



# شرکت فرااتصال رایان عصر

پیشرو در زمینه فناوری اطلاعات و ارتباطات

## کابل های صنعتی

شرکت فرااتصال رایان عصر به عنوان تأمین کننده تخصصی کابل های ترموکوپل تولید شده توسط شرکت های صاحب نام از جمله BLF، LAPPKABLE، CAVICEL، CAVITERM، TEMPESENS و HELUKABEL ترکیبی از کیفیت ساخت بالا و عملکرد پایدار در محیط های صنعتی را ارائه می دهد. این کابل ها با انتقال دقیق سیگنال از سنسور به تجهیزات کنترلی، نقش مهمی در سیستم های اندازه گیری دما ایفا می کنند. بهره گیری از هادی های استاندارد و عایق مقاوم در برابر حرارت، موجب افزایش دقت و طول عمر محصول شده است. طراحی مقاوم در برابر نویز و تداخلات الکترومغناطیسی، ثبات سیگنال را تضمین می کند. این محصولات در صنایع پتروشیمی، نیروگاهی، غذایی و ماشین سازی کاربرد فراوان دارند. کیفیت ساخت بالا در کنار دوام و ایمنی، این کابل ها را به گزینه ای مطمئن برای پروژه های حرفه ای تبدیل کرده است.



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**LAPP**KABEL

**BELDEN**

**SIEMENS**

**FABER CABEL**

**Draka**

**TMC**

**Prysmian**

**legrand**

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**AMARYLLO**

**iii-PRO**

**F e e L T E K**

**CISCO**

**EasyLan<sup>®</sup>**

**igus**

**HUBBELL**

**GAI-TRONICS**

**P PROMISE**

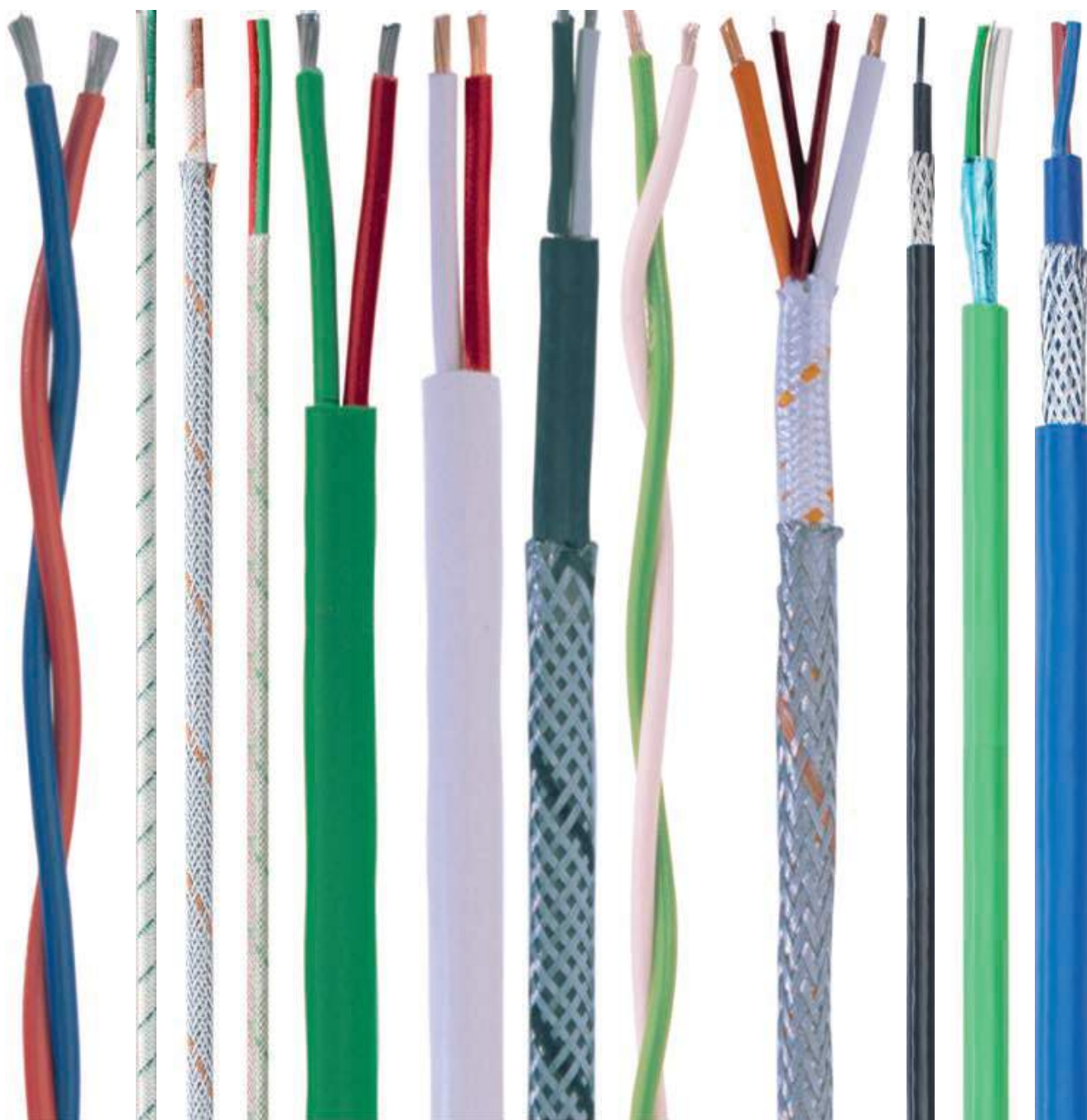
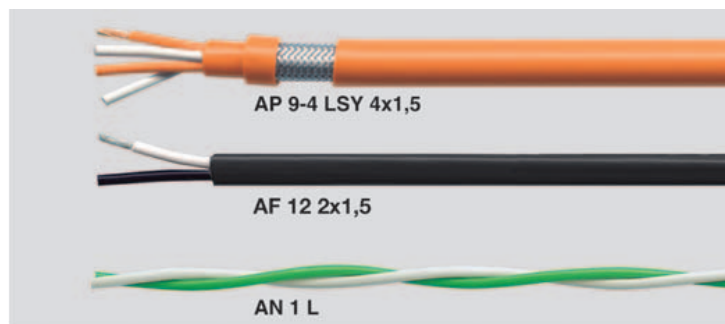
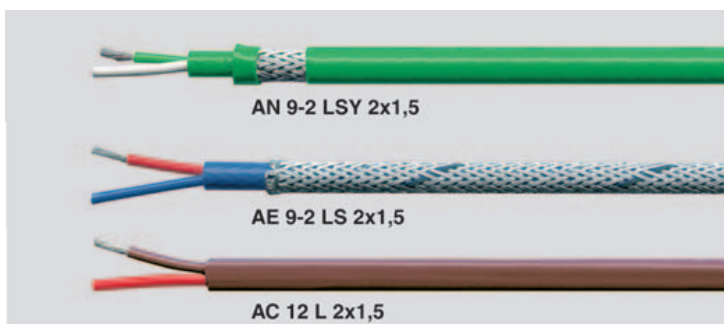
**SENTECH**













Thermocouple Cables For Direct  
Temperature Measurement

## THERMOCOUPLE

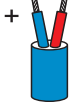


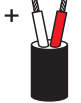


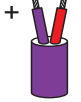

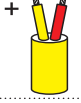

THERMOCOUPLE CABLES



■ COLOR CODING AND TEMPERATURE RANGES FOR THERMAL CABLES & COMPENSATING CABLES

Code letter of the thermocouple	Material combination		 NF C 42-324		 BS 4937	
	+	-	THL	AGL	THL	AGL
	(plus)	(minus)				
<b>T</b>	<b>Cu</b>	<b>Cu Ni</b>	<b>TX</b> -25°C to +100°C		<b>TC</b> -25°C to +100°C	
<b>U</b>	<b>Cu</b>	<b>Cu Ni</b>				
<b>J</b>	<b>Fe</b>	<b>Cu Ni</b>	<b>JX</b> -25°C to +200°C		<b>JC</b> -25°C to +250°C	
<b>L</b>	<b>Fe</b>	<b>Cu Ni</b>				
<b>E</b>	<b>Ni Cr</b>	<b>Cu Ni</b>	<b>EX</b> -25°C to +200°C		<b>EC</b> -25°C to +250°C	
	<b>Ni Cr</b>	<b>Ni</b>	<b>KX</b> -25°C to +200°C		<b>KC</b> -25°C to +200°C	
<b>K</b>	<b>Ni Cr</b>	<b>Ni</b>			<b>WC</b> 0°C to +100°C	
	<b>Ni Cr</b>	<b>Ni</b>			<b>VC</b> 0°C to +100°C	
<b>N</b>	<b>Ni Cr Si</b>	<b>Ni Si</b>				
<b>R</b>	<b>PtRh 13</b>	<b>Pt</b>			<b>SC</b> 0°C to +200°C	
<b>S</b>	<b>PtRh 10</b>	<b>Pt</b>				
<b>B</b>	<b>PtRh 30</b>	<b>PtRh 6</b>			<b>BC</b> 0°C to +100°C	

