索引 Index

补偿电缆
Compensating Cable

广泛用于冶金、化工、石油、发电以及科研等部门
采用热电偶方法测量温度的场合，
用于热电偶与测温显示仪表之间的连接。
The products could be applied to metallurgy, chemistry, petroleum
and power generation industries and temp measuring occasions
by thermocouples in some scientific and research departments
and connection between thermocouples and temp measuring indicators.

补偿电缆 Compensating Cable

热电偶用补偿导线及电缆
Thermocouple Compensating Conductor and Cable

执行标准 Executive Standard
补偿导线按照GB/T4989标准制造。
Compensating conductor is manufactured as per GB/T4989 standard.
补偿电缆按照JB/T7495标准制造。
Compensating cable is manufactured as per JB/T7495 standard.
补偿电缆按照Q/75230256-2.30标准制造。
Compensating cable is manufactured as per Q/75230256-2.30 standard.

适用范围 Application Scope
本产品广泛适用于冶金、化工、石油、发电以及科研等部门采用热电偶方法测量温度的场合。用于热电偶与测温显示仪表之间的连接。

The product is expansively applied to various occasions, where temp is measured by thermocouple method in metallurgy, chemical dinsutry, petroleum, power generation and scientific institutions, and applied to connection between thermocouple and temp measuring display.

使用特性 Operating Features
1. 补偿导线（电缆）的热电动势及允差值见表1。
Thermo-electromotive force and permissible tolerance of compensating wire or cable are shown in table 1.

表1 Table 1

补偿导线型号 Type of compensating conductor	100℃（μV）			200℃（μV）		
	热电动势标称值 Nom. value of Thermo-electromotive force	允差Tolerance		热电动势标称值 Nom. value of Thermo-electromotive force	允差Tolerance	
		普通级 General grade	精密级 Precise grade		普通级 General grade	精密级 Precise grade
SC或RC	645	±60	±30	1440	±60	– –
KCA或KX	4095	±100	±60	8137	±100	±60
KCB	4095	±100	±60	– –	– –	– –
NX或NC	2774	±100	±60	5912	±100	±60
EX	6317	±200	±120	13419	±200	±120
JX	5268	±140	±85	10777	±140	±85
TX	4277	±60	±30	9285	±90	±48

2. 补偿导线（电缆）的往复电阻见表2。
The reciprocal resistance of the compensating wire or cable detailed in table 2.

表2 Table 2

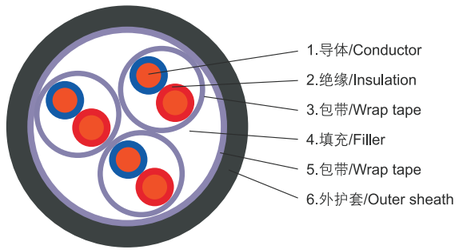
型号 Type	20℃时往复电阻 ≤Ω/m Reciprocal resistance at 20℃≤Ω/m			
	0.5mm²	1.0mm²	1.5mm²	2.5mm²
SC或RC	0.10	0.05	0.03	0.02
KCA	1.40	0.70	0.47	0.28
KCB	1.04	0.52	0.35	.021
KX	2.20	1.10	0.73	0.44
NC	1.50	0.75	0.50	0.30
NX	2.86	1.43	0.95	0.57
EX	2.50	1.25	0.83	0.50
JX	1.30	0.65	0.43	0.26
TX	1.04	0.52	0.35	0.21

型号、名称、分度号及配套用热电偶类型
Type, Description, Graduation Mark and Type of Assorted Thermocouple

