



IEC 60584-3 Type NC compensating cable

# NC

## Type N Thermocouple Compensating Cable

Cu / CuNi compensating cable (NCA / NCB) for Type N (Nicrosil-Nisil) thermocouples



IEC 60584-3 Type NC (NCA/NCB)

Cu (+) / CuNi (-) Compensating

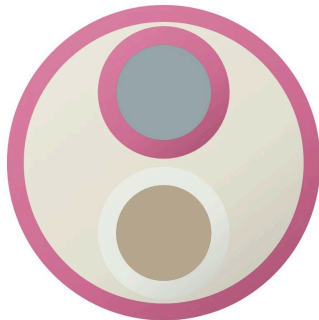
Class 2 ( $\pm 2.5$  °C) · Low Loop R

### Application

Low-resistance Type NC (NCA 0...+200 °C and NCB 0...+100 °C) thermocouple compensating cable built to IEC 60584-3 with specially alloyed Copper (+ Cu) and Copper-Nickel (- CuNi) conductors calibrated to match the  $\sim 27.7 \mu\text{V}/^\circ\text{C}$  Type N (Nicrosil-Nisil) EMF slope.

**Typical uses:** Steel Blast Furnaces, Stoves & Reheat Furnaces, Ethylene Crackers & Petrochemical Heaters, Power Generation Boilers & Superheaters, Ceramic, Brick & Refractory Tunnel Kilns, Industrial Incineration & Flue-Gas Trunks

### Construction



Cross-section, not to scale

**1** Matched Type NC (NCA/NCB) compensating conductors**2** Colour-coded core insulation**3** Individual & collective Al/PET screens

100 % electrostatic shielding

**4** Optional SWA armour**5** Outer jacket (Pink RAL 3015, Orange or Ex-i Blue)

IEC 60332-1-2 / IEC 60332-3-24 flame retardant

## Technical data

Typical values

|                                         |                                                                                                                                                              |                                        |                                                                                                                                               |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Compensated thermocouple type           | Type N (Nicrosil-Nisil, NiCrSi-NiSi) per IEC 60584-1                                                                                                         | Positive conductor (+)                 | High-conductivity Copper (Cu, non-magnetic, ~1.72 $\mu\Omega\cdot\text{cm}$ )                                                                 |
| Negative conductor (-)                  | Type-N-calibrated Copper-Nickel (CuNi alloy, non-magnetic, ~34 $\mu\Omega\cdot\text{cm}$ )                                                                   | Tolerance Class 2 (IEC 60584-3)        | $\pm 2.5\text{ }^{\circ}\text{C}$ ( $\pm 65\text{ }\mu\text{V}$ ) over 0...+100 $^{\circ}\text{C}$ (NCB) or 0...+200 $^{\circ}\text{C}$ (NCA) |
| Loop resistance @ 20 $^{\circ}\text{C}$ | $\approx 0.72\text{ }\Omega/\text{m}$ (0.5 mm <sup>2</sup> ) · 0.36 $\Omega/\text{m}$ (1.0 mm <sup>2</sup> ) · 0.24 $\Omega/\text{m}$ (1.5 mm <sup>2</sup> ) | Permissible junction temperature range | 0 $^{\circ}\text{C}$ to +100 $^{\circ}\text{C}$ (Type NCB) · 0 $^{\circ}\text{C}$ to +200 $^{\circ}\text{C}$ (Type NCA)                       |
| Insulation rating (by jacket type)      | -25...+105 $^{\circ}\text{C}$ (PVC) · -40...+90 $^{\circ}\text{C}$ (XLPE/LSZH) · -60...+200 $^{\circ}\text{C}$ (FEP)                                         | Conductor stranding                    | 0.5 mm <sup>2</sup> (7/0.30) · 1.0 mm <sup>2</sup> (7/0.43) · 1.5 mm <sup>2</sup> (7/0.53)                                                    |
| Min. bending radius                     | 7.5 × OD (unarmoured) · 10 × OD (SWA armoured)                                                                                                               | Flame retardance                       | IEC 60332-1-2 & IEC 60332-3-24 Cat C                                                                                                          |
| Corrosion resistance                    | 100 % non-ferrous Cu/CuNi conductors                                                                                                                         | Standards                              | IEC 60584-3 & ANSI/ISA MC96.1                                                                                                                 |

