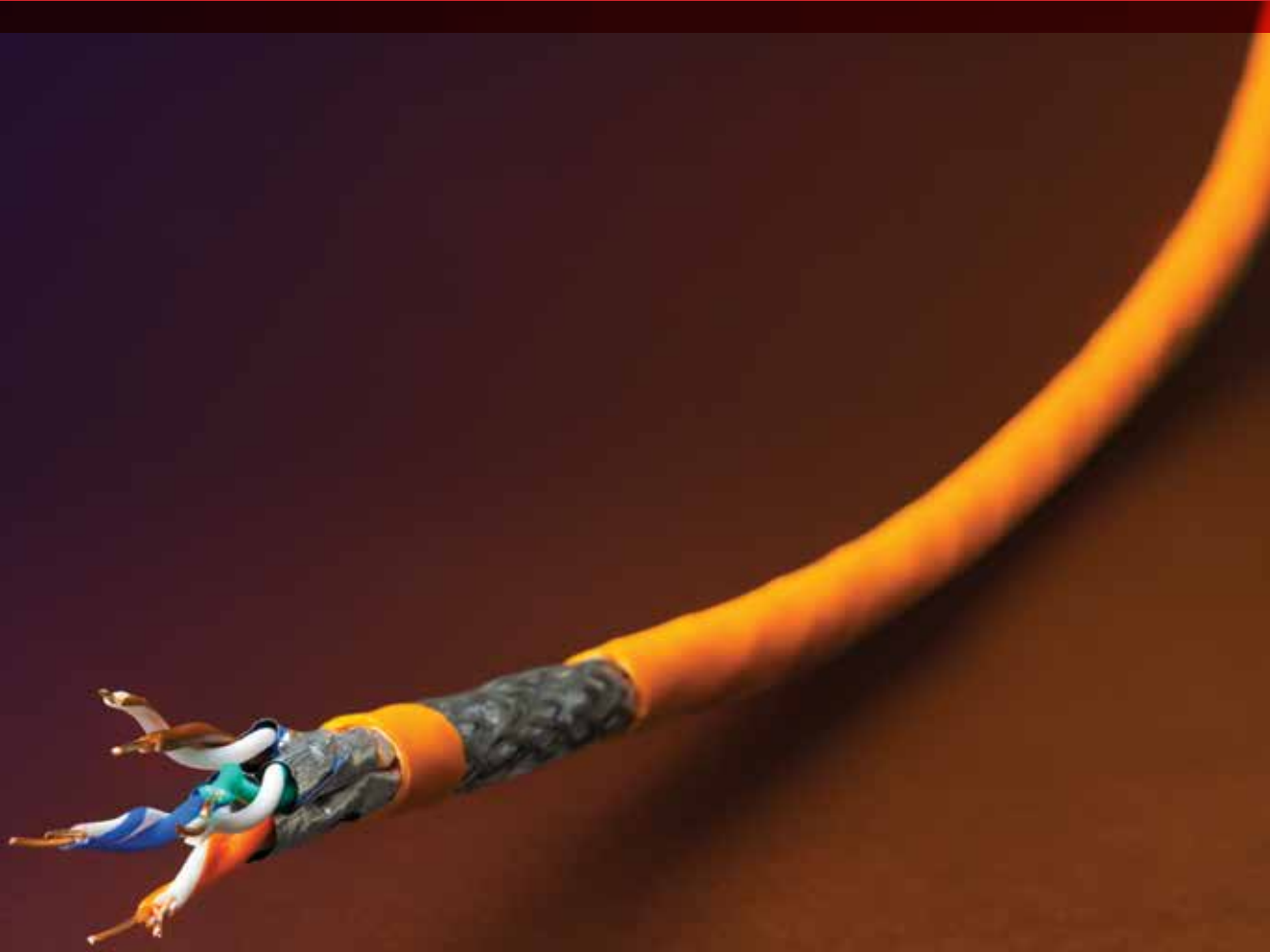


# CABLE CATALOGUE





# index



05

Data  
Cables



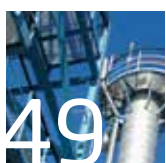
33

Coaxial  
Cables



41

Fire Resistant  
Cables



49

Signal and Control  
Cables



69

Various  
Cables



77

Technical  
Information



## Vision

To be recognized worldwide as a high quality cable manufacturer and developer offering the most appropriate coaxial cable solutions to our clients while ensuring the development of the company through reasonable profits.

## Mission

To fulfill customer satisfaction by continuously improving the products and standards to ensure long term growth while providing the highest service from our dedicated staff and applying a cost effective production system.

# DATA

Cables





# TECHNOLOGY



# SL200 U24

Data cable , Category 5e

U/UTP, Class D, 100MHz

4x2xAWG24

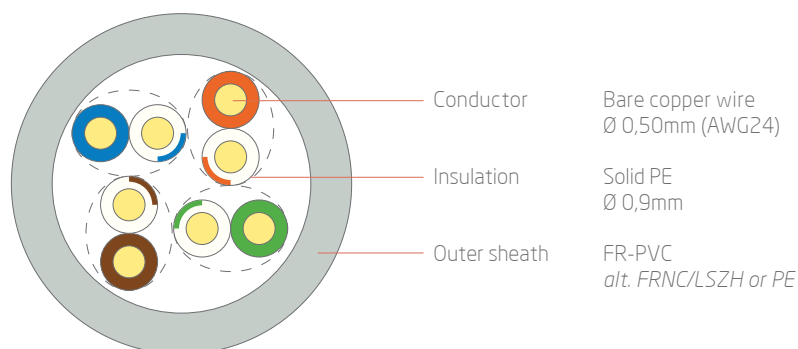


Types  
SL200 U24 PVC  
SL200 U24 LSZH  
SL200 U24 PE

## PRODUCT INFORMATION

### Cable constructions

SL200 U24



### Features and applications

Recber SL200 U24 is premium grade Class D data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality.

Suitable for applications up to Class D (100MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals,voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-3-1
- U.S. Standards ANSI EIA/TIA 568-C.2

### Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL200 U24

Data cable , Category 5e

U/UTP, Class D, 100MHz

4x2xAWG24



## Electrical characteristics (HF) at 20 °C

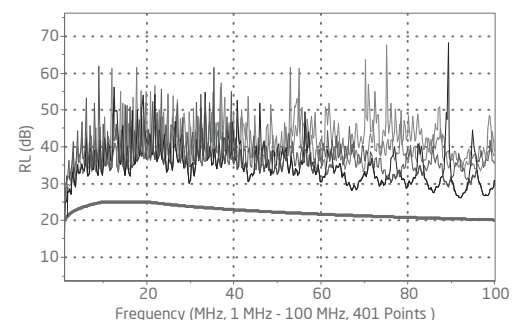
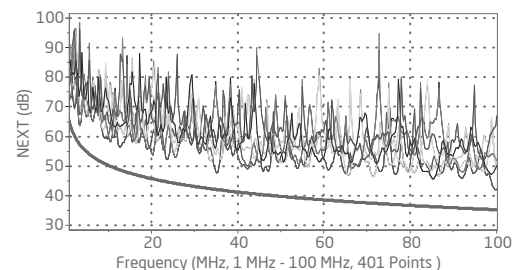
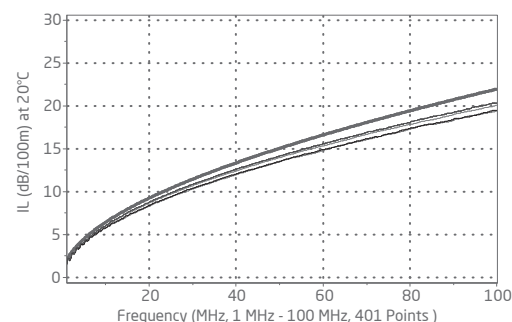
| Frequency [MHz] | Attenuation [dB/100m] |      | NEXT [dB] |      | PS-NEXT [dB] |      | ACR [dB/100m] |      | PS-ACR [dB/100m] |      | ACR-F [dB/100m] |      | PS-ACR-F [dB/100m] |      | RL [dB] |      |
|-----------------|-----------------------|------|-----------|------|--------------|------|---------------|------|------------------|------|-----------------|------|--------------------|------|---------|------|
|                 | typ.                  | max. | typ.      | min. | typ.         | min. | typ.          | min. | typ.             | min. | typ.            | min. | typ.               | min. | typ.    | min. |
| 1               | 1,9                   | 2,1  | 71        | 65,3 | 68           | 62,3 | 69            | 63,2 | 66               | 60,2 | 82              | 63,8 | 79                 | 60,8 | 23      | 20   |
| 4               | 3,6                   | 4    | 62        | 56,3 | 59           | 53,3 | 58            | 52,3 | 55               | 49,3 | 70              | 51,8 | 67                 | 48,8 | 33      | 23   |
| 10              | 5,5                   | 6,3  | 56        | 50,3 | 53           | 47,3 | 51            | 44   | 48               | 41   | 55              | 43,8 | 52                 | 40,8 | 31      | 25   |
| 16              | 7,7                   | 8    | 54        | 47,2 | 51           | 44,2 | 46            | 39,2 | 43               | 36,2 | 48              | 39,7 | 45                 | 36,7 | 32      | 25   |
| 31,25           | 11,3                  | 11,4 | 50        | 42,9 | 47           | 39,9 | 39            | 31,5 | 36               | 28,5 | 40              | 33,9 | 37                 | 30,9 | 32      | 23,6 |
| 62,50           | 16,2                  | 16,5 | 45        | 38,4 | 42           | 35,4 | 29            | 21,8 | 26               | 18,8 | 37              | 27,9 | 34                 | 24,9 | 29      | 21,5 |
| 100             | 21                    | 21,3 | 42        | 35,3 | 39           | 32,3 | 21            | 14   | 18               | 11   | 30              | 23,8 | 27                 | 20,8 | 27      | 20,1 |
| 200             | 27,5                  | -    | 36        | -    | 33           | -    | 9             | -    | 6                | -    | 22              | -    | 19                 | -    | 19      | -    |

## Electrical characteristics (LF) at 20 °C

|                            |          |                |
|----------------------------|----------|----------------|
| • DC resistance            | max.     | 95 Ω/km        |
| • Resistance unbalance     | max.     | 2 %            |
| • Insulation resistance    | min.     | 2 G Ω x km     |
| • Mutual capacitance       | nom.     | 48 pF/m        |
| • Capacitance unbalance    | max.     | 1500 pF/km     |
| • Characteristic impedance | @ 100MHz | 100 ± 5 Ω      |
| • Coupling attenuation     | min.     | 40 dB (Type 1) |
| • Velocity of propagation  | approx.  | 67 %           |
| • Propagation delay        | nom.     | 535 ns/100 m   |
| • Skew at 100MHz           | nom.     | 20 ns/100 m    |
| • Testing voltage          |          | 1000 V         |
| • Operating voltage        | max.     | 125 V          |

## Mechanical characteristics

|                                      |      |                                                           |
|--------------------------------------|------|-----------------------------------------------------------|
| • Bending radius during installation | min. | 8 x D                                                     |
| • as installed                       | min. | 4 x D                                                     |
| • Tensile strength                   | max. | 100 N                                                     |
| • Crush resistance                   | min. | 1000 N/10cm                                               |
| • Impact strength                    | min. | 10 impacts                                                |
| • Temperature range installation     |      | 0 °C to +50 °C                                            |
| • in operation                       |      | -20 °C to +60 °C (FR-PVC / LSZH)<br>-40 °C to +80 °C (PE) |



| Part no. | Dimensions   | Outer dia. approx.[mm] | Cu content [kg/km] | Cable weight [kg/km] | Fire load [MJ/m] [kWh/m] | Sheath - Color                     | Packing [m]  |
|----------|--------------|------------------------|--------------------|----------------------|--------------------------|------------------------------------|--------------|
| 505001   | 4 x 2 x 0,50 | 5,0                    | 15                 | 31                   | 0,36 0,10                | FR-PVC <sup>1)</sup> (RAL 7035)    | 305/500/1000 |
| 505004   | 4 x 2 x 0,50 | 5,0                    | 15                 | 32                   | 0,33 0,09                | FRNC/LSZH <sup>2)</sup> (RAL 1021) | 500/1000     |
| 505007   | 4 x 2 x 0,50 | 5,0                    | 15                 | 27                   | 0,55 0,15                | PE <sup>3)</sup> (RAL 9011)        | 500/1000     |

<sup>1)</sup> FR-PVC=Flame Retardant Polyvinyl Chloride

<sup>2)</sup> FRNC/LSZH=Flame Retardant Non Corrosive / Low Smoke Zero Halogen

<sup>3)</sup> PE=Polyethylene

# SL200 F/U24

Data cable , Category 5e

F/UTP, Class D , 100MHz

4x2xAWG24

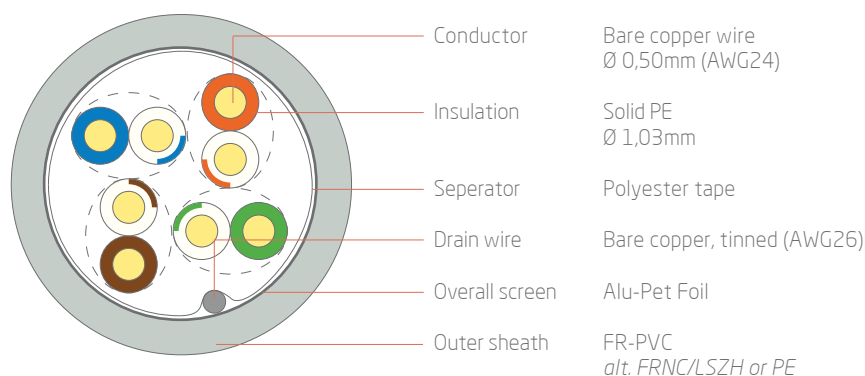


**Types**  
SL200 F/U24 PVC  
SL200 F/U24 LSZH  
SL200 F/U24 PE

## PRODUCT INFORMATION

### Cable constructions

SL200 F/U24



### Features and applications

Recber SL200 F/U24 is premium grade Class D data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to overall foil screen.

Suitable for applications up to Class D (100MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-2-1
- U.S. Standards ANSI EIA/TIA 568-C.2

### Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL200 F/U24

Data cable , Category 5e

F/UTP, Class D, 100MHz

4x2xAWG24

## Electrical characteristics (HF) at 20 °C

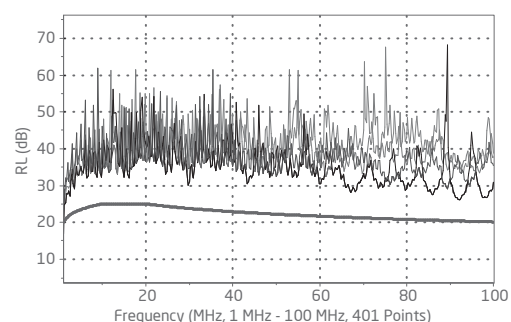
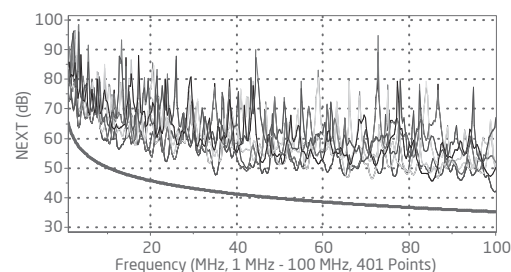
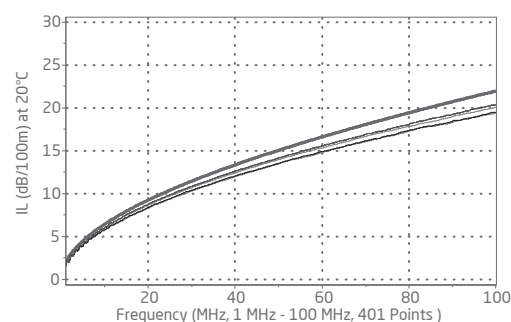
| Frequency<br>[MHz] | Attenuation<br>[dB/100m] |      | NEXT<br>[dB] |      | PS-NEXT<br>[dB] |      | ACR<br>[dB/100m] |      | PS-ACR<br>[dB/100m] |      | ACR-F<br>[dB/100m] |      | PS-ACR-F<br>[dB/100m] |      | RL<br>[dB] |      |
|--------------------|--------------------------|------|--------------|------|-----------------|------|------------------|------|---------------------|------|--------------------|------|-----------------------|------|------------|------|
|                    | typ.                     | max. | typ.         | min. | typ.            | min. | typ.             | min. | typ.                | min. | typ.               | min. | typ.                  | min. | typ.       | min. |
| 1                  | 1,9                      | 2,1  | 71           | 65,3 | 68              | 62,3 | 69               | 63,2 | 66                  | 60,2 | 82                 | 63,8 | 79                    | 60,8 | 23         | 20   |
| 4                  | 3,6                      | 4    | 62           | 56,3 | 59              | 53,3 | 58               | 52,3 | 55                  | 49,3 | 70                 | 51,8 | 67                    | 48,8 | 33         | 23   |
| 10                 | 5,5                      | 6,3  | 56           | 50,3 | 53              | 47,3 | 51               | 44   | 48                  | 41   | 55                 | 43,8 | 52                    | 40,8 | 31         | 25   |
| 16                 | 7,7                      | 8    | 54           | 47,2 | 51              | 44,2 | 46               | 39,2 | 43                  | 36,2 | 48                 | 39,7 | 45                    | 36,7 | 32         | 25   |
| 31,25              | 11,3                     | 11,4 | 50           | 42,9 | 47              | 39,9 | 39               | 31,5 | 36                  | 28,5 | 40                 | 33,9 | 37                    | 30,9 | 32         | 23,6 |
| 62,50              | 16,2                     | 16,5 | 45           | 38,4 | 42              | 35,4 | 29               | 21,8 | 26                  | 18,8 | 37                 | 27,9 | 34                    | 24,9 | 29         | 21,5 |
| 100                | 21                       | 21,3 | 42           | 35,3 | 39              | 32,3 | 21               | 14   | 18                  | 11   | 30                 | 23,8 | 27                    | 20,8 | 27         | 20,1 |
| 200                | 27,5                     | -    | 36           | -    | 33              | -    | 9                | -    | 6                   | -    | 22                 | -    | 19                    | -    | 19         | -    |

## Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 95 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 48 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 50/100/200 mΩ/m
- Coupling attenuation **min.** 55 dB
- Velocity of propagation **approx.** 67 %
- Propagation delay **nom.** 535 ns/100 m
- Skew at 100MHz **nom.** 20 ns/100 m
- Testing voltage 1000 V
- Operating voltage **max.** 125 V

## Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- as installed **min.** 4 x D
- Tensile strength **max.** 80 N
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation 0 °C to +50 °C
- in operation -20 °C to +60 °C (FR-PVC / LSZH)
- -40 °C to +80 °C (PE)



| Part no. | Dimensions   | Outer dia.<br>approx.[mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Fire load<br>[MJ/m] [kWh/m] | Sheath - Color                     | Packing<br>[m] |
|----------|--------------|---------------------------|-----------------------|-------------------------|-----------------------------|------------------------------------|----------------|
| 505002   | 4 x 2 x 0,50 | 6,0                       | 15                    | 41                      | 0,43 0,12                   | FR-PVC <sup>1)</sup> (RAL 7035)    | 500/1000       |
| 505005   | 4 x 2 x 0,50 | 6,0                       | 15                    | 42                      | 0,39 0,11                   | FRNC/LSZH <sup>2)</sup> (RAL 1021) | 500/1000       |
| 505008   | 4 x 2 x 0,50 | 6,0                       | 15                    | 34                      | 0,62 0,17                   | PE <sup>3)</sup> (RAL 9011)        | 500/1000       |

<sup>1)</sup> FR-PVC=Flame Reterdant Polyvinyl Chloride

<sup>2)</sup> FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

<sup>3)</sup> PE=Polyethylene

# SL200 SF/U24

Data cable , Category 5e

SF/UTP, Class D, 100MHz

4x2xAWG24



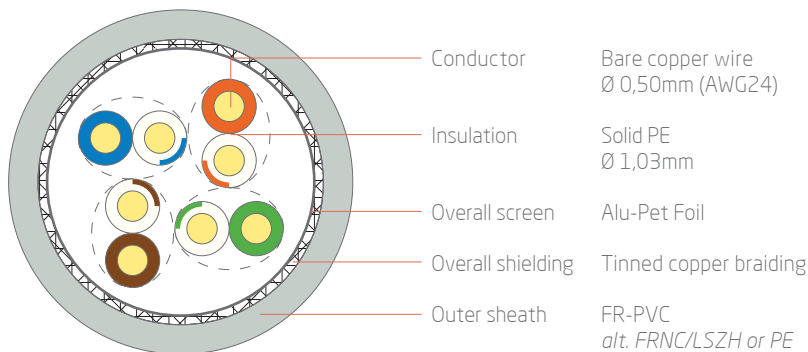
## Types

SL200 SF/U24 PVC  
SL200 SF/U24 LSZH  
SL200 SF/U24 PE

## PRODUCT INFORMATION

### Cable constructions

SL200 SF/U24



### Features and applications

Recber SL200 SF/U24 is premium grade Class D data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to overall foil screen and tinned copper braiding.

Suitable for applications up to Class D (100MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-2-1
- U.S. Standards ANSI EIA/TIA 568-C.2

### Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL200 SF/U24

Data cable , Category 5e

SF/UTP, Class D, 100MHz

4x2xAWG24



## Electrical characteristics (HF) at 20 °C

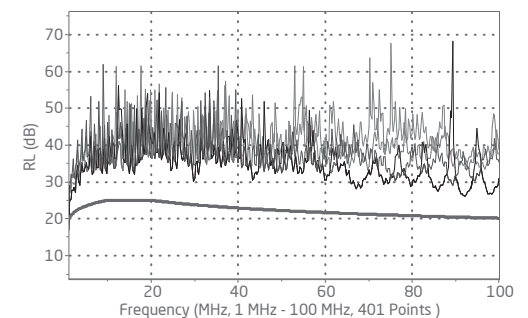
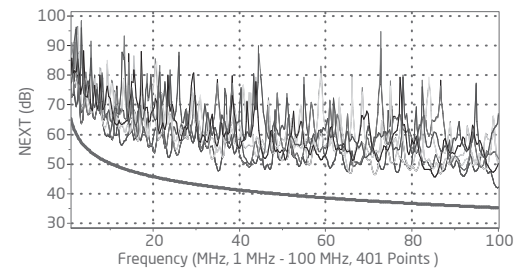
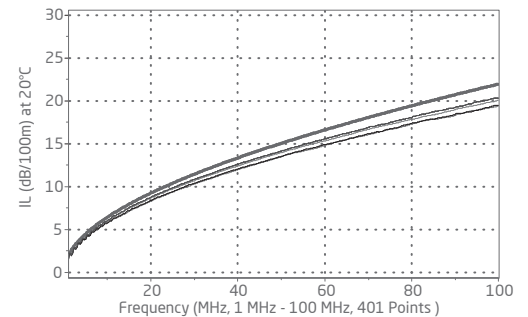
| Frequency [MHz] | Attenuation [dB/100m] |      | NEXT [dB] |      | PS-NEXT [dB] |      | ACR [dB/100m] |      | PS-ACR [dB/100m] |      | ACR-F [dB/100m] |      | PS-ACR-F [dB/100m] |      | RL [dB] |      |
|-----------------|-----------------------|------|-----------|------|--------------|------|---------------|------|------------------|------|-----------------|------|--------------------|------|---------|------|
|                 | typ.                  | max. | typ.      | min. | typ.         | min. | typ.          | min. | typ.             | min. | typ.            | min. | typ.               | min. | typ.    | min. |
| 1               | 1,9                   | 2,1  | 71        | 65,3 | 68           | 62,3 | 69            | 63,2 | 66               | 60,2 | 82              | 63,8 | 79                 | 60,8 | 23      | 20   |
| 4               | 3,6                   | 4    | 62        | 56,3 | 59           | 53,3 | 58            | 52,3 | 55               | 49,3 | 70              | 51,8 | 67                 | 48,8 | 33      | 23   |
| 10              | 5,5                   | 6,3  | 56        | 50,3 | 53           | 47,3 | 51            | 44   | 48               | 41   | 55              | 43,8 | 52                 | 40,8 | 31      | 25   |
| 16              | 7,7                   | 8    | 54        | 47,2 | 51           | 44,2 | 46            | 39,2 | 43               | 36,2 | 48              | 39,7 | 45                 | 36,7 | 32      | 25   |
| 31,25           | 11,3                  | 11,4 | 50        | 42,9 | 47           | 39,9 | 39            | 31,5 | 36               | 28,5 | 40              | 33,9 | 37                 | 30,9 | 32      | 23,6 |
| 62,50           | 16,2                  | 16,5 | 45        | 38,4 | 42           | 35,4 | 29            | 21,8 | 26               | 18,8 | 37              | 27,9 | 34                 | 24,9 | 29      | 21,5 |
| 100             | 21                    | 21,3 | 42        | 35,3 | 39           | 32,3 | 21            | 14   | 18               | 11   | 30              | 23,8 | 27                 | 20,8 | 27      | 20,1 |
| 200             | 27,5                  | -    | 36        | -    | 33           | -    | 9             | -    | 6                | -    | 22              | -    | 19                 | -    | 19      | -    |

## Electrical characteristics (LF) at 20 °C

|                            |              |               |
|----------------------------|--------------|---------------|
| • DC resistance            | max.         | 95 Ω/km       |
| • Resistance unbalance     | max.         | 2 %           |
| • Insulation resistance    | min.         | 2 G Ω x km    |
| • Mutual capacitance       | nom.         | 48 pF/m       |
| • Capacitance unbalance    | max.         | 1500 pF/km    |
| • Characteristic impedance | @ 100MHz     | 100 ± 5 Ω     |
| • Transfer impedance       | @ 1/10/30MHz | 20/20/30 mΩ/m |
| • Coupling attenuation     | min.         | 75 dB         |
| • Velocity of propagation  | approx.      | 67 %          |
| • Propagation delay        | nom.         | 535 ns/100 m  |
| • Skew at 100MHz           | nom.         | 20 ns/100 m   |
| • Testing voltage          |              | 1000 V        |
| • Operating voltage        | max.         | 125 V         |

## Mechanical characteristics

|                                      |      |                                                           |
|--------------------------------------|------|-----------------------------------------------------------|
| • Bending radius during installation | min. | 8 x D                                                     |
| • as installed                       | min. | 4 x D                                                     |
| • Tensile strength                   | max. | 120 N                                                     |
| • Crush resistance                   | min. | 1000 N/10cm                                               |
| • Impact strength                    | min. | 10 impacts                                                |
| • Temperature range installation     |      | 0 °C to +50 °C                                            |
| • in operation                       |      | -20 °C to +60 °C (FR-PVC / LSZH)<br>-40 °C to +80 °C (PE) |



| Part no. | Dimensions   | Outer dia. approx.[mm] | Cu content [kg/km] | Cable weight [kg/km] | Fire load [MJ/m] [kWh/m] | Sheath - Color                     | Packing [m] |
|----------|--------------|------------------------|--------------------|----------------------|--------------------------|------------------------------------|-------------|
| 505003   | 4 x 2 x 0,50 | 6,4                    | 22                 | 47                   | 0,53 0,15                | FR-PVC <sup>1)</sup> (RAL 7035)    | 500/1000    |
| 505006   | 4 x 2 x 0,50 | 6,4                    | 22                 | 48                   | 0,49 0,14                | FRNC/LSZH <sup>2)</sup> (RAL 1021) | 500/1000    |
| 505009   | 4 x 2 x 0,50 | 6,4                    | 22                 | 40                   | 0,72 0,20                | PE <sup>3)</sup> (RAL 9011)        | 500/1000    |

<sup>1)</sup> FR-PVC=Flame Retardant Polyvinyl Chloride

<sup>2)</sup> FRNC/LSZH=Flame Retardant Non Corrosive / Low Smoke Zero Halogen

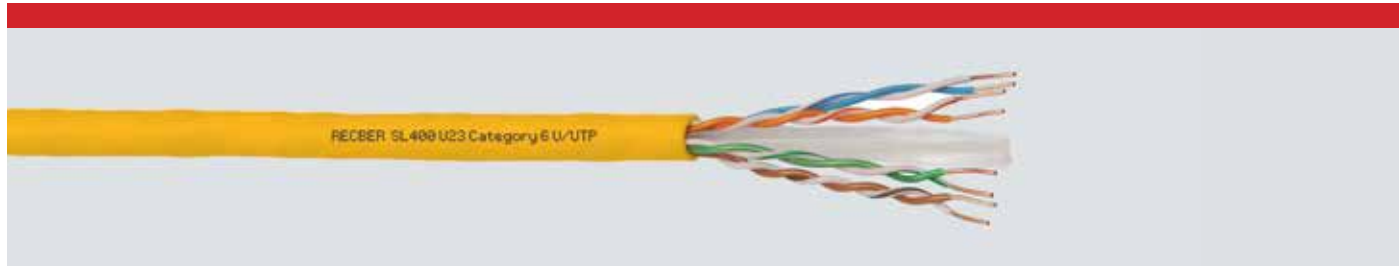
<sup>3)</sup> PE=Polyethylene

# SL400 U23

Data cable , Category 6

U/UTP, Class E , 250MHz

4x2xAWG23

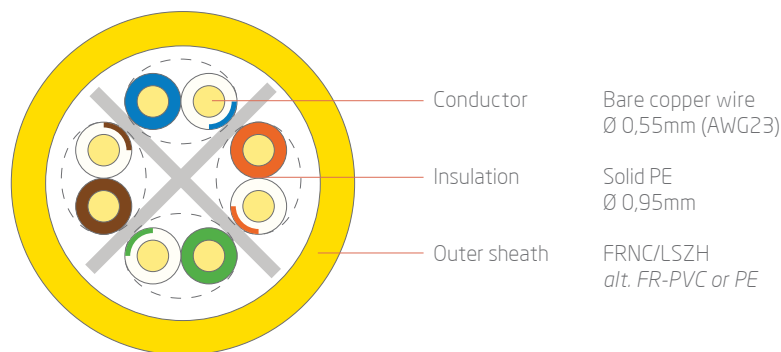


**Types**  
SL400 U23 PVC  
SL400 U23 LSZH  
SL400 U23Dx LSZH  
SL400 U23 PE

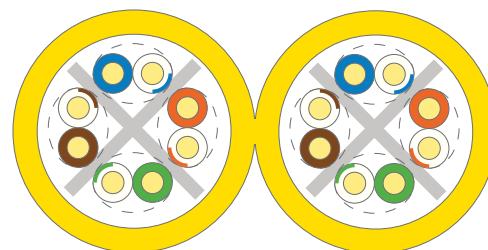
## PRODUCT INFORMATION

### Cable constructions

SL400 U23



SL400 U23Dx LSZH  
Duplex construction



### Features and applications

Recber SL400 U23 is premium grade Class E data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality.

