

UL Instrumentation Cable

Thermocouple Extension Cables and Thermocouple Wire — Overview

Construction Thermocouple Extension Cable

Conductor material determined by the thermocouple extension wire type. FEP or PVC insulated with FEP or PVC jacket. Nylon rip cord included in all PVC-jacketed thermocouple extension cables. Communication wire included on all multi-pair, PVC constructions — 22 AWG (7x30) bare copper orange PVC insulation.

NOTE: The temperature ranges in Table A are applicable only to the thermocouple conductors and not to the cable. The cable must never be exposed to temperatures higher than the maximum temperature ratings shown in Table B.

Table B: Other Insulation/Jacket Options

UL Listed for PLTC	
Insulation/Jacket	Max. Temp Rating
XLPE/PVC	90°C
XLPE/CPE	90°C
PVC/PVC	105°C
PVC/CPE	105°C
PE/PVC	75°C
FPE/PVC	75°C
TPE/TPE	105°C
XLPE/Haloarrest®	90°C
FEP/FEP	200°C

Application

Unshielded

Parallel non-shielded extension wire may be utilized in low noise environments when recommended by the instrument manufacturer.

Overall Shield

Recommended, except in areas where high voltage and current sources create excessive noise interference. The Beldfoil® shield with drain wire provides 100% coverage for maximum shield effectiveness.

Individually Shielded

Individually shielded pairs are recommended for use in applications where optimum noise rejection is required.

PVC Insulated, PVC Jacketed Cable Specifications

- UL Subject 13
- UL 1685 (UL 1581) Vertical Tray Flame Test comparable to IEEE 383-1974 (70,000 BTU) Flame Test
- ANSI/MC 96.1-1982
- NEC CMG
- NEC Type PLTC Listed, which is approved for cable tray use in Class 1, Division 2, hazardous areas and non-hazardous areas, cable trays, raceways, conduit and supported by messenger wires.

- NEC Type ITC Listed, which is approved for cable tray use, raceways hazardous locations according to Articles 501, 502, 503 and 504; or as aerial on a cable messenger, and under raised floors in control rooms and rack rooms where arranged to prevent damage to the cable. Usages are allowed based on qualified persons servicing all installations.
- PVC/PVC constructions are CMG, FT4, IEEE 1202 and IEEE 383-2003 rated, and meet ICEA T-29-520 Flame Test.
- UL 1277 TC versions approved for use in Class 1 trays available as special.

Shielded Twisted Pair (FEP insulated, FEP jacketed cable specifications)

- UL Subject 13
- NFPA 262 (UL 910 Steiner Tunnel Flame Test) comparable to FT6 Flame Test
- ANSI/MC 96.1-1982
- NEC Type CL3P/PLTC Listed, which is approved for use in ducts, plenums and other space used for environmental air.
- UL 1277 TC versions approved for use in Class 1 trays available as special.

Thermocouple Wire

Conductor material determined by the thermocouple type. FEP insulated and jacketed flat constructions.

FEP thermocouple wire is impervious to chemical attack and is flame retardant.

Table A: Thermocouple Identification and Limits of Error — Reference Junction 0°C*

ANSI Symbol	Temperature Range (°C) (conductor only)	Limits of Error Standard (°C)	Jacket Color	Insulation Color Code		Conductor Identification	
				Positive (+)	Negative (-)	Positive (+)	Negative (-)
E	0 to 340 340 to 540	±1.7°C ±.50%	Brown	Purple	Red	Chromel® Non-magnetic	Constantan Silver Color
J	0 to 293 293 to 480	±2.2°C ±.75%	Brown	White	Red	Iron Magnetic	Constantan Non-magnetic
K	0 to 293 293 to 980	±2.2°C ±.75%	Brown	Yellow	Red	Chromel Non-magnetic	Alumel® Magnetic
T	0 to 133 133 to 260	±1.0°C ±.75%	Brown	Blue	Red	Copper Copper Color	Constantan Non-magnetic
EX	0 to 200	±1.7°C	Purple	Purple	Red	Chromel	Constantan
JX	0 to 200	±2.2°C	Black	White	Red	Iron	Constantan
KX	0 to 200	±2.2°C	Yellow	Yellow	Red	Chromel	Alumel
TX	0 to 100	±1.0°C	Blue	Blue	Red	Copper	Constantan

Limits of error per ANSI MC96.1-1982. Limits shown do not include system or installation error. Percentages refer to the temperature being measured.

*The Temperature Range and Limits of Error are for standard grade thermocouples, Reference ANSI MC96.1-1982 for special grade thermocouples. The Temperature Ranges for type E, J, K and T thermocouple wires listed above pertain to 20 AWG wire.

