HARMONISED FLEXIBLE CABLE 450/750 V · DIN VDE 0282 / EN 50525 | 450/750 V | 2 sizes | CR rubber | TINNED COPPER

H07RN-F 12G 450/750 V

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

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01 Application and Product Overview

H07RN-F is the harmonised flexible rubber cable for 450/750 V that is used wherever a robust, oil-resistant connection cable is needed for medium to heavy mechanical stress. EPR-insulated fine-wire cores are stranded and enclosed in a polychloroprene sheath that tolerates abrasion, oil and weather. The cable is used on building sites, in workshops and on agricultural and industrial equipment, indoors and outdoors.

Design

The conductors are class 5 fine-wire copper. The insulation is EPR of type EI4 for 60 °C at the conductor; multi-core cables from 7 cores, and cables from 10 mm², have a rubber inner sheath. The outer sheath is polychloroprene. Cores are identified to DIN VDE 0293-308; the G versions contain a green-yellow protective core, the × versions do not.

Typical applications

- Portable tools, power distribution and site connections on building sites
- Industrial and agricultural machinery, pumps and compressors with moving parts
- Stage and event technology, temporary installations and generators
- Connections of cranes, lifts and conveyors with limited travel
- Outdoor use in wet and damp conditions, with oil and weather exposure
- Mobile switchgear and extension cables with heavy-duty plugs
- Boats, yards and harbour installations where a robust rubber sheath is needed
- General use in dry, damp, wet and outdoor areas for medium mechanical stress

2 sizes	450/750 V	+60 °C	CR rubber
Cross-section 1.5 – 2.5 mm²	Rated voltage U_0/U	Maximum conductor temperature	Sheath: CR rubber

Key features

- Polychloroprene (CR) sheath: oil, weather and abrasion resistant
- EPR insulation, 60 °C at the conductor; short-circuit temperature 200 °C
- Rated voltage 450/750 V, test voltage 2.5 kV
- Class 5 fine-wire conductors for flexible routing
- Flame-retardant to IEC 60332-1-2
- Harmonised type: recognised across the CENELEC area
- 2 sizes from 1.5 to 2.5 mm²; weight from 520 to 730 kg/km; copper from 173 to 288 kg/km

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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.

Standard background

H07RN-F is a harmonised type: the H stands for a cable whose design has been agreed in the CENELEC area (HAR). The 07 stands for the rated voltage of 450/750 V, R for rubber insulation, N for a polychloroprene sheath and F for flexible conductors. The type is covered by DIN EN 50525-2-21 (VDE 0285-525-2-21), which replaced the former DIN VDE 0282 part 4.

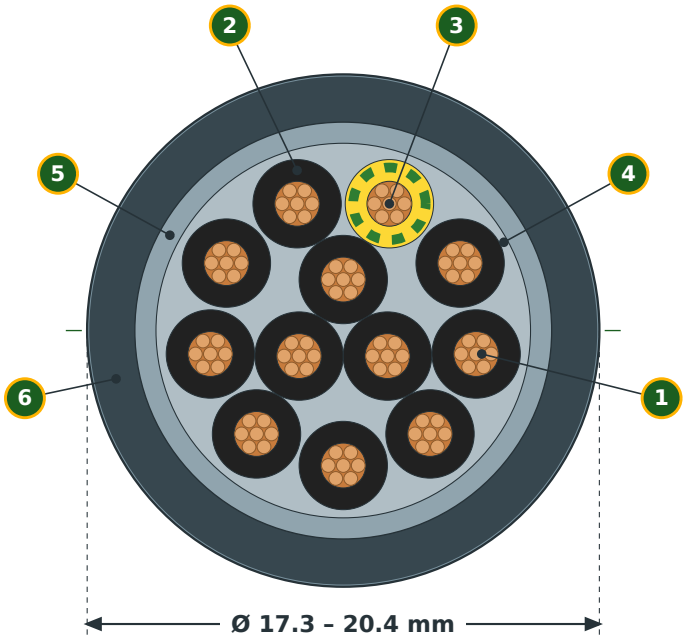
450/750 V is the common rating for industrial and building-site distribution on 400 V systems and allows a margin for DC and rectified supplies. The test voltage is 2.5 kV.

02 Construction

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

H07RN-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 EI4 (60 °C)
3	Protective (PE) core	Green-yellow insulation, same cross-section as the power cores
4	Filler and binder tape	Rubber or compound filler with polyester binder tape
5	Inner sheath	Rubber compound, extruded over the stranded core
6	Outer sheath	Polychloroprene (CR) rubber, type 5GM5

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 EI4 (60 °C), maximum conductor temperature 60 °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	Rubber compound; thickness about 0.8 mm at this size
Outer sheath	Polychloroprene (CR) rubber, type 5GM5; 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	+60 °C
Maximum temperature at short circuit	+200 °C (5 s maximum)
Ambient temperature, fixed installation	−40 °C to +60 °C
Ambient temperature, in motion	−25 °C to +60 °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	No (CR rubber)
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-H07R-0773-01	1.7	17.3	20.4	82	102	520	173	270	13.7	8	0.211
12G2.5	FC-H07R-0773-02	2.2	20.6	23.9	96	120	730	288	450	8.21	12	0.352

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 60 °C)

°C	20	25	30	35	40	45	50	55	60
Factor	1.15	1.08	1.00	0.91	0.82	0.71	0.58	0.41	–

Short-circuit current rating

I_k = 0.141 kA/mm² × cross-section of the power core (conductor 60 °C → 200 °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 60 °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 60 °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	8	15.9	17.64	4.41	0.30	0.669	0.299	0.211	0.122
12G2.5	12	9.50	15.90	3.97	0.41	1.11	0.499	0.352	0.204

06 Selection Guide and Sizing Aid

H07RN-F 12G covers 2 sizes. The smallest, 12G1.5, has an outer diameter of up to 20.4 mm and weighs about 520 kg/km; the largest, 12G2.5, has an outer diameter of up to 23.9 mm and weighs about 730 kg/km, 1.4 times as much. Across the range the rated current rises from 8 A to 12 A at 30 °C and the fixed bending radius from 82 mm to 96 mm.

