Extension & Compensating Cable

Nowadays, Thermocouple are being widely used in every industrial field from chemical, petrochemicals, metals, ceramics and electronics to aerospace. Although it is theoretically ideal to have Thermocouple connected directly to instrument, long distance between them often makes to cost prohibitive and causes some troules in the circuit. Therefore, it is desirable to use extension or compensating cable that have same or similar EMF characteristics to those of Thermocouple. It is also necessary to change insulation cover materials according to the operating conditions.
DAEHAN have a large stock of various cable as listed below and on pages 36~38

Types

Thermo couple SYMBOL	CODE	CONDUCTORS +leg/-leg	TOLERANCE TO JIS C1610-1981 ANSI MC96.1		INSULATION COLOR CODES				
					JAPANESE STANDARD JIS C1610-1981	AMERICAN STANDARD ANSIISA MC96.1	BRITISH STANDARD BS 1843. 1952	GERMAN STANDARD DIN 43714	FRENCH STANDARD NF NF C42-323
B	*BX	Copper / Copper led wire	0 to 100℃	(1)	+ − Red White Gray	+ − White Red Gray		+ − Red Gray Gray	
			0 to 150℃						
S & R	*SX (*RX)	Copper / Copper Nickel Compensation for Type S & R	0 to 150℃	(2) +3℃ -7℃	+ − Red White Black	+ − Black Red Green	+ − White Blue Green	+ − Red White White SX only	+ − Yellow Green Green SX only
			0 to 200℃	(2) ±0.057 mV					
K	KX	Nickel / Nickel Chromium Aluminum Extension for Type K	-20 to 150℃	±2.5℃	+ − Red White Blue	+ − Yellow Red Yellow	+ − Brown Blue Red	+ − Red Green Green	+ − Yellow Purple Yellow
				±1.5℃					
			0 to 200℃	±2.2℃					
				±1.1℃					
	*WK	Iron / Copper Nickel Compensation for Type K	-20 to 150℃	±3℃	+ − Red White Blue				+ − Yellow White White
			-						
	VX	Copper / Constantan Compensation for Type K	-20 to 150℃	±2.5℃	+ − Red White Blue		+ − White Blue Red		+ − Yellow Brown Red
E	EX	Nickel / Constantan Chromium Extension for Type E	-20 to 150℃	±2.5℃	+ − Red White Purple	+ − Purple Red Purple	+ − Brown Blue Brown	+ − Red Black Black	
			0 to 200℃	±1.7℃					
				±0.8℃					
J	JX	Iron / Constantan Extension for Type J	-20 to 150℃	±2.5℃	+ − Red White Yellow	+ − White Red Black	+ − Yellow Blue Black	+ − Red Blue Blue	+ − Yellow Black Black
			0 to 200℃	±2.2℃					
				±1.1℃					
T	TK	Copper / Constantan Extension for Type T	-20 to 150℃	±2.0℃	+ − Red White Brown	+ − Blue Red Blue	+ − White Blue Blue	+ − Red Brown Brown	+ − Yellow Blue Blue
				±1.0℃					
			-60 to 100℃	±1.0℃					
				±0.5℃					

Insulation Resistance shall be more than 5 m Ω/10m.
Notes : (1) BX has positive leg of same material (Cu), so no tolearance is stipulated.
(2) These figures do not represent actual measuring error because Types R and S have non-liner EMF characteristics.
* These color codes nomally relate only to the compensating cable for use with appropriate Thermocouple conductor combnation type code.

