



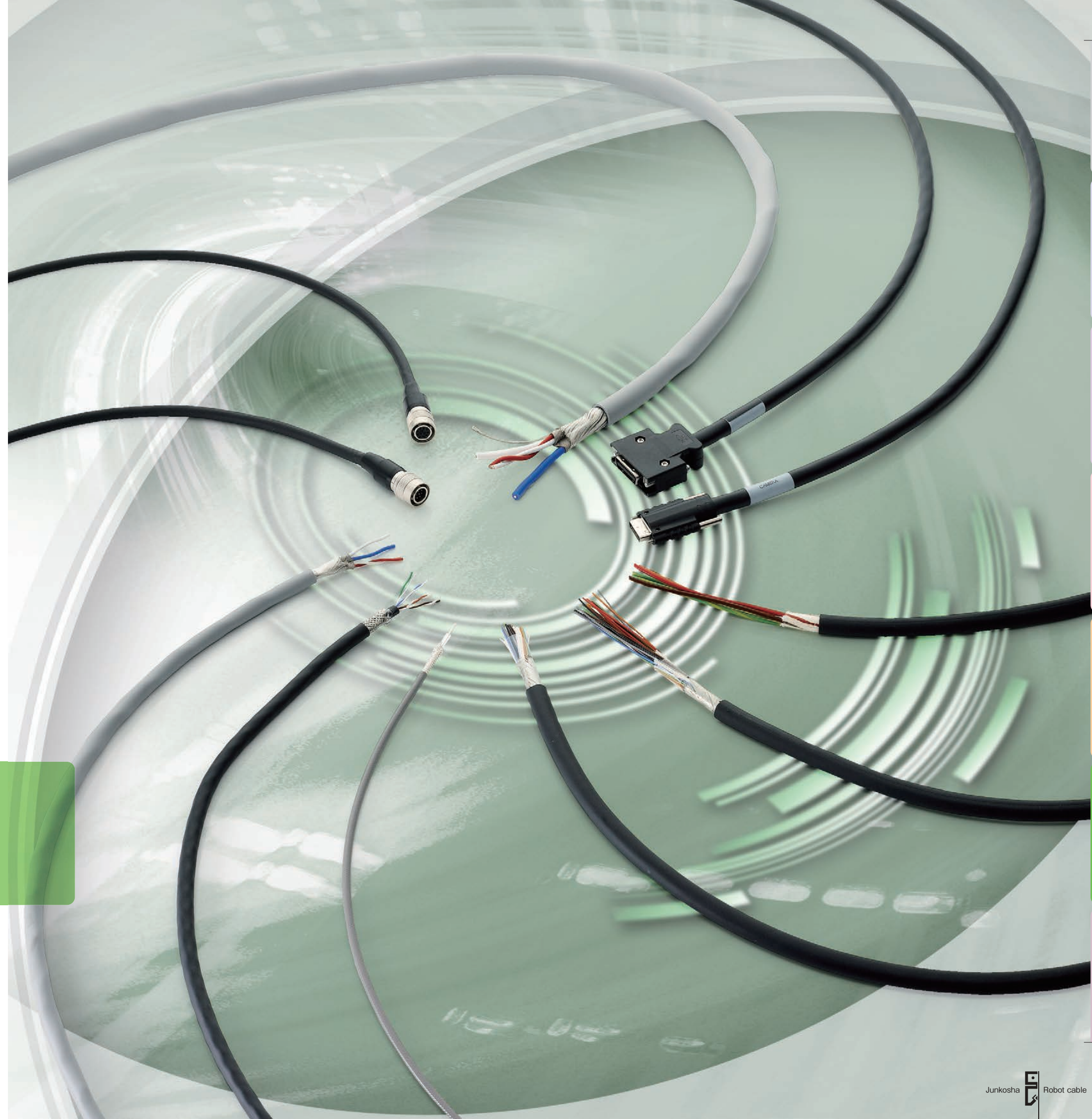
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Cables for application

JUNFLON® coaxial cable for movable parts
High performance camera link cable assembly for movable parts
Analog camera cable for movable parts
LAN cable for movable parts
Device net cable for movable parts
Robot cable for servo motor

Junkosha specializes in the manufacture of robot cables and analog and digital transmission cables. Based on years of expertise in these cable technologies, Junkosha provides highly durable and reliable coaxial cables, camera cables, LAN cables, and cables for servomotors and encoders.