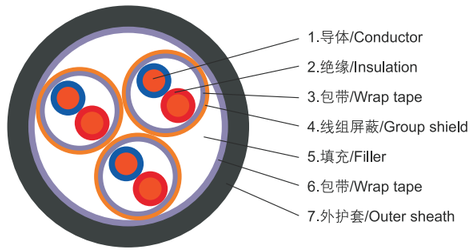
表3 Table 3

型号 Type	名称 Description	分度号 Graduation mark	配套用热电偶类型 Type of assorted thermocouple	绝缘层颜色 Color of insulation	
				正极 Positive pole	负极 Negative pole
SC	铜－铜镍0.6补偿型电缆 Copper-copper nickel 0.6 compensating cable	S	铂铑10－铂热电偶 Platinum rhodium 10–platinum	红 Red	绿 Green
RC	铜–铜镍0.6补偿型电缆 Copper-copper nickel 0.6 compensating cable	R	铂铑13－铂热电偶 Platinum rhodium 13－platinum	红 Red	绿 Green
KCA	铁–铜镍22补偿型电缆 Iron-copper nickel 22 compensating cable	K	镍铬–镍硅热电偶 Nickel chromium–nickel silicon	红 Red	蓝 Blue
KCB	铜–铜镍40补偿型电缆 Copper-copper nickel 40 compensating cable			红 Red	蓝 Blue
KX	镍铬10–镍硅3延长型电缆 Nickel chromium 10-nickel silicon 3 extension cable			红 Red	黑 Black
NC	铁–铜镍18补偿型电缆 Iron-copper nickel 18 compensating cable	N	镍铬硅－镍硅热电偶 Nickel chromium silicon–nickel silicon	红 Red	灰 Grey
NX	镍铬14硅–镍硅延长型电缆 Nickel chromium 14 silicon-nickel silicon extension cable			红 Red	灰 Grey
EX	镍铬10–镍硅45延长型电缆 Nickel chromium 10-nickel silicon 45 extension cable	E	镍铬－铜镍热电偶 Nickel chromium-copper nickel	红 Red	棕 Brown
JX	铁–铜镍45补偿型电缆 Iron-copper nickel 45 compensating cable	J	铁－铜镍热电偶 Iron-copper nickel	红 Red	紫 Purple
TX	铜–铜镍45补偿型电缆 Copper-copper nickel 45 compensating cable	T	铜－铜镍热电偶 Copper-copper nickel	红 Red	白 White

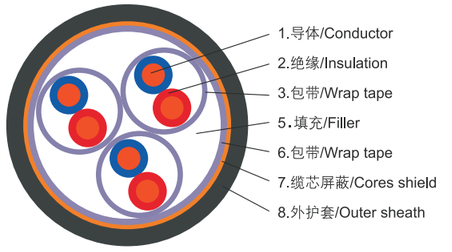
电缆结构图 Cable Drawings



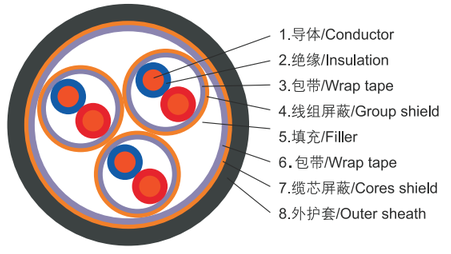
无分屏无总屏型 Without individual and collective shield



有分屏无总屏型 Without collective but individual shield



无分屏有总屏型 Without individual but collective shield



有分屏有总屏型 With individual and collective shield

补偿电缆 Compensating Cable

热电偶本安补偿导线及电缆
Thermocouple Compensating Intrinsically Safe Conductor and Cable

标准 Standard

本安补偿导线按照GB/T4989、GB3836.4标准制造。

Intrinsically safe compensating conductor is manufactured as per GB/T4989、GB3836.4 standards.

本安补偿电缆按照JB/T7495、GB3836.4标准制造。

Intrinsically safe compensating cable is manufactured as per JB/T7495、GB3836.4 standards.

适用范围 Applicable Scope

本产品适用于有爆炸危险的环境及防爆安全性要求较高场合延伸防爆热电偶冷端与防爆测温仪表相接，构成本质安全热电偶测温系统。聚氯乙烯绝缘和护套补偿导线，具有优良的防潮、耐腐和阻燃性能；耐热用氟聚合物绝缘和护套电缆更具有耐高温、低温、耐酸、耐碱、耐油、耐磨、耐老化、防水不燃烧等优良特性。

The product is applied to connection between extension explosion-proof thermocouple cold termination and explosion-proof temp measuring instruments in dangerous environment and places, where high explosion-proof safety condition is required to form intrinsically safe thermocouple temp measuring system. PVC insulated and sheathed compensating conductor has good features as: moisture-resistant, corrosion-resistant and flame-retardant, heat-resistant fluoropolymer insulated and sheathed cable has good features to resist high and low temp, acid, alkali, oil, wearing, ageing, water and fire etc.

产品特性 Products Features

1. 本安补偿导线（电缆）的热电动势、允差值及热电偶测量温度见表1。

Thermo-electromotive force, tolerance of compensating intrinsically safe conductor (cable) and thermocouple measuring temp are detailed in table 1.

