

热电偶用补偿导线、补偿电缆

Compensational Wire & Cable for Thermocouple

补偿导线与补偿电缆是在一定温度范围内(包括常温)具有与所匹配的热电偶的热电动势值相同的一对或多对带有绝缘层的导线或电缆,用它们连接热电偶与测量装置,以补偿它们与热电偶连接处的温度变化所产生的误差,补偿导线与补偿电缆分为延长型和补偿型两种。

Compensational wire & cable are cables & wires with one pair or multi-pair and insulated layer with the same Pyro-EMF value of matched thermocouple within certain temperature. They are used to connect thermocouple and measuring devices to compensate the error resulting from temperature change on connection part. They are divided into two type including extension type and compensational type.

一、生产执行标准

GB/T4989-94及JB/T7495-94

Executive standard:

GB/T4989-94 & JB/T7495-94

二、使用条件

1、工作温度: Working Temperature

耐热用: 最高200℃和260℃两种。

一般用: 最高70℃和105℃两种。

Max. 200℃&260℃ for heat resistant cable

Max. 70℃&105℃ for common cable

2、最低环境温度: Min Environment Temperature

氟塑料绝缘和护套线缆: 固定敷设-60℃, 非固定敷设-20℃。

聚氯乙烯绝缘和护套线缆: 固定敷设-40℃, 非固定敷设-15℃。

Working Condition

Wire & cable with fluoroplastic insulation and sheath:

-60℃ for fixed installation, -20℃ for non-fixed installation

Wire & cable with PVC insulation and sheath: -40℃ for fixed installation, -15℃ for non-fixed installation

3、允许弯曲半径:

a)有铜带屏蔽的补偿电缆, 应不小于电缆外径的16倍;

b)其它结构的补偿电缆, 应不小于电缆外径的10倍。

Bending radius:

It should be no less than 16 times that of cable outer diameter for compensational cable with copper tape shielding.

It should be no less than 10 times that of cable outer diameter for compensational cable with other structure.

三、型号、名称

Type and Description

一) 补偿导线 Compensational Wire

型号Type	名称Description
KX-GS-VV	聚氯乙烯绝缘和护套一般用精密级K分度热电偶用补偿导线 Precise grade compensational wire for thermocouple of K graduation with PVC insulation and sheath for general purpose
KX-GS-VPV	聚氯乙烯绝缘和护套铜丝编织屏蔽一般用精密级K分度热电偶用屏蔽补偿导线 Precise grade compensational wire for thermocouple of K graduation with PVC insulation and sheath, copper wire braided shielding for general purpose
KX-HS-FF	氟塑料绝缘和护套耐热用精密级K分度热电偶用高温补偿导线 Precise grade high temperature compensational wire for thermocouple of K graduation with Fluoroplastic insulation and sheath for heat resistant purpose
KX-HS-FP ₁ F	氟塑料绝缘和护套镀锡铜丝编织屏蔽耐热用精密级K分度热电偶用高温补偿导线 Precise grade high temperature compensational wire for thermocouple of K graduation with Fluoroplastic insulation and sheath, tinned copper wire braided shielding for heat resistant purpose
KX-HS-FB	聚四氟乙烯绝缘、玻璃丝编织护套耐热用精密级K分度热电偶用高温补偿导线 Precise grade high temperature compensational wire for thermocouple of K graduation with F4 insulation and glass wire braided sheath for heat resistant purpose
KX-HS-FBP ₁	聚四氟乙烯带绕包绝缘玻璃丝编织、镀锡铜丝编织屏蔽, 玻璃丝编织外护套耐热用精密级K分度热电偶用高温补偿导线 Precise grade high temperature compensational wire for thermocouple of K graduation with F46 wrapped insulation glass wire braiding, tinned copper wire braided shielding and glass wire braided outer sheath for heat resistant purpose
KX-HS-FP ₁ V ₁₀₅	氟塑料绝缘镀锡铜丝编织屏蔽耐热105℃聚氯乙烯护套耐热用精密级K分度热电偶用高温补偿导线 Precise grade high temperature compensational wire for thermocouple of K graduation with Fluoroplastic insulation, tinned copper wire braided shielding, 105℃ heat resistant and PVC sheath for heat resistant purpose

注: 普通级补偿导线型号表示方法: 在精密级补偿导线型号基础上去掉字母“S”即可(下同)。

Note: type-naming method of common grade compensational wire: “S” should be omitted on the basis of precise grade compensational wire type.

