



IEC 60584-3 Type EX thermocouple cable

EX / Type E extension Thermocouple Cable

True NiCr / CuNi (Type E) high-EMF ($\sim 68 \mu\text{V}/^\circ\text{C}$) non-magnetic thermocouple cable



IEC 60584-3 / ANSI MC96.1

NiCr (+) / CuNi (-) True EX

 $\sim 68 \mu\text{V}/^\circ\text{C}$ · Non-Magnetic

Application

High-output Type EX thermocouple extension cable built to IEC 60584-3 and ANSI MC96.1 with non-magnetic Nickel-Chromium (+ NiCr) and Copper-Nickel (- CuNi) conductors delivering the highest Seebeck output ($\sim 68 \mu\text{V}/^\circ\text{C}$) of any standard thermocouple.

Typical uses: Gas & Steam Turbine Exhaust Monitoring, Cryogenic Air Separation & LNG Plants, MRI, Cyclotron & High-Magnetic-Field Labs, Aerospace Propulsion & Thermal Test Cells, Chemical & Petrochemical Process Units

Construction



EX / TYPE E EXTENSION TEBAOFLEX.COM



Cross-section, not to scale

1 True Type EX thermocouple alloy conductors**2** Colour-coded core insulation**3** Individual & collective Al/PET screens

100 % electrostatic shielding

4 Optional SWA or tinned copper braid**5** Outer jacket (Violet / Purple RAL 4005 or Ex-i Blue)

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

Technical data

Typical values

Positive conductor (+)	Nickel-Chromium (NiCr ~90 % Ni / 10 % Cr, non-magnetic, ~70.6 $\mu\Omega\cdot\text{cm}$)	Negative conductor (-)	Copper-Nickel (CuNi ~55 % Cu / 45 % Ni, non-magnetic, ~49 $\mu\Omega\cdot\text{cm}$)
Tolerance Class 1 (IEC 60584-3)	$\pm 1.5\text{ }^{\circ}\text{C}$ ($\pm 120\text{ }\mu\text{V}$) over $-25\text{ }^{\circ}\text{C}$ to $+200\text{ }^{\circ}\text{C}$ junction range	Tolerance Class 2 (IEC 60584-3)	$\pm 2.5\text{ }^{\circ}\text{C}$ ($\pm 200\text{ }\mu\text{V}$) over $-25\text{ }^{\circ}\text{C}$ to $+200\text{ }^{\circ}\text{C}$ junction range
Nominal Seebeck coefficient	$\approx 68.0\text{ }\mu\text{V}/^{\circ}\text{C}$ (0 to $+100\text{ }^{\circ}\text{C}$) · loop R $\approx 1.20\text{ }\Omega/\text{m}$ at 1.0 mm^2	Thermoelectric calibration range	$-25\text{ }^{\circ}\text{C}$ to $+200\text{ }^{\circ}\text{C}$ (true extension grade EX)
Insulation rating (by jacket type)	$-25\ldots+105\text{ }^{\circ}\text{C}$ (HR-PVC) · $-40\ldots+90\text{ }^{\circ}\text{C}$ (XLPE/LSZH) · $-60\ldots+200\text{ }^{\circ}\text{C}$ (FEP)	Conductor stranding	0.5 mm^2 (7/0.30) · 1.0 mm^2 (7/0.43) · 1.5 mm^2 (7/0.53) or solid
Min. bending radius	$7.5 \times \text{OD}$ (unarmoured) · $10 \times \text{OD}$ (SWA armoured)	Flame retardance	IEC 60332-1-2 & IEC 60332-3-24 Cat C
Corrosion & magnetic immunity	100 % non-ferrous, non-magnetic conductor pair	Standards	IEC 60584-3, ANSI/ISA MC96.1 (ASTM E230) & DIN 43722

Sizes

14 standard constructions

Tick the sizes you need and send this page to info@tebaoflex.com or WhatsApp +86 185 9591 3361.

