HARMONISED FLEXIBLE CABLE 450/750 V · DIN VDE 0282 / EN 50525 | 450/750 V | 2 sizes | PUR, low-temp | TINNED COPPER | LOW-TEMPERATURE GRADE

H07BQ-F 12G 450/750 V

PUR-Sheathed Flexible Cable 450/750 V 450/750 V – 12 cores of equal cross-section in concentric layers with a short lay length. Low-temperature polyurethane sheath. Complete technical data sheet: construction, dimensions, weights, current ratings, voltage drop and installation guidance for 2 sizes.

Document no. FC-TDS-VDE-2026-0883-EN · Revision 0 · Issued 2 November 2026 · Language: English

01 Application and Product Overview

H07BQ-F is the harmonised PUR-sheathed flexible cable for 450/750 V. EPR-insulated fine-wire cores are enclosed in an orange polyurethane sheath that is far more resistant to cuts, abrasion and oil than a rubber sheath. The cable is halogen-free and is used for tools, drives and machines in workshops, on building sites and in industry.

Design

The conductors are class 5 fine-wire copper, bare or tinned. The insulation is EPR (type 3GI3) rated for 90 °C at the conductor. The outer sheath is polyurethane of type TMPU (EN 50363-10-2), extruded tightly over the stranded cores. The bright orange sheath makes the cable easy to see on a site.

Typical applications

- Hand-held tools, drills and saws on building sites
- Machine connections in workshops, with oil and coolant exposure
- Cleaning, spray and wash-down equipment
- Garden, agricultural and forestry machinery
- Mobile compressors and generators
- Extension cables and cable reels for site distribution
- Production lines with abrasive floors
- Cold-climate duty: sites, cold stores and open-cast operations where the cable is moved at temperatures down to 40 °C

2 sizes	450/750 V	+90 °C	Halogen-free
Cross-section 1.5 – 2.5 mm²	Rated voltage U_0/U	Maximum conductor temperature	Sheath: PUR, low-temp

Key features

- Orange PUR sheath: high resistance to cuts, abrasion, tear and oil
- Halogen-free; hydrolysis- and microbe-resistant
- EPR insulation rated 90 °C at the conductor
- Rated voltage 450/750 V, test voltage 2.5 kV
- Flexible use from −30 °C to +80 °C, fixed use from −40 °C to +90 °C
- Bending radius 5 × D flexing, 3 × D fixed
- 2 sizes from 1.5 to 2.5 mm²; weight from 490 to 700 kg/km; copper from 173 to 288 kg/km

Core layout and conductor

12 cores of equal cross-section in concentric layers with a short lay length. Core colours: black with white numbers; one green-yellow core (DIN VDE 0293-308); the green-yellow core is the protective conductor. With 12 cores the cable combines power, brake, heater and signal circuits in one connection. The conductors are tinned: each copper wire carries a thin tin coating. Tinning protects the copper against oxidation and corrosion in damp, salty or sulphurous atmospheres and keeps the conductor solderable, which is an advantage in outdoor, marine and mining installations. The resistance limits of tinned class 5 conductors are marginally higher than for bare copper; the R_{20} column shows the tinned values.

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Standard background

H05BQ-F and H07BQ-F are harmonised types covered by DIN VDE 0282-10 (HD 22.10) and now by DIN EN 50525-2-21. The cable replaced the former VDE type NGMH11YÖ. H07 identifies the 450/750 V rating, B the EPR insulation, Q the polyurethane sheath and F the flexible conductor.

