

# KN Series

**KNPEV** (Polyethylene insulated polyvinylchloride jacketed instrumentation cable)

**KNPEE** (Polyethylene insulated polyethylene jacketed instrumentation cable)

**KNPVV** (Polyvinylchloride insulated polyvinylchloride jacketed instrumentation cable)

**EM KNPEE/F** (Polyethylene insulated flame retardant polyethylene jacketed instrumentation cable)

EM KNPEE/F is an eco-friendly product with a flame retardant polyethylene jacket. (EM denotes eco-, flame-retardant material.)

Flame  
retardant

Oil  
resistant

Heat  
resistant

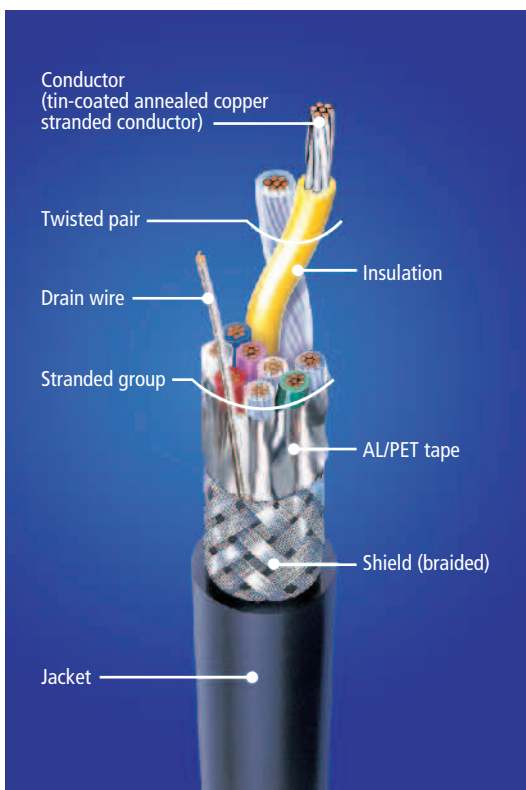
Noise  
resistant



## Applications

Instrumentation cables are for low-voltage circuits (60V or less), used for wiring in the automatic controls of various production equipment in factories and in centralized control systems as well as circuits for office computer systems. KN Series instrumentation cables from Nihon Electric Wire & Cable support a wide range of uses, from factories to offices.

## Structure (KNPEV-SB)



## Features

KNPEV-SB with standard specifications has the following outstanding features.

### Workability

- ◆ Tin-coated annealed copper for the conductor prevents bad connections caused by corrosion.
- ◆ Identification of entire core prevents wiring errors and simplifies connection work.
- ◆ Inserted drain wire makes ground wiring easy.
- ◆ Excellent flexibility due to use of a lead-free, highly flexible vinyl compound for the jacket and a braided shield structure.

### Electrical Properties

- ◆ Polyethylene with superior electrical properties is used for insulation.

### Noise Resistant

- ◆ Double shielding—AL/PET tape applied under tin-coated annealed copper braided shield—and a twisted pair structure prevent noise caused by electrostatic induction and induction between circuits (cross talk).

### Flame Retardant

- ◆ Cable passes UL VW-1 (vertical-specimen flame test) for flame retardance.

### Heat Resistant

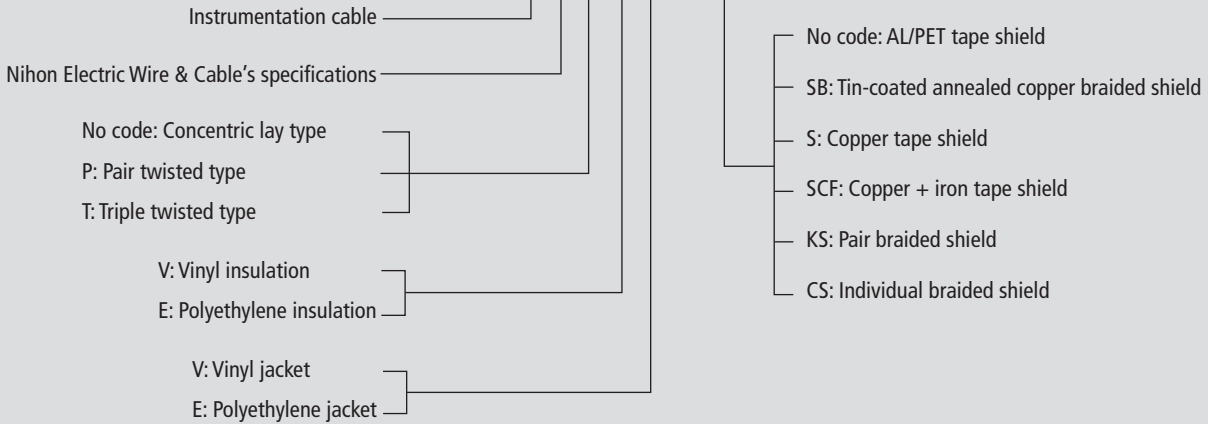
- ◆ Heat resistant property of the jacket maintains cable stability under high temperatures.

