ANHUI FEICHUN SPECIAL CABLE CO., LTD.
安徽飞纯特种电缆有限公司
INDUSTRIAL POWER, DATA & COMMUNICATIONS CABLE SPECIALIST · WWW.FEICHUNCABLES.COM

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CLASS Product Data Sheet | X05VV-F НГ(A)-LS · 3G1.5 · 3G2.5 · 4G1.5 · 4G2.5 · 4G4 · 0.5 kV Flexible Power Cable (EAEU / GOST Compliant)
STANDARDS IEC 60228 Cl. 5 | DIN VDE 0298-4 | IEC 60332-3-22 Cat. A | GOST 31565-2012 | IEC 61034-2 | IEC 60228 | EN 50288

✦ FEICHUN X05VV-F НГ(A)-LS
FLEXIBLE POWER CABLE FAMILY

X05VV-F НГ(A)-LS
Flexible Power Cable

5 Variants · 3G1.5 ⟶ 4G4 mm² · 300/500 V (0.5 kV) · GOST + IEC Dual-Compliant
НГ(A) = Flame Retardant Cat. A · LS = Low Smoke · G = Green/Yellow PE

Feichun Engineering Cables · EAEU / Russian Export · IEC 60228 Cl. 5 · X05VV-F 4G4 ★ Highlighted

PRODUCT SPECIFICATION — FLEXIBLE PVC/PVC HALOGEN-REDUCED, FLAME-RETARDANT LOW-SMOKE POWER & CONTROL CABLE FOR INDUSTRIAL SWITCHGEAR, CONTROL PANELS, AND EAEU/RUSSIAN MARKET INSTALLATIONS — X05VV-F SERIES WITH НГ(A)-LS SUFFIX

X05VV-F НГ(A)-LS · 3G1.5 · 3G2.5 · 4G1.5 · 4G2.5 · 4G4 | 300/500 V (0.5 kV) | IEC 60228 CLASS 5 TINNED COPPER | 4G4 mm² ★ HIGHLIGHTED

The X05VV-F НГ(A)-LS series is a flexible PVC-insulated, PVC-sheathed low-smoke power cable combining the European harmonised X05VV-F cable construction with the rigorous Russian/EAEU НГ(A)-LS designation — the highest category of flame-retardant (non-fire-propagating in bundle, Category A per GOST 31565), low-smoke performance. Fine-stranded Class 5 tinned copper conductors throughout; G-suffix denotes inclusion of a green/yellow protective earth conductor. Five standard configurations from 3G1.5 to 4G4 mm² cover the complete range of 16 A lighting/control circuits through 34 A (27 A derated) industrial sub-distribution feeds. Suitable for fixed and occasional-movement installations in commercial buildings, industrial control cabinets, and process plants supplying the Eurasian Economic Union (EAEU) market.

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FC X05VV-F НГ(A)-LS · 300/500 V · CLASS 5 CU · 3G/4G · FLAME RETARDANT CAT. A · LOW SMOKE · GOST 31565-2012 · IEC 60332-3-22 · IEC 61034-2

X05VV-F НГ(A)-LS — DESIGNATION DECODING & DESIGN PHILOSOPHY · 300/500 V (0.5 KV)

1A — TYPE DESIGNATION EXPLAINED

DUAL STANDARD SUFFIX: EUROPEAN X05VV-F BASE CONSTRUCTION + GOST НГ(A)-LS FIRE-SAFETY DESIGNATION

X05VV-F follows the European harmonised cable designation format: **X** = non-harmonised national variant; **05** = 300/500 V rated voltage (U₀/U); **V** = PVC conductor insulation; **V** = PVC outer sheath; **F** = Class 5 fine-stranded flexible conductor (IEC 60228). The appended **НГ(A)-LS** suffix is a Russian Federation / GOST designation with three components: **НГ** (не распространяющий горение) = non-fire-propagating when cables are laid in bundles; **(A)** = Category A, the most demanding tier of the GOST 31565 flame-retardant hierarchy; **LS** (Low Smoke) = reduced smoke and acid gas emission during combustion per IEC 61034-2. The core count suffix **nG** denotes n power conductors plus one green/yellow protective earth (PE) conductor — e.g., 4G2.5 = three phase conductors + one PE, all 2.5 mm².