Additional constructions available upon request.

Standard lengths may be subject to tolerance. Custom lengths may be available upon request. Contact the Belden Electronics Division Customer Service Department for additional information. 1-800-BELDEN-1

UL Instrumentation Cable

Thermocouple Extension Cables

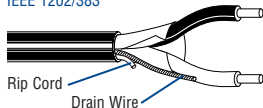
Industrial Grade Sunlight- and Oil-Resistant Jackets

Description	Part No.	ANSI Type	No. of Pairs	Color Code	Jacket Color	Standard Lengths		Standard Unit Weight		Insulation Thickness		Nominal OD	
						Ft.	m	Lbs.	kg	Inch	mm	Inch	mm

20 AWG Pairs Solid Conductors • (See chart on page 18.53 for conductor specifications by ANSI Type)

Overall Beldfoil® Shield (100% Coverage) • PVC Insulation • PVC Jacket

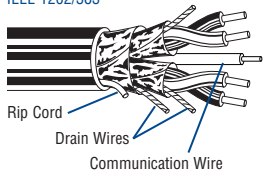
300V 105°C
NEC: PLTC, ITC, CMG
CEC: CMG FT4
ICEA T-29-520
IEEE 1202/383



3111A	JX	1	White, Red	Black	5000 †	1524.0	115.0	52.2	.016	.41	.206	5.23
3112A	KX	1	Yellow, Red	Yellow	5000 †	1524.0	120.0	54.5	.016	.41	.206	5.23
3113A	TX	1	Blue, Red	Blue	5000 †	1524.0	115.0	52.2	.016	.41	.206	5.23

Individually Shielded + Overall Beldfoil Shield (100% Coverage) • PVC Insulation • PVC Jacket

300V 105°C
NEC: PLTC, ITC, CMG
CEC: CMG FT4
ICEA T-29-520
IEEE 1202/383

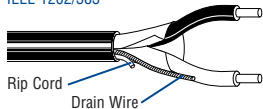


3115A	JX	2	White, Red	Black	5000 †	1524.0	315.0	143.0	.016	.41	.332	8.43
1006A	JX	4	White, Red	Black	5000 †	1524.0	480.0	217.9	.016	.41	.383	9.73
1012A	KX	4	Yellow, Red	Yellow	5000 †	1524.0	530.0	240.6	.016	.41	.383	9.73
1013A	KX	8	Yellow, Red	Yellow	5000 †	1524.0	825.0	374.6	.016	.41	.503	12.78
1014A	KX	12	Yellow, Red	Yellow	5000 †	1524.0	1195.0	542.5	.016	.41	.603	15.32

16 AWG Pairs Solid Conductors • (See chart on page 18.53 for conductor specifications by ANSI Type)

Overall Beldfoil Shield (100% Coverage) • PVC Insulation • PVC Jacket

300V 105°C
NEC: PLTC, ITC, CMG
CEC: CMG FT4
ICEA T-29-520
IEEE 1202/383



1101A	EX	1	Purple, Red	Purple	10000 †	3048.0	450.0	204.3	.017	.43	.248	6.30
1000A	JX	1	White, Red	Black	1000	304.8	42.0	19.1	.017	.43	.248	6.30
					10000 †	3048.0	420.0	190.7				
1018A	KX	1	Yellow, Red	Yellow	1000	304.8	42.0	19.1	.017	.43	.248	6.30
					10000 †	3048.0	420.0	190.7				
1023A	TX	1	Blue, Red	Blue	10000 †	3048.0	450.0	204.3	.017	.43	.248	6.30

Multiple pair cables have each pair numbered for ease of identification.

†Final put-up length may vary ±10% from length shown.

UL Instrumentation Cable

High-Temperature Thermocouple Extension Cables and Thermocouple Wire
Industrial Grade Sunlight- and Oil-Resistant Jackets

Description	Part No.	ANSI Type	No. of Pairs/Cond.	Color Code	Jacket Color	Standard Lengths		Standard Unit Weight		Insulation Thickness		Nominal OD	
						Ft.	m	Lbs.	kg	Inch	mm	Inch	mm

High-Temp Extension Cable • 20 AWG Solid Conductors • (See chart on page 18.53 for conductor specifications by ANSI Type)

Plenum • Unshielded • FEP Insulation • FEP Jacket

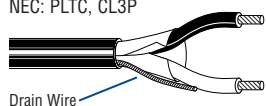
300V 200°C NEC: PLTC, CL3P		83932	KX	2/c	Yellow, Red	Yellow	500 †	152.4	6.5	3.0	.010	.25	.076	1.93
							1000 †	304.8	12.0	5.4			x .128	x 3.25
		83934	TX	2/c	Blue, Red	Blue	500 †	152.4	13.0	6.0	.010	.25	.076	1.93
							1000 †	304.8	13.0	6.0			x .128	x 3.25