Order designation	Configuration	Insulation / Sheath	Temp. range	Outer $\varnothing \approx$ mm	Weight $\approx$ kg/km	Min. bend R fixed mm
EX Heat-Resistant PVC / PVC Screened ($-25\ldots+105\text{ }^{\circ}\text{C}$) 9 sizes						
☐ EX-PVC-OS 1×2×0.5	1×2×0.5 mm ² (7/0.30)	PVC / PVC (OS)	$-25\ldots+105\text{ }^{\circ}\text{C}$	5.6	44	42
☐ EX-PVC-PiMF 2×2×0.5	2×2×0.5 mm ² (7/0.30)	PVC / PVC (PiMF+OS)	$-25\ldots+105\text{ }^{\circ}\text{C}$	8.6	84	64
☐ EX-PVC-PiMF 4×2×0.5	4×2×0.5 mm ² (7/0.30)	PVC / PVC (PiMF+OS)	$-25\ldots+105\text{ }^{\circ}\text{C}$	10.8	142	81
☐ EX-PVC-PiMF 8×2×0.5	8×2×0.5 mm ² (7/0.30)	PVC / PVC (PiMF+OS)	$-25\ldots+105\text{ }^{\circ}\text{C}$	14.1	246	106
☐ EX-PVC-PiMF 12×2×0.5	12×2×0.5 mm ² (7/0.30)	PVC / PVC (PiMF+OS)	$-25\ldots+105\text{ }^{\circ}\text{C}$	16.9	348	127
☐ EX-PVC-OS 1×2×1.0	1×2×1.0 mm ² (7/0.43)	PVC / PVC (OS)	$-25\ldots+105\text{ }^{\circ}\text{C}$	6.7	68	50
☐ EX-PVC-PiMF 4×2×1.0	4×2×1.0 mm ² (7/0.43)	PVC / PVC (PiMF+OS)	$-25\ldots+105\text{ }^{\circ}\text{C}$	12.8	212	96
☐ EX-PVC-OS 1×2×1.5	1×2×1.5 mm ² (7/0.53)	PVC / PVC (OS)	$-25\ldots+105\text{ }^{\circ}\text{C}$	7.5	92	56
☐ EX-PVC-PiMF 4×2×1.5	4×2×1.5 mm ² (7/0.53)	PVC / PVC (PiMF+OS)	$-25\ldots+105\text{ }^{\circ}\text{C}$	14.3	286	107
EX High-Temperature FEP / FEP Screened ($-60\ldots+200\text{ }^{\circ}\text{C}$) 3 sizes						
☐ EX-FEP-OS 1×2×0.5	1×2×0.5 mm ² (7/0.30)	FEP / FEP (OS)	$-60\ldots+200\text{ }^{\circ}\text{C}$	4.6	38	34
☐ EX-FEP-PiMF 4×2×0.5	4×2×0.5 mm ² (7/0.30)	FEP / FEP (PiMF+OS)	$-60\ldots+200\text{ }^{\circ}\text{C}$	9.2	128	69
☐ EX-FEP-OS 1×2×1.0	1×2×1.0 mm ² (7/0.43)	FEP / FEP (OS)	$-60\ldots+200\text{ }^{\circ}\text{C}$	5.6	58	42
EX XLPE / LSZH / SWA Armoured Direct-Burial ($-40\ldots+90\text{ }^{\circ}\text{C}$) 2 sizes						
☐ EX-XLPE-SWA 1×2×1.5	1×2×1.5 mm ² (7/0.53)	XLPE / SWA / LSZH	$-40\ldots+90\text{ }^{\circ}\text{C}$	12.1	298	121
☐ EX-XLPE-SWA 4×2×1.5	4×2×1.5 mm ² (7/0.53)	XLPE / SWA / LSZH	$-40\ldots+90\text{ }^{\circ}\text{C}$	19.8	745	198

– Specify 'IEC' (+ Violet / – White) or 'ANSI' (+ Purple / – Red) colour coding when ordering.

Loop resistance & EMF parameters by conductor size

4 sizes

Conductor size	(+) NiCr R_{20} $\Omega/\text{m} \approx$	(-) CuNi R_{20} $\Omega/\text{m} \approx$	Loop R_{20} / pair $\Omega/\text{m} \approx$	Class 1 tol. ($-25\ldots+200\text{ }^{\circ}\text{C}$)
0.50 mm ² (7/0.30 mm · AWG 20)	1.41	0.98	2.39	$\pm 1.5\text{ }^{\circ}\text{C}$ ($\pm 120\text{ }\mu\text{V}$)
0.75 mm ² (7/0.37 mm · AWG 18)	0.94	0.65	1.59	$\pm 1.5\text{ }^{\circ}\text{C}$ ($\pm 120\text{ }\mu\text{V}$)
1.00 mm ² (7/0.43 mm · AWG 17)	0.71	0.49	1.20	$\pm 1.5\text{ }^{\circ}\text{C}$ ($\pm 120\text{ }\mu\text{V}$)
1.50 mm ² (7/0.53 mm · AWG 16)	0.47	0.33	0.80	$\pm 1.5\text{ }^{\circ}\text{C}$ ($\pm 120\text{ }\mu\text{V}$)

– Because both NiCr (70.6 $\mu\Omega\cdot\text{cm}$) and CuNi (49 $\mu\Omega\cdot\text{cm}$) are high-resistivity alloys, select 1.0 mm² or 1.5 mm² on runs exceeding 100 m.

Standards and approvals

- ✓ IEC 60584-3 Class 1 & Class 2 Certified
- ✓ ANSI/ISA MC96.1 & ASTM E230 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

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Email

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Web

tebaoflex.com/cables/ex-thermocouple-extension-cable



Typical values for this cable type, based on IEC 60584-3 / ANSI MC96.1 / ASTM E230. Values for your order are confirmed in the quotation. Subject to change without notice. Jiangsu Tebaoflex Special Cable Co., Ltd., Taicang, Jiangsu, China.