Suitable for applications up to Class E (250MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-6-1
- U.S. Standards ANSI EIA/TIA 568-C.2

### Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL400 U23

Data cable , Category 6

U/UTP, Class E , 250MHz

4x2xAWG23

## Electrical characteristics (HF) at 20 °C

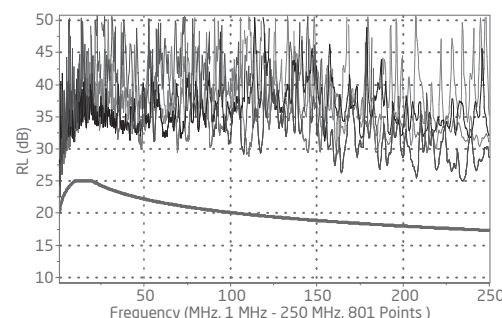
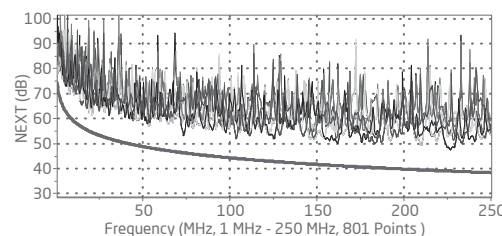
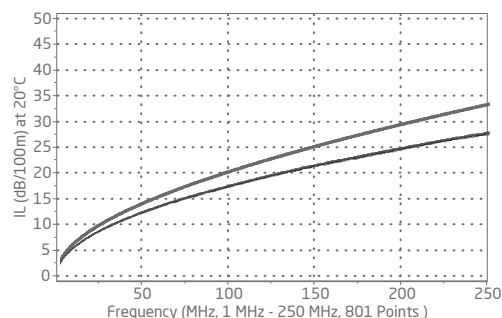
| Frequency [MHz] | Attenuation [dB/100m] |      | NEXT [dB] |      | PS-NEXT [dB] |      | ACR [dB/100m] |      | PS-ACR [dB/100m] |      | ACR-F [dB/100m] |      | PS-ACR-F [dB/100m] |      | RL [dB] |      |
|-----------------|-----------------------|------|-----------|------|--------------|------|---------------|------|------------------|------|-----------------|------|--------------------|------|---------|------|
|                 | typ.                  | max. | typ.      | min. | typ.         | min. | typ.          | min. | typ.             | min. | typ.            | min. | typ.               | min. | typ.    | min. |
| 1               | 1,9                   | 2,1  | 82        | 66   | 79           | 64   | 80            | 63,9 | 77               | 61,9 | 85              | 66   | 82                 | 64   | 26      | 20   |
| 4               | 3,8                   | 3,8  | 76        | 65,3 | 73           | 63,3 | 72            | 61,4 | 69               | 59,4 | 77              | 58   | 74                 | 55   | 31      | 23   |
| 10              | 5,9                   | 6    | 70        | 59,3 | 67           | 57,3 | 64            | 53,3 | 61               | 51,3 | 68              | 50   | 64                 | 47   | 32      | 25   |
| 16              | 7,4                   | 7,6  | 65        | 56,2 | 62           | 54,2 | 58            | 48,6 | 55               | 46,6 | 63              | 45,9 | 60                 | 42,9 | 34      | 25   |
| 31,25           | 10,5                  | 10,7 | 60        | 51,9 | 57           | 49,9 | 49            | 41,1 | 46               | 39,1 | 51              | 40,1 | 48                 | 37,1 | 36      | 23,6 |
| 62,50           | 15,1                  | 15,5 | 58        | 47,4 | 55           | 45,4 | 43            | 31,9 | 40               | 29,9 | 44              | 34,1 | 41                 | 31,1 | 32      | 21,5 |
| 100             | 19                    | 19,9 | 52        | 44,3 | 49           | 42,3 | 33            | 24,4 | 30               | 22,4 | 35              | 30   | 32                 | 27   | 32      | 20,1 |
| 250             | 31                    | 33   | 48        | 38,3 | 45           | 36,3 | 17            | 5,3  | 14               | 3,3  | 19              | 22   | 16                 | 19   | 30      | 17,3 |
| 300             | 36                    | -    | 43        | -    | 40           | -    | 13            | -    | 10               | -    | 14              | -    | 11                 | -    | 28      | -    |
| 400             | 41,6                  | -    | 40        | -    | 37           | -    | 8             | -    | 5                | -    | 8               | -    | 5                  | -    | 26      | -    |

## Electrical characteristics (LF) at 20 °C

|                            |          |                |
|----------------------------|----------|----------------|
| • DC resistance            | max.     | 76 Ω/km        |
| • Resistance unbalance     | max.     | 2 %            |
| • Insulation resistance    | min.     | 2 G Ω x km     |
| • Mutual capacitance       | nom.     | 48 pF/m        |
| • Capacitance unbalance    | max.     | 1500 pF/km     |
| • Characteristic impedance | @ 100MHz | 100 ± 5 Ω      |
| • Coupling attenuation     | min.     | 45 dB (Type 1) |
| • Velocity of propagation  | approx.  | 67 %           |
| • Propagation delay        | nom.     | 535 ns/100 m   |
| • Skew at 100MHz           | nom.     | 20 ns/100 m    |
| • Testing voltage          |          | 1000 V         |
| • Operating voltage        | max.     | 125 V          |

## Mechanical characteristics

|                                      |      |                                                           |
|--------------------------------------|------|-----------------------------------------------------------|
| • Bending radius during installation | min. | 8 x D                                                     |
| • as installed                       | min. | 4 x D                                                     |
| • Tensile strength                   | max. | 100 N (Sx) <sup>1)</sup> , 200 N (Dx) <sup>1)</sup>       |
| • Crush resistance                   | min. | 1000 N/10cm                                               |
| • Impact strength                    | min. | 10 impacts                                                |
| • Temperature range installation     |      | 0 °C to +50 °C                                            |
| • in operation                       |      | -20 °C to +60 °C (FR-PVC / LSZH)<br>-40 °C to +80 °C (PE) |



| Part no. | Dimensions         | Outer dia. approx.[mm] | Cu content [kg/km] | Cable weight [kg/km] | Fire load [MJ/m] [kWh/m] | Sheath - Color                     | Packing [m]  |
|----------|--------------------|------------------------|--------------------|----------------------|--------------------------|------------------------------------|--------------|
| 506019   | 4 x 2 x 0,55       | 5,8                    | 18                 | 38                   | 0,70 0,19                | FR-PVC <sup>2)</sup> (RAL 7035)    | 305/500/1000 |
| 506022   | 4 x 2 x 0,55       | 5,8                    | 18                 | 39                   | 0,65 0,18                | FRNC/LSZH <sup>3)</sup> (RAL 1021) | 500/1000     |
| 506073   | 2 x (4 x 2 x 0,55) | 5,8 x 11,8             | 36                 | 78                   | 1,30 0,36                | FRNC/LSZH <sup>3)</sup> (RAL 1021) | 500          |
| 506025   | 4 x 2 x 0,55       | 5,8                    | 18                 | 35                   | 1,05 0,30                | PE <sup>4)</sup> (RAL 9011)        | 500/1000     |

<sup>1)</sup> Sx= Simplex , Dx= Duplex

<sup>2)</sup> FR-PVC=Flame Reterdant Polyvinyl Chloride

<sup>3)</sup> FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

<sup>4)</sup> PE=Polyethylene

# SL400 F/U23

Data cable , Category 6

F/UTP, Class E, 250MHz

4x2xAWG23



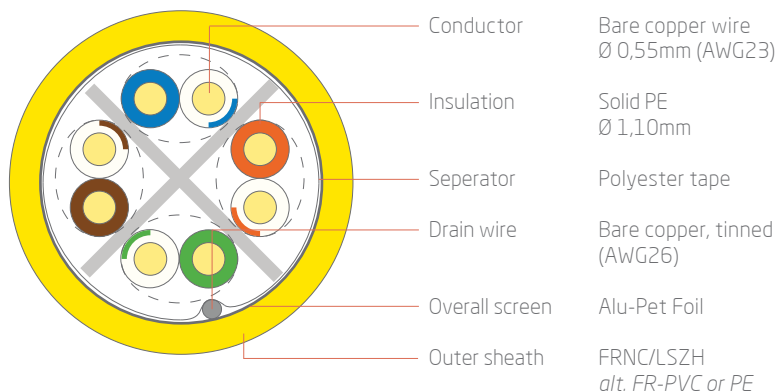
## Types

SL400 F/U23 PVC  
SL400 F/U23 LSZH  
SL400 F/U23Dx LSZH  
SL400 F/U23 PE

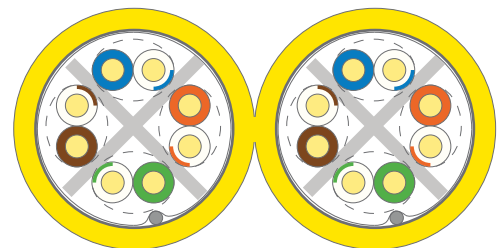
## PRODUCT INFORMATION

### Cable constructions

SL400 F/U23



SL400 F/U23Dx LSZH  
Duplex construction



### Features and applications

Recber SL400 F/U23 is premium grade Class E data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to overall foil screen.

Suitable for applications up to Class E (250MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-5-1
- U.S. Standards ANSI EIA/TIA 568-C.2

### Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL400 F/U23

Data cable , Category 6

F/UTP, Class E, 250MHz

4x2xAWG23

## Electrical characteristics (HF) at 20 °C

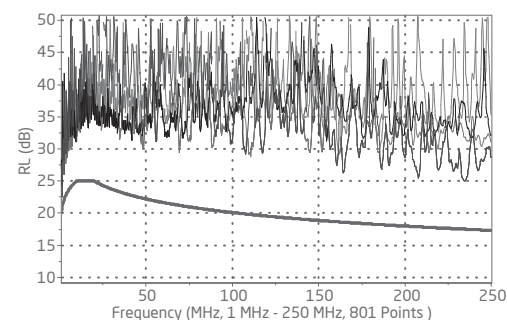
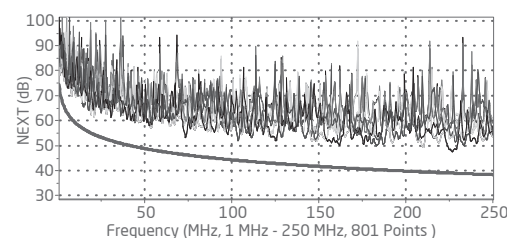
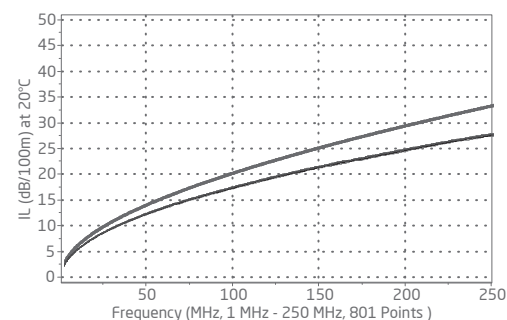
| Frequency [MHz] | Attenuation [dB/100m] |      | NEXT [dB] |      | PS-NEXT [dB] |      | ACR [dB/100m] |      | PS-ACR [dB/100m] |      | ACR-F [dB/100m] |      | PS-ACR-F [dB/100m] |      | RL [dB] |      |
|-----------------|-----------------------|------|-----------|------|--------------|------|---------------|------|------------------|------|-----------------|------|--------------------|------|---------|------|
|                 | typ.                  | max. | typ.      | min. | typ.         | min. | typ.          | min. | typ.             | min. | typ.            | min. | typ.               | min. | typ.    | min. |
| 1               | 1,9                   | 2,1  | 84        | 66   | 81           | 64   | 82            | 63,9 | 79               | 61,9 | 85              | 66   | 82                 | 64   | 26      | 20   |
| 4               | 3,8                   | 3,8  | 78        | 65,3 | 75           | 63,3 | 74            | 61,4 | 71               | 59,4 | 77              | 58   | 74                 | 55   | 31      | 23   |
| 10              | 5,9                   | 6    | 72        | 59,3 | 69           | 57,3 | 66            | 53,3 | 63               | 51,3 | 68              | 50   | 64                 | 47   | 32      | 25   |
| 16              | 7,4                   | 7,6  | 67        | 56,2 | 64           | 54,2 | 60            | 48,6 | 57               | 46,6 | 63              | 45,9 | 60                 | 42,9 | 34      | 25   |
| 31,25           | 10,5                  | 10,7 | 62        | 51,9 | 59           | 49,9 | 51            | 41,1 | 48               | 39,1 | 51              | 40,1 | 48                 | 37,1 | 36      | 23,6 |
| 62,50           | 15,1                  | 15,5 | 60        | 47,4 | 57           | 45,4 | 45            | 31,9 | 42               | 29,9 | 44              | 34,1 | 41                 | 31,1 | 32      | 21,5 |
| 100             | 19                    | 19,9 | 54        | 44,3 | 51           | 42,3 | 35            | 24,4 | 32               | 22,4 | 35              | 30   | 32                 | 27   | 32      | 20,1 |
| 250             | 31                    | 33   | 50        | 38,3 | 47           | 36,3 | 19            | 5,3  | 16               | 3,3  | 19              | 22   | 16                 | 19   | 30      | 17,3 |
| 300             | 36                    | -    | 45        | -    | 42           | -    | 15            | -    | 12               | -    | 14              | -    | 11                 | -    | 28      | -    |
| 400             | 41,6                  | -    | 42        | -    | 39           | -    | 10            | -    | 7                | -    | 8               | -    | 5                  | -    | 26      | -    |

## Electrical characteristics (LF) at 20 °C

|                            |              |                 |
|----------------------------|--------------|-----------------|
| • DC resistance            | max.         | 76 Ω/km         |
| • Resistance unbalance     | max.         | 2 %             |
| • Insulation resistance    | min.         | 2 G Ω x km      |
| • Mutual capacitance       | nom.         | 48 pF/m         |
| • Capacitance unbalance    | max.         | 1500 pF/km      |
| • Characteristic impedance | @ 100MHz     | 100 ± 5 Ω       |
| • Transfer impedance       | @ 1/10/30MHz | 50/100/200 mΩ/m |
| • Coupling attenuation     | min.         | 55 dB (Type 1)  |
| • Velocity of propagation  | approx.      | 67 %            |
| • Propagation delay        | nom.         | 510 ns/100 m    |
| • Skew at 100MHz           | nom.         | 25 ns/100 m     |
| • Testing voltage          |              | 1000 V          |
| • Operating voltage        | max.         | 125 V           |

## Mechanical characteristics

|                                      |      |                                                           |
|--------------------------------------|------|-----------------------------------------------------------|
| • Bending radius during installation | min. | 8 x D                                                     |
| • as installed                       | min. | 4 x D                                                     |
| • Tensile strength                   | max. | 110 N (Sx) <sup>1)</sup> , 220 N (Dx) <sup>1)</sup>       |
| • Crush resistance                   | min. | 1000 N/10cm                                               |
| • Impact strength                    | min. | 10 impacts                                                |
| • Temperature range installation     |      | 0 °C to +50 °C                                            |
| • in operation                       |      | -20 °C to +60 °C (FR-PVC / LSZH)<br>-40 °C to +80 °C (PE) |



| Part no. | Dimensions         | Outer dia. approx.[mm] | Cu content [kg/km] | Cable weight [kg/km] | Fire load [MJ/m] [kWh/m] | Sheath - Color                     | Packing [m] |
|----------|--------------------|------------------------|--------------------|----------------------|--------------------------|------------------------------------|-------------|
| 506020   | 4 x 2 x 0,55       | 7,2                    | 20                 | 54                   | 0,90 0,25                | FR-PVC <sup>2)</sup> (RAL 7035)    | 500/1000    |
| 506023   | 4 x 2 x 0,55       | 7,2                    | 20                 | 55                   | 0,85 0,24                | FRNC/LSZH <sup>3)</sup> (RAL 1021) | 500/1000    |
| 506032   | 2 x (4 x 2 x 0,55) | 7,2 x 14,6             | 40                 | 110                  | 1,70 0,48                | FRNC/LSZH <sup>3)</sup> (RAL 1021) | 500         |
| 506026   | 4 x 2 x 0,55       | 7,2                    | 20                 | 46                   | 1,50 0,42                | PE <sup>4)</sup> (RAL 9011)        | 500/1000    |

<sup>1)</sup> Sx= Simplex , Dx= Duplex

<sup>2)</sup> FR-PVC=Flame Reterdant Polyvinyl Chloride

<sup>3)</sup> FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

<sup>4)</sup> PE=Polyethylene

# SL400 SF/U23

Data cable , Category 6

SF/UTP, Class E, 250MHz

4x2xAWG23



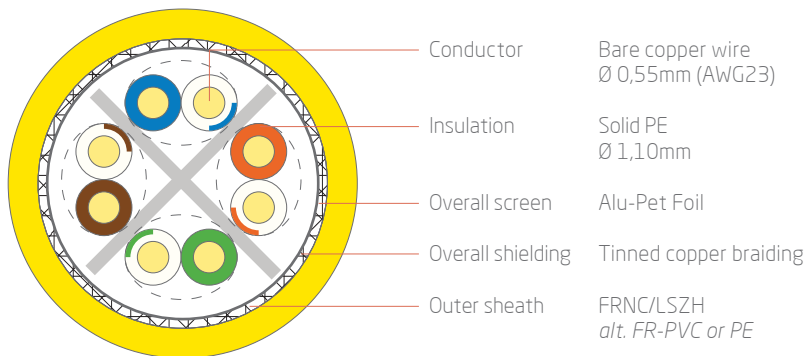
## Types

SL400 SF/U23 PVC  
SL400 SF/U23 LSZH  
SL400 SF/U23Dx LSZH  
SL400 SF/U23 PE

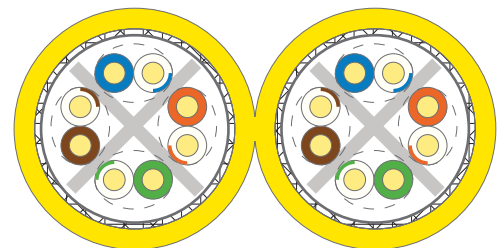
## PRODUCT INFORMATION

### Cable constructions

SL400 SF/U23



SL400 SF/U23Dx LSZH  
Duplex construction



### Features and applications

Recber SL400 SF/U23 is premium grade Class E data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to overall foil screen and tinned copper braiding.

Suitable for applications up to Class E (250MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-5-1
- U.S. Standards ANSI EIA/TIA 568-C.2

### Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL400 SF/U23

Data cable , Category 6

SF/UTP, Class E, 250MHz

4x2xAWG23



## Electrical characteristics (HF) at 20 °C

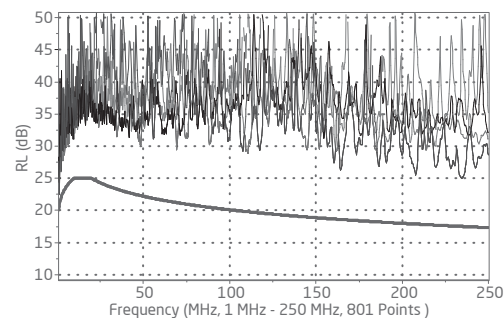
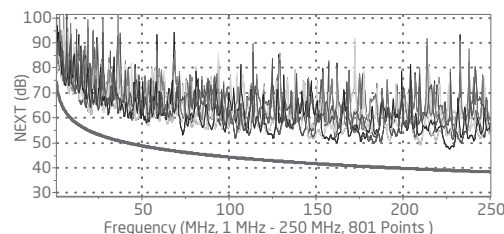
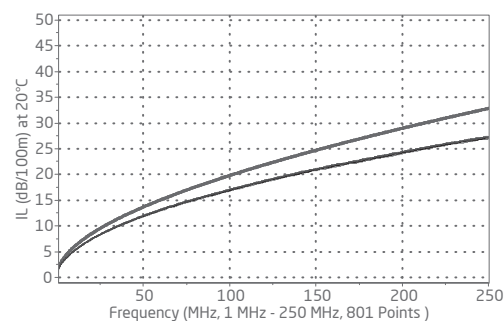
| Frequency [MHz] | Attenuation [dB/100m] |      | NEXT [dB] |      | PS-NEXT [dB] |      | ACR [dB/100m] |      | PS-ACR [dB/100m] |      | ACR-F [dB/100m] |      | PS-ACR-F [dB/100m] |      | RL [dB] |      |
|-----------------|-----------------------|------|-----------|------|--------------|------|---------------|------|------------------|------|-----------------|------|--------------------|------|---------|------|
|                 | typ.                  | max. | typ.      | min. | typ.         | min. | typ.          | min. | typ.             | min. | typ.            | min. | typ.               | min. | typ.    | min. |
| 1               | 1,9                   | 2,1  | 84        | 66   | 81           | 64   | 82            | 63,9 | 79               | 61,9 | 85              | 66   | 82                 | 64   | 26      | 20   |
| 4               | 3,8                   | 3,8  | 78        | 65,3 | 75           | 63,3 | 74            | 61,4 | 71               | 59,4 | 77              | 58   | 74                 | 55   | 31      | 23   |
| 10              | 5,9                   | 6    | 72        | 59,3 | 69           | 57,3 | 66            | 53,3 | 63               | 51,3 | 68              | 50   | 64                 | 47   | 32      | 25   |
| 16              | 7,4                   | 7,6  | 67        | 56,2 | 64           | 54,2 | 60            | 48,6 | 57               | 46,6 | 63              | 45,9 | 60                 | 42,9 | 34      | 25   |
| 31,25           | 10,5                  | 10,7 | 62        | 51,9 | 59           | 49,9 | 51            | 41,1 | 48               | 39,1 | 51              | 40,1 | 48                 | 37,1 | 36      | 23,6 |
| 62,50           | 15,1                  | 15,5 | 60        | 47,4 | 57           | 45,4 | 45            | 31,9 | 42               | 29,9 | 44              | 34,1 | 41                 | 31,1 | 32      | 21,5 |
| 100             | 19                    | 19,9 | 54        | 44,3 | 51           | 42,3 | 35            | 24,4 | 32               | 22,4 | 35              | 30   | 32                 | 27   | 32      | 20,1 |
| 250             | 31                    | 33   | 50        | 38,3 | 47           | 36,3 | 19            | 5,3  | 16               | 3,3  | 19              | 22   | 16                 | 19   | 30      | 17,3 |
| 300             | 36                    | -    | 45        | -    | 42           | -    | 15            | -    | 12               | -    | 14              | -    | 11                 | -    | 28      | -    |
| 400             | 41,6                  | -    | 42        | -    | 39           | -    | 10            | -    | 7                | -    | 8               | -    | 5                  | -    | 26      | -    |

## Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 76 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 48 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 12/10/30 mΩ/m
- Coupling attenuation **min.** 80 dB (Type 1)
- Velocity of propagation **approx.** 67 %
- Propagation delay **nom.** 510 ns/100 m
- Skew at 100MHz **nom.** 25 ns/100 m
- Testing voltage 1000 V
- Operating voltage **max.** 125 V

## Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- as installed **min.** 4 x D
- Tensile strength **max.** 160 N (Sx)<sup>1)</sup>, 320 N (Dx)<sup>1)</sup>
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation 0 °C to +50 °C
- in operation -20 °C to +60 °C (FR-PVC / LSZH)
- 40 °C to +80 °C (PE)



| Part no. | Dimensions         | Outer dia. approx.[mm] | Cu content [kg/km] | Cable weight [kg/km] | Fire load [MJ/m] [kWh/m] | Sheath - Color                     | Packing [m] |
|----------|--------------------|------------------------|--------------------|----------------------|--------------------------|------------------------------------|-------------|
| 506021   | 4 x 2 x 0,55       | 7,6                    | 28                 | 62                   | 0,95 0,26                | FR-PVC <sup>2)</sup> (RAL 7035)    | 500/1000    |
| 506024   | 4 x 2 x 0,55       | 7,6                    | 28                 | 63                   | 0,90 0,25                | FRNC/LSZH <sup>3)</sup> (RAL 1021) | 500/1000    |
| 506033   | 2 x (4 x 2 x 0,55) | 7,6 x 15,4             | 56                 | 126                  | 1,80 0,50                | FRNC/LSZH <sup>3)</sup> (RAL 1021) | 500         |
| 506027   | 4 x 2 x 0,55       | 7,6                    | 28                 | 54                   | 1,56 0,43                | PE <sup>4)</sup> (RAL 9011)        | 500/1000    |

<sup>1)</sup> Sx= Simplex , Dx= Duplex

<sup>2)</sup> FR-PVC=Flame Reterdant Polyvinyl Chloride

<sup>3)</sup> FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

<sup>4)</sup> PE=Polyethylene

# SL500 U/F23

Data cable , Category 6<sub>A</sub>

U/FTP, Class E<sub>A</sub>, 500MHz

4x2xAWG23



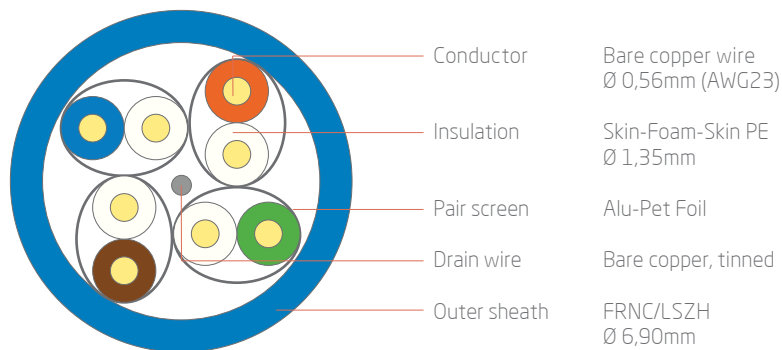
## PRODUCT INFORMATION

### Types

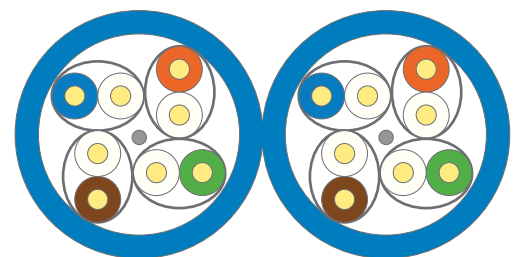
SL500 U/F23 LSZH  
SL500 U/F23Dx LSZH

### Cable constructions

SL500 U/F23  
Simplex construction



SL500 U/F23Dx  
Duplex construction



### Features and applications

Recber SL500 U/F23 is premium grade Class E<sub>A</sub> copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF).

Suitable for applications up to Class E<sub>A</sub> (500MHz) , Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice ,VoIP (Voice over IP), 10GbE acc.to IEEE 802.3.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-10-1

### Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL500 U/F23

Data cable , Category 6<sub>A</sub>

U/FTP, Class E<sub>A</sub>, 500MHz

4x2xAWG23



## Electrical characteristics (HF) at 20 °C

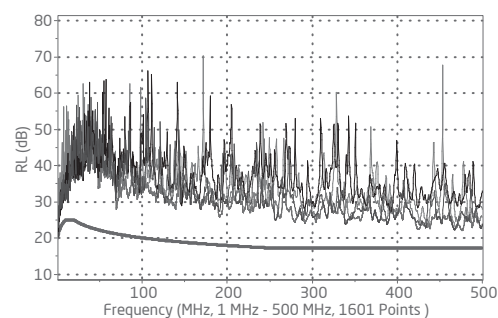
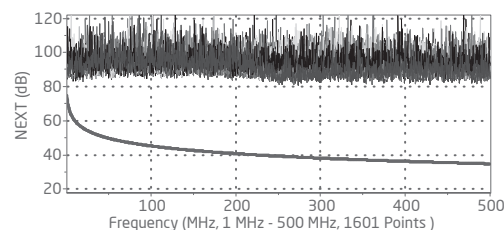
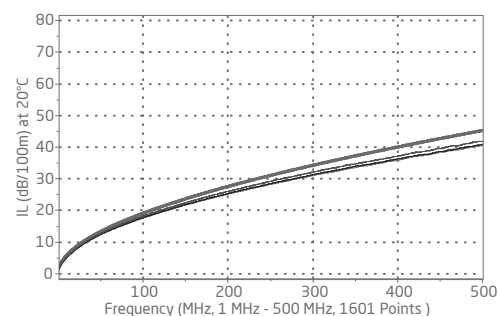
| Frequency [MHz] | Attenuation [dB/100m] |      | NEXT [dB] |      | PS-NEXT [dB] |      | ACR [dB/100m] |       | PS-ACR [dB/100m] |       | ACR-F [dB/100m] |      | PS-ACR-F [dB/100m] |      | RL [dB] |      |
|-----------------|-----------------------|------|-----------|------|--------------|------|---------------|-------|------------------|-------|-----------------|------|--------------------|------|---------|------|
|                 | typ.                  | max. | typ.      | min. | typ.         | min. | typ.          | min.  | typ.             | min.  | typ.            | min. | typ.               | min. | typ.    | min. |
| 1               | 1,9                   | 2,1  | 95        | 75,3 | 92           | 72,3 | 93            | 73,2  | 90               | 70,2  | 100             | 78   | 97                 | 75   | 26      | 20   |
| 4               | 3,5                   | 3,8  | 95        | 66,3 | 92           | 63,3 | 91            | 62,5  | 88               | 59,5  | 100             | 83,3 | 97                 | 80,3 | 27      | 23   |
| 10              | 5,6                   | 5,9  | 95        | 60,3 | 92           | 57,3 | 89            | 54,4  | 86               | 51,4  | 92              | 75,3 | 89                 | 72,3 | 30      | 25   |
| 16              | 6,9                   | 7,5  | 95        | 57,2 | 92           | 54,2 | 88            | 49,8  | 85               | 46,8  | 88              | 71,2 | 85                 | 68,2 | 30      | 25,7 |
| 31,25           | 9,80                  | 10,5 | 95        | 52,9 | 92           | 49,9 | 85            | 42,4  | 82               | 39,4  | 82              | 65,4 | 79                 | 62,4 | 30      | 23,6 |
| 62,50           | 14,1                  | 15   | 95        | 48,4 | 92           | 45,4 | 81            | 33,4  | 78               | 30,4  | 76              | 59,4 | 73                 | 56,4 | 30      | 21,5 |
| 100             | 17,7                  | 19,1 | 95        | 45,3 | 92           | 42,3 | 77            | 26,2  | 74               | 23,2  | 72              | 55,3 | 69                 | 52,3 | 30      | 20,1 |
| 250             | 29,5                  | 31,1 | 85        | 39,3 | 82           | 36,3 | 55            | 8,3   | 52               | 5,3   | 64              | 47,3 | 61                 | 44,3 | 24      | 17,3 |
| 400             | 38,8                  | 40,1 | 80        | 36,3 | 77           | 33,3 | 41            | -3,8  | 38               | -6,8  | 57              | 43,3 | 54                 | 40,3 | 23      | 15,9 |
| 500             | 43,5                  | 45,3 | 75        | 34,8 | 72           | 31,8 | 31            | -10,4 | 28               | -13,4 | 55              | 41,3 | 52                 | 38,3 | 22      | 15,2 |

## Electrical characteristics (LF) at 20 °C

|                            |              |                           |
|----------------------------|--------------|---------------------------|
| • DC resistance            | max.         | 74 Ω/km                   |
| • Resistance unbalance     | max.         | 2 %                       |
| • Insulation resistance    | min.         | 2 G Ω x km                |
| • Mutual capacitance       | nom.         | 43 pF/m                   |
| • Capacitance unbalance    | max.         | 1500 pF/km                |
| • Characteristic impedance | @ 100MHz     | 100 ± 5 Ω                 |
| • Transfer impedance       | @ 1/10/30MHz | 50/100/200 mΩ/m (Grade 2) |
| • Coupling attenuation     | min.         | 55 dB (Type 2)            |
| • Velocity of propagation  | approx.      | 79 %                      |
| • Propagation delay        | nom.         | 420 ns/100 m              |
| • Skew at 100MHz           | nom.         | 7 ns/100 m                |
| • Testing voltage          |              | 1000 V                    |
| • Operating voltage        | max.         | 125 V                     |

## Mechanical characteristics

|                                      |      |                                                     |
|--------------------------------------|------|-----------------------------------------------------|
| • Bending radius during installation | min. | 8 x D                                               |
| • as installed                       | min. | 4 x D                                               |
| • Tensile strength                   | max. | 100 N (Sx) <sup>1)</sup> , 200 N (Dx) <sup>1)</sup> |
| • Crush resistance                   | min. | 1000 N/10cm                                         |
| • Impact strength                    | min. | 10 impacts                                          |
| • Temperature range installation     |      | 0 °C to +50 °C                                      |
| • in operation                       |      | -20 °C to +60 °C                                    |



| Part no. | Dimensions         | Outer dia. approx.[mm] | Cu content [kg/km] | Cable weight [kg/km] | Fire load [MJ/m] [kWh/m] | Sheath - Color                     | Packing [m] |
|----------|--------------------|------------------------|--------------------|----------------------|--------------------------|------------------------------------|-------------|
| 506046   | 4 x 2 x 0,56       | 6,90                   | 21                 | 52                   | 0,50 0,14                | FRNC/LSZH <sup>2)</sup> (RAL 5015) | 500/1000    |
| 506064   | 2 x (4 x 2 x 0,56) | 6,90 x 14,0            | 42                 | 104                  | 1,00 0,28                | FRNC/LSZH <sup>2)</sup> (RAL 5015) | 1000        |

<sup>1)</sup> Sx= Simplex , Dx= Duplex

<sup>2)</sup> FRNC/LSZH=Flame Retardant Non Corrosive / Low Smoke Zero Halogen

# SL500 F/F23

Data cable , Category 6<sub>A</sub>

F/FTP, Class E<sub>A</sub>, 500MHz

4x2xAWG23

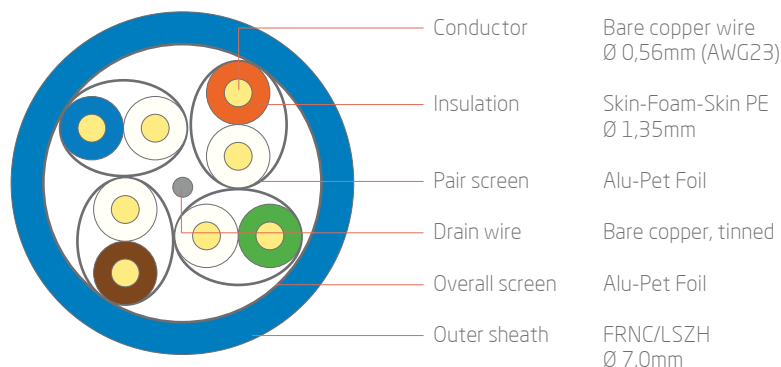


## PRODUCT INFORMATION

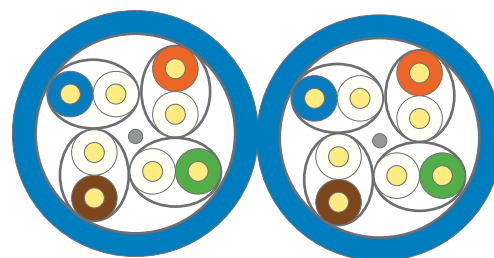
Types  
SL500 F/F23 LSZH  
SL500 F/F23Dx LSZH

### Cable constructions

SL500 F/F23  
Simplex construction



SL500 F/F23Dx  
Duplex construction



### Features and applications

Recber SL500 F/F23 is premium grade Class E<sub>A</sub> copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF) and overall screen.