High-Temp Extension Cable • 20 AWG Stranded (7x28) Conductors • (See chart on page 18.53 for conductor specifications by ANSI Type)

Plenum • Unshielded • FEP Insulation • FEP Jacket

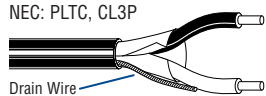
300V 200°C NEC: PLTC, CL3P		83930	JX	2/c	White, Red	Black	500 †	152.4	7.5	3.4	.010	.25	.082	2.08
							1000 †	304.8	13.0	6.0			x .140	x 3.56

Plenum • Overall Beldfoil® Shield (100% Coverage) • FEP Insulation • FEP Jacket

300V 200°C NEC: PLTC, CL3P		83955	EX	1 pr.	Purple, Red	Purple	500 †	152.4	9.0	4.1	.010	.25	.145	3.68
							1000 †	304.8	16.0	7.3				
		83950	JX	1 pr.	White, Red	Black	500 †	152.4	9.5	4.3	.010	.25	.145	3.68
							1000 †	304.8	16.0	7.3				
		83952	KX	1 pr.	Yellow, Red	Yellow	500 †	152.4	9.5	4.3	.010	.25	.145	3.68
							1000 †	304.8	16.0	7.3				
		83954	TX	1 pr.	Blue, Red	Blue	500 †	152.4	9.0	4.1	.010	.25	.145	3.68
							1000 †	304.8	17.0	7.7				

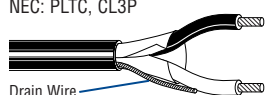
High-Temp Extension Cable • 16 AWG Pairs Solid Conductors • (See chart on page 18.53 for conductor specifications by ANSI Type)

Plenum • Overall Beldfoil Shield (100% Coverage) • FEP Insulation • FEP Jacket

300V 200°C NEC: PLTC, CL3P		1114A	EX	1	Purple, Red	Purple	5000 †	1524.0	160.0	72.6	.010	.25	.172	4.37
							10000 †	3048.0	320.0	145.2				
		1115A	JX	1	White, Red	Black	5000 †	1524.0	155.0	70.4	.010	.25	.172	4.37
							10000 †	3048.0	310.0	140.8				
		1116A	KX	1	Yellow, Red	Yellow	5000 †	1524.0	160.0	72.6	.010	.25	.171	4.34
							10000 †	3048.0	320.0	145.2				
		1117A	TX	1	Blue, Red	Blue	5000 †	1524.0	160.0	72.6	.010	.25	.172	4.37
							10000 †	3048.0	320.0	145.2				

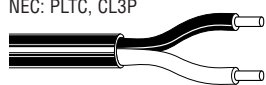
High-Temp Extension Cable • 16 AWG Pairs Stranded (7x24) Conductors • (See chart on page 18.53 for conductor specifications by ANSI Type)

Plenum • Overall Beldfoil Shield (100% Coverage) • FEP Insulation • FEP Jacket

300V 200°C NEC: PLTC, CL3P		83951	JX	1	White, Red	Black	500 †	152.4	16.0	7.3	.010	.25	.189	4.80
							1000 †	304.8	32.0	14.5				
		83953	KX	1	Yellow, Red	Yellow	500 †	152.4	16.0	7.3	.010	.25	.187	4.75
							1000 †	304.8	32.0	14.5				

High-Temp Thermocouple Wire • 20 AWG Solid Conductors • (See chart on page 18.53 for conductor specifications by ANSI Type)

Plenum • Unshielded • FEP Insulation • FEP Jacket

300V 200°C NEC: PLTC, CL3P		83915	E	2/c	Purple, Red	Brown	500 †	152.4	7.0	3.2	.010	.25	.076	1.93
							1000 †	304.8	13.0	6.0			x .128	x 3.25
		83900	J	2/c	White, Red	Brown	100	30.5	2.1	1.0	.010	.25	.076	1.93
							500 †	152.4	7.0	3.2			x .128	x 3.25
		83905	K	2/c	Yellow, Red	Brown	100	30.5	2.1	1.0	.010	.25	.076	1.93
							500 †	152.4	7.0	3.2			x .128	x 3.25
		83910	T	2/c	Blue, Red	Brown	100	30.5	2.1	1.0	.010	.25	.076	1.93
							500 †	152.4	7.0	3.2			x .128	x 3.25
							1000 †	304.8	12.0	5.4				

FEP = Fluorinated Ethylene-propylene

†Final put-up length may vary ±10% from length shown.

Multiple pair cables have each pair numbered for ease of identification.