DIN VDE 0250-812 · HEAVY RUBBER-SHEATHED FLEXIBLE CABLE | 0.66/1.14 kV | 3 sizes | CR rubber | TINNED COPPER

NSSHöu 12G 0.66/1.14 kV

Heavy Rubber-Sheathed Flexible Cable 0.66/1.14 kV – 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 3 sizes.

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01 Application and Product Overview

NSSHöu is the VDE designation of the heavy rubber-sheathed flexible cable (Gummischlauchleitung) for 0.6/1 kV. EPR-insulated cores of fine-wire class 5 copper are stranded together, bedded in a rubber inner sheath and protected by a thick, oil-resistant polychloroprene outer sheath that withstands crushing, abrasion and repeated bending. It is the established connection cable for mobile machines, portable switchgear and heavy tools on building sites, in quarries and in mines.

Design

The cores are insulated with a cross-linked EPR compound of type 3GI3, which permits a conductor temperature of 90 °C, and are stranded in layers with a short lay length. A rubber inner sheath fills the interstices and gives the stranded core a round, stable shape. The outer sheath is a polychloroprene compound of type 5GM5 to DIN VDE 0207-21. In the VDE designation the letters ö and u stand for oil resistance and flame retardancy; the suffix J marks a version with a green-yellow protective core, O a version without. In this datasheet J corresponds to the “G” configurations and O to the “×” configurations.

Typical applications

- Mobile switchgear, site distribution boards and portable generators on building sites and in quarries
- Feeder cables for electric tools, concrete pumps, mixers, crushers and conveyor drives that are moved regularly
- Underground and open-cast mining equipment that needs a robust connection cable of moderate length
- Cranes, hoists and loading equipment where the cable is dragged, stepped on or run over
- Machine tools and switch cabinets in dry, damp and wet areas, indoors and outdoors
- Temporary power supplies for events, harbours and shipyards with heavy mechanical loading
- Battery and DC-motor connections of industrial trucks and mining vehicles
- Replacement and extension of existing NSSHöu cabling in plants built to DIN VDE 0250-812

3 sizes	0.66/1.14 kV	+90 °C	CR rubber
Cross-section 1.5 – 4 mm²	Rated voltage U_0/U	Maximum conductor temperature	Sheath: CR rubber

Key features

- Thick rubber double sheath (inner and outer) for high resistance to crushing, impact and abrasion
- EPR insulation rated for 90 °C at the conductor; short-circuit temperature 250 °C
- Oil-resistant to DIN EN 60811-404 and flame-retardant to IEC 60332-1-2
- Fine-wire class 5 conductors for flexibility and easy termination
- Suitable for outdoor use: resistant to weather, ozone and UV radiation
- Cores identified to DIN VDE 0293-308; green-yellow PE core in the J versions
- 3 sizes from 1.5 to 4 mm²; weight from 620 to 1,260 kg/km; copper from 173 to 460 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

DIN VDE 0250-812 is the national standard for the NSSHöu heavy rubber-sheathed flexible cable. It fixes the conductor class, the insulation and sheath compounds, the wall thicknesses, the dimension limits and the routine and type tests. The harmonised H07RN-F cable covers lighter duty at 450/750 V; NSSHöu is the step up for 0.6/1 kV systems and for heavier mechanical loading.

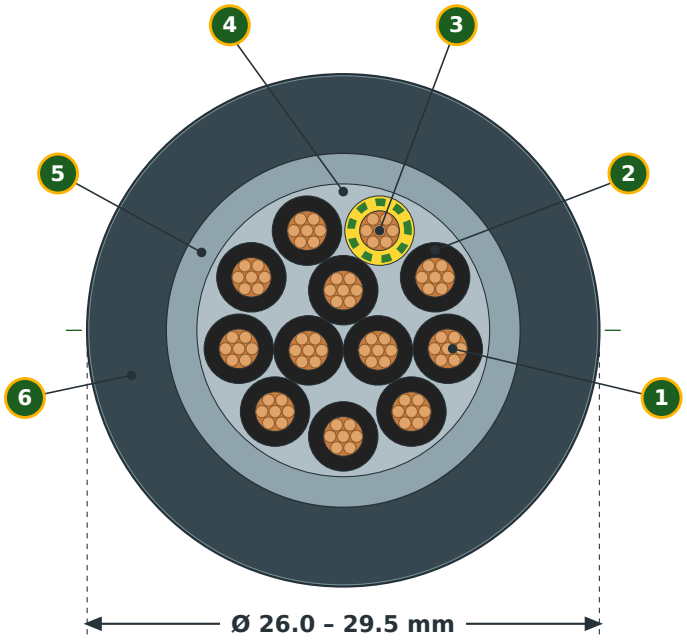
The standard sheath compound is flexible down to 25 °C in motion and 40 °C in fixed installation. For regular use below this limit select the low-temperature grade of the same cable.

