HARMONISED FLEXIBLE CABLE 300/500 V · DIN VDE 0282 / EN 50525 | 300/500 V | 4 sizes | rubber | TINNED COPPER

H05RR-F 3G 300/500 V

Ordinary-Duty Rubber Cable 300/500 V 300/500 V – 3 cores of equal cross-section in concentric layers with a short lay length. General-purpose rubber sheath. Complete technical data sheet: construction, dimensions, weights, current ratings, voltage drop and installation guidance for 4 sizes.

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01 Application and Product Overview

H05RR-F is the harmonised ordinary-duty rubber cable for 300/500 V. EPR-insulated fine-wire cores are enclosed in a general-purpose rubber sheath. The cable is a light, flexible connection for appliances and tools that are moved occasionally and need little mechanical protection.

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

4 sizes	300/500 V	+60 °C	rubber
Cross-section 0.75 – 2.5 mm²	Rated voltage U_0/U	Maximum conductor temperature	Sheath: rubber

Key features

- General-purpose rubber sheath for ordinary mechanical duty
- EPR insulation, 60 °C at the conductor
- Rated voltage 300/500 V, test voltage 2 kV
- Class 5 fine-wire conductors
- Flame-retardant to IEC 60332-1-2
- Harmonised type (HAR)
- 4 sizes from 0.75 to 2.5 mm²; weight from 101 to 211 kg/km; copper from 22 to 72 kg/km

Core layout and conductor

3 cores of equal cross-section in concentric layers with a short lay length. Core colours: green-yellow, blue, brown (DIN VDE 0293-308); the green-yellow core is the protective conductor. The three-core layout feeds a three-phase motor without neutral in a TN-S system. 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

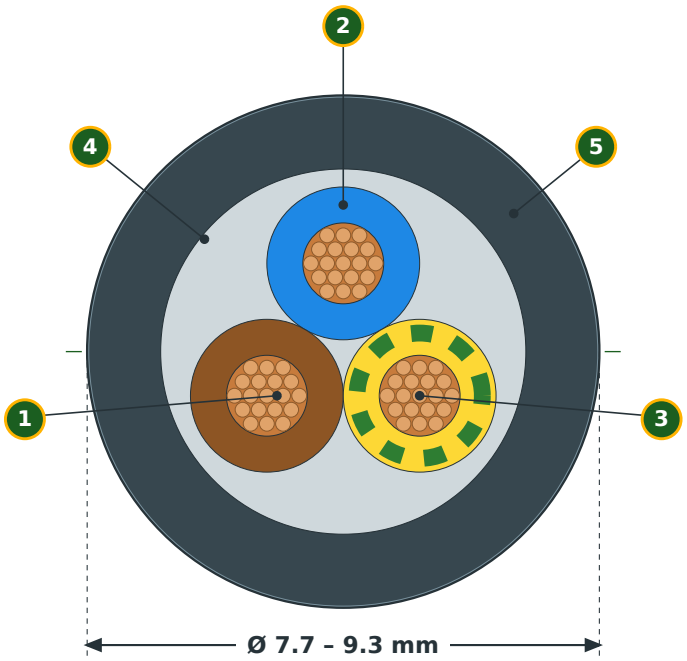
H05RR-F is the harmonised ordinary-duty rubber cable: 05 stands for 300/500 V, R for rubber insulation, R for a rubber sheath and F for flexible conductors. It is covered by DIN EN 50525-2-21 (VDE 0285-525-2-21). For heavier duty, select H05RN-F or H07RN-F.

300/500 V suits domestic, office and light-industrial circuits up to 400 V three-phase. The test voltage is 2 kV.