■ COLOR CODING AND TEMPERATURE RANGES FOR THERMAL CABLES & COMPENSATING CABLES

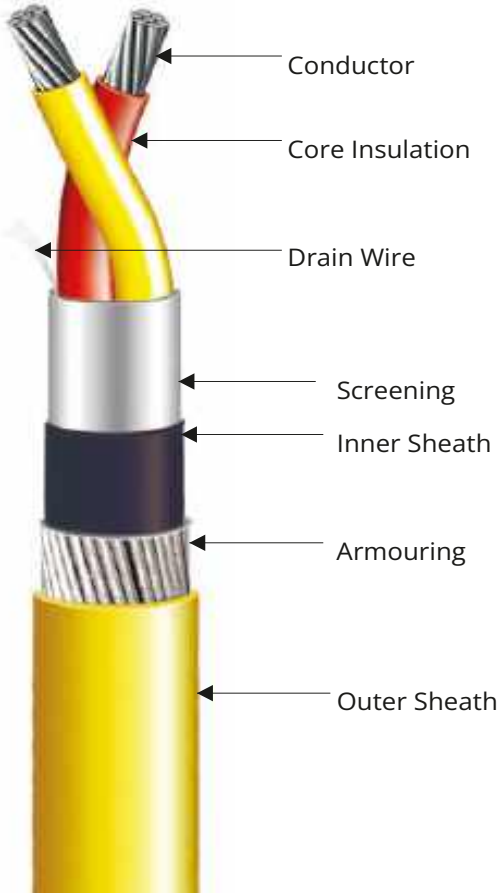
ANSI MC 96.1		DIN IEC 584		DIN 43710*	
Identification		Identification		Identification	
THL	AGL	THL	AGL	THL	AGL
<b>TX</b> 0°C to +100°C		<b>TX</b> -25°C to +100°C		<b>UX**</b> 0°C to +200°C	
<b>JX</b> 0°C to +200°C		<b>JX**</b> -25°C to +200°C		<b>LX**</b> 0°C to +200°C	
<b>EX</b> 0°C to +200°C		<b>EX</b> -25°C to +200°C			
<b>KX</b> 0°C to +200°C		<b>KX</b> -25°C to +200°C			
			<b>KCA**</b> 0°C to +150°C		
			<b>KCB</b> 0°C to +100°C		
		<b>NX</b> -25°C to +200°C	<b>NC</b> 0°C to +150°C		
			<b>RCA/SCA</b> 0°C to +100°C		
			<b>RCB/SCB**</b> 0°C to +200°C		
	<b>SX</b> 0°C to +200°C		<b>BC</b> 0°C to +100°C		
	<b>BX</b> 0°C to +100°C	(According to DIN 43710/85)			

**THL = Thermocouple wire**  
**AGL = Compensating cable**

Example: KCA Compensating cable

KCA (plus) ≙ positive core for AGL KC  
KCA (minus) ≙ negative core for AGL KC  
standard type

\*) DIN 43710 was withdrawn in April 1994. Thus the element types "U" and "L" are no longer standardized.



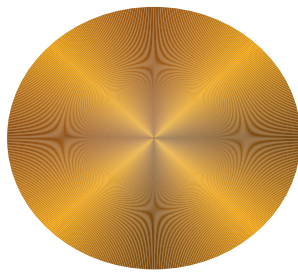
**Insulation Type**

Temperature range for various insulations are listed below :

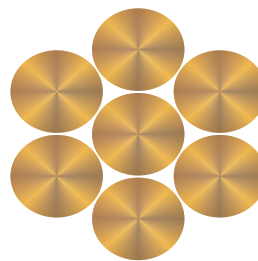
<b>Alumina Fibre</b>	-73°C	1200°C
<b>Ceramic Fibre/Silica</b>	-73°C	800°C
<b>Fibre Glass</b>	-73°C	550°C
<b>Polyimide</b>	-70°C	310°C
<b>PTFE/PFA</b>	-65°C	260°C
<b>PEEK</b>	-60°C	250°C
<b>FEP</b>	-65°C	200°C
<b>ETFE/ X-ETFE</b>	-65°C	200°C
<b>SILICON</b>	-50°C	200°C
<b>XLPE</b>	-40°C	105°C
<b>XLPO</b>	-40°C	125°C
<b>PVC</b>	-30°C	105°C
<b>HDPE</b>	-50°C	90°C
<b>PUR</b>	-55°C	90°C
<b>LDPE</b>	-50°C	70°C
<b>TPE</b>	-15°C	90°C

Insulation refers to the protective layer of plastic, polymer, or high-temperature compounds applied directly over a conductor. Tempsens offers a wide range of insulation materials, designed to perform across an extensive temperature spectrum, from -73°C to 1200°C.

**CONDUCTOR**



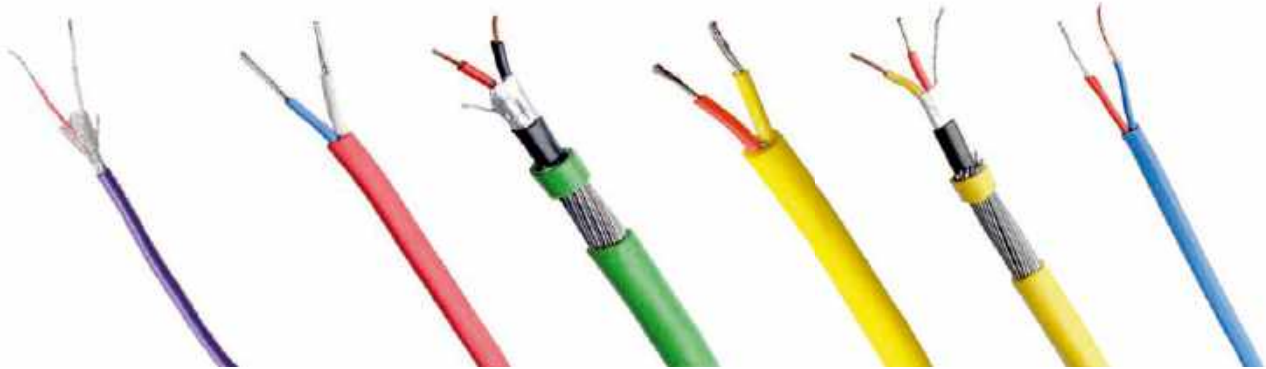
Solid



Stranded






























<b>Tarature standard</b>	Standard type	<b>TX - JX - KX - SX - WX</b>
<b>Tarature speciali a richiesta</b>	Special type on request	<b>EX - BX - VX</b>