300/500 V (0.5 kV) | НГ(A) GOST 31565 Cat. A | LS Low Smoke IEC 61034 | IEC 60332-3-22 | IEC 60228 Cl. 5 Cu

1B — 3G SERIES: 3-CORE + PE · CONSTRUCTION & PHYSICAL DATA

3G = 3 × POWER CONDUCTORS + 1 × GREEN/YELLOW PROTECTIVE EARTH — 3-PHASE OR 1-PHASE+N+PE CIRCUITS

The **3G variants** house three insulated power conductors (typically colour-coded brown/black/grey for L1/L2/L3, or brown/blue for live/neutral in single-phase plus an additional conductor) plus a mandatory **green/yellow striped PE conductor** of identical cross-section. The four cores are cabled together in a round lay over a central filler, enclosed in a common PVC outer sheath. Class 5 fine-stranded tinned copper conductors provide the flexibility required for cabinet wiring and occasional repositioning during maintenance. The PVC insulation system — special LS-grade compound — achieves low smoke density and reduced HCl emission compared to standard PVC while maintaining identical mechanical and electrical performance.

3G SERIES PHYSICAL DATA		
Parameter	**3G1.5**	**3G2.5**
AWG equivalent	16	14

X05VV-F НГ(A)-LS · 4G4 MM² — 0.5 KV ★ HIGHLIGHTED REFERENCE VARIANT

X05VV-F НГ(A)-LS 4G4 MM² — FULL SPECIFICATION ★ HIGHLIGHTED



4G4 · OD ~13 mm
★ Highlighted · PVC/PVC LS

★ HIGHLIGHTED VARIANT — 4G4 mm²

X05VV-F НГ(A)-LS 4G4 — FULL SPECIFICATION ★	
No. cores × cross-section	4 × 4.0 mm² + 1 × 4.0 mm² GY/GN PE
AWG equivalent	12 AWG
Outer diameter	11.2 – 14.3 mm
Copper weight	154 kg/km
Total cable weight	290 kg/km
Ampacity — base (30 °C, free air)	34 A
Ampacity — derated (3 loaded)	≈ 27 A (factor × 0.80)
Nom. voltage U₀/U	300 / 500 V (0.5 kV)
Test voltage (kV)	2.0 kV AC (1 min)
Insulation resistance	≥ 20 MΩ × km (at 70 °C)
Conductor resistance (20 °C)	≤ 4.61 Ω/km (per IEC 60228 Cl. 5)
Min. bend radius (fixed)	4 × OD ≈ 52 mm
Min. bend radius (occasional)	12.5 × OD ≈ 163 mm

★ 4G4 SELECTION RATIONALE — LARGEST STANDARD VARIANT FOR SUB-DISTRIBUTION FEEDS

The **X05VV-F НГ(A)-LS 4G4 mm²** represents the upper end of the standard X05VV-F flexible cable range and is the primary choice for **sub-distribution board feeds and heavy-current control panel wiring** in industrial installations. The 4.0 mm² cross-section delivers a base current capacity of 34 A — sufficient for driving three-phase motor starters up to approximately 7.5 kW, distribution branch circuits serving multiple outlet groups, or single-phase feeds at up to 25 A with a diversity margin. In the common scenario where all three phase conductors are simultaneously loaded at full capacity, the mandatory four-core derating factor reduces the sustained permissible current to approximately

НГ(A)-LS FIRE & SMOKE PERFORMANCE — GOST 31565-2012 & IEC 60332-3-22 CATEGORY A

НГ(A) — FLAME RETARDANCY: CATEGORY A (HIGHEST LEVEL)

НГ(A) = НЕ РАСПРОСТРАНЯЮЩИЙ ГОРЕНИЕ, CATEGORY A — 7 LITRES/MIN AIR, TOTAL TEST VOLUME ≥ 3.5 L/M

The **НГ(A)** designation is the most demanding flame-retardancy category in the Russian / EAEU cable classification system, governed by **GOST 31565-2012** and harmonised with **IEC 60332-3-22 (Category A)**. In the bundle flame test, cables are mounted vertically in a defined ladder arrangement representing a realistic cable installation density; the minimum volume of non-metallic (combustible) material in the test is **7 litres per metre of cable run** — the highest combustible loading used in any category. After the prescribed 40-minute flame application, the char zone must not propagate beyond a defined height limit, confirming that the cable will not act as a wick propagating fire through vertical cable shafts, trunking, or riser ducts. This makes НГ(A)-LS cables mandatory in high-density cable installations in public buildings (metro stations, airports, hospitals, commercial centres), industrial control rooms, and any installation subject to Russian Federal Law No. 123-FZ (Technical Regulation on Fire Safety) or EAEU TR 043/2017.