02 Construction

FEICHUN · CROSS-SECTION A-A · 300/500 V

H05RR-F
Sample size 3G1 · 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	Outer sheath	General-purpose rubber, type EM3

The drawing shows size 3G1. 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	Green-yellow, blue, brown to DIN VDE 0293-308
Stranding	Cores in concentric layers with a short lay length
Outer sheath	General-purpose rubber, type EM3; thickness about 1.2 mm at this size

03 Electrical, Thermal and Mechanical Characteristics

Electrical data

Rated voltage U_0/U	300/500 V AC
Test voltage	2 kV AC, 5 min
Maximum operating voltage, three-phase	550 V
Maximum operating voltage, DC (core-earth / core-core)	0.3/0.5 kV (DC 0.45/0.9 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

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Thermal and mechanical data

Maximum conductor temperature	+60 °C
Maximum temperature at short circuit	+200 °C (5 s maximum)
Ambient temperature, fixed installation	−30 °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 (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 – 300/500 V (4 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
3G0.75	FC-H05R-0979-01	1.2	7.4	8.9	27	36	101	22	34	26.7	10	0.106
3G1	FC-H05R-0979-02	1.4	7.7	9.3	28	37	115	29	45	20.0	12	0.141
3G1.5	FC-H05R-0979-03	1.7	8.8	10.6	32	42	153	43	68	13.7	16	0.211
3G2.5	FC-H05R-0979-04	2.2	10.4	12.5	50	62	211	72	112	8.21	22	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. 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).

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
3G0.75	10	30.9	42.90	10.72	0.93	0.334	0.150	0.106	0.061
3G1	12	23.1	38.58	9.65	1.00	0.446	0.199	0.141	0.081
3G1.5	16	15.9	35.28	8.82	1.22	0.669	0.299	0.211	0.122
3G2.5	22	9.50	29.14	7.29	1.38	1.11	0.499	0.352	0.204

06 Selection Guide and Sizing Aid

H05RR-F 3G covers 4 sizes. The smallest, 3G0.75, has an outer diameter of up to 8.9 mm and weighs about 101 kg/km; the largest, 3G2.5, has an outer diameter of up to 12.5 mm and weighs about 211 kg/km, 2.1 times as much. Across the range the rated current rises from 10 A to 22 A at 30 °C and the fixed bending radius from 27 mm to 50 mm.

Example 1. A circuit draws 7 A continuously at 40 °C ambient temperature, in a group of two cables. Temperature factor 0.82, grouping factor 0.80: required table current = 7 / (0.82 × 0.80) = 11 A. The smallest suitable size is 3G1 with 12 A.

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Example 2. A circuit draws 13 A continuously at 35 °C ambient temperature, on its own. Temperature factor 0.91: required table current = 13 / (0.91) = 15 A. The smallest suitable size is 3G1.5 with 16 A.

07 Engineering Profile by Size

Every size of H05RR-F 3G with the dimensions that decide how it behaves in a circuit: layers, weight, copper share, heat, voltage drop, bending, termination and pull.

3G0.75. This size has with a conductor of Ø 1.2 mm under 0.60 mm of insulation (core Ø 2.4 mm) and an outer sheath of 1.2 mm; outer diameter 7.4–8.9 mm, weight about 101 kg/km of which copper 22 kg/km (22 %). Rated current 10 A at 30 °C; at that load the voltage drop is 42.90 V per 100 m (10.72 % of 400 V) and the loss 0.93 kW per 100 m. Bending radius 27 mm fixed, 36 mm moving; gland M16, lug bolt M5. Short-circuit rating 0.106 kA for 1 s; permitted pull 34 N, free-hanging length 34 m.

3G1. This size has with a conductor of Ø 1.3 mm under 0.60 mm of insulation (core Ø 2.5 mm) and an outer sheath of 1.2 mm; outer diameter 7.7–9.3 mm, weight about 115 kg/km of which copper 29 kg/km (25 %). Rated current 12 A at 30 °C; at that load the voltage drop is 38.58 V per 100 m (9.65 % of 400 V) and the loss 1.00 kW per 100 m. Bending radius 28 mm fixed, 37 mm moving; gland M16, lug bolt M5. Short-circuit rating 0.141 kA for 1 s; permitted pull 45 N, free-hanging length 39 m.