Suitable for applications up to Class E<sub>A</sub> (500MHz) , Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice ,VoIP (Voice over IP), 10GbE acc.to IEEE 802.3.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-10-1

### Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL500 F/F23

Data cable , Category 6<sub>A</sub>

F/FTP, Class E<sub>A</sub>, 500MHz

4x2xAWG23



## Electrical characteristics (HF) at 20 °C

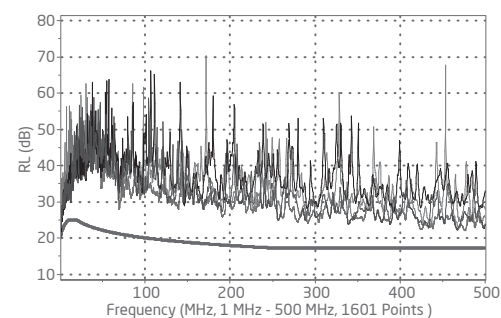
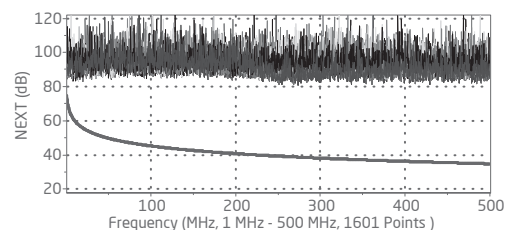
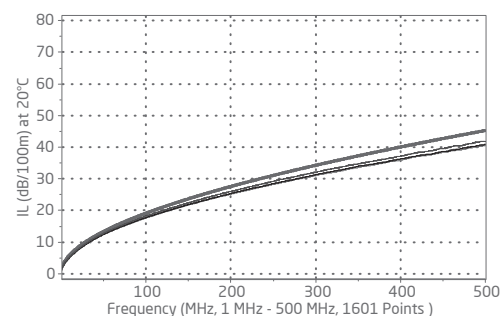
| Frequency [MHz] | Attenuation [dB/100m] |      | NEXT [dB] |      | PS-NEXT [dB] |      | ACR [dB/100m] |       | PS-ACR [dB/100m] |       | ACR-F [dB/100m] |      | PS-ACR-F [dB/100m] |      | RL [dB] |      |
|-----------------|-----------------------|------|-----------|------|--------------|------|---------------|-------|------------------|-------|-----------------|------|--------------------|------|---------|------|
|                 | typ.                  | max. | typ.      | min. | typ.         | min. | typ.          | min.  | typ.             | min.  | typ.            | min. | typ.               | min. | typ.    | min. |
| 1               | 1,9                   | 2,1  | 95        | 75,3 | 92           | 72,3 | 93            | 73,2  | 90               | 70,2  | 100             | 78   | 97                 | 75   | 26      | 20   |
| 4               | 3,5                   | 3,8  | 95        | 66,3 | 92           | 63,3 | 91            | 62,5  | 88               | 59,5  | 100             | 83,3 | 97                 | 80,3 | 27      | 23   |
| 10              | 5,6                   | 5,9  | 95        | 60,3 | 92           | 57,3 | 89            | 54,4  | 86               | 51,4  | 92              | 75,3 | 89                 | 72,3 | 30      | 25   |
| 16              | 6,9                   | 7,5  | 95        | 57,2 | 92           | 54,2 | 88            | 49,8  | 85               | 46,8  | 88              | 71,2 | 85                 | 68,2 | 30      | 25,7 |
| 31,25           | 9,80                  | 10,5 | 95        | 52,9 | 92           | 49,9 | 85            | 42,4  | 82               | 39,4  | 82              | 65,4 | 79                 | 62,4 | 30      | 23,6 |
| 62,50           | 14,1                  | 15   | 95        | 48,4 | 92           | 45,4 | 81            | 33,4  | 78               | 30,4  | 76              | 59,4 | 73                 | 56,4 | 30      | 21,5 |
| 100             | 17,7                  | 19,1 | 95        | 45,3 | 92           | 42,3 | 77            | 26,2  | 74               | 23,2  | 72              | 55,3 | 69                 | 52,3 | 30      | 20,1 |
| 250             | 29,5                  | 31,1 | 85        | 39,3 | 82           | 36,3 | 55            | 8,3   | 52               | 5,3   | 64              | 47,3 | 61                 | 44,3 | 24      | 17,3 |
| 400             | 38,8                  | 40,1 | 80        | 36,3 | 77           | 33,3 | 41            | -3,8  | 38               | -6,8  | 57              | 43,3 | 54                 | 40,3 | 23      | 15,9 |
| 500             | 43,5                  | 45,3 | 75        | 34,8 | 72           | 31,8 | 31            | -10,4 | 28               | -13,4 | 55              | 41,3 | 52                 | 38,3 | 22      | 15,2 |

## Electrical characteristics (LF) at 20 °C

|                            |              |                          |
|----------------------------|--------------|--------------------------|
| • DC resistance            | max.         | 74 Ω/km                  |
| • Resistance unbalance     | max.         | 2 %                      |
| • Insulation resistance    | min.         | 2 G Ω x km               |
| • Mutual capacitance       | nom.         | 43 pF/m                  |
| • Capacitance unbalance    | max.         | 1500 pF/km               |
| • Characteristic impedance | @ 100MHz     | 100 ± 5 Ω                |
| • Transfer impedance       | @ 1/10/30MHz | 20/50/100 mΩ/m (Grade 2) |
| • Coupling attenuation     | min.         | 65 dB (Type 2)           |
| • Velocity of propagation  | approx.      | 79 %                     |
| • Propagation delay        | nom.         | 420 ns/100 m             |
| • Skew at 100MHz           | nom.         | 7 ns/100 m               |
| • Testing voltage          |              | 1000 V                   |
| • Operating voltage        | max.         | 125 V                    |

## Mechanical characteristics

|                                      |      |                                                     |
|--------------------------------------|------|-----------------------------------------------------|
| • Bending radius during installation | min. | 8 x D                                               |
| • as installed                       | min. | 4 x D                                               |
| • Tensile strength                   | max. | 100 N (Sx) <sup>1)</sup> , 200 N (Dx) <sup>1)</sup> |
| • Crush resistance                   | min. | 1000 N/10cm                                         |
| • Impact strength                    | min. | 10 impacts                                          |
| • Temperature range installation     |      | 0 °C to +50 °C                                      |
| • in operation                       |      | -20 °C to +60 °C                                    |



| Part no. | Dimensions         | Outer dia. approx.[mm] | Cu content [kg/km] | Cable weight [kg/km] | Fire load [MJ/m] [kWh/m] | Sheath - Color                     | Packing [m] |
|----------|--------------------|------------------------|--------------------|----------------------|--------------------------|------------------------------------|-------------|
| 506047   | 4 x 2 x 0,56       | 7,00                   | 21                 | 53                   | 0,53 0,15                | FRNC/LSZH <sup>2)</sup> (RAL 5015) | 500/1000    |
| 506065   | 2 x (4 x 2 x 0,56) | 7,00 x 14,2            | 42                 | 106                  | 1,06 0,30                | FRNC/LSZH <sup>2)</sup> (RAL 5015) | 1000        |

<sup>1)</sup> Sx= Simplex , Dx= Duplex

<sup>2)</sup> FRNC/LSZH=Flame Retardant Non Corrosive / Low Smoke Zero Halogen

# SL900 S/F23

Data cable , Category 7

S/FTP, Class F, 600MHz

4x2xAWG23



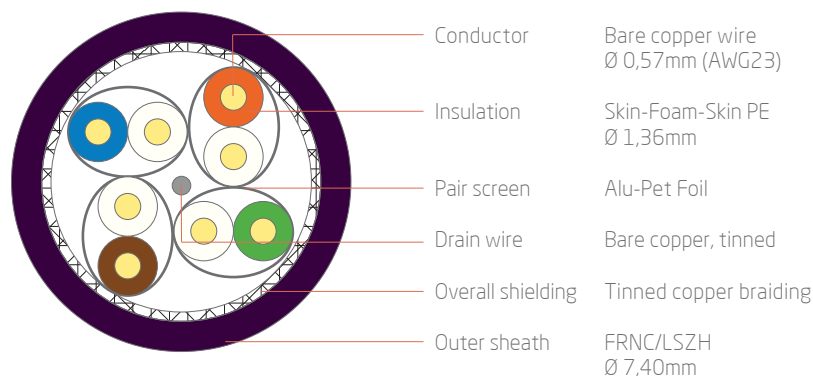
## PRODUCT INFORMATION

### Types

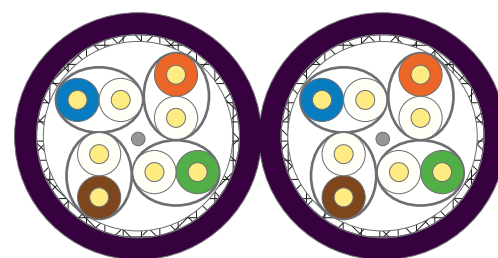
SL900 S/F23 LSZH  
SL900 S/F23Dx LSZH

### Cable constructions

SL900 S/F23  
Simplex construction



SL900 S/F23Dx  
Duplex construction



### Features and applications

Recber SL900 S/F23 is premium grade Class F copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF) and overall tinned copper braiding.

Suitable for applications up to Class F (600MHz) , Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice ,VoIP (Voice over IP), 10GbE acc.to IEEE 802.3.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-4-1

### Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL900 S/F23

Data cable , Category 7

S/FTP, Class F, 600MHz

4x2xAWG23

## Electrical characteristics (HF) at 20 °C

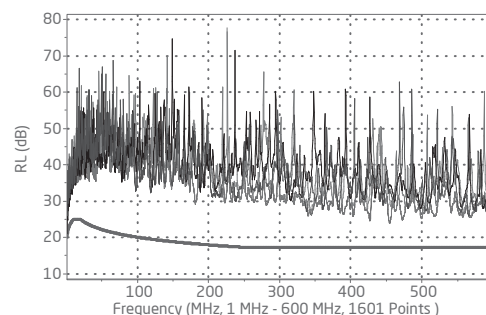
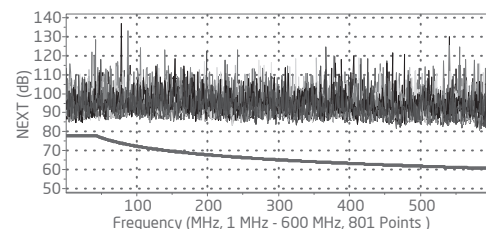
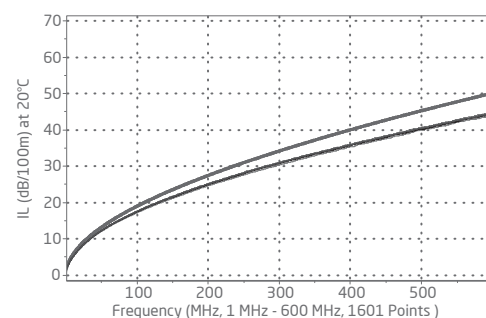
| Frequency [MHz] | Attenuation [dB/100m] |      | NEXT [dB] |      | PS-NEXT [dB] |      | ACR [dB/100m] |      | PS-ACR [dB/100m] |      | ACR-F [dB/100m] |      | PS-ACR-F [dB/100m] |      | RL [dB] |      |
|-----------------|-----------------------|------|-----------|------|--------------|------|---------------|------|------------------|------|-----------------|------|--------------------|------|---------|------|
|                 | typ.                  | max. | typ.      | min. | typ.         | min. | typ.          | min. | typ.             | min. | typ.            | min. | typ.               | min. | typ.    | min. |
| 1               | 1,8                   | 2,0  | 100       | 80   | 97           | 77   | 98            | 78   | 95               | 75   | 107             | 80   | 104                | 77   | 26      | 20   |
| 4               | 3,3                   | 3,6  | 100       | 80   | 97           | 77   | 96            | 77   | 93               | 74   | 107             | 80   | 104                | 77   | 30      | 23   |
| 10              | 5,3                   | 5,7  | 100       | 80   | 97           | 77   | 94            | 74   | 91               | 71   | 104             | 74   | 101                | 71   | 33      | 25   |
| 100             | 17,5                  | 18,5 | 100       | 72   | 97           | 69   | 82            | 54   | 79               | 51   | 92              | 54   | 89                 | 51   | 33      | 20,1 |
| 200             | 25,2                  | 26,8 | 100       | 68   | 97           | 65   | 75            | 41   | 72               | 38   | 84              | 48   | 81                 | 45   | 32      | 18   |
| 250             | 28,0                  | 30,2 | 100       | 66   | 97           | 63   | 72            | 36   | 69               | 33   | 81              | 46   | 78                 | 43   | 30      | 17,3 |
| 500             | 40,5                  | 44,1 | 96        | 62   | 93           | 59   | 55            | 18   | 52               | 15   | 68              | 40   | 65                 | 37   | 27      | 17,3 |
| 600             | 44,5                  | 48,9 | 90        | 61   | 87           | 58   | 45            | 12   | 42               | 9    | 64              | 38   | 61                 | 35   | 25      | 17,3 |
| 800             | 53,5                  | -    | 84        | -    | 81           | -    | 30            | -    | 27               | -    | 56              | -    | 53                 | -    | 23      | -    |
| 862             | 55,0                  | -    | 83        | -    | 80           | -    | 28            | -    | 25               | -    | 54              | -    | 51                 | -    | 22      | -    |
| 900             | 57,0                  | -    | 81        | -    | 78           | -    | 24            | -    | 21               | -    | 49              | -    | 46                 | -    | 21      | -    |

## Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 72 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 42 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 5/5/10 mΩ/m (Grade 1)
- Coupling attenuation **min.** 85 dB (Type 1)
- Velocity of propagation **approx.** 79 %
- Propagation delay **nom.** 420 ns/100 m
- Skew at 100MHz **nom.** 5 ns/100 m
- Testing voltage 1000 V
- Operating voltage **max.** 125 V

## Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- as installed **min.** 4 x D
- Tensile strength **max.** 110 N (Sx)<sup>1)</sup>, 220 N (Dx)<sup>1)</sup>
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation 0 °C to +50 °C
- in operation -20 °C to +60 °C



| Part no. | Dimensions         | Outer dia. approx.[mm] | Cu content [kg/km] | Cable weight [kg/km] | Fire load [MJ/m] [kWh/m] | Sheath - Color                     | Packing [m] |
|----------|--------------------|------------------------|--------------------|----------------------|--------------------------|------------------------------------|-------------|
| 507002   | 4 x 2 x 0,57       | 7,40                   | 30                 | 60                   | 0,57 0,16                | FRNC/LSZH <sup>2)</sup> (RAL 4007) | 500/1000    |
| 507005   | 2 x (4 x 2 x 0,57) | 7,40 x 15,6            | 60                 | 120                  | 1,14 0,32                | FRNC/LSZH <sup>2)</sup> (RAL 4007) | 1000        |

<sup>1)</sup> Sx= Simplex , Dx= Duplex

<sup>2)</sup> FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

# SL1200 S/F23

Data cable , Category 7<sub>A</sub>

S/FTP, Class F<sub>A</sub>, 1000MHz

4x2xAWG23



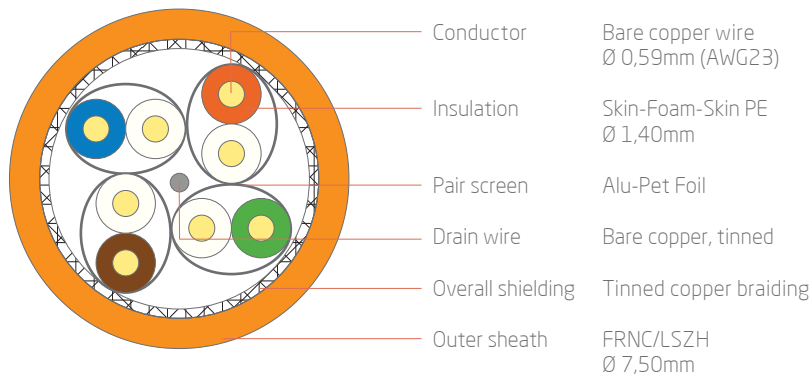
## PRODUCT INFORMATION

### Types

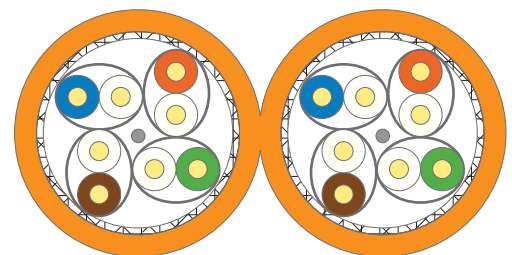
SL1200 S/F23 LSZH  
SL1200 S/F23Dx LSZH

### Cable constructions

SL1200 S/F23  
Simplex construction



SL1200 S/F23Dx  
Duplex construction



### Features and applications

Recber SL1200 S/F23 is premium grade Class F<sub>A</sub> copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF) and overall tinned copper braiding.

Suitable for applications up to Class F<sub>A</sub> (1000MHz), Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice, VoIP (Voice over IP), 10GbE acc. to IEEE 802.3.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-9-1

### Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL1200 S/F23

Data cable , Category 7<sub>A</sub>

S/FTP, Class F<sub>A</sub>, 1000MHz

4x2xAWG23

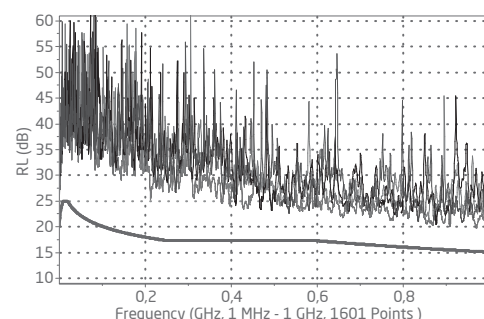
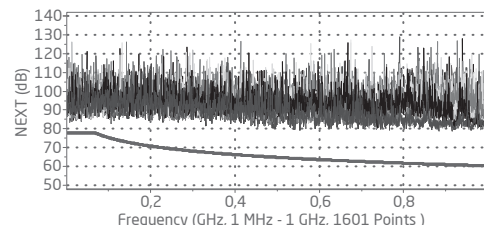
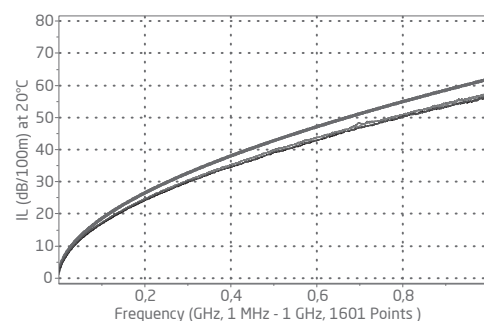


## Electrical characteristics (HF) at 20 °C

| Frequency<br>[MHz] | Attenuation<br>[dB/100m] |      | NEXT<br>[dB] |      | PS-NEXT<br>[dB] |      | ACR<br>[dB/100m] |      | PS-ACR<br>[dB/100m] |      | ACR-F<br>[dB/100m] |      | PS-ACR-F<br>[dB/100m] |      | RL<br>[dB] |      |
|--------------------|--------------------------|------|--------------|------|-----------------|------|------------------|------|---------------------|------|--------------------|------|-----------------------|------|------------|------|
|                    | typ.                     | max. | typ.         | min. | typ.            | min. | typ.             | min. | typ.                | min. | typ.               | min. | typ.                  | min. | typ.       | min. |
| 1                  | 1,9                      | 2,1  | 104          | 78   | 101             | 75   | 102              | 75,9 | 99                  | 72,9 | 108                | 78   | 105                   | 75   | 26         | 20   |
| 4                  | 3,5                      | 3,7  | 104          | 78   | 101             | 75   | 100              | 74,3 | 97                  | 71,3 | 107                | 78   | 104                   | 75   | 30         | 23   |
| 10                 | 5,4                      | 5,8  | 104          | 78   | 101             | 75   | 99               | 72,2 | 96                  | 69,2 | 104                | 75,3 | 101                   | 72,3 | 33         | 25   |
| 100                | 17,4                     | 18,5 | 104          | 75,4 | 101             | 72,4 | 87               | 56,9 | 84                  | 53,9 | 92                 | 55,3 | 89                    | 52,3 | 33         | 20,1 |
| 200                | 24,9                     | 26,5 | 104          | 70,9 | 101             | 67,9 | 79               | 44,4 | 76                  | 41,4 | 84                 | 49,3 | 81                    | 46,3 | 32         | 18   |
| 250                | 27,8                     | 29,7 | 104          | 69,4 | 101             | 66,4 | 76               | 39,7 | 73                  | 36,7 | 79                 | 47,3 | 76                    | 44,3 | 30         | 17,3 |
| 500                | 40,1                     | 42,8 | 99           | 64,9 | 96              | 61,9 | 59               | 22,2 | 56                  | 19,2 | 67                 | 41,3 | 64                    | 38,3 | 28         | 17,3 |
| 600                | 43,8                     | 47,1 | 93           | 63,7 | 90              | 60,7 | 50               | 16,6 | 47                  | 13,6 | 60                 | 39,7 | 57                    | 36,7 | 25         | 17,3 |
| 862                | 54,0                     | 57,2 | 86           | 61,4 | 83              | 58,4 | 32               | 4,2  | 29                  | 1,2  | 53                 | 36,6 | 50                    | 33,6 | 23         | 15,7 |
| 1000               | 58,0                     | 61,9 | 84           | 60,4 | 81              | 57,4 | 26               | -1,5 | 23                  | -4,5 | 43                 | 35,3 | 40                    | 32,3 | 20         | 15,1 |
| 1200               | 64                       | -    | 82           | -    | 79              | -    | 18               | -    | 15                  | -    | 38                 | -    | 35                    | -    | 19         | -    |

## Electrical characteristics (LF) at 20 °C

|                            |              |                       |
|----------------------------|--------------|-----------------------|
| • DC resistance            | max.         | 68 Ω/km               |
| • Resistance unbalance     | max.         | 2 %                   |
| • Insulation resistance    | min.         | 2 G Ω x km            |
| • Mutual capacitance       | nom.         | 42 pF/m               |
| • Capacitance unbalance    | max.         | 1500 pF/km            |
| • Characteristic impedance | @ 100MHz     | 100 ± 5 Ω             |
| • Transfer impedance       | @ 1/10/30MHz | 5/5/10 mΩ/m (Grade 1) |
| • Coupling attenuation     | min.         | 85 dB (Type 1)        |
| • Velocity of propagation  | approx.      | 79 %                  |
| • Propagation delay        | nom.         | 420 ns/100 m          |
| • Skew at 100MHz           | nom.         | 5 ns/100 m            |
| • Testing voltage          |              | 1000 V                |
| • Operating voltage        | max.         | 125 V                 |



## Mechanical characteristics

|                                      |      |                                                     |
|--------------------------------------|------|-----------------------------------------------------|
| • Bending radius during installation | min. | 8 x D                                               |
| • as installed                       | min. | 4 x D                                               |
| • Tensile strength                   | max. | 110 N (Sx) <sup>1)</sup> , 220 N (Dx) <sup>1)</sup> |
| • Crush resistance                   | min. | 1000 N/10cm                                         |
| • Impact strength                    | min. | 10 impacts                                          |
| • Temperature range installation     |      | 0 °C to +50 °C                                      |
| • in operation                       |      | -20 °C to +60 °C                                    |

| Part no. | Dimensions         | Outer dia.<br>approx.[mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Fire load<br>[MJ/m] [kWh/m] | Sheath - Color                     | Packing<br>[m] |
|----------|--------------------|---------------------------|-----------------------|-------------------------|-----------------------------|------------------------------------|----------------|
| 507008   | 4 x 2 x 0,59       | 7,50                      | 32                    | 63                      | 0,64 0,18                   | FRNC/LSZH <sup>2)</sup> (RAL 2003) | 500/1000       |
| 507011   | 2 x (4 x 2 x 0,59) | 7,50 x 15,8               | 64                    | 126                     | 1,28 0,36                   | FRNC/LSZH <sup>2)</sup> (RAL 2003) | 500            |

<sup>1)</sup> Sx= Simplex , Dx= Duplex

<sup>2)</sup> FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

# SL1500 S/F22

Data cable , Category 7<sub>A</sub>

S/FTP, Class F<sub>A</sub>, 1200MHz

4x2xAWG22



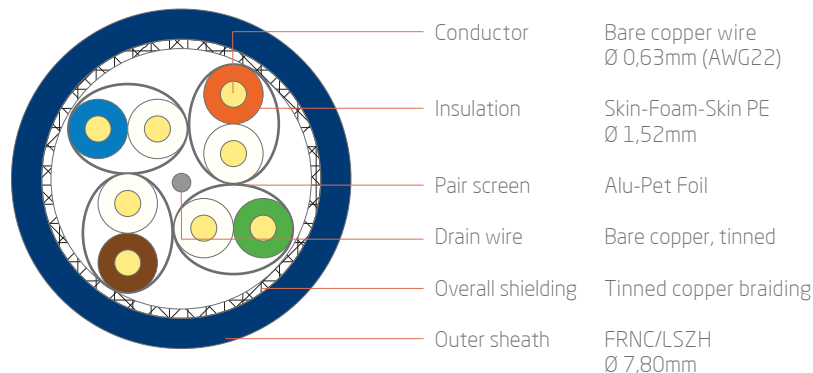
## PRODUCT INFORMATION

### Types

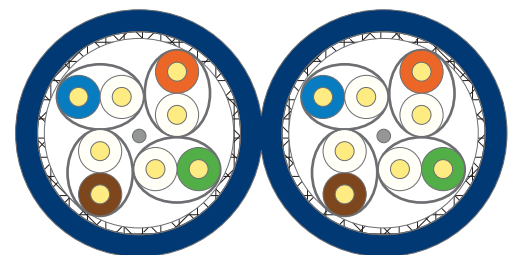
SL1500 S/F22 LSZH  
SL1500 S/F22Dx LSZH

### Cable constructions

SL1500 S/F22  
Simplex construction



SL1500 S/F22Dx  
Duplex construction



### Features and applications

Recber SL1500 S/F22 is premium grade Class F<sub>A</sub> copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF) and overall tinned copper braiding.

Suitable for applications up to Class F<sub>A</sub> (1200MHz), Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice, VoIP (Voice over IP), 10GbE acc. to IEEE 802.3.

### Standards

- International standard ISO/IEC 11801 2<sup>nd</sup> ed., IEC 61156-5, IEC 61156-7
- European standard EN 50173-1, EN 50288-9-1

### Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

# SL1500 S/F22

Data cable , Category 7<sub>A</sub>

S/FTP, Class F<sub>A</sub>, 1200MHz

4x2xAWG22

## Electrical characteristics (HF) at 20 °C

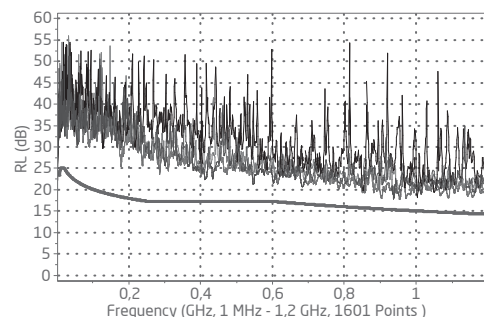
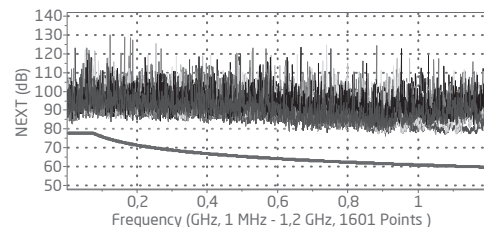
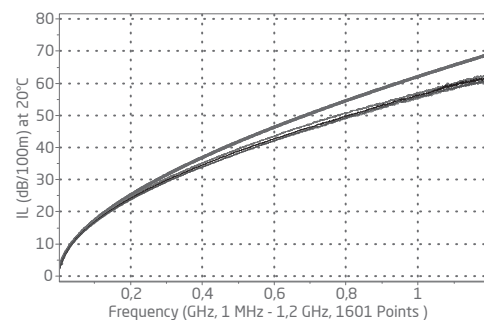
| Frequency<br>[MHz] | Attenuation<br>[dB/100m] |      | NEXT<br>[dB] |      | PS-NEXT<br>[dB] |      | ACR<br>[dB/100m] |      | PS-ACR<br>[dB/100m] |       | ACR-F<br>[dB/100m] |      | PS-ACR-F<br>[dB/100m] |      | RL<br>[dB] |      |
|--------------------|--------------------------|------|--------------|------|-----------------|------|------------------|------|---------------------|-------|--------------------|------|-----------------------|------|------------|------|
|                    | typ.                     | max. | typ.         | min. | typ.            | min. | typ.             | min. | typ.                | min.  | typ.               | min. | typ.                  | min. | typ.       | min. |
| 1                  | 1,7                      | 1,9  | 105          | 78   | 102             | 75   | 103              | 76,1 | 100                 | 73,1  | 110                | 78   | 107                   | 75   | 26         | 20   |
| 4                  | 3,2                      | 3,5  | 105          | 78   | 102             | 75   | 102              | 74,5 | 99                  | 71,5  | 108                | 78   | 105                   | 75   | 30         | 23   |
| 10                 | 4,9                      | 5,4  | 105          | 78   | 102             | 75   | 100              | 72,6 | 97                  | 69,6  | 105                | 74   | 102                   | 71   | 33         | 25   |
| 100                | 16,1                     | 17,5 | 105          | 76   | 102             | 73   | 89               | 58,5 | 86                  | 55,5  | 95                 | 54   | 92                    | 51   | 33         | 20,1 |
| 250                | 26                       | 28,5 | 105          | 70   | 102             | 67   | 79               | 41,5 | 76                  | 38,5  | 85                 | 46   | 82                    | 43   | 27         | 17,3 |
| 500                | 37,2                     | 41,8 | 99           | 65,5 | 96              | 62,5 | 62               | 23,7 | 59                  | 20,7  | 71                 | 40   | 78                    | 37   | 26         | 17,3 |
| 600                | 40,2                     | 46,3 | 96           | 64,3 | 93              | 61,3 | 56               | 18   | 53                  | 15    | 63                 | 38,4 | 60                    | 35,4 | 26         | 17,3 |
| 862                | 49                       | 56,9 | 93           | 62   | 90              | 59   | 44               | 5,1  | 41                  | 2,1   | 56                 | 35,3 | 53                    | 32,3 | 23         | 15,7 |
| 1000               | 54,8                     | 62   | 88           | 61   | 85              | 58   | 33               | -1   | 30                  | -4    | 52                 | 34   | 49                    | 31   | 22         | 15,1 |
| 1200               | 58,0                     | 69   | 85           | 59,8 | 82              | 56,8 | 27               | -9,2 | 24                  | -12,2 | 43                 | 32,4 | 40                    | 29,4 | 20         | 14,3 |
| 1500               | 67,5                     | -    | 81           | -    | 78              | -    | 15               | -    | 12                  | -     | 38                 | -    | 35                    | -    | 19         | -    |

## Electrical characteristics (LF) at 20 °C

|                            |              |                      |
|----------------------------|--------------|----------------------|
| • DC resistance            | max.         | 60 Ω/km              |
| • Resistance unbalance     | max.         | 2 %                  |
| • Insulation resistance    | min.         | 2 G Ω x km           |
| • Mutual capacitance       | nom.         | 41 pF/m              |
| • Capacitance unbalance    | max.         | 1500 pF/km           |
| • Characteristic impedance | @ 100MHz     | 100 ± 5 Ω            |
| • Transfer impedance       | @ 1/10/30MHz | 5/5/8 mΩ/m (Grade 1) |
| • Coupling attenuation     | min.         | 85 dB (Type 1)       |
| • Velocity of propagation  | approx.      | 79 %                 |
| • Propagation delay        | nom.         | 420 ns/100 m         |
| • Skew at 100MHz           | nom.         | 5 ns/100 m           |
| • Testing voltage          |              | 1000 V               |
| • Operating voltage        | max.         | 125 V                |

## Mechanical characteristics

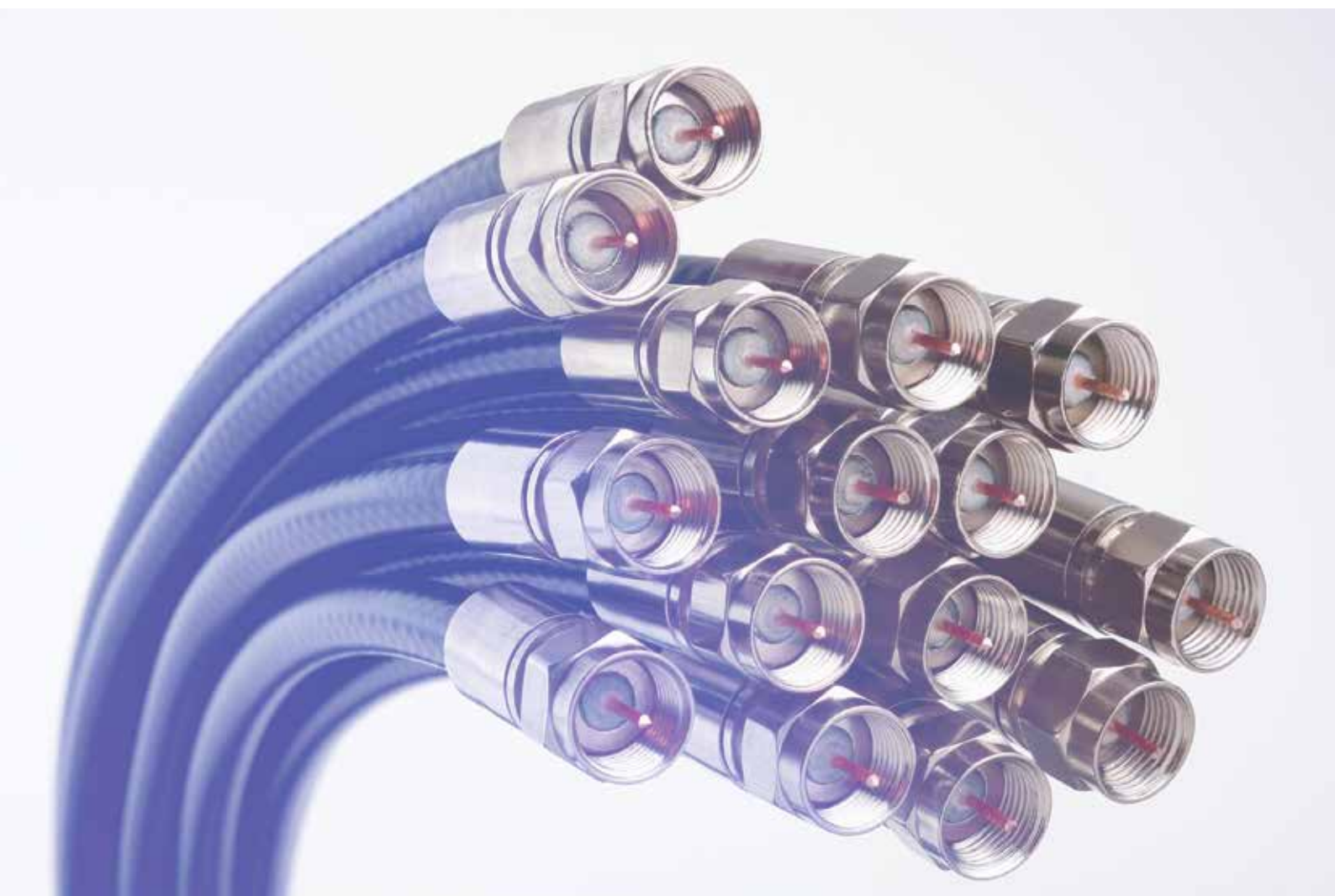
|                                      |      |                                                     |
|--------------------------------------|------|-----------------------------------------------------|
| • Bending radius during installation | min. | 8 x D                                               |
| • as installed                       | min. | 4 x D                                               |
| • Tensile strength                   | max. | 130 N (Sx) <sup>1)</sup> , 260 N (Dx) <sup>1)</sup> |
| • Crush resistance                   | min. | 1000 N/10cm                                         |
| • Impact strength                    | min. | 10 impacts                                          |
| • Temperature range installation     |      | 0 °C to +50 °C                                      |
| • in operation                       |      | -20 °C to +60 °C                                    |



| Part no. | Dimensions         | Outer dia.<br>approx.[mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Fire load<br>[MJ/m] [kWh/m] | Sheath - Color                       | Packing<br>[m] |
|----------|--------------------|---------------------------|-----------------------|-------------------------|-----------------------------|--------------------------------------|----------------|
| 507008   | 4 x 2 x 0,63       | 7,80                      | 35                    | 67                      | 0,72 0,20                   | ■ FRNC/LSZH <sup>2)</sup> (RAL 5002) | 500/1000       |
| 507011   | 2 x (4 x 2 x 0,63) | 7,80 x 16,4               | 70                    | 134                     | 1,44 0,40                   | ■ FRNC/LSZH <sup>2)</sup> (RAL 5002) | 500            |