Example 1. A circuit draws 5 A continuously at 40 °C ambient temperature, in a group of two cables. Temperature factor 0.82, grouping factor 0.80: required table current = 5 / (0.82 × 0.80) = 8 A. The smallest suitable size is 12G1.5 with 8 A.

Example 2. A circuit draws 10 A continuously at 35 °C ambient temperature, on its own. Temperature factor 0.91: required table current = 10 / (0.91) = 11 A. The smallest suitable size is 12G2.5 with 12 A.

07 Engineering Profile by Size

Every size of H07RN-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 520 kg/km of which copper 173 kg/km (33 %). Rated current 8 A at 30 °C; at that load the voltage drop is 17.64 V per 100 m (4.41 % of 400 V) and the loss 0.30 kW per 100 m. Bending radius 82 mm fixed, 102 mm moving; gland M32, lug bolt M5. Short-circuit rating 0.211 kA for 1 s; permitted pull 270 N, free-hanging length 52 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 730 kg/km of which copper 288 kg/km (39 %). Rated current 12 A at 30 °C; at that load the voltage drop is 15.90 V per 100 m (3.97 % of 400 V) and the loss 0.41 kW per 100 m. Bending radius 96 mm fixed, 120 mm moving; gland M32, lug bolt M5. Short-circuit rating 0.352 kA for 1 s; permitted pull 450 N, free-hanging length 62 m.

Averaged over all sizes copper makes up 37 % of the cable weight; the share rises from 33 % at 12G1.5 to 39 % 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 H07RN-F 12G 450/750 V	–	20.4	520	270	8
H07RN-F 7G 450/750 V 7G1.5	core configuration	17.0 (-17%)	366 (-30%)	158 (-41%)	11 (+38%)
H07RN-F 18G 450/750 V 18G1.5	core configuration	25.5 (+25%)	790 (+52%)	400 (+48%)	7 (-12%)
H07RN-F 12G 450/750 V 12G1.5	tinned vs bare copper	20.4 (+0%)	520 (+0%)	270 (+0%)	9 (+12%)
H07RN-F 12G 450/750 V 12G1.5	low-temperature sheath	20.4 (+0%)	520 (+0%)	270 (+0%)	8 (+0%)
H07RN-F 6G 450/750 V 6G1.5	core configuration	15.0 (-26%)	297 (-43%)	135 (-50%)	12 (+50%)
H07RN-F 19G 450/750 V 19G1.5	core configuration	25.0 (+23%)	800 (+54%)	430 (+59%)	7 (-12%)
H07RN-F 5G 450/750 V 5G1.5	core configuration	13.4 (-34%)	250 (-52%)	112 (-59%)	13 (+62%)
H07RN-F 24G 450/750 V 24G1.5	core configuration	28.0 (+37%)	920 (+77%)	540 (+100%)	6 (-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 EN 50525-2-21 (VDE 0285-525-2-21)	Flexible elastomer-insulated cables for general applications
DIN EN 50525-1	General requirements
DIN VDE 0293-308	Core identification
DIN VDE 0295 / IEC 60228	Conductors, class 5
DIN VDE 0298-3 / -4	Application and current-carrying capacity
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) and mineral-oil resistance on type-test samples

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 EN 50525-2-21. 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

- Do not exceed the tensile load of 15 N/mm² of the total copper cross-section.
- Keep to the bending radii of section 04: fixed 3 × D up to 12 mm, 4 × D above; free movement 3 × D up to 8 mm, 4 × D up to 12 mm, 5 × D above.
- Unwind cables from a drum or reel completely before loading them with more than half the rated current.
- Use cable glands with a clamping range that matches the outer diameter.
- Protect the cable against permanent mechanical damage and avoid contact with hot surfaces above 60 °C.
- Where the cable is exposed to sunlight for years, check the sheath at regular intervals.

Sheath marking

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FEICHUN H07RN-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: H07RN-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.

- H07RN-F 7G 450/750 V – core configuration, CR rubber, tinned
- H07RN-F 18G 450/750 V – core configuration, CR rubber, tinned
- H07RN-F 12G 450/750 V – tinned vs bare copper, CR rubber
- H07RN-F 12G 450/750 V – low-temperature sheath, CR rubber, low-temp, tinned
- H07RN-F 6G 450/750 V – core configuration, CR rubber, tinned
- H07RN-F 19G 450/750 V – core configuration, CR rubber, tinned
- H07RN-F 5G 450/750 V – core configuration, CR rubber, tinned
- H07RN-F 24G 450/750 V – core configuration, CR rubber, tinned

Overview of all H07RN-F datasheets: H07 Series Flexible Cables 450/750 V

Frequently asked questions

What does H07RN-F stand for?
Harmonised type, 450/750 V, rubber insulation, polychloroprene sheath, flexible conductors.

Can H07RN-F be used outdoors?
Yes. The polychloroprene sheath resists weather, ozone and oil; for permanent burial a cable designed for direct burial is required.

What sizes are available for H07RN-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 730 kg/km.

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What current can 12G2.5 carry?
12 A in free air at 30 °C ambient, with the conductor at 60 °C. Other temperatures and grouping change the value; use the factors in section 04.

15 Trademark Notice and Intellectual Property

Cable type designations such as H07RN-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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