

Data sheet

chainflex® CF898

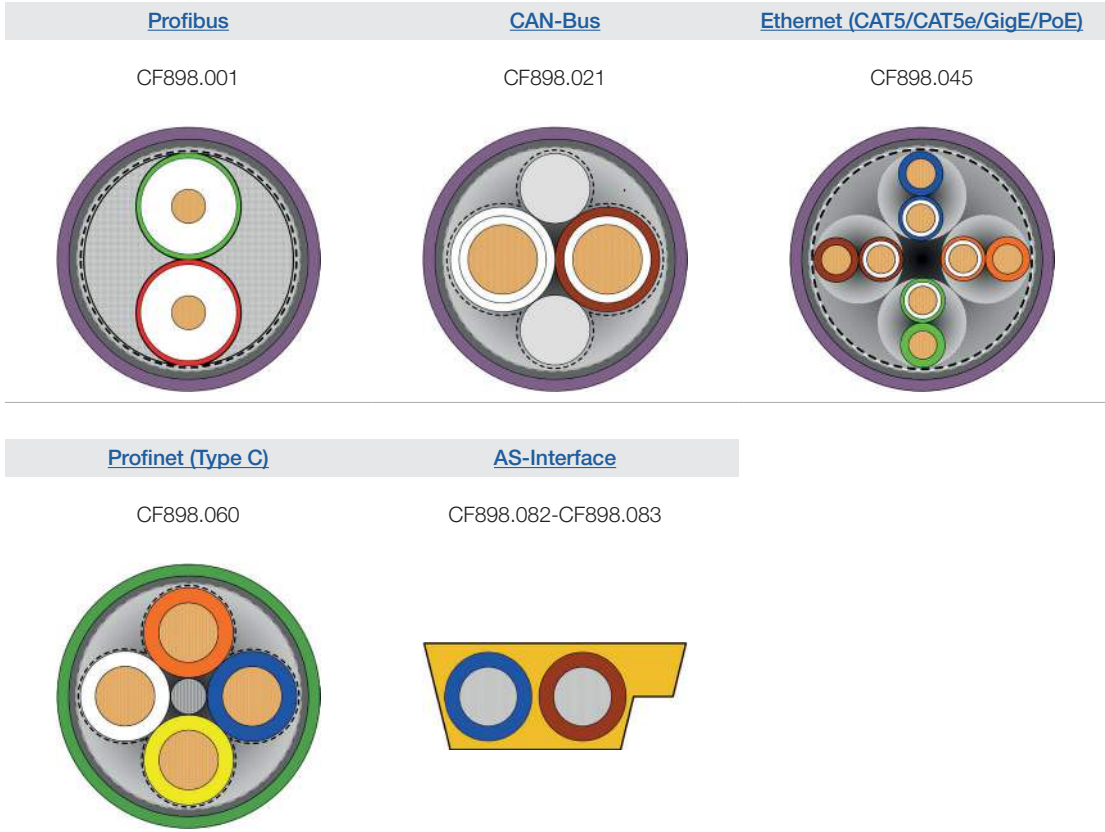


Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant
● Shielded ● Flame retardant



Example image

igus® chainflex® CF898.045



Guarantee
igus chainflex
36
month guarantee

igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year

CFRIP

UL US LISTED

UL US

NFPA

CECPA

DNVGL

EAC

REACH

RoHS

Clean-room

DESINA

CE

Data sheet







chainflex® CF898



Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant



Cable structure

-  **Conductor** Conductor consisting of bare copper wires (according to DIN EN 60228).
-  **Core insulation** According to bus specification.
-  **Core structure** According to bus specification.
-  **Core identification** According to bus specification.
▶ Product range table
-  **Overall shield** Braiding made of tinned copper wires.
Coverage approx. 60 % optical
-  **Outer jacket** Low-adhesion iguPUR mixture, adapted to suit the requirements in e-chains®.
Colour: Red lilac (similar to RAL 4001), Variants ▶ Product range table
Printing: black

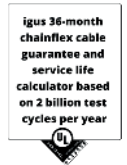
„00000 m** igus chainflex M CF898.---① ---② ---③ EAC/CTP CE ---④
 ---⑤ conform RoHS-II conform
 www.igus.de +++ chainflex cable works +++

* **Length printing:** Not calibrated. Only intended as an orientation aid.
 ① / ② Cable identification according to Part No. (see technical table).
 ③ Printing of the UL style (see related chapter).
 ④ Printing: DESINA (only if DESINA is fulfilled).
 ⑤ Printing according to bus specification (inclusive wave resistance).
 Example: ... chainflex **CF898.001 (2x0.25)C** ...