表1 Table 1

补偿导线型号 Type of compensating conductor	100℃（μV）			200℃（μV）			热电偶测量端温度 Testing temperature of thermocouple terminal ℃
	热电动势标称值 Nom. value of Thermo-electromotive force	允差Tolerance		热电动势标称值 Nom. value of Thermo-electromotive force	允差Tolerance		
		普通级 General grade	精密级 Precise grade		普通级 General grade	精密级 Precise grade	
SC or RC	645	±60	±30	1440	±60	– –	1000
KCA or KX	4095	±100	±60	8137	±100	±60	1000
KCB	4095	±100	±60	– –	– –	– –	900
NX or NC	2774	±100	±60	5912	±100	±60	900
EX	6317	±200	±120	13419	±200	±120	500
JX	5268	±140	±85	10777	±140	±85	500
TX	4277	±60	±30	9285	±90	±48	300
BC	33	±50	±25	– –	– –	– –	1400

2. 本安补偿导线（电缆）的往复电阻见表2。

The reciprocal resistance of intrinsically safe compensating conductor (cable) is detailed in table 2.

表2 Table 2

型号Type	20℃时往复电阻Reciprocal resistance at 20℃≤Ω/m			
	0.5mm²	1.0mm²	1.5mm²	2.5mm²
SC or RC	0.10	0.05	0.03	0.02
KCA	1.40	0.70	0.47	0.28
KCB	1.04	0.52	0.35	0.21
KX	2.20	1.10	0.73	0.44
NC	1.50	0.75	0.50	0.30
NX	2.86	1.43	0.95	0.57
EX	2.50	1.25	0.83	0.50
JX	1.30	0.65	0.43	0.26
TX	1.04	0.52	0.35	0.21
BC	0.07	0.03	0.02	0.01

3. 本安补偿导线、电缆除有上述性能指标外，还具有以下主要本安性能指标见表3。

The intrinsically safe compensating wire or cable has following intrinsically safe properties is shown in table 3.

表3 Table 3

性能项目 Performance items	单位 Unit	指标 Index
工作电容 Operating capacitance	PF/m	≤80
电容不平衡 Capacitance unbalance	PF/m	≤1
分布电感 Distributed inductance	μH/m	≤0.6
静电感应电压（静电电压20kV） Electrostatic inductance voltage (electrostatic voltage 20kV)	V	≤1
电磁干扰感应电压（干扰磁场400A/m） Electro-magnetic interference inductance voltage (Interference magnetic field 400A/m)	mV	≤5

4. 其它性能指标 Other performance index

表4 Table 4

其它性能 Other performances	单位Unit	技术指标 Technical index	
		PVC绝缘 PVC insulation	PE、F_{46}绝缘 PE、F_{46} insulation
20℃时绝缘电阻Insulation resistance at 20℃	MΩ · km	25	100
阻燃特性 Flame-retardant feature	–	SA、SB、SC类（按GB/T18380试验） Grade SA、SB、SC (tested according to GB/T18380)	

补偿电缆 Compensating Cable

使用特性 Application characteristics

1. 使用温度 Operating temperature

   耐热级, Heat-resistant grade: 200℃。

   普通级, Common grade: 70℃。

2. 最低环境温度 Min. ambient temperature

   聚氯乙烯绝缘和护套导线、电缆: PVC insulated and sheathed conductor and cable

   固定敷设, Fixed installation: -40℃;

   非固定敷设, Non-fixed installation: -15℃。

   氟聚合物绝缘和护套导线、电缆: Fluoropolymer insulated and sheathed conductor and cable

   固定敷设, Fixed installation: -60℃;

   非固定敷设, Non-fixed installation: -20℃。

3. 电缆安装敷设温度 Installation and Laying temperature of cable

   聚氯乙烯护套导线、电缆不低于: 0℃;

   It shall not be less than 0℃ for PVC insulated and sheathed conductor and cable

   氟聚合物护套导线、电缆不低于: -20℃。

   It shall not be less than -20℃ for fluoropolymer insulated and sheathed conductor and cable

4. 电缆允许弯曲半径 Recommended bending radius of cable

   非铠装电缆不小于电缆外径的6倍;

   It shall not be 6 times less than cable O.D for non-armored cable

   铜带屏蔽或铠装不小于电缆外径的12倍;

   It shall not be 12 times less than cable O.D for copper tape shielded or armored cable

   氟聚合物绝缘和护套电缆不小于电缆外径的8倍。

   It shall not be 8 times less than cable O.D for fluoropolymer insulated and sheathed cable