## Sizes

14 standard constructions

Tick the sizes you need and send this page to [info@tebaoflex.com](mailto:info@tebaoflex.com) or WhatsApp +86 185 9591 3361.

| Order designation                                                                         | Configuration                     | Insulation / Sheath | Junction range              | Outer Ø ≈ mm | Weight ≈ kg/km | Min. bend R fixed mm |
|-------------------------------------------------------------------------------------------|-----------------------------------|---------------------|-----------------------------|--------------|----------------|----------------------|
| NCB PVC / PVC Screened Marshalling Cables (0...+100 $^{\circ}\text{C}$ ) 9 sizes          |                                   |                     |                             |              |                |                      |
| <input type="checkbox"/> NCB-PVC-OS 1×2×0.5                                               | 1×2×0.5 mm <sup>2</sup> (7/0.30)  | PVC / PVC (OS)      | 0...+100 $^{\circ}\text{C}$ | 5.6          | 44             | 42                   |
| <input type="checkbox"/> NCB-PVC-PiMF 2×2×0.5                                             | 2×2×0.5 mm <sup>2</sup> (7/0.30)  | PVC / PVC (PiMF+OS) | 0...+100 $^{\circ}\text{C}$ | 8.6          | 84             | 64                   |
| <input type="checkbox"/> NCB-PVC-PiMF 4×2×0.5                                             | 4×2×0.5 mm <sup>2</sup> (7/0.30)  | PVC / PVC (PiMF+OS) | 0...+100 $^{\circ}\text{C}$ | 10.8         | 142            | 81                   |
| <input type="checkbox"/> NCB-PVC-PiMF 8×2×0.5                                             | 8×2×0.5 mm <sup>2</sup> (7/0.30)  | PVC / PVC (PiMF+OS) | 0...+100 $^{\circ}\text{C}$ | 14.1         | 246            | 106                  |
| <input type="checkbox"/> NCB-PVC-PiMF 12×2×0.5                                            | 12×2×0.5 mm <sup>2</sup> (7/0.30) | PVC / PVC (PiMF+OS) | 0...+100 $^{\circ}\text{C}$ | 16.9         | 348            | 127                  |
| <input type="checkbox"/> NCB-PVC-OS 1×2×1.0                                               | 1×2×1.0 mm <sup>2</sup> (7/0.43)  | PVC / PVC (OS)      | 0...+100 $^{\circ}\text{C}$ | 6.7          | 68             | 50                   |
| <input type="checkbox"/> NCB-PVC-PiMF 4×2×1.0                                             | 4×2×1.0 mm <sup>2</sup> (7/0.43)  | PVC / PVC (PiMF+OS) | 0...+100 $^{\circ}\text{C}$ | 12.8         | 212            | 96                   |
| <input type="checkbox"/> NCB-PVC-OS 1×2×1.5                                               | 1×2×1.5 mm <sup>2</sup> (7/0.53)  | PVC / PVC (OS)      | 0...+100 $^{\circ}\text{C}$ | 7.5          | 92             | 56                   |
| <input type="checkbox"/> NCB-PVC-PiMF 4×2×1.5                                             | 4×2×1.5 mm <sup>2</sup> (7/0.53)  | PVC / PVC (PiMF+OS) | 0...+100 $^{\circ}\text{C}$ | 14.3         | 286            | 107                  |
| NCA FEP / FEP Extended-Range Compensating Cables (0...+200 $^{\circ}\text{C}$ ) 2 sizes   |                                   |                     |                             |              |                |                      |
| <input type="checkbox"/> NCA-FEP-OS 1×2×1.0                                               | 1×2×1.0 mm <sup>2</sup> (7/0.43)  | FEP / FEP (OS)      | 0...+200 $^{\circ}\text{C}$ | 5.6          | 58             | 42                   |
| <input type="checkbox"/> NCA-FEP-PiMF 4×2×1.0                                             | 4×2×1.0 mm <sup>2</sup> (7/0.43)  | FEP / FEP (PiMF+OS) | 0...+200 $^{\circ}\text{C}$ | 11.2         | 188            | 84                   |
| NCB XLPE / LSZH / SWA Armoured Direct-Burial Trunks (0...+90 $^{\circ}\text{C}$ ) 3 sizes |                                   |                     |                             |              |                |                      |
| <input type="checkbox"/> NCB-XLPE-SWA 1×2×1.5                                             | 1×2×1.5 mm <sup>2</sup> (7/0.53)  | XLPE / SWA / LSZH   | 0...+90 $^{\circ}\text{C}$  | 12.1         | 298            | 121                  |
| <input type="checkbox"/> NCB-XLPE-SWA 4×2×1.5                                             | 4×2×1.5 mm <sup>2</sup> (7/0.53)  | XLPE / SWA / LSZH   | 0...+90 $^{\circ}\text{C}$  | 19.8         | 745            | 198                  |
| <input type="checkbox"/> NCB-XLPE-SWA 8×2×1.5                                             | 8×2×1.5 mm <sup>2</sup> (7/0.53)  | XLPE / SWA / LSZH   | 0...+90 $^{\circ}\text{C}$  | 25.4         | 1,210          | 254                  |