LS — LOW SMOKE & REDUCED ACID GAS EMISSION

LS = LOW SMOKE — IEC 61034-2 MINIMUM LIGHT TRANSMITTANCE ≥ 60 % IN 3 M × 3 M × 3 M TEST CHAMBER

The **LS (Low Smoke)** suffix certifies that cables, when burned under the standardised conditions of **IEC 61034-2**, produce combustion gases with a light transmittance of at least **60 % measured at 3 minutes** in the IEC 3 m cube test enclosure — meaning the smoke density remains low enough that occupants can see escape routes during a fire. Standard PVC cables fail this criterion severely (transmittance often below 20 %). The LS compound is achieved by reformulating the PVC sheath and core insulation plasticiser and stabiliser package to reduce the volatile carbon and halogen-bearing decomposition products. Additionally, **HCl acid gas emission** is significantly reduced compared to standard PVC — the special compound formulation typically achieves HCl emission below 15 % (measured per IEC 60754-1/2) versus 25–30 % for standard PVC. While the material remains PVC-based (as opposed to halogen-free LSZH / XLPE), the LS-PVC significantly reduces toxicity and corrosive damage to electrical infrastructure during a fire event, meeting EAEU / Russian market certification requirements without the full cost premium of true halogen-free construction.



3G1.5 · OD ~9 mm PVC/PVC LS



3G2.5 · OD ~10 mm PVC/PVC LS

Outer Ø (mm)	7.4–9.4	9.2–11.4
Cu weight (kg/km)	43	72
Total weight (kg/km)	115	165
Ampacity (30 °C, free air)	16 A	25 A
Nom. voltage Uo/U	300 / 500 V (0.5 kV)	

X05VV-F НГ(А)-LS · 4G SERIES — FOUR CORE + PE · INDUSTRIAL SUB-DISTRIBUTION & CONTROL

1C — 4G1.5 & 4G2.5: CONSTRUCTION & PHYSICAL DATA

ℹ 4G = 4 × POWER CONDUCTORS + 1 × GREEN/YELLOW PE — 3-PHASE + N + PE (5-WIRE TN-S DISTRIBUTION)

The **4G variants** provide four insulated power conductors — typically coloured brown/black/grey for three live phases (L1/L2/L3) and blue for the neutral (N) — plus the mandatory green/yellow PE conductor. This five-element construction enables direct connection to TN-S earthing systems without the need for a separate earth cable run. The 1.5 mm² variant is widely specified for 16 A lighting and socket circuits; the 2.5 mm² variant handles 25 A feeds with a derated sustained current of approximately 20 A when three conductors are simultaneously fully loaded.



4G1.5 · OD ~9 mm 5-core + PE



4G2.5 · OD ~11 mm 5-core + PE

4G SERIES PHYSICAL DATA		
Parameter	**4G1.5**	**4G2.5**
AWG equivalent	16	14
Outer Ø (mm)	8.4–10.5	10.1–12.5
Cu weight (kg/km)	58	96
Total weight (kg/km)	145	205
Ampacity (30 °C base)	16 A	25 A (≈20 A derated)

27 A. The cable's compact PVC/PVC LS construction and Class 5 fine-stranded conductors make it well-suited for the **tight bend radii inside industrial switchgear cubicles and control cabinets**, while the НГ(А)-LS designation satisfies the most stringent flame-retardancy and smoke-limitation requirements mandated for public buildings and industrial facilities operating under EAEU / Russian Federation fire safety codes. At 11.2–14.3 mm OD and 290 kg/km, the cable feeds directly into standard cable glands and cable tray systems without the bulkiness of armoured alternatives.