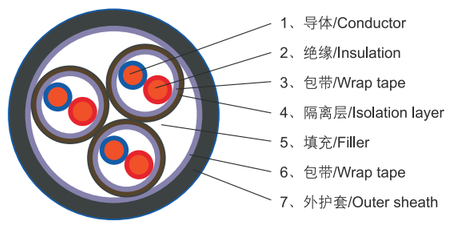
型号、名称、分度号及配套用热电偶类型 Type, Description, Graduation Mark and Type of Assorted Thermocouple

表1 Table 1

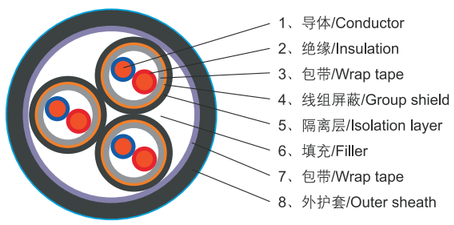
型号 Type	名 称 Description	分度号	配套用热电偶类型 Type of assorted thermocouple	绝缘层颜色 Color of insulation	
				正极 Positive pole	负极 Negative pole
SC	铜－铜镍$_{0.6}$补偿型电缆 Copper-copper nickel 0.6 compensating cable	S	铂铑$_{10}$－铂热电偶 Platinum rhodium 10－platinum	红 Red	绿 Green
RC	铜－铜镍$_{0.6}$补偿型电缆 Copper－copper nickel 0.6 compensating cable	R	铂铑$_{13}$－铂热电偶 Platinum rhodium 13－platinum	红 Red	绿 Green
KCA	铁－铜镍$_{22}$补偿型电缆 Iron-copper nickel 22 compensating cable	K	镍铬－镍硅热电偶 Nickel chromium－nickel silicon	红 Red	蓝 Blue
KCB	铜－铜镍$_{40}$补偿型电缆 Copper-copper nickel 40 compensating cable			红 Red	蓝 Blue
KX	镍铬$_{10}$－镍硅3延长型电缆 Nickel chromium 10-nickel silicon 3 extension cable			红 Red	黑 Black

型号 Type	名 称 Description	分度号	配套用热电偶类型 Type of assorted thermocouple	绝缘层颜色 Color of insulation	
				正极 Positive pole	负极 Negative pole
NC	铁－铜镍$_{18}$补偿型电缆 Iron-copper nickel 18 compensating cable	N	镍铬硅－镍硅热电偶 Nickel chromium silicon－nickel silicon	红 Red	灰 Grey
NX	镍铬$_{14}$硅－镍硅延长型电缆 Nickel chromium 14 silicon-nickel silicon extension cable			红 Red	灰 Grey
EX	镍铬$_{10}$－镍硅$_{45}$延长型电缆 Nickel chromium 10-nickel silicon 45 extension cable	E	镍铬－铜镍热电偶 Nickel chromium－copper nickel	红 Red	棕 Brown
JX	铁－铜镍$_{45}$延长型电缆 Iron-copper nickel 45 extension cable	J	铁－铜镍热电偶 Iron－copper nickel	红 Red	紫 Purple
TX	铜－铜镍$_{45}$延长型电缆 Copper-copper nickel 45 compensating cable	T	铜－铜镍热电偶 Copper－copper nickel	红 Red	白 White
BC	铂铑$_{30}$－铂铑$_{6}$补偿型电缆 Platinum rhodium 30-Platinum rhodium 6 compensating cable	B	铂铑$_{30}$－铂铑$_{6}$铠装热电偶 Platinum rhodium 30－Platinum rhodium 6 thermocouple with armor	红 Red	黄 Yellow

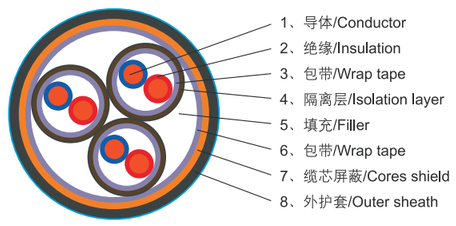
电缆结构图 Cable Drawings



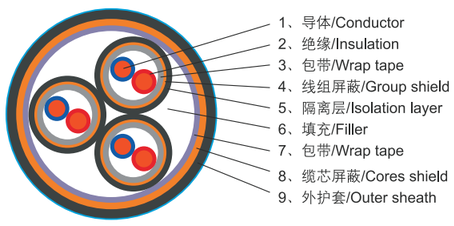
无分屏无总屏型 Without individual and collective shield



有分屏无总屏型 Without collective but individual shield



无分屏有总屏型 Without individual but collective shield



有分屏有总屏型 With individual and collective shield