## THERMOCOUPLE CABLES

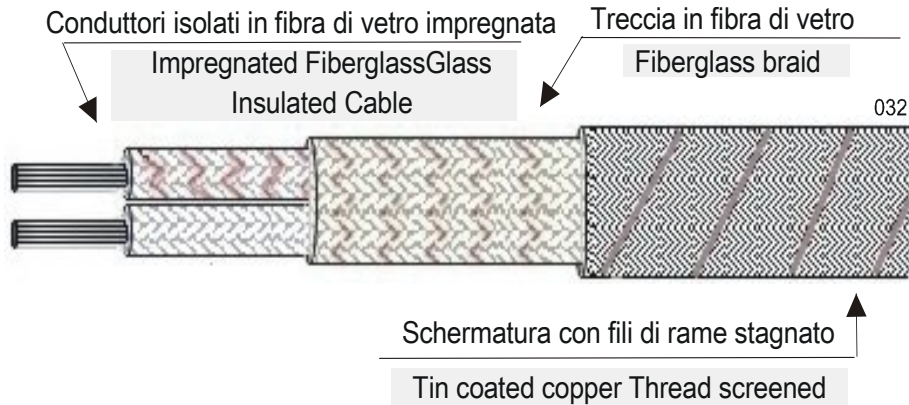


<b>Construction</b>	Single or Multi Pair
<b>Voltage Grade</b>	Up to 1.1 KV
<b>Conductor</b>	TC, EX, C (as per below table)
<b>Type of Conductor</b>	K, T, J, E, N, R, S, B, D, C
<b>Conductor Size</b>	AWG 12 to AWG 34
<b>Conductor Stranding</b>	Solid or Multi Strand
<b>Core Insulation</b>	PVC, XLPE, LSZH, PE, PTFE, FEP, PFA, PEEK, Silicon, ETFE, Polyimide, Fiber Glass, Ceramic Fiber, Alumina Yarn
<b>Screening (If applicable)</b>	Aluminum Foil with drain wire / Mesh Braided
<b>Inner/Outer Sheath</b>	PVC, LSZH, PTFE, FEP, PFA, ETFE, Silicon, Polyimide, Fiber Glass, Ceramic Fiber, PUR, Alumina Yarn
<b>Armouring (If applicable)</b>	G.I. Armouring (For High Temperature insulations)/SS Braiding
<b>Color Code</b>	As per below table
<b>Standards</b>	ANSI MC 96.1, IEC 584.3, IS 8784, JSS 51034, JSS 51038, IS1554, IS8130, IS7098-I, IS5831, IS3975, IEC 60228, IEC 60502, IEC60332, IS9968

### Colour Code & Accuracy of Thermocouple, Extension & Compensating Cables

T/CTYPE	CONDUCTOR		CONDUCTOR COMBINATIONS		COLOR CODE		TOLERANCE CLASS AS PER IEC 584.3		CABLE TEMP. RANGE°C
	EXTENSION CABLE	COMPENSATING CABLE	+LEG	-LEG	IEC 5843:1989	ANSI/MC96.1	CLASS 1	CLASS 2	
K	KX		CHROMEL	ALUMEL			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	0°C TO +1100°C
			CHROMEL	ALUMEL			±1.5°C	±2.5°C	-25°C TO +200°C
	KCB	KCA	IRON	CONSTANTAN			-	±2.5°C	0°C TO +150°C
			COPPER	CONSTANTAN			-	±2.5°C	0°C TO +100°C
T	TX		COPPER	CONSTANTAN			±0.5°C or 0.4% of T	±1.0°C or 0.75% of T	-185°C TO +300°C
			COPPER	CONSTANTAN			±0.5°C	±1.0°C	-25°C TO +100°C
J	JX		IRON	CONSTANTAN			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	+20°C TO +700°C
			IRON	CONSTANTAN			±1.5°C	±2.5°C	-25°C TO +200°C
N	NX		NICROSIL	NISIL			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	0°C TO +1100°C
			NICROSIL	NISIL			±1.5°C	±2.5°C	-25°C TO +200°C
E	EX		CHROMEL	CONSTANTAN			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	0°C TO +800°C
			CHROMEL	CONSTANTAN			±1.5°C	±2.5°C	-25°C TO +200°C
R		RCA	COPPER	COPPER LOW VALUE NICKEL			-	±2.5°C	0°C TO +100°C
S		SCA	COPPER	COPPER LOW VALUE NICKEL			-	±2.5°C	0°C TO +100°C
B		BC	COPPER	COPPER			-	-	0°C TO +100°C
D		DC	ALLOY 203*	ALLOY 225*			-	±4.5°C	0°C TO +100°C
C		CC	ALLOY 405*	ALLOY 426*			-	±4.4°C	0°C TO +100°C

## Technical Sheet Catalogue Cables



PRODUCER ACRONYM

**VHDT2-TA**

**C231**

### EXTENSION-COMPENSATION CABLES

TWIN-LEAD WITH FLEXIBLE CONDUCTORS GLASS-GLASS INSULATED AND EXTERNAL SHIELDING (VHDT2-TS) OR EXTERNAL ARMOUR (VHDT2-TA)

MAX WORKING VOLTAGE	TEST VOLTAGE In AIR	TEMPERATURE RANGE	Symbols, colours, types and standards See table	PACKING SEE TABLE
<b>48V</b>	<b>1000V</b>	<b>250°C</b>	<b>T008</b>	<b>T002-T003</b>

The colouring of the cores can be obtained through "striping" (White background and coloured stripe) or through integral colouring

Ø of the capillary in shielding **TS** for sec. up to 0,25 mm<sup>2</sup> 0,10 for sec. >0,25 mm<sup>2</sup> 0,15  
 For version with Armour **TA** for the construction of the braid, is foreseen capillary with Ø 0,20 mm. for all sections

<b>Tarature standard</b>	Standard type	<b>TX - JX - KX - SX - WX</b>
<b>Tarature speciali a richiesta</b>	Special type on request	<b>EX - BX - VX</b>

In the case the required type asks for bare copper conductors and in absence of special requirements, these conductors will be manufactured with capillary wires of 0,20 - 0,25 or 0,30 mm diameter, at our discretion.

SEE RECOMMENDATIONS FOR USE AND ADDITIONAL INFORMATION ON THE BACK SIDE OF THIS DOCUMENT

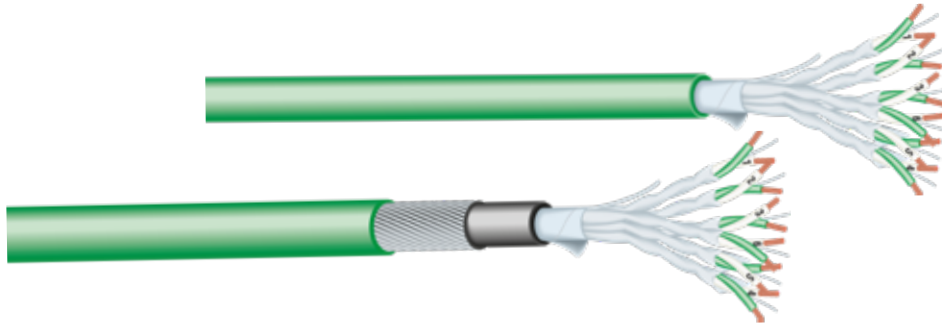
Caratteristiche Dimensionali		Dimensional Characteristics		Dimensioni e peso sono riferiti alla versione schermata
CONDUTTORE	CONDUCTOR	ISOLANTE	INSULATION	Dimensions and weight refer to the shielded version

Section (mm <sup>2</sup> )	Composition (AWG)	Compositon [n° x Ø(mm)]	Diameter (mm)	Insulation Thickness (mm)	Core Ø (mm)	External Dimens. (mm)	Wire Weight (Kg/Km)
2 x 0,22	2 x 24	7 x 0,20	0,65	0,25	1,15	2,10 x 3,10	13,50
2 x 0,25	2 x 23	8 x 0,20	0,70	0,25	1,20	2,20 x 3,20	14,50
2 x 0,35	2 x 22	11 x 0,20	0,80	0,25	1,30	2,50 x 3,60	25,00
2 x 0,50	2 x 20	6 x 0,32	0,90	0,25	1,40	2,80 x 3,90	28,00
2 x 0,80	2 x 18	10 x 0,32	1,20	0,35	1,90	3,00 x 4,50	39,00
2 x 1,00	2 x 17	12 x 0,32	1,30	0,35	2,00	3,10 x 4,70	44,00
2 x 1,30	2 x 16	16 x 0,32	1,50	0,30	2,10	3,40 x 4,90	50,00
2 x 1,50	2 x 16	19 x 0,32	1,60	0,30	2,20	3,40 x 5,00	55,00

TOLLERANZA SUL Ø ESTERNO EXTERNAL Ø TOLERANCE ±0,20mm



## Thermocouple Cables Multipair Individual and Overall Screen



### NOT ARMoured

XLPE/IS/OS/LSZH

### ARMoured

XLPE/IS/OS/LSZH/SWA/LSZH

### APPLICATIONS

Can be used in cable tray or conduit to connect different types of thermocouple in industrial process controls, refineries, oil and gas plants.

### OPERATING TEMPERATURE

-20 °C to +80 °C (for general use); -40 °C to +90 °C (on request).

### MINIMUM BENDING RADIUS

#### Not armoured type:

12 times the outer diameter (for conductors class 1 and class 2);  
10 times the outer diameter (for conductors class 5).

#### Armoured type:

15 times the outer diameter.