Junkosha robot cable Cables for application

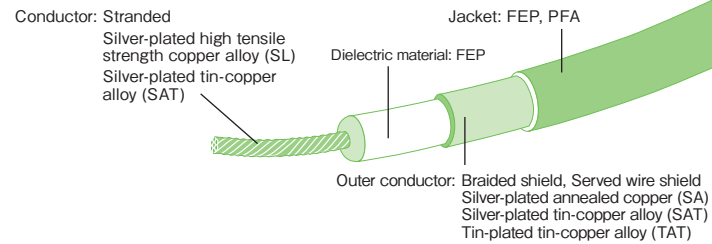




JUNFLON[®] coaxial cable for movable parts

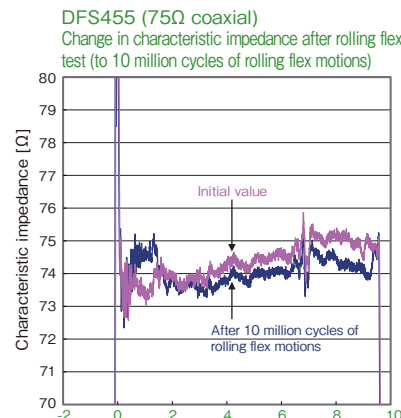
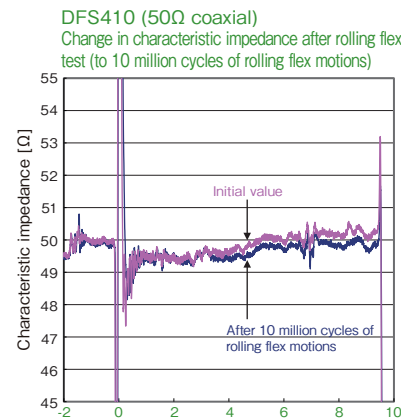
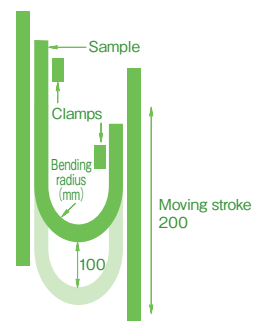
Products Data

The 50Ω and 70Ω coaxial cables are ideal for movable wiring. They combined with outstanding electrical characteristics of fluoropolymers and high mechanical life characteristics.



Technical Data

Rolling flex test



Catalog No.	DFS400	DFS405	DFS410	DFS415	DFS430	DFS450	DFS455	DFS440
Bending radius (mm)	40	40	40	40	50	50	50	50

※ Recommended minimum bending radius confirmed by characteristic change after rolling flex test (to 10 million cycles of rolling flex motions)

Specifications for Coaxial Cables

DFS series for moving parts (FEP dielectric material)

Catalog No.	Characteristic impedance [Ω]	Inner conductor			Dielectric material			Outer conductor			Jacket				Stand-ard capac-ity [pF/m]	Nominal attenuation [dB/km]				Con-ductor resistance 20°C max. [Ω/km]	Approx. mass [kg/km]
		Material	Strands/dia. [strands/mm]	O.D. [mm]	Material	Color	O.D. [mm]	Material	Strands/dia. [strands/mm]	Density min. [%]	Material	Color	Thick-ness [mm]	Finished O.D. [mm]		100 MHz	300 MHz	1000 MHz	3000 MHz		
DFS400	50	SL	19/0.079	0.395	FEP	Natural	1.14	SAT	16/4/0.08	90	FEP	Gray	0.23	2.0	95	390	680	1280	2460	241	9.3
DFS405	50	SL	19/0.079	0.395	FEP	Natural	1.19	SAT	*1 44/0.08	90	FEP	Gray	0.275	1.9	95	370	650	1290	2570	241	7.8
DFS410	50	SL	19/0.102	0.478	FEP	Natural	1.42	SAT	16/5/0.08	90	FEP	Gray	0.24	2.3	95	316	560	1060	2050	147	12.2
DFS415	50	SL	19/0.102	0.478	FEP	Natural	1.46	SAT	*1 54/0.08	90	FEP	Gray	0.24	2.1	95	305	540	1080	2180	147	10.3
DFS420	50	SL	19/0.127	0.597	FEP	Natural	1.80	SAT	16/6/0.08	90	FEP	Gray	0.25	2.7	95	251	446	856	1680	93.2	16.6
DFS425	50	SL	19/0.127	0.597	FEP	Natural	1.84	SAT	*1 67/0.08	90	FEP	Gray	0.25	2.5	95	245	435	878	1800	93.2	14.3
DFS430	50	SL	19/0.160	0.752	FEP	Natural	2.30	SAT	24/5/0.08	90	FEP	Gray	0.25	3.2	95	200	356	692	1380	57.4	23.1
DFS440	50	SL	19/0.203	0.955	FEP	Natural	2.95	SAT	24/5/0.10	90	FEP	Gray	0.275	4.0	95	158	285	562	1140	35.1	35.8
DFS450	75	SL	19/0.079	0.395	FEP	Natural	2.23	SAT	24/5/0.08	90	FEP	Black	0.235	3.1	64	209	373	723	1440	241	20.3
DFS455	75	SL	19/0.079	0.395	FEP	Natural	2.21	SAT	*1 65/0.10	90	FEP	Black	0.245	2.9	64	210	375	764	1580	241	18.1
DFS460	75	SL	19/0.102	0.478	FEP	Natural	2.67	SAT	24/6/0.08	90	FEP	Black	0.265	3.6	64	174	313	612	1240	147	26.4
DFS465	75	SL	19/0.102	0.478	FEP	Natural	2.67	SAT	*1 65/0.12	90	FEP	Black	0.245	3.4	64	174	313	643	1350	147	35.3
DFS470	75	SL	19/0.127	0.597	FEP	Natural	3.34	SAT	24/6/0.10	90	FEP	Black	0.23	4.3	64	142	257	510	1050	93.2	39.4
DFS480	75	SL	19/0.160	0.752	FEP	Natural	4.24	SAT	24/7/0.10	90	FEP	Black	0.28	5.3	64	114	210	425	894	57.4	58.3
DFS490	75	SL	19/0.203	0.955	FEP	Natural	5.43	SAT	32/7/0.10	90	FEP	Black	0.285	6.5	64	92	172	355	766	35.1	85.9

● Minimum insulation resistance: 1,000 MΩ·km ● Test voltage: 1,000 V, 1 minute

*1 Served wire shield (number of ends/mm)

DFS series (FEP dielectric material)