Guaranteed service life according to guarantee conditions

| Double strokes | 1 million | 3 million | 5 million |
|---------------------------|---------------------|---------------------|---------------------|
| Temperature, from/to [°C] | R min. [factor x d] | R min. [factor x d] | R min. [factor x d] |
| -20/-10 | 17.5 | 18.5 | 19.5 |
| -10/+60 | 15 | 16 | 17 |
| +60/+70 | 17.5 | 18.5 | 19.5 |

Minimum guaranteed service life of the cable under the specified conditions.
 The installation of the cable is recommended within the middle temperature range.



Example image

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Example image

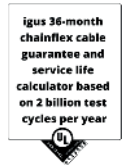
Properties and approvals

-  **UV resistance** Medium
-  **Oil resistance** Oil-resistant (following DIN EN 50363-10-2), Class 3
-  **Flame retardant** **CF898.001-CF898.060:** According to IEC 60332-1-2, FT1, VW-1
CF898.082-CF898.083: According to IEC 60332-1-2, FT2
-  **Silicone-free** Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
-  **UL verified** Certificate No. B129699: „igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year“
-  **UL/CSA AWM** See table UL/CSA AWM for details
-  **NFPA** **CF898.001-CF898.060:** Following NFPA 79-2018, chapter 12.9
-  **EAC** Certificate No. RU C-DE.ME77.B.00295/19 (TR ZU)
-  **REACH** In accordance with regulation (EC) No. 1907/2006 (REACH)
-  **Lead-free** Following 2011/65/EC (RoHS-II/RoHS-III)
-  **CE** Following 2014/35/EU

Properties and approvals

UL/CSA AWM Details

| Part No. | UL style core insulation | UL style outer jacket | UL Voltage Rating | UL Temperature Rating |
|-----------|--------------------------|-----------------------|-------------------|-----------------------|
| | | | [V] | [°C] |
| CF898.001 | 1589 | 20236 | 30 | 80 |
| CF898.021 | 10578 | 21161 | 300 | 80 |
| CF898.045 | 11602 | 21161 | 300 | 80 |
| CF898.060 | 11602 | 21161 | 300 | 80 |
| CF898.082 | - | 21866 | 90 | 80 |
| CF898.083 | - | 21866 | 90 | 80 |



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chainflex® CF898








Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant



Example image

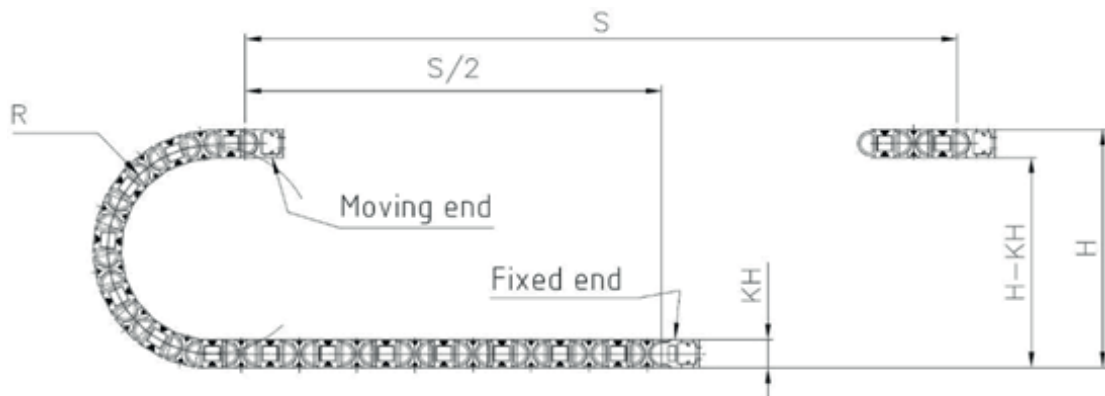
Dynamic information

| | | | |
|---|------------------------|---|---|
|  | Bend radius | e-chain® linear flexible fixed | min. 15 x d min. 12 x d min. 8 x d |
|  | Temperature | e-chain® linear flexible fixed | -20 °C up to +70 °C -40 °C up to +70 °C (following DIN EN 60811-504) -50 °C up to +70 °C (following DIN EN 50305) |
|  | v max. | unsupported | 3 m/s |
|  | a max. | | 20 m/s ² |
|  | Travel distance | | Unsupported travel distances up to 10 m, Class 1 |

These values are based on specific applications or tests. They do not represent the limit of what is technically feasible.