### Oil Resistant

- ◆ Consideration of oil resistance in the jacket enables the cables to be used in locations such as factories, where cutting oil and lubrication oil are likely to adhere to surfaces.

## Coding for Model Number

Example: **K N P E V - S B**



\* Code for EM cable is EM KNPEE-SB/F, with a flame retardant polyethylene jacket.

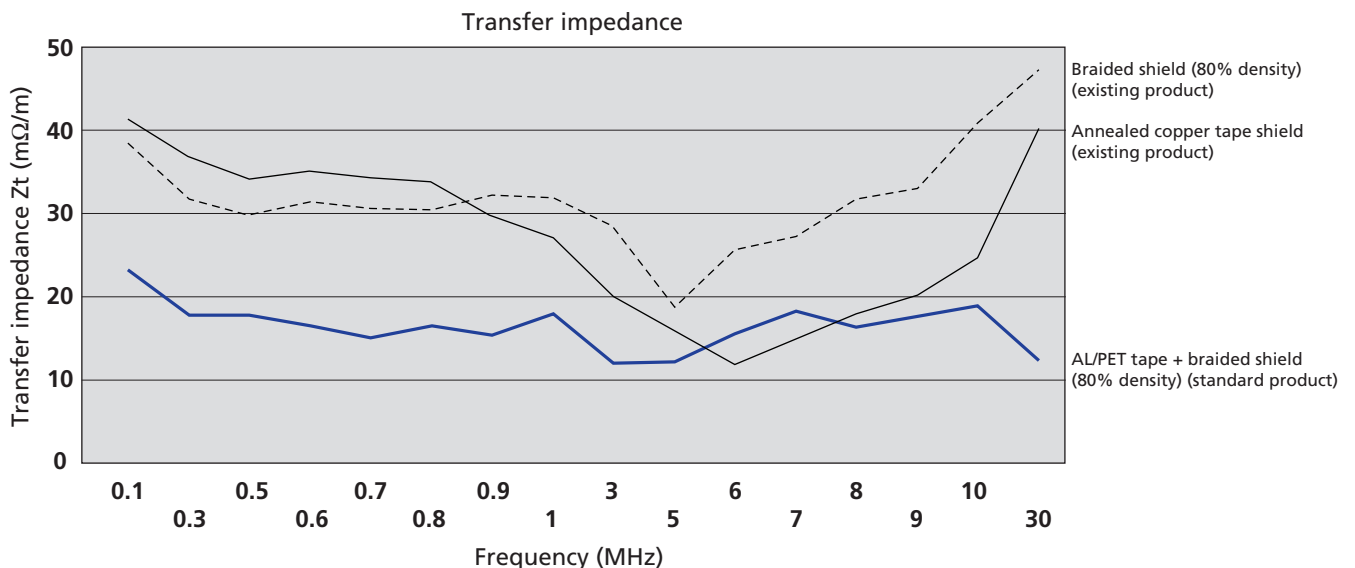
## Electrical Properties

Nominal cross-sectional area (mm <sup>2</sup> )	Conductor resistance (Ω/km 20°C)	Test voltage (Volts per minute)	Insulation resistance (MΩ km) 20°C		Reference		
					Capacitance (average) (nF/km)		
					Twisted pair type		One pair; pair shielded type
			PVC insulation	PE insulation	PVC insulation	PE insulation	PE insulation
0.2	112 or less	AC 500	100 or more	5,000 or more	150 or less	70 or less	100 or less
0.3	65.7 or less	AC 700	100 or more	10,000 or more	150 or less	70 or less	100 or less
0.5	39.4 or less	AC1,000	100 or more	10,000 or more	150 or less	70 or less	100 or less
0.75	26.3 or less	AC1,000	100 or more	10,000 or more	150 or less	70 or less	100 or less
0.9	22.6 or less	AC1,500	100 or more	10,000 or more	150 or less	70 or less	100 or less
1.25	17.8 or less	AC1,500	100 or more	10,000 or more	150 or less	70 or less	100 or less
2.0	10.2 or less	AC1,500	100 or more	10,000 or more	150 or less	70 or less	100 or less

