Low Voltage Aerial Bundled Cable Systems
General

Insulated overhead cable systems have been used in Europe since the late 1950’s. The first European system had a separate catenary wire but later the neutral conductor was modified to act as the messenger as well. This latter type of cable, ABC with messenger was developed by Prysmian Cables and Systems Oy in Finland and is widely used all over the world.

In the late 1960’s a system was developed in which all the phase conductors and the neutral conductor are of the same construction. This type is known as the Four Core System and is also in use in many countries.

Prysmian Cables and Systems Oy has been actively involved in many countries and has modified ABC systems to meet local requirements. The know-how based on long experience is available to all our customers.

Why the ABC system?

An electrical network should satisfy the need for high level of technology and the low cost of the network. In general the network should meet at least the following requirements:

- low cost of total material
- low cost of labour
- low cost of installation
- low cost of annual operation and maintenance
- low cost of later extension
- high reliability
- low cost of achieving safety and technical requirements
- low cost of total investment
- minimal cost of line route clearing
- minimum number of accessories and tools

To meet the above requirements Prysmian has developed a total and comprehensive electrification system, the ABC system.

The complete system consist of ABC cable, accessories and tools for installation.

The ABC system is used world wide (Europe, the Middle East, Africa, Asia, Central and South America).
Product inspection

To secure the highest quality of the ABC-cable through the whole production, each drum is inspected after finishing.

Each finished production length (each drum) is immersed in water for at least 10 minutes before the voltage test. Then the AC-test voltage is connected for 5 minutes between each insulated conductor and water.

During the test no break-down should occur. This guarantees that there is no hole in core insulations, and the cable is safe for installation.

Our quality consciousness has resulted in us receiving an ISO 9001 certificate from Lloyd’s Register Quality Assurance Limited in 1992, latest renewal in 2007.

In acknowledgement of our contribution to environmental issues, we have been awarded an ISO 14001 Certificate of Approval in 1998, latest renewal in 2007.

Recently, our commitment to safety has resulted in us receiving the certificate on our safety management system according to OHSAS 18001.
AMKA-T

CONSTRUCTION

Phase conductor

Round, stranded and compacted aluminium conductor

Street lighting conductor

Maximum two optional conductors
16 mm²: Round and solid or round, stranded and compacted aluminium conductor
25 mm²: Round, stranded and compacted aluminium conductor

Messenger

Bare, round, stranded and compacted aluminium alloy conductor
or
Insulated, round, stranded and uncompacted aluminium alloy conductor (U/I)

Insulation

Extruded black weather-resistant HDPE

Design

The cable consists of one, two or three insulated phase conductors and one or two optional insulated street lighting conductors stranded around the bare or insulated messenger
- direction of lay: right handed Z

Marking

Core identification with longitudinal ridges

Marks of origin

Embossed on the phase core insulation: manufacturer, year of manufacturing, insulation material.

Advantage

Hardness of HDPE insulation gives excellent protection against mechanical damages
## TECHNICAL DATA FOR TYPICAL AMKA-T CONSTRUCTIONS

<table>
<thead>
<tr>
<th>Construction</th>
<th>1x16+16</th>
<th>3x16+25</th>
<th>3x25+25</th>
<th>3x35+25</th>
<th>3x50+35</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Diameter for phase conductor, approx., mm</td>
<td>4,7</td>
<td>4,7</td>
<td>5,8</td>
<td>6,8</td>
<td>8,0</td>
<td>9,6</td>
<td>11,3</td>
<td>12,7</td>
<td>14,1</td>
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<tr>
<td>Diameter for insulated phase conductor, approx., mm</td>
<td>6,7</td>
<td>6,7</td>
<td>7,8</td>
<td>8,8</td>
<td>10,4</td>
<td>12,4</td>
<td>14,1</td>
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<td>17,7</td>
</tr>
<tr>
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<td>4,7/5,1</td>
<td>5,8/6,3</td>
<td>5,8/6,3</td>
<td>5,8/6,3</td>
<td>6,8/7,5</td>
<td>8,0/8,7</td>
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<td>Diameter for insulated messenger, approx., mm</td>
<td>/7,1</td>
<td>/8,3</td>
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<td>/8,3</td>
<td>/9,5</td>
<td>/11,1</td>
<td>/13,2</td>
<td>/13,2</td>
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</tr>
<tr>
<td>Overall diameter for complete cable, approx., mm</td>
<td>12/15</td>
<td>20/23</td>
<td>23/25</td>
<td>25/27</td>
<td>29/31</td>
<td>34/37</td>
<td>39/43</td>
<td>43/46</td>
<td>46/50</td>
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<tr>
<td>Weight for complete cable, approx., kg/km</td>
<td>105/130</td>
<td>250/275</td>
<td>340/370</td>
<td>430/455</td>
<td>590/625</td>
<td>840/890</td>
<td>1150/1250</td>
<td>1400/1500</td>
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<td>1,1</td>
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<td>2,3</td>
<td>3,4</td>
<td>4,7</td>
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Bare compacted messenger / Insulated uncompacted messenger (U/I)