0.66/1.14 kV is the rating for the 1,000 V (1.14 kV) systems used in mining and in heavy industry; it has a slightly thicker insulation than the 0.6/1 kV version. The test voltage is 3 kV.

02 Construction

FEICHUN · CROSS-SECTION A-A · 0.66/1.14 kV

NSSHöu
Sample size 12G2.5 · 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	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 12G2.5. 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	Rubber compound; thickness about 1.6 mm at this size
Outer sheath	Polychloroprene (CR) rubber, type 5GM5; thickness about 4.3 mm at this size

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03 Electrical, Thermal and Mechanical Characteristics

Electrical data

Rated voltage U_0/U	0.66/1.14 kV AC
Test voltage	3 kV AC, 5 min
Maximum operating voltage, three-phase	1.2 kV
Maximum operating voltage, DC (core-earth / core-core)	1.0/1.8 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	−40 °C to +80 °C
Ambient temperature, in motion	−25 °C to +80 °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 – 0.66/1.14 kV (3 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-NSSH-0155-01	1.7	22.0	25.0	100	125	620	173	270	13.7	12	0.214
12G2.5	FC-NSSH-0155-02	2.2	26.0	29.5	118	148	920	288	450	8.21	16	0.357
12G4	FC-NSSH-0155-03	2.7	30.0	34.0	136	170	1,260	460	720	5.09	22	0.572

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 690 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 690 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	4.22	0.75	0.678	0.303	0.214	0.124
12G2.5	16	10.5	23.34	3.38	0.80	1.13	0.506	0.357	0.206
12G4	22	6.49	19.97	2.89	0.94	1.81	0.809	0.572	0.330

06 Selection Guide and Sizing Aid

NSSHöu 12G covers 3 sizes. The smallest, 12G1.5, has an outer diameter of up to 25.0 mm and weighs about 620 kg/km; the largest, 12G4, has an outer diameter of up to 34.0 mm and weighs about 1,260 kg/km, 2.0 times as much. Across the range the rated current rises from 12 A to 22 A at 30 °C and the fixed bending radius from 100 mm to 136 mm.

Example 1. A circuit draws 11 A continuously at 40 °C ambient temperature, in a group of two cables. Temperature factor 0.91, grouping factor 0.80: required table current = 11 / (0.91 × 0.80) = 16 A. The smallest suitable size is 12G2.5 with 16 A.

Example 2. A circuit draws 19 A continuously at 35 °C ambient temperature, on its own. Temperature factor 0.96: required table current = 19 / (0.96) = 20 A. The smallest suitable size is 12G4 with 22 A.

07 Engineering Profile by Size

Every size of NSSHöu 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 1.5 mm inner and 3.4 mm outer sheath; outer diameter 22.0–25.0 mm, weight about 620 kg/km of which copper 173 kg/km (28 %). Rated current 12 A at 30 °C; at that load the voltage drop is 29.15 V per 100 m (4.22 % of 690 V) and the loss 0.75 kW per 100 m. Bending radius 100 mm fixed, 125 mm moving; gland M32, lug bolt M5. Short-circuit rating 0.214 kA for 1 s; permitted pull 270 N, free-hanging length 44 m.

12G2.5. This size has with a conductor of Ø 2.1 mm under 0.80 mm of insulation (core Ø 3.7 mm) and 1.6 mm inner and 4.3 mm outer sheath; outer diameter 26.0–29.5 mm, weight about 920 kg/km of which copper 288 kg/km (31 %). Rated current 16 A at 30 °C; at that load the voltage drop is 23.34 V per 100 m (3.38 % of 690 V) and the loss 0.80 kW per 100 m. Bending radius 118 mm fixed, 148 mm moving; gland M40, lug bolt M5. Short-circuit rating 0.357 kA for 1 s; permitted pull 450 N, free-hanging length 49 m.

12G4. This size has with a conductor of Ø 2.7 mm under 0.80 mm of insulation (core Ø 4.3 mm) and 1.8 mm inner and 5.2 mm outer sheath; outer diameter 30.0–34.0 mm, weight about 1,260 kg/km of which copper 460 kg/km (37 %). Rated current 22 A at 30 °C; at that load the voltage drop is 19.97 V per 100 m (2.89 % of 690 V) and the loss 0.94 kW per 100 m. Bending radius 136 mm fixed, 170 mm moving; gland M50, lug bolt M5. Short-circuit rating 0.572 kA for 1 s; permitted pull 720 N, free-hanging length 58 m.

Averaged over all sizes copper makes up 33 % of the cable weight; the share rises from 28 % at 12G1.5 to 37 % at 12G4, 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 0.66/1.14 kV.