二) 补偿电缆 Compensational Cable

型号Type	名称Description
KX-GS-VV	聚氯乙烯绝缘对绞聚氯乙烯护套一般用精密级K分度热电偶用补偿电缆 Precise grade compensational cable for thermocouple of K graduation with PVC insulation and twinning PVC sheath for general purpose
KX-GS-VPV	聚氯乙烯绝缘对绞铜丝编织分屏蔽聚氯乙烯护套一般用精密级K分度热电偶用补偿电缆 Precise grade compensational cable for thermocouple of K graduation with PVC insulation, twinning copper wire braided individual shielding, PVC sheath for general purpose
KX-GS-VPVP	聚氯乙烯绝缘对绞铜丝编织分屏蔽和总屏蔽聚氯乙烯护套一般用精密级K分度热电偶用补偿电缆 Precise grade compensational cable for thermocouple of K graduation with PVC insulation, twinning copper wire braided individual & general shielding, PVC sheath for general purpose
KX-GS-VVP	聚氯乙烯绝缘对绞铜丝编织总屏蔽聚氯乙烯护套一般用精密级K分度热电偶用补偿电缆 Precise grade compensational cable for thermocouple of K graduation with PVC insulation, twinning copper wire braided general shielding, PVC sheath for general purpose
KX-HS-FF	氟塑料绝缘对绞氟塑料护套精密级K分度热电偶用高温补偿电缆 Precise grade high temperature compensational cable for thermocouple of K graduation with Fluoroplastic insulation and twinning Fluoroplastic sheath
KX-HS-FP ₁ F	氟塑料绝缘对绞镀锡铜丝编织分屏蔽氟塑料护套精密级K分度热电偶用高温补偿电缆 Precise grade high temperature compensational cable for thermocouple of K graduation with Fluoroplastic insulation, twinning tinned copper wire braided individual shielding and Fluoroplastic sheath
KX-HS-FP ₁ FP ₁	氟塑料绝缘对绞镀锡铜丝编织分屏蔽和总屏蔽氟塑料护套精密级K分度热电偶用高温补偿电缆 Precise grade high temperature compensational cable for thermocouple of K graduation with Fluoroplastic insulation, twinning tinned copper wire braided individual & general shielding and Fluoroplastic sheath
KX-HS-FFP ₁	氟塑料绝缘对绞镀锡铜丝编织总屏蔽氟塑料护套精密级K分度热电偶用高温补偿电缆 Precise grade high temperature compensational cable for thermocouple of K graduation with Fluoroplastic insulation, twinning tinned copper wire braided general shielding and Fluoroplastic sheath
KX-HS-FV ₁₀₅	氟塑料绝缘对绞耐热105℃聚氯乙烯护套精密级K分度热电偶用高温补偿电缆 Precise grade high temperature compensational cable for thermocouple of K graduation with Fluoroplastic insulation, twinning 105℃ heat resistant PVC sheath
KX-HS-FP ₁ V ₁₀₅	氟塑料绝缘对绞镀锡铜丝编织分屏蔽耐热105℃聚氯乙烯护套精密级K分度热电偶用高温补偿电缆 Precise grade high temperature compensational cable for thermocouple of K graduation with Fluoroplastic insulation, twinning tinned copper wire braided individual shielding 105℃ heat resistant PVC sheath
KX-HS-FP ₁ V ₁₀₅ P ₁	氟塑料绝缘对绞镀锡铜丝编织分屏蔽总屏蔽耐热105℃聚氯乙烯护套精密级K分度热电偶用高温补偿电缆 Precise grade high temperature compensational cable for thermocouple of K graduation with Fluoroplastic insulation, twinning tinned copper wire braided individual and general shielding 105℃ heat resistant PVC sheath
KX-HS-FV ₁₀₅ P ₁	氟塑料绝缘对绞镀锡铜丝编织总屏蔽耐热105℃聚氯乙烯护套精密级K分度热电偶用高温补偿电缆 Precise grade high temperature compensational cable for thermocouple of K graduation with Fluoroplastic insulation, twinning tinned copper wire braided general shielding 105℃ heat resistant PVC sheath