<sup>1)</sup> Sx= Simplex , Dx= Duplex

<sup>2)</sup> FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen



# COAXIAL

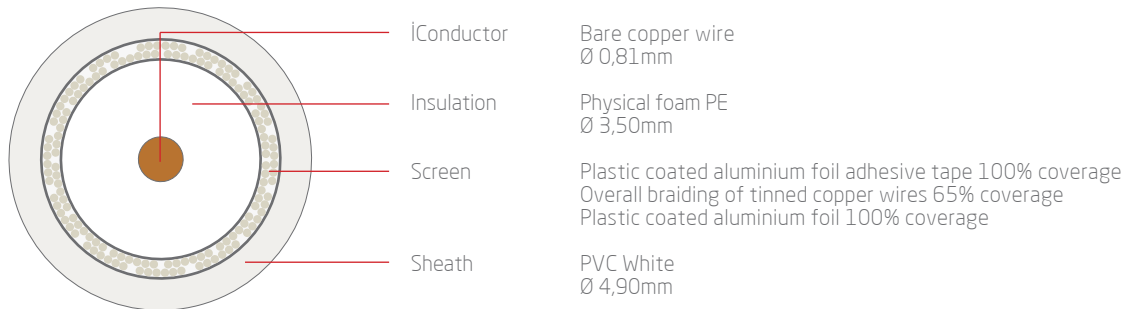
Cables





Class A+  
EN 50117-2-4

### Cable construction



### Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

### Technical information

Temperature range -30 °C ... +70 °C  
Min. bending radius 10 x D

Impedance 75 ± 3 Ω  
Capacitance 52 ± 2 pF/m  
Velocity of propagation %85 ± 2  
Insulation resistance ≥ 2 G Ω x km  
Max. operating voltage 1300 V  
Test voltage 3000 V

Standards EN 50117, IEC 61196

Features  
Vertical flame propagation EN 60332-1-2

|                    |          |              |
|--------------------|----------|--------------|
| Attenuation @20 °C | 50 MHz   | 5,90 dB/100m |
|                    | 200 MHz  | 11,7 dB/100m |
|                    | 470 MHz  | 18,1 dB/100m |
|                    | 860 MHz  | 24,8 dB/100m |
|                    | 1000 MHz | 26,8 dB/100m |
|                    | 2150 MHz | 40,6 dB/100m |
|                    | 2400 MHz | 43,2 dB/100m |
|                    | 3000 MHz | 48,9 dB/100m |

|                           |               |         |
|---------------------------|---------------|---------|
| Return loss <sup>1)</sup> | 5-470 MHz     | > 20 dB |
|                           | 470-1000MHz   | > 18 dB |
|                           | 1000-2000 MHz | > 16 dB |
|                           | 2000-3000 MHz | > 15 dB |

<sup>1)</sup> According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.

|                       |               |         |
|-----------------------|---------------|---------|
| Screening attenuation | 30-1000MHz    | ≥ 95 dB |
|                       | 1000-2000 MHz | ≥ 85 dB |
|                       | 2000-3000 MHz | ≥ 75 dB |

|                    |         |            |
|--------------------|---------|------------|
| Transfer impedance | 5-30MHz | ≤ 2,5 mΩ/m |
|--------------------|---------|------------|

|                 |          |
|-----------------|----------|
| Screening class | Class A+ |
|-----------------|----------|



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

| Part no. | Cable construction | Outer dia.<br>approx. [mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Sheath - Color   | Packing<br>[m] |
|----------|--------------------|----------------------------|-----------------------|-------------------------|------------------|----------------|
| 307128   | TRB 80 Plus        | 4,90                       | 12                    | 26                      | White (RAL 9003) | 100/500/1000   |

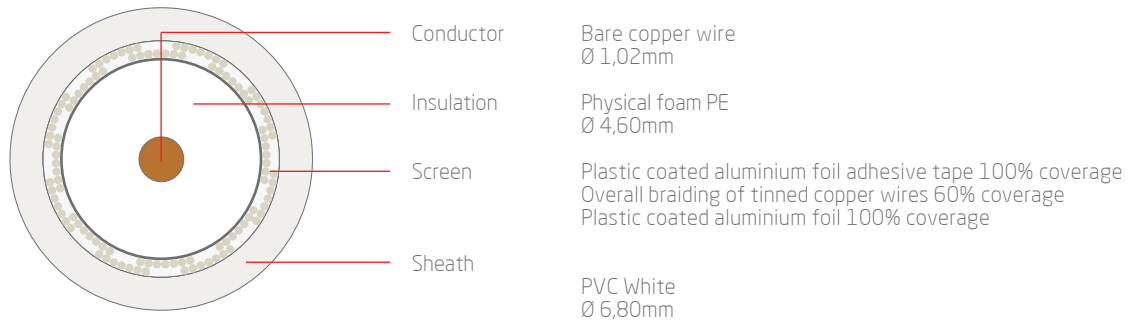
# TRB 102 Plus

75 Ohm HGV Coaxial Cable



Class A+  
EN 50117-2-4

## Cable construction



## Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

## Technical information

Temperature range -30 °C ... +70 °C  
Min. bending radius 10 x D

Impedance 75 ± 3 Ω  
Capacitance 52 ± 2 pF/m  
Velocity of propagation %84 ± 2  
Insulation resistance ≥ 2 G Ω x km  
Max. operating voltage 1300 V  
Test voltage 3000 V

Standards EN 50117, IEC 61196

Features  
Vertical flame propagation EN 60332-1-2

|                    |          |              |
|--------------------|----------|--------------|
| Attenuation @20 °C | 50 MHz   | 4,90 dB/100m |
|                    | 200 MHz  | 9,60 dB/100m |
|                    | 470 MHz  | 14,8 dB/100m |
|                    | 860 MHz  | 20,4 dB/100m |
|                    | 1000 MHz | 22,1 dB/100m |
|                    | 2150 MHz | 33,7 dB/100m |
|                    | 2400 MHz | 35,8 dB/100m |
|                    | 3000 MHz | 40,7 dB/100m |

|                           |               |         |
|---------------------------|---------------|---------|
| Return loss <sup>1)</sup> | 5-470 MHz     | > 20 dB |
|                           | 470-1000MHz   | > 18 dB |
|                           | 1000-2000 MHz | > 16 dB |
|                           | 2000-3000 MHz | > 15 dB |

<sup>1)</sup> According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.

|                       |               |         |
|-----------------------|---------------|---------|
| Screening attenuation | 30-1000MHz    | ≥ 95 dB |
|                       | 1000-2000 MHz | ≥ 85 dB |
|                       | 2000-3000 MHz | ≥ 75 dB |

|                    |         |            |
|--------------------|---------|------------|
| Transfer impedance | 5-30MHz | ≤ 2,5 mΩ/m |
|--------------------|---------|------------|

|                 |          |
|-----------------|----------|
| Screening class | Class A+ |
|-----------------|----------|



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

| Part no. | Cable construction | Outer dia.<br>approx. [mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Sheath - Color   | Packing<br>[m] |
|----------|--------------------|----------------------------|-----------------------|-------------------------|------------------|----------------|
| 307129   | TRB 102 Plus       | 6,80                       | 16                    | 49                      | White (RAL 9003) | 100/500/1000   |

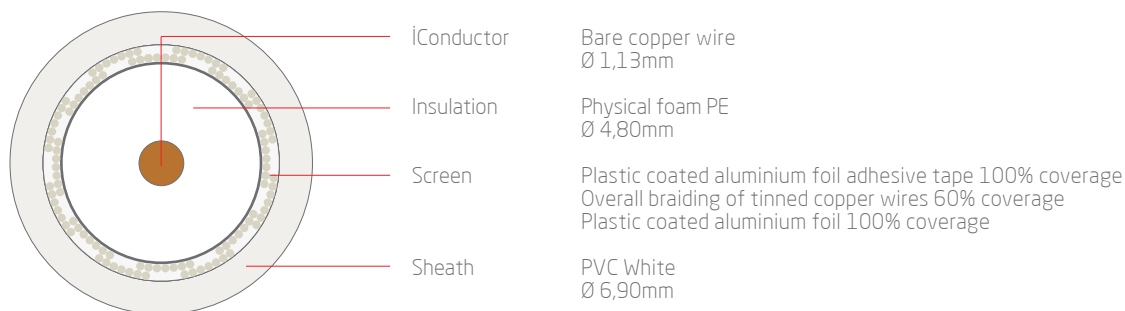
# TRB 113 Plus

75 Ohm HGV Coaxial Cable



Class A+  
EN 50117-2-4

## Cable construction



## Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

## Technical information

Temperature range -30 °C ... +70 °C  
Min. bending radius 10 x D

Impedance 75 ± 3 Ω  
Capacitance 52 ± 2 pF/m  
Velocity of propagation %86 ± 2  
Insulation resistance ≥ 2 G Ω x km  
Max. operating voltage 1300 V  
Test voltage 3000 V

Standards EN 50117, IEC 61196

Features  
Vertical flame propagation EN 60332-1-2

| Attenuation @20 °C | 50 MHz   | 4,30 dB/100m |
|--------------------|----------|--------------|
|                    | 200 MHz  | 8,40 dB/100m |
|                    | 470 MHz  | 13,0 dB/100m |
|                    | 860 MHz  | 18,0 dB/100m |
|                    | 1000 MHz | 19,5 dB/100m |
|                    | 2150 MHz | 29,7 dB/100m |
|                    | 2400 MHz | 31,7 dB/100m |
|                    | 3000 MHz | 36,0 dB/100m |

| Return loss <sup>1)</sup> | 5-470 MHz     | > 23 dB |
|---------------------------|---------------|---------|
|                           | 470-1000MHz   | > 20 dB |
|                           | 1000-2000 MHz | > 18 dB |
|                           | 2000-3000 MHz | > 16 dB |

<sup>1)</sup> According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.

| Screening attenuation | 30-1000MHz    | ≥ 95 dB |
|-----------------------|---------------|---------|
|                       | 1000-2000 MHz | ≥ 85 dB |
|                       | 2000-3000 MHz | ≥ 75 dB |

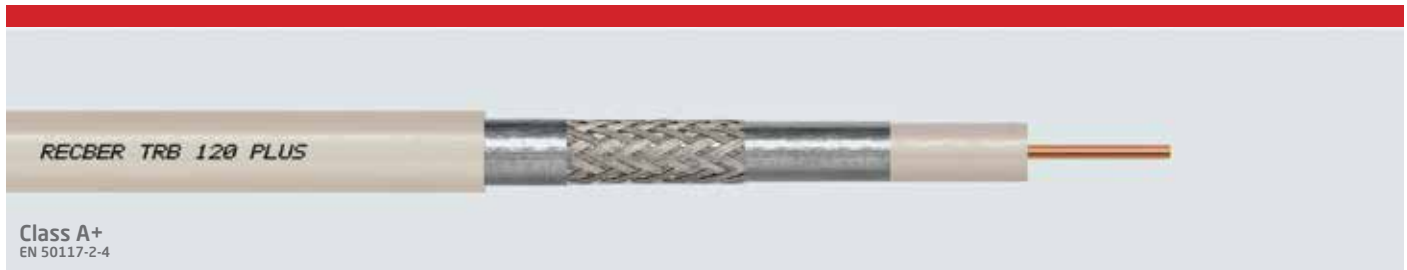
| Transfer impedance | 5-30MHz | ≤ 2,5 mΩ/m |
|--------------------|---------|------------|
|--------------------|---------|------------|

| Screening class | Class A+ |
|-----------------|----------|
|-----------------|----------|



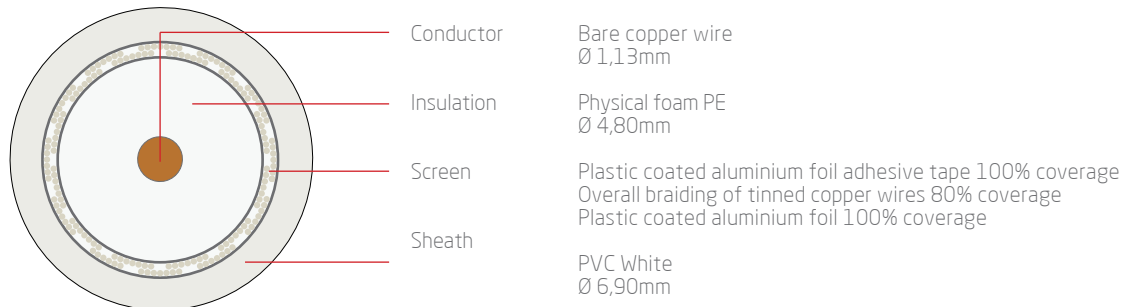
Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

| Part no. | Cable construction | Outer dia.<br>approx. [mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Sheath - Color   | Packing<br>[m] |
|----------|--------------------|----------------------------|-----------------------|-------------------------|------------------|----------------|
| 307130   | TRB 113 Plus       | 6,90                       | 18                    | 50                      | White (RAL 9003) | 100/500/1000   |



Class A+  
EN 50117-2-4

### Cable construction



### Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

### Technical information

Temperature range -30 °C ... +70 °C  
Min. bending radius 10 x D

Impedance 75 ± 3 Ω  
Capacitance 52 ± 2 pF/m  
Velocity of propagation %86 ± 2  
Insulation resistance ≥ 2 G Ω x km  
Max. operating voltage 1300 V  
Test voltage 3000 V

Standards EN 50117, IEC 61196

Features  
Vertical flame propagation EN 60332-1-2

| Attenuation @20 °C | 50 MHz   | 4,30 dB/100m |
|--------------------|----------|--------------|
|                    | 200 MHz  | 8,40 dB/100m |
|                    | 470 MHz  | 13,0 dB/100m |
|                    | 860 MHz  | 18,0 dB/100m |
|                    | 1000 MHz | 19,5 dB/100m |
|                    | 2150 MHz | 29,7 dB/100m |
|                    | 2400 MHz | 31,7 dB/100m |
|                    | 3000 MHz | 36,0 dB/100m |

| Return loss <sup>1)</sup> | 5-470 MHz     | > 23 dB |
|---------------------------|---------------|---------|
|                           | 470-1000MHz   | > 20 dB |
|                           | 1000-2000 MHz | > 18 dB |
|                           | 2000-3000 MHz | > 16 dB |

<sup>1)</sup> According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.

| Screening attenuation | 30-1000MHz    | ≥ 95 dB |
|-----------------------|---------------|---------|
|                       | 1000-2000 MHz | ≥ 85 dB |
|                       | 2000-3000 MHz | ≥ 75 dB |

| Transfer impedance | 5-30MHz | ≤ 2,5 mΩ/m |
|--------------------|---------|------------|
|--------------------|---------|------------|

| Screening class | Class A+ |
|-----------------|----------|
|-----------------|----------|

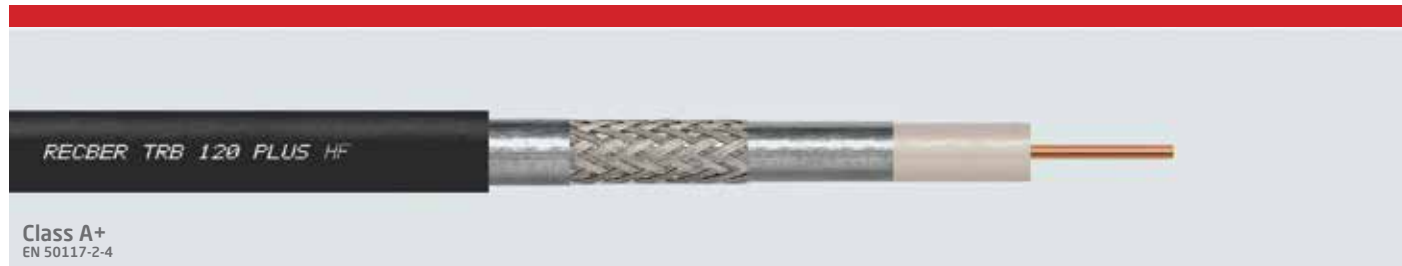


Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

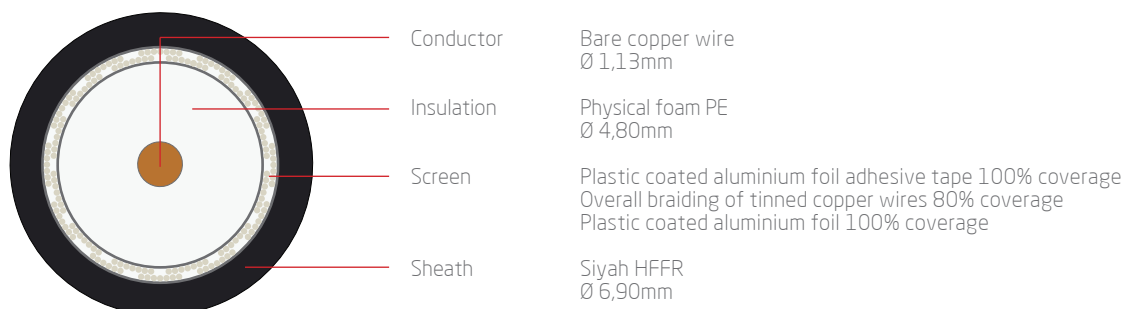
| Part no. | Cable construction | Outer dia.<br>approx. [mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Sheath - Color    | Packing<br>[m] |
|----------|--------------------|----------------------------|-----------------------|-------------------------|-------------------|----------------|
| 307131   | TRB 120 Plus       | 6,90                       | 22                    | 53                      | White (RAL 9003)  | 100/500/1000   |
| 307106   | TRB 120 Plus       | 6,90                       | 22                    | 53                      | Purple (RAL 4005) | 100/500/1000   |

# TRB 120 Plus HF

75 Ohm HGV Coaxial Cable



## Cable construction



## Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

Due to usage of HFFR type material in its construction, cable does not burn easily avoiding the spread of fire, it does not produce dangerous gas combination resulting with closed vision after burning and thus, can be safely used in buildings like hospitals, cinemas and schools where lots of people may become there.

## Technical information

Temperature range -30 °C ... +70 °C  
Min. bending radius 10 x D

Impedance 75 ± 3 Ω  
Capacitance 52 ± 2 pF/m  
Velocity of propagation %86 ± 2  
Insulation resistance ≥ 2 G Ω x km  
Max. operating voltage 1300 V  
Test voltage 3000 V

Standards EN 50117, IEC 61196

Features  
Vertical flame propagation EN 60332-1-2  
Corrosive gas measurement EN 50267-2-1/2  
Smoke density EN 61034-2

| Attenuation @20 °C | 50 MHz   | 4,30 dB/100m |
|--------------------|----------|--------------|
|                    | 200 MHz  | 8,40 dB/100m |
|                    | 470 MHz  | 13,0 dB/100m |
|                    | 860 MHz  | 18,0 dB/100m |
|                    | 1000 MHz | 19,5 dB/100m |
|                    | 2150 MHz | 29,7 dB/100m |
|                    | 2400 MHz | 31,7 dB/100m |
|                    | 3000 MHz | 36,0 dB/100m |

| Return loss <sup>1)</sup> | 5-470 MHz     | > 23 dB |
|---------------------------|---------------|---------|
|                           | 470-1000MHz   | > 20 dB |
|                           | 1000-2000 MHz | > 18 dB |
|                           | 2000-3000 MHz | > 16 dB |

<sup>1)</sup> According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.

| Screening attenuation | 30-1000MHz    | ≥ 95 dB |
|-----------------------|---------------|---------|
|                       | 1000-2000 MHz | ≥ 85 dB |
|                       | 2000-3000 MHz | ≥ 75 dB |

| Transfer impedance | 5-30MHz | ≤ 2,5 mΩ/m |
|--------------------|---------|------------|
|--------------------|---------|------------|

| Screening class | Class A+ |
|-----------------|----------|
|-----------------|----------|



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

| Part no. | Cable construction | Outer dia.<br>approx. [mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Sheath - Color   | Packing<br>[m] |
|----------|--------------------|----------------------------|-----------------------|-------------------------|------------------|----------------|
| 307175   | TRB 120 Plus HF    | 6,90                       | 22                    | 53                      | Black (RAL 9011) | 100/500/1000   |
| 307176   | TRB 120 Plus HF    | 6,90                       | 22                    | 53                      | Lila (RAL 4005)  | 100/500/1000   |

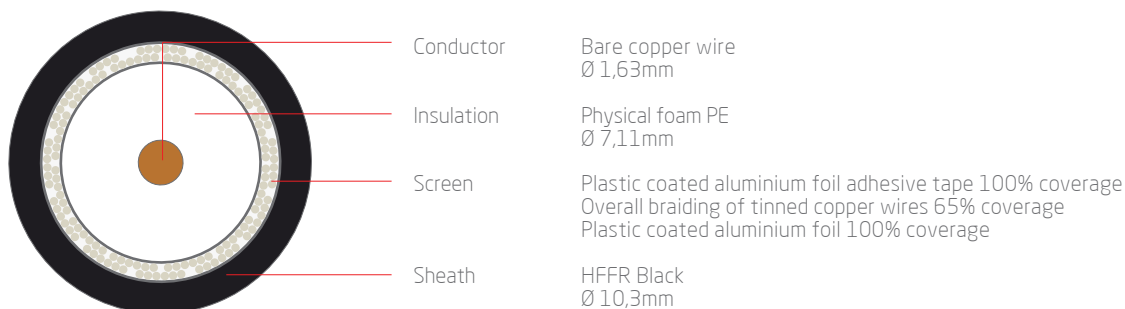
# TRB 11 Plus HF

75 Ohm HGV Coaxial Cable



Class A+  
EN 50117-2-4

## Cable construction



## Application

In CATV distribution broadcasts, the cable operating range 5-3000 MHz in compliance standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable or main cable to transmit signals for indoor applications.

Due to usage of HFFR type material in its construction, cable does not burn easily avoiding the spread of fire, it does not produce dangerous gas combination resulting with closed vision after burning and thus, can be safely used in buildings like hospitals, cinemas and schools where lots of people may become there.

## Technical information

Temperature range -30 °C ... +70 °C  
Min. bending radius 10 x D

Impedance 75 ± 3 Ω  
Capacitance 52,4 ± 2 pF/m  
Velocity of propagation %85 ± 2  
Insulation resistance ≥ 2 G Ω x km  
Max. operating voltage 2000 V  
Test voltage 5000 V

Standards EN 50117, IEC 61196

Features  
Vertical flame propagation EN 60332-1-2  
Corrosive gas measurement EN 50267-2-1/2  
Smoke density EN 61034-2

| Attenuation @20 °C | 50 MHz   | 3,10 dB/100m |
|--------------------|----------|--------------|
|                    | 200 MHz  | 6,20 dB/100m |
|                    | 470 MHz  | 9,60 dB/100m |
|                    | 860 MHz  | 13,3 dB/100m |
|                    | 1000 MHz | 14,4 dB/100m |
|                    | 2150 MHz | 22,3 dB/100m |
|                    | 2400 MHz | 23,7 dB/100m |
|                    | 3000 MHz | 27,1 dB/100m |

| Return loss <sup>1)</sup> | 5-470 MHz     | > 23 dB |
|---------------------------|---------------|---------|
|                           | 470-1000MHz   | > 20 dB |
|                           | 1000-2000 MHz | > 18 dB |
|                           | 2000-3000 MHz | > 16 dB |

<sup>1)</sup> According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.

| Screening attenuation | 30-1000MHz    | ≥ 95 dB |
|-----------------------|---------------|---------|
|                       | 1000-2000 MHz | ≥ 85 dB |
|                       | 2000-3000 MHz | ≥ 75 dB |

| Transfer impedance | 5-30MHz | ≤ 2,5 mΩ/m |
|--------------------|---------|------------|
|--------------------|---------|------------|

| Screening class | Class A+ |
|-----------------|----------|
|-----------------|----------|



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

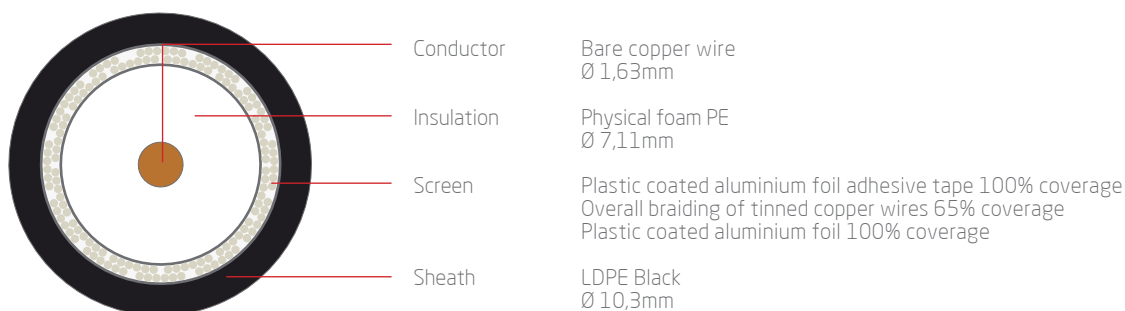
| Part no. | Cable construction | Outer dia.<br>approx. [mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Sheath - Color   | Packing<br>[m] |
|----------|--------------------|----------------------------|-----------------------|-------------------------|------------------|----------------|
| 307177   | TRB 11 Plus HF     | 10,3                       | 35                    | 110                     | Black (RAL 9011) | 500/1000       |

# TRB 11 PE

75 Ohm HGV Coaxial Cable



## Cable construction



## Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable or main cable to transmit signals for outdoor and underground applications.

## Technical information

Temperature range -30 °C ... +70 °C  
Min. bending radius 10 x D

Impedance 75 ± 3 Ω  
Capacitance 52,4 ± 2 pF/m  
Velocity of propagation %85 ± 2  
Insulation resistance ≥ 2 G Ω x km  
Max. operating voltage 2000 V  
Test voltage 5000 V

Standards EN 50117, IEC 61196

| Attenuation @20 °C | 50 MHz   | 3,10 dB/100m |
|--------------------|----------|--------------|
|                    | 200 MHz  | 6,20 dB/100m |
|                    | 470 MHz  | 9,60 dB/100m |
|                    | 860 MHz  | 13,3 dB/100m |
|                    | 1000 MHz | 14,4 dB/100m |
|                    | 2150 MHz | 22,3 dB/100m |
|                    | 2400 MHz | 23,7 dB/100m |
|                    | 3000 MHz | 27,1 dB/100m |

| Return loss <sup>1)</sup> | 5-470 MHz     | > 23 dB |
|---------------------------|---------------|---------|
|                           | 470-1000MHz   | > 20 dB |
|                           | 1000-2000 MHz | > 18 dB |
|                           | 2000-3000 MHz | > 16 dB |

<sup>1)</sup> According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.

| Screening attenuation | 30-1000MHz    | ≥ 95 dB |
|-----------------------|---------------|---------|
|                       | 1000-2000 MHz | ≥ 85 dB |
|                       | 2000-3000 MHz | ≥ 75 dB |

| Transfer impedance | 5-30MHz | ≤ 2,5 mΩ/m |
|--------------------|---------|------------|
|--------------------|---------|------------|

| Screening class | Class A+ |
|-----------------|----------|
|-----------------|----------|



Low Voltage Directive 2006/95/EC  
EC Directive 2011/65/EU

| Part no. | Cable construction | Outer dia.<br>approx. [mm] | Cu content<br>[kg/km] | Cable weight<br>[kg/km] | Sheath - Color     | Packing<br>[m] |
|----------|--------------------|----------------------------|-----------------------|-------------------------|--------------------|----------------|
| 307190   | TRB 11 PE          | 10,3                       | 35                    | 85                      | ■ Black (RAL 9011) | 500/1000       |

# FIRE RESISTANT

Cables







# JE-H(St)H...Bd FE180 PH120

Fire alarm cables



## Technical information

- Temperature range  
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius; 10x cable Ø
- Nominal voltage; 300 V
- Test voltage; 800 V  
(core/core and core/screen)
- Mutual capacitance; 120nF/km  
(for the cables up to 4 pair, this value may be increased by 20%)
- Capacitance unbalances; 200pF/100m  
(20% of the values, but one value up to 400pF is allowed)
- Loop resistance @20°C  
0,80mm - max. 73,2 Ohm/km  
1,0mm<sup>2</sup> - max. 36,2 Ohm/km  
1,5mm<sup>2</sup> - max. 24,2 Ohm/km
- Insulation resistance; min. 100 M.Ohm x km

Installation cable according to DIN VDE 0815

TSE  
VDE  
CE

TSEK UBM-03-BK-023  
DIN VDE 0815  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

- Annealed solid copper conductor; Ø 0,80, 1,12 and 1,37mm
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Core and pair identification acc. to DIN VDE 0815
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length (2-paired versions are stranded in star quad cable design)
- Polyester tape used as separator over cores
- Tinned copper drain wire Ø 0,80mm, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

## Application

These fire resistant halogen-free installation cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used especially for installation in fire alarm systems. Thanks electrostatic screen and tin-plated drain wire, external electrical interferences of high frequency and electromagnetic field are minimized. Twisted pair structure minimizes crosstalk. For fixed installation on and under plaster, in dry and damp rooms. For outdoor use this cable should be installed under plaster only. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals.

| Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------|-------------------|-------------------|----------------------|----------|-----------------------------|-------------------|-------------------|----------------------|
| 112050   | 1x2x0,80                  | 6,0               | 13,5              | 48                   | 112057   | 1x2x1,0                     | 6,8               | 22,2              | 56                   |
| 112051   | 2x2x0,80                  | 6,7               | 22,6              | 67                   | 112058   | 2x2x1,0                     | 7,6               | 40,0              | 84                   |
| 112052   | 3x2x0,80                  | 8,5               | 31,8              | 92                   | 112071   | 1x2x1,5                     | 7,6               | 30,6              | 71                   |
| 112053   | 4x2x0,80                  | 9,2               | 40,9              | 98                   | 112072   | 2x2x1,5                     | 8,5               | 56,9              | 111                  |



## Technical information

- Temperature range  
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm² 300/500 V  
from 2,5mm² 450/750 V
- Test voltage  
up to 1,5mm² 1500 V  
from 2,5mm² 2500 V
- Conductor resistance @20°C  
0,75mm² max. 26,0 Ohm/km  
1,0mm² max. 19,5 Ohm/km  
1,5mm² max. 13,3 Ohm/km  
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

**TSE**  
**VDE**  
**CE**

TSEK UBM-03-BK-028  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Colour coded acc. to DIN 47100 for more than 5 cores white core/ black numbered
- Core stranded in layers with optimal lay-length
- Glass-fibre tape used as separator over cores
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

## Application

These fire resistant halogen-free flexible cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals.

| Part No. | No. pairs x cross-sec [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-----------------------------|-------------------|-------------------|----------------------|----------|-----------------------------|-------------------|-------------------|----------------------|
| 101104   | 2x0,75                      | 5,1               | 12,2              | 39                   | 101140   | 2x1,5                       | 6,9               | 24,4              | 68                   |
| 101105   | 3x0,75                      | 5,9               | 18,4              | 48                   | 101141   | 3x1,5                       | 7,4               | 36,6              | 81                   |
| 101106   | 4x0,75                      | 6,5               | 24,5              | 61                   | 101142   | 4x1,5                       | 8,2               | 48,9              | 103                  |
| 101107   | 5x0,75                      | 7,1               | 30,7              | 76                   | 101143   | 5x1,5                       | 9,0               | 61,2              | 129                  |
| 101108   | 6x0,75                      | 7,8               | 36,8              | 92                   | 101144   | 6x1,5                       | 9,8               | 73,5              | 156                  |
| 101109   | 7x0,75                      | 7,8               | 43,0              | 97                   | 101145   | 7x1,5                       | 9,8               | 85,8              | 165                  |
| 101110   | 8x0,75                      | 9,2               | 49,3              | 128                  | 101146   | 8x1,5                       | 11,7              | 98,1              | 219                  |
| 101111   | 10x0,75                     | 10,0              | 61,6              | 141                  | 101147   | 10x1,5                      | 12,7              | 122,8             | 242                  |
| 101112   | 12x0,75                     | 10,3              | 73,9              | 160                  | 101148   | 12x1,5                      | 13,2              | 147,3             | 281                  |

| Part No. | No. pairs x cross-sec [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-----------------------------|-------------------|-------------------|----------------------|----------|-----------------------------|-------------------|-------------------|----------------------|
| 101122   | 2x1,0                       | 5,9               | 16,3              | 49                   | 101158   | 2x2,5                       | 7,9               | 40,7              | 95                   |
| 101123   | 3x1,0                       | 6,3               | 24,5              | 58                   | 101159   | 3x2,5                       | 8,3               | 61,1              | 114                  |
| 101124   | 4x1,0                       | 6,9               | 32,7              | 72                   | 101160   | 4x2,5                       | 9,3               | 81,4              | 148                  |
| 101125   | 5x1,0                       | 7,5               | 40,9              | 90                   | 101161   | 5x2,5                       | 10,2              | 101,9             | 185                  |
| 101126   | 6x1,0                       | 8,3               | 49,2              | 109                  | 101162   | 6x2,5                       | 11,2              | 122,5             | 224                  |
| 101127   | 7x1,0                       | 8,3               | 57,4              | 115                  | 101163   | 7x2,5                       | 11,2              | 142,9             | 240                  |
| 101128   | 8x1,0                       | 9,8               | 65,7              | 152                  | 101164   | 8x2,5                       | 13,4              | 163,6             | 313                  |
| 101129   | 10x1,0                      | 10,7              | 82,2              | 170                  | 101165   | 10x2,5                      | 14,6              | 204,8             | 352                  |
| 101130   | 12x1,0                      | 11,0              | 98,5              | 194                  | 101166   | 12x2,5                      | 15,2              | 204,8             | 360                  |