Catalog No.	Characteristic impedance [Ω]	Inner conductor		Dielectric material		Outer conductor		Jacket			Stand-ard capac-ity [pF/m]	Attenuation 100 MHz standard [dB/km]	Conductor resistance 20°C max [Ω/km]	Test voltage [V/min.]	Minimum insulation resistance [MΩ·km]	Approx. mass [kg/km]
		Material	Strands/dia. [strands/mm]	Material	O.D. [mm]	Material	type	Material	Color	Finished O.D. [mm]						
DFS320	50	SAT	7/0.03	FEP	0.26	TAT	27/0.03	PFA	Gray	0.42	95	1650	4620	300	1000	0.46
DFS330	50	SAT	7/0.05	FEP	0.44	TAT	44/0.03	PFA	Gray	0.60	95	980	1660	300	1000	0.91
DFS370	75	SAT	7/0.05	FEP	0.82	TA	49/0.05	PFA	Black	1.02	64	540	1660	300	1000	3.66

● Minimum insulation resistance: 1,000 MΩ·km ● Test voltage: 1,000 V, 1 minute

SGC series

Ultra-thin coaxial cables with finished outer diameters of 0.5 mm or less and the corresponding assemblies are available. Select this series for the internal wiring of MEMS and humanoid robots.

		Unit	AWG40	AWG42	AWG44	AWG46
		Material	—	Silver-plated copper alloy	Silver-plated copper alloy	Silver-plated copper alloy
Inner conductor	Strands/dia.	strands/mm	7/0.030	7/0.025	7/0.020	7/0.016
	O.D.	mm	0.090	0.075	0.060	0.048
Dielectric material	Material	—	PFA	PFA	PFA	PFA
	O.D.	mm	0.22	0.16	0.14	0.12
Shield	Material	—	Tin-plated copper alloy	Tin-plated copper alloy	Tin-plated copper alloy	Tin-plated copper alloy
	O.D.	mm	0.30	0.22	0.20	0.16
Jacket	Material	—	PFA	PFA	PFA	PFA
	O.D.	mm	0.36	0.28	0.26	0.20
Conductor resistance		Ω/km	Less than 5100	Less than 6650	Less than 9250	Less than 14500
Characteristic impedance		Ω	45	42	45	45
Standard capacitance		pF/m	110	115	110	110
Allowable current		mA	340	270	200	150

● Minimum insulation resistance: 1,000 MΩ·km ● Test voltage: 1,000 V, 1 minute

Order Information

All orders must include;

Catalog number + Length

*Please order in the minimum order quantity

Example ▶ DFS020 100m×5

Option

Specify if you need UL compliance.
Following AWM is available.
● UL AWMStyle No.1745 90°C 30V



High Performance Cable Assembly Movable Parts for USB3.0



The structure of the cable assemblies is partially different from USB3.0 standard. We realize high durability by applying the original specification.

Products Data

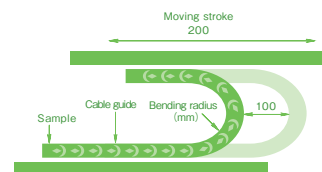
These cables maintain excellent signal transmission characteristics under severe conditions involving more than 50 million repeated flex motions so that decrease in maintenance is expected.

Frequency (GHz)	0.1	1.25	2.5	7.5
Standard (dB/3.0m)	-1.5以下	-5以下	-7.5以下	-25以下
Initial value	-1.1	-4.23	-6.27	-11.74
After 50 million cycles	-1.12	-4.35	-6.59	-18.57

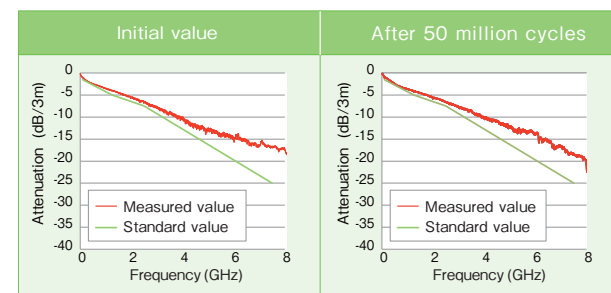
※The data is not a guaranteed value but a measured value under the condition below.

Technical Data

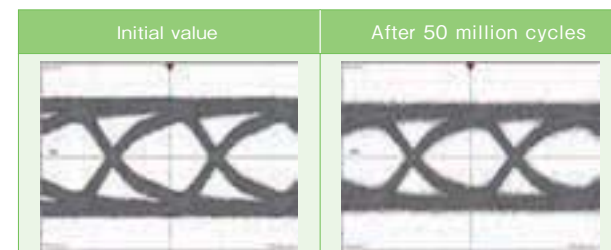
Cable supporting carrier rolling flex test
•Bending radius :30mm •Sample length :3000mm
•Input voltage :1V •5Gbps



Cable for USB3.0 rolling flex test: Measurement of insertion loss



Cable for USB3.0 rolling flex test: Measurement of Eye pattern

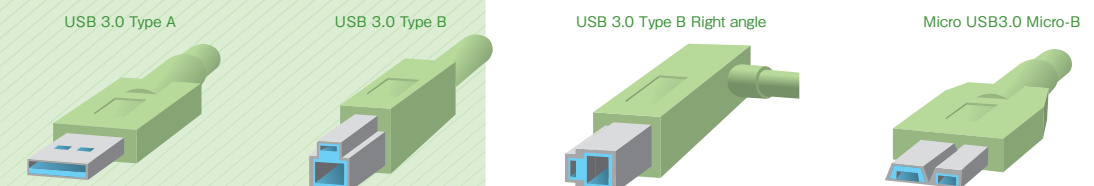


Cable and connector combination

Catalogue No.	Cable Outer Diameter [mm]	Connector 1	Connector 2
JU30-AA-□□□	6.7	USB 3.0 Type A	USB 3.0 Type A
JU30-AB-□□□	6.7	USB 3.0 Type A	USB 3.0 Type B
JU30-AMB-□□□	6.7	USB 3.0 Type A	Micro USB 3.0 Micro - B
JU30-ALB-□□□	6.7	USB 3.0 Type A	USB 3.0 Type B Right angle
JU30-BB-□□□	6.7	USB 3.0 Type B	USB 3.0 Type B
JU30-BMB-□□□	6.7	USB 3.0 Type B	Micro USB 3.0 Micro - B
JU30-BLB-□□□	6.7	USB 3.1 Type B	USB 3.0 Type B Right angle