## Shield Properties (reference values)

### Comparison with existing products

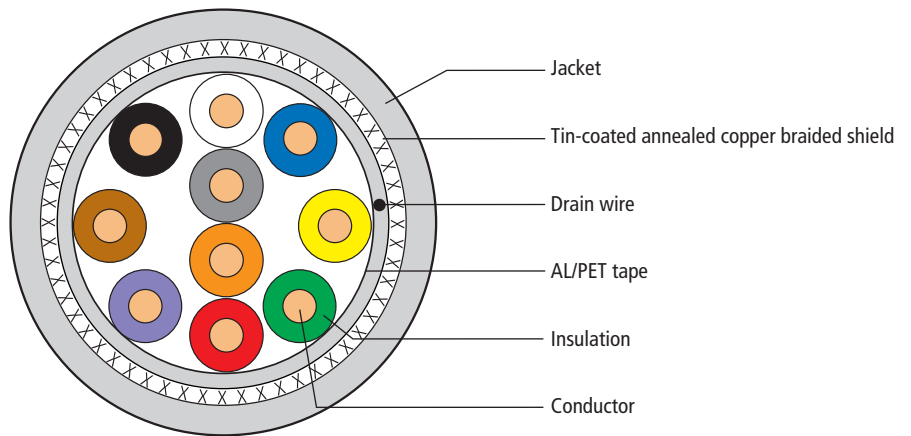
The graph below indicates the frequency properties of various shields measured by the transfer impedance method (IEC Pub. 96.1). However, since measurement is made on our instrumentation cable (standard inventory), the shield effect varies depending on the thickness of the shielding tape and braided density. The lower the transfer impedance  $Z_t$  (Ω/m), the better the shield effect.



\* Values listed above are representative and not guaranteed under all conditions.