## Technical information

- Temperature range  
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

TSE  
VDE  
CE

TSEK UBM-03-BK-028  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Colour coded acc. to DIN 47100 for more than 5 cores white core/black numbered
- Core stranded in layers with optimal lay-length
- Glass-fibre tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

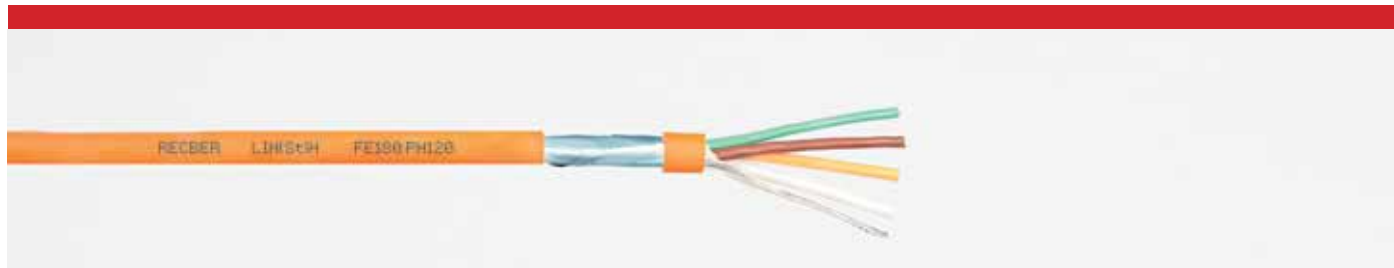
## Application

These fire resistant halogen-free flexible cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility (EMC).

| Part No. | No. pairs x cross-sec [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------------------|-------------------|-------------------|----------------------|----------|------------------------------------------|-------------------|-------------------|----------------------|
| 102104   | 2x0,75                                   | 5,6               | 19,2              | 48                   | 102140   | 2x1,5                                    | 6,9               | 32,8              | 77                   |
| 102105   | 3x0,75                                   | 5,9               | 25,4              | 56                   | 102141   | 3x1,5                                    | 7,4               | 46,3              | 91                   |
| 102106   | 4x0,75                                   | 6,5               | 32,8              | 69                   | 102142   | 4x1,5                                    | 8,1               | 58,8              | 113                  |
| 102107   | 5x0,75                                   | 7,0               | 39,1              | 84                   | 102143   | 5x1,5                                    | 8,9               | 72,5              | 141                  |
| 102108   | 6x0,75                                   | 7,7               | 46,6              | 101                  | 102144   | 6x1,5                                    | 9,7               | 86,3              | 169                  |
| 102109   | 7x0,75                                   | 7,7               | 52,7              | 106                  | 102145   | 7x1,5                                    | 9,7               | 98,6              | 179                  |
| 102110   | 8x0,75                                   | 9,0               | 60,6              | 137                  | 102146   | 8x1,5                                    | 11,5              | 114,2             | 235                  |
| 102111   | 10x0,75                                  | 9,8               | 74,5              | 152                  | 102147   | 10x1,5                                   | 12,5              | 139,4             | 259                  |
| 102112   | 12x0,75                                  | 10,2              | 86,8              | 173                  | 102148   | 12x1,5                                   | 13,0              | 166,2             | 300                  |

| Part No. | No. pairs x cross-sec [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------------------|-------------------|-------------------|----------------------|----------|------------------------------------------|-------------------|-------------------|----------------------|
| 102122   | 2x1,0                                    | 5,9               | 23,4              | 56                   | 102158   | 2x2,5                                    | 7,8               | 50,4              | 105                  |
| 102123   | 3x1,0                                    | 6,2               | 31,6              | 64                   | 102159   | 3x2,5                                    | 8,3               | 72,2              | 126                  |
| 102124   | 4x1,0                                    | 6,9               | 41,1              | 81                   | 102160   | 4x2,5                                    | 9,1               | 92,8              | 158                  |
| 102125   | 5x1,0                                    | 7,5               | 50,6              | 100                  | 102161   | 5x2,5                                    | 10,0              | 114,8             | 197                  |
| 102126   | 6x1,0                                    | 8,3               | 60,3              | 121                  | 102162   | 6x2,5                                    | 11,1              | 136,4             | 238                  |
| 102127   | 7x1,0                                    | 8,3               | 68,5              | 127                  | 102163   | 7x2,5                                    | 11,1              | 156,9             | 255                  |
| 102128   | 8x1,0                                    | 9,7               | 78,5              | 165                  | 102164   | 8x2,5                                    | 13,2              | 180,5             | 330                  |
| 102129   | 10x1,0                                   | 10,5              | 95,9              | 182                  | 102165   | 10x2,5                                   | 14,3              | 224,5             | 371                  |
| 102130   | 12x1,0                                   | 10,8              | 114,3             | 209                  | 102166   | 12x2,5                                   | 14,9              | 265,8             | 429                  |



## Technical information

- Temperature range  
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm² 300/500 V  
from 2,5mm² 450/750 V
- Test voltage  
up to 1,5mm² 1500 V  
from 2,5mm² 2500 V
- Conductor resistance @20°C  
0,75mm² max. 26,0 Ohm/km  
1,0mm² max. 19,5 Ohm/km  
1,5mm² max. 13,3 Ohm/km  
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

TSE  
VDE  
CE

TSEK UBM-03-BK-028  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Colour coded acc. to DIN 47100 for more than 5 cores white core/ black numbered
- Core stranded in layers with optimal lay-length
- Glass-fibre tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

## Application

These fire resistant halogen-free flexible cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals. Electrostatic screen assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility (EMC).

| Part No. | No. pairs x cross-sec [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-----------------------------|-------------------|-------------------|----------------------|----------|-----------------------------|-------------------|-------------------|----------------------|
| 103104   | 2x0,75                      | 5,7               | 16,7              | 47                   | 103140   | 2x1,5                       | 7,1               | 28,8              | 75                   |
| 103105   | 3x0,75                      | 6,0               | 22,8              | 54                   | 103141   | 3x1,5                       | 7,5               | 41,1              | 87                   |
| 103106   | 4x0,75                      | 6,6               | 29,0              | 67                   | 103142   | 4x1,5                       | 8,3               | 53,4              | 110                  |
| 103107   | 5x0,75                      | 7,2               | 35,1              | 83                   | 103143   | 5x1,5                       | 9,2               | 65,7              | 138                  |
| 103108   | 6x0,75                      | 7,9               | 41,3              | 98                   | 103144   | 6x1,5                       | 10,0              | 78,0              | 165                  |
| 103109   | 7x0,75                      | 7,9               | 47,4              | 103                  | 103145   | 7x1,5                       | 10,0              | 90,3              | 175                  |
| 103110   | 8x0,75                      | 9,3               | 53,7              | 134                  | 103146   | 8x1,5                       | 11,8              | 102,6             | 226                  |
| 103111   | 10x0,75                     | 10,1              | 66,1              | 147                  | 103147   | 10x1,5                      | 12,9              | 127,3             | 252                  |
| 103112   | 12x0,75                     | 10,4              | 78,4              | 167                  | 103148   | 12x1,5                      | 13,3              | 151,8             | 289                  |

| Part No. | No. pairs x cross-sec [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-----------------------------|-------------------|-------------------|----------------------|----------|-----------------------------|-------------------|-------------------|----------------------|
| 103122   | 2x1,0                       | 6,0               | 20,8              | 55                   | 103158   | 2x2,5                       | 8,0               | 45,1              | 102                  |
| 103123   | 3x1,0                       | 6,4               | 28,9              | 64                   | 103159   | 3x2,5                       | 8,5               | 65,5              | 122                  |
| 103124   | 4x1,0                       | 7,1               | 37,1              | 80                   | 103160   | 4x2,5                       | 9,4               | 85,9              | 154                  |
| 103125   | 5x1,0                       | 7,6               | 45,4              | 96                   | 103161   | 5x2,5                       | 10,3              | 106,4             | 192                  |
| 103126   | 6x1,0                       | 8,5               | 53,6              | 118                  | 103162   | 6x2,5                       | 11,4              | 127,0             | 233                  |
| 103127   | 7x1,0                       | 8,5               | 61,8              | 124                  | 103163   | 7x2,5                       | 11,4              | 147,4             | 250                  |
| 103128   | 8x1,0                       | 10,0              | 70,1              | 161                  | 103164   | 8x2,5                       | 13,6              | 168,1             | 324                  |
| 103129   | 10x1,0                      | 10,8              | 86,6              | 177                  | 103165   | 10x2,5                      | 14,7              | 209,3             | 360                  |
| 103130   | 12x1,0                      | 11,1              | 103,0             | 201                  | 103166   | 12x2,5                      | 15,3              | 250,3             | 419                  |



## Technical information

- Temperature range  
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

TSE  
ANSI  
CE

TSEK UBM-03-BK-028  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Colour coded acc. to DIN 47100 for more than 5 cores white core/ black numbered
- Core stranded in layers with optimal lay-length
- Glass-fibre tape used as separator over cores
- Electrostatic screen (St) of plastic coated aluminium foil
- Overall braiding of tinned copper wires
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Insulation integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

## Application

These fire resistant halogen-free flexible cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

| Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------|-------------------|-------------------|----------------------|----------|---------------------------|-------------------|-------------------|----------------------|
| 104104   | 2x0,75                    | 6,3               | 19,3              | 53                   | 104140   | 2x1,0                     | 6,6               | 23,4              | 61                   |
| 104105   | 3x0,75                    | 6,6               | 25,5              | 61                   | 104141   | 3x1,0                     | 6,9               | 31,6              | 69                   |
| 104106   | 4x0,75                    | 7,2               | 31,7              | 74                   | 104142   | 4x1,0                     | 7,6               | 41,1              | 86                   |
| 104107   | 5x0,75                    | 7,8               | 39,1              | 90                   | 104143   | 5x1,0                     | 8,2               | 49,5              | 105                  |
| 104108   | 6x0,75                    | 8,5               | 45,4              | 107                  | 104144   | 6x1,0                     | 9,0               | 59,1              | 126                  |
| 104109   | 7x0,75                    | 8,5               | 51,5              | 112                  | 104145   | 7x1,0                     | 9,0               | 67,3              | 132                  |
| 104110   | 8x0,75                    | 9,8               | 59,4              | 143                  | 104146   | 8x1,0                     | 10,5              | 77,2              | 170                  |
| 104111   | 10x0,75                   | 10,7              | 73,2              | 159                  | 104147   | 10x1,0                    | 11,4              | 94,0              | 190                  |
| 104112   | 12x0,75                   | 11,0              | 85,6              | 179                  | 104148   | 12x1,0                    | 11,7              | 110,4             | 214                  |

| Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------|-------------------|-------------------|----------------------|----------|---------------------------|-------------------|-------------------|----------------------|
| 104122   | 2x1,5                     | 7,6               | 32,8              | 81                   | 104158   | 2x2,5                     | 8,6               | 49,2              | 110                  |
| 104123   | 3x1,5                     | 8,1               | 45,1              | 95                   | 104159   | 3x2,5                     | 9,0               | 71,0              | 130                  |
| 104124   | 4x1,5                     | 8,9               | 58,8              | 119                  | 104160   | 4x2,5                     | 10,0              | 91,6              | 165                  |
| 104125   | 5x1,5                     | 9,7               | 71,3              | 146                  | 104161   | 5x2,5                     | 10,9              | 113,6             | 204                  |
| 104126   | 6x1,5                     | 10,5              | 85,1              | 175                  | 104162   | 6x2,5                     | 11,9              | 135,8             | 245                  |
| 104127   | 7x1,5                     | 10,5              | 97,4              | 184                  | 104163   | 7x2,5                     | 11,9              | 156,3             | 261                  |
| 104128   | 8x1,5                     | 12,4              | 111,6             | 241                  | 104164   | 8x2,5                     | 14,1              | 177,8             | 336                  |
| 104129   | 10x1,5                    | 13,4              | 136,7             | 264                  | 104165   | 10x2,5                    | 15,3              | 222,4             | 380                  |
| 104130   | 12x1,5                    | 13,9              | 162,1             | 305                  | 104166   | 12x2,5                    | 15,9              | 263,6             | 440                  |

# SIGNAL AND CONTROL

Cables









## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

## Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector.

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 201050   | 2x0,22                                    | 3,5               | 3,6               | 15                   | 201122   | 2x1,0                                     | 5,4               | 16,3              | 41                   |
| 201051   | 3x0,22                                    | 3,9               | 5,4               | 18                   | 201123   | 3x1,0                                     | 5,7               | 24,5              | 48                   |
| 201052   | 4x0,22                                    | 4,2               | 7,2               | 22                   | 201124   | 4x1,0                                     | 6,5               | 32,7              | 64                   |
| 201053   | 5x0,22                                    | 4,5               | 8,9               | 27                   | 201125   | 5x1,0                                     | 7,0               | 40,9              | 79                   |
| 201054   | 6x0,22                                    | 4,9               | 10,8              | 32                   | 201126   | 6x1,0                                     | 7,7               | 49,2              | 96                   |
| 201055   | 7x0,22                                    | 4,9               | 12,6              | 34                   | 201127   | 7x1,0                                     | 7,7               | 57,4              | 102                  |
| 201056   | 8x0,22                                    | 5,7               | 14,3              | 44                   | 201128   | 8x1,0                                     | 9,2               | 65,7              | 136                  |
| 201057   | 10x0,22                                   | 6,1               | 18,0              | 46                   | 201129   | 10x1,0                                    | 9,9               | 82,2              | 147                  |
| 201058   | 12x0,22                                   | 6,5               | 21,5              | 56                   | 201130   | 12x1,0                                    | 10,2              | 98,5              | 171                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 201086   | 2x0,50                                    | 4,7               | 8,2               | 28                   | 201140   | 2x1,5                                     | 6,5               | 24,4              | 60                   |
| 201087   | 3x0,50                                    | 4,9               | 12,3              | 32                   | 201141   | 3x1,5                                     | 6,9               | 36,6              | 71                   |
| 201088   | 4x0,50                                    | 5,4               | 16,3              | 40                   | 201142   | 4x1,5                                     | 7,6               | 48,9              | 90                   |
| 201089   | 5x0,50                                    | 5,9               | 20,4              | 49                   | 201143   | 5x1,5                                     | 8,3               | 61,2              | 113                  |
| 201090   | 6x0,50                                    | 6,6               | 24,5              | 62                   | 201144   | 6x1,5                                     | 9,2               | 73,5              | 140                  |
| 201091   | 7x0,50                                    | 6,6               | 28,6              | 65                   | 201145   | 7x1,5                                     | 9,2               | 85,8              | 149                  |
| 201092   | 8x0,50                                    | 7,7               | 32,8              | 85                   | 201146   | 8x1,5                                     | 10,8              | 98,1              | 192                  |
| 201093   | 10x0,50                                   | 8,3               | 41,1              | 90                   | 201147   | 10x1,5                                    | 11,9              | 122,8             | 215                  |
| 201094   | 12x0,50                                   | 8,6               | 49,2              | 104                  | 201148   | 12x1,5                                    | 12,3              | 147,3             | 250                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 201104   | 2x0,75                                    | 5,1               | 12,2              | 34                   | 201158   | 2x2,5                                     | 7,3               | 40,7              | 83                   |
| 201105   | 3x0,75                                    | 5,4               | 18,4              | 41                   | 201159   | 3x2,5                                     | 7,7               | 61,1              | 100                  |
| 201106   | 4x0,75                                    | 5,9               | 24,5              | 51                   | 201160   | 4x2,5                                     | 8,5               | 81,4              | 129                  |
| 201107   | 5x0,75                                    | 6,6               | 30,7              | 67                   | 201161   | 5x2,5                                     | 9,5               | 101,9             | 166                  |
| 201108   | 6x0,75                                    | 7,2               | 36,8              | 79                   | 201162   | 6x2,5                                     | 10,4              | 122,5             | 200                  |
| 201109   | 7x0,75                                    | 7,2               | 43,0              | 84                   | 201163   | 7x2,5                                     | 10,4              | 142,9             | 217                  |
| 201110   | 8x0,75                                    | 8,4               | 49,3              | 109                  | 201164   | 8x2,5                                     | 12,5              | 163,6             | 282                  |
| 201111   | 10x0,75                                   | 9,3               | 61,6              | 122                  | 201165   | 10x2,5                                    | 13,5              | 204,8             | 312                  |
| 201112   | 12x0,75                                   | 9,6               | 73,9              | 141                  | 201166   | 12x2,5                                    | 14,0              | 245,8             | 366                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

## Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 203050   | 2x0,22                                    | 4,2               | 8,1               | 23                   | 203122   | 2x1,0                                     | 5,9               | 23,4              | 49                   |
| 203051   | 3x0,22                                    | 4,4               | 9,9               | 24                   | 203123   | 3x1,0                                     | 6,2               | 31,5              | 57                   |
| 203052   | 4x0,22                                    | 4,7               | 11,8              | 28                   | 203124   | 4x1,0                                     | 7,0               | 41,0              | 74                   |
| 203053   | 5x0,22                                    | 5,0               | 14,7              | 34                   | 203125   | 5x1,0                                     | 7,5               | 50,6              | 91                   |
| 203054   | 6x0,22                                    | 5,4               | 16,6              | 39                   | 203126   | 6x1,0                                     | 8,2               | 60,2              | 109                  |
| 203055   | 7x0,22                                    | 5,4               | 18,4              | 41                   | 203127   | 7x1,0                                     | 8,2               | 68,4              | 115                  |
| 203056   | 8x0,22                                    | 6,2               | 22,6              | 53                   | 203128   | 8x1,0                                     | 9,7               | 78,4              | 150                  |
| 203057   | 10x0,22                                   | 6,8               | 26,3              | 59                   | 203129   | 10x1,0                                    | 10,4              | 95,8              | 163                  |
| 203058   | 12x0,22                                   | 7,0               | 29,9              | 66                   | 203130   | 12x1,0                                    | 10,7              | 112,3             | 186                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 203086   | 2x0,50                                    | 5,2               | 14,0              | 35                   | 203140   | 2x1,5                                     | 7,0               | 32,7              | 70                   |
| 203087   | 3x0,50                                    | 5,4               | 18,1              | 39                   | 203141   | 3x1,5                                     | 7,4               | 46,3              | 82                   |
| 203088   | 4x0,50                                    | 5,9               | 23,4              | 48                   | 203142   | 4x1,5                                     | 8,1               | 58,7              | 101                  |
| 203089   | 5x0,50                                    | 6,6               | 28,7              | 62                   | 203143   | 5x1,5                                     | 8,8               | 72,5              | 125                  |
| 203090   | 6x0,50                                    | 7,1               | 32,9              | 72                   | 203144   | 6x1,5                                     | 9,7               | 86,3              | 154                  |
| 203091   | 7x0,50                                    | 7,1               | 37,0              | 75                   | 203145   | 7x1,5                                     | 9,7               | 98,5              | 164                  |
| 203092   | 8x0,50                                    | 8,2               | 43,9              | 97                   | 203146   | 8x1,5                                     | 11,3              | 114,1             | 210                  |
| 203093   | 10x0,50                                   | 8,8               | 52,3              | 103                  | 203147   | 10x1,5                                    | 12,4              | 139,3             | 234                  |
| 203094   | 12x0,50                                   | 9,3               | 60,6              | 122                  | 203148   | 12x1,5                                    | 12,8              | 164,0             | 269                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 203104   | 2x0,75                                    | 5,6               | 19,2              | 42                   | 203158   | 2x2,5                                     | 7,8               | 50,4              | 94                   |
| 203105   | 3x0,75                                    | 5,9               | 25,4              | 49                   | 203159   | 3x2,5                                     | 8,2               | 72,1              | 113                  |
| 203106   | 4x0,75                                    | 6,6               | 32,8              | 64                   | 203160   | 4x2,5                                     | 9,2               | 92,7              | 146                  |
| 203107   | 5x0,75                                    | 7,1               | 39,0              | 77                   | 203161   | 5x2,5                                     | 10,0              | 114,8             | 181                  |
| 203108   | 6x0,75                                    | 7,7               | 46,5              | 91                   | 203162   | 6x2,5                                     | 10,9              | 136,4             | 216                  |
| 203109   | 7x0,75                                    | 7,7               | 52,7              | 95                   | 203163   | 7x2,5                                     | 10,9              | 156,8             | 232                  |
| 203110   | 8x0,75                                    | 8,9               | 60,5              | 122                  | 203164   | 8x2,5                                     | 13,0              | 180,4             | 300                  |
| 203111   | 10x0,75                                   | 9,8               | 74,4              | 137                  | 203165   | 10x2,5                                    | 14,0              | 224,4             | 333                  |
| 203112   | 12x0,75                                   | 10,1              | 86,8              | 156                  | 203166   | 12x2,5                                    | 14,5              | 265,6             | 387                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

## Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 205050   | 2x0,22                                    | 3,9               | 5,3               | 20                   | 205122   | 2x1,0                                     | 5,6               | 20,8              | 47                   |
| 205051   | 3x0,22                                    | 4,1               | 7,1               | 21                   | 205123   | 3x1,0                                     | 5,9               | 28,9              | 54                   |
| 205052   | 4x0,22                                    | 4,4               | 9,0               | 25                   | 205124   | 4x1,0                                     | 6,7               | 37,1              | 70                   |
| 205053   | 5x0,22                                    | 4,7               | 10,7              | 30                   | 205125   | 5x1,0                                     | 7,2               | 45,4              | 86                   |
| 205054   | 6x0,22                                    | 5,1               | 12,6              | 35                   | 205126   | 6x1,0                                     | 7,9               | 53,6              | 103                  |
| 205055   | 7x0,22                                    | 5,1               | 14,4              | 37                   | 205127   | 7x1,0                                     | 7,9               | 61,8              | 109                  |
| 205056   | 8x0,22                                    | 5,9               | 16,1              | 47                   | 205128   | 8x1,0                                     | 9,4               | 70,1              | 143                  |
| 205057   | 10x0,22                                   | 6,5               | 19,8              | 53                   | 205129   | 10x1,0                                    | 10,1              | 86,6              | 154                  |
| 205058   | 12x0,22                                   | 6,7               | 23,3              | 59                   | 205130   | 12x1,0                                    | 10,4              | 103,0             | 178                  |
| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
| 205086   | 2x0,50                                    | 4,9               | 9,9               | 31                   | 205140   | 2x1,5                                     | 6,7               | 28,8              | 66                   |
| 205087   | 3x0,50                                    | 5,1               | 14,0              | 35                   | 205141   | 3x1,5                                     | 7,1               | 41,1              | 77                   |
| 205088   | 4x0,50                                    | 5,6               | 18,1              | 43                   | 205142   | 4x1,5                                     | 7,8               | 53,4              | 97                   |
| 205089   | 5x0,50                                    | 6,1               | 22,2              | 53                   | 205143   | 5x1,5                                     | 8,5               | 65,7              | 119                  |
| 205090   | 6x0,50                                    | 6,8               | 26,3              | 66                   | 205144   | 6x1,5                                     | 9,4               | 78,0              | 147                  |
| 205091   | 7x0,50                                    | 6,8               | 30,4              | 69                   | 205145   | 7x1,5                                     | 9,4               | 90,3              | 156                  |
| 205092   | 8x0,50                                    | 7,9               | 34,6              | 89                   | 205146   | 8x1,5                                     | 11,0              | 102,6             | 200                  |
| 205093   | 10x0,50                                   | 8,5               | 42,9              | 95                   | 205147   | 10x1,5                                    | 12,1              | 127,3             | 223                  |
| 205094   | 12x0,50                                   | 8,8               | 51,0              | 109                  | 205148   | 12x1,5                                    | 12,5              | 151,8             | 258                  |
| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
| 205104   | 2x0,75                                    | 5,3               | 16,7              | 40                   | 205158   | 2x2,5                                     | 7,5               | 45,1              | 89                   |
| 205105   | 3x0,75                                    | 5,6               | 22,8              | 47                   | 205159   | 3x2,5                                     | 7,9               | 65,5              | 107                  |
| 205106   | 4x0,75                                    | 6,1               | 29,0              | 57                   | 205160   | 4x2,5                                     | 8,7               | 85,9              | 135                  |
| 205107   | 5x0,75                                    | 6,8               | 35,1              | 73                   | 205161   | 5x2,5                                     | 9,7               | 106,4             | 173                  |
| 205108   | 6x0,75                                    | 7,4               | 41,3              | 86                   | 205162   | 6x2,5                                     | 10,6              | 127,0             | 207                  |
| 205109   | 7x0,75                                    | 7,4               | 47,4              | 91                   | 205163   | 7x2,5                                     | 10,6              | 147,4             | 224                  |
| 205110   | 8x0,75                                    | 8,6               | 53,7              | 115                  | 205164   | 8x2,5                                     | 12,7              | 168,1             | 289                  |
| 205111   | 10x0,75                                   | 9,5               | 66,1              | 129                  | 205165   | 10x2,5                                    | 13,7              | 209,3             | 320                  |
| 205112   | 12x0,75                                   | 9,8               | 78,4              | 148                  | 205166   | 12x2,5                                    | 14,2              | 250,3             | 374                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

## Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Electrostatic screen (St) of plastic coated aluminium foil used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 207050   | 2x0,22                                    | 7,0               | 7,0               | 22                   | 207122   | 2x1,0                                     | 5,9               | 22,2              | 49                   |
| 207051   | 3x0,22                                    | 8,8               | 8,8               | 24                   | 207123   | 3x1,0                                     | 6,2               | 30,4              | 56                   |
| 207052   | 4x0,22                                    | 11,8              | 11,8              | 29                   | 207124   | 4x1,0                                     | 7,0               | 39,8              | 73                   |
| 207053   | 5x0,22                                    | 13,6              | 13,6              | 34                   | 207125   | 5x1,0                                     | 7,5               | 48,2              | 89                   |
| 207054   | 6x0,22                                    | 16,6              | 16,6              | 40                   | 207126   | 6x1,0                                     | 8,2               | 57,8              | 107                  |
| 207055   | 7x0,22                                    | 18,4              | 18,4              | 41                   | 207127   | 7x1,0                                     | 8,2               | 66,0              | 113                  |
| 207056   | 8x0,22                                    | 20,2              | 20,2              | 51                   | 207128   | 8x1,0                                     | 9,7               | 75,9              | 148                  |
| 207057   | 10x0,22                                   | 25,1              | 25,1              | 58                   | 207129   | 10x1,0                                    | 10,4              | 93,9              | 162                  |
| 207058   | 12x0,22                                   | 28,7              | 28,7              | 64                   | 207130   | 12x1,0                                    | 10,4              | 110,3             | 184                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 207086   | 2x0,50                                    | 5,2               | 12,8              | 34                   | 207141   | 2x1,5                                     | 7,0               | 31,6              | 69                   |
| 207087   | 3x0,50                                    | 5,4               | 16,9              | 38                   | 207142   | 3x1,5                                     | 7,4               | 43,9              | 80                   |
| 207088   | 4x0,50                                    | 5,9               | 22,2              | 47                   | 207143   | 4x1,5                                     | 8,1               | 57,5              | 101                  |
| 207089   | 5x0,50                                    | 6,6               | 27,6              | 61                   | 207144   | 5x1,5                                     | 8,8               | 71,2              | 125                  |
| 207090   | 6x0,50                                    | 7,1               | 31,7              | 71                   | 207145   | 6x1,5                                     | 9,7               | 83,7              | 153                  |
| 207091   | 7x0,50                                    | 7,1               | 35,8              | 74                   | 207146   | 7x1,5                                     | 9,7               | 96,0              | 162                  |
| 207092   | 8x0,50                                    | 8,2               | 41,5              | 96                   | 207147   | 8x1,5                                     | 11,3              | 110,2             | 207                  |
| 207093   | 10x0,50                                   | 8,8               | 49,8              | 102                  | 207148   | 10x1,5                                    | 12,4              | 136,6             | 232                  |
| 207094   | 12x0,50                                   | 8,8               | 58,0              | 115                  | 207149   | 12x1,5                                    | 12,4              | 161,1             | 265                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 207104   | 2x0,75                                    | 5,6               | 18,1              | 42                   | 207158   | 2x2,5                                     | 7,8               | 49,2              | 94                   |
| 207105   | 3x0,75                                    | 5,9               | 24,2              | 48                   | 207159   | 3x2,5                                     | 8,2               | 69,7              | 111                  |
| 207106   | 4x0,75                                    | 6,6               | 31,6              | 63                   | 207160   | 4x2,5                                     | 9,2               | 91,5              | 145                  |
| 207107   | 5x0,75                                    | 7,1               | 37,8              | 76                   | 207161   | 5x2,5                                     | 10,0              | 112,2             | 179                  |
| 207108   | 6x0,75                                    | 7,7               | 45,3              | 90                   | 207162   | 6x2,5                                     | 10,9              | 134,4             | 215                  |
| 207109   | 7x0,75                                    | 7,7               | 51,5              | 95                   | 207163   | 7x2,5                                     | 10,9              | 154,8             | 231                  |
| 207110   | 8x0,75                                    | 8,9               | 59,3              | 121                  | 207164   | 8x2,5                                     | 13,0              | 177,6             | 299                  |
| 207111   | 10x0,75                                   | 9,8               | 71,9              | 135                  | 207165   | 10x2,5                                    | 14,0              | 220,0             | 330                  |
| 207112   | 12x0,75                                   | 9,8               | 84,2              | 153                  | 207166   | 12x2,5                                    | 14,0              | 261,0             | 382                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

## Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector.

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE  
ANSI  
C €

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 209086   | 2x2x0,50                                  | 7,3               | 16,4              | 48                   | 209122   | 2x2x1,0                                   | 8,5               | 32,8              | 71                   |
| 209087   | 3x2x0,50                                  | 7,7               | 24,6              | 62                   | 209123   | 3x2x1,0                                   | 9,2               | 49,3              | 99                   |
| 209088   | 4x2x0,50                                  | 8,5               | 32,9              | 78                   | 209124   | 4x2x1,0                                   | 10,1              | 65,7              | 125                  |
| 209089   | 5x2x0,50                                  | 9,5               | 41,1              | 98                   | 209125   | 5x2x1,0                                   | 11,1              | 82,2              | 152                  |

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 209104   | 2x2x0,75                                  | 8,0               | 24,6              | 60                   | 209140   | 2x2x1,5                                   | 10,2              | 49,1              | 103                  |
| 209105   | 3x2x0,75                                  | 8,4               | 36,9              | 79                   | 209141   | 3x2x1,5                                   | 10,8              | 73,6              | 139                  |
| 209106   | 4x2x0,75                                  | 9,5               | 49,2              | 105                  | 209142   | 4x2x1,5                                   | 12,2              | 98,2              | 183                  |
| 209107   | 5x2x0,75                                  | 10,4              | 61,6              | 126                  | 209143   | 5x2x1,5                                   | 13,4              | 122,8             | 221                  |



### Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm² 300/500 V  
from 2,5mm² 450/750 V
- Test voltage  
up to 1,5mm² 1500 V  
from 2,5mm² 2500 V
- Conductor resistance @20°C  
0,22mm² max. 85,0 Ohm/km  
0,50mm² max. 39,0 Ohm/km  
0,75mm² max. 26,0 Ohm/km  
1,0mm² max. 19,5 Ohm/km  
1,5mm² max. 13,3 Ohm/km  
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

### Cable according to DIN VDE 0812

### Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

### Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

### Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

| Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------|-------------------|-------------------|----------------------|----------|------------------------------|-------------------|-------------------|----------------------|
| 211086   | 2x2x0,50                     | 7,8               | 26,1              | 59                   | 211122   | 2x2x1,0                      | 9,2               | 44,1              | 88                   |
| 211087   | 3x2x0,50                     | 8,2               | 35,7              | 75                   | 211123   | 3x2x1,0                      | 9,7               | 62,0              | 114                  |
| 211088   | 4x2x0,50                     | 9,2               | 44,2              | 95                   | 211124   | 4x2x1,0                      | 10,6              | 79,4              | 141                  |
| 211089   | 5x2x0,50                     | 10,0              | 53,9              | 113                  | 211125   | 5x2x1,0                      | 11,6              | 98,4              | 170                  |

| Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------|-------------------|-------------------|----------------------|----------|------------------------------|-------------------|-------------------|----------------------|
| 211104   | 2x2x0,75                     | 8,5               | 35,8              | 73                   | 211140   | 2x2x1,5                      | 10,7              | 62,8              | 118                  |
| 211105   | 3x2x0,75                     | 8,9               | 48,2              | 92                   | 211141   | 3x2x1,5                      | 11,3              | 89,7              | 157                  |
| 211106   | 4x2x0,75                     | 10,0              | 62,1              | 119                  | 211142   | 4x2x1,5                      | 12,7              | 114,8             | 201                  |
| 211107   | 5x2x0,75                     | 10,9              | 75,5              | 142                  | 211143   | 5x2x1,5                      | 13,9              | 142,3             | 243                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm² 300/500 V  
from 2,5mm² 450/750 V
- Test voltage  
up to 1,5mm² 1500 V  
from 2,5mm² 2500 V
- Conductor resistance @20°C  
0,22mm² max. 85,0 Ohm/km  
0,50mm² max. 39,0 Ohm/km  
0,75mm² max. 26,0 Ohm/km  
1,0mm² max. 19,5 Ohm/km  
1,5mm² max. 13,3 Ohm/km  
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

| Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------|-------------------|-------------------|----------------------|
| 213086   | 2x2x0,50                     | 7,5               | 18,2              | 52                   |
| 213087   | 3x2x0,50                     | 7,9               | 26,4              | 66                   |
| 213088   | 4x2x0,50                     | 8,7               | 34,6              | 82                   |
| 213089   | 5x2x0,50                     | 9,7               | 42,9              | 103                  |

| Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------|-------------------|-------------------|----------------------|
| 213122   | 2x2x1,0                      | 8,7               | 37,3              | 78                   |
| 213123   | 3x2x1,0                      | 9,4               | 53,7              | 106                  |
| 213124   | 4x2x1,0                      | 10,3              | 70,2              | 133                  |
| 213125   | 5x2x1,0                      | 11,3              | 86,6              | 159                  |

| Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------|-------------------|-------------------|----------------------|
| 213104   | 2x2x0,75                     | 8,2               | 29,1              | 67                   |
| 213105   | 3x2x0,75                     | 8,6               | 41,4              | 86                   |
| 213106   | 4x2x0,75                     | 9,7               | 53,7              | 112                  |
| 213107   | 5x2x0,75                     | 10,6              | 66,1              | 133                  |

| Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------|-------------------|-------------------|----------------------|
| 213140   | 2x2x1,5                      | 10,4              | 53,5              | 110                  |
| 213141   | 3x2x1,5                      | 11,0              | 78,1              | 146                  |
| 213142   | 4x2x1,5                      | 12,4              | 102,6             | 190                  |
| 213143   | 5x2x1,5                      | 13,6              | 127,3             | 229                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ωm x km

## Cable according to DIN VDE 0812

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Electrostatic screen (St) of plastic coated aluminium foil used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air). Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 215086   | 2x2x0,50                                  | 7,8               | 26,2              | 60                   | 215122   | 2x2x1,0                                   | 9,2               | 44,1              | 89                   |
| 215087   | 3x2x0,50                                  | 8,2               | 35,7              | 76                   | 215123   | 3x2x1,0                                   | 9,7               | 62,0              | 115                  |
| 215088   | 4x2x0,50                                  | 9,2               | 44,2              | 96                   | 215124   | 4x2x1,0                                   | 10,6              | 79,5              | 142                  |
| 215089   | 5x2x0,50                                  | 10,0              | 53,9              | 114                  | 215125   | 5x2x1,0                                   | 11,6              | 98,4              | 171                  |

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 215104   | 2x2x0,75                                  | 8,5               | 35,8              | 74                   | 215140   | 2x2x1,5                                   | 10,7              | 62,8              | 119                  |
| 215105   | 3x2x0,75                                  | 8,9               | 48,2              | 93                   | 215141   | 3x2x1,5                                   | 11,3              | 89,7              | 158                  |
| 215106   | 4x2x0,75                                  | 10,0              | 59,5              | 118                  | 215142   | 4x2x1,5                                   | 12,7              | 114,9             | 202                  |
| 215107   | 5x2x0,75                                  | 10,9              | 75,5              | 143                  | 215143   | 5x2x1,5                                   | 13,9              | 142,3             | 244                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

## Cable according to DIN VDE 0812

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector.