注：1、其它型号补偿导线如：KC、JX、SC、EX、NC、TX等，只需改写型号的第一项，如：EX-G-VV、TX-H-FVP等；
2、需导体为多股软芯时，应在原型号后加“R”表示，如：TX-G-VVPR；
3、还可根据需要提供聚乙烯(Y)绝缘、交联聚乙烯(YJ)绝缘补偿电缆。
4、补偿电缆屏蔽层也可采用金属带绕包形式，如：复合铝带(P3)、复合铜带(P2)；
5、需阻燃型补偿电缆，应在原型号前加“ZR-”；
6、需铠装型补偿电缆，应在原型号后加“-22”表示钢带铠装；加“-32”表示钢丝铠装。
7、需本安型补偿电缆，应在原型号前加“ia-”表示。

Note: 1: The first part of type is changed for indication of compensational wires of other types such as KC, JX, SC, EX, NC, TX etc. eg. EX-G-VV, TX-H-FVP
2: Suffix “R” is added to the original type for indication of cable with soft multi-strand core. eg. TX-G-VVPR
3: We also produce compensational cable with PE (Y) insulation or XLPE (YJ) insulation if needed.
4: Shielding layer material of compensational cable includes metallic tape wrapping such as compound aluminum tape (P3) and compound copper tape (P2).
5: Prefix “ZR-” is added to the original type for indication of flame retardant type compensational cable.
6: Suffix “-22” is added to the original type for indication of compensational cable with steel tape armor, “-32” for that with steel wire armor.
7: Prefix “ia-” is added to the original type for indication of intrinsic safety type compensational cable.

四、规格范围

Specification Range

名称 Name	线芯对数 Pair No. of core	标称截面 mm ² Nominal cross section area	线芯结构 Core structure	
			A	R
补偿导线 compensational wire	1	0.5	1/0.80	7/0.30
		1.0	1/1.13	7/0.43
补偿电缆 compensational cable	1~19	1.5	1/1.37	7/0.52
		2.0	1/1.76	19/0.41

五、主要技术要求

Main Technical Requirement

产品类型 Type	补偿导线及电缆线芯 Compensational wire & cable core		补偿导线绝缘层着色 Insulation color of compensational wire		配用热电偶分度号 Thermocouple graduation
	正极plus	负极minus	正极plus	负极minus	
SC or RC	铜Cu	铜镍0.6 Cu-Ni	红red	绿green	S (铂铑10-铂) 或 R (铂铑13-铂) S (PtRh10-PT) or R (PtRh13-PT)
KCA	铁Fe	铜镍22 Cu-Ni	红red	蓝blue	K (镍铬-镍硅) K (NiCr-NiSi)
KCB	铜Cu	铜镍40 Cu-Ni	红red	蓝blue	
KX	镍铬10 Ni-Cr 10	镍硅3 Ni-Si	红red	黑black	
EX	镍铬10 Ni-Cr 10	铜镍45 Cu-Ni	红red	棕brown	E (镍铬-铜镍) E (NiCr-NiSi)
JX	铁Fe	铜镍45 Cu-Ni	红red	紫violet	J (铁-铜镍) J (Fe-CuNi)
TX	铜Cu	铜镍45 Cu-Ni	红red	白white	T (铜-铜镍) T (Cu-CuNi)
NC	铁Fe	铜镍18 Cu-Ni	红red	灰grey	N (镍铬硅-镍硅) N (NiCrSi-NiSi)
NX	镍铬14硅 Ni-Cr 14 Si	镍硅4 Ni-Si	红red	灰grey	

六、补偿导线与补偿电缆使用分类、等级及护套着色

Category, Class mark and Sheath Color of Compensational Cable and Wire

使用分类 Category	标志代号 Mark code	允差等级及标志 Error allowance grade & mark		护套着色 Sheath color		
		普通级 Common grade	精密级 Precise grade	普通级 Common grade	精密级 Precise grade	本安型 Intrinsic safety
一般用general	G	省略omitted	S	黑色black	灰色grey	蓝色blue
耐热用 Heat resistance	H			黑色black	黄色yellow	蓝色blue

注：在旧标准GB4989-85中，普通级用B表示，精密级用A表示。

Note: In early version of GB4989-85 standard, B stands for common grade; A stands for precise grade.

