Thermocouple Compensating Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

500V Pairs, Type KCB
XLPE Insulated, Individual & Overall Screen, Unarmoured or Armoured, PVC Sheathed Cable

Description: Type KCB-XLPE/ISOS/PVC-UV or Type KCB-XLPE/ISOS/PVC/SWA/PVC-UV

Model Code: Type KCB-XIOP-UV or Type KCB-XIOPSP-UV

Application :	This cable is used in temperature measurement to convey information from a thermocouple sensor, to the measuring instrument.
Voltage rating :	500V
Construction :	Solid conductor (Positive: Copper / Negative: Copper Nickel), XLPE insulated, twisted pairs, individual and overall screen (aluminium/ polyester tape with tinned copper drain wire), unarmoured or galvanized steel wire armoured, UV resistant PVC* sheathed cable
Insulation colour :	(+) Green, (-) White (with numbering)
Sheath colour :	Green
Specification :	BS EN 50288-7, IEC 60584-3, IEC 60332-1-2
	IEC 60332-3 (upon request)
Operating temperature :	90˚C

**LSZH sheath (upon request), comply with IEC 60332-3, IEC 60754, IEC 61034-2*

No. of Pairs	Conductor		Insulation	Unarmoured Cable			Armoured Cable		
	Nominal Area	No./Diam. of Strand	Thickness	Part No.	Approx. Overall Diam.	Approx. Weight	Part No.	Approx. Overall Diam.	Approx. Weight
	(mm^2)	(no./mm)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
2P	0.5	1/0.80	0.6	**042P6686**	11.3	140	**042P6896**	13.5	435
4P				**044P6686**	13.0	195	**044P6896**	15.2	540
6P				**046P6686**	15.8	270	**046P6896**	17.9	680
8P				**048P6686**	17.9	345	**048P6896**	20.6	945
10P				**040P6686**	20.4	425	**040P6896**	23.0	1105
12P				**04BP6686**	21.1	475	**04BP6896**	23.6	1180
16P				**04FP6686**	23.5	595	**04FP6896**	26.7	1555
20P				**04KP6686**	26.0	715	**04KP6896**	29.2	1800
24P				**04RP6686**	28.9	870	**04RP6896**	32.2	2050
36P				**04P26686**	33.3	1210	**04P26896**	37.4	2905
2P	1	1/1.13	0.6	**062P6686**	12.5	175	**062P6896**	14.7	495
4P				**064P6686**	14.8	260	**064P6896**	17.0	650
6P				**066P6686**	17.9	360	**066P6896**	20.5	965
8P				**068P6686**	20.2	460	**068P6896**	22.8	1135
10P				**060P6686**	22.8	560	**060P6896**	25.4	1330
12P				**06BP6686**	23.8	645	**06BP6896**	27.0	1625
16P				**06FP6686**	26.5	815	**06FP6896**	29.7	1920
20P				**06KP6686**	29.6	1005	**06KP6896**	32.8	2250
24P				**06RP6686**	32.8	1210	**06RP6896**	36.9	2870
36P				**06P26686**	37.7	1675	**06P26896**	41.7	3585

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Description: Type KCB-XLPE/ISOS/PVC-UV or Type KCB-XLPE/ISOS/PVC/SWA/PVC-UV

Model Code: Type KCB-XIOP-UV or Type KCB-XIOPSP-UV

No. of Pairs	Conductor		Insulation	Unarmoured Cable			Armoured Cable		
	Nominal Area	No./Diam. of Strand	Thickness	Part No.	Approx. Overall Diam.	Approx. Weight	Part No.	Approx. Overall Diam.	Approx. Weight
	(mm^2)	(no./mm)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
2P	1.3	1/1.29	0.6	**412P6686**	13.5	200	**412P6896**	15.5	550
4P				**414P6686**	16.0	300	**414P6896**	18.5	830
6P				**416P6686**	19.0	420	**416P6896**	21.6	1055
8P				**418P6686**	21.4	525	**418P6896**	23.8	1245
10P				**410P6686**	24.2	655	**410P6896**	27.4	1650
12P				**41BP6686**	25.2	750	**41BP6896**	28.4	1785
16P				**41FP6686**	28.0	950	**41FP6896**	31.3	2130
20P				**41KP6686**	31.4	1170	**41KP6896**	35.4	2765
24P				**41RP6686**	35.8	1405	**41RP6896**	38.9	3185
36P				**41P26686**	40.2	1975	**41P26896**	45.1	4455
2P	1.5	1/1.38	0.6	**072P6686**	13.7	210	**072P6896**	15.8	570
4P				**074P6686**	16.2	320	**074P6896**	18.8	860
6P				**076P6686**	19.5	445	**076P6896**	21.1	1095
8P				**078P6686**	21.8	560	**078P6896**	24.4	1300
10P				**070P6686**	24.8	695	**070P6896**	28.0	1735
12P				**07BP6686**	25.8	800	**07BP6896**	29.0	1880
16P				**07FP6686**	28.8	1020	**07FP6896**	32.1	2220
20P				**07KP6686**	32.2	1255	**07KP6896**	36.2	2890
24P				**07RP6686**	35.8	1510	**07RP6896**	39.8	3330
36P				**07P26686**	41.3	2135	**07P26896**	46.3	4705

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Table 4 : Code, Colour Code and Properties