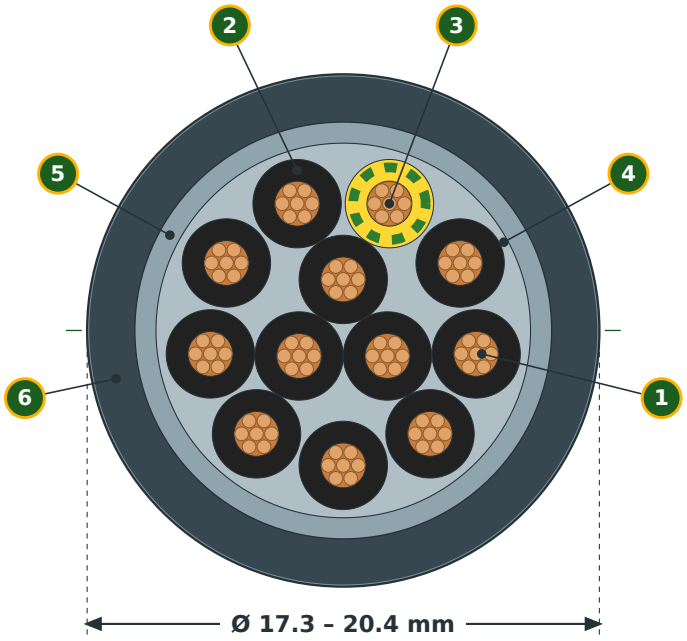
The low-temperature grade of the sheath compound remains flexible down to 40 °C in motion and 50 °C in fixed installation, so the cable can be reeled and trailed on cold sites, in cold stores and in northern open-cast operations. The mechanical and electrical ratings are those of the standard grade; only the cold-flexing limit is extended.

450/750 V is the common rating for industrial and building-site distribution on 400 V systems and allows a margin for DC and rectified supplies. The test voltage is 2.5 kV.

02 Construction

FEICHUN · CROSS-SECTION A–A · 450/750 V

H07BQ-F
Sample size 12G1.5 · Rev 0 · Illustrative, not to scale



No.	Component	Material
1	Conductor	Tinned annealed fine-wire copper, class 5 to IEC 60228 / DIN VDE 0295
2	Insulation	EPR rubber, type 3GI3 (90 °C)
3	Protective (PE) core	Green-yellow insulation, same cross-section as the power cores
4	Filler and binder tape	Halogen-free filler with polyester binder tape
5	Inner sheath	Halogen-free compound, extruded over the stranded core
6	Outer sheath	Polyurethane (PUR), low-temperature grade

The drawing shows size 12G1.5. Other sizes have the same construction with scaled dimensions; the layout of every size is checked for non-overlap of all elements.

Construction details

Conductor	Tinned annealed fine-wire copper, class 5 to DIN VDE 0295 / IEC 60228
Insulation	EPR rubber, type 3GI3 (90 °C), maximum conductor temperature 90 °C
Core identification	Black with white numbers; one green-yellow core to DIN VDE 0293-308
Stranding	Cores in concentric layers with a short lay length
Inner sheath	Halogen-free compound; thickness about 0.8 mm at this size
Outer sheath	Polyurethane (PUR), low-temperature grade; thickness about 1.8 mm at this size

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03 Electrical, Thermal and Mechanical Characteristics

Electrical data

Rated voltage U_0/U	450/750 V AC
Test voltage	2.5 kV AC, 5 min
Maximum operating voltage, three-phase	825 V
Maximum operating voltage, DC (core-earth / core-core)	0.45/0.75 kV (DC 0.675/1.1 kV)
Current-carrying capacity	Design values by the method of DIN VDE 0298-4, free air, 30 °C ambient
Conductor resistance	Maximum at 20 °C, class 5, tinned

Thermal and mechanical data

Maximum conductor temperature	+90 °C
Maximum temperature at short circuit	+250 °C (5 s maximum)
Ambient temperature, fixed installation	−50 °C to +90 °C
Ambient temperature, in motion	−40 °C to +90 °C
Minimum bending radius	Fixed: 3 × D (D ≤ 12 mm), 4 × D (D > 12 mm); moving: 3 × D (D ≤ 8 mm), 4 × D (D ≤ 12 mm), 5 × D (D > 12 mm) (DIN VDE 0298-3)
Maximum tensile load	15 N/mm² continuous on the total copper cross-section
Flame propagation	IEC 60332-1-2 / DIN EN 60332-1-2
Halogen-free	Yes (insulation and sheath), IEC 60754-1/-2
Mineral oil resistance	Resistant, DIN EN 60811-404
UV and ozone resistance	Resistant
Water	Damp and wet areas, spray water