七、补偿导线及补偿电缆热电特性及允差表

Pyro-electric Character and Error Allowance of Compensational Cable and Wire

型号 Type	使用分类 Category	导线温度范围 ℃ Tem range of cable&wire	热电动势及允差 μV Pyro EMF			热电偶测量端 温度℃ Measuring end tem. of thermocouple	20℃时往复电阻值 $\leq \Omega/m$ Reciprocating resistance at 20℃			
			热电势 Pyro EMF	精密级 Precise grade	普通级 Common grade		0.5 mm ²	1.0mm ²	1.5mm ²	1.5mm ²
SC&RC	G	0~100	646	$\pm 30(\pm 2.5^\circ C)$	$\pm 60(\pm 5.0^\circ C)$	1000	0.10	0.05	0.03	0.02
	H	0~200	1440	/	$\pm 60(\pm 5.0^\circ C)$					
KCA	G	0~100	4095	$\pm 60(\pm 1.5^\circ C)$	$\pm 100(\pm 2.5^\circ C)$	1000	1.40	0.70	0.47	0.28
	H	0~200	8137			900				
KCB	G	0~100	4095			900	1.04	0.52	0.35	0.21
KX	G	-20~100	4095			900	2.20	1.10	0.73	0.44
	H	-25~200	8137	900						
EX	G	-20~100	6317	$\pm 120(\pm 1.5^\circ C)$	$\pm 200(\pm 2.5^\circ C)$	500	2.50	1.25	0.83	0.50
	H	-25~200	13419			500				
JX	G	-20~100	5268	$\pm 85(\pm 1.5^\circ C)$	$\pm 140(\pm 2.5^\circ C)$	500	1.30	0.65	0.43	0.26
	H	-25~200	10777			500				
TX	G	-20~100	4277	$\pm 30(\pm 0.5^\circ C)$	$\pm 60(\pm 1.0^\circ C)$	300	1.04	0.52	0.35	0.21
	H	25~200	9285	$\pm 48(\pm 0.8^\circ C)$	$\pm 90(\pm 1.5^\circ C)$	300				
NC	G	0~100	2774	$\pm 60(\pm 1.5^\circ C)$	$\pm 100(\pm 2.5^\circ C)$	900	1.50	0.75	0.50	0.30
	H	0~200	5912			900				
NX	G	-20~100	2774			900	2.86	1.43	0.95	0.57
	H	-25~200	5912			900				

八、其它参数指标

Other Parameter Indices

项目 Item	单位 Unit	参数指标Parameter Indices	
		PVC绝缘 PVC insulation	PE、XLPE、F46&F绝缘 PE、XLPE、F46&F insulation
绝缘电阻Insulated resistance	M Ω .km	25	100
电压试验 Voltage test	V/1min	1000	
阻燃性能Flame resistant performance	符合GB/T18380-2001阻燃标准中A、B、C类规定。 Meet the requirement of flame retardance of category A, B, C stipulated in GB/T18380-2001 standard.		

九、规格尺寸

Specification and Size

一) 补偿导线Compensational Wire

芯数×标称 截面mm ² core No. * nominal cross section area	导体 种类 Conductor category	最大外径mm Max OD				计算重量kg/km Calculated weight			
		VV	VPV	FF	FP1F	VV	VPV	FF	FP1F
2×0.5	A	3.7×6.4	4.7×7.4	2.6×4.6	3.2×5.2	30	50	27	45
	R	3.9×6.6	4.9×7.6	2.8×4.8	3.4×5.4	35	55	30	50
2×1.0	A	5.0×7.7	6.0×8.7	3.0×5.3	3.6×5.9	56	82	39	64
	R	5.1×8.0	6.1×9.0	3.1×5.6	3.7×6.2	60	87	45	69
2×1.5	A	5.2×8.3	6.2×9.3	3.2×5.8	3.8×6.4	68	93	54	77
	R	5.5×8.7	6.5×9.7	3.4×6.2	4.0×6.8	75	102	60	87
2×2.5	A	5.7×9.3	6.7×10.3	3.6×6.7	4.2×7.3	94	121	77	103
	R	5.9×9.8	6.9×10.8	4.0×7.3	4.6×7.9	101	133	84	114