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 202050   | 2x0,22                                    | 3,5               | 3,6               | 16                   | 202122   | 2x1,0                                     | 5,4               | 16,3              | 42                   |
| 202052   | 3x0,22                                    | 3,9               | 5,4               | 19                   | 202123   | 3x1,0                                     | 5,7               | 24,5              | 49                   |
| 202053   | 4x0,22                                    | 4,2               | 7,2               | 23                   | 202124   | 4x1,0                                     | 6,5               | 32,7              | 66                   |
| 202054   | 5x0,22                                    | 4,5               | 8,9               | 28                   | 202125   | 5x1,0                                     | 7,0               | 40,9              | 81                   |
| 202055   | 6x0,22                                    | 4,9               | 10,8              | 33                   | 202126   | 6x1,0                                     | 7,7               | 49,2              | 98                   |
| 202056   | 7x0,22                                    | 4,9               | 12,6              | 34                   | 202127   | 7x1,0                                     | 7,7               | 57,4              | 104                  |
| 202057   | 8x0,22                                    | 5,7               | 14,3              | 45                   | 202128   | 8x1,0                                     | 9,2               | 65,7              | 138                  |
| 202058   | 10x0,22                                   | 6,1               | 18,0              | 47                   | 202129   | 10x1,0                                    | 9,9               | 82,2              | 150                  |
| 202059   | 12x0,22                                   | 6,5               | 21,5              | 57                   | 202130   | 12x1,0                                    | 10,2              | 98,5              | 174                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 202086   | 2x0,50                                    | 4,7               | 8,2               | 29                   | 202140   | 2x1,5                                     | 6,5               | 24,4              | 61                   |
| 202087   | 3x0,50                                    | 4,9               | 12,3              | 33                   | 202141   | 3x1,5                                     | 6,9               | 36,6              | 72                   |
| 202088   | 4x0,50                                    | 5,4               | 16,3              | 41                   | 202142   | 4x1,5                                     | 7,6               | 48,9              | 92                   |
| 202089   | 5x0,50                                    | 5,9               | 20,4              | 51                   | 202143   | 5x1,5                                     | 8,3               | 61,2              | 115                  |
| 202090   | 6x0,50                                    | 6,6               | 24,5              | 64                   | 202144   | 6x1,5                                     | 9,2               | 73,5              | 143                  |
| 202091   | 7x0,50                                    | 6,6               | 28,6              | 67                   | 202145   | 7x1,5                                     | 9,2               | 85,8              | 152                  |
| 202092   | 8x0,50                                    | 7,7               | 32,8              | 87                   | 202146   | 8x1,5                                     | 10,8              | 98,1              | 196                  |
| 202093   | 10x0,50                                   | 8,3               | 41,1              | 93                   | 202147   | 10x1,5                                    | 11,9              | 122,8             | 219                  |
| 202094   | 12x0,50                                   | 8,6               | 49,2              | 107                  | 202148   | 12x1,5                                    | 12,3              | 147,3             | 255                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 202104   | 2x0,75                                    | 5,1               | 12,2              | 35                   | 202158   | 2x2,5                                     | 7,3               | 40,7              | 84                   |
| 202105   | 3x0,75                                    | 5,4               | 18,4              | 41                   | 202159   | 3x2,5                                     | 7,7               | 61,1              | 102                  |
| 202106   | 4x0,75                                    | 5,9               | 24,5              | 52                   | 202160   | 4x2,5                                     | 8,5               | 81,4              | 131                  |
| 202107   | 5x0,75                                    | 6,6               | 30,7              | 68                   | 202161   | 5x2,5                                     | 9,5               | 101,9             | 169                  |
| 202108   | 6x0,75                                    | 7,2               | 36,8              | 81                   | 202162   | 6x2,5                                     | 10,4              | 122,5             | 203                  |
| 202109   | 7x0,75                                    | 7,2               | 43,0              | 86                   | 202163   | 7x2,5                                     | 10,4              | 142,9             | 220                  |
| 202110   | 8x0,75                                    | 8,4               | 49,3              | 111                  | 202164   | 8x2,5                                     | 12,5              | 163,6             | 286                  |
| 202111   | 10x0,75                                   | 9,3               | 61,6              | 125                  | 202165   | 10x2,5                                    | 13,5              | 204,8             | 317                  |
| 202112   | 12x0,75                                   | 9,6               | 73,9              | 144                  | 202166   | 12x2,5                                    | 14,0              | 245,8             | 372                  |



### Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

### Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

### Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

### Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 204051   | 2x0,22                                    | 4,2               | 8,1               | 23                   | 204123   | 2x1,0                                     | 5,9               | 23,4              | 50                   |
| 204052   | 3x0,22                                    | 4,4               | 9,9               | 25                   | 204124   | 3x1,0                                     | 6,2               | 31,5              | 58                   |
| 204053   | 4x0,22                                    | 4,7               | 11,8              | 29                   | 204125   | 4x1,0                                     | 7,0               | 41,0              | 76                   |
| 204054   | 5x0,22                                    | 5,0               | 14,7              | 35                   | 204126   | 5x1,0                                     | 7,5               | 50,6              | 92                   |
| 204055   | 6x0,22                                    | 5,4               | 16,6              | 40                   | 204127   | 6x1,0                                     | 8,2               | 60,2              | 111                  |
| 204056   | 7x0,22                                    | 5,4               | 18,4              | 42                   | 204128   | 7x1,0                                     | 8,2               | 68,4              | 117                  |
| 204057   | 8x0,22                                    | 6,2               | 22,6              | 54                   | 204129   | 8x1,0                                     | 9,7               | 78,4              | 153                  |
| 204058   | 10x0,22                                   | 6,8               | 26,3              | 60                   | 204130   | 10x1,0                                    | 10,4              | 95,8              | 166                  |
| 204059   | 12x0,22                                   | 7,0               | 29,9              | 67                   | 204131   | 12x1,0                                    | 10,7              | 112,3             | 190                  |
| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
| 204086   | 2x0,50                                    | 5,2               | 14,0              | 36                   | 204140   | 2x1,5                                     | 7,0               | 32,7              | 71                   |
| 204087   | 3x0,50                                    | 5,4               | 18,1              | 40                   | 204141   | 3x1,5                                     | 7,4               | 46,3              | 84                   |
| 204088   | 4x0,50                                    | 5,9               | 23,4              | 49                   | 204142   | 4x1,5                                     | 8,1               | 58,7              | 103                  |
| 204089   | 5x0,50                                    | 6,6               | 28,7              | 63                   | 204143   | 5x1,5                                     | 8,8               | 72,5              | 128                  |
| 204090   | 6x0,50                                    | 7,1               | 32,9              | 74                   | 204144   | 6x1,5                                     | 9,7               | 86,3              | 157                  |
| 204091   | 7x0,50                                    | 7,1               | 37,0              | 77                   | 204145   | 7x1,5                                     | 9,7               | 98,5              | 167                  |
| 204092   | 8x0,50                                    | 8,2               | 43,9              | 99                   | 204146   | 8x1,5                                     | 11,3              | 114,1             | 214                  |
| 204093   | 10x0,50                                   | 8,8               | 52,3              | 106                  | 204147   | 10x1,5                                    | 12,4              | 139,3             | 238                  |
| 204094   | 12x0,50                                   | 9,3               | 61,8              | 126                  | 204148   | 12x1,5                                    | 12,8              | 164,0             | 274                  |
| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
| 204104   | 2x0,75                                    | 5,6               | 19,2              | 43                   | 204158   | 2x2,5                                     | 7,8               | 50,4              | 95                   |
| 204105   | 3x0,75                                    | 5,9               | 25,4              | 50                   | 204159   | 3x2,5                                     | 8,2               | 72,1              | 115                  |
| 204106   | 4x0,75                                    | 6,6               | 32,8              | 65                   | 204160   | 4x2,5                                     | 9,2               | 92,7              | 148                  |
| 204107   | 5x0,75                                    | 7,1               | 39,0              | 78                   | 204161   | 5x2,5                                     | 10,0              | 114,8             | 184                  |
| 204108   | 6x0,75                                    | 7,7               | 46,5              | 93                   | 204162   | 6x2,5                                     | 10,9              | 136,4             | 219                  |
| 204109   | 7x0,75                                    | 7,7               | 52,7              | 98                   | 204163   | 7x2,5                                     | 10,9              | 156,8             | 236                  |
| 204110   | 8x0,75                                    | 8,9               | 60,5              | 124                  | 204164   | 8x2,5                                     | 13,0              | 180,4             | 305                  |
| 204111   | 10x0,75                                   | 9,8               | 74,4              | 139                  | 204165   | 10x2,5                                    | 14,0              | 224,4             | 339                  |
| 204112   | 12x0,75                                   | 10,1              | 86,8              | 159                  | 204166   | 12x2,5                                    | 14,5              | 265,6             | 394                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 206050   | 2x0,22                                    | 4,2               | 8,1               | 24                   | 206122   | 2x1,0                                     | 5,9               | 22,2              | 49                   |
| 206051   | 3x0,22                                    | 4,4               | 9,9               | 25                   | 206123   | 3x1,0                                     | 6,2               | 31,6              | 58                   |
| 206052   | 4x0,22                                    | 4,7               | 11,8              | 29                   | 206124   | 4x1,0                                     | 7,0               | 39,8              | 75                   |
| 206053   | 5x0,22                                    | 5,0               | 13,6              | 34                   | 206125   | 5x1,0                                     | 7,5               | 49,4              | 92                   |
| 206054   | 6x0,22                                    | 5,4               | 16,6              | 41                   | 206126   | 6x1,0                                     | 8,2               | 57,8              | 109                  |
| 206055   | 7x0,22                                    | 5,4               | 18,4              | 42                   | 206127   | 7x1,0                                     | 8,2               | 66,0              | 115                  |
| 206056   | 8x0,22                                    | 6,2               | 21,4              | 54                   | 206128   | 8x1,0                                     | 9,7               | 75,9              | 151                  |
| 206057   | 10x0,22                                   | 6,8               | 25,1              | 60                   | 206129   | 10x1,0                                    | 10,4              | 93,9              | 165                  |
| 206058   | 12x0,22                                   | 7,0               | 28,7              | 67                   | 206130   | 12x1,0                                    | 10,7              | 110,3             | 189                  |
| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
| 206086   | 2x0,50                                    | 5,2               | 14,0              | 36                   | 206140   | 2x1,5                                     | 7,0               | 31,6              | 70                   |
| 206087   | 3x0,50                                    | 5,4               | 18,1              | 40                   | 206141   | 3x1,5                                     | 7,4               | 43,9              | 82                   |
| 206088   | 4x0,50                                    | 5,9               | 22,2              | 49                   | 206142   | 4x1,5                                     | 8,1               | 57,5              | 103                  |
| 206089   | 5x0,50                                    | 6,6               | 27,6              | 63                   | 206143   | 5x1,5                                     | 8,8               | 71,2              | 127                  |
| 206090   | 6x0,50                                    | 7,1               | 31,7              | 73                   | 206144   | 6x1,5                                     | 9,7               | 83,7              | 156                  |
| 206091   | 7x0,50                                    | 7,1               | 35,8              | 76                   | 206145   | 7x1,5                                     | 9,7               | 96,0              | 165                  |
| 206092   | 8x0,50                                    | 8,2               | 41,5              | 98                   | 206146   | 8x1,5                                     | 11,3              | 110,2             | 210                  |
| 206093   | 10x0,50                                   | 8,8               | 51,1              | 105                  | 206147   | 10x1,5                                    | 12,4              | 136,6             | 236                  |
| 206094   | 12x0,50                                   | 9,3               | 59,3              | 124                  | 206148   | 12x1,5                                    | 12,8              | 161,3             | 272                  |
| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
| 206104   | 2x0,75                                    | 5,6               | 18,1              | 43                   | 206158   | 2x2,5                                     | 7,8               | 49,2              | 95                   |
| 206105   | 3x0,75                                    | 5,9               | 24,2              | 49                   | 206159   | 3x2,5                                     | 8,2               | 69,7              | 113                  |
| 206106   | 4x0,75                                    | 6,6               | 31,6              | 64                   | 206160   | 4x2,5                                     | 9,2               | 91,5              | 148                  |
| 206107   | 5x0,75                                    | 7,1               | 37,8              | 77                   | 206161   | 5x2,5                                     | 10,0              | 112,2             | 182                  |
| 206108   | 6x0,75                                    | 7,7               | 45,3              | 92                   | 206162   | 6x2,5                                     | 10,9              | 134,4             | 218                  |
| 206109   | 7x0,75                                    | 7,7               | 51,5              | 97                   | 206163   | 7x2,5                                     | 10,9              | 154,8             | 235                  |
| 206110   | 8x0,75                                    | 8,9               | 59,3              | 123                  | 206164   | 8x2,5                                     | 13,0              | 177,6             | 303                  |
| 206111   | 10x0,75                                   | 9,8               | 71,9              | 138                  | 206165   | 10x2,5                                    | 14,0              | 220,0             | 335                  |
| 206112   | 12x0,75                                   | 10,1              | 84,2              | 157                  | 206166   | 12x2,5                                    | 14,5              | 261,3             | 391                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Electrostatic screen (St) of plastic coated aluminium foil used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 208050   | 2x0,22                                    | 4,2               | 8,1               | 24                   | 208086   | 2x0,50                                    | 5,2               | 14,0              | 36                   |
| 208051   | 3x0,22                                    | 4,4               | 9,9               | 25                   | 208087   | 3x0,50                                    | 5,4               | 18,1              | 40                   |
| 208052   | 4x0,22                                    | 4,7               | 11,8              | 29                   | 208088   | 4x0,50                                    | 5,9               | 22,2              | 49                   |
| 208053   | 5x0,22                                    | 5,0               | 13,6              | 34                   | 208089   | 5x0,50                                    | 6,6               | 27,6              | 63                   |
| 208054   | 6x0,22                                    | 5,4               | 16,6              | 41                   | 208090   | 6x0,50                                    | 7,1               | 31,7              | 73                   |
| 208055   | 7x0,22                                    | 5,4               | 18,4              | 42                   | 208091   | 7x0,50                                    | 7,1               | 35,8              | 76                   |
| 208056   | 8x0,22                                    | 6,2               | 21,4              | 54                   | 208092   | 8x0,50                                    | 8,2               | 41,5              | 98                   |
| 208057   | 10x0,22                                   | 6,8               | 25,1              | 60                   | 208093   | 10x0,50                                   | 8,8               | 51,1              | 105                  |
| 208058   | 12x0,22                                   | 7,0               | 28,7              | 67                   | 208094   | 12x0,50                                   | 9,3               | 59,3              | 124                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 208104   | 2x0,75                                    | 5,6               | 18,1              | 43                   | 208122   | 2x1,0                                     | 5,9               | 22,2              | 49                   |
| 208105   | 3x0,75                                    | 5,9               | 24,2              | 49                   | 208123   | 3x1,0                                     | 6,2               | 31,6              | 58                   |
| 208106   | 4x0,75                                    | 6,6               | 31,6              | 64                   | 208124   | 4x1,0                                     | 7,0               | 39,8              | 75                   |
| 208107   | 5x0,75                                    | 7,1               | 37,8              | 77                   | 208125   | 5x1,0                                     | 7,5               | 49,4              | 92                   |
| 208108   | 6x0,75                                    | 7,7               | 45,3              | 92                   | 208126   | 6x1,0                                     | 8,2               | 57,8              | 109                  |
| 208109   | 7x0,75                                    | 7,7               | 51,5              | 97                   | 208127   | 7x1,0                                     | 8,2               | 66,0              | 115                  |
| 208110   | 8x0,75                                    | 8,9               | 59,3              | 123                  | 208128   | 8x1,0                                     | 9,7               | 75,9              | 151                  |
| 208111   | 10x0,75                                   | 9,8               | 71,9              | 138                  | 208129   | 10x1,0                                    | 10,4              | 93,9              | 165                  |
| 208112   | 12x0,75                                   | 10,1              | 84,2              | 157                  | 208130   | 12x1,0                                    | 10,7              | 110,3             | 189                  |

| Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 208140   | 2x1,5                                     | 7,0               | 31,6              | 70                   | 208158   | 2x2,5                                     | 7,8               | 49,2              | 95                   |
| 208141   | 3x1,5                                     | 7,4               | 43,9              | 82                   | 208159   | 3x2,5                                     | 8,2               | 69,7              | 113                  |
| 208142   | 4x1,5                                     | 8,1               | 57,5              | 103                  | 208160   | 4x2,5                                     | 9,2               | 91,5              | 148                  |
| 208143   | 5x1,5                                     | 8,8               | 71,2              | 127                  | 208161   | 5x2,5                                     | 10,0              | 112,2             | 182                  |
| 208144   | 6x1,5                                     | 9,7               | 83,7              | 156                  | 208162   | 6x2,5                                     | 10,9              | 134,4             | 218                  |
| 208145   | 7x1,5                                     | 9,7               | 96,0              | 165                  | 208163   | 7x2,5                                     | 10,9              | 154,8             | 235                  |
| 208146   | 8x1,5                                     | 11,3              | 110,2             | 210                  | 208164   | 8x2,5                                     | 13,0              | 177,6             | 303                  |
| 208147   | 10x1,5                                    | 12,4              | 136,6             | 236                  | 208165   | 10x2,5                                    | 14,0              | 220,0             | 335                  |
| 208148   | 12x1,5                                    | 12,8              | 161,3             | 272                  | 208166   | 12x2,5                                    | 14,5              | 261,3             | 391                  |



### Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

### Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

### Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

### Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector.

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 441502   | 2x2x0,50                                  | 7,3               | 16,4              | 49                   | 441102   | 2x2x1,0                                   | 8,5               | 32,8              | 73                   |
| 441503   | 3x2x0,50                                  | 7,7               | 24,6              | 64                   | 441103   | 3x2x1,0                                   | 9,2               | 49,3              | 102                  |
| 441504   | 4x2x0,50                                  | 8,5               | 32,9              | 80                   | 441104   | 4x2x1,0                                   | 10,1              | 65,7              | 128                  |
| 441505   | 5x2x0,50                                  | 9,5               | 41,1              | 101                  | 441105   | 5x2x1,0                                   | 11,1              | 82,2              | 155                  |

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 441702   | 2x2x0,75                                  | 8,0               | 24,6              | 62                   | 441802   | 2x2x1,5                                   | 10,2              | 49,1              | 105                  |
| 441703   | 3x2x0,75                                  | 8,4               | 36,9              | 81                   | 441803   | 3x2x1,5                                   | 10,8              | 73,6              | 142                  |
| 441704   | 4x2x0,75                                  | 9,5               | 49,2              | 107                  | 441804   | 4x2x1,5                                   | 12,2              | 98,2              | 186                  |
| 441705   | 5x2x0,75                                  | 10,4              | 61,6              | 129                  | 441805   | 5x2x1,5                                   | 13,4              | 122,8             | 226                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility (EMC).

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 212086   | 2x2x0,50                                  | 7,8               | 26,1              | 61                   | 212122   | 2x2x1,0                                   | 9,2               | 44,1              | 90                   |
| 212087   | 3x2x0,50                                  | 8,2               | 35,7              | 77                   | 212123   | 3x2x1,0                                   | 9,7               | 62,0              | 116                  |
| 212088   | 4x2x0,50                                  | 9,2               | 44,2              | 97                   | 212124   | 4x2x1,0                                   | 10,6              | 79,4              | 144                  |
| 212089   | 5x2x0,50                                  | 10,0              | 53,9              | 115                  | 212125   | 5x2x1,0                                   | 11,6              | 98,4              | 173                  |

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 212104   | 2x2x0,75                                  | 8,5               | 35,8              | 74                   | 212140   | 2x2x1,5                                   | 10,7              | 62,8              | 121                  |
| 212105   | 3x2x0,75                                  | 8,9               | 48,2              | 94                   | 212141   | 3x2x1,5                                   | 11,3              | 89,7              | 160                  |
| 212106   | 4x2x0,75                                  | 10,0              | 62,1              | 122                  | 212142   | 4x2x1,5                                   | 12,7              | 114,8             | 205                  |
| 212107   | 5x2x0,75                                  | 10,9              | 75,5              | 145                  | 212143   | 5x2x1,5                                   | 13,9              | 142,3             | 248                  |



### Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm² 300/500 V  
from 2,5mm² 450/750 V
- Test voltage  
up to 1,5mm² 1500 V  
from 2,5mm² 2500 V
- Conductor resistance @20°C  
0,22mm² max. 85,0 Ohm/km  
0,50mm² max. 39,0 Ohm/km  
0,75mm² max. 26,0 Ohm/km  
1,0mm² max. 19,5 Ohm/km  
1,5mm² max. 13,3 Ohm/km  
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

### Cable according to DIN VDE 0812

### Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

### Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

### Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility (EMC).

| Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------|-------------------|-------------------|----------------------|----------|------------------------------|-------------------|-------------------|----------------------|
| 214086   | 443502                       | 7,5               | 18,2              | 53                   | 214122   | 2x2x1,0                      | 8,7               | 37,3              | 79                   |
| 214087   | 443503                       | 7,9               | 26,4              | 68                   | 214123   | 3x2x1,0                      | 9,4               | 53,7              | 109                  |
| 214088   | 443504                       | 8,7               | 34,6              | 84                   | 214124   | 4x2x1,0                      | 10,3              | 70,2              | 135                  |
| 214089   | 443505                       | 9,7               | 42,9              | 105                  | 214125   | 5x2x1,0                      | 11,3              | 86,6              | 163                  |

| Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------|-------------------|-------------------|----------------------|----------|------------------------------|-------------------|-------------------|----------------------|
| 214104   | 2x2x0,75                     | 8,2               | 29,1              | 68                   | 214140   | 2x2x1,5                      | 10,4              | 53,5              | 112                  |
| 214105   | 3x2x0,75                     | 8,6               | 41,4              | 88                   | 214141   | 3x2x1,5                      | 11,0              | 78,1              | 149                  |
| 214106   | 4x2x0,75                     | 9,7               | 53,7              | 114                  | 214142   | 4x2x1,5                      | 12,4              | 102,6             | 194                  |
| 214107   | 5x2x0,75                     | 10,6              | 66,1              | 136                  | 214143   | 5x2x1,5                      | 13,6              | 127,3             | 234                  |



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius  
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage  
up to 1,5mm<sup>2</sup> 300/500 V  
from 2,5mm<sup>2</sup> 450/750 V
- Test voltage  
up to 1,5mm<sup>2</sup> 1500 V  
from 2,5mm<sup>2</sup> 2500 V
- Conductor resistance @20°C  
0,22mm<sup>2</sup> max. 85,0 Ohm/km  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

## Cable according to DIN VDE 0812

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Electrostatic screen (St) of plastic coated aluminium foil used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE  
VDE  
CE

TSEK UBM-03-BK-022  
DIN VDE 0812  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 216086   | 2x2x0,50                                  | 7,8               | 26,2              | 61                   | 216122   | 2x2x1,0                                   | 9,2               | 44,1              | 91                   |
| 216087   | 3x2x0,50                                  | 8,2               | 35,7              | 77                   | 216123   | 3x2x1,0                                   | 9,7               | 62,0              | 117                  |
| 216088   | 4x2x0,50                                  | 9,2               | 44,2              | 98                   | 216124   | 4x2x1,0                                   | 10,6              | 79,5              | 145                  |
| 216089   | 5x2x0,50                                  | 10,0              | 53,9              | 116                  | 216125   | 5x2x1,0                                   | 11,6              | 98,4              | 174                  |

| Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. pairs x cross-sec. [mm <sup>2</sup> ] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|-------------------------------------------|-------------------|-------------------|----------------------|----------|-------------------------------------------|-------------------|-------------------|----------------------|
| 216104   | 2x2x0,75                                  | 8,5               | 35,8              | 75                   | 216140   | 2x2x1,5                                   | 10,7              | 62,8              | 122                  |
| 216105   | 3x2x0,75                                  | 8,9               | 48,2              | 95                   | 216141   | 3x2x1,5                                   | 11,3              | 89,7              | 161                  |
| 216106   | 4x2x0,75                                  | 10,0              | 59,5              | 120                  | 216142   | 4x2x1,5                                   | 12,7              | 114,9             | 206                  |
| 216107   | 5x2x0,75                                  | 10,9              | 75,5              | 146                  | 216143   | 5x2x1,5                                   | 13,9              | 142,3             | 249                  |



# VARIOUS

## Cables





## Technical information

- Temperature range  
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius; 10x cable Ø
- Nominal voltage; 300 V
- Test voltage; 800 V  
(core/core and core/screen)
- Mutual capacitance; 100nF/km  
(for the cables up to 4 pair, this value may be increased by 20%)
- Capacitance unbalances; 300pF/100m  
(20% of the values, but one value up to 500pF is allowed)
- Loop resistance @20°C  
0,80mm - max. 73,2 Ohm/km  
1,0mm<sup>2</sup> - max. 36,2 Ohm/km  
1,5mm<sup>2</sup> - max. 24,2 Ohm/km
- Insulation resistance; min. 100 M.Ohm x km

Installation cable according to DIN VDE 0815

TSE  
VDE  
CE

TSEK UBM-03-BK-023  
DIN VDE 0815  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

- Annealed solid copper conductor; Ø 0,80, 1,12 and 1,37mm
- Core insulation PVC compound; type YI1 acc. to DIN VDE 0207 part 4, type TI51 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN VDE 0815
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length (2-paired versions are stranded in star quad cable design)
- Polyester tape used as separator over cores
- Tinned copper drain wire Ø 0,80mm, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Red RAL 3000

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

## Application

These cables are used especially for installation in fire alarm systems. Thanks to electrostatic screen and tin-plated drain wire, external electrical interferences of high frequency and electromagnetic field are minimized. Twisted pair structure minimizes crosstalk. For fixed installation on and under plaster, in dry and damp rooms. For outdoor use this cable should be installed under plaster only.

| Part No. | No. pairs x<br>diameter<br>[mm] | Outer<br>Ø<br>app. [mm] | Cu<br>weight<br>[kg/km] | Cable<br>weight<br>[kg/km] | Part No. | No. pairs x<br>cross-sec.<br>[mm²] | Outer<br>Ø<br>app. [mm] | Cu<br>weight<br>[kg/km] | Cable<br>weight<br>[kg/km] |
|----------|---------------------------------|-------------------------|-------------------------|----------------------------|----------|------------------------------------|-------------------------|-------------------------|----------------------------|
| 109097   | 1x2x0,80                        | 5,5                     | 10,2                    | 37                         | 109173   | 1x2x1,0                            | 6,3                     | 22,2                    | 55                         |
| 109098   | 2x2x0,80                        | 6,1                     | 19,3                    | 52                         | 109174   | 2x2x1,0                            | 7,1                     | 40,0                    | 82                         |
| 109099   | 3x2x0,80                        | 8,1                     | 28,4                    | 76                         | 109175   | 1x2x1,5                            | 7,1                     | 30,6                    | 70                         |
| 109100   | 4x2x0,80                        | 8,8                     | 37,5                    | 93                         | 109176   | 2x2x1,5                            | 8,1                     | 56,9                    | 109                        |



## Technical information

- Temperature range  
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius; 10x cable Ø
- Nominal voltage; 300 V
- Test voltage; 800 V  
(core/core and core/screen)
- Mutual capacitance; 100nF/km  
(for the cables up to 4 pair, this value may be increased by 20%)
- Capacitance unbalances; 300pF/100m  
(20% of the values, but one value up to 500pF is allowed)
- Loop resistance @20°C  
0,80mm - max. 73,2 Ohm/km  
1,0mm<sup>2</sup> - max. 36,2 Ohm/km  
1,5mm<sup>2</sup> - max. 24,2 Ohm/km
- Insulation resistance; min. 100 M.Ohm x km

## Installation cable according to DIN VDE 0815

TSE  
VDE  
CE

TSEK UBM-03-BK-023  
DIN VDE 0815  
Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

- Annealed solid copper conductor; Ø 0,80, 1,12 and 1,37mm
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN VDE 0815
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length (2-paired versions are stranded in star quad cable design)
- Polyester tape used as separator over cores
- Tinned copper drain wire Ø 0,80mm, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Red RAL 3000

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

## Application

These halogen-free installation cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used especially for installation in fire alarm systems. Thanks to electrostatic screen and tin-plated drain wire, external electrical interferences of high frequency and electromagnetic field are minimized. Twisted pair structure minimizes crosstalk. For fixed installation on and under plaster, in dry and damp rooms. For outdoor use this cable should be installed under plaster only.

| Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] | Part No. | No. cores x cross-sec. [mm²] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------|-------------------|-------------------|----------------------|----------|------------------------------|-------------------|-------------------|----------------------|
| 110097   | 1x2x0,80                  | 5,5               | 13,5              | 41                   | 110135   | 1x2x1,0                      | 6,3               | 22,2              | 56                   |
| 110098   | 2x2x0,80                  | 6,1               | 22,6              | 57                   | 110136   | 2x2x1,0                      | 7,1               | 40,0              | 84                   |
| 110099   | 3x2x0,80                  | 8,1               | 31,8              | 81                   | 110192   | 1x2x1,5                      | 7,1               | 30,6              | 71                   |
| 110100   | 4x2x0,80                  | 8,8               | 40,9              | 98                   | 110193   | 2x2x1,5                      | 8,1               | 56,9              | 112                  |



### Technical information

- Temperature range  
flexible 0°C up to +50°C, fixed -20°C up to +60°C
- Minimum bending radius; 8x cable Ø
- Operating voltage; max. 125 V
- Test voltage; 1,0 kV DC for 1 minute
- Conductor resistance @20°C; max. 97,8 Ohm/km
- Conductor resistance unbalance @20°C; max. 5%
- Mutual capacitance; max. 56 nF/km
- Capacitance unbalance; max. 400pF/500m
- Insulation resistance; min. 5 G.Ohm x km

### Cable according to ANSI/TIA 568-C.2

TSE  
CE

TSE K 116  
Low Voltage Directive 2006/95/EC  
RoHS compliant

**PDV:** annealed copper, PVC sheath  
**PDV-K:** tinned copper, PVC sheath  
**PDH:** annealed copper, LSZH sheath  
**PDH-K:** tinned copper, LSZH sheath

### Application

These indoor telephone cables are used in subscriber and switchboard system.