Cross Section

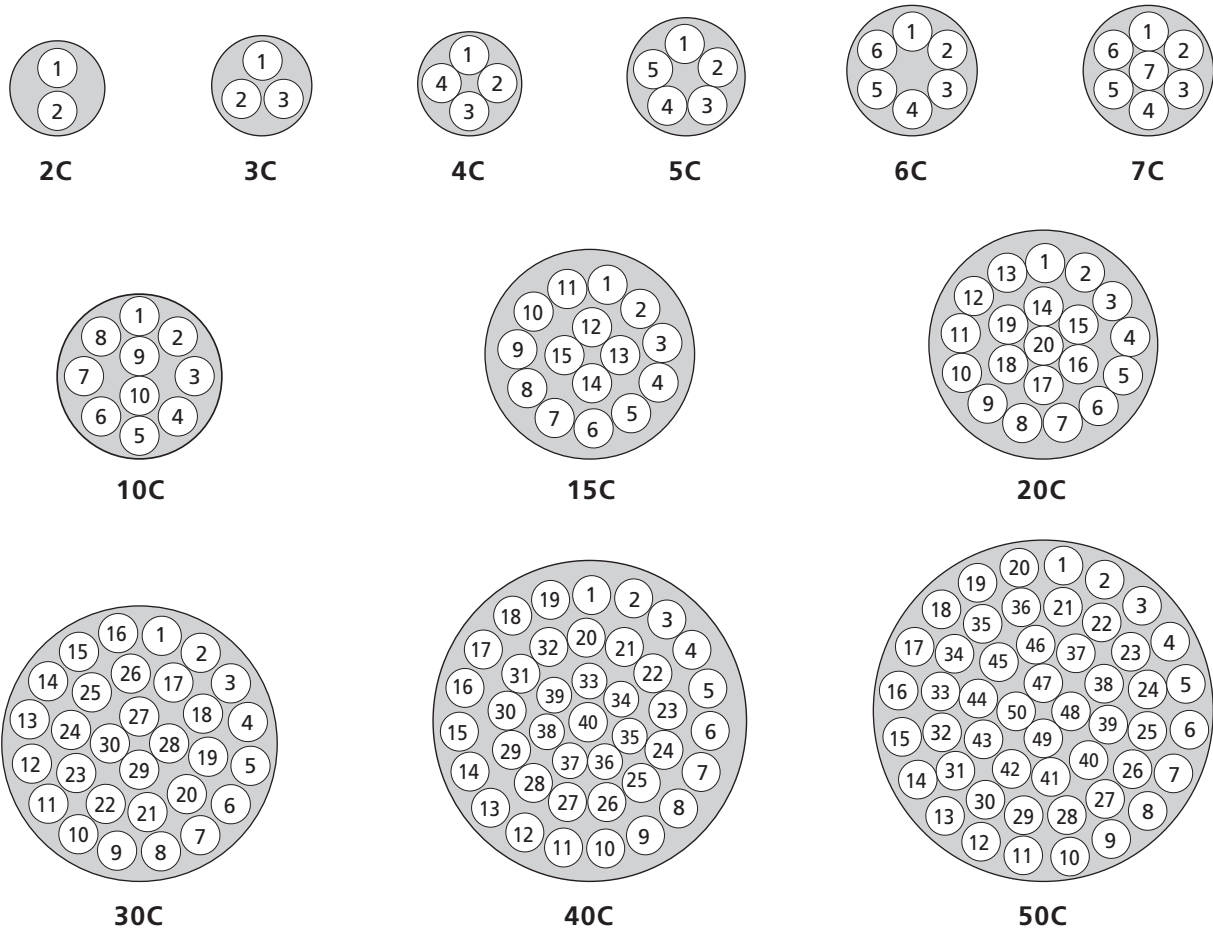
Example: KNEV-SB  
10C



Core Identification

Core No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Color code	White	Blue	Yellow	Green	Red	Purple	Brown	Black	Gray	Orange	Light blue	Bright green	Pink	White	Blue	Yellow	Green	Red	Purple	Brown	Black	Gray	Orange	Light blue	Bright green
Core No.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Color code	Pink	White	Blue	Yellow	Green	Red	Purple	Brown	Black	Gray	Orange	Light blue	Bright green	Pink	White	Blue	Yellow	Green	Red	Purple	Brown	Black	Gray	Orange	Light blue