二) 补偿电缆 Compensational Cable

芯数×标 称截面 mm ² core No. * nominal cross section area	导体 种类 Conductor category	最大外径mm Max OD						计算重量kg/km Calculated weight					
		VV	VPV	FV	FP1V	FF	FP1F	VV	VPV	FV	FP1V	FF	FP1F
1×2×0.5	A	6.9	7.4	6.7	7.2	5.0	5.6	58	70	49	68	36	53
	R	7.3	7.7	7.0	7.4	5.2	5.8	59	73	52	73	38	56
1×2×1.0	A	8.7	9.1	7.4	7.8	5.8	6.3	87	107	64	86	50	70
	R	8.9	9.4	7.6	8.3	6.1	6.8	94	113	70	95	54	80
1×2×1.5	A	9.1	9.8	7.9	8.4	6.4	6.9	104	125	78	103	62	89
	R	9.6	10.5	8.1	8.8	6.6	7.4	109	131	83	110	72	95
1×2×2.5	A	10.0	10.7	8.8	9.2	7.4	7.8	129	153	106	133	92	117
	R	10.7	11.3	9.2	10.1	7.8	8.7	143	179	113	144	99	126

2×2×0.5	A	10.3	11.4	9.4	11.1	7.9	9.7	107	177	93	175	79	156
	R	10.6	12.0	9.5	11.4	8.1	10.0	115	186	98	183	84	164
2×2×1.0	A	13.0	15.0	10.5	12.2	9.0	11.0	175	282	128	220	112	207
	R	13.3	15.4	10.9	12.9	9.5	11.7	177	293	135	236	120	221
2×2×1.5	A	13.6	16.1	11.3	13.1	9.9	11.9	197	314	153	257	137	240
	R	15.1	16.8	11.9	14.4	10.7	13.0	226	338	174	294	158	277
2×2×2.5	A	15.8	17.5	12.8	15.2	11.6	13.6	277	388	211	346	198	325
	R	16.8	18.6	13.6	16.6	12.4	15.1	302	449	239	383	238	360
3×2×0.5	A	10.6	12.1	9.8	11.7	8.4	10.5	122	212	105	206	91	193
	R	11.2	12.7	10.0	12.1	8.6	10.9	134	220	110	210	96	204
3×2×1.0	A	14.4	15.8	11.0	13.0	9.6	11.8	217	336	156	272	139	254
	R	14.7	16.3	11.6	13.6	10.3	12.4	232	356	170	291	155	273
3×2×1.5	A	15.2	17.1	12.0	14.5	10.8	13.0	264	387	195	337	181	317
	R	16.0	17.8	12.5	15.3	11.3	13.8	278	411	214	362	198	344
3×2×2.5	A	16.7	18.6	13.5	16.1	12.3	14.5	338	485	273	434	256	412
	R	17.9	19.8	15.2	17.6	13.6	16.1	369	553	314	466	295	446
4×2×0.5	A	11.3	12.9	10.5	13.5	9.0	12.3	151	252	133	254	113	236
	R	12.0	14.5	10.7	14.7	9.2	13.2	160	283	139	265	172	248
4×2×1.0	A	15.4	16.9	11.8	15.6	10.6	14.1	262	410	187	342	185	322
	R	16.2	17.4	12.4	16.6	11.2	15.1	271	418	201	368	218	346
4×2×1.5	A	16.3	18.3	12.9	16.8	11.7	15.3	309	462	235	405	250	383
	R	18.3	19.1	13.5	17.8	12.3	16.3	330	487	270	431	327	408
4×2×2.5	A	18.0	20.6	14.5	18.8	13.6	17.3	404	612	348	521	355	497
	R	19.3	21.9	16.3	21.5	14.7	19.7	440	691	377	566	446	540
5×2×0.5	A	12.7	15.0	11.7	14.4	10.5	12.5	183	321	158	322	214	302
	R	13.4	15.8	11.9	14.9	10.7	13.6	196	343	172	337	251	319
5×2×1.0	A	17.3	18.9	13.1	16.1	11.9	14.5	318	485	230	410	288	392
	R	18.0	19.4	14.5	16.9	13.0	15.4	334	504	269	448	311	423
5×2×1.5	A	18.3	21.0	15.1	17.2	13.5	15.6	383	591	300	492	411	468