□□□:Cable length (Ex. : 50cm→005、1m→010、2m→020、3m→030)

Connector Type



AA Type (Connector : Type A - Type A)	
Type A	Type A
AB Type (Connector : Type A - Type B)	
Type A	Type B
AMB Type (Connector : Type A - Micro B)	
Type A	Micro-B
ALB Type (Connector : Type A - Type B Right angle)	
Type A	Type B Right angle
BB Type (Connector : Type B - Type B)	
Type B	Type B
BMB Type (Connector : Type B - Micro B)	
Type B	Micro-B
BLB Type (Connector : Type A - Type B Right angle)	
Type B	Type B Right angle

Option UL-Compliantproducts are also available.

Order Information

Complete the Robot Cable Design Communication Sheet on Page 12



High performance camera link cable assembly for movable parts



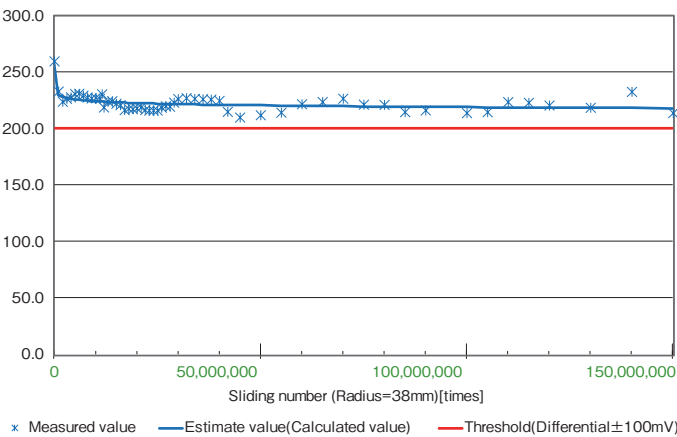
Products Data

The PoCL equivalent camera-link cable assemblies are suitable for movable wiring. These cables maintain excellent signal transmission characteristics under severe conditions involving more than 10 million repeated rolling flex motions so that decrease in maintenance frequency is expected.

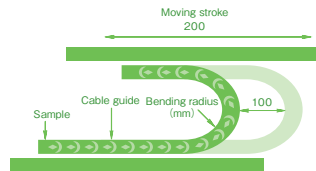
Technical Data

5.2m Base configuration cable

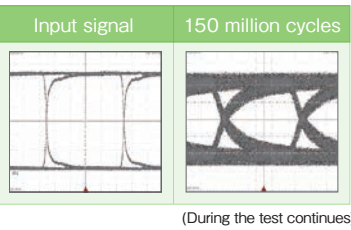
- Data rate: 595Mbps(It corresponds to 85MHz),
- Input voltage: 700mVp-p
- 4 cables, Total 24 Lines



Cable supporting carrier rolling flex test
•Bending radius:38mm
•Sample length:5200mm •595Mbps



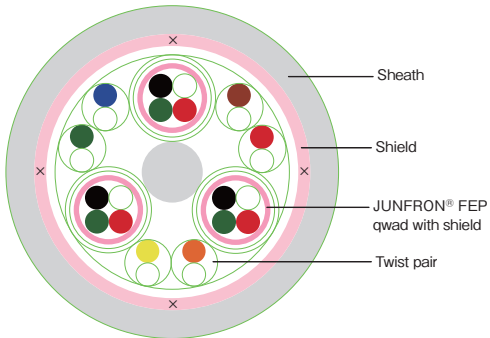
Camera link cable rolling flex test
Eye pattern measurement



(During the test continues)

Cable specification

Conductor size	AWG28
Characteristic impedance [Ω]	Standard 100 Ω
Numbers of core	22 or 24 cores
O.D.	Standard 8.0mm (22 cores)
	Standard 9.0mm (24 cores)
Color	black



Two types of cables assembled with the MDR and/or HDR connectors are available: a CL cable that complies with the Camera Link Interface Standard and a PoCL (Power over Camera Link) cable that allows power to be supplied over the cable.

Type	Catalog No.	Numbers of core	O.D. [mm]	Camera side connector	Board side connector
CL	JCL22-SS-□□□	22	8	Standard	Standard
	JCL22-MS-□□□	22	8	Mini	Standard
	JCL22-MM-□□□	22	8	Mini	Mini
PoCL	JCL24-SS-□□□	24	9	Standard	Standard
	JCL24-MS-□□□	24	9	Mini	Standard
	JCL24-MM-□□□	24	9	Mini	Mini

*Standard : MDR , Mini : HDR

□□□: Cable length
(Ex: 50cm→005, 1m→010, 2m→020, 3m:030, ~8m→080)

Type SS (MDR on both ends)



Type MS
(HDR on one end and MDR on the other end)



Type MM (HDR on both ends)



Option

UL-compliant products are also available.