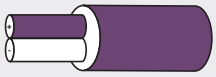
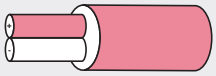
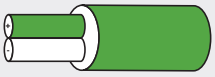
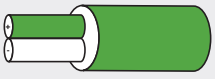
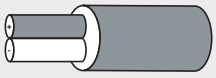
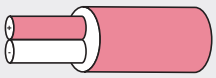
Sensors	Types	Conductor Composition		Colours (IEC 60584-3-2007)	Nominal e.m.f. (microvolts 0°C/100°C)	Limits of Error		Temperature of Connected Point with Thermocouple	Measuring Junction Temperature
		Positive (PX)	Negative (NX)			Class 1	Class 2		
						(°C)		(°C)	(°C)
Extension Cables :									
K	KX	Nickel Chromium	Nickel Aluminium	 Green (+) White (-) Green (Sheath)	4,10	±1.5	±2.5	-25 ~ +200	900
J	JX	Iron	Copper Nickel (Constantan)	 Black (+) White (-) Black (Sheath)	5,27	±1.5	±2.5	-25 ~ +200	500
T	TX	Copper	Copper Nickel (Constantan)	 Brown (+) White (-) Brown (Sheath)	4,28	±0.5	±1.0	-25 ~ +100	300
E	EX	Nickel Chromium	Copper Nickel (Constantan)	 Violet (+) White (-) Violet (Sheath)	6,32	±1.5	±2.5	-25 ~ +200	500
N	NX	Nickel Chromium Silicon	Nickel Silicon	 Pink (+) White (-) Pink (Sheath)	2,77	±1.5	±2.5	-25 ~ +200	900
Compensating Cables :									
K	KCA	Iron	Copper Nickel Alloy	 Green (+) White (-) Green (Sheath)	4,10	-	±2.5	0 ~ +150	900
	KCB	Copper	Copper Nickel (Constantan)	 Green (+) White (-) Green (Sheath)	4,10	-	±2.5	0 ~ +100	900
R	RCA	Copper	Copper Low Nickel Alloy	 Orange (+) White (-) Orange (Sheath)	0,65	-	±2.5	0 ~ +100	1000
	RCB	Copper	Copper Nickel Mo Alloy	 Orange (+) White (-) Orange (Sheath)	0,65	-	±5.0	0 ~ +200	1000
S	SCA	Copper	Copper Low Nickel Alloy	 Orange (+) White (-) Orange (Sheath)	0,65	-	±2.5	0 ~ +100	1000
	SCB	Copper	Copper Nickel Mo Alloy	 Orange (+) White (-) Orange (Sheath)	0,65	-	±5.0	0 ~ +200	1000
B	BC	Copper	Copper	 Grey (+) White (-) Grey (Sheath)	0,03	-	±3.5	0 ~ +100	1400
N	NC	Copper Nickel Mg	Copper Nickel Mg	 Pink (+) White (-) Pink (Sheath)	2,77	-	±2.5	0 ~ +150	900

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Table 5 : Code and Notes

Sensors	Types	Conductor Composition		Notes
		Positive (PX)	Negative (NX)	
K	KX	Nickel Chromium	Nickel Aluminium	Type KX thermocouple extension cable conductors are made from the same constituent elements as the Type K thermocouple combination and therefore minimises potential errors when connecting to a sensor.
	KCA	Iron	Copper Nickel Alloy	This compensating cable conductor combination is little known and generally not available. It should not be confused with the more popular Type KCB as shown below.
	KCB	Copper	Copper Nickel (Constantan)	This popular compensating cable conductor combination (previously known as Type V) is made with Copper vs Copper-Nickel conductors, and should only be used when the ambient temperature of the interconnection point between the cable and its Type K sensor is below 100°C. If suitable to your requirements it can save money where long runs are necessary.
J	JX	Iron	Copper Nickel (Constantan)	Type JX extension cable conductors are made from the same constituent elements as Type J thermocouples. There is no compensating cable available for Type J, however the extension cable is relatively inexpensive.
T	TX	Copper	Copper Nickel (Constantan)	Type TX extension cable conductors are made from the same constituent elements as Type T thermocouples. There is no compensating cable available for Type T, however the extension cable is relatively inexpensive.
E	EX	Nickel Chromium	Copper Nickel (Constantan)	Type EX extension cable conductors are made from the same constituent elements as Type E thermocouples. There is no compensating cable available for Type E.
R	RCA	Copper	Copper Low Nickel Alloy	Type RCA compensating cable is suitable for connecting to Type R thermocouples where the ambient temperature of the interconnection point between the cable and its Type R sensor is below 100°C.
	RCB		Copper Nickel Mo Alloy	Type RCB compensating cable is suitable for connecting to Type R thermocouples where the ambient temperature of the interconnection point between the cable and its Type R sensor is below 200°C, however this increased range is achieved with a lesser degree of accuracy than Type RCA as shown above.
S	SCA	Copper	Copper Low Nickel Alloy	Type SCA compensating cable is suitable for connecting to Type S thermocouples where the ambient temperature of the interconnection point between the cable and its Type S sensor is below 100°C. SCA is in fact the same material as Type RCA.
	SCB		Copper Nickel Mo Alloy	Type SCB compensating cable is suitable for connecting to Type S thermocouples where the ambient temperature of the interconnection point between the cable and its Type S sensor is below 200°C, however this increased range is achieved with a lesser degree of accuracy than Type SCA as shown above. SCB is in fact the same material as Type RCB.
B	BC	Copper	Copper	This compensating cable is made from Copper vs Copper conductors. The expected maximum additional deviation when the ambient interconnection point is between 0 and 100°C would be approximately 3.5°C when the measuring junction is at 1400°C.
N	NX	Nickel Chromium Silicon	Nickel Silicon	Type NX extension cable conductors are made from the same constituent elements as Type N thermocouples. Although there is a designated compensating cable for Type N, it is not readily available at the present.
	NC	Copper Nickel Mg	Copper Nickel Mg	Type NC compensating cable is not readily available at the present. It can be assumed that as Type N thermocouples become more popular the compensating cable will start to be produced.