COMPLETE SERIES COMPARISON — ALL 5 VARIANTS · PHYSICAL & ELECTRICAL PARAMETERS

MASTER SPECIFICATION TABLE — X05VV-F НГ(А)-LS FULL SERIES

TYPE DESIGNATION	AWG	OUTER Ø (MM)	CU (KG/KM)	WT (KG/KM)	BASE A	DERATED A ⚡
X05VV-F НГ(А)-LS 3G1.5	16	7.4 – 9.4	43	115	16 A	—
X05VV-F НГ(А)-LS 3G2.5	14	9.2 – 11.4	72	165	25 A	—
X05VV-F НГ(А)-LS 4G1.5	16	8.4 – 10.5	58	145	16 A	16 A
X05VV-F НГ(А)-LS 4G2.5	14	10.1 – 12.5	96	205	25 A	≈20 A
X05VV-F НГ(А)-LS 4G4 ★	12	11.2 – 14.3	154	290	34 A	≈27 A

⚡ Derated value: 3 conductors fully loaded simultaneously, factor × 0.80 (VDE 0298-4). 3G variants: only 2 loaded power conductors in single-phase use — derating not generally required. Base ampacity at 30 °C ambient, free air, per DIN VDE 0298-4. Voltage Uo/U = 300/500 V for all variants. "G" = includes green/yellow PE conductor of equal cross-section.

ℹ CORE COLOUR IDENTIFICATION — IEC 60446 / CENELEC HD 308

Standard core identification follows IEC 60446 and CENELEC HD 308: **Brown** = L1 (Phase 1); **Black** = L2 (Phase 2) or switched live; **Grey** = L3 (Phase 3); **Blue** = Neutral (N); **Green/Yellow striped** = Protective Earth (PE). In 3G cables: three conductors typically Brown + Black + Green/Yellow, with Blue used for neutral where required. In 4G cables: Brown + Black + Grey + Blue as power/neutral cores, plus the separate Green/Yellow PE. Cores are identified by colour print on the PVC insulation — readable throughout the cable length without stripping.

MECHANICAL & TEMPERATURE PARAMETERS

MECHANICAL & THERMAL DATA (ALL VARIANTS)	
Conductor class	IEC 60228 Class 5 (fine-stranded tinned Cu)
Max. conductor temp. (normal)	70 °C (PVC insulated)
Max. conductor temp. (short circuit)	160 °C (max. 5 s)
Operating temp. — fixed install.	−40 °C to +70 °C
Operating temp. — occasional movement	−5 °C to +70 °C
Bend radius — fixed installation	4 × OD (minimum)
Bend radius — occasional movement	12.5 × OD (minimum)
Conductor resistance (1.5 mm², 20 °C)	≤ 13.3 Ω/km (IEC 60228 Cl. 5)
Conductor resistance (4.0 mm², 20 °C)	≤ 4.61 Ω/km (IEC 60228 Cl. 5)
Insulation voltage test	2.0 kV AC (1 min, water immersion)

FIRE & ENVIRONMENTAL PROPERTY SUMMARY	
Flame retardancy standard	GOST 31565-2012 / IEC 60332-3-22 Cat. A
Category designation	НГ(А) – Category A (max density)
Combustible volume (test)	≥ 7 L/m (Category A threshold)
Smoke density test standard	IEC 61034-2 (3 m cube test)
Min. light transmittance (3 min)	≥ 60 % (LS criterion)
HCl acid gas emission	Typically < 15 % (IEC 60754-1)
Applicable regulation (RU/EAEU)	Federal Law 123-FZ · EAEU TR 043/2017

ELECTRICAL REFERENCE — AMPACITY PER DIN VDE 0298-4 & MULTI-CORE DERATING

⚠ BASE AMPACITY PER DIN VDE 0298-4 AT 30 °C AMBIENT, FREE AIR — DERATE WHEN 3+ CONDUCTORS SIMULTANEOUSLY FULLY LOADED

Power cable ampacity is determined by the maximum permissible conductor temperature (70 °C for PVC insulation) and the ambient conditions. The base values in this sheet apply to **30 °C ambient, single-circuit free air installation, two loaded conductors in single-phase or three loaded conductors in 3-phase**. When additional conductors are simultaneously loaded at or near full rated current, thermal interaction within the cable cross-section reduces the permissible per-conductor current. For the 4G variants operating as 3-phase + N feeds, the standard derating factor of **× 0.80** applies when all four active conductors carry load — representing the typical TN-S distribution scenario.