04 Dimensions, Weights and Rated Data – 450/750 V (2 sizes)

Type designation cores × mm²	FeiChun article no.	Cond. Ø max mm	Outer Ø min mm	Outer Ø max mm	Bend radius fixed mm	Bend radius moving mm	Weight approx. kg/km	Copper kg/km	Max. pull N	R_{20} max Ω/km	Rated current A	I_k (1 s) kA
12G1.5	FC-H07B-0883-01	1.7	17.3	20.4	82	102	490	173	270	13.7	12	0.214
12G2.5	FC-H07B-0883-02	2.2	20.6	23.9	96	120	700	288	450	8.21	16	0.357

Current-carrying capacity: design values by the method of DIN VDE 0298-4, free air, 30 °C ambient; for other ambient temperatures use the factors below and the multi-core reduction factor already included in the table. Copper weight = 9.6 kg/(km·mm²) of copper cross-section (VDE copper index). Pull force = 15 N/mm² × total copper cross-section of the power cores. Diameters, dimensions and weights are nominal design values calibrated to published type tables; they vary within manufacturing tolerances. Confirm critical dimensions before dimensioning reels, glands or festoon systems. Other sizes and configurations are produced to order.

Ambient temperature factors (conductor 90 °C)

°C	20	25	30	35	40	45	50	55	60
Factor	1.08	1.04	1.00	0.96	0.91	0.87	0.82	0.76	0.71

Short-circuit current rating

I_k = 0.143 kA/mm² × cross-section of the power core (conductor 90 °C → 250 °C). For another duration t: $I_{k,t} = I_{k,1s} / \sqrt{t}$ (0.1 s ≤ t ≤ 5 s).

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05 Voltage Drop, Losses and Short-Circuit Data

Voltage drop per 100 m of cable at rated current with the conductor at 90 °C, cos φ = 0.8 and reactance 0.08 Ω/km (three-phase). The percentage refers to a system voltage of 400 V. Loss is the total I²R loss of the loaded cores per 100 m. The short-circuit columns give the permitted current for four durations.

Type designation cores × mm²	Rated current A	R at 90 °C Ω/km	Voltage drop V / 100 m	Voltage drop % of 400 V	Loss kW / 100 m	I_k 0.1 s kA	I_k 0.5 s kA	I_k 1 s kA	I_k 3 s kA
12G1.5	12	17.5	29.15	7.29	0.75	0.678	0.303	0.214	0.124
12G2.5	16	10.5	23.34	5.84	0.80	1.13	0.506	0.357	0.206

06 Selection Guide and Sizing Aid

H07BQ-F 12G covers 2 sizes. The smallest, 12G1.5, has an outer diameter of up to 20.4 mm and weighs about 490 kg/km; the largest, 12G2.5, has an outer diameter of up to 23.9 mm and weighs about 700 kg/km, 1.4 times as much. Across the range the rated current rises from 12 A to 16 A at 30 °C and the fixed bending radius from 82 mm to 96 mm.

Example 1. A circuit draws 8 A continuously at 40 °C ambient temperature, in a group of two cables. Temperature factor 0.91, grouping factor 0.80: required table current = 8 / (0.91 × 0.80) = 11 A. The smallest suitable size is 12G1.5 with 12 A.

Example 2. A circuit draws 14 A continuously at 35 °C ambient temperature, on its own. Temperature factor 0.96: required table current = 14 / (0.96) = 15 A. The smallest suitable size is 12G2.5 with 16 A.

07 Engineering Profile by Size

Every size of H07BQ-F 12G with the dimensions that decide how it behaves in a circuit: layers, weight, copper share, heat, voltage drop, bending, termination and pull.

12G1.5. This size has with a conductor of Ø 1.7 mm under 0.80 mm of insulation (core Ø 3.3 mm) and 0.8 mm inner and 1.8 mm outer sheath; outer diameter 17.3–20.4 mm, weight about 490 kg/km of which copper 173 kg/km (35 %). Rated current 12 A at 30 °C; at that load the voltage drop is 29.15 V per 100 m (7.29 % of 400 V) and the loss 0.75 kW per 100 m. Bending radius 82 mm fixed, 102 mm moving; gland M32, lug bolt M5. Short-circuit rating 0.214 kA for 1 s; permitted pull 270 N, free-hanging length 56 m.