### CABLE CONSTRUCTION

**Conductors** Solid alloy.

**Calibration** ANSI MC 96.1 or IEC 60584-3.

**Insulation** PVC, PE, XLPE or LSZH thermoplastic material.

**Twisting** The insulated cores shall be twisted in pairs for a good reduction of the electromagnetic noise.

**Individual screen** Aluminium/polyester tape, coverage >100%, aluminium in contact with tinned copper drain wire.

**Cabling** The screened pairs are cabled with suitable non hygroscopic fillers (when necessary) and wrapped with polyester tape if required.

**Overall screen** Aluminium/polyester tape, coverage >100%, aluminium in contact with tinned copper drain wire.

#### Armoured

Inner sheath: PE, PVC or LSZH thermoplastic material.

Armour: Single layer of galvanized steel wires (SWA).

**Outer sheath** PVC or LSZH thermoplastic material.

## EN 50288-7 (300 V)

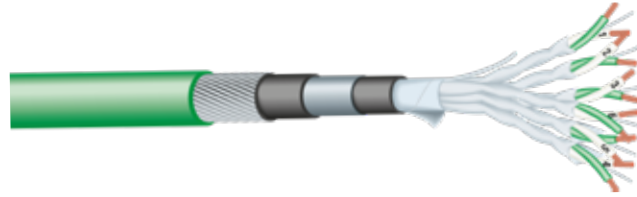
Cross section (AWG)	UNARMoured		ARMoured		
	Outer diameter (mm)	Weight (kg/km)	Diameter under armour (mm)	Outer diameter (mm)	Weight (kg/km)
<b>20 AWG solid</b>	<b>U-XLPE/IS/OS/LSZH</b>		<b>U-XLPE/IS/OS/LSZH/SWA/LSZH</b>		
1x2x20	5,1	51	5,1	9,5	217
2x2x20	7,7	100	7,7	12,3	369
4x2x20	8,9	150	8,9	13,5	451
6x2x20	10,6	220	10,6	15,3	666
12x2x20	14,0	360	14,0	18,9	901
16x2x20	15,6	480	15,6	21,3	1302
24x2x20	19,4	690	19,4	25,3	1647
<b>18 AWG solid</b>	<b>U-XLPE/IS/OS/LSZH</b>		<b>U-XLPE/IS/OS/LSZH/SWA/LSZH</b>		
1x2x18	5,8	60	5,8	10,9	252
2x2x18	8,9	140	8,9	14,2	423
4x2x18	10,3	200	10,3	15,8	652
6x2x18	12,4	280	12,4	17,9	787
12x2x18	16,4	490	16,4	22,2	1327
16x2x18	18,3	630	18,3	24,2	1572
24x2x18	22,8	930	22,8	29,0	2074
<b>16 AWG solid</b>	<b>U-XLPE/IS/OS/LSZH</b>		<b>U-XLPE/IS/OS/LSZH/SWA/LSZH</b>		
1x2x16	6,8	63	6,8	12,0	283
2x2x16	10,7	180	10,7	16,2	473
4x2x16	12,6	270	12,6	18,1	742
6x2x16	15,1	360	15,1	20,8	911
12x2x16	20,3	640	20,3	26,2	1496
16x2x16	22,6	860	22,6	28,7	1915
24x2x16	28,4	1250	28,4	35,5	2663

### approximate values

#### Electrical Characteristics

	20	18	16
Cross section (AWG)			
Capacitance (pF/m)	≤150	≤150	≤150
L/R (μH/Ohm)	≤25	≤25	≤25

## Thermocouple Cables Multipair Individual and Overall Screen Armoured and Lead Sheathed



XLPE/IS/OS/LSZH/SWA/LSZH

### APPLICATIONS

Can be used in cable tray or conduit to connect different types of thermocouple in industrial process controls, refineries, oil and gas plants.

### OPERATING TEMPERATURE

-20 °C to +80 °C (for general use); -40 °C to +90 °C (on request).

### MINIMUM BENDING RADIUS

20 times the outer diameter.

### CABLE CONSTRUCTION

**Conductors** Solid alloy.

**Calibration** ANSI MC 96.1 or IEC 60584-3.

**Insulation** PVC, PE, XLPE or LSZH thermoplastic material.

**Twisting** The insulated cores shall be twisted in pairs for a good reduction of the electromagnetic noise.

**Individual screen** Aluminium/polyester tape, coverage >100%, aluminium in contact with tinned copper drain wire.

**Cabling** The screened pairs are cabled with suitable non hygroscopic fillers (when necessary) and wrapped with polyester tape if required.

**Overall screen** Aluminium/polyester tape, coverage >100%, aluminium in contact with tinned copper drain wire.

**Bedding** PVC or LSZH thermoplastic material.

**Lead Sheath** Lead alloy.

**Inner sheath** PVC or LSZH thermoplastic material.

**Armour** Single layer of galvanized steel wires (SWA).

**Outer sheath** PVC or LSZH thermoplastic material.

### EN 50288-7 (300 V)

Cross section (AWG)	Diameter under armour (mm)	Outer diameter (mm)	Weight (kg/km)
<b>20 AWG solid</b>			
1x2x20	7,1	13,3	716
2x2x20	10,8	17,2	1218
4x2x20	12,5	18,9	1488
6x2x20	14,8	21,4	2198
12x2x20	19,6	26,5	2973
16x2x20	21,8	29,8	4297
24x2x20	27,2	35,4	5435
<b>18 AWG solid</b>	<b>U-XLPE/IS/OS/LSZH/LC/LSZH/SWA/LSZH</b>		
1x2x18	8,1	15,3	832
2x2x18	12,5	19,9	1396
4x2x18	14,4	22,1	2152
6x2x18	17,4	25,1	2597
12x2x18	23,0	31,1	4379
16x2x18	25,6	33,9	5188
24x2x18	31,9	40,6	6844
<b>16 AWG solid</b>	<b>U-XLPE/IS/OS/LSZH/LC/LSZH/SWA/LSZH</b>		
1x2x16	9,5	16,8	934
2x2x16	15,0	22,7	1561
4x2x16	17,6	25,3	2449
6x2x16	21,1	29,1	3006
12x2x16	28,4	36,7	4937
16x2x16	31,6	40,2	6320
24x2x16	39,8	49,7	8788

#### approximate values

Electrical Characteristics			
Cross section (AWG)	20	18	16
Capacitance (pF/m)	≤150	≤150	≤150
L/R (μH/Ohm)	≤25	≤25	≤25

