DIN VDE 0250-204 · PVC INSTALLATION CABLE | 300/500 V | 8 sizes | PVC

NYM-O 3× 300/500 V

PVC-Sheathed Installation Cable 300/500 V – 3 cores of equal cross-section in concentric layers with a short lay length. PVC sheath. Complete technical data sheet: construction, dimensions, weights, current ratings, voltage drop and installation guidance for 8 sizes.

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01 Application and Product Overview

NYM-O is the PVC-sheathed installation cable of DIN VDE 0250-204 for fixed installation in dry, damp and wet rooms, in walls, under plaster and in concrete. PVC-insulated copper cores are laid up with a filler compound and enclosed in a grey PVC sheath. It is the standard cable of building services and light industrial installations.

Design

The conductors are solid (class 1) up to 10 mm² and stranded (class 2) from 16 mm². Each core is insulated with PVC compound of type TI1 for 70 °C at the conductor; the cores are stranded with a filler compound that gives the cable its round cross-section, and the sheath is PVC of type TM1. The J versions contain a green-yellow protective core, the O versions do not.

Typical applications

- Fixed installation in dry, damp and wet rooms, inside walls and under plaster
- Installation in cavities, on and in masonry and concrete, except for direct burial
- Circuits for lighting, sockets and fixed appliances in houses and workshops
- Sub-distribution cabling in light industrial buildings
- Agricultural buildings and utility rooms where damp conditions occur
- Outdoor installation in protective conduit, shielded from direct sunlight
- Replacement or extension of existing NYM wiring
- Machine and control-cabinet feeds in fixed, non-moving applications

8 sizes	300/500 V	+70 °C	PVC
Cross-section 1.5 – 35 mm²	Rated voltage U_0/U	Maximum conductor temperature	Sheath: PVC

Key features

- PVC insulation and sheath, rated 70 °C at the conductor, short-circuit temperature 160 °C
- Solid conductors up to 10 mm², stranded conductors from 16 mm²
- Cores identified to DIN VDE 0293-308
- Flame-retardant to IEC 60332-1-2
- Fixed installation only; bending radius 4 × D
- Rated voltage 300/500 V, test voltage 2 kV
- 8 sizes from 1.5 to 35 mm²; weight from 118 to 1,550 kg/km; copper from 43 to 1,010 kg/km

Core layout and conductor

3 cores of equal cross-section in concentric layers with a short lay length. Core colours: brown, black, grey (DIN VDE 0293-308); no protective core is included. The three-core layout feeds a three-phase motor without neutral; protective earth is provided separately.

Standard background

DIN VDE 0250-204 is the national standard of the NYM installation cable. NYM is for fixed installation only; it is not a flexible cable and must not be used for moving parts or for permanent direct burial. Reaction-to-fire classification under the Construction Products Regulation is project-specific and is not stated in this datasheet.

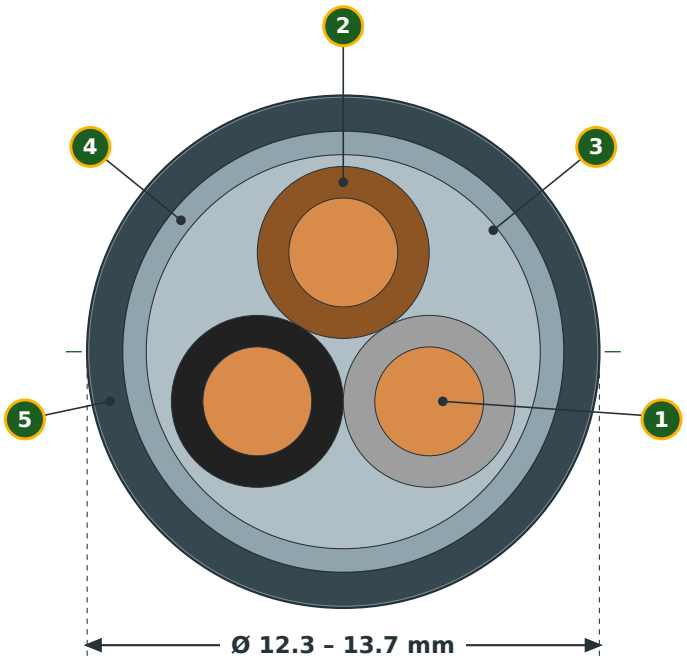
300/500 V suits domestic, office and light-industrial circuits up to 400 V three-phase. The test voltage is 2 kV.