Order information

All orders must include catalog number and cable length



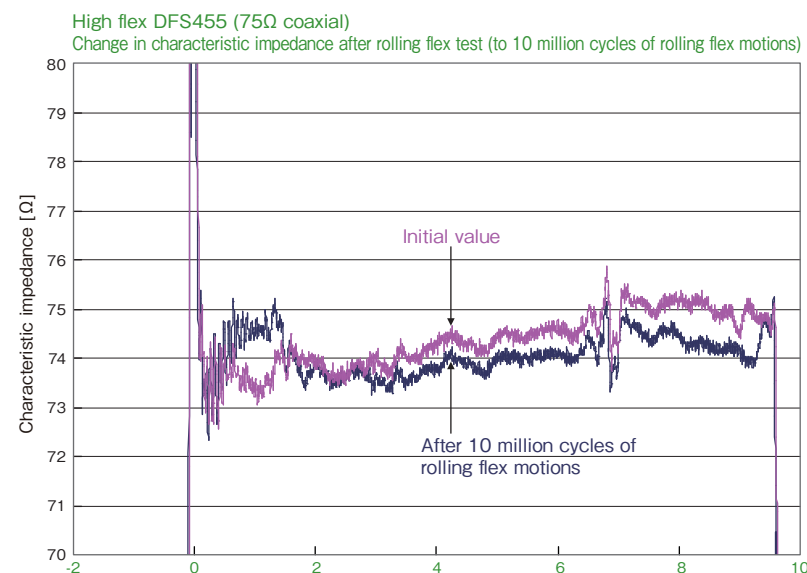
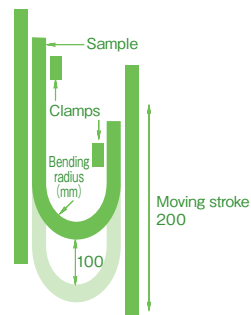
Analog camera cable for movable parts

Products Data

The analog camera cables for movable wiring combine JUNFLON[®] coaxial cables series for movable wiring (p. 79) and various JUNFLON[®] flexible wires. They have been customized for use with specific equipment. Contact the Junkosha customer service center or a sales representative after referring to the Robot Cable Design Communication Sheet (p. 12).

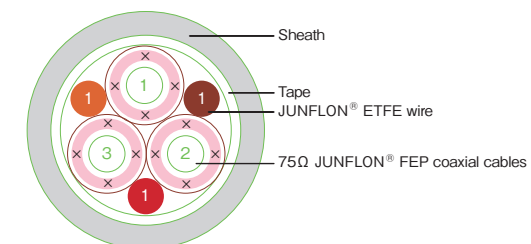
Technical Data

Rolling flex test
• Bending radius : 50mm
• 10 million cycles

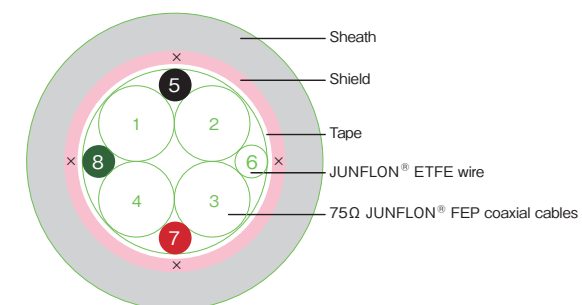


Examples of custom specifications for analog camera cables

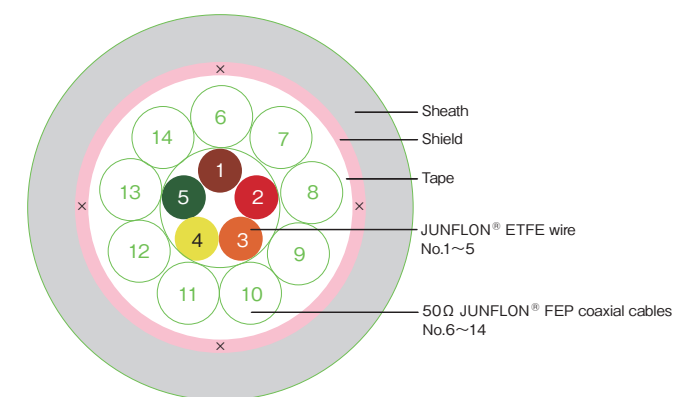
Ex.① Three 75Ω coaxial cables and three JUNFLON[®] ETFE cables