12G2.5. This size has with a conductor of Ø 2.1 mm under 0.90 mm of insulation (core Ø 3.9 mm) and 0.8 mm inner and 2.1 mm outer sheath; outer diameter 20.6–23.9 mm, weight about 700 kg/km of which copper 288 kg/km (41 %). Rated current 16 A at 30 °C; at that load the voltage drop is 23.34 V per 100 m (5.84 % of 400 V) and the loss 0.80 kW per 100 m. Bending radius 96 mm fixed, 120 mm moving; gland M32, lug bolt M5. Short-circuit rating 0.357 kA for 1 s; permitted pull 450 N, free-hanging length 65 m.

Averaged over all sizes copper makes up 39 % of the cable weight; the share rises from 35 % at 12G1.5 to 41 % at 12G2.5, which is why the larger sizes are costed mostly on the copper market price.

08 Construction Dimensions by Size

Wall thicknesses and diameters of the layers at each size, taken from the validated cross-section layout; the overall diameter in section 04 is the sum of these layers within tolerance. The insulation wall follows the voltage class 450/750 V.

Type designation cores × mm²	Conductor Ø mm	Core Ø over insulation, mm	Insulation wall mm	Laid-up core Ø mm	Inner sheath mm	Outer sheath mm	Screen + braid mm	Sheath share of Ø, %
12G1.5	1.65	3.25	0.80	13.8	0.78	1.75	–	27
12G2.5	2.13	3.93	0.90	16.5	0.81	2.06	–	26

09 Termination Planning (indicative)

Type designation cores × mm²	Outer Ø or W × H mm	Cable gland thread	Lug / ferrule bolt	Strip length mm	Straight length behind gland, mm
12G1.5	20.4	M32	M5	10	40
12G2.5	23.9	M32	M5	10	50

Gland threads, lug bolts and strip lengths are planning guides computed from the dimensions above; confirm them with the accessory manufacturer.

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10 Comparison with Related Variants at Size 12G1.5

Variant	Differs in	Outer Ø / H mm	Weight kg/km	Pull N	Current A
This datasheet H07BQ-F 12G 450/750 V	–	20.4	490	270	12
H07BQ-F 7G 450/750 V 7G1.5	core configuration	17.0 (-17%)	341 (-30%)	158 (-41%)	16 (+33%)
H07BQ-F 18G 450/750 V 18G1.5	core configuration	25.5 (+25%)	760 (+55%)	400 (+48%)	10 (-17%)
H07BQ-F 12G 450/750 V 12G1.5	tinned vs bare copper	20.4 (+0%)	490 (+0%)	270 (+0%)	12 (+0%)
H07BQ-F 12G 450/750 V 12G1.5	low-temperature sheath	20.4 (+0%)	490 (+0%)	270 (+0%)	12 (+0%)
H07BQ-F 6G 450/750 V 6G1.5	core configuration	15.0 (-26%)	276 (-44%)	135 (-50%)	17 (+42%)
H07BQ-F 19G 450/750 V 19G1.5	core configuration	25.0 (+23%)	770 (+57%)	430 (+59%)	10 (-17%)
H07BQ-F 5G 450/750 V 5G1.5	core configuration	13.4 (-34%)	233 (-52%)	112 (-59%)	19 (+58%)
H07BQ-F 24G 450/750 V 24G1.5	core configuration	28.0 (+37%)	880 (+80%)	540 (+100%)	9 (-25%)

Percentages show the change against this datasheet; where a variant does not offer the exact size, the nearest listed size is used.

11 Standards and Testing

Standard	Scope
DIN VDE 0282-10 (HD 22.10) / DIN EN 50525-2-21	Flexible EPR/PUR cables
DIN EN 50363-10-2	Sheathing compound TMPU
DIN VDE 0293-308	Core identification
DIN VDE 0295 / IEC 60228	Conductors, class 5
DIN EN 60754-1 / -2	Halogen content of the compounds
DIN EN 60332-1-2 / IEC 60332-1-2	Flame propagation

Routine and type tests

- AC voltage test on every drum length (routine test): 2.5 kV, 5 min
- Conductor resistance and checks of dimensions, insulation thickness and sheath thickness
- Continuity of conductors and protective earth
- Flame propagation test (IEC 60332-1-2) on type-test samples
- Verification of the halogen-free compounds (IEC 60754-1/-2)

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.

