FLAT FESTOON CABLE · PORT CRANES | 0.6/1 kV | PUR low-temp | Article FC-FS20-003

# NGFLGÖU 10G4 0.6/1 kV

Flat Festoon Cable for Port Cranes 0.6/1 kV – 10-core flat festoon cable, halogen-free low-temperature PUR sheath. Complete technical data sheet of this single model: cross-section drawing, dimensions, weight, current ratings, reel design data, standards and ordering information.

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## 01 Application and Product Overview

**NGFLGÖU 10G4** is a low-temperature PUR-sheathed flat festoon cable with 10 cores of 4 mm² rated 0.6/1 kV for festoon systems of port cranes and stackers. The cores lie parallel in one plane inside a flat sheath measuring 43.4 × 6.5 mm, weighing about 570 kg/km, with a current of 25 A per core at 30 °C and a minimum bending radius of 52 mm.

### Typical applications

- Power and control supply of trolleys, hoists and travelling crane equipment suspended in festoon systems
- Port cranes, stackers and warehouse cranes with long travel distances
- Parallel cores in one plane reduce twisting and let the cable hang in regular loops on festoon trolleys
- Indoor and covered outdoor use; the sheath resists oil, abrasion and weather

### Design

10 cores of equal cross-section lie side by side in one plane inside a flat sheath. The green-yellow protective core is placed at the edge. The flat shape lets the cable hang in uniform loops from festoon trolleys and keeps twisting low. Bend the cable only flat-wise, about an axis parallel to the cable width; edge-wise bending is not permitted.

| 43.4 × 6.5 mm | 570 kg/km | 25 A | 52 mm |
|---|---|---|---|
| Flat cable, width × height | Approx. weight | Rated current per core, 30 °C | Min. bending radius |

### Key features

- Cores lie parallel in one plane for orderly hanging on festoon trolleys
- Fine-wire class 5 copper conductors for repeated bending
- Green-yellow protective core at the edge of the flat cable
- Halogen-free insulation and sheaths; no halogen acid gases when burned (IEC 60754-1/-2)
- Flexible in motion down to −40 °C (fixed installation −50 °C)
- Flame retardant to IEC 60332-1-2

### Type designation

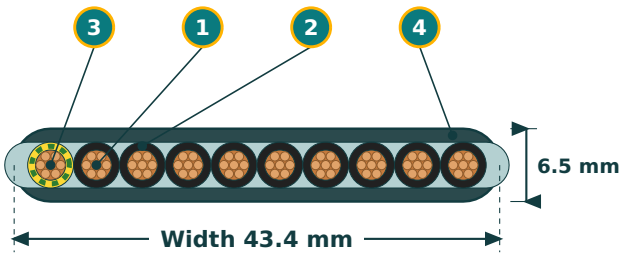
NGFLGÖU (also typed NGFLGOEU) is the German VDE-style type designation used in the trade for flat, oil-resistant, rubber-sheathed cables for festoon systems. The designation identifies the cable class and is used so that engineers can find and compare the product. Construction, dimensions and data in this datasheet are FeiChun's own. This model is the low-temperature PUR-sheathed version of the construction.

## 02 Construction

**FEICHUN · CROSS-SECTION A–A · 0.6/1 kV**

**NGFLGÖU 10G4**

Article FC-FS20-003 · Rev 0 · Illustrative, not to scale




| No. | Component | Material |
|---|---|---|
| 1 | Conductor | Bare annealed fine-wire copper, class 5 to IEC 60228 |
| 2 | Insulation | Halogen-free cross-linked polyethylene (XLPE) |
| 3 | Protective (PE) core | Class 5 copper, green-yellow insulation, same cross-section as the power cores |
| 4 | Outer sheath | Halogen-free polyurethane (PUR), flame-retardant, low-temperature grade |

**Figure 1.** Cross-section of NGFLGÖU 10G4 0.6/1 kV. The drawing is generated from the geometry of this exact size; elements are shown to scale relative to each other and do not overlap.

### Construction details

| | |
|---|---|
| **Conductor** | Bare annealed fine-wire copper, class 5 to DIN EN 60228 / IEC 60228 / VDE 0295 |
| **Insulation** | Halogen-free cross-linked polyethylene (XLPE) to IEC 60502-1, maximum conductor temperature 90 °C |
| **Core identification** | Green-yellow core at the edge; remaining cores black with white numbers |
| **Core arrangement** | Cores lie parallel in one plane and are enclosed by a common flat outer sheath |
| **Outer sheath** | Halogen-free polyurethane (PUR), flame-retardant, low-temperature grade |

### Sheath material

The low-temperature grade of halogen-free polyurethane (PUR) keeps the sheath flexible down to −40 °C in motion (−50 °C fixed), so the cable can be reeled in winter service without sheath cracking. It retains the abrasion, cut and tear resistance of standard PUR, resists mineral oil, UV radiation and ozone, and emits no halogen acid gases when burned. Typical use: terminals in northern climates and cold-storage yards.