	R	19.3	22.0	15.8	18.2	14.3	16.6	405	624	332	524	453	499
5×2×2.5	A	20.9	23.0	17.1	19.1	15.5	17.6	531	750	434	640	411	612
	R	22.3	24.5	18.3	21.8	16.7	20.0	574	848	473	726	453	696
6×2×0.5	A	15.0	16.8	13.2	16.3	12.0	14.7	234	384	195	385	178	361
	R	15.8	17.7	13.5	16.8	12.3	15.3	250	410	209	406	192	383
6×2×1.0	A	19.7	22.1	15.5	18.0	14.0	16.5	382	609	304	503	283	473
	R	20.9	22.8	16.5	19.1	15.0	17.6	433	643	326	539	303	507
6×2×1.5	A	21.5	23.9	17.1	19.5	15.5	17.9	492	703	363	592	352	562
	R	22.7	25.1	18.0	21.2	16.5	19.5	521	756	405	659	381	634
6×2×2.5	A	23.9	26.6	19.4	22.4	17.8	20.7	641	870	527	798	502	767
	R	25.5	28.4	21.6	24.8	19.8	23.0	697	1048	603	870	573	836
7×2×0.5	A	15.2	17.1	13.4	16.5	12.2	15.0	248	413	207	411	187	388
	R	16.1	17.9	14.4	17.0	12.9	15.5	260	435	235	436	215	408
7×2×1.0	A	20.7	22.4	15.8	18.2	14.3	16.7	429	650	318	531	296	505
	R	21.2	23.1	16.8	19.4	15.3	17.9	445	675	341	572	318	545
7×2×1.5	A	21.9	24.3	17.3	19.7	15.7	18.2	514	750	398	631	375	606
	R	23.0	25.4	18.3	21.5	16.7	19.8	537	796	426	704	402	672
7×2×2.5	A	24.2	27.1	19.7	22.7	18.2	21.0	676	971	562	857	535	825
	R	26.0	28.8	21.9	25.2	20.1	23.4	727	1113	637	932	607	897
8×2×0.5	A	16.5	18.5	15.2	17.8	13.6	16.3	279	464	245	400	228	435
	R	17.5	19.5	15.6	18.5	14.1	16.9	294	485	263	483	242	457
8×2×1.0	A	22.4	24.4	17.2	19.8	15.6	18.3	480	730	357	595	333	568
	R	23.1	25.1	18.3	21.8	16.7	20.0	490	759	380	671	360	640
8×2×1.5	A	23.8	26.8	18.8	22.1	17.3	20.4	574	840	450	741	426	710
	R	25.1	28.2	20.6	23.4	18.8	21.7	604	922	508	792	480	760
8×2×2.5	A	26.8	29.5	22.1	24.8	20.4	23.0	786	1089	663	968	634	934
	R	28.8	31.5	23.9	27.8	22.4	25.4	844	1250	718	1074	686	1046
9×2×0.5	A	17.3	19.5	16.0	18.7	14.4	17.2	300	509	273	503	252	478
	R	18.4	21.1	16.4	19.5	14.9	17.9	321	559	288	530	266	505
9×2×1.0	A	23.7	25.7	18.0	21.5	16.5	19.7	527	802	391	680	369	651
	R	24.3	26.8	19.3	22.9	17.7	21.1	542	859	423	735	398	703
9×2×1.5	A	25.1	28.3	19.8	23.2	18.2	21.5	633	955	497	816	472	783
	R	27.0	29.7	21.7	24.6	19.9	22.9	686	1010	560	866	530	837
9×2×2.5	A	28.3	31.1	23.3	26.5	21.6	24.3	866	1201	734	1091	703	1064
	R	30.5	33.2	25.2	29.4	23.4	26.8	932	1423	795	1186	761	1157
10×2×0.5	A	17.5	19.5	16.1	18.8	14.5	17.3	324	541	293	540	271	514
	R	18.5	21.2	16.5	19.6	15.0	17.9	346	599	310	570	287	543
10×2×1.0	A	23.8	25.8	18.1	21.6	16.6	19.8	566	862	423	735	400	701
	R	24.5	26.9	19.4	23.0	17.8	21.1	584	922	458	791	433	758