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02 Construction

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

NYM-O
Sample size 3×6 · Rev 0 · Illustrative, not to scale



No.	Component	Material
1	Conductor	Solid copper, class 1 to IEC 60228 (up to 10 mm²); stranded class 2 from 16 mm²
2	Insulation	PVC compound, type TI1 (70 °C)
3	Filler and binder tape	Rubber or compound filler with polyester binder tape
4	Inner sheath	Rubber compound, extruded over the stranded core
5	Outer sheath	PVC compound, type TM1

The drawing shows size 3×6. 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	Bare solid copper, class 1 (up to 10 mm²) and stranded class 2 (from 16 mm²) to DIN VDE 0295 / IEC 60228
Insulation	PVC compound, type TI1 (70 °C), maximum conductor temperature 70 °C
Core identification	Brown, black, grey to DIN VDE 0293-308
Stranding	Cores in concentric layers with a short lay length
Inner sheath	Rubber compound; thickness about 0.6 mm at this size
Outer sheath	PVC compound, type TM1; thickness about 0.9 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; installation method C for NYM-type cables
Conductor resistance	Maximum at 20 °C, class 1 / class 2 solid and stranded

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Thermal and mechanical data

Maximum conductor temperature	+70 °C
Maximum temperature at short circuit	+160 °C (5 s maximum)
Ambient temperature, fixed installation	−30 °C to +70 °C
Ambient temperature, handling	+5 °C to +70 °C; not for moving applications
Minimum bending radius	Fixed installation: 4 × D
Maximum tensile load	50 N/mm² during installation on the total copper cross-section
Flame propagation	IEC 60332-1-2 / DIN EN 60332-1-2
Halogen-free	No (PVC)
Mineral oil resistance	Not specified
UV and ozone resistance	Limited; protect from direct sunlight
Water	Damp and wet rooms, fixed installation

04 Dimensions, Weights and Rated Data – 300/500 V (8 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
3×1.5	FC-NYM-0709-01	1.4	8.9	9.9	40	–	118	43	225	12.1	20	0.172
3×2.5	FC-NYM-0709-02	1.8	10.1	11.3	45	–	176	72	375	7.41	27	0.287
3×4	FC-NYM-0709-03	2.3	11.2	12.5	50	–	268	115	600	4.61	36	0.460
3×6	FC-NYM-0709-04	2.8	12.3	13.7	55	–	337	173	900	3.08	46	0.690
3×10	FC-NYM-0709-05	3.6	15.2	16.9	68	–	530	288	1,500	1.83	63	1.15
3×16	FC-NYM-0709-06	4.7	18.3	20.3	81	–	820	460	2,400	1.15	85	1.84
3×25	FC-NYM-0709-07	5.9	22.2	24.7	99	–	1,230	720	3,750	0.727	112	2.88
3×35	FC-NYM-0709-08	7.0	24.0	26.5	106	–	1,550	1,010	5,250	0.524	138	4.03

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 = 50 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 70 °C)

°C	20	25	30	35	40	45	50	55	60
Factor	1.12	1.06	1.00	0.94	0.87	0.79	0.71	0.61	0.50