The design follows DIN VDE 0282-10. This datasheet does not claim the VDE approval mark; mark or approval certificates, where required for a project, are arranged on request and apply only to the type tested.

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12 Installation, Marking and Delivery

Installation guidance

- Keep to the bending radii of section 04: flexing 5 × D, fixed 3 × D.
- Do not exceed the tensile load of 15 N/mm² of the copper cross-section.
- Avoid prolonged contact with hot surfaces above the rated conductor temperature.
- Cut and strip the PUR sheath with a sharp, round-blade tool.
- Use cable glands with a clamping range that matches the outer diameter.
- Store the cable dry and away from direct sunlight for long periods.

Sheath marking

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FEICHUN H07BQ-F [cross-section] 450/750 V [year] [serial no.] [metre mark]
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Packing and delivery

Drum	Steel or fumigated wooden drums; 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
Drum label	Type, cross-section, length, gross/net weight, batch no., drum no.

Ordering information

Order example: H07BQ-F 12G1.5 450/750 V – 500 m on one drum. When requesting a quotation, state the cable type, configuration, cross-section, voltage, conductor (tinned), length per piece, required standards and installation conditions.

13 Certification and Quality

All cable is subject to FeiChun’s quality control, with routine testing over 100 % of the delivered length. Declarations of conformity, type-test reports and third-party tests (for example for a mine, a tunnel or a rail project) are provided per project requirement; copies of the records are available on request. FeiChun holds CE, EAC and UKCA documentation for certain product groups. Whether a certificate covers this specific construction must be confirmed with FeiChun before it is quoted in a tender.

VDE, mine-specific (for example coal-mine safety marks, MSHA) and ATEX / IECEx approvals are not implied by this datasheet. They depend on the project, the machine and the country and are arranged with the end user.

14 Related Datasheets and Frequently Asked Questions

Variants of this cable with a different configuration, conductor, temperature grade, screen or voltage. All datasheets are PDF files.

- H07BQ-F 7G 450/750 V – core configuration, PUR, low-temp, tinned
- H07BQ-F 18G 450/750 V – core configuration, PUR, low-temp, tinned
- H07BQ-F 12G 450/750 V – tinned vs bare copper, PUR, low-temp
- H07BQ-F 12G 450/750 V – low-temperature sheath, PUR, tinned
- H07BQ-F 6G 450/750 V – core configuration, PUR, low-temp, tinned
- H07BQ-F 19G 450/750 V – core configuration, PUR, low-temp, tinned
- H07BQ-F 5G 450/750 V – core configuration, PUR, low-temp, tinned
- H07BQ-F 24G 450/750 V – core configuration, PUR, low-temp, tinned

Overview of all H07BQ-F datasheets: H07 Series Flexible Cables 450/750 V

Frequently asked questions

What is the difference between H07BQ-F and H07RN-F?
H07BQ-F has a PUR sheath (cut- and abrasion-resistant, halogen-free); H07RN-F has a polychloroprene sheath.

Is H07BQ-F halogen-free?
Yes. Insulation and sheath are halogen-free compounds.

What sizes are available for H07BQ-F 12G?
2 sizes from 1.5 to 2.5 mm². The outer dimension of the largest size, 12G2.5, is 23.9 mm and the weight is about 700 kg/km.

What current can 12G2.5 carry?
16 A in free air at 30 °C ambient, with the conductor at 90 °C. Other temperatures and grouping change the value; use the factors in section 04.

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15 Trademark Notice and Intellectual Property

Cable type designations such as H07BQ-F are standardised, descriptive designations defined in DIN VDE and EN standards; they are used to state which standard this product is designed to. References to other manufacturers' trade names, where made, serve only for technical comparison; FeiChun Cables is not affiliated with them.

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Document control

Document no. FC-TDS-VDE-2026-0883-EN
Revision 0 — first issue
Date 2 November 2026
Product H07BQ-F 450/750 V

Prepared — Engineering | Checked — QC | Approved — International Business

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