Typical lab test setup for this cable series

| | |
|------------------------------------|--------------------------------------|
| Test bend radius R | approx. 75 - 100 mm |
| Test travel S/S₂ | approx. 1 - 15 m |
| Test duration | minimum 2 - 4 million double strokes |
| Test speed | approx. 0,5 - 2 m / s |
| Test acceleration | approx. 0.5 - 1.5 m / s ² |



Typical application areas

- For flexing applications, Class 3
- Especially for unsupported travels, Class 1
- With influence of oil, Class 3
- No torsion, Class 1
- Indoor and outdoor applications without direct solar radiation
- Machining units/machine tools, low temperature applications



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Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant
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Technical tables:

Mechanical information

| Part No. | Number of cores and conductor nominal cross section [mm²] | Outer diameter (d) max. [mm] | Copper index [kg/km] | Weight [kg/km] |
|-------------------------------|---|------------------------------|----------------------|----------------|
| Profibus (1x2x0,64 mm) | | | | |
| CF898.001 | (2x0.25)C | 8.0 | 18 | 56 |
| CAN-Bus | | | | |
| CF898.021 | (2x0.5)C | 8.5 | 24 | 80 |
| Ethernet/CAT5e | | | | |
| CF898.045 | (4x(2x0.14))C | 7.0 | 25 | 54 |
| Profinet | | | | |
| CF898.060 ¹³⁾ |  (4x0.34)C | 7.0 | 25 | 58 |
| ASI BUS (flat cables) | | | | |
| CF898.082 ¹⁴⁾ | 2x2.5 | | 50 | 82 |
| CF898.083 ¹⁵⁾ | 2x2.5 | | 50 | 79 |

¹³⁾ Colour outer jacket: Yellow-green (RAL 6018)

¹⁴⁾ Colour outer jacket: Yellow (RAL 1021)

¹⁵⁾ Colour outer jacket: Jet black (RAL 9005)

G = with green-yellow earth core

x = without earth core

Note: The given outer diameters are maximum values and may tend toward lower tolerance limits.



igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year



Example image



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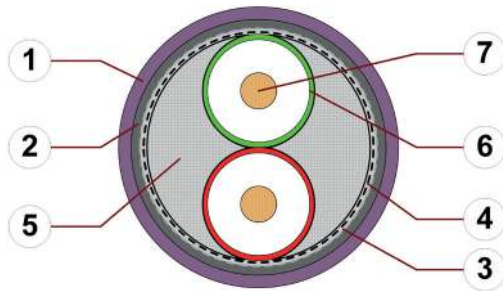


Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant

Profibus
CF898.001

Cable structure

(Electrical information please see next page)



1. Outer jacket: Pressure extruded iguPUR mixture
2. Overall shield: Braiding made of tinned copper wires
3. Shield foil: Aluminium clad plastic foil
4. Banding: Plastic foil
5. Filler: Plastic yarns
6. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
7. Conductor: Stranded conductor consisting of bare copper wires

Example image

For detailed overview please see design table

Design table

| Part No. | Core group | Colour code | Drawing |
|-----------|------------|-------------|---------|
| CF898.001 | 2x0.25 | red, green | |



Example image



Data sheet

chainflex® CF898



Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant



Example image

Profibus
CF898.001

Electrical information

(Cable structure please see previous page)

| | |
|---|-----------------------------|
| Part No. | CF898.001 |
| Nominal voltage | 50 V 30 V (following UL) |
| Testing voltage (following DIN EN 50289-1-3) | 500 V |
| Characteristic wave impedance (following DIN EN 50289-1-11) | 150 ± 15 Ω (at 3-16 MHz) |

Line attenuation approx. [dB/100m]

| Part No. | 0.01 MHz | 0.04 MHz | 4 MHz | 16 MHz |
|-----------|-------------|-------------|----------|-----------|
| CF898.001 | 0.3 | 0.4 | 2.5 | 5.2 |

| Conductor nominal cross section | Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2) | Maximum current rating at 30 °C (following DIN VDE 0298-4) |
|---------------------------------|---|---|
| [mm ²] | [Ω/km] | [A] |
| 0.25 | 88 | 5 |

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.