Short-circuit current rating

I_k = 0.115 kA/mm² × cross-section of the power core (conductor 70 °C → 160 °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 70 °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 70 °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
3×1.5	20	14.5	40.29	10.07	1.74	0.545	0.244	0.172	0.100
3×2.5	27	8.87	33.39	8.35	1.94	0.909	0.407	0.287	0.166
3×4	36	5.52	27.81	6.95	2.14	1.45	0.651	0.460	0.266
3×6	46	3.69	23.87	5.97	2.34	2.18	0.976	0.690	0.398
3×10	63	2.19	19.64	4.91	2.61	3.64	1.63	1.15	0.664
3×16	85	1.38	16.91	4.23	2.98	5.82	2.60	1.84	1.06
3×25	112	0.870	14.43	3.61	3.27	9.09	4.07	2.88	1.66
3×35	138	0.627	13.14	3.28	3.58	12.73	5.69	4.03	2.32

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06 Selection Guide and Sizing Aid

NYM-O 3× covers 8 sizes. The smallest, 3×1.5, has an outer diameter of up to 9.9 mm and weighs about 118 kg/km; the largest, 3×35, has an outer diameter of up to 26.5 mm and weighs about 1,550 kg/km, 13.1 times as much. Across the range the rated current rises from 20 A to 138 A at 30 °C and the fixed bending radius from 40 mm to 106 mm.

Example 1. A circuit draws 23 A continuously at 40 °C ambient temperature, in a group of two cables. Temperature factor 0.87, grouping factor 0.80: required table current = 23 / (0.87 × 0.80) = 34 A. The smallest suitable size is 3×4 with 36 A.

Example 2. A circuit draws 73 A continuously at 35 °C ambient temperature, on its own. Temperature factor 0.94: required table current = 73 / (0.94) = 79 A. The smallest suitable size is 3×16 with 85 A.

07 Engineering Profile by Size

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

3×1.5. This size has with a conductor of Ø 1.4 mm under 0.70 mm of insulation (core Ø 2.8 mm) and 0.6 mm inner and 0.8 mm outer sheath; outer diameter 8.9–9.9 mm, weight about 118 kg/km of which copper 43 kg/km (36 %). Rated current 20 A at 30 °C; at that load the voltage drop is 40.29 V per 100 m (10.07 % of 400 V) and the loss 1.74 kW per 100 m. Bending radius 40 mm fixed, no moving use; gland M16, lug bolt M5. Short-circuit rating 0.172 kA for 1 s; permitted pull 225 N, free-hanging length 194 m.

3×2.5. This size has with a conductor of Ø 1.8 mm under 0.80 mm of insulation (core Ø 3.4 mm) and 0.6 mm inner and 0.8 mm outer sheath; outer diameter 10.1–11.3 mm, weight about 176 kg/km of which copper 72 kg/km (41 %). Rated current 27 A at 30 °C; at that load the voltage drop is 33.39 V per 100 m (8.35 % of 400 V) and the loss 1.94 kW per 100 m. Bending radius 45 mm fixed, no moving use; gland M20, lug bolt M5. Short-circuit rating 0.287 kA for 1 s; permitted pull 375 N, free-hanging length 217 m.

3×4. This size has with a conductor of Ø 2.3 mm under 0.80 mm of insulation (core Ø 3.9 mm) and 0.6 mm inner and 0.9 mm outer sheath; outer diameter 11.2–12.5 mm, weight about 268 kg/km of which copper 115 kg/km (43 %). Rated current 36 A at 30 °C; at that load the voltage drop is 27.81 V per 100 m (6.95 % of 400 V) and the loss 2.14 kW per 100 m. Bending radius 50 mm fixed, no moving use; gland M25, lug bolt M5. Short-circuit rating 0.460 kA for 1 s; permitted pull 600 N, free-hanging length 228 m.