CROSS-SECTION	AWG	BASE AMPACITY	TYPICAL APPLICATION
1.5 mm²	16	16 A	Lighting / socket circuits, control wiring
2.5 mm²	14	25 A	Ring main units, machine power feeds
4.0 mm² ★	12	34 A (27 A ⚡)	Sub-distribution boards, motor feeds to ~7.5 kW

MULTI-CORE DERATING FACTOR — DIN VDE 0298-4 (SIMULTANEOUSLY LOADED CONDUCTORS)

2 conductors (1-phase base)	× 1.00
3 conductors (3-phase base)	× 1.00
4 conductors loaded (4G config.)	× 0.80
5 conductors loaded	× 0.75

*Worked examples: 4G4 ★ (4 conductors, 3 phases + N fully loaded): 34 A × 0.80 = **27 A/core**. 4G2.5 (3 phases fully loaded): 25 A × 0.80 = **20 A/core**. — Neutral carries residual unbalance current; if balanced 3-phase load, neutral typically not included in derating calculation per IEC 60364-5-52.*

APPLIED INTERNATIONAL & RUSSIAN/EAEU STANDARDS

- `IEC 60228 Class 5` — Fine-stranded flexible tinned copper conductors; maximum DC resistance limits for each cross-section; ensures the required flexibility for cabinet wiring and occasional repositioning throughout the cable life. Conductor resistance for 4.0 mm² Class 5 must not exceed 4.61 Ω/km at 20 °C.

- `DIN VDE 0298-4` — Current-carrying capacity and derating tables for cables and flexible cords; provides the base ampacity values at 30 °C ambient, free air, and defines the temperature correction and multi-conductor bundle derating factors applied throughout this data sheet.
- `IEC 60332-3-22 / GOST 31565-2012` — Bundle flame propagation test (Category A); the most demanding tier with ≥ 7 L/m combustible material loading. The НГ(А) suffix on Russian-market cables certifies compliance. Used to verify that installed cable bundles will not propagate fire vertically in real-world conduit or cable-tray installations.
- `IEC 61034-2` — Measurement of smoke density of cables burning under defined conditions in a 3 m × 3 m × 3 m chamber. The LS suffix certifies minimum 60 % light transmittance at 3 minutes, ensuring visibility for safe evacuation during fire events. Standard PVC without LS treatment typically falls below 20 % transmittance.
- `IEC 60754-1 / IEC 60754-2` — Tests on gases evolved during combustion of materials from cables; Part 1 measures total acid gas emission (HCl equivalent); Part 2 measures degree of acidity (pH and conductivity). The LS-grade PVC compound used in this series achieves significantly reduced acid gas yield versus standard PVC.
- `EAEU TR 043/2017 / Federal Law 123-FZ` — Eurasian Economic Union Technical Regulation on cable product safety requirements; mandates НГ(А)-LS minimum performance for cables installed in public and industrial buildings in Russia and EAEU member states. Required for EAEU Declaration of Conformity (ДС) and EAC mark.

3G1.5 · 3G2.5	4G1.5 · 4G2.5	4G4 mm² ★
НГ(А) Cat. A	LS Low Smoke	IEC 60228 Cl. 5
300/500 V	VDE 0298-4 Derate	GOST 31565-2012

ORDERING & CONTACT INFORMATION

Specify complete type designation including НГ(А)-LS suffix, core arrangement, cross-section, voltage, and drum/coil quantity. Examples:

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X05VV-F НГ(А)-LS 4G4 300/500V, 500 m drum
X05VV-F НГ(А)-LS 3G2.5 300/500V, 100 m coil
X05VV-F НГ(А)-LS 4G1.5 300/500V, 200 m coil
```

All 5 variants available from stock. Custom lengths, non-standard core counts, armoured variants, and LSZH/halogen-free alternatives available on enquiry. EAEU EAC Declaration of Conformity and GOST test certificates available on request. Compatible replacement for equivalent European H05VV-F LS-PVC series with EAEU / GOST fire-safety compliance.

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