Layout



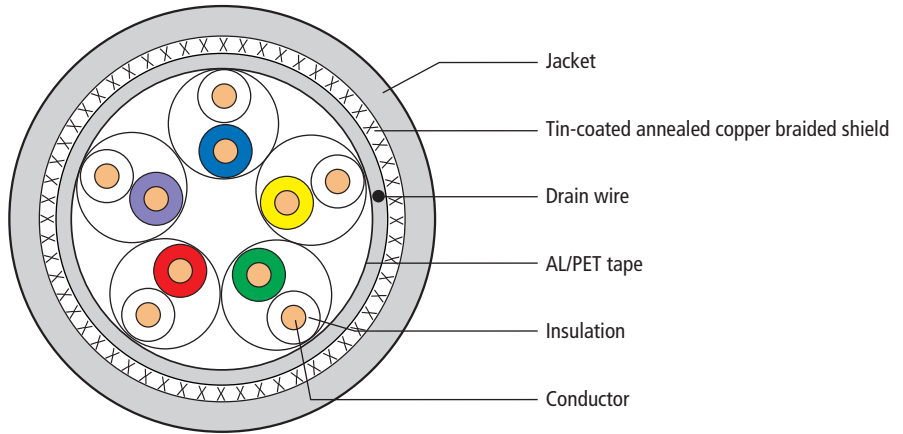
## Structure Table

No. of cores	Conductor			Jacket standard thickness (mm)	Approximate overall outer diameter (mm)	Approximate volume (kg/km)			
	Nominal cross-section area (mm <sup>2</sup> )	Composite (number of conductors/mm)	Outer diameter (mm)			EV	VV	EE	EM EE/F
2	0.2	7/0.18	0.54	1.3	5.5	35	35	30	35
3				1.3	5.5	40	40	35	40
4				1.3	6.0	45	45	35	45
5				1.3	6.0	50	50	40	50
6				1.3	6.5	55	55	45	55
7				1.3	6.5	55	60	50	55
10				1.3	7.5	70	70	60	70
15				1.3	8.0	85	90	75	85
20				1.3	9.0	105	110	95	105
30				1.3	10.0	140	150	125	140
40				1.3	11.0	170	180	155	170
50				1.3	13.0	205	215	185	205
2	0.3	12/0.18	0.72	1.3	6.0	45	40	35	45
3				1.3	6.0	50	50	40	50
4				1.3	6.5	55	55	50	55
5				1.3	7.0	65	65	55	65
6				1.3	7.5	70	75	60	70
7				1.3	7.5	75	75	65	75
10				1.3	8.5	90	95	80	90
15				1.3	9.5	120	130	110	120
20				1.3	10.0	150	155	135	150
30				1.3	12.0	200	210	185	200
40				1.3	13.0	250	265	230	250
50				1.3	14.0	295	320	275	295
2	0.5	20/0.18	0.93	1.3	7.0	55	55	45	55
3				1.3	7.0	65	65	55	65
4				1.3	7.5	75	75	65	75
5				1.3	8.0	85	90	75	85
6				1.3	8.5	95	100	85	95
7				1.3	8.5	100	110	90	100
10				1.3	10.0	130	140	120	130
15				1.3	11.0	175	185	160	175
20				1.3	13.0	215	235	200	215
30				1.3	15.0	300	320	275	300
40				1.3	16.0	375	405	350	375
50				1.4	18.0	460	500	435	460
2	0.75	30/0.18	1.14	1.3	7.5	70	70	60	70
3				1.3	8.0	80	85	70	80
4				1.3	8.5	95	100	85	95
5				1.3	9.5	115	120	100	115
6				1.3	10.0	130	135	115	130
7				1.3	10.0	135	145	120	135
10				1.3	11.0	180	190	160	180
15				1.3	13.0	240	255	220	240
20				1.3	15.0	300	325	275	300
30				1.4	18.0	420	425	395	425
40				1.5	20.0	550	605	520	550
50				1.6	22.0	685	750	650	685
2	0.9	7/0.4	1.2	1.3	7.5	70	75	65	70
3				1.3	8.0	85	90	75	85
4				1.3	8.5	100	105	90	100
5				1.3	9.5	120	125	105	120
6				1.3	10.0	135	145	125	135
7				1.3	10.0	145	155	130	145
10				1.3	12.0	190	205	175	190
15				1.3	13.0	255	280	245	255
20				1.3	15.0	320	350	305	320
30				1.4	18.0	450	500	435	450
40				1.5	20.0	590	655	570	590
50				1.6	23.0	755	825	720	755
2	1.25	7/0.45	1.35	1.3	8.5	85	90	75	85
3				1.3	9.0	100	110	95	100
4				1.3	9.5	125	135	115	125
5				1.3	10.0	140	150	130	140
6				1.3	11.0	165	175	150	165
7				1.3	11.0	175	190	160	175
10				1.3	13.0	230	250	215	230
15				1.3	15.0	315	350	300	315
20				1.3	17.0	395	435	370	395
30				1.5	20.0	575	635	550	575
40				1.6	23.0	755	830	725	755
50				1.7	26.0	955	1050	910	955
2	2.0	37/0.26	1.83	1.3	9.5	115	125	105	115
3				1.3	10.0	145	150	130	145
4				1.3	11.0	175	180	160	175
5				1.3	12.0	200	210	180	200
6				1.3	12.0	230	245	215	230
7				1.3	12.0	250	265	230	250
10				1.3	15.0	335	355	315	335
15				1.4	18.0	475	510	450	475
20				1.5	20.0	625	670	595	625
30				1.6	24.0	900	970	860	900

Note: Overall outer diameter and approximate volume are for cables with braided shield specifications.