– Do not interchange KCB and NCB: although both use Cu/CuNi alloys, NCB uses a different CuNi composition matched to ~27.7  $\mu\text{V}/^{\circ}\text{C}$  instead of ~40.6  $\mu\text{V}/^{\circ}\text{C}$ .

## NC vs NX loop resistance & tolerance comparison

3 sizes

| IEC 60584-3 code    | Conductor alloys +/-      | Junction temp. range                              | Tolerance                                                                  | Loop R @ 1.0 mm <sup>2</sup> $\Omega/\text{m} \approx$ |
|---------------------|---------------------------|---------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------|
| NX (True Extension) | (+) NiCrSi / (-) NiSi     | -25 $^{\circ}\text{C}$ to +200 $^{\circ}\text{C}$ | Class 1: $\pm 1.5\text{ }^{\circ}\text{C}$ ( $\pm 39\text{ }\mu\text{V}$ ) | 1.35                                                   |
| NCA (Compensating)  | (+) Cu / (-) CuNi (N-cal) | 0 $^{\circ}\text{C}$ to +200 $^{\circ}\text{C}$   | Class 2: $\pm 2.5\text{ }^{\circ}\text{C}$ ( $\pm 65\text{ }\mu\text{V}$ ) | 0.36                                                   |
| NCB (Compensating)  | (+) Cu / (-) CuNi (N-cal) | 0 $^{\circ}\text{C}$ to +100 $^{\circ}\text{C}$   | Class 2: $\pm 2.5\text{ }^{\circ}\text{C}$ ( $\pm 65\text{ }\mu\text{V}$ ) | 0.36                                                   |

– NC cuts loop resistance from 1.35  $\Omega/\text{m}$  to 0.36  $\Omega/\text{m}$  at 1.0 mm<sup>2</sup>, preventing high source impedance faults on long DCS input runs.

## Standards and approvals

- ✓ IEC 60584-3 Class 2 (NCA / NCB) Certified
- ✓ BS EN 50288-7 & BS 5308 Compliant
- ✓ CE, RoHS 2 (2011/65/EU) & REACH

## Certifications



Management systems: ISO 9001, ISO 14001, ISO 45001

### Request a quotation

Send the size, length and destination. An application engineer replies within 2 business hours.

WhatsApp / phone

+86 185 9591 3361

Email

info@tebaoflex.com

Web

[tebaoflex.com/cables/type-n-thermocouple-compensating-cable](https://tebaoflex.com/cables/type-n-thermocouple-compensating-cable)



Typical values for this cable type, based on IEC 60584-3 / BS EN 50288-7. Values for your order are confirmed in the quotation. Subject to change without notice.  
Jiangsu Tebaoflex Special Cable Co., Ltd., Taicang, Jiangsu, China.