## 03 Electrical, Thermal and Mechanical Characteristics

### Electrical data

| | |
|---|---|
| **Rated voltage $U_0/U$** | 0.6/1 kV AC |
| **Test voltage** | 3.5 kV AC, 5 min |
| **Maximum operating voltage, DC** | 0.9/1.8 kV |
| **Current-carrying capacity** | To DIN VDE 0298-4 at 30 °C ambient; the table gives rated design values |
| **Conductor resistance** | Maximum at 20 °C, class 5 to IEC 60228 |

### Thermal and mechanical data

| | |
|---|---|
| **Maximum conductor temperature** | +90 °C |
| **Maximum temperature at short circuit** | +250 °C |
| **Ambient temperature, fixed installation** | −50 °C to +80 °C |
| **Ambient temperature, in motion** | −40 °C to +80 °C |
| **Minimum bending radius** | 5 × H fixed; 8 × H in festoon operation (H = cable thickness) |
| **Maximum tensile load** | 15 N/mm² continuous, on the total copper cross-section of the power cores |
| **Flame propagation** | IEC 60332-1-2 / DIN EN 60332-1-2 |
| **Halogen-free** | Yes (insulation, inner and outer sheath); IEC 60754-1/-2 |
| **UV and ozone resistance** | Resistant |
| **Mineral oil resistance** | Resistant, IEC 60811-404 |

### Sheath material comparison

| Property | PUR | PUR low-temp | CSP rubber | CPE rubber |
|---|---|---|---|---|
| **Abrasion resistance** | Excellent | **Excellent** | Good | Good |
| **Cut and tear resistance** | Excellent | **Excellent** | Good | Good |
| **Mineral oil resistance** | Very good | **Very good** | Very good | Very good |
| **Weather, UV and ozone resistance** | Very good | **Very good** | Excellent | Very good |
| **Cold flexibility (moving)** | −30 °C | **−40 °C** | −30 °C | −30 °C |
| **Halogen-free (IEC 60754-1/-2)** | Yes | **Yes** | No | No |

The column of the sheath used in this cable is highlighted. Ratings are qualitative; ask FeiChun for test data on a specific requirement.

## 04 Technical Data of NGFLGÖU 10G4 0.6/1 kV

| | | | |
|---|---|---|---|
| **Type designation** | **NGFLGÖU 10G4** | **FeiChun article no.** | FC-FS20-003 |
| **Cores** | 10 × 4 mm² (incl. green-yellow PE core) | **Rated voltage $U_0/U$** | 0.6/1 kV AC |
| **Test voltage** | 3.5 kV AC, 5 min | **Conductor** | Class 5 fine-wire copper, Ø max 2.7 mm |
| **Insulation** | XLPE, 0.7 mm nominal | **Outer sheath** | PUR low-temp, ≈ 1.2 mm nominal |
| **Width × height** | 43.4 × 6.5 mm | **Weight, approx.** | 570 kg/km |
| **Copper weight** | 356 kg/km | **$R_{20}$ max** | 4.95 Ω/km |
| **$R_{90}$ (calculated)** | 6.31 Ω/km | **Rated current per core** | 25 A (free air, 30 °C) |
| **$I_k$ (1 s, 90 → 250 °C)** | 0.572 kA | **Min. bending radius, festoon** | 52 mm (8 × H) |
| **Max. pull force** | 600 N | **Flame propagation** | IEC 60332-1-2 |

Diameters, dimensions and weights are nominal design values and vary within manufacturing tolerances; confirm critical dimensions before dimensioning reels, guides or festoon systems. Current ratings are design values to DIN VDE 0298-4 for flexible cables in free air at 30 °C ambient; values per core include the derating factor for the number of cores. Pull force = 15 N/mm² × total copper cross-section of the power cores. Other sizes and configurations are produced to order.