### Current carrying capacity, with solar radiation 1200 W/m² and wind velocity 0.6 m/s

![Current carrying capacity graph](chart.png)
## AMKA-X

### CONSTRUCTION

**Phase conductor**  
Round, stranded and compacted aluminium conductor

**Street lighting conductor**  
Maximum two optional conductors  
- 16 mm²: Round and solid or round, stranded and compacted aluminium conductor  
- 25 mm²: Round, stranded and compacted aluminium conductor

**Messenger**  
Bare, round, stranded and compacted aluminium alloy conductor  
or  
Insulated, round, stranded and uncompacted aluminium alloy conductor (U/I)

**Insulation**  
Extruded black weather-resistant XLPE

**Design**  
The cable consists of one, two or three insulated phase conductors and one or two optional insulated street lighting conductors stranded around the bare or insulated messenger  
- direction of lay: right handed Z

**Marking**  
Core identification with longitudinal ridges

**Marks of origin**  
Embossed on the phase core insulation: manufacturer, year of manufacturing, insulation material.

**Advantage**  
XLPE insulation allows high current carrying capacity
### TECHNICAL DATA FOR TYPICAL AMKA-X CONSTRUCTIONS

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<td>-/11,7</td>
<td>-/13,4</td>
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<td>-/13,4</td>
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<tr>
<td>Overall diameter for complete cable, approx., mm</td>
<td>13/16</td>
<td>22/25</td>
<td>24/27</td>
<td>26/29</td>
<td>30/33</td>
<td>34/38</td>
<td>40/44</td>
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<td>46/50</td>
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<tr>
<td>Weight for complete cable, approx., kg/km</td>
<td>110/140</td>
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<td>360/395</td>
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<td>620/660</td>
<td>850/910</td>
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<td>1,3</td>
<td>1,5</td>
<td>2,0</td>
<td>2,0</td>
<td>2,8</td>
<td>4,0</td>
<td>5,6</td>
<td>5,6</td>
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Bare compacted messenger / Insulated uncompacted messenger (U/I)

### Current carrying capacity, with solar radiation 1200 W/m² and wind velocity 0.6 m/s

![Current carrying capacity graph](image-url)
AMK-T

CONSTRUCTION

Conductor
Round, stranded and compacted aluminium conductor

Insulation
Extruded black weather-resistant HDPE

Design
The cable consists of insulated conductors stranded together - direction of lay: right handed Z

Marking
Core identification with longitudinal ridges

Marks of origin
Embossed on the phase core insulation: manufacturer, year of manufacturing, insulation material.

Advantage
Hardness of HDPE insulation gives excellent protection against mechanical damages.
## TECHNICAL DATA FOR TYPICAL AMK-T CONSTRUCTIONS

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<td>15</td>
<td>18</td>
<td>21</td>
<td>23</td>
<td>27</td>
<td>31</td>
<td>37</td>
<td>40</td>
<td>44</td>
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<tr>
<td>Weight for complete cable, approx., kg/km</td>
<td>125</td>
<td>250</td>
<td>380</td>
<td>480</td>
<td>675</td>
<td>945</td>
<td>1300</td>
<td>1650</td>
<td>2050</td>
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<tr>
<td>Breaking load of single core, min., kN</td>
<td>2,6</td>
<td>2,6</td>
<td>4,2</td>
<td>5,6</td>
<td>7,4</td>
<td>10,3</td>
<td>14,0</td>
<td>17,6</td>
<td>22,0</td>
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<td>5,2</td>
<td>10,4</td>
<td>16,8</td>
<td>22,4</td>
<td>29,6</td>
<td>41,2</td>
<td>56,0</td>
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### Current carrying capacity, with solar radiation 1200 W/m² and wind velocity 0.6 m/s

![Current carrying capacity graph](image)
**AMK-X**

**CONSTRUCTION**

**Conductor**
- Round, stranded and compacted aluminium conductor

**Insulation**
- Extruded black weather-resistant XLPE

**Design**
- The cable consists of insulated conductors stranded together
- Direction of lay: right handed Z

**Marking**
- Core identification with longitudinal ridges

**Marks of origin**
- Embossed on the phase core insulation:
  - Manufacturer, year of manufacturing, insulation material.

**Advantage**
- XLPE insulation allows high current carrying capacity
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<td>16</td>
<td>19</td>
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<td>38</td>
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<td>44</td>
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<td>Weight for complete cable, approx., kg/km</td>
<td>140</td>
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<td>405</td>
<td>510</td>
<td>715</td>
<td>960</td>
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<td>1650</td>
<td>2000</td>
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### Current carrying capacity, with solar radiation 1200 W/m² and wind velocity 0.6 m/s

![Graph showing current carrying capacity vs. ambient temperature]