3×6. This size has with a conductor of Ø 2.8 mm under 0.80 mm of insulation (core Ø 4.4 mm) and 0.6 mm inner and 0.9 mm outer sheath; outer diameter 12.3–13.7 mm, weight about 337 kg/km of which copper 173 kg/km (51 %). Rated current 46 A at 30 °C; at that load the voltage drop is 23.87 V per 100 m (5.97 % of 400 V) and the loss 2.34 kW per 100 m. Bending radius 55 mm fixed, no moving use; gland M25, lug bolt M5. Short-circuit rating 0.690 kA for 1 s; permitted pull 900 N, free-hanging length 272 m.

3×10. This size has with a conductor of Ø 3.6 mm under 1.00 mm of insulation (core Ø 5.6 mm) and 0.6 mm inner and 1.1 mm outer sheath; outer diameter 15.2–16.9 mm, weight about 530 kg/km of which copper 288 kg/km (54 %). Rated current 63 A at 30 °C; at that load the voltage drop is 19.64 V per 100 m (4.91 % of 400 V) and the loss 2.61 kW per 100 m. Bending radius 68 mm fixed, no moving use; gland M25, lug bolt M6. Short-circuit rating 1.15 kA for 1 s; permitted pull 1,500 N, free-hanging length 288 m.

3×16. This size has with a conductor of Ø 4.7 mm under 1.00 mm of insulation (core Ø 6.7 mm) and 0.6 mm inner and 1.6 mm outer sheath; outer diameter 18.3–20.3 mm, weight about 820 kg/km of which copper 460 kg/km (56 %). Rated current 85 A at 30 °C; at that load the voltage drop is 16.91 V per 100 m (4.23 % of 400 V) and the loss 2.98 kW per 100 m. Bending radius 81 mm fixed, no moving use; gland M32, lug bolt M6. Short-circuit rating 1.84 kA for 1 s; permitted pull 2,400 N, free-hanging length 298 m.

3×25. This size has with a conductor of Ø 5.9 mm under 1.20 mm of insulation (core Ø 8.3 mm) and 0.6 mm inner and 1.9 mm outer sheath; outer diameter 22.2–24.7 mm, weight about 1,230 kg/km of which copper 720 kg/km (59 %). Rated current 112 A at 30 °C; at that load the voltage drop is 14.43 V per 100 m (3.61 % of 400 V) and the loss 3.27 kW per 100 m. Bending radius 99 mm fixed, no moving use; gland M32, lug bolt M8. Short-circuit rating 2.88 kA for 1 s; permitted pull 3,750 N, free-hanging length 310 m.

3×35. This size has with a conductor of Ø 6.9 mm under 1.20 mm of insulation (core Ø 9.3 mm) and 0.6 mm inner and 1.7 mm outer sheath; outer diameter 24.0–26.5 mm, weight about 1,550 kg/km of which copper 1,010 kg/km (65 %). Rated current 138 A at 30 °C; at that load the voltage drop is 13.14 V per 100 m (3.28 % of 400 V) and the loss 3.58 kW per 100 m. Bending radius 106 mm fixed, no moving use; gland M40, lug bolt M8. Short-circuit rating 4.03 kA for 1 s; permitted pull 5,250 N, free-hanging length 345 m.

Averaged over all sizes copper makes up 57 % of the cable weight; the share rises from 36 % at 3×1.5 to 65 % at 3×35, which is why the larger sizes are costed mostly on the copper market price.

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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, %
3×1.5	1.38	2.78	0.70	6.6	0.60	0.80	–	30
3×2.5	1.78	3.38	0.80	7.9	0.60	0.80	–	26
3×4	2.26	3.86	0.80	8.9	0.60	0.87	–	25
3×6	2.76	4.36	0.80	10.0	0.60	0.90	–	23
3×10	3.57	5.57	1.00	12.6	0.60	1.13	–	22
3×16	4.68	6.68	1.00	15.0	0.60	1.57	–	22
3×25	5.85	8.25	1.20	18.4	0.60	1.95	–	22
3×35	6.92	9.32	1.20	20.7	0.60	1.70	–	18