芯数×标称截面 mm ² core No. * nominal cross section area	导体 种类 Conductor category	最大外径mm Max OD						计算重量kg/km Calculated weight					
		VV	VPV	FV	FP1V	FF	FP1F	VV	VPV	FV	FP1V	FF	FP1F
10×2×1.5	A	25.2	28.4	19.8	23.3	18.2	21.6	684	1027	538	878	514	844
	R	27.1	29.8	21.8	24.7	20.0	22.9	742	1085	606	934	575	903
10×2×2.5	A	28.5	31.2	23.4	26.6	21.7	24.4	941	1296	797	1180	767	1152
	R	30.6	33.3	25.3	29.5	23.5	26.8	1009	1536	863	1279	827	1250
12×2×0.5	A	18.5	21.5	17.1	20.7	15.5	18.9	372	641	336	636	313	617
	R	19.7	22.6	17.6	21.5	16.1	19.7	396	680	354	681	332	650
12×2×1.0	A	25.2	27.5	19.4	23.0	17.8	21.2	647	1014	490	843	465	811
	R	26.5	28.7	21.3	24.4	19.6	22.7	697	1054	557	908	526	874
12×2×1.5	A	27.3	30.1	21.9	24.9	20.1	23.1	812	1191	655	1014	625	980
	R	28.8	31.8	23.2	26.8	21.5	25.1	856	1254	700	1119	668	1091
12×2×2.5	A	30.4	33.3	25.0	28.4	23.2	26.2	1086	1541	929	1367	896	1339
	R	32.7	35.6	26.5	31.5	25.9	28.9	1167	1767	1030	1404	1011	1455
14×2×0.5	A	20.6	22.9	18.3	22.1	-	-	420	736	380	732	-	-
	R	21.9	24.2	18.9	22.9	-	-	473	770	401	769	-	-
14×2×1.0	A	27.7	30.1	21.5	24.6	-	-	763	1161	588	960	-	-
	R	28.6	30.9	22.9	26.7	-	-	792	1199	634	1061	-	-
14×2×1.5	A	29.4	32.6	23.5	27.2	-	-	925	1379	749	1183	-	-
	R	31.0	34.2	25.0	28.8	-	-	975	1459	801	1266	-	-
14×2×2.5	A	32.8	35.9	27.2	30.5	-	-	1241	1762	1090	1564	-	-
	R	35.2	38.8	28.7	33.8	-	-	1335	2063	1180	1734	-	-
16×2×0.5	A	21.5	23.9	19.0	23.0	-	-	501	820	427	815	-	-
	R	22.8	25.2	19.7	23.9	-	-	528	860	453	861	-	-
16×2×1.0	A	28.9	31.4	22.3	25.6	-	-	855	1300	663	1075	-	-
	R	29.8	32.2	23.9	27.8	-	-	893	1380	715	1186	-	-
16×2×1.5	A	30.7	34.0	24.5	28.3	-	-	1050	1546	845	1328	-	-
	R	32.5	35.8	26.5	30.0	-	-	1100	1648	927	1418	-	-
16×2×2.5	A	34.2	38.0	28.5	31.8	-	-	1408	1982	1237	1796	-	-
	R	36.7	40.6	30.9	35.3	-	-	1516	2326	1341	1956	-	-
19×2×0.5	A	23.2	25.7	21.2	24.9	-	-	571	936	517	934	-	-
	R	24.6	27.6	22.0	25.7	-	-	598	1005	546	985	-	-
19×2×1.0	A	31.4	34.0	24.2	28.0	-	-	978	1528	758	1263	-	-
	R	32.9	34.9	25.9	30.0	-	-	1008	1577	818	1361	-	-
19×2×1.5	A	33.3	36.9	27.0	30.6	-	-	1193	1773	998	1528	-	-
	R	35.8	39.3	28.7	32.5	-	-	1254	1920	1065	1665	-	-
19×2×2.5	A	37.2	41.2	30.9	34.4	-	-	1615	2317	1420	2072	-	-
	R	40.5	44.1	33.6	38.7	-	-	1763	2677	1543	2284	-	-

订货须知：1、订货时务必注明产品型号、规格、导体种类、数量等；
2、根据双方协议允许任何长度交货；长度计量误差不超过±0.5%。

Note for ordering:
1: Cable type, specification, conductor category and quantity etc should be indicated clearly when ordering.
2: Delivery length of cable depends on both agreements with length error allowance of ±0.5%.