Data sheet

chainflex® CF898

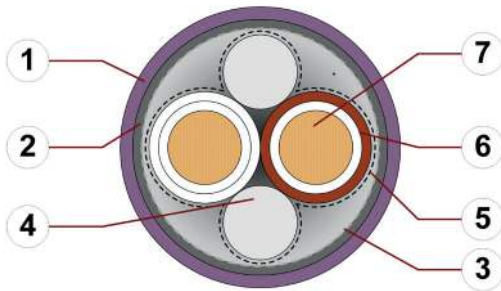


Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant

CAN-Bus
CF898.021

Cable structure

(Electrical information please see next page)



1. Outer jacket: Pressure extruded iguPUR mixture
2. Overall shield: Braiding made of tinned copper wires
3. Shield foil: Aluminium clad plastic foil
4. Filler: Plastic dummy
5. Banding: Plastic foil
6. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
7. Conductor: Stranded conductor consisting of bare copper wires

Example image

For detailed overview please see design table

Design table

| Part No. | Core group | Colour code | Drawing |
|-----------|------------|--------------|---------|
| CF898.021 | 2x0.5 | white, brown | |



Example image



igus® chainflex® CF898.045

Data sheet

chainflex® CF898



Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant



Example image

CAN-Bus
CF898.021

Electrical information

(Cable structure please see previous page)

| | |
|---|------------------------------|
| Part No. | CF898.021 |
| Nominal voltage | 50 V 300 V (following UL) |
| Testing voltage (following DIN EN 50289-1-3) | 500 V |
| Characteristic wave impedance (following DIN EN 50289-1-11) | 120 ± 12 Ω (at 1 MHz) |

| Conductor nominal cross section | Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2) | Maximum current rating at 30 °C (following DIN VDE 0298-4) |
|---------------------------------|---|---|
| [mm ²] | [Ω/km] | [A] |
| 0.5 | 39 | 10 |

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.



Data sheet

chainflex® CF898



Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant

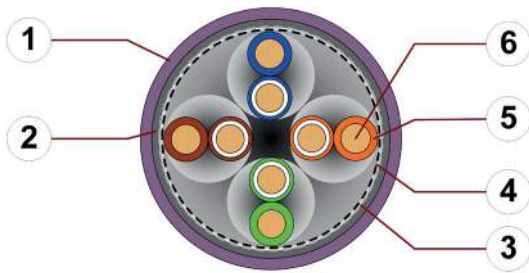


Example image

Ethernet (CAT5/CAT5e/GigE/PoE) CF898.045

Cable structure

(Electrical information please see next page)



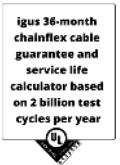
1. Outer jacket: Pressure extruded iguPUR mixture
2. Overall shield: Braiding made of tinned copper wires
3. Shield foil: Aluminium clad plastic foil
4. Banding: Plastic foil
5. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
6. Conductor: Stranded conductor consisting of bare copper wires

Example image

For detailed overview please see design table

Design table

| Part No. | Core group | Colour code | Drawing |
|-----------|------------|--|---------|
| CF898.045 | 4x(2x0.14) | white-blue/blue, white-orange/orange, white-green/green, white-brown/brown | |



Data sheet

chainflex® CF898



Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant
● Shielded ● Flame retardant



Example image

Ethernet (CAT5/CAT5e/GigE/PoE)

CF898.045

Electrical information

(Cable structure please see previous page)

| | |
|--|------------------------------|
| Part No. | CF898.045 |
| Nominal voltage | 50 V 300 V (following UL) |
| Testing voltage (following DIN EN 50289-1-3) | 500 V |
| Characteristic wave impedance (following DIN EN 50289-1-11) | 100 ± 25 Ω |
| Operating capacity | 47 pF/m |
| Nominal Velocity of Propagation (NVP) | 67 % |

Line attenuation approx. [dB/100m]

| Part No. | 1 MHz | 4 MHz | 10 MHz | 16 MHz | 20 MHz | 31.25 MHz | 62.5 MHz | 100 MHz |
|-----------|-------|-------|--------|--------|--------|-----------|----------|---------|
| CF898.045 | 3.2 | 6.0 | 9.5 | 12.1 | 13.6 | 17.1 | 14.8 | 32.0 |

| Conductor nominal cross section | Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2) | Maximum current rating at 30 °C (following DIN VDE 0298-4) |
|---------------------------------|---|---|
| [mm ²] | [Ω/km] | [A] |
| 0.14 | 145 | 2.5 |

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.