### Cable construction

- Annealed or tinned solid copper conductor; Ø0,50mm
- Core insulation solid HDPE; acc. to EN 50290 2-23, type 2YI1 acc to DIN VDE 0207
- Core and pair identification acc. to IEC 189 and IEC 708
- Cores twisted as pairs (or stranded as quad), pairs stranded to unit, several units stranded to layers
- Units identified by coloured identification PP tapes
- Insulated drain wire (transparent jacket) with solid copper
- Cores wrapped with polyester tape
- Outer sheath, flame resistant PVC or LSZH compound;

**PVC sheath:** Grey RAL 7035, type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22

**LSZH sheath:** Yellow RAL 1021, Orange RAL 2003, Blue RAL 5015, type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27

### Features

- Vertical flame propagation for PVC and LSZH acc. to DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement only for LSZH acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density only for LSZH acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

### PDV

| Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------|-------------------|-------------------|----------------------|
| 401018   | 1x2x0,50+0,50             | 2,8               | 5                 | 12                   |
| 401019   | 2x2x0,50+0,50             | 3,9               | 9                 | 18                   |
| 401020   | 3x2x0,50+0,50             | 4,1               | 12                | 23                   |
| 401021   | 4x2x0,50+0,50             | 4,7               | 16                | 30                   |
| 401022   | 5x2x0,50+0,50             | 5,1               | 19                | 36                   |
| 401023   | 6x2x0,50+0,50             | 5,7               | 23                | 44                   |
| 401025   | 10x2x0,50+0,50            | 6,7               | 37                | 64                   |
| 401027   | 20x2x0,50+0,50            | 9,2               | 72                | 126                  |
| 401029   | 30x2x0,50+0,50            | 11,0              | 107               | 183                  |
| 401031   | 50x2x0,50+0,50            | 13,6              | 178               | 284                  |
| 401032   | 100x2x0,50+0,50           | 18,7              | 359               | 546                  |

### PDH

| Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------|-------------------|-------------------|----------------------|
| 403018   | 1x2x0,50+0,50             | 2,8               | 5                 | 12                   |
| 403019   | 2x2x0,50+0,50             | 3,9               | 9                 | 18                   |
| 403020   | 3x2x0,50+0,50             | 4,1               | 12                | 23                   |
| 403021   | 4x2x0,50+0,50             | 4,7               | 16                | 30                   |
| 403022   | 5x2x0,50+0,50             | 5,1               | 19                | 36                   |
| 403023   | 6x2x0,50+0,50             | 5,7               | 23                | 44                   |
| 403025   | 10x2x0,50+0,50            | 6,7               | 37                | 64                   |
| 403027   | 20x2x0,50+0,50            | 9,2               | 72                | 126                  |
| 403029   | 30x2x0,50+0,50            | 11,0              | 107               | 183                  |
| 403031   | 50x2x0,50+0,50            | 13,6              | 178               | 284                  |
| 403032   | 100x2x0,50+0,50           | 18,7              | 359               | 546                  |

### PDV-K

| Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------|-------------------|-------------------|----------------------|
| 402018   | 1x2x0,50+0,50             | 2,8               | 5                 | 12                   |
| 402019   | 2x2x0,50+0,50             | 3,9               | 9                 | 18                   |
| 402020   | 3x2x0,50+0,50             | 4,1               | 12                | 23                   |
| 402021   | 4x2x0,50+0,50             | 4,7               | 16                | 30                   |
| 402022   | 5x2x0,50+0,50             | 5,1               | 19                | 36                   |
| 402023   | 6x2x0,50+0,50             | 5,7               | 23                | 44                   |
| 402025   | 10x2x0,50+0,50            | 6,7               | 37                | 64                   |
| 402027   | 20x2x0,50+0,50            | 9,2               | 72                | 126                  |
| 402029   | 30x2x0,50+0,50            | 11,0              | 107               | 183                  |
| 402031   | 50x2x0,50+0,50            | 13,6              | 178               | 284                  |
| 402032   | 100x2x0,50+0,50           | 18,7              | 359               | 546                  |

### PDH-K

| Part No. | No. pairs x diameter [mm] | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------|-------------------|-------------------|----------------------|
| 404018   | 1x2x0,50+0,50             | 2,8               | 5                 | 12                   |
| 404019   | 2x2x0,50+0,50             | 3,9               | 9                 | 18                   |
| 404020   | 3x2x0,50+0,50             | 4,1               | 12                | 23                   |
| 404021   | 4x2x0,50+0,50             | 4,7               | 16                | 30                   |
| 404022   | 5x2x0,50+0,50             | 5,1               | 19                | 36                   |
| 404023   | 6x2x0,50+0,50             | 5,7               | 23                | 44                   |
| 404025   | 10x2x0,50+0,50            | 6,7               | 37                | 64                   |
| 404027   | 20x2x0,50+0,50            | 9,2               | 72                | 126                  |
| 404029   | 30x2x0,50+0,50            | 11,0              | 107               | 183                  |
| 404031   | 50x2x0,50+0,50            | 13,6              | 178               | 284                  |
| 404032   | 100x2x0,50+0,50           | 18,7              | 359               | 546                  |

# RG 59 MiniCoax + 2x0,50+2x0,22mm<sup>2</sup>

CCTV Cable



## Technical information

- Temperature range; -30°C .....+70°C
- Minimum bending radius; 10x cable Ø
- Maximum nominal voltage; 1,1 kV
- Test voltage; 2,5 kV
- Characteristic impedance; 75±3 Ohm
- Capacitance; nom. 55±2 pF/m
- Velocity of propagation; %80
- Attenuation @20°C
 

|        |             |
|--------|-------------|
| 1MHz   | 2,2 dB/100m |
| 5MHz   | 3,2 dB/100m |
| 10MHz  | 4,8 dB/100m |
| 100MHz | 15 dB/100m  |
- Conductor resistance @20°C
 

|                                                     |
|-----------------------------------------------------|
| coaxial, max. 85,0 Ohm/km                           |
| power cores, 0,50mm <sup>2</sup> max. 39,0 Ohm/km   |
| control cores, 0,22mm <sup>2</sup> max. 85,0 Ohm/km |
- Insulation resistance
 

|                                              |
|----------------------------------------------|
| coaxial, min. 2000 M.Ohm x km                |
| power and control cores, min. 200 M.Ohm x km |

## Features

- Vertical flame propagation for PVC and LSZH acc. to DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement only for LSZH acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density only for LSZH acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2



Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

### Coaxial, 0,22mm<sup>2</sup>

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation, physical foam PE; EN 50290 2-23
- Electrostatic screen of plastic coated aluminium foil
- Overall braiding of aluminum wires

### Power cores, 0,50mm<sup>2</sup>

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC or LSZH compound
- Colour coded; red, black

### Control cores, 0,22mm<sup>2</sup>

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC or LSZH compound
- Colour coded; yellow, blue

### Cable

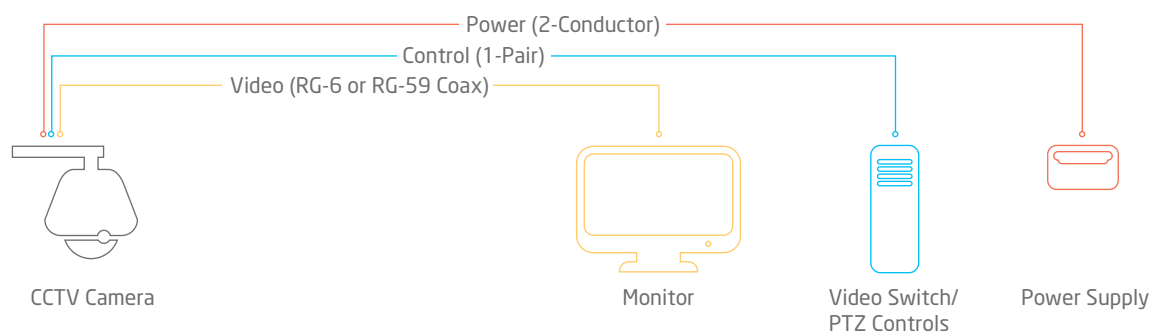
- Cores stranded in layers with optimal lay-length
- Electrostatic screen of plastic coated aluminium foil
- Outer sheath, flame resistant PVC or LSZH compound;

**PVC core:** type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21

**LSZH core:** type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26

**PVC sheath:** Grey RAL 7001, type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22

**LSZH sheath:** Grey RAL 7001, type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27



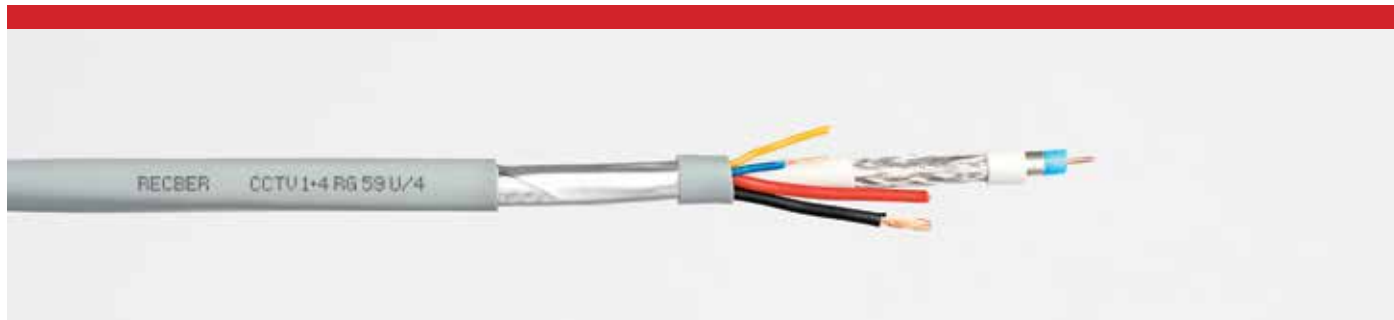
## Application

These composite CCTV/Surveillance cables are used in closed circuit camera applications (for pan/tilt/zoom - PTZ cameras) to transmit video, audio and power signals simultaneously. Thanks to composite construction, these cables let users save from installation time significantly.

| Part No. | Product Name                                                  | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------------------------------------------|-------------------|-------------------|----------------------|
| 306051   | CCTV 1+2 RG 59 MiniCoax + 2x0,22mm <sup>2</sup>               | 5,7               | 6                 | 27                   |
| 306052   | CCTV 1+2 RG 59 MiniCoax + 2x0,50mm <sup>2</sup>               | 6,2               | 10                | 36                   |
| 306053   | CCTV 1+4 RG 59 MiniCoax + 4x0,22mm <sup>2</sup>               | 6,2               | 9                 | 36                   |
| 306054   | CCTV 1+4 RG 59 MiniCoax + 2x0,50+2x0,22mm <sup>2</sup>        | 6,2               | 14                | 42                   |
| 306055   | CCTV 1+12 RG 59 MiniCoax + 12x0,22mm <sup>2</sup>             | 7,6               | 23                | 71                   |
| 306081   | CCTV 1+4 RG 59 MiniCoax + 2x0,50+2x0,22mm <sup>2</sup> - LSZH | 6,2               | 14                | 43                   |

# RG 59 U/4 + 2x0,50+2x0,22mm<sup>2</sup>

CCTV Cable



## Technical information

- Temperature range; -30°C .....+70°C
- Minimum bending radius; 10x cable Ø
- Maximum nominal voltage; 1,1 kV
- Test voltage; 2,5 kV
- Characteristic impedance; 75±3 Ohm
- Capacitance; nom. 55±2 pF/m
- Velocity of propagation; %80
- Attenuation @20°C
  - 1MHz 1,0 dB/100m
  - 5MHz 2,3 dB/100m
  - 10MHz 3,3 dB/100m
  - 100MHz 9,8 dB/100m
- Conductor resistance @20°C
  - coaxial, max. 34,5 Ohm/km
  - power cores, 0,75mm<sup>2</sup> max. 26,0 Ohm/km
  - control cores, 0,22mm<sup>2</sup> max. 85,0 Ohm/km
- Insulation resistance
  - coaxial, min. 2000 M.Ohm x km
  - power and control cores, min. 200 M.Ohm x km

## Features

- Vertical flame propagation for PVC and LSZH acc. to DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement only for LSZH acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density only for LSZH acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2



Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

### Coaxial, RG 59

- Annealed solid copper conductor; Ø0,81mm (AWG 20)
- Core insulation, physical foam PE; EN 50290 2-23
- Electrostatic screen of plastic coated aluminium foil
- Overall braiding of aluminum wires
- Inner sheath, flame resistant PVC or LSZH compound;
- Power cores, 0,75mm<sup>2</sup>**
  - Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
  - Core insulation PVC or LSZH compound
  - Colour coded; red, black
- Control cores, 0,22mm<sup>2</sup>**
  - Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
  - Core insulation PVC or LSZH compound
  - Colour coded; yellow, blue

### Cable

- Cores stranded in layers with optimal lay-length
- Electrostatic screen of plastic coated aluminium foil
- Outer sheath, flame resistant PVC, LSZH or PE compound;

**PVC core:** type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21

**LSZH core:** type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26

**PVC sheath:** Grey RAL 7001, type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22

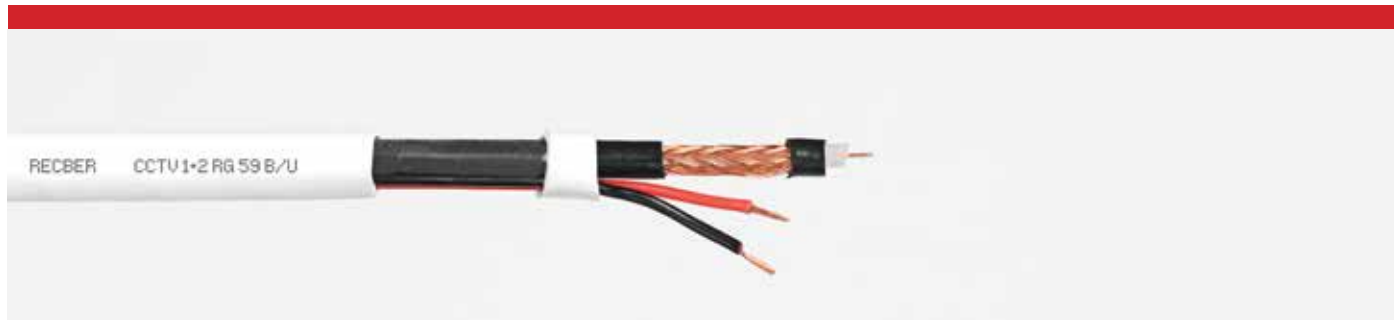
**LSZH sheath:** Grey RAL 7001, type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27

**PE sheath:** Black, type LDPE acc. to EN 50290 2-24

## Application

These composite CCTV/Surveillance cables are used in closed circuit camera applications (for pan/tilt/zoom - PTZ cameras) to transmit video, audio and power signals simultaneously. Thanks to composite construction, these cables let users save from installation time significantly.

| Part No. | Product Name                                             | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|----------------------------------------------------------|-------------------|-------------------|----------------------|
| 306056   | CCTV 1+2 RG 59 U/4 + 2x0,50mm <sup>2</sup>               | 8,6               | 13                | 64                   |
| 306057   | CCTV 1+4 RG 59 U/4 + 2x0,50+2x0,22mm <sup>2</sup>        | 8,6               | 16                | 70                   |
| 306058   | CCTV 1+4 RG 59 U/4 + 2x0,75+2x0,22mm <sup>2</sup>        | 9,2               | 20                | 80                   |
| 306083   | CCTV 1+2 RG 59 U/4 + 2x0,75+2x0,22mm <sup>2</sup> - LSZH | 9,2               | 20                | 82                   |



## Technical information

- Temperature range; -30°C .....+70°C
- Minimum bending radius; 10x cable Ø
- Maximum nominal voltage; 1,1 kV
- Test voltage; 2,5 kV
- Characteristic impedance; 75±3 Ohm
- Capacitance; nom. 67±2 pF/m
- Velocity of propagation; %66
- Attenuation @20°C
 

|        |             |
|--------|-------------|
| 1MHz   | 1,2 dB/100m |
| 5MHz   | 2,5 dB/100m |
| 10MHz  | 3,5 dB/100m |
| 100MHz | 11 dB/100m  |
- Conductor resistance @20°C
 

|                                       |
|---------------------------------------|
| coaxial, max. 68 Ohm/km               |
| power cores, 0,50mm² max. 39,0 Ohm/km |
| power cores, 0,75mm² max. 26,0 Ohm/km |
| power cores, 1,0mm² max. 19,5 Ohm/km  |
- Insulation resistance
 

|                                  |
|----------------------------------|
| coaxial, min. 2000 M.Ohm x km    |
| power cores, min. 200 M.Ohm x km |

## Features

- Vertical flame propagation for PVC acc. to DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

CE Low Voltage Directive 2006/95/EC  
RoHS compliant

## Cable construction

### Coaxial, RG 59 B/U

- Annealed solid copper conductor; Ø0,60mm
- Core insulation, solid PE; EN 50290 2-23
- Overall braiding of copper wires
- Inner sheath, flame resistant PVC
- **Power cores, 0,75mm²**
- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Colour coded; red, black

### Cable

- Power and coaxial cores stranded in layers with optimal lay-length
- Stranded cores wrapped with polyester tape
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Black RAL 9005

## Application

These composite CCTV/Surveillance cables are used in closed circuit camera applications (for pan/tilt/zoom - PTZ cameras) to transmit video, audio and power signals simultaneously. Thanks to composite construction, these cables let users save from installation time significantly.

| Part No. | Product Name                          | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|---------------------------------------|-------------------|-------------------|----------------------|
| 306149   | CCTV 1+2 RG 59 B/U + 2x0,50mm²        | 9,5               | 20                | 89                   |
| 306150   | CCTV 1+2 RG 59 B/U + 2x0,75mm²        | 9,8               | 24                | 96                   |
| 306151   | CCTV 1+2 RG 59 B/U + 2x1,0mm²         | 10,0              | 28                | 102                  |
| 306152   | CCTV 1+2 RG 59 B/U + 2x0,50mm² - Dual | 5,8x11,6          | 20                | 77                   |
| 306153   | CCTV 1+2 RG 59 B/U + 2x0,75mm² - Dual | 5,8x11,6          | 24                | 77                   |
| 306154   | CCTV 1+2 RG 59 B/U + 2x1,0mm² - Dual  | 5,8x11,6          | 28                | 79                   |

# H03VH-H



## Technical information

- Temperature range  
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Nominal voltage; 300/300 V
- Conductor resistance @20°C  
0,50mm<sup>2</sup> max. 39,0 Ohm/km  
0,75mm<sup>2</sup> max. 26,0 Ohm/km  
1,0mm<sup>2</sup> max. 19,5 Ohm/km  
1,5mm<sup>2</sup> max. 13,3 Ohm/km  
2,5mm<sup>2</sup> max. 7,98 Ohm/km
- Insulation resistance @70°C  
0,50mm<sup>2</sup> min. 0,016 M.Ohm x km  
0,75mm<sup>2</sup> min. 0,014 M.Ohm x km  
1,0mm<sup>2</sup> min. 0,012 M.Ohm x km  
1,5mm<sup>2</sup> min. 0,010 M.Ohm x km  
2,5mm<sup>2</sup> min. 0,009 M.Ohm x km

## Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Insulation colour, white, black and transparent

## Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2



Low Voltage Directive 2006/95/EC  
RoHS compliant

## Application

Flexible cable for dry areas, used for connection of small mobile devices, requiring special flexibility in conditions free of any mechanical stresses. Permitted frequent bending, but no twisting. Commonly used as speaker cables (transparent jacketed) and also suitable for radios, desk lamps, electric razors and similar household or office devices, as long as the cable is adapted to essential specifications of the device. Not suitable for cookers and hot devices. Cable ends must be provided with inseparable plugs additionally protected by rubber or thermoplastic insertion.

| Part No. | Product Name                       | Outer Ø app. [mm] | Cu weight [kg/km] | Cable weight [kg/km] |
|----------|------------------------------------|-------------------|-------------------|----------------------|
| 901062   | 2x0,50mm <sup>2</sup> -white       | 2,3x5,2           | 8                 | 19                   |
| 901064   | 2x0,50mm <sup>2</sup> -black       | 2,3x5,2           | 8                 | 19                   |
| 901065   | 2x0,50mm <sup>2</sup> -transparent | 2,3x5,2           | 8                 | 19                   |
| 901066   | 2x0,75mm <sup>2</sup> -white       | 2,6x5,6           | 12                | 26                   |
| 901068   | 2x0,75mm <sup>2</sup> -black       | 2,6x5,6           | 12                | 26                   |
| 901069   | 2x0,75mm <sup>2</sup> -transparent | 2,6x5,6           | 12                | 26                   |
| 901073   | 2x1,0mm <sup>2</sup> -transparent  | 2,8x6,1           | 16                | 30                   |
| 901077   | 2x1,5mm <sup>2</sup> -transparent  | 3,2x6,9           | 24                | 41                   |
| 901078   | 2x2,5mm <sup>2</sup> -transparent  | 3,8x8,2           | 40                | 63                   |

# TECHNICAL INFORMATION

REACH

DIN



# RoHS



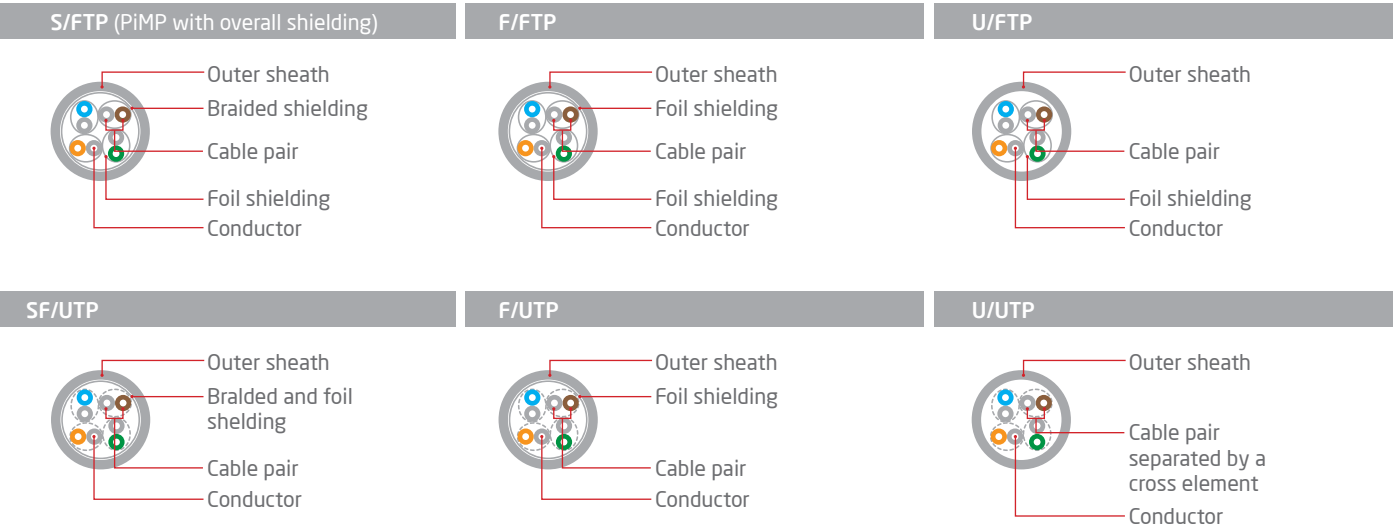
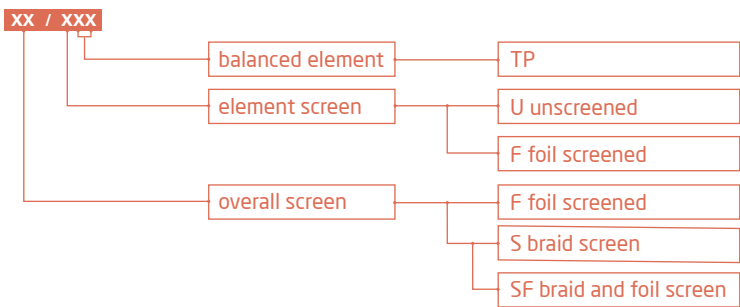
# Technical information

## Cable type

Based on Amendment 1 and 2 to ISO/IEC 11801, 2nd Ed. following classes for balanced cabling are specified:

| Category           | Class                | Bandwidth | Application                                                    |
|--------------------|----------------------|-----------|----------------------------------------------------------------|
| Cat 5 <sub>e</sub> | Class D              | 100 MHz   | 100 MbE 100 Mbit/s (Fast Ethernet) IEEE 802.3 u                |
| Cat 6              | Class E              | 250 MHz   | 1 GbE 1,000 Mbit/s (Gigabit Ethernet) IEEE 802.3 ab            |
| Cat 6 <sub>A</sub> | Class E <sub>A</sub> | 500 MHz   | Up to 10 GbE 10,000 Mbit/s (10 Gigabit Ethernet) IEEE 802.3 an |
| Cat 7              | Class F              | 600 MHz   | 10 GbE 10,000 Mbit/s (10 Gigabit Ethernet) IEEE 802.3 an       |
| Cat 7 <sub>A</sub> | Class F <sub>A</sub> | 1000 MHz  | 10 GbE TV 10,000 Mbit/s (10 Gigabit Ethernet) and TV           |

This standard also defines cable construction types as follows:



## Cable naming

### TP (twisted pair) design

|        |                                                              |
|--------|--------------------------------------------------------------|
| S/FTP  | Overall shielding (copper braiding)/individual shield (foil) |
| F/FTP  | Overall shielding (foil)/individual shielding (foil)         |
| U/FTP  | Unshielded/individual shielding (foil)                       |
| SF/UTP | Overall shielding (copper braiding & foil)/unshielded        |
| F/UTP  | Overall shielding (foil)/unshielded                          |
| U/UTP  | Unshielded/unshielded                                        |

| Pair designation | Color code             | Abbreviation   |
|------------------|------------------------|----------------|
| Pair 1           | White-Blue<br>Blue     | (W-BL)<br>(BL) |
| Pair 2           | White-Orange<br>Orange | (W-O)<br>(O)   |
| Pair 3           | White-Green<br>Green   | (W-G)<br>(G)   |
| Pair 4           | White-Brown<br>Brown   | (W-BR)<br>(BR) |

## Technical terms

**IL (Insertion loss):** The signal loss resulting from the insertion of a component, or link, or channel, between a transmitter and receiver (often referred to as attenuation).

**NEXT (Near-End crosstalk):** An interfering signal, induced by the field produced by a transmitted signal in one twisted pair on to a neighbouring twisted pair. The crosstalk is length-independent and becomes bigger with an increasing frequency. The 568C.2 standard specifies the minimum crosstalk value at various frequencies

**FEXT (Far-End crosstalk):** An interfering signal, referring to crosstalk that is measured at the opposite end of the cable from which it is being disturbed. The crosstalk is length-independent and becomes bigger with an increasing frequency.

**PSNEXT (Power Sum Near-End Crosstalk loss):** A computation of the unwanted signal coupling from multiple transmitters at the near-end into a pair measured at the near-end.

**ACR (Attenuation to Crosstalk Ratio):** A normalization of the NEXT measurement results. It is derived by subtracting the insertion loss of the disturbing pair from the NEXT, that this pair induces in an adjacent pair.

**ACR-F (Attenuation to Crosstalk Ratio-Far):** A normalization of the FEXT measurement results. It is derived by subtracting the insertion loss of the disturbing pair from the FEXT, that this pair induces in an adjacent pair. Also known as ELFEXT.

**PSACR-F (Power Sum Attenuation to Crosstalk Ratio-Far):** A computation, taking into account the combined crosstalk (statistical) on a receive pair from all far-end disturbers operating simultaneously. Also known as PSELFEXT.

**Propagation Delay:** The time due to the transmission medium between when a signal is transmitted and when it is received.

**Delay Skew :** The difference in propagation delay between the fastest and slowest set of wire pairs. An ideal skew is between 25 and 50 nanoseconds over a 100 meter cable. The lower this skew the better, less than 25 ns is excellent, but 45 to 50 ns is marginal.

**Velocity of Propagation:** The transmission speed of electrical energy in a length of cable compared to speed in free space. Usually expressed as a percentage.

**Return Loss:** A ratio expressed in dB of the power of the outgoing signal to the power of the reflected signal.

**Characteristic Impedance:** In a transmission line of infinite length, the ratio of the applied voltage to the resultant current at the point the voltage is applied. Or the impedance which makes a transmission cable seem infinitely long, when connected across the cable's output terminals.

**DC Resistance:** The property of a conductor, wire or shield that determines the current flow for a given applied voltage. DC resistance shall be measured in accordance with ASTM D4566 for all horizontal cable pairs. For all categories of horizontal cable, the resistance of any conductor shall not exceed 9,38  $\Omega$  per 100 m (328 ft) at or corrected to a temperature of 20 °C.

**Mutual Capacitance:** This is the function of the line geometry and the dielectric constant of the insulation. As long as the dielectric constant of the insulation is constant with frequency, the mutual capacitance is almost frequency-independent. The mutual capacitance increases linearly with the cable length.

**Coupling Attenuation:** This is the sum of the unsymmetrical attenuation of cable pairs and the shielding effectiveness/attenuation.

**Transfer Impedance:** The Transfer Impedance is a main parameter for the quality of the screen and is frequency dependent.

The relation is between the voltage drop along the screen on the disturbed lengthways side (outer) to the interfering current on the other side (inside) of the screen. The transfer resistance is determined by the construction of the screen, the skin effect and the capacitive coupling.

**Crosstalk:** The transmitted signal on one circuit or cable pair causes interference in another circuit or cable pair.

# Technical information

## TESTS RELATED TO FLAMMABILITY AND FIRE PROPAGATION

### Vertical flame propagation IEC 60332-1-2 / EN 60332-1-2 / DIN VDE 0482-332-1-2

**Test procedure:** 60 cm long single insulated wire or cable is fixed vertically and flamed with a propane gas burner at an angle of 45° to the vertical.

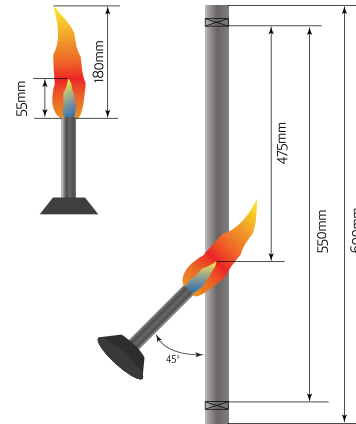
Test apparatus is acc. to IEC / EN 60332-1-1

**Burner/supply arrangement:** Determined acc. to IEC 60695-11-2

#### Test duration:

| Cable diameter              | Duration                |
|-----------------------------|-------------------------|
| $D \leq 25 \text{ mm}$      | $60 \pm 2 \text{ sec}$  |
| $25 < D \leq 50 \text{ mm}$ | $120 \pm 2 \text{ sec}$ |
| $50 < D < 75 \text{ mm}$    | $240 \pm 2 \text{ sec}$ |
| $D > 75 \text{ mm}$         | $480 \pm 2 \text{ sec}$ |

**Compliance condition:** The fire damage must end at least 50 mm below the upper fixing clamp. The cable must be self-extinguishing. In case the flame reaches to the point which is > 540 mm away from below part of upper fixing clamp, then a fault is recorded and two more trials should be performed. Providing that both trials meet the condition, the cable is evaluated as to pass the test.



### Vertical flame spread IEC 60332-3 / EN 60332-3 / DIN VDE 0482-332-3

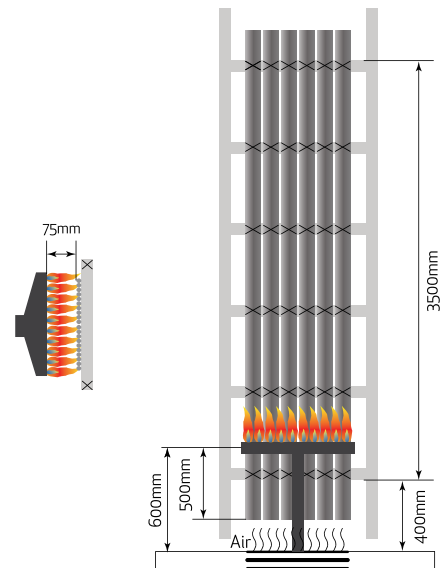
**Test procedure:** Test cables of 360 cm in length are fixed parallel to a test-ladder as one or more layers, distances between cables are determined based on conductor cross-section of tested cables. The flame is applied to the cable bundles.

Test apparatus and burner/supply arrangement acc. to IEC / EN 60332-3-10

#### Test duration:

| Part number | Category                                | Duration |
|-------------|-----------------------------------------|----------|
| Part 21     | CAT A F/R for special applications only | -        |
| Part 22     | CAT A (7L flammable material/m)         | 40 min   |
| Part 23     | CAT B (3,5L flammable material/m)       | 40 min   |
| Part 24     | CAT C (1,5L flammable material/m)       | 20 min   |
| Part 25     | CAT D (0,5L flammable material/m)       | 20 min   |

**Compliance condition:** After the application of flame acc.to above table, flame must be self-extinguishing and fire damage to the cables must not exceed 2,5 m in height from the bottom edge of the burner.



### Circuit integrity (Fire alone) IEC 60331-21 / DIN VDE 0472-814 / IEC 60331-22 (draft) / IEC 60331-23

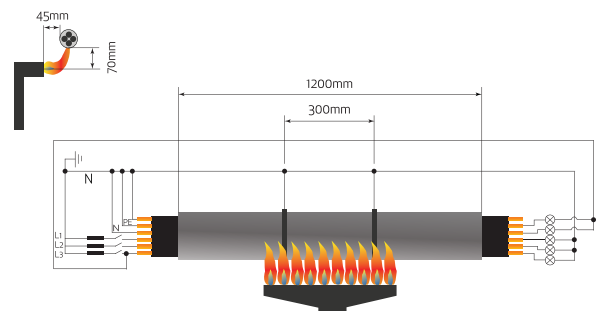
**Test procedure:** Test cable of approximately 1200 mm in length is fixed in a horizontal position, with the core and shield connected to a power supply at the specific voltages. The flame with a temperature of min. 750 °C, is applied under the cable from a horizontally offset position. Related standard has different parts for specific cable types as follows:

#### Test duration:

| Part number     | Related cables                               |
|-----------------|----------------------------------------------|
| Part 21         | power and control cables $\leq 1 \text{ kV}$ |
| Part 22 (draft) | power cables $> 1 \text{ kV}$                |
| Part 23         | electric data cables                         |

Test apparatus and burner/supply arrangement acc. to IEC 60331-11  
Test duration: 180 min (FE180)

**Compliance condition:** After the flame is applied and during a cooling period of an additional 15 minutes, single cable should maintain circuit integrity and it must still be possible to transmit power or signals via all conductors. There must be no short circuit between the conductors or to the shielding and no open phase.



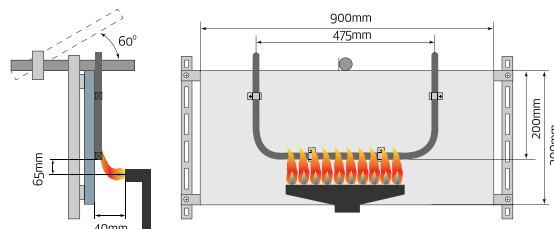
## Circuit integrity (Fire and mechanical shock) EN 50200 / DIN VDE 0482-200

**Test procedure:** Test cable having a max. diameter of 20mm and min. 1200 mm in length is fixed onto a positioning board, with the core and shield connected to a power supply at the specific voltages. The positioning board is subjected to shocks every 5 minutes during the test. The flame with a temperature of min. 842 °C, is applied from the front.

Test apparatus and burner/supply arrangement acc. to EN 50200

**Test duration:** 120 min (PH120)

**Compliance condition:** After the flame is applied, single cable should maintain circuit integrity and it must still be possible to transmit power or signals via all conductors. There must be no short circuit between the conductors or to the shielding and no open phase.