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	1.51	3.41	–	42
12G2.5	2.13	3.73	0.80	15.7	1.64	4.25	–	43
12G4	2.70	4.30	0.80	18.0	1.80	5.20	–	44

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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	25.0	M32	M5	10	50
12G2.5	29.5	M40	M5	10	60
12G4	34.0	M50	M5	10	70

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

10 Comparison with Related Variants at Size 12G2.5

Variant	Differs in	Outer Ø / H mm	Weight kg/km	Pull N	Current A
This datasheet NSSHöu 12G 0.66/1.14 kV	–	29.5	920	450	16
NSSHöu 10G 0.66/1.14 kV 10G2.5	core configuration	28.0 (-5%)	880 (-4%)	375 (-17%)	18 (+12%)
NSSHöu 3×+3E 0.66/1.14 kV 3×25+3×25/3E	core configuration	40.5 (+37%)	2,060 (+124%)	1,120 (+149%)	130 (+712%)
NSSHöu 12G 0.66/1.14 kV 12G2.5	tinned vs bare copper	29.5 (+0%)	920 (+0%)	450 (+0%)	17 (+6%)
NSSHöu 12G 0.66/1.14 kV 12G2.5	low-temperature sheath	29.5 (+0%)	920 (+0%)	450 (+0%)	16 (+0%)
NSSHCöu 12G 0.66/1.14 kV 12G2.5	overall screen	30.0 (+2%)	1,010 (+10%)	450 (+0%)	16 (+0%)
NSSHöu 12G 0.6/1 kV 12G2.5	voltage class	28.0 (-5%)	860 (-7%)	450 (+0%)	16 (+0%)
NSSHöu 8G 0.66/1.14 kV 8G2.5	core configuration	27.5 (-7%)	850 (-8%)	300 (-33%)	20 (+25%)
NSSHöu 3×+3E+2×1.5 0.66/1.14 kV 3×25+3×25/3E+2×1.5	core configuration	43.5 (+47%)	2,260 (+146%)	1,120 (+149%)	130 (+712%)

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 0250-812	Rubber-insulated flexible cable NSSHöu, 0.6/1 kV
DIN VDE 0295 / IEC 60228	Conductors, class 5
DIN VDE 0207-20 / -21	Rubber insulation and sheath compounds (3GI3, 5GM5)
DIN VDE 0293-308	Core identification
DIN VDE 0298-3 / -4	Application: bending, tensile load; current-carrying capacity
DIN EN 60811-404	Mineral oil resistance of sheath
DIN EN 60332-1-2 / IEC 60332-1-2	Flame propagation, single cable

Routine and type tests

- AC voltage test on every drum length (routine test): 3 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 VDE 0250-812. 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 permissible tensile load of 15 N/mm² of the total copper cross-section; use a cable grip that holds the sheath, never the conductors.
- Keep the bending radius at or above the values in section 04; for free movement use 3 × D up to 8 mm, 4 × D up to 12 mm and 5 × D above 12 mm outer diameter.
- Lay the cable without kinks and unwind it completely from the reel before loading it above 50 % of the rated current.
- Use cable glands whose clamping range covers the maximum outer diameter and seal the cable entry to the enclosure rating.
- Protect the cable against permanent running-over by vehicles; where this cannot be avoided use cable ramps or protective ducts.
- Leave the green-yellow protective core slightly longer than the power cores, so that it is the last to be loaded if the cable is pulled at the terminal.

Sheath marking

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FEICHUN NSSHöu [cross-section] 0.66/1.14 kV [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: NSSHöu 12G2.5 0.66/1.14 kV – 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.

- NSSHöu 10G 0.66/1.14 kV – core configuration, CR rubber, tinned
- NSSHöu 3×+3E 0.66/1.14 kV – core configuration, CR rubber, tinned
- NSSHöu 12G 0.66/1.14 kV – tinned vs bare copper, CR rubber
- NSSHöu 12G 0.66/1.14 kV – low-temperature sheath, CR rubber, low-temp, tinned
- NSSHCöu 12G 0.66/1.14 kV – overall screen, CR rubber, tinned
- NSSHöu 12G 0.6/1 kV – voltage class, CR rubber, tinned
- NSSHöu 8G 0.66/1.14 kV – core configuration, CR rubber, tinned
- NSSHöu 3×+3E+2×1.5 0.66/1.14 kV – core configuration, CR rubber, tinned

Overview of all NSSHöu datasheets: NSSHöu Heavy Rubber-Sheathed Flexible Cables

Frequently asked questions

Which cable is meant by NSSHöu?
NSSHöu is the VDE designation of the heavy rubber-sheathed flexible cable to DIN VDE 0250-812, rated 0.6/1 kV, with EPR insulation and a polychloroprene sheath.

What is the difference between the -J and the -O version?
The J version contains a green-yellow protective core; the O version does not. NSSHöu 12G is the J (with PE core) version.

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What sizes are available for NSSHöu 12G?

3 sizes from 1.5 to 4 mm². The outer dimension of the largest size, 12G4, is 34.0 mm and the weight is about 1,260 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.

15 Trademark Notice and Intellectual Property

Cable type designations such as NSSHöu 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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