Ex.② Four 75Ω coaxial cables and four JUNFLON[®] ETFE cables



Ex.③ Nine 50Ω coaxial cables and five JUNFLON[®] ETFE cables



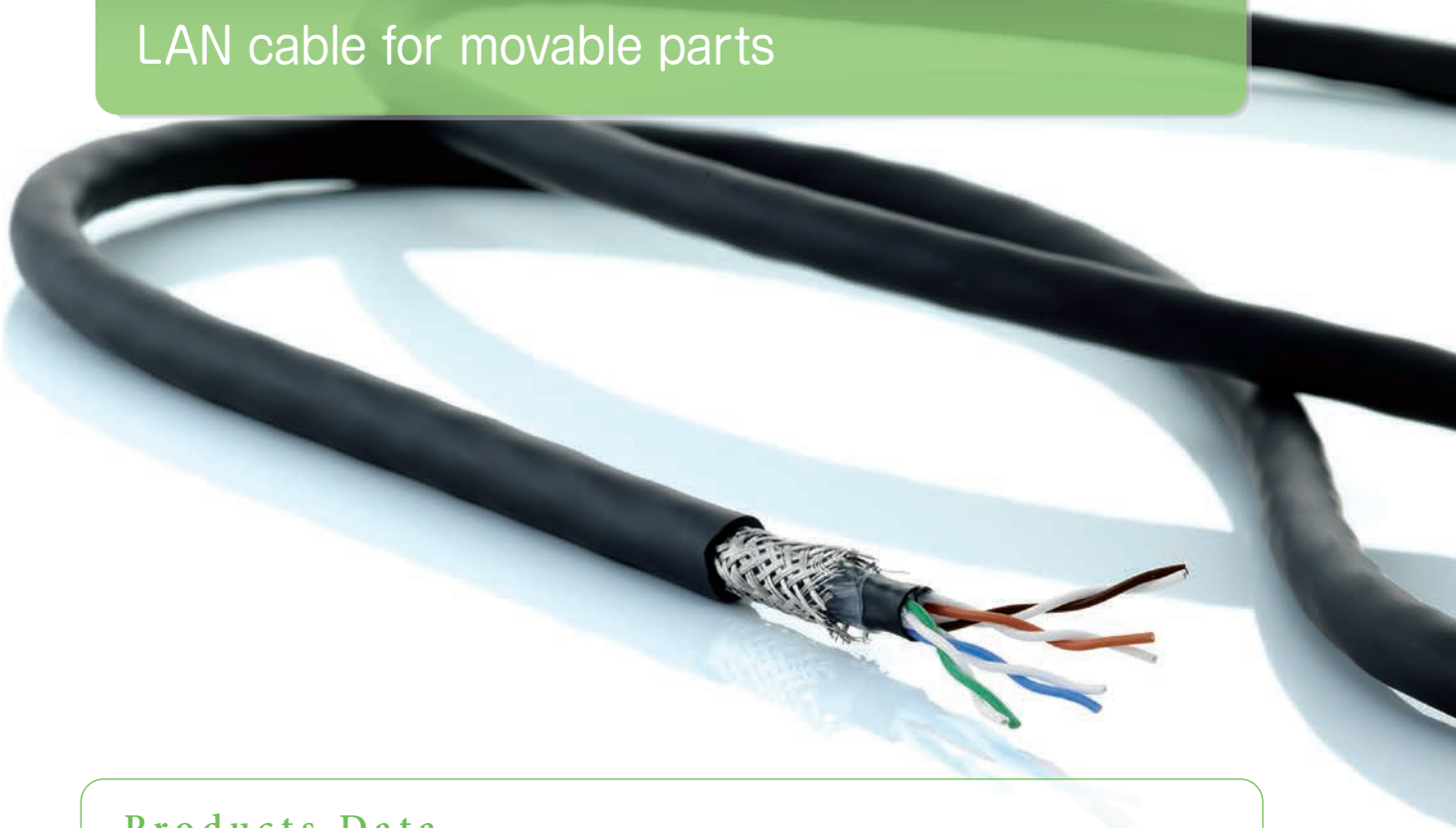
Option UL-compliant products are also available.

Order information

Complete the Robot Cable Design Communication Sheet on Page 12.



LAN cable for movable parts

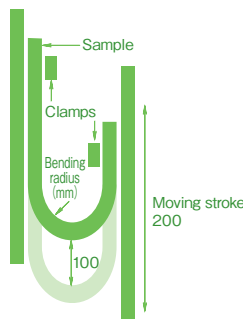


Products Data

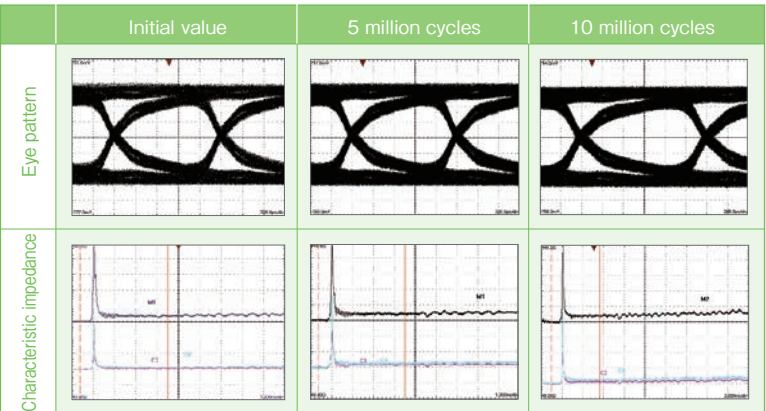
The CAT5e LAN cables are suitable for use as movable (rolling flex) wiring. These cables maintain excellent signal transmission characteristics under severe conditions so that decrease in maintenance frequency is expected.

Technical Data

Rolling flex test
•Bending radius : 60mm
•Stroke : 200mm
•625Mbps •Length : 8m



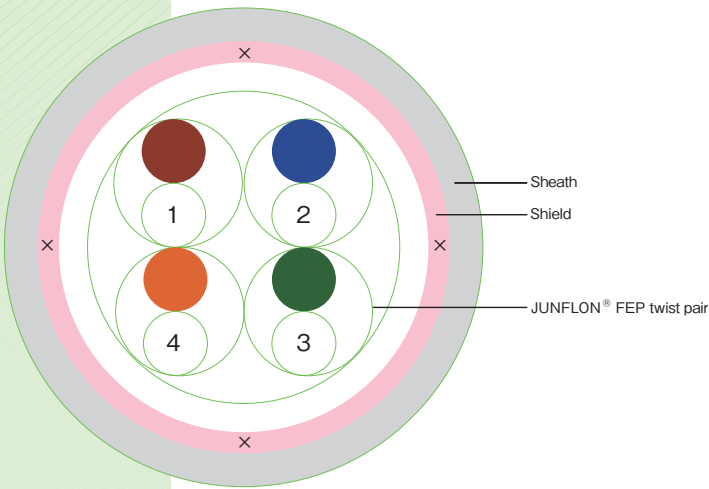
Change in eye pattern and characteristic impedance after rolling flex test



Cable specification

Cat5e LAN cable for movable parts

Catalog No.		JLAN-CAT5-27
Element		4 pairs
Conductor	Size	AWG 27
	Material	Silver-plated high tensile strength copper alloy
Insulation	Material	FEP
Built-in shield		Served wire shield
Sheath		PVC
Finished O.D.		Standard 7.6mm (max. 8.3mm)
Weight		74g
Characteristics	Characteristic impedance [Ω]	Standard 100
	Conductor resistance (Ω/km) @20°C	150 or less
	Insulation resistance (MΩ·km)	1500 or more



Order Information

Please order by catalog No.
(Standard length, no splices/ cut in 100m, coil)
*Insulation color is standard

Example ▶ JLAN-CAT5-27 100m×5

Option UL-compliant products are also available.