Cross Section

Example: KNPEV-SB  
5P



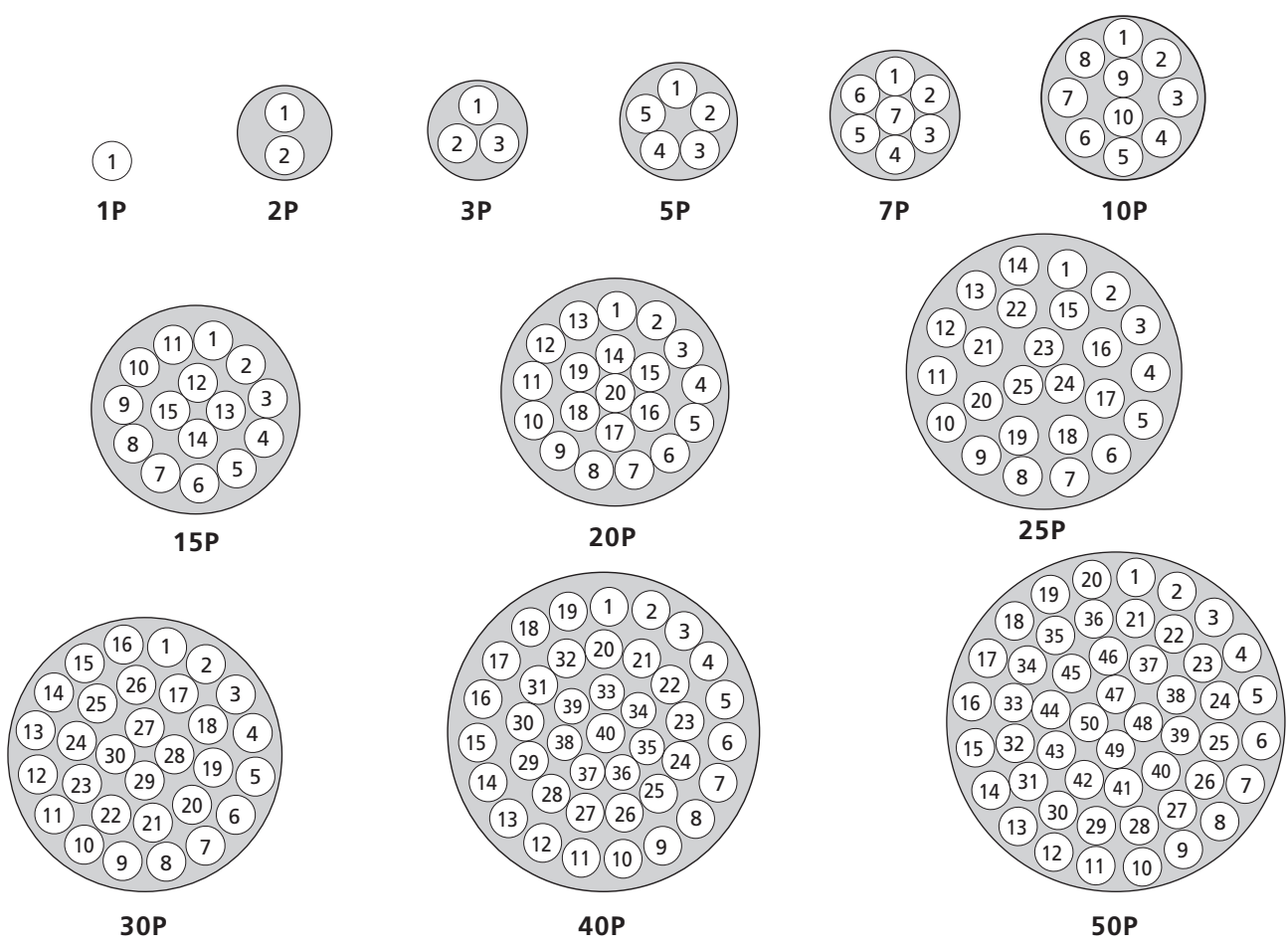
Core Identification

Core No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Type 1 core	Blue	Yellow	Green	Red	Purple	Blue	Yellow	Green	Red	Purple	Blue	Yellow	Green	Red	Purple	Blue	Yellow	Green	Red	Purple	Blue	Yellow	Green	Red	Purple	
Type 2 core	White	White	White	White	White	Brown	Brown	Brown	Brown	Brown	Black	Black	Black	Black	Black	Gray	Gray	Gray	Gray	Gray	Gray	Orange	Orange	Orange	Orange	Orange

Core No.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
Type 1 core	Blue	Yellow	Green	Red	Purple	Blue	Yellow	Green	Red	Purple	Blue	Yellow	Green	Red	Purple	Blue	Yellow	Green	Red	Purple	Blue	Yellow	Green	Red	Purple	
Type 2 core	Light blue	Light blue	Light blue	Light blue	Light blue	Bright green	Bright green	Bright green	Bright green	Bright green	Pink	Pink	Pink	Pink	Pink	White	White	White	White	White	White	Brown	Brown	Brown	Brown	Brown