### COMPENSATING CABLES

Part no.	Thermocouple element material in accordance with DIN 43713	Thermocouple type	Type	Core insulation	Jacket / armoring jacket	Outer ø approx. mm	Form	Temperature range of insulation °C	Installation temperature range °C	min. bending radius x cable ø	Weight approx. kg/km
<b>Single-pair: 2 x 1.5 mm<sup>2</sup> (L = stranded wire, conductor make-up 48 x 0.20 mm; M = solid conductor, conductor ø 1.38 mm)</b>											
48001	FE-CuNi (Ko)	L	AE 1 L stranded	PVC	-	5.4	round	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	7.5	40
48002	SoNiCr-SoNi	K	AN 1 L stranded	PVC	-	5.4	round				
48003	SoPtRh-SoPt	S	AP 1 L stranded	PVC	-	5.4	round				
48230	Cu-CuNi (Ko)	U	AC 1 L stranded	PVC	-	5.4	round	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	10	40
48478	Fe-CuNi	J	AF 1 L stranded	PVC	-	5.4	round				
48004	Fe-CuNi (Ko)	L	AE 1 M stranded	PVC	-	5.4	round				
48005	SoNiCr-SoNi	K	AN 1 M stranded	PVC	-	5.4	round	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	10	40
48006	SoPtRh-SoPt	S	AP 1 M stranded	PVC	-	5.4	round				
48231	Cu-CuNi (Ko)	U	AC 1 M stranded	PVC	-	5.4	round				
48007	Fe-CuNi (Ko)	L	AE 1 L-SIL stranded	silicone	-	5.4	round	-60°C to +180°C	stationary -25°C to +180°C flexing -25°C to +180°C (short time +200°C)	7.5	40
48008	SoNiCr-SoNi	K	AN 1 L-SIL stranded	silicone	-	5.4	round				
48009	SoPtRh-SoPt	S	AP 1 L-SIL stranded	silicone	-	5.4	round				
48232	Cu-CuNi (Ko)	U	AC 1 L-SIL stranded	silicone	-	5.4	round	-60°C to +180°C	stationary -25°C to +180°C flexing -25°C to +180°C (short time +200°C)	15	248
48233	Fe-CuNi (Ko)	L	AE 2 M-SIL stranded	silicone	Textile tape/ lead sheath/ tin. steel wire braid	7.8	round				
48234	SoNiCr-SoNi	K	AN 2 M-SIL stranded	silicone		7.8	round				
48235	SoPtRh-SoPt	S	AP 2 M-SIL stranded	silicone		7.8	round				
48236	Cu-CuNi (Ko)	U	AC 2 M-SIL stranded	silicone	-	7.8	round	-60°C to +180°C	stationary -25°C to +180°C flexing -25°C to +180°C (short time +200°C)	15	248
48010	Fe-CuNi (Ko)	L	AE 3 L parallel	glass-fiber	glass-fiber braid	5.0x7.2	oval				
48011	SoNiCr-SoNi	K	AN 3 L parallel	glass-fiber		5.0x7.2	oval				
48012	SoPtRh-SoPt	S	AP 3 L parallel	glass-fiber		5.0x7.2	oval				
48237	Cu-CuNi (Ko)	U	AC 3 L parallel	glass-fiber	-	5.0x7.2	oval	-60°C to +180°C	stationary -25°C to +180°C flexing -25°C to +180°C (short time +200°C)	7.5	64
48238	Fe-CuNi (Ko)	L	AE 3 Ln-SIL parallel	silicone	silicone	5.2x7.4	oval				
48239	SoNiCr-SoNi	K	AN 3 Ln-SIL parallel	silicone		5.2x7.4	oval				
48240	SoPtRh-SoPt	S	AP 3 Ln-SIL parallel	silicone		5.2x7.4	oval				
48241	Cu-CuNi (Ko)	U	AC 3 Ln-SIL parallel	silicone	-	5.2x7.4	oval	-60°C to +180°C	stationary -25°C to +180°C flexing -25°C to +180°C (short time +200°C)	7.5	62
48013	Fe-CuNi (Ko)	L	AE 4 L parallel	glass-fiber	Glass-fiber braid/ galv. steel wire braid	5.8x8.0	oval				
48014	SoNiCr-SoNi	K	AN 4 L parallel	glass-fiber		5.8x8.0	oval				
48015	SoPtRh-SoPt	S	AP 4 L parallel	glass-fiber		5.8x8.0	oval				
48242	Cu-CuNi (Ko)	U	AC 4 L parallel	glass-fiber	-	5.8x8.0	oval	-60°C to +180°C	stationary -25°C to +180°C flexing -25°C to +180°C (short time +200°C)	7.5	87
48016	Fe-CuNi (Ko)	L	AE 4 Ln-SIL	silicone	silicone/ galv. steel wire braid	6.0x8.2	oval				
48017	SoNiCr-SoNi	K	AN 4 Ln-SIL	silicone		6.0x8.2	oval				
48018	SoPtRh-SoPt	S	AP 4 Ln-SIL	silicone		6.0x8.2	oval				
48243	Cu-CuNi (Ko)	U	AC 4 Ln-SIL	silicone	-	6.0x8.2	oval	-60°C to +180°C	stationary -25°C to +180°C flexing -25°C to +180°C (short time +200°C)	7.5	85
48244	Fe-CuNi (Ko)	L	AE 5 L	PVC	PETP tape/ galv. Cu-round wire braid/ PVC jacket	8.1	round				
48245	SoNiCr-SoNi	K	AN 5 L	PVC		8.1	round				
48246	SoPtRh-SoPt	S	AP 5 L	PVC		8.1	round				
48247	Cu-CuNi (Ko)	U	AC 5 L	PVC	-	8.1	round	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	7.5	93
48248	Fe-CuNi (Ko)	L	AE 6 L-SIL	silicone	PETP tape/ bl. Cu-ground wire 0.5 mm ø / Alu tape/silicone	8.0	round				
48249	SoNiCr-SoNi	K	AN 6 L-SIL	silicone		8.0	round				
48250	SoPtRh-SoPt	S	AP 6 L-SIL	silicone		8.0	round				
48251	Cu-CuNi (Ko)	U	AC 6 L-SIL	silicone	-	8.0	round	-60°C to +180°C	stationary -25°C to +180°C flexing -25°C to +180°C (short time +200°C)	7.5	94
48252	Fe-CuNi (Ko)	L	AE 6 M-SIL	silicone	PETP tape/ bl. Cu-ground wire 0.5 mm ø / Alu tape/silicone	7.8	round				
48253	SoNiCr-SoNi	K	AN 6 M-SIL	silicone		7.8	round				
48254	SoPtRh-SoPt	S	AP 6 M-SIL	silicone		7.8	round				
48255	Cu-CuNi (Ko)	U	AC 6 M-SIL	silicone	-	7.8	round	-60°C to +180°C	stationary -25°C to +180°C flexing -25°C to +180°C (short time +200°C)	12	92
48019	Fe-CuNi (Ko)	L	AE 7 L parallel	PVC	glass-fiber	5.5x8.2	oval				
48020	SoNiCr-SoNi	K	AN 7 L parallel	PVC		5.5x8.2	oval				
48021	SoPtRh-SoPt	S	AP 7 L parallel	PVC		5.5x8.2	oval				
48256	Cu-CuNi (Ko)	U	AC 7 L parallel	PVC	-	5.5x8.2	oval	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	7.5	60
48022	Fe-CuNi (Ko)	L	AE 8 L	PVC	Glass-fiber/ galv. steel wire braid	6.9x9.0	oval				
48023	SoNiCr-SoNi	K	AN 8 L	PVC		6.9x9.0	oval				
48024	SoPtRh-SoPt	S	AP 8 L	PVC		6.9x9.0	oval				
48257	Cu-CuNi (Ko)	U	AC 8 L	PVC	-	6.9x9.0	oval	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	7.5	82
48025	Fe-CuNi (Ko)	L	AE 9 L	PVC	PVC	7.0	round				
48026	SoNiCr-SoNi	K	AN 9 L	PVC		7.0	round				
48027	SoPtRh-SoPt	S	AP 9 L	PVC		7.0	round				
48258	Cu-CuNi (Ko)	U	AC 9 L	PVC	-	7.0	round	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	7.5	79
48479	Fe-CuNi	J	AF 9 L	PVC	PVC/galv. steel wire braid/ PVC	7.0	round				
48028	Fe-CuNi (Ko)	L	AE 9-2 LS	PVC		7.8	round				
48029	SoNiCr-SoNi	K	AN 9-2 LS	PVC		7.8	round				
48030	SoPtRh-SoPt	S	AP 9-2 LS	PVC	-	7.8	round	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	7.5	108
48259	Cu-CuNi (Ko)	U	AC 9-2 LS	PVC	7.8	round					
48480	Fe-CuNi	J	AF 9-2 LS	PVC	7.8	round					
48031	Fe-CuNi (Ko)	L	AE 9-2 LSY	PVC	PVC/galv. steel wire braid/ PVC	9.8	round	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	7.5	147
48032	SoNiCr-SoNi	K	AN 9-2 LSY	PVC		9.8	round				
48069	SoPtRh-SoPt	S	AP 9-2 LSY	PVC		9.8	round				
48260	Cu-CuNi (Ko)	U	AC 9-2 LSY	PVC	-	9.8	round	-10°C to +80°C	stationary -25°C to +70°C flexing -5°C to +70°C	7.5	147

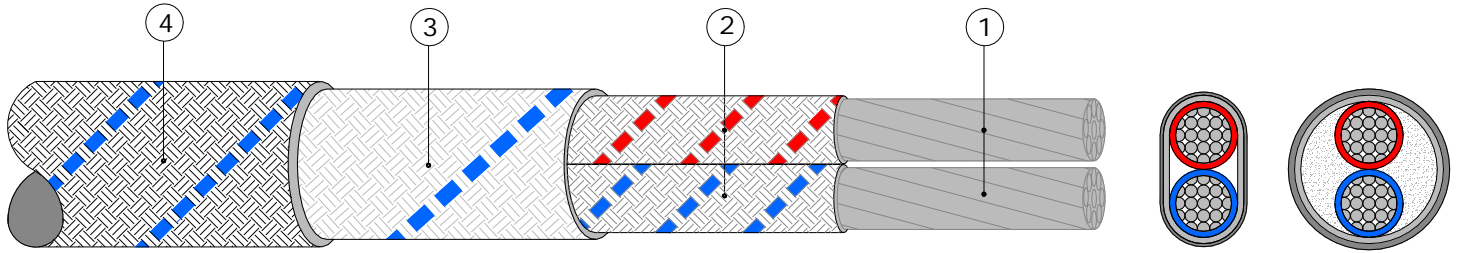
L = stranded conductor    M = solid conductor    tin. = tinned    galv. = galvanized