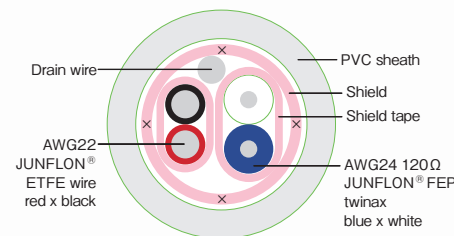


Device net cable for movable parts



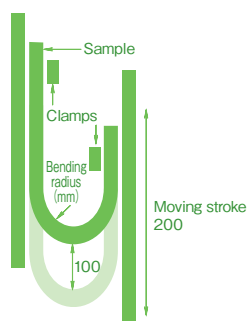
Products Data

The Device Net-equivalent cables are suitable for use as movable (rolling flex) wiring. These cables maintain excellent signal transmission characteristics under severe conditions involving more than 10 million repeated rolling flex motions so that decrease in maintenance frequency is expected.

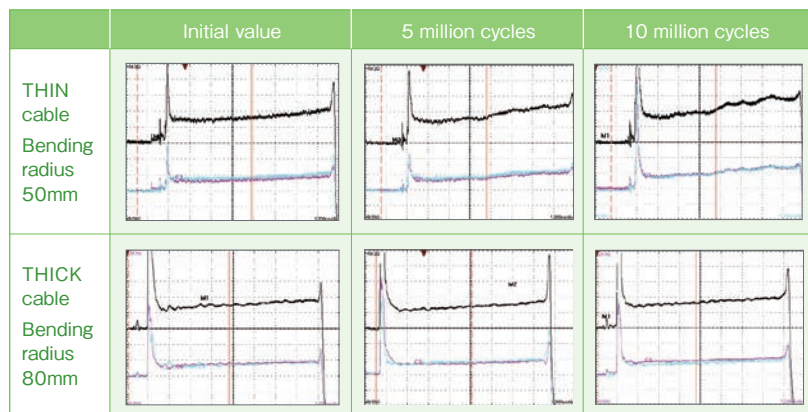


Technical Data

Rolling flex test
• Bending radius : 50 and 80mm
• Stroke : 200mm

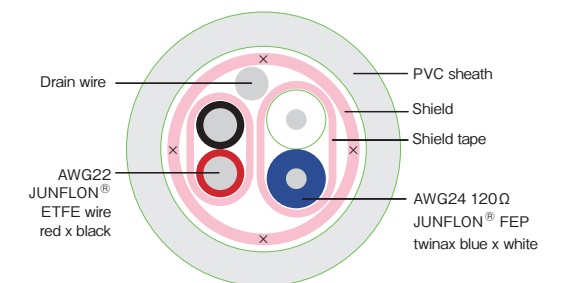


Change in characteristic impedance after rolling flex test



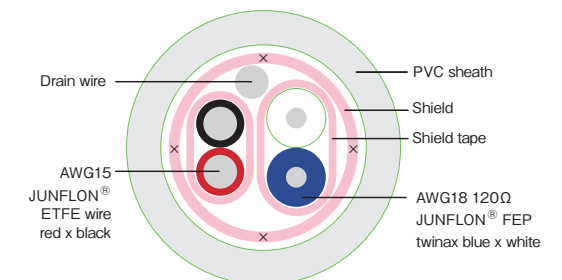
DeviceNet-compliant cables for movable wiring (THIN)

Catalog No.		JPVAN-THIN-01	
Element		Twinax signal transmission cable	Shield twist pair power line
Conductor	Size	AWG24	AWG22
	Material	Tin-plated annealed copper	Tin-plated annealed copper
Insulation	Material	Flexible stranded	Flexible stranded
	Material	FEP	ETFE
Drain wire		AWG22 tin-plated annealed copper, flexible stranded	
Built-in shield		Copper alloy, Special served wire shield	
Sheath		PVC	
Finished O.D.		Standard 8.7 mm (Max. 9.5 mm)	
Weight		85 g	
Characteristics	Characteristic impedance (Ω)	120 ±12	Standard 100
	Conductor resistance (Ω/km) @20°C	100 or less	50.8 or less
	Insulation resistance (MΩ·km)	1,500 or more	1,500 or more



DeviceNet-compliant cables for movable wiring (THICK)

Catalog No.		JDVAN-THICK-02	
Element		Twinax signal transmission cable	Shield twist pair power line
Conductor	Size	AWG18	AWG15
	Material	Tin-plated annealed copper	Tin-plated annealed copper
Insulation	Material	Flexible stranded	Flexible stranded
	Material	FEP	ETFE
Drain wire		AWG18 tin-plated annealed copper, flexible stranded	
Built-in shield		Copper alloy, Special served wire shield	
Sheath		PVC	
Finished O.D.		Standard 15.7 mm (Max. 179.5 mm)	
Weight		250 g	
Characteristics	Characteristic impedance (Ω)	120 ±12	Standard 100
	Conductor resistance (Ω/km) @20°C	22.6 or less	10.3 or less
	Insulation resistance (MΩ·km)	1,500 or more	1,500 or more