### Calculated electrical data

| Quantity | Value | Basis |
|---|---|---|
| **Conductor resistance at 90 °C** | 6.31 Ω/km | $R_{90} = R_{20} \times (1 + 0.00393 \times 70)$ |
| **Voltage drop per core at rated current** | 15.78 V per 100 m | Single conductor, conductor at 90 °C |
| **Conductor loss at rated current** | 35.5 W/m | All 9 load-carrying cores at 90 °C |
| **Length for 3 % drop, 24 V DC** | 2 m | Out-and-back loop of two cores at rated current |
| **Length for 3 % drop, 230 V AC** | 21 m | Out-and-back loop of two cores at rated current |

### Current-carrying capacity by ambient temperature

| Ambient °C | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|
| **Current per core, A** | 27 | 26 | 25 | 24 | 23 | 22 | 20 |

Permissible current = table current × ambient temperature factor (conductor 90 °C). Factors: 20 °C: 1.08, 25 °C: 1.04, 30 °C: 1.00, 35 °C: 0.96, 40 °C: 0.91, 45 °C: 0.87, 50 °C: 0.82.

### Short-circuit current rating of the power cores

| Duration t (s) | 0.1 | 0.2 | 0.5 | 1 | 2 | 3 | 5 |
|---|---|---|---|---|---|---|---|
| $I_k$ (kA) | 1.81 | 1.28 | 0.809 | 0.572 | 0.404 | 0.330 | 0.256 |

$I_k$ = 0.143 kA/mm² × 4 mm² for 1 s (conductor 90 °C → 250 °C); for another duration t: $I_{k,t} = I_{k,1s} / \sqrt{t}$ (0.1 s ≤ t ≤ 5 s).

## 05 Festoon Installation Data

The flat construction of NGFLGÖU 10G4 lets the cable hang in regular loops from festoon trolleys. The minimum festoon loop diameter is 104 mm (twice the minimum bending radius of 52 mm).

| Cable length | Cable weight kg | Min. festoon loop Ø mm (2 × bending radius) |
|---|---|---|
| 10 m | 6 | 104 |
| 25 m | 14 | 104 |
| 50 m | 28 | 104 |
| 100 m | 57 | 104 |

### Installation guidance

- Hang the cable on festoon trolleys or rollers; the spacing between trolleys must not exceed half of the loop length.
- Keep the bending radius at or above 8 × H (cable thickness); bend only flat-wise and do not twist the cable about its axis.
- Do not pull the cable by its conductors; use cable clamps that grip the sheath.
- Connect the green-yellow protective core before connecting the other cores.

## 06 Sizes in this Series and Selection Aid

NGFLGÖU 0.6/1 kV low-temp PUR is offered in 6 sizes from 1.5 to 16 mm². Each size has its own datasheet; the size of this document is highlighted. The next smaller or larger size can be opened directly from the table.

| Type designation | Article no. | Width × height mm | Weight kg/km | Current A | Bend radius mm |
|---|---|---|---|---|---|
| 10G1.5 | FC-FS20-001 | 32.8 × 5.4 | 285 | 14 | 43 |
| 10G2.5 | FC-FS20-002 | 37.7 × 5.9 | 400 | 19 | 47 |
| **10G4** | **FC-FS20-003** | **43.4 × 6.5** | **570** | **25** | **52** |
| 10G6 | FC-FS20-004 | 49.5 × 7.2 | 790 | 32 | 57 |
| 10G10 | FC-FS20-005 | 57.3 × 8.0 | 1,200 | 44 | 64 |
| 10G16 | FC-FS20-006 | 68.3 × 9.2 | 1,810 | 59 | 74 |

**Example.** At 40 °C ambient each core of NGFLGÖU 10G4 may carry 25 × 0.91 = 23 A. A 50 m cable weighs about 28 kg.

## 07 Standards and Testing

| Standard | Scope |
|---|---|
| **DIN EN 60228 / IEC 60228 / VDE 0295** | Conductors, class 5 |
| **IEC 60502-1** | Insulation compound, power cables up to 1 kV |
| **DIN VDE 0298-3** | Application of cables – bending radii and tensile loads |
| **DIN VDE 0298-4** | Application of cables – current-carrying capacity |
| **DIN EN 60332-1-2 / IEC 60332-1-2** | Flame propagation, single cable |
| **DIN VDE 0298-300** | Core identification |
| **IEC 60754-1 / -2** | Halogen acid gas emission when burned |
| **IEC 60811-404** | Mineral oil immersion test |
| **DIN VDE 0292** | Type designation of cables (designation practice) |

### Routine and type tests

- AC voltage test on every reel length (routine test): 3.5 kV AC, 5 min
- Conductor resistance and checks of dimensions, insulation thickness and sheath thickness
- Continuity of conductors and protective earth
- Bending, tensile tests (type test)
- Flame propagation (IEC 60332-1-2) and confirmation of halogen-free materials

**Test documentation:** every delivery is accompanied by a test certificate from FeiChun's own laboratory. Third-party witnessed tests can be arranged at the buyer's cost.