COMPENSATING CABLES

Part no.	Thermocouple element material in accordance with DIN 43713	Thermocouple type	Core insulation	Jacket/ armoring jacket	Outer Ø approx. mm	Form	Temperature range of insulation °C	Installation temperature range °C	min. bending radius x cable Ø	Weight approx. kg/km
<b>Single-pair: 2 x 1.5 mm<sup>2</sup> (L = stranded wire, conductor make-up 48 x 0.20 mm; M = solid conductor, conductor Ø 1.38 mm)</b>										
48033	FE-CuNi (Ko)	L	AE 9 M	PVC	7.0	round	-10°C to +80°	stationary	12	79
48034	SoNiCr-SoNi	K	AN 9 M	PVC	7.0	round		-25°C to +70°C	12	79
48035	SoPtRh-SoPt	S	AP 9 M	PVC	7.0	round		flexing	12	79
48261	Cu-CuNi (Ko)	U	AC 9 M	PVC	7.0	round		-5°C to +70°C	12	79
48262	Fe-CuNi (Ko)	L	AE 9-2 MSY	PVC	9.6	round	-10°C to +80°C	stationary	12	144
48263	SoNiCr-SoNi	K	AN 9-2 MSY	PVC	9.6	round		-25°C to +70°C	12	144
48264	SoPtRh-SoPt	S	AP 9-2 MSY	PVC	9.6	round		flexing	12	144
48265	Cu-CuNi (Ko)	U	AC 9-2 MSY	PVC	9.6	round		-5°C to +70°C	12	144
48036	Fe-CuNi (Ko)	L	AE 10 L-SIL parallel	silicone	5.5x8.2	oval	-60°C to +180°C	stationary	7.5	59
48037	SoNiCr-SoNi	K	AN 10 L-SIL parallel	silicone	5.5x8.2	oval		-25°C to +180°C	7.5	59
48038	SoPtRh-SoPt	S	AP 10 L-SIL parallel	silicone	5.5x8.2	oval		flexing	7.5	59
48266	Cu-CuNi (Ko)	U	AC 10 L-SIL parallel	silicone	5.5x8.2	oval		(short time +200°C)	7.5	59
48039	Fe-CuNi (Ko)	L	AE 11 L	silicone	6.3x9.0	oval	-60°C to +180°C	stationary	7.5	82
48040	SoNiCr-SoNi	K	AN 11 L	silicone	6.3x9.0	oval		-25°C to +180°C	7.5	82
48041	SoPtRh-SoPt	S	AP 11 L	silicone	6.3x9.0	oval		flexing	7.5	82
48267	Cu-CuNi (Ko)	U	AC 11 L	silicone	6.3x9.0	oval		(short time +200°C)	7.5	82
48042	Fe-CuNi (Ko)	L	AE 11 Lr	silicone	6.7	round	-60°C to +180°C	stationary	7.5	83
48043	SoNiCr-SoNi	K	AN 11 Lr	silicone	6.7	round		-25°C to +180°C	7.5	83
48044	SoPtRh-SoPt	S	AP 11 Lr	silicone	6.7	round		flexing	7.5	83
48268	Cu-CuNi (Ko)	U	AC 11 Lr	silicone	6.7	round		(short time +200°C)	7.5	83
48045	Fe-CuNi (Ko)	L	AE 11 Mr	silicone	6.5	round	-60°C to +180°C	stationary	12	83
48046	SoNiCr-SoNi	K	AN 11 Mr	silicone	6.5	round		-25°C to +180°C	12	83
48047	SoPtRh-SoPt	S	AP 11 Mr	silicone	6.5	round		flexing	12	83
48269	Cu-CuNi (Ko)	U	AC 11 Mr	silicone	6.5	round		(short time +200°C)	12	83
48048	Fe-CuNi (Ko)	L	AE 12 L parallel	PVC	4.3x7.0	oval	-10°C to +80°C	stationary	7.5	69
48049	SoNiCr-SoNi	K	AN 12 L parallel	PVC	4.3x7.0	oval		-25°C to +70°C	7.5	69
48050	SoPtRh-SoPt	S	AP 12 L parallel	PVC	4.3x7.0	oval		flexing	7.5	69
48270	Cu-CuNi (Ko)	U	AC 12 L parallel	PVC	4.3x7.0	oval		-5°C to +70°C	7.5	69
48481	Fe-CuNi	J	AF 12 L parallel	PVC	4.3x7.0	oval		7.5	69	
48051	Fe-CuNi (Ko)	L	AE 12 M parallel	PVC	4.2x6.8	oval	-10°C to +80°C	stationary	12	61
48052	SoNiCr-SoNi	K	AN 12 M parallel	PVC	4.2x6.8	oval		-25°C to +70°C	12	61
48053	SoPtRh-SoPt	S	AP 12 M parallel	PVC	4.2x6.8	oval		flexing	12	61
48271	Cu-CuNi (Ko)	U	AC 12 M parallel	PVC	4.2x6.8	oval		-5°C to +70°C	12	61
48054	Fe-CuNi (Ko)	L	AE 13 L parallel	silicone	3.2x5.9	oval	-60°C to +180°C	stationary	7.5	45
48055	SoNiCr-SoNi	K	AN 13 L parallel	silicone	3.2x5.9	oval		-25°C to +180°C	7.5	45
48056	SoPtRh-SoPt	S	AP 13 L parallel	silicone	3.2x5.9	oval		flexing	7.5	45
48272	Cu-CuNi (Ko)	U	AC 13 L parallel	silicone	3.2x5.9	oval		(short time +200°C)	7.5	45
48057	Fe-CuNi (Ko)	L	AE 13 M	silicone	3.5x6.0	oval	-60°C to +180°C	stationary	12	45
48058	SoNiCr-SoNi	K	AN 13 M	silicone	3.5x6.0	oval		-25°C to +180°C	12	45
48059	SoPtRh-SoPt	S	AP 13 M	silicone	3.5x6.0	oval		flexing	12	45
48273	Cu-CuNi (Ko)	U	AC 13 M	silicone	3.5x6.0	oval		(short time +200°C)	12	45
48060	Fe-CuNi (Ko)	L	AE 14 L	silicone	11.7	round	-60°C to +180°C	stationary	7.5	196
48061	SoNiCr-SoNi	K	AN 14 L	silicone	11.7	round		-25°C to +180°C	7.5	196
48062	SoPtRh-SoPt	S	AP 14 L	silicone	11.7	round		flexing	7.5	196
48274	Cu-CuNi (Ko)	U	AC 14 L	silicone	11.7	round		(short time +200°C)	7.5	196
48063	Fe-CuNi (Ko)	L	AE 15 L	silicone	7.7	round	-60°C to +180°C	stationary	7.5	76
48064	SoNiCr-SoNi	K	AN 15 L	silicone	7.7	round		-25°C to +180°C	7.5	76
48065	SoPtRh-SoPt	S	AP 15 L	silicone	7.7	round		flexing	7.5	76
48275	Cu-CuNi (Ko)	U	AC 15 L	silicone	7.7	round		(short time +200°C)	7.5	76
48482	Fe-CuNi	J	AF 15 L	silicone	7.7	round		7.5	76	
48066	Fe-CuNi (Ko)	L	AE 15 LS	silicone	7.8	round	-10°C to +180°C	stationary	7.5	105
48067	SoNiCr-SoNi	K	AN 15 LS	silicone	7.8	round		-25°C to +180°C	7.5	105
48068	SoPtRh-SoPt	S	AP 15 LS	silicone	7.8	round		flexing	7.5	105
48276	Cu-CuNi (Ko)	U	AC 15 LS	silicone	7.8	round		(short time +200°C)	7.5	105
48277	Fe-CuNi (Ko)	L	AE 16 L-SIL parallel	silicone	2.8x5.6	oval	-10°C to +180°C	stationary	7.5	38
48278	SoNiCr-SoNi	K	AN 16 L-SIL parallel	silicone	2.8x5.6	oval		-25°C to +180°C	7.5	38
48279	SoPtRh-SoPt	S	AP 16 L-SIL parallel	silicone	2.8x5.6	oval		flexing	7.5	38
48280	Cu-CuNi (Ko)	U	AC 16 L-SIL parallel	silicone	2.8x5.6	oval		(short time +200°C)	7.5	38
48281	Fe-CuNi (Ko)	L	AE 18 L	HELUFLO <sup>®</sup> -FEP	4.4	round	-100°C to 200°C	stationary	7.5	37
48282	SoNiCr-SoNi	K	AN 18 L	HELUFLO <sup>®</sup> -FEP	4.4	round		-25°C to +205°C	7.5	37
48283	SoPtRh-SoPt	S	AP 18 L	HELUFLO <sup>®</sup> -FEP	4.4	round		flexing	7.5	37
48284	Cu-CuNi (Ko)	U	AC 18 L	HELUFLO <sup>®</sup> -FEP	4.4	round		-25°C to +205°C	7.5	37
48285	Fe-CuNi (Ko)	L	AE 19 L	HELUFLO <sup>®</sup> -FEP	5.6	round	-100°C to 200°C	stationary	7.5	60
48286	SoNiCr-SoNi	K	AN 19 L	HELUFLO <sup>®</sup> -FEP	5.6	round		-25°C to +205°C	7.5	60
48287	SoPtRh-SoPt	S	AP 19 L	HELUFLO <sup>®</sup> -FEP	5.6	round		flexing	7.5	60
48288	Cu-CuNi (Ko)	U	AC 19 L	HELUFLO <sup>®</sup> -FEP	5.6	round		-25°C to +205°C	7.5	60

