ANHUI FEICHUN SPECIAL CABLE CO., LTD.
安徽飞纯特种电缆有限公司
THERMOCOUPLE & INSTRUMENTATION CABLE SPECIALIST

DOCUMENT FC-DS-KNLST-KCA-2025-001
REVISION Rev. A | **DATE** 2025-07-01
CLASS Technical Data Sheet | Thermocouple Compensation
STANDARD IEC 60584 | DIN 43710

PRODUCT SPECIFICATION — THERMOCOUPLE COMPENSATION CABLE, MULTI-PAIR, FOIL-SCREENED

KNL-ST NiCr/Ni KCA

Compensating Cable for Type K Thermocouple | PVC-ST-PVC Construction
Multi-Pair (12 × 2 × 1.5 mm²) | Aluminium Foil Screen + Drain Wire

Contact: Tech@feichuncables.com

K TYPE K THERMOCOUPLE COMPENSATION | NiCr/Ni | KCA CLASS

★ FEATURED SPECIFICATION
12 × 2 × 1.5 mm²
KCA — IEC 60584
Replaces: LAPP 0168510

CROSS-REFERENCE — DIRECT REPLACEMENT

This product is a **direct equivalent replacement** for **LAPP KABEL P/N 0168510** (NiCr/Ni IEC-KCA PVC-ST-PVC 12×2×1.5). Identical construction type, conductor alloy, screening, and colour coding per IEC 60584.

FEATURED SPECIFICATION

PRODUCT PARAMETERS	
Type designation	**KNL-ST NiCr/Ni KCA 12×2×1.5 IEC**
Thermocouple type	**Type K (NiCr/Ni)**
Compensation class	**KCA (compensating alloy)**
No. of pairs × cross-section	**12 × 2 × 1.5 mm² (12 pairs, 24 cores)**
AWG equivalent	**≈ 16 AWG**
Screen type — ST	**Aluminium foil + drain wire**
Approx. outer diameter	**22.2 mm**
Approx. weight	**573 kg/km**
Cu weight	**Negligible (alloy conductors)***

* Conductors are Fe/CuNi alloy — not pure copper. Copper weight applies only to drain wire, which is minimal.

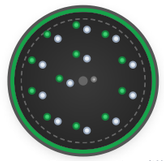
CONDUCTOR ALLOY & COMPENSATION PRINCIPLE

POLE	ALLOY	IEC COLOUR
+ (Positive)	Fe (Iron)	Green (sheath & positive)
– (Negative)	CuNi (Constantan)	White

KCA Compensation Principle: Although designed for Type K (NiCr/Ni) thermocouples, KCA-class cables use lower-cost substitute alloys (Fe/CuNi) that replicate the thermoelectric EMF characteristics of NiCr/Ni within a limited operating range — typically **0 °C to +100 °C** (or up to +150 °C). This provides accurate temperature signal transmission at substantially lower material cost than extension-grade (KX) cables. Tolerance acc. to Class 2 per DIN/IEC.

CABLE CONSTRUCTION — PVC-ST-PVC

- **Conductor:** Finely stranded thermocouple compensation alloy, 48 × 0.20 mm construction (Fe for +, CuNi for −), conforming to IEC 60584 Class KCA
- **Core insulation:** PVC (Polyvinyl Chloride)
- **Core identification:** Pairs with consecutive digit printing (1-1, 2-2, 3-3 … 12-12) from 4 cores onward. Colour coding per IEC 60584-3
- **Pair construction:** Cores twisted in pairs; pairs stranded in layers
- **Screen — ST (Static):** Aluminium foil shield over entire cable assembly with tinned copper drain wire — provides EMI protection for low-level thermocouple signals
- **Outer sheath:** PVC
- **Sheath colour:** Green (Type K identification per IEC 60584)



Cross-section (illustrative): 12 twisted pairs (green +, white −)
Al-foil screen (dashed ring) with drain wire | Green PVC outer sheath

CONSTRUCTION VERSIONS AVAILABLE

VERSION	CONSTRUCTION	APPLICATION
Y	PVC insulation → layers stranded → PVC outer sheath	Standard, no screen or armour
SY	As Y + galvanised steel braid + PVC outer sheath	Mechanical protection
ST ★	Pairs twisted → layers → Al foil screen + drain wire → PVC outer sheath	EMI shielding (this product)

MECHANICAL PARAMETERS

Min. bending radius — flexible	12.5 × Outer Ø
Min. bending radius — SY (steel braid)	15 × Outer Ø
Min. bending radius — ST (foil screen)	15 × Outer Ø

CLASSIFICATION

COLOUR CODING — IEC 60584 VS DIN 43710

IEC 60584 (THIS PRODUCT)

TC TYPE	+ CONDUCTOR	– CONDUCTOR	SHEATH
K (NiCr/Ni)	Green	White	Green
J (Fe/CuNi)	Black	White	Black
S/R (PtRh/Pt)	Orange	White	Orange

DIN 43710 (REFERENCE)

TC TYPE	+ CONDUCTOR	– CONDUCTOR & SHEATH
K (NiCr/Ni)	Red	Green
J (Fe/CuNi)	Red	Blue
S/R (PtRh/Pt)	Red	White

ALLOY DESIGNATION GUIDE

X-suffix = Thermocouple extension alloy (e.g. **JX**, **KX**) — uses the same alloy as the thermocouple itself.

C-suffix = Compensation alloy (e.g. **KCA**) — uses a lower-cost substitute alloy that matches EMF characteristics within a limited temperature range.

APPLICATION

Multi-pair thermocouple compensation cables are designed for **temperature measurement and process control systems** in industrial environments. The ST (static screen) version provides aluminium foil shielding to protect low-level thermocouple signals from electromagnetic interference. Suitable for connection between Type K thermocouples and instrumentation panels, DCS/PLC systems, and data acquisition equipment.

APPLICABLE STANDARDS

- IEC 60584 — Thermocouples: EMF tables, tolerances & colour codes
- DIN 43710 — Thermocouple & compensation cables (DIN colour code)
- IEC 60584-3 — Extension & compensating cable colour identification
- DIN VDE 0207 — PVC insulation and sheath compounds
- Tolerance: Class 2 per DIN / IEC
- Classification: ETIM 5.0 / 6.0 EC000838

TEMPERATURE RANGE

REFERRED TO INSULATION & SHEATH MATERIALS	
Flexible operation	−5 °C to +80 °C
Fixed installation	−40 °C to +80 °C

ETIM 5.0 Class-ID	EC000838
ETIM 5.0 Description	Thermocouple compensating cable
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ETIM 6.0 Description	Thermocouple compensating cable

PACKAGING & DELIVERY

Standard packaging	Coil ≤ 30 kg or ≤ 250 m; drum for larger quantities
Order specification	Please specify format (e.g. 1 × 500 m drum or 5 × 100 m coils)

ORDER REFERENCE & CONTACT

For inquiries and orders, please reference: **KNL-ST NiCr/Ni KCA 12×2×1.5 IEC**
Cross-reference: **LAPP 0168510** (direct replacement)
Contact: **Tech@feichuncables.com** | Custom pair counts and lengths available on request.

All data are nominal and subject to normal manufacturing tolerances.
The company reserves the right to modify specifications without prior notice.
Replaces LAPP Kabel P/N 0168510 | IEC 60584 / DIN 43710 compliant.