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
3×1.5	9.9	M16	M5	10	20
3×2.5	11.3	M20	M5	10	20
3×4	12.5	M25	M5	10	25
3×6	13.7	M25	M5	11	30
3×10	16.9	M25	M6	11	35
3×16	20.3	M32	M6	12	40
3×25	24.7	M32	M8	14	50
3×35	26.5	M40	M8	16	55

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 3×6

Variant	Differs in	Outer Ø / H mm	Weight kg/km	Pull N	Current A
This datasheet NYM-O 3× 300/500 V	–	13.7	337	900	46
NYM-J 3G 300/500 V 3G6	core configuration	13.7 (+0%)	337 (+0%)	900 (+0%)	46 (+0%)
NYM-J 4G 300/500 V 4G6	core configuration	15.1 (+10%)	440 (+31%)	1,200 (+33%)	46 (+0%)
NYM-O 2× 300/500 V 2×6	core configuration	13.9 (+1%)	278 (-18%)	600 (-33%)	46 (+0%)
NYM-O 4× 300/500 V 4×6	core configuration	15.1 (+10%)	440 (+31%)	1,200 (+33%)	39 (-15%)
NYM-J 1G 300/500 V 1G6	core configuration	7.5 (-45%)	106 (-69%)	300 (-67%)	46 (+0%)
NYM-J 5G 300/500 V 5G6	core configuration	16.0 (+17%)	510 (+51%)	1,500 (+67%)	39 (-15%)
NYM-O 300/500 V 1×6	core configuration	7.5 (-45%)	106 (-69%)	300 (-67%)	46 (+0%)
NYM-O 5× 300/500 V 5×6	core configuration	16.0 (+17%)	510 (+51%)	1,500 (+67%)	34 (-26%)

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

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11 Standards and Testing

Standard	Scope
DIN VDE 0250-204	PVC-sheathed installation cable NYM-J / NYM-O, 300/500 V
DIN VDE 0295 / IEC 60228	Conductors, class 1 and class 2
DIN VDE 0293-308	Core identification
DIN VDE 0298-4	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
- Flame propagation test (IEC 60332-1-2) 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 0250-204. 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.

12 Installation, Marking and Delivery

Installation guidance

- Install at ambient temperatures of −5 °C or higher; PVC stiffens in the cold.
- Keep the bending radius at 4 × D or more; do not kink the cable.
- Fix the cable with clips that do not squeeze the sheath, at the usual distances for the installation method.
- Do not use NYM for moving applications; use a flexible rubber or PUR cable instead.
- In wet rooms use cable glands or sealing entries rated for the enclosure.
- Observe the current-carrying capacity for the installation method and the grouping with other cables.

Sheath marking

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FEICHUN NYM-O [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: NYM-O 3×6 300/500 V – 500 m on one drum. When requesting a quotation, state the cable type, configuration, cross-section, voltage, conductor (bare copper), 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.

- NYM-J 3G 300/500 V – core configuration, PVC
- NYM-J 4G 300/500 V – core configuration, PVC
- NYM-O 2× 300/500 V – core configuration, PVC
- NYM-O 4× 300/500 V – core configuration, PVC

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- NYM-J 1G 300/500 V – core configuration, PVC
- NYM-J 5G 300/500 V – core configuration, PVC
- NYM-O 300/500 V – core configuration, PVC
- NYM-O 5× 300/500 V – core configuration, PVC

Overview of all NYM datasheets: NYM PVC Installation Cables

Frequently asked questions

Is NYM suitable for outdoor use?
Only in protective conduit and shielded from direct sunlight; direct burial requires a cable such as NYY.

What do -J and -O mean?
J: with green-yellow protective core; O: without. NYM-O is the O (without PE core) version.

What sizes are available for NYM-O 3×?
8 sizes from 1.5 to 35 mm². The outer dimension of the largest size, 3×35, is 26.5 mm and the weight is about 1,550 kg/km.

What current can 3×10 carry?
63 A in free air at 30 °C ambient, with the conductor at 70 °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 NYM-O 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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