L = stranded conductor galv. = galvanized M = solid conductor tin. = tinned

Type VVR 1 Class C



- 1 - Flexible conductor
- 2 - Fiberglass braid impregnated with silicone rubber
- 3 - Oval type: fiberglass braid  
Round type: fiberglass braid impregnated with silicone rubber
- 4 - Tin plated copper braid

### TECHNICAL DATA

- Working temperature of the insulating materials – 25°C + 250°C
- Temperature over short period 280°C
- Alloys temperature range and technical data see Technical Data Alloys
- Resistance to flame not propagate the flame, self-extinguishing
- Impermeability do not use in wet environments
- Colouring of cable according to the standards DIN43714 ANSI MC96.1 IEC 584-3
- Bending radius 6 x outer diameter
- The impregnation with silicone rubber of the fiberglass braid makes the braid soft and mechanically flexible
- Colouring of conductors
- Packaging coils or reels

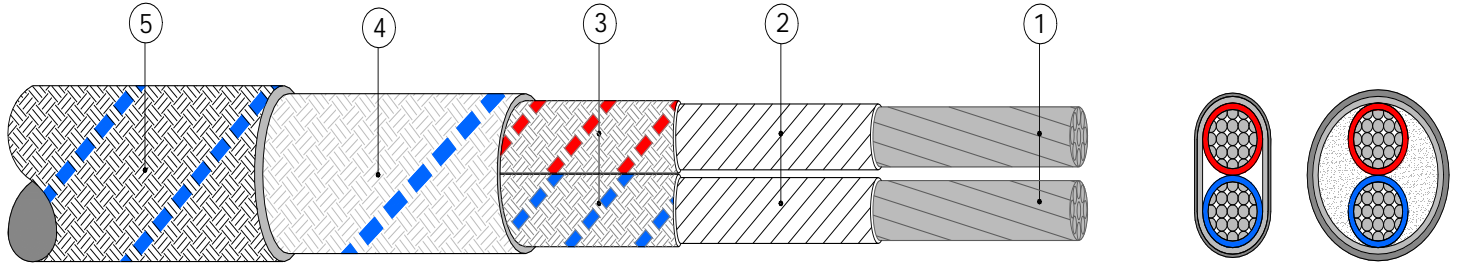
### OPTIONS

white with coloured stripes

On request for minimum quantities you can have:

- Braided stainless steel 304 500 m
- Different construction of stranding with single wire  $\varnothing$  0.20 - 0.32 mm 3000 m

Nominal size mm <sup>2</sup>	Stranding n° wires x diam. mm	Outer diameter			Type
		Round type mm	Oval type mm	Tolerance mm	
2 x 0.22	7 x 0.20	3.00	2.90 x 2.05	± 0.20	Jx Kx Wx Tx Sx Rx Bx Bx <sup>2</sup>
2 x 0.35	11 x 0.20	3.80	3.60 x 2.45		
2 x 0.50	6 x 0.32	4.00	3.80 x 2.55		
2 x 0.80	10 x 0.32	4.30	4.35 x 3.00		
2 x 1	12 x 0.32	4.40	4.40 x 3.10		



- 1 - Flexible conductor
- 2 - Fiberglass spiral impregnated with silicone rubber
- 3 - Fiberglass braid impregnated with silicone rubber
- 4 - Oval type: fiberglass braid  
Round type: fiberglass braid impregnated with silicone rubber
- 5 - Tin plated copper braid

### TECHNICAL DATA

- Working temperature of the insulating materials - 25°C + 250°C
- Temperature over short period 280°C
- Alloys temperature range and technical data see Technical Data Alloys
- Resistance to flame not propagate the flame, self-extinguishing
- Impermeability do not use in wet environments
- Colouring of cable according to the standards DIN43714 ANSI MC96.1 IEC 584-3
- Bending radius 6 x outer diameter
- The impregnation with silicone rubber of the fiberglass braid makes the braid soft and mechanically flexible
- Colouring of conductors white with coloured stripes
- Packaging coils or reels

### OPTIONS

On request for minimum quantities you can have:

- Different construction of stranding with single wire Ø 0.20 3000 m
- Braided stainless steel 500 m

Nominal size mm <sup>2</sup>	Stranding n° wires x diam.mm	Outer diameter			Type
		Round type mm	Oval type mm	Tolerance mm	
2 x 1.30	16 x 0.32	5.10	5.00 x 3.50	± 0.20	Jx Kx Wx Tx Sx Rx Bx Bx <sup>2</sup>
2 x 1.50	19 x 0.32	5.60	5.50 x 3.60		

## Temperature measurement (extension and compensating cables)



### Info

- Version SY - Armoured against mechanical loads
- Version ST - Screened against electromagnetic interference

### Product Make-up

- **Version Y:**
  - Fine-wire conductor alloy
  - PVC core insulation
  - Cores twisted into layers
  - PVC outer sheath
- **Version SY:**
  - Design as version Y
  - Additional galvanised steel wire braiding
  - PVC outer sheath
- **Version ST:**
  - Design as version Y
  - Cores twisted in pairs, pairs twisted in layers
  - Aluminium foil screening + drain wire
  - PVC outer sheath
- **Design, for example PVC-PVC-S-PVC:**
  - PVC core insulation
  - PVC inner sheath
  - Steel wire braiding
  - PVC outer sheath
- **Design, for example PVC-ST-PVC:**
  - PVC core insulation
  - Static foil screen
  - PVC outer sheath
- **Colour identity code**
  - DIN 43710**  
Negative conductor and outer sheath:  
Fe/CuNi: blue  
NiCr/Ni: green  
PtRh/Pt: white  
Positive conductor: always red
  - IEC 60 584**  
Positive conductor and outer sheath:  
Fe/CuNi: black  
NiCr/Ni: green  
PtRh/Pt: orange  
Negative conductor: always white
- **Extension**-conductor alloys are identified with **X**, e.g. JX (Fe/CuNi)
- **Compensating**-conductor alloys are identified with **C**, e.g. KCA (NiCr/Ni)

### Technical data



#### Classification

ETIM 5.0 Class-ID: EC000838

ETIM 5.0 Class-Description:  
Thermocouple cable



#### Core identification code

From 4 cores in pairs with consecutively marked numbers (1-1, 2-2, 3-3, 4-4...)