Extension & Compensating Cable

Electrical Resistance

Nom. cross-sec. area A (mm^2)	Core No. / Dia.	BX	RX SX	KX	WX	VX	EX	JX	TX
0.5	20 / 0.18	0.34 0.34	0.34 0.10	1.38 0.56	0.24 0.46	0.034 0.98	1.38 0.98	0.24 0.98	0.034 0.98
		0.068	0.13	1.94	1.70	1.01	2.36	1.22	1.01
0.75	30 / 0.18	0.023 0.023	0.023 0.067	0.92 0.37	0.16 0.31	0.023 0.65	0.92 0.65	0.16 0.65	0.023 0.65
		0.046	0.090	1.29	1.47	1.67	1.57	0.81	0.67
1.25	7 / 0.45	0.014 0.014	0.014 0.040	0.55 0.22	0.096 0.18	0.014 0.39	0.55 0.39	0.096 0.39	0.014 0.39
		0.028	0.054	0.7	0.28	0.40	0.94	0.49	0.40
1.3	4 / 0.65 or 1 / 1.3	0.013 0.013	0.013 0.038	0.53 0.22	0.092 0.18	0.013 0.38	0.53 0.38	0.092 0.38	0.013 0.38
		0.026	0.051	0.75	0.27	0.39	0.91	0.47	0.39
2.0	7 / 0.6 or 1 / 1.6	0.0085 0.0085	0.0085 0.025	0.35 0.14	0.060 0.12	0.0085 0.25	0.35 0.25	0.060 0.25	0.0085 0.25
		0.017	0.034	0.49	0.18	0.26	0.60	0.31	0.26
2.3	7 / 0.65	0.0074 0.0074	0.0074 0.022	0.30 0.12	0.052 0.10	0.0074 0.21	0.30 0.21	0.052 0.21	0.0074 0.21
		0.015	0.029	0.42	0.15	0.22	0.51	0.26	0.22

Overall Materials for Compensating Cables

PVC Cover :

PVC covering has been widely used as a good substitute for rubber insulator. At YAMARI, PVC is used as the insulator of standard compensting cable for general use.
Recommendable Temperature Range : -20~+80°C

Asbestos Cover :

Asbestos fiber is so good high temperature insulator as glass fiber but is hygroscopic property may deteriorate insulation resistance. It is recommended for use in dry and high temperatures.
Recommendable Temperature Range : Room temperature ~500°C

Glass Fiber Cover :

Glass fiber is known as a traditional high temperature insulator because it has excellent incombustibility, heat restance, electrice insulation, and chemical stability. Although single glass fiber is not hygroscopic, bundle there of are somehygroscopic. So, silicon or other resin is impregnated and baked over them to prevent moisture absorption.
Recommendable Temperature Range : 20~270°C

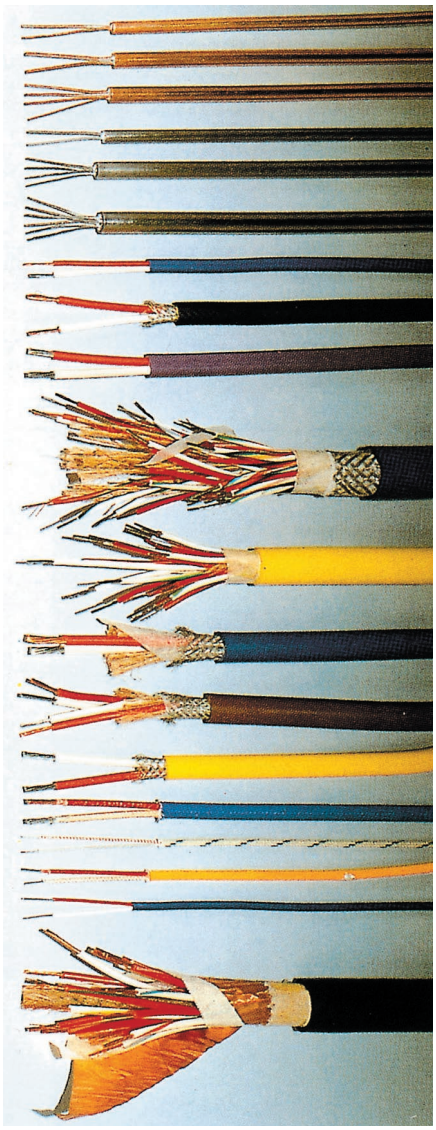
Silicon Rubber Cover :

Silicon rubber has been widely used as an excellent insulator with less deterioration of physical properties.
It has almost same electric properties as natural rubber and no serious change in voltage withstanding occur over recommendable temperature range. It has also good resistance to chemicals (except for concentrated Alkalis), oils and grease, weather and ozone.
Recommendable Temperature Range : -60~250°C