## 08 Installation, Marking, Delivery and Ordering

### Installation guidance

- Hang the cable on festoon trolleys or rollers; the spacing between trolleys must not exceed half of the loop length.
- Keep the bending radius at or above 8 × H (cable thickness); bend only flat-wise and do not twist the cable about its axis.
- Do not pull the cable by its conductors; use cable clamps that grip the sheath.
- Connect the green-yellow protective core before connecting the other cores.

### Sheath marking

FEICHUN NGFLGÖU 10G4 0.6/1 kV PUR low-temp [year] [serial no.] [metre mark]

### Packing and delivery

| | |
|---|---|
| **Reel** | Steel or fumigated wooden reels; cable ends sealed with heat-shrink caps |
| **Delivery length** | As ordered, in one continuous length without joints |
| **Lead time** | 2–3 weeks after technical approval |
| **Warranty** | At least 3 years against manufacturing defects |
| **Reel label** | Type, cross-section, length, gross/net weight, batch no., reel no. |

### Ordering information

| Field | Example | Meaning |
|---|---|---|
| **Type designation** | NGFLGÖU | Cable type as used in the trade |
| **Core configuration** | 10G4 | Number of cores with G (protective core included) and core cross-section in mm² |
| **Rated voltage** | 0.6/1 kV | $U_0$/U, AC |
| **Sheath** | low-temp PUR | Halogen-free polyurethane (PUR), flame-retardant, low-temperature grade |
| **Length and packing** | 500 m, steel reel | Delivery length in one piece; reel type on request |
| **FeiChun article no.** | FC-FS20-003 | Quote this number in enquiries and orders |

**Order example: NGFLGÖU 10G4 0.6/1 kV PUR low-temp** – 500 m on one steel reel (FeiChun article FC-FS20-003). When requesting a quotation, state the cable type, configuration, cross-section, voltage, length per piece, required standards and installation conditions.

## 09 Certification and Quality

All cable is subject to FeiChun's quality control, with routine testing over 100 % of the delivered length. Certificates, type tests and third-party tests (for example partial discharge or compatibility with cable accessories) are provided per project requirement; copies of the records are available on request.

The CE, EAC and UKCA certificates issued for the D2X11Y base type (LVD 2014/35/EU, TR CU 004/2011, UKCA) apply to that product group. Confirm with FeiChun that the certificate scope covers this construction before quoting it in a tender.

## 10 Related Datasheets and FAQ

Cables of the same class with a different sheath, configuration or voltage and the closest cross-section. All datasheets are PDF files.

- NGFLGÖU 8G4 0.6/1 kV low-temp PUR – 8-core flat festoon cable
- NGFLGÖU 12G4 0.6/1 kV low-temp PUR – 12-core flat festoon cable
- NGFLGÖU 7G4 0.6/1 kV low-temp PUR – 7-core flat festoon cable
- NGFLGÖU 10G4 0.6/1 kV PUR – 10-core flat festoon cable
- NGFLGÖU 10G4 0.6/1 kV CSP rubber – 10-core flat festoon cable
- NGFLGÖU 10G4 0.6/1 kV CPE rubber – 10-core flat festoon cable

Overview of all datasheets in this family: Flat Festoon Cables 0.6/1 kV

### Frequently asked questions

**What is NGFLGÖU 10G4 used for?**
NGFLGÖU 10G4 is intended for power and control supply of trolleys, hoists and travelling crane equipment suspended in festoon systems.

**What are the dimensions and weight of NGFLGÖU 10G4 0.6/1 kV?**
The overall size (width × height) is 43.4 × 6.5 mm and the weight is about 570 kg/km, of which copper is 356 kg/km. These are nominal design values and vary within manufacturing tolerances.

**What is the minimum bending radius of NGFLGÖU 10G4?**
The minimum bending radius in festoon operation is 52 mm (8 × H).

**What current can each core of NGFLGÖU 10G4 carry?**
25 A per core in free air at 30 °C ambient, already reduced for the number of loaded cores. Apply the ambient temperature factor from the table in section 04.

**Is NGFLGÖU 10G4 halogen-free?**
Yes. Insulation and sheaths are halogen-free (IEC 60754-1/-2) and the cable is flame retardant to IEC 60332-1-2.

**Which other sizes of this type are available?**
NGFLGÖU 0.6/1 kV low-temp PUR is offered in 1.5, 2.5, 4, 6, 10, 16 mm². Each size has its own datasheet, linked in section 06.

## 11 Notices and Intellectual Property

NGFLGÖU is a type designation used in the cable trade to name a class of cable; it is used here for identification and comparison only. The designation does not imply approval of the product by a third party unless a certificate is named in section 09.

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