#### Based on

Limiting deviation in accordance with DIN and IEC in accordance with class 2



#### Conductor stranding

48 x 0.20 mm



#### Minimum bending radius

For flexible use:  
12.5 x outer diameter  
Type SY with steel braid:  
15 x outer diameter  
Type ST with foil screen:  
15 x outer diameter



#### Temperature range

(referring to insulation and sheath material)

Flexing: -5°C to +80°C

Fixed installation: -40°C to +80°C

Article number	Thermocouple	Product Make-up	Cable design	Number of cores and mm <sup>2</sup> per conductor	Outer diameter (mm)	Weight (kg/km)
<b>Type Y without steel wire braiding</b>						
0155001	Fe/CuNi	DIN-LX	PVC-PVC	4 x 1.5	8.2	130
0165001	Fe/CuNi	IEC-JX	PVC-PVC	4 x 1.5	8.2	130
0156001	NiCr/Ni	DIN-KCA	PVC-PVC	4 x 1.5	8.2	130
0166001	NiCr/Ni	IEC-KCA	PVC-PVC	4 x 1.5	8.2	130
0157001	PtRh/Pt	DIN-RCB/SCB	PVC-PVC	4 x 1.5	8.2	130
0167001	PtRh/Pt	IEC-RCB/SCB	PVC-PVC	4 x 1.5	8.2	130
0155002	Fe/CuNi	DIN-LX	PVC-PVC	6 x 1.5	10.2	200
0165002	Fe/CuNi	IEC-JX	PVC-PVC	6 x 1.5	10.2	200
0156002	NiCr/Ni	DIN-KCA	PVC-PVC	6 x 1.5	10.2	200
0166002	NiCr/Ni	IEC-KCA	PVC-PVC	6 x 1.5	10.2	200
0157002	PtRh/Pt	DIN-RCB/SCB	PVC-PVC	6 x 1.5	10.2	200
0167002	PtRh/Pt	IEC-RCB/SCB	PVC-PVC	6 x 1.5	10.2	200
0155003	Fe/CuNi	DIN-LX	PVC-PVC	8 x 1.5	11.2	238
0165003	Fe/CuNi	IEC-JX	PVC-PVC	8 x 1.5	11.2	238
0156003	NiCr/Ni	DIN-KCA	PVC-PVC	8 x 1.5	11.2	238
0166003	NiCr/Ni	IEC-KCA	PVC-PVC	8 x 1.5	11.2	238
0155005	Fe/CuNi	DIN-LX	PVC-PVC	12 x 1.5	13.3	335
0165005	Fe/CuNi	IEC-JX	PVC-PVC	12 x 1.5	13.3	335
0155007	Fe/CuNi	DIN-LX	PVC-PVC	16 x 1.5	15.0	447
0165007	Fe/CuNi	IEC-JX	PVC-PVC	16 x 1.5	15.0	447
0156007	NiCr/Ni	DIN-KCA	PVC-PVC	16 x 1.5	15.0	447
0166007	NiCr/Ni	IEC-KCA	PVC-PVC	16 x 1.5	15.0	447
0155010	Fe/CuNi	DIN-LX	PVC-PVC	24 x 1.5	19.0	555
0165010	Fe/CuNi	IEC-JX	PVC-PVC	24 x 1.5	19.0	555
0156010	NiCr/Ni	DIN-KCA	PVC-PVC	24 x 1.5	19.0	555
0166010	NiCr/Ni	IEC-KCA	PVC-PVC	24 x 1.5	19.0	555
<b>Type SY with steel wire braiding</b>						
0155501	Fe/CuNi	DIN-LX	PVC-PVC-S-PVC	4 x 1.5	11.4	240
0165501	Fe/CuNi	IEC-JX	PVC-PVC-S-PVC	4 x 1.5	11.4	240
0156501	NiCr/Ni	DIN-KCA	PVC-PVC-S-PVC	4 x 1.5	11.4	240
0166501	NiCr/Ni	IEC-KCA	PVC-PVC-S-PVC	4 x 1.5	11.4	240
0157501	PtRh/Pt	DIN-RCB/SCB	PVC-PVC-S-PVC	4 x 1.5	11.4	240

## Temperature measurement (extension and compensating cables)

Article number	Thermocouple	Product Make-up	Cable design	Number of cores and mm <sup>2</sup> per conductor	Outer diameter (mm)	Weight (kg/km)
0167501	PtRh/Pt	IEC-RCB/SCB	PVC-PVC-S-PVC	4 x 1.5	11.4	240
0155502	Fe/CuNi	DIN-LX	PVC-PVC-S-PVC	6 x 1.5	13.0	355
0165502	Fe/CuNi	IEC-JX	PVC-PVC-S-PVC	6 x 1.5	13.0	355
0156502	NiCr/Ni	DIN-KCA	PVC-PVC-S-PVC	6 x 1.5	13.0	355
0166502	NiCr/Ni	IEC-KCA	PVC-PVC-S-PVC	6 x 1.5	13.0	355
0157502	PtRh/Pt	DIN-RCB/SCB	PVC-PVC-S-PVC	6 x 1.5	13.0	355
0167502	PtRh/Pt	IEC-RCB/SCB	PVC-PVC-S-PVC	6 x 1.5	13.0	355
0155503	Fe/CuNi	DIN-LX	PVC-PVC-S-PVC	8 x 1.5	13.8	410
0165503	Fe/CuNi	IEC-JX	PVC-PVC-S-PVC	8 x 1.5	13.8	410
0156503	NiCr/Ni	DIN-KCA	PVC-PVC-S-PVC	8 x 1.5	13.8	410
0166503	NiCr/Ni	IEC-KCA	PVC-PVC-S-PVC	8 x 1.5	13.8	410
0155505	Fe/CuNi	DIN-LX	PVC-PVC-S-PVC	12 x 1.5	17.9	550
0165505	Fe/CuNi	IEC-JX	PVC-PVC-S-PVC	12 x 1.5	17.9	550
0156505	NiCr/Ni	DIN-KCA	PVC-PVC-S-PVC	12 x 1.5	17.9	550
0166505	NiCr/Ni	IEC-KCA	PVC-PVC-S-PVC	12 x 1.5	17.9	550
0155507	Fe/CuNi	DIN-LX	PVC-PVC-S-PVC	16 x 1.5	19.4	730
0165507	Fe/CuNi	IEC-JX	PVC-PVC-S-PVC	16 x 1.5	19.4	730
0155510	Fe/CuNi	DIN-LX	PVC-PVC-S-PVC	24 x 1.5	23.8	847
0165510	Fe/CuNi	IEC-JX	PVC-PVC-S-PVC	24 x 1.5	23.8	847
<b>Type ST with static overall screening</b>						
0158500	Fe/CuNi	DIN-LX	PVC-ST-PVC	2 x 2 x 1.5	11.4	145
0168500	Fe/CuNi	IEC-JX	PVC-ST-PVC	2 x 2 x 1.5	11.4	145
0158501	NiCr/Ni	DIN-KCA	PVC-ST-PVC	2 x 2 x 1.5	11.4	145
0168501	NiCr/Ni	IEC-KCA	PVC-ST-PVC	2 x 2 x 1.5	11.4	145
0158503	Fe/CuNi	DIN-LX	PVC-ST-PVC	4 x 2 x 1.5	13.7	257
0168503	Fe/CuNi	IEC-JX	PVC-ST-PVC	4 x 2 x 1.5	13.7	257
0158504	NiCr/Ni	DIN-KCA	PVC-ST-PVC	4 x 2 x 1.5	13.7	257
0168504	NiCr/Ni	IEC-KCA	PVC-ST-PVC	4 x 2 x 1.5	13.7	257
0158506	Fe/CuNi	DIN-LX	PVC-ST-PVC	8 x 2 x 1.5	18.3	469
0168506	Fe/CuNi	IEC-JX	PVC-ST-PVC	8 x 2 x 1.5	18.3	469
0158507	NiCr/Ni	DIN-KCA	PVC-ST-PVC	8 x 2 x 1.5	18.3	469
0168507	NiCr/Ni	IEC-KCA	PVC-ST-PVC	8 x 2 x 1.5	18.3	469
0158509	Fe/CuNi	DIN-LX	PVC-ST-PVC	12 x 2 x 1.5	22.2	573
0168509	Fe/CuNi	IEC-JX	PVC-ST-PVC	12 x 2 x 1.5	22.2	573
0158510	NiCr/Ni	DIN-KCA	PVC-ST-PVC	12 x 2 x 1.5	22.2	573
0168510	NiCr/Ni	IEC-KCA	PVC-ST-PVC	12 x 2 x 1.5	22.2	573

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.

Please find our standard lengths at: [www.lappkabel.de/en/cable-standardlengths](http://www.lappkabel.de/en/cable-standardlengths)

Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum

Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).

Photographs are not to scale and do not represent detailed images of the respective products.