Data sheet

chainflex® CF898



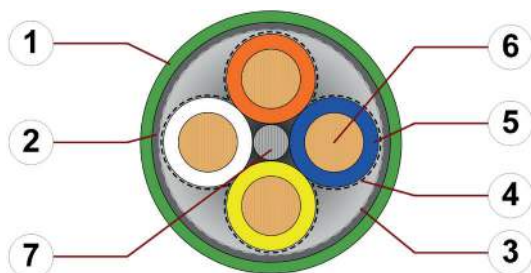
Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant

Profinet (Type C)

CF898.060

Cable structure

(Electrical information please see next page)



1. Outer jacket: Pressure extruded iguPUR mixture
2. Overall shield: Braiding made of tinned copper wires
3. Shield foil: Aluminium clad plastic foil
4. Banding: Plastic foil
5. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
6. Conductor: Stranded conductor consisting of bare copper wires
7. Filler: Plastic yarns

Example image

For detailed overview please see design table

Design table

| Part No. | Core group | Colour code | Drawing |
|-----------|------------|---|---------|
| CF898.060 | 4x0.34 | white, orange, blue, yellow (Star-quad) | |



Example image



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Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant
● Shielded ● Flame retardant



Example image

igus® chainflex® CF898.060

Profinet (Type C)

CF898.060

Electrical information

(Cable structure please see previous page)

| | |
|--|------------------------------|
| Part No. | CF898.060 |
| Nominal voltage | 50 V 300 V (following UL) |
| Testing voltage (following DIN EN 50289-1-3) | 500 V |
| Characteristic wave impedance (following DIN EN 50289-1-11) | 100 ± 15 Ω |
| Operating capacity | 53 pF/m |
| Nominal Velocity of Propagation (NVP) | 67 % |

Line attenuation approx. [dB/100m]

| Part No. | 1 MHz | 4 MHz | 10 MHz | 16 MHz | 20 MHz | 31.25 MHz | 62.5 MHz | 100 MHz |
|-----------|-------|-------|--------|--------|--------|-----------|----------|---------|
| CF898.060 | 3.2 | 6.0 | 9.5 | 12.1 | 13.6 | 17.1 | 14.8 | 32.0 |

| Conductor nominal cross section | Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2) | Maximum current rating at 30 °C (following DIN VDE 0298-4) |
|---------------------------------|---|---|
| [mm ²] | [Ω/km] | [A] |
| 0.34 | 59 | 7 |

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.



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chainflex® CF898



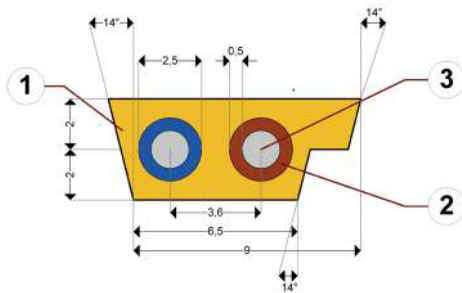
Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant

AS-Interface

CF898.082-CF898.083

Cable structure

(Electrical information please see next page)



1. Outer jacket: Pressure extruded PUR mixture
2. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
3. Conductor: Fine-wire strand made of tinned copper wires

Example image

For detailed overview please see design table

Design table

| Part No. | Core group | Colour code | Drawing |
|-----------|------------|-------------|---------|
| CF898.082 | 2x2.5 | blue, brown | |
| CF898.083 | 2x2.5 | blue, brown | |



Example image

Data sheet

chainflex® CF898



Bus cable (Class 3.1.3.1) ● For flexing applications ● iguPUR outer jacket ● Oil-resistant ● Shielded ● Flame retardant



Example image

AS-Interface

CF898.082-CF898.083

Electrical information

(Cable structure please see previous page)

| Part No. | CF898.082 | CF898.083 |
|--|-----------------------------------|-----------|
| Nominal voltage | 50 V 90 V (in Anlehnung an UL) | |
| Testing voltage (following DIN EN 50289-1-3) | 500 V | |
| Characteristic wave impedance (following DIN EN 50289-1-11) | 100 ± 15 Ω | |
| Operating capacity | <75 pF/m | |

| Conductor nominal cross section | Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2) | Maximum current rating at 30 °C (following DIN VDE 0298-4) |
|---------------------------------|---|---|
| [mm ²] | [Ω/km] | [A] |
| 2.5 | 9.0 | 30 |

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.

