available from current production.
Find out more:

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