## Smoke density IEC 61034-2 / EN 61034-2 / DIN VDE 0482-1034-2

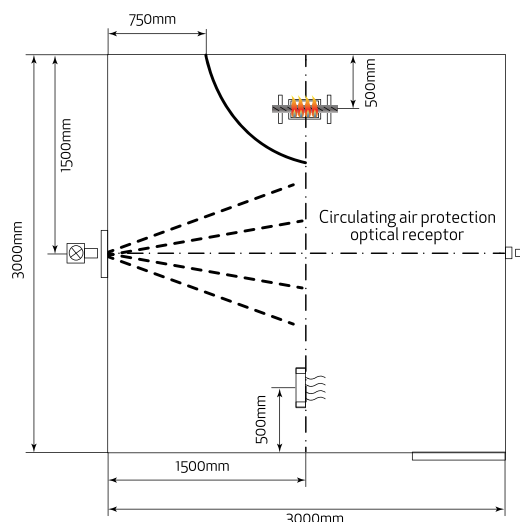
**Test procedure:** Single cable bundle is burnt in a 3 meter cube metal cabinet by 1L ± 0,01 of alcohol mixture, contained in a metal tray. A photometric system, based on a light source and a photocell, is placed horizontally in the mid vertical plane of the cube, at height of 2150mm ± 100mm. The light transmittance in the resulting smoke is measured optically.

| Cable diameter (D) mm | Number of single cables in bundle | Number of bundle |
|-----------------------|-----------------------------------|------------------|
| D > 40                | 1                                 | 1                |
| 20 < D ≤ 40           | 2                                 | 1                |
| 10 < D ≤ 20           | 3                                 | 1                |
| 5 ≤ D ≤ 10            | 45/D                              | 1                |
| 1 < D ≤ 5             | 7                                 | 45/3D            |

Test apparatus and burner/supply arrangement acc. to IEC/EN 61034-1

**Test duration:** 40 min

**Compliance condition:** The test is regarded as passed when the photometrically measured light absorption appears within 40 minutes and minimum 60% light transmission is obtained.



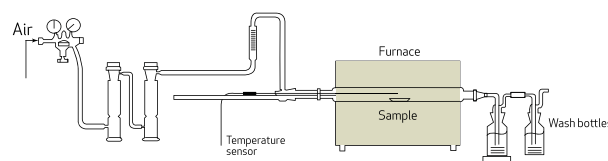
## Determination of the amount of halogen acid gas IEC 60754-1 / EN 50267-2-1 / DIN VDE 0482-267-2-1

**Test procedure:** Test sample should be between 500mg and 1000mg in weight. Sample is heated in a tube. Applied flame temperature is 800±10°C. The resulting gases are dissolved and halogen content is measured.

Test apparatus and burner/supply arrangement acc. to EN 50267-1

**Test duration:** 20 min at 800±10°C

**Compliance condition:** The amount of halogen acid is determined as mg of hydrochloric acid per gramm mass of sample. In the cases that amount of halogen acid is determined as less than 5mg/g or if the tested material is described as "zero halogen", the method specified in IEC 60754-2/EN 50267-2-2 should be used.



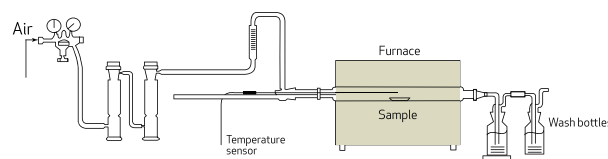
## Determination of degree of acidity of gases for materials by measuring pH and conductivity IEC 60754-2 / EN 50267-2-2 / DIN VDE 0482-267-2-2

**Test procedure:** Test sample should be 1000mg in weight. Sample is heated in a tube. Applied flame temperature is min. 935°C. The resulting gases are dissolved in pure water and pH value and the conductivity are halogen content is measured.

Test apparatus and burner/supply arrangement acc. to EN 50267-1

**Test duration:** 30 min at 935°C

**Compliance condition:** The test is regarded as passed when the measured pH-value is ≥ 4,3 and the electrical conductivity 10 µS/mm.



# Technical information

## Abbreviations acc. to DIN VDE 0812 / 0815

|      |                                              |
|------|----------------------------------------------|
| Li   | stranded wire conductor                      |
| Y    | PVC insulation                               |
| H    | HF insulation                                |
| (St) | electrostatic screen                         |
| C    | tinned copper wire braided screen            |
| Y    | PVC sheath                                   |
| H    | HF sheath                                    |
| Tp   | twisted pair                                 |
| J    | installation cable                           |
| JE   | installation cable for industrial electronic |
| Y    | PVC insulation                               |
| H    | HF insulation                                |
| (St) | electrostatic screen                         |
| Y    | PVC sheath                                   |
| H    | HF sheath                                    |
| Lg   | in layers stranding                          |
| Bd   | in bundle stranding                          |

**FE180** : Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331  
**PH120** : Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

## Colour code according to DIN 47100 with colour repetition as from the 45<sup>th</sup> core

| Core No. | Core colour  | Core No. | Core colour | Core No. | Core colour  | Core No. | Core colour  |
|----------|--------------|----------|-------------|----------|--------------|----------|--------------|
| 1        | white        | 17       | white-grey  | 33       | green-red    | 49       | grey         |
| 2        | brown        | 18       | grey-brown  | 34       | yellow-red   | 50       | pink         |
| 3        | green        | 19       | white-pink  | 35       | green-black  | 51       | blue         |
| 4        | yellow       | 20       | pink-brown  | 36       | yellow-black | 52       | red          |
| 5        | grey         | 21       | white-blue  | 37       | grey-blue    | 53       | black        |
| 6        | pink         | 22       | brown-blue  | 38       | pink-blue    | 54       | violet       |
| 7        | blue         | 23       | white-red   | 39       | grey-red     | 55       | grey-pink    |
| 8        | red          | 24       | brown-red   | 40       | pink-red     | 56       | red-blue     |
| 9        | black        | 25       | white-black | 41       | grey-black   | 57       | white-green  |
| 10       | violet       | 26       | brown-black | 42       | pink-black   | 58       | brown-green  |
| 11       | grey-pink    | 27       | grey-green  | 43       | blue-black   | 59       | white-yellow |
| 12       | red-blue     | 28       | yellow-grey | 44       | red-black    | 60       | yellow-brown |
| 13       | white-green  | 29       | pink-green  | 45       | white        | 61       | white-grey   |
| 14       | brown-green  | 30       | yellow-pink | 46       | brown        |          |              |
| 15       | white-yellow | 31       | green-blue  | 47       | green        |          |              |
| 16       | yellow-brown | 32       | yellow-blue | 48       | yellow       |          |              |

## Colour code according to DIN 47100 (twisted pairs) with colour repetition

| Pair number | Pair colours |             |
|-------------|--------------|-------------|
|             | a-core       | a-core      |
| 1 23 45     | white        | brown       |
| 2 24 46     | green        | yellow      |
| 3 25 47     | grey         | pink        |
| 4 26 48     | blue         | red         |
| 5 27 49     | black        | violet      |
| 6 28 50     | greypink     | redblue     |
| 7 29 51     | whitegreen   | browngreen  |
| 8 30 52     | whiteyellow  | yellowbrown |
| 9 31 53     | whitegrey    | greybrown   |
| 10 32 54    | whitepink    | pinkbrown   |
| 11 33 55    | whiteblue    | brownblue   |
| 12 34 56    | whitered     | brownred    |
| 13 35 57    | whiteblack   | brownblack  |
| 14 36 58    | greycgreen   | yellowgrey  |
| 15 37 59    | pinkgreen    | yellowpink  |
| 16 38 60    | greenblue    | yellowblue  |
| 17 39 61    | greenred     | yellowred   |
| 18 40       | greenblack   | yellowblack |
| 19 41       | greyblue     | pinkblue    |
| 20 42       | greyred      | pinkred     |
| 21 43       | greyblack    | pinkblack   |
| 22 44       | blueblack    | redblack    |

## Copper stranded conductor structure according to DIN VDE 0295 and IEC 60228

Stranded conductor structure according to DIN VDE 0295 has been defined in conformity with IEC 60228 for conductor class 2 column 1, conductor class 5 column 3 and conductor Class 6 Column 4 as from 0,50 mm<sup>2</sup>. The diameters of the individual wires of each conductor must not exceed the maximum value stated for each nominal cross-section, see table below

| Cross section | Multi-wire round-section conductor VDE 0295 class 2 <sup>2)</sup> column 1 | Multi-wire flexible strands Standard Structure column 2 | Fine-wired flexible strands VDE 0295 class 5 <sup>1)</sup> column 3 | Ultra-fine-wired flexible strands       |                    |                                               |                                     |
|---------------|----------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------|--------------------|-----------------------------------------------|-------------------------------------|
|               |                                                                            |                                                         |                                                                     | VDE 0295 class 6 <sup>1)</sup> column 4 | Standard structure |                                               |                                     |
|               |                                                                            |                                                         |                                                                     |                                         | column 5           | column 6                                      | column 7                            |
| -             | -                                                                          | 7x0,08                                                  | -                                                                   | -                                       | -                  | -                                             | -                                   |
| 0,035         | -                                                                          | -                                                       | -                                                                   | -                                       | -                  | 14x0,07                                       | 26x0,05                             |
| 0,05          | -                                                                          | -                                                       | -                                                                   | -                                       | -                  | -                                             | 40x0,05                             |
| 0,08          | -                                                                          | -                                                       | -                                                                   | -                                       | 7x0,124            | 24x0,07*                                      | -                                   |
| 0,09          | -                                                                          | -                                                       | 18x0,10                                                             | 18x0,10                                 | 18x0,10            | 36x0,07                                       | 72x0,05                             |
| 0,14          | -                                                                          | -                                                       | 14x0,15                                                             | 32x0,10                                 | 32x0,10            | 65x0,07                                       | 128x0,05                            |
| 0,25          | -                                                                          | 7x0,25                                                  | 19x0,15                                                             | 42x0,10                                 | 42x0,10            | 88x0,07                                       | 174x0,05                            |
| 0,34          | -                                                                          | 7x0,27                                                  | 12x0,20                                                             | 21x0,15                                 | 48x0,10            | 100x0,07                                      | 194x0,05                            |
| 0,38          | -                                                                          | 7x0,30                                                  | 16x0,20                                                             | 28x0,15                                 | 64x0,10            | 131x0,07                                      | 256x0,05                            |
| 0,50          | 7x0,30                                                                     | 7x0,37                                                  | 24x0,20                                                             | 42x0,15                                 | 96x0,10            | 195x0,07                                      | 384x0,05                            |
| 0,75          | 7x0,37                                                                     | 7x0,43                                                  | 32x0,20                                                             | 56x0,15                                 | 128x0,10           | 260x0,07                                      | 512x0,05                            |
| 1,0           | 7x0,43                                                                     | 7x0,52                                                  | 30x0,25                                                             | 84x0,15                                 | 192x0,10           | 392x0,07                                      | 768x0,05                            |
| 1,5           | 7x0,52                                                                     | 19x0,41                                                 | 50x0,25                                                             | 140x0,15                                | 320x0,10           | 651x0,07                                      | 1280x0,05                           |
| 2,5           | 7x0,67                                                                     | 19x0,52                                                 | 56x0,30                                                             | 224x0,15                                | 512x0,10           | 1040x0,07                                     | -                                   |
| 4             | 7x0,85                                                                     | 19x0,64                                                 | 84x0,30                                                             | 192x0,20                                | 768x0,10           | 1560x0,07                                     | -                                   |
| 6             | 7x1,05                                                                     | 49x0,51                                                 | 80x0,40                                                             | 320x0,20                                | 1280x0,10          | 2600x0,07                                     | -                                   |
| 10            | 7x1,35                                                                     | 49x0,65                                                 | 128x0,40                                                            | 512x0,20                                | 2048x0,10          | 4116x0,07                                     | -                                   |
| 16            | 7x1,70                                                                     | 84x0,62                                                 | 200x0,40                                                            | 800x0,20                                | 3200x0,10          | 6370x0,07                                     | -                                   |
| 25            | 7x2,13                                                                     | 133x0,58                                                | 280x0,40                                                            | 1120x0,20                               | 4410x0,10          | 9100x0,07                                     | -                                   |
| 35            | 7x2,52                                                                     | 133x0,69                                                | 400x0,40                                                            | 705x0,30                                | -                  | Maximum permissible largest individual wire Ø |                                     |
| 50            | 19x1,83                                                                    | 189x0,69                                                | 356x0,50                                                            | 990x0,30                                | -                  |                                               |                                     |
| 70            | 19x2,17                                                                    | 259x0,69                                                | 485x0,50                                                            | 1340x0,30                               | -                  | Nominal wire-Ø                                | Maximum value for individual wire-Ø |
| 95            | 19x2,52                                                                    | 336x0,67                                                | 614x0,50                                                            | 1690x0,30                               | -                  |                                               |                                     |
| 120           | 37x2,03                                                                    | 392x0,69                                                | 765x0,50                                                            | 2123x0,30                               | -                  | 0,20                                          | 0,21                                |
| 150           | 37x2,27                                                                    | 494x0,69                                                | 944x0,50                                                            | 1470x0,40                               | -                  | 0,25                                          | 0,26                                |
| 185           | 37x2,52                                                                    | 627x0,70                                                | 1225x0,50                                                           | 1905x0,40                               | -                  | 0,30                                          | 0,31                                |
| 240           | 61x2,24                                                                    | 790x0,70                                                | 1530x0,50                                                           | 2385x0,40                               | -                  | 0,40                                          | 0,41                                |
| 300           | 61x2,50                                                                    | -                                                       | 2034x0,50                                                           | -                                       | -                  | 0,50                                          | 0,51                                |
| 400           | 61x2,89                                                                    | -                                                       | 1768x0,60                                                           | -                                       | -                  | 0,60                                          | 0,61                                |
| 500           | 61x3,23                                                                    | -                                                       | 2228x0,60                                                           | -                                       | -                  |                                               |                                     |
| 630           | 91x2,97                                                                    | -                                                       | -                                                                   | -                                       | -                  |                                               |                                     |

\*Alternative 19x0,08

### Note:

<sup>1)</sup> DIN VDE 0295, in conformity with IEC 60228, specifies only the maximum individual-wire diameter for Conductor Class 5 and Conductor Class 6. The number of wires is in no case binding.

<sup>2)</sup> For Conductor Class 2, however, the minimum number of individual wires in the round-section conductor and not the individual-wire diameter applies. The required maximum values for conductor resistance in each conductor at 20°C are definitive. The respective nominal cross-section for the specified maximum values must not be exceeded.

Explanatory notes on ultra-fine-wired stranded conductors, Class 6

Column 4 Standard flexible structure as per DIN VDE

Column 5 High flexibility

Column 6 Ultra-high flexibility

Column 7 Extreme flexibility

# Technical information

## AWG wires and stranded conductors

| AWG No. | AWG- structure<br>n x AWG | Cable structure<br>n x wire-Ø<br>mm | Conductor<br>cross-section<br>mm <sup>2</sup> | Outer<br>conductor Ø<br>mm | Conductor<br>resistance<br>Ω/km | Conductor<br>Weight<br>kg/km |
|---------|---------------------------|-------------------------------------|-----------------------------------------------|----------------------------|---------------------------------|------------------------------|
| 36      | solid                     | solid                               | 0,013                                         | 0,127                      | 1460,0                          | 0,116                        |
| 36      | 7/44                      | 7 x 0,05                            | 0,014                                         | 0,152                      | 1271,0                          | 0,125                        |
| 34      | solid                     | solid                               | 0,020                                         | 0,160                      | 918,0                           | 0,178                        |
| 34      | 7/42                      | 7 x 0,064                           | 0,022                                         | 0,192                      | 777,0                           | 0,196                        |
| 32      | solid                     | solid                               | 0,032                                         | 0,203                      | 571,0                           | 0,284                        |
| 32      | 7/40                      | 7 x 0,078                           | 0,034                                         | 0,203                      | 538,0                           | 0,302                        |
| 32      | 19/44                     | 19 x 0,05                           | 0,037                                         | 0,229                      | 448,0                           | 0,329                        |
| 30      | solid                     | solid                               | 0,051                                         | 0,254                      | 365,0                           | 0,45                         |
| 30      | 7/38                      | 7 x 0,102                           | 0,057                                         | 0,305                      | 339,0                           | 0,507                        |
| 30      | 19/42                     | 19 x 0,064                          | 0,061                                         | 0,305                      | 286,7                           | 0,543                        |
| 28      | solid                     | solid                               | 0,080                                         | 0,330                      | 232,0                           | 0,71                         |
| 28      | 7/36                      | 7 x 0,127                           | 0,087                                         | 0,381                      | 213,0                           | 0,774                        |
| 28      | 19/40                     | 19 x 0,078                          | 0,091                                         | 0,406                      | 186,0                           | 0,81                         |
| 27      | 7/35                      | 7 x 0,142                           | 0,111                                         | 0,457                      | 179,0                           | 0,988                        |
| 26      | solid                     | solid                               | 0,128                                         | 0,404                      | 143,0                           | 1,14                         |
| 26      | 10/36                     | 10 x 0,127                          | 0,127                                         | 0,533                      | 137,0                           | 1,13                         |
| 26      | 19/38                     | 19 x 0,102                          | 0,155                                         | 0,508                      | 113,0                           | 1,38                         |
| 26      | 7/34                      | 7 x 0,160                           | 0,141                                         | 0,483                      | 122,0                           | 1,25                         |
| 24      | solid                     | solid                               | 0,205                                         | 0,511                      | 89,4                            | 1,82                         |
| 24      | 7/32                      | 7 x 0,203                           | 0,227                                         | 0,610                      | 76,4                            | 2,02                         |
| 24      | 10/34                     | 10 x 0,160                          | 0,201                                         | 0,582                      | 85,6                            | 1,79                         |
| 24      | 19/36                     | 19 x 0,127                          | 0,241                                         | 0,610                      | 69,2                            | 2,14                         |
| 24      | 41/40                     | 41 x 0,078                          | 0,196                                         | 0,582                      | 84,0                            | 1,74                         |
| 22      | solid                     | solid                               | 0,324                                         | 0,643                      | 55,3                            | 2,88                         |
| 22      | 7/30                      | 7 x 0,254                           | 0,355                                         | 0,762                      | 48,4                            | 3,16                         |
| 22      | 19/34                     | 19 x 0,160                          | 0,382                                         | 0,787                      | 45,1                            | 3,40                         |
| 22      | 26/36                     | 26 x 0,127                          | 0,330                                         | 0,762                      | 52,3                            | 2,94                         |
| 20      | solid                     | solid                               | 0,519                                         | 0,813                      | 34,6                            | 4,61                         |
| 20      | 7/28                      | 7 x 0,320                           | 0,562                                         | 0,965                      | 33,8                            | 5,00                         |
| 20      | 10/30                     | 10 x 0,254                          | 0,507                                         | 0,889                      | 33,9                            | 4,51                         |
| 20      | 19/32                     | 19 x 0,203                          | 0,615                                         | 0,940                      | 28,3                            | 5,47                         |
| 20      | 26/34                     | 26 x 0,160                          | 0,523                                         | 0,914                      | 33,0                            | 4,65                         |
| 20      | 41/36                     | 41 x 0,127                          | 0,520                                         | 0,914                      | 32,9                            | 4,63                         |
| 18      | solid                     | solid                               | 0,823                                         | 1,020                      | 21,8                            | 7,32                         |
| 18      | 7/26                      | 7 x 0,404                           | 0,897                                         | 1,219                      | 19,2                            | 7,98                         |
| 18      | 16/30                     | 16 x 0,254                          | 0,811                                         | 1,194                      | 21,3                            | 7,22                         |
| 18      | 19/30                     | 19 x 0,254                          | 0,963                                         | 1,245                      | 17,9                            | 8,57                         |
| 18      | 41/34                     | 41 x 0,160                          | 0,824                                         | 1,194                      | 20,9                            | 7,33                         |
| 18      | 65/36                     | 65 x 0,127                          | 0,823                                         | 1,194                      | 21,0                            | 7,32                         |
| 16      | solid                     | solid                               | 1,310                                         | 1,290                      | 13,7                            | 11,66                        |
| 16      | 7/24                      | 7 x 0,511                           | 1,440                                         | 1,524                      | 12,0                            | 12,81                        |
| 16      | 65/34                     | 65 x 0,160                          | 1,310                                         | 1,499                      | 13,2                            | 11,65                        |
| 16      | 26/30                     | 26 x 0,254                          | 1,317                                         | 1,499                      | 13,1                            | 11,72                        |
| 16      | 19/29                     | 19 x 0,287                          | 1,229                                         | 1,473                      | 14,0                            | 10,94                        |
| 16      | 105/36                    | 105 x 0,127                         | 1,330                                         | 1,499                      | 13,1                            | 11,84                        |
| 14      | solid                     | solid                               | 2,080                                         | 1,630                      | 8,6                             | 18,51                        |
| 14      | 7/22                      | 7 x 0,643                           | 2,238                                         | 1,854                      | 7,6                             | 19,92                        |
| 14      | 19/27                     | 19 x 0,361                          | 1,945                                         | 1,854                      | 8,9                             | 17,31                        |
| 14      | 41/30                     | 41 x 0,254                          | 2,078                                         | 1,854                      | 8,3                             | 18,49                        |
| 14      | 105/34                    | 105 x 0,160                         | 2,111                                         | 1,854                      | 8,2                             | 18,79                        |

| AWG No. | AWG- structure<br>n x AWG | Cable structure<br>n x wire-Ø<br>mm | Conductor<br>cross-section<br>mm <sup>2</sup> | Outer<br>conductor Ø<br>mm | Conductor<br>resistance<br>Ω/km | Conductor<br>Weight<br>kg/km |
|---------|---------------------------|-------------------------------------|-----------------------------------------------|----------------------------|---------------------------------|------------------------------|
| 12      | solid                     | solid                               | 3,31                                          | 2,05                       | 5,4                             | 29,46                        |
| 12      | 7/20                      | 7 x 0,813                           | 3,63                                          | 2,438                      | 4,8                             | 32,30                        |
| 12      | 19/25                     | 19 x 0,455                          | 3,09                                          | 2,369                      | 5,6                             | 27,50                        |
| 12      | 65/30                     | 65 x 0,254                          | 3,292                                         | 2,413                      | 5,7                             | 29,29                        |
| 12      | 165/34                    | 165 x 0,60                          | 3,316                                         | 2,413                      | 5,2                             | 29,51                        |
| 10      | solid                     | solid                               | 5,26                                          | 2,59                       | 3,4                             | 46,81                        |
| 10      | 37/26                     | 37 x 0,404                          | 4,74                                          | 2,921                      | 3,6                             | 42,18                        |
| 10      | 49/27                     | 49 x 0,363                          | 5,068                                         | 2,946                      | 3,6                             | 45,10                        |
| 10      | 105/30                    | 105 x 0,254                         | 5,317                                         | 2,946                      | 3,2                             | 47,32                        |
| 8       | 49/25                     | 49 x 0,455                          | 7,963                                         | 3,734                      | 2,2                             | 70,87                        |
| 8       | 133/29                    | 133 x 0,287                         | 8,604                                         | 3,734                      | 2,0                             | 76,57                        |
| 8       | 655/36                    | 655 x 0,127                         | 8,297                                         | 3,734                      | 2,0                             | 73,84                        |
| 4       | 133/25                    | 133 x 0,455                         | 21,625                                        | 5,898                      | 0,80                            | 192,46                       |
| 4       | 259/27                    | 259 x 0,363                         | 26,804                                        | 5,898                      | 0,66                            | 238,55                       |
| 4       | 1666/36                   | 1666 x 0,127                        | 21,104                                        | 5,898                      | 0,82                            | 187,82                       |
| 2       | 133/23                    | 133 x 0,574                         | 34,416                                        | 7,417                      | 0,50                            | 306,30                       |
| 2       | 259/26                    | 259 x 0,404                         | 33,201                                        | 7,417                      | 0,52                            | 295,49                       |
| 2       | 665/30                    | 665 x 0,254                         | 33,696                                        | 7,417                      | 0,52                            | 299,89                       |
| 2       | 2646/36                   | 2646 x 0,127                        | 33,518                                        | 7,417                      | 0,52                            | 298,31                       |
| 1       | 133/22                    | 133 x 0,643                         | 43,187                                        | 8,331                      | 0,40                            | 384,37                       |
| 1       | 259/2                     | 259 x 0,455                         | 42,112                                        | 8,331                      | 0,41                            | 374,80                       |
| 1       | 817/30                    | 817 x 0,254                         | 41,397                                        | 8,331                      | 0,42                            | 368,43                       |
| 1       | 2109/34                   | 2109 x 0,160                        | 42,403                                        | 8,331                      | 0,41                            | 377,39                       |
| 1/0     | 133/21                    | 133 x 0,724                         | 54,75                                         | 9,347                      | 0,31                            | 487,28                       |
| 1/0     | 259/24                    | 259 x 0,511                         | 53,116                                        | 9,347                      | 0,32                            | 472,73                       |
| 2/0     | 133/20                    | 133 x 0,813                         | 69,043                                        | 10,516                     | 0,25                            | 614,48                       |
| 2/0     | 259/23                    | 259 x 0,574                         | 67,021                                        | 10,516                     | 0,25                            | 596,49                       |
| 3/0     | 259/22                    | 259 x 0,643                         | 84,102                                        | 11,786                     | 0,20                            | 748,51                       |
| 3/0     | 427/24                    | 427 x 0,511                         | 87,570                                        | 11,786                     | 0,20                            | 779,37                       |
| 4/0     | 259/21                    | 259 x 0,724                         | 106,626                                       | 13,259                     | 0,16                            | 948,97                       |
| 4/0     | 427/23                    | 427 x 0,574                         | 110,494                                       | 13,259                     | 0,15                            | 983,39                       |

#### AWG wires (solid conductors)

| AWG No. | wire-Ø<br>mm | AWG No. | wire-Ø<br>mm | AWG No. | wire-Ø<br>mm |
|---------|--------------|---------|--------------|---------|--------------|
| 44      | 0,050        | 26      | 0,404        | 10      | 2,588        |
| 41      | 0,070        | 25      | 0,455        | 9       | 2,906        |
| 40      | 0,079        | 24      | 0,511        | 8       | 3,268        |
| 39      | 0,089        | 23      | 0,574        | 7       | 3,665        |
| 38      | 0,102        | 22      | 0,643        | 6       | 4,115        |
| 37      | 0,114        | 21      | 0,724        | 5       | 4,620        |
| 36      | 0,127        | 20      | 0,813        | 4       | 5,189        |
| 35      | 0,142        | 19      | 0,912        | 3       | 5,827        |
| 34      | 0,160        | 18      | 1,024        | 2       | 6,543        |
| 33      | 0,180        | 17      | 1,151        | 1       | 7,348        |
| 32      | 0,203        | 16      | 1,290        | 1/0     | 8,252        |
| 31      | 0,226        | 15      | 1,450        | 2/0     | 9,266        |
| 30      | 0,254        | 14      | 1,628        | 3/0     | 10,404       |
| 29      | 0,287        | 13      | 1,829        | 4/0     | 11,684       |
| 28      | 0,320        | 12      | 2,052        |         |              |
| 27      | 0,363        | 11      | 2,304        |         |              |

# Technical information

## Conductor resistance data according to VDE 0295 and IEC 60228

| Conductor dimensions                  | High-voltage cables            |                            |                            |                            |                            |                 | Welding cable              |                                |
|---------------------------------------|--------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|-----------------|----------------------------|--------------------------------|
|                                       | Cu conductors                  |                            |                            |                            | Al conductors              |                 | Cu conductors              |                                |
|                                       | consisting of tin-plated wires |                            | consisting of bright wires |                            | consisting of bright wires |                 | consisting of bright wires | consisting of tin-plated wires |
| Nominal cross-section mm <sup>2</sup> | Class 1<br>Class 2<br>Ω/km     | Class 5<br>Class 6<br>Ω/km | Class 1<br>Class 2<br>Ω/km | Class 5<br>Class 6<br>Ω/km | Class 1<br>Ω/km            | Class 2<br>Ω/km | Ω/km                       | Ω/km                           |
| 0,05                                  | -                              | ~380,0                     | -                          | ~360,0                     | -                          | -               | -                          | -                              |
| 0,08                                  | -                              | ~240,0                     | -                          | ~230,0                     | -                          | -               | -                          | -                              |
| 0,09                                  | -                              | ~230,0                     | -                          | ~215,0                     | -                          | -               | -                          | -                              |
| 0,14                                  | -                              | ~140,0                     | -                          | ~138,0                     | -                          | -               | -                          | -                              |
| 0,22                                  | -                              | ~96,8                      | -                          | ~95,0                      | -                          | -               | -                          | -                              |
| 0,25                                  | -                              | ~79,3                      | -                          | ~77,8                      | -                          | -               | -                          | -                              |
| 0,34                                  | -                              | ~57,1                      | -                          | ~56,0                      | -                          | -               | -                          | -                              |
| 0,50                                  | 36,7                           | 40,1                       | 36,0                       | 39,0                       | -                          | -               | -                          | -                              |
| 0,75                                  | 24,8                           | 26,7                       | 24,5                       | 26,0                       | -                          | -               | -                          | -                              |
| 1,0                                   | 18,2                           | 20,0                       | 18,1                       | 19,5                       | -                          | -               | -                          | -                              |
| 1,5                                   | 12,2                           | 13,7                       | 12,1                       | 13,3                       | -                          | -               | -                          | -                              |
| 2,5                                   | 7,56                           | 8,21                       | 7,41                       | 7,98                       | -                          | -               | -                          | -                              |
| 4,0                                   | 4,70                           | 5,09                       | 4,61                       | 4,95                       | -                          | -               | -                          | -                              |
| 6,0                                   | 3,11                           | 3,39                       | 3,08                       | 3,30                       | -                          | -               | -                          | -                              |
| 10                                    | 1,84                           | 1,95                       | 1,83                       | 1,91                       | -                          | -               | -                          | -                              |
| 16                                    | 1,16                           | 1,24                       | 1,15                       | 1,21                       | -                          | 1,912)          | 1,16                       | 1,19                           |
| 25                                    | 0,734                          | 0,795                      | 0,7271)                    | 0,780                      | 1,20                       | 1,20            | 0,758                      | 0,780                          |
| 35                                    | 0,529                          | 0,565                      | 0,5241)                    | 0,554                      | 0,868                      | 0,868           | 0,536                      | 0,552                          |
| 50                                    | 0,391                          | 0,393                      | 0,3871)                    | 0,386                      | 0,641                      | 0,641           | 0,379                      | 0,390                          |
| 70                                    | 0,270                          | 0,277                      | 0,2681)                    | 0,272                      | 0,443                      | 0,443           | 0,268                      | 0,276                          |
| 95                                    | 0,195                          | 0,210                      | 0,1931)                    | 0,206                      | 0,320                      | 0,320           | 0,198                      | 0,204                          |
| 120                                   | 0,154                          | 0,164                      | 0,1531)                    | 0,161                      | 0,253                      | 0,253           | 0,155                      | 0,159                          |
| 150                                   | 0,126                          | 0,132                      | 0,1241)                    | 0,129                      | 0,206                      | 0,206           | 0,125                      | 0,129                          |
| 185                                   | 0,100                          | 0,108                      | 0,0991                     | 0,106                      | 0,164                      | 0,164           | 0,102                      | 0,105                          |
| 240                                   | 0,0762                         | 0,0817                     | 0,0754                     | 0,0801                     | 0,125                      | 0,125           | -                          | -                              |
| 300                                   | 0,0607                         | 0,0654                     | 0,0601                     | 0,0641                     | 0,100                      | 0,100           | -                          | -                              |
| 400                                   | 0,0475                         | 0,0495                     | 0,0470                     | 0,0486                     | -                          | 0,0778          | -                          | -                              |
| 500                                   | 0,0369                         | 0,0391                     | 0,0366                     | 0,0384                     | -                          | 0,0605          | -                          | -                              |
| 630                                   | 0,0286                         | 0,0292                     | 0,0283                     | 0,0287                     | -                          | 0,0469          | -                          | -                              |

<sup>1)</sup> applies to mineral insulated Class 1 cables

<sup>2)</sup> applies only to conductors with reduced cross-section for NAYCWY 4 x 25/16

### Explanatory notes

Class 1 - for single-wire conductors

Class 2 - for multi-wire conductors

Class 5 - for fine-wired conductors

Class 6 - for ultra-fine-wired conductors

## ROHS DIRECTIVE 2002/95/EC

EU legislation restricting the use of hazardous substances in electrical and electronic equipment (RoHS Directive 2002/95/EC) and promoting the collection and recycling of such equipment (WEEE Directive 2002/96/EC) has been in force since February 2003.

## REACH REGULATION (EC) No 1907/2006

The Registration, Evaluation, Authorisation of Chemicals (REACH) is a European Union Regulation of December 2006 which was seven years in the making and has been called the EU's most complex piece of legislation

**Polyvinylchloride (PVC):** A general purpose thermoplastic used for wire and cable insulation and jackets. PVC is a synthetic material containing halogen (unlike Polyethylene). Halogens (salt creators) are chlorine, bromine, fluorine, iodine and astat. PVC jacketed cables are flame-retardant. Synthetic materials containing halogen, form highly-poisonous gases in case of fire. When mixed with water these gases form harmful corrosive acids.

**Polyethylene (PE):** A polyolefin thermoplastic material having excellent electrical properties. PE is a halogen-free synthetic material that burns easily. By adding additives, PE can be made flame retardant and get low smoke characteristics.

**Halogen free coating material (HF):** A halogen is a salt creator. Chlorine, bromine, fluorine and astat are listed in the periodic table of elements. Cables with a PVC (polyvinyl chloride) sheath are flame retardant. Halogen-free sheath materials don't contain any halogens. Therefore no corrosive gases are emitted from the cable in the event of a fire, the smoke emission is reduced to a minimum level and fire propagation is avoided. There are several identifications used for HF materials in the market:

### HF, FR, NC, LS and OH or ZH

**HF** : Halogen Free  
**FR** : Flame Retardant  
**NC** : Non Corrosive  
**LS** : Low Smoke  
**OH or ZH** : Zero Halogen

## Halogen-free Security Cables and Wires Application

The application of halogen-free security cables and wires are specified more and more with increasing numbers for the buildings where people gather or everywhere, where safety consciousness to protect the human life and valuable materials take a special significance. For example,

- Hospitals, airports, in multi-storey buildings, stores and shops, hotels, theaters, cinemas, schools etc.
- Fire warning plants, alarm systems, ventilation systems, escalators, lifts, safety lights, operation and intensive stations, maintenance equipment
- Underground railways and other railway plants
- Data processing installations
- Power stations and industrial plants with high valuable machines and materials or risky potentials
- Mining works
- Shipbuilding and offshore plants
- Emergency power supply works