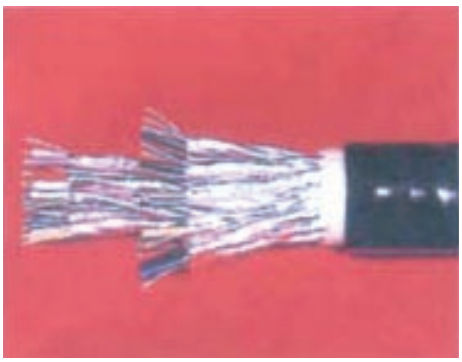
Teflon* (fluoric resin PTFE. FEP) Cover :

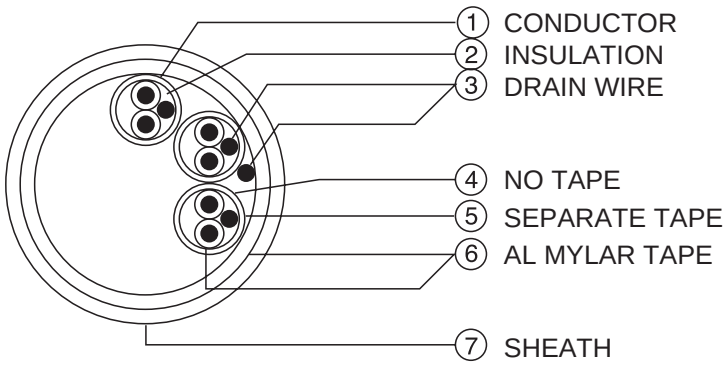
Teflon is the most excellent insulator among oranic materials in respect to heat resistance, chemical resistance, electric insulation, high frequency resistance, weater resistance, etc. High mechanical strength and, especially, high pressure resistance in wider range of operating temperatures.
Recommendable Temperature Range : -100~260°C

* Teflon is the registered trad mark by Dupont, U.S.A.



Power Control Cable





DH-PCC01 K-TYPE - A - B - C

A. Size

1. 0.5SQ(7/0.3) 2, 0.75SQ(7/0.37) 3. 1.25SQ(7/0.45) 4. 20.SQ(7/0.6)

B. Pair

1. 1P(2C) 2. 2P(4C) 3. 4P(8C) 4. 5P(10C) 5. 10P(20C)

C. Material

1. KKAMSR (Silicon & Al. - Mylar)
2. KKAMSR (PVC & Al. - Mylar)
3. KKAMSF (Teflon & Al. - Mylar)

DH-PCC02 R-TYPE - A - B - C

A. Size

1. 0.5SQ(7/0.3) 2, 0.75SQ(7/0.37) 3. 1.25SQ(7/0.45) 4. 20.SQ(7/0.6)

B. Pair

1. 1P(2C) 2. 2P(4C) 3. 4P(8C) 4. 5P(10C) 5. 10P(20C)

C. Material

1. KKAMSR (Silicon & Al. - Mylar)
2. KKAMSR (PVC & Al. - Mylar)
3. KKAMSF (Teflon & Al. - Mylar)

MULTI CORE SPECIFICATION

MODEL NAME : FT-KX-SH-MTGF-SOSR-0.75㎟ × 10P

STANDARD	KS C 1609. JIS C 1610

1	CONDUCTOR	KX/ POS.-CHROMEL NEG.-ALUMEL	
2	CONDUCTOR SIZE	0.75㎟ (24/∅0.20mm)	
3	COLOR	JACKET	None.
		INSULATION	POS.(RED)/NEG.(WITE)
4	INSULATION	0.90mm NOMINAL THICKNESS MICA & COATED MINERAL FIBER	
5	PAIR SHIELD	None.	
6	OVERALL SHIELD	STAINLESS STEEL BRAID (SUS 304)	
7	WORKING TEMPERATURE	Up to 800℃	
8	E.M.F TEMPERATURE(100℃)	4.096mV/±2.0℃	
9	JACKET	None.	
10	APPROX. OVERALL DIA OF CABLE	ABOUT 16.0mm∅	
11	REEL LENGTH	ON REQUEST	
12	PACKING	WOODEN DRUM PACKING	

□ CABLE DRAWING

THERMOCOUPLE EXTENSION WIRE & MULTI CABLE DRAWING