Layout



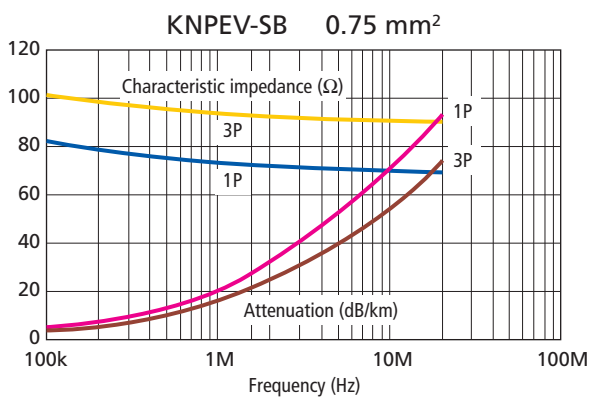
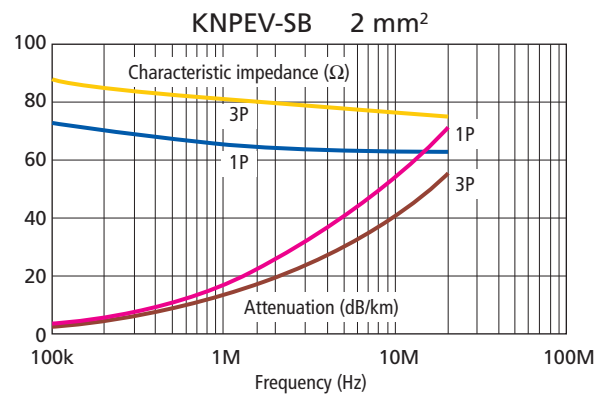
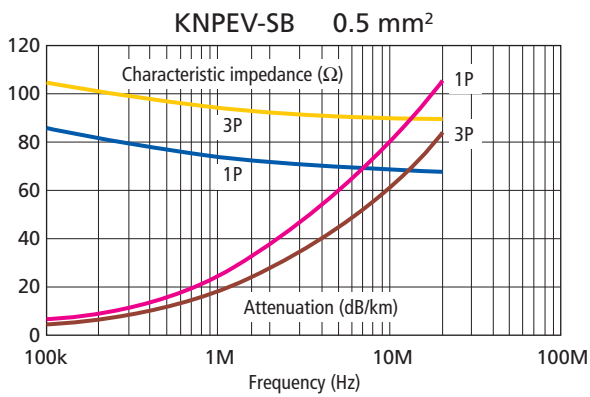
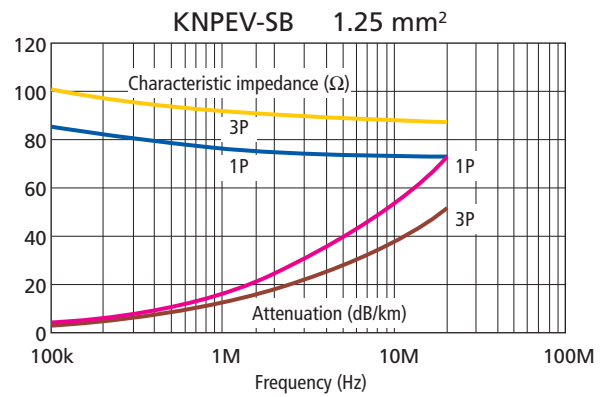
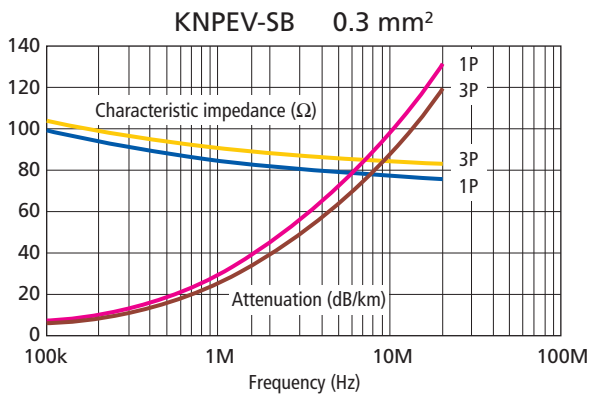
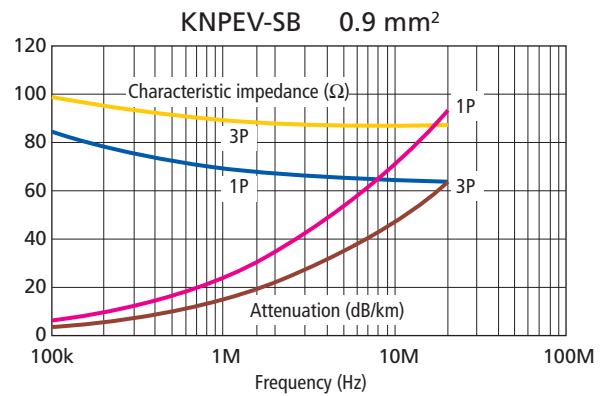
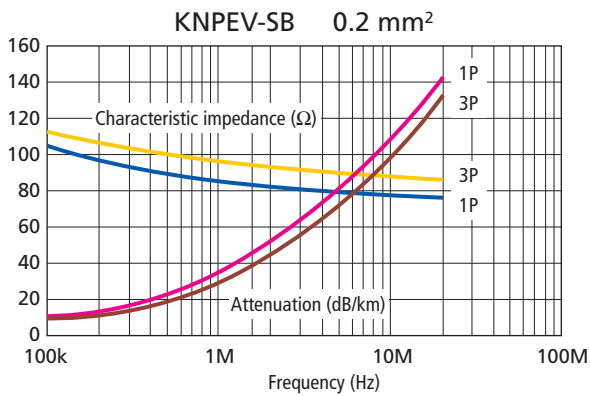
## Structure Table