3G1.5. This size has with a conductor of Ø 1.7 mm under 0.70 mm of insulation (core Ø 3.1 mm) and an outer sheath of 1.3 mm; outer diameter 8.8–10.6 mm, weight about 153 kg/km of which copper 43 kg/km (28 %). Rated current 16 A at 30 °C; at that load the voltage drop is 35.28 V per 100 m (8.82 % of 400 V) and the loss 1.22 kW per 100 m. Bending radius 32 mm fixed, 42 mm moving; gland M20, lug bolt M5. Short-circuit rating 0.211 kA for 1 s; permitted pull 68 N, free-hanging length 45 m.

3G2.5. This size has with a conductor of Ø 2.1 mm under 0.80 mm of insulation (core Ø 3.7 mm) and an outer sheath of 1.4 mm; outer diameter 10.4–12.5 mm, weight about 211 kg/km of which copper 72 kg/km (34 %). Rated current 22 A at 30 °C; at that load the voltage drop is 29.14 V per 100 m (7.29 % of 400 V) and the loss 1.38 kW per 100 m. Bending radius 50 mm fixed, 62 mm moving; gland M25, lug bolt M5. Short-circuit rating 0.352 kA for 1 s; permitted pull 112 N, free-hanging length 54 m.

Averaged over all sizes copper makes up 29 % of the cable weight; the share rises from 22 % at 3G0.75 to 34 % at 3G2.5, 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 300/500 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, %
3G0.75	1.17	2.37	0.60	5.7	–	1.21	–	30
3G1	1.35	2.55	0.60	6.1	–	1.23	–	29
3G1.5	1.65	3.05	0.70	7.2	–	1.28	–	26
3G2.5	2.13	3.73	0.80	8.6	–	1.42	–	25

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
3G0.75	8.9	M16	M5	10	15
3G1	9.3	M16	M5	10	15
3G1.5	10.6	M20	M5	10	15
3G2.5	12.5	M25	M5	10	25

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 3G1

Variant	Differs in	Outer Ø / H mm	Weight kg/km	Pull N	Current A
This datasheet H05RR-F 3G 300/500 V	–	9.3	115	45	12
H05RR-F 2× 300/500 V 2×1	core configuration	8.8 (-5%)	85 (-26%)	30 (-33%)	12 (+0%)
H05RR-F 3× 300/500 V 3×1	core configuration	9.3 (+0%)	115 (+0%)	45 (+0%)	12 (+0%)
H05RR-F 3G 300/500 V 3G1	tinned vs bare copper	9.3 (+0%)	115 (+0%)	45 (+0%)	12 (+0%)
H05RR-F 4G 300/500 V 4G1	core configuration	10.3 (+11%)	147 (+28%)	60 (+33%)	12 (+0%)
H05RR-F 4× 300/500 V 4×1	core configuration	10.3 (+11%)	147 (+28%)	60 (+33%)	10 (-17%)
H05RR-F 5G 300/500 V 5G1	core configuration	11.1 (+19%)	167 (+45%)	75 (+67%)	10 (-17%)
H05RR-F 5× 300/500 V 5×1	core configuration	11.1 (+19%)	167 (+45%)	75 (+67%)	9 (-25%)
H05RR-F 5× 300/500 V 5×1	core configuration, tinned vs bare copper	11.1 (+19%)	167 (+45%)	75 (+67%)	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 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 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 H05RR-F [cross-section] 300/500 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: H05RR-F 3G1 300/500 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.

- H05RR-F 2× 300/500 V – core configuration, rubber, tinned
- H05RR-F 3× 300/500 V – core configuration, rubber, tinned
- H05RR-F 3G 300/500 V – tinned vs bare copper, rubber
- H05RR-F 4G 300/500 V – core configuration, rubber, tinned
- H05RR-F 4× 300/500 V – core configuration, rubber, tinned
- H05RR-F 5G 300/500 V – core configuration, rubber, tinned
- H05RR-F 5× 300/500 V – core configuration, rubber, tinned
- H05RR-F 5× 300/500 V – core configuration, tinned vs bare copper, rubber

Overview of all H05RR-F datasheets: H05 Series Flexible Cables 300/500 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 H05RR-F 3G?
4 sizes from 0.75 to 2.5 mm². The outer dimension of the largest size, 3G2.5, is 12.5 mm and the weight is about 211 kg/km.

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What current can 3G1.5 carry?
16 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 H05RR-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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