No. of pairs	Conductor			Jacket standard thickness (mm)	Approximate overall outer diameter (mm)	Approximate volume (kg/km)						
	Nominal cross-section area (mm <sup>2</sup> )	Composite (number of conductors/mm)	Outer diameter (mm)			EV	VV	EE	EM EE/F			
1	0.2	7 / 0.18	0.54	1.3	5.5	35	35	30	35			
2				1.3	7.0	55	55	45	55			
3				1.3	7.5	60	65	50	60			
4				1.3	8.0	70	70	60	70			
5				1.3	8.5	85	85	70	85			
7				1.3	9.0	95	100	85	95			
10				1.3	10.0	115	125	105	115			
15				1.3	12.0	150	160	140	150			
20				1.3	13.0	185	205	170	185			
25				1.3	14.0	215	235	200	215			
30				1.3	15.0	245	270	230	245			
40				1.3	16.0	305	330	285	305			
50				1.4	18.0	370	410	355	370			
1				0.3	12 / 0.18	0.72	1.3	6.0	40	45	35	40
2	1.3	8.0	70				70	60	70			
3	1.3	8.5	80				80	65	80			
4	1.3	9.0	95				100	80	95			
5	1.3	10.0	110				115	90	110			
7	1.3	11.0	125				135	115	125			
10	1.3	12.0	160				175	145	160			
15	1.3	14.0	215				235	200	215			
20	1.3	15.0	265				290	250	265			
25	1.3	17.0	315				350	300	315			
30	1.4	18.0	370				405	350	370			
40	1.5	20.0	475				510	450	475			
50	1.6	23.0	595				640	560	595			
1	0.5	20 / 0.18	0.93				1.3	7.0	55	55	50	55
2				1.3	9.5	100	105	80	100			
3				1.3	10.0	115	115	100	115			
4				1.3	11.0	135	145	120	135			
5				1.3	12.0	160	170	140	160			
7				1.3	13.0	180	195	165	180			
10				1.3	15.0	235	250	220	235			
15				1.4	17.0	325	355	305	325			
20				1.4	19.0	415	450	390	415			
25				1.5	21.0	505	555	465	505			
30				1.6	23.0	605	650	565	605			
40				1.7	25.0	765	830	720	765			
50				1.8	29.0	935	1030	880	935			
1				0.75	30 / 0.18	1.14	1.3	7.5	65	70	60	65
2	1.3	11.0	125				130	110	125			
3	1.3	12.0	145				155	130	145			
4	1.3	13.0	180				190	160	180			
5	1.3	14.0	215				230	195	215			
7	1.3	15.0	245				270	230	245			
10	1.4	17.0	325				355	310	325			
15	1.5	21.0	465				505	435	465			
20	1.6	23.0	605				655	570	605			
25	1.7	26.0	735				800	690	735			
30	1.7	27.0	850				925	800	850			
1	0.9	7 / 0.4	1.2				1.3	7.5	70	75	65	70
2							1.3	11.0	130	140	115	130
3							1.3	12.0	155	165	140	155
4				1.3	13.0	190	200	175	190			
5				1.3	14.0	230	240	205	230			
7				1.3	15.0	260	290	250	260			
10				1.4	17.0	350	390	340	350			
15				1.5	21.0	500	540	470	500			
20				1.6	23.0	640	700	610	640			
25				1.7	26.0	785	860	750	785			
30				1.7	27.0	905	1000	860	905			
1				1.25	7 / 0.45	1.35	1.3	8.5	80	85	75	80
2							1.3	12.0	155	160	130	155
3							1.3	14.0	185	200	170	185
4	1.3	15.0	230				250	215	230			
5	1.3	16.0	270				290	255	270			
7	1.4	17.0	325				355	305	325			
10	1.5	19.0	435				475	410	435			
15	1.6	24.0	630				690	600	630			
20	1.7	26.0	805				880	760	805			
25	1.8	29.0	985				1100	930	985			
30	1.9	31.0	1150				1270	1050	1150			
1	2.0	37 / 0.26	1.83				1.3	9.5	115	125	105	115
2							1.3	14.0	215	225	200	215
3							1.3	15.0	265	290	240	265
4				1.4	17.0	335	355	310	335			
5				1.4	19.0	400	430	365	400			
7				1.5	20.0	495	515	465	495			
10				1.6	24.0	675	720	640	675			
15				1.8	28.0	970	1050	910	970			
20				1.9	32.0	1250	1350	1180	1250			

\* Tin-coated annealed copper stranded conductor specified in JIS C3152. Remarks: We also produce an annealed copper stranded conductor specified in JIS C3102.  
Note: Overall outer diameter and approximate volume are for cables with braided shield specifications.

## Transfer Properties (reference values)

Transfer properties (characteristic impedance and attenuation) classified by conductor size of KNPEV-SB are shown below. Since property values differ slightly between 1P and 2P or other multi-pair cables, representative values of 1P and 3P cables are shown below.



\* Values listed above are representative and not guaranteed under all conditions.