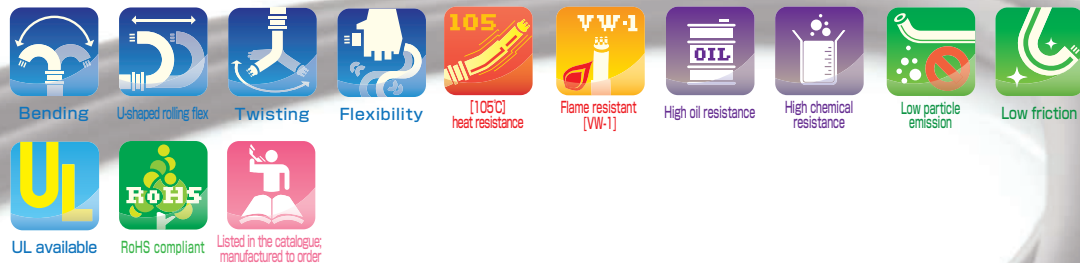
Option

UL-compliant products are also available.

Order Information

Please order by catalog No.
(Standard length, no splices/ cut in 100m, coil)
*Insulation color is standard

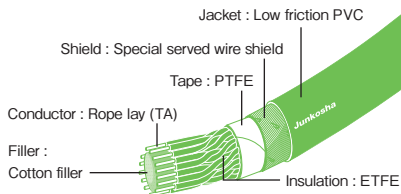
Example ▶ JDVAN-THIN-01 100m×3



Robot cable for servo motor

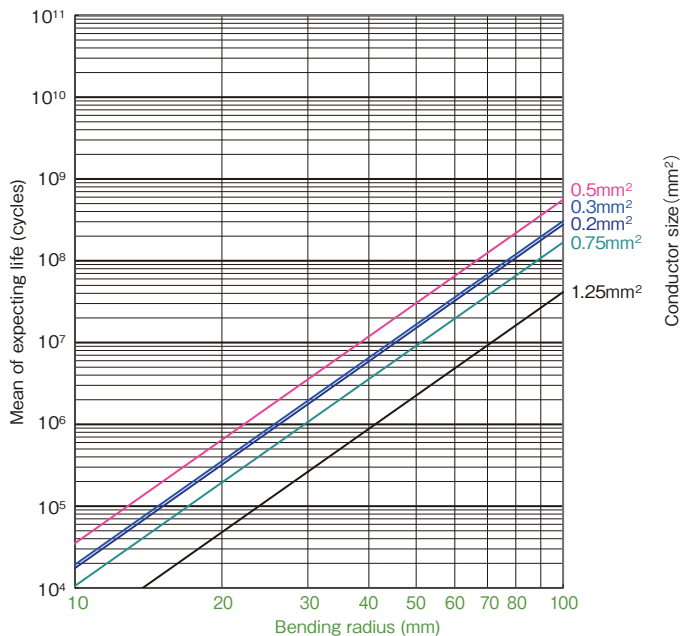
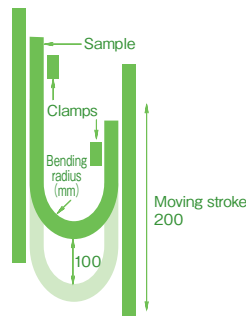
Products Data

The long-life, flex-resistant, space-saving cables are designed for use as movable wiring for servomotors and peripheral equipment. The sheath material is low-friction PVC.



Technical Data

Rolling flex test
•Stroke : 200mm



Cable specification

① Servo motor power cable

Catalog No.	Conductor cross section [mm²]	No. of cores	Finished O.D. [mm]	Weight [kg/km]	Shield structure	Rated voltage [V]	Allowable current [A]	Rated temperature [°C]
ME17FVT04	0.75sq	4	7.4	95	Special served wire shield	600	5	105
ME1AFVT04	1.25sq	4	8.4	125	Special served wire shield	600	7	105
ME1BFVT04	2.0sq	4	9.5	170	Special served wire shield	600	9	105
ME1CFVT04	3.5sq	4	11.6	260	Special served wire shield	600	13	105

② Encoder signal cable

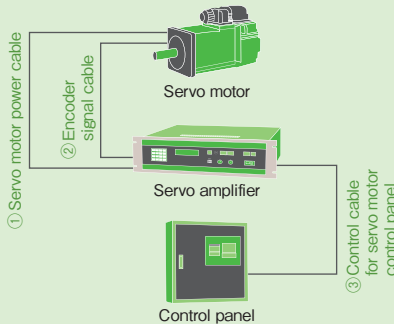
Catalog No.	Conductor cross section [mm²]	No. of cores	Finished O.D. [mm]	Weight [kg/km]	Shield structure	Rated voltage [V]	Allowable current [A]	Rated temperature [°C]
ME12FVT03	0.2sq	3(6)	6.6	60	Special served wire shield	300	1	105
ME12FVT04		4(8)	7.1	70	Special served wire shield	300	1	105
ME12FVT05		5(10)	7.7	80	Special served wire shield	300	1	105
ME12FVT06		6(12)	8.3	90	Special served wire shield	300	1	105
ME13FVT03	0.3sq	3(6)	7.6	75	Special served wire shield	300	1.5	105
ME13FVT04		4(8)	8.2	90	Special served wire shield	300	1.5	105
ME13FVT05		5(10)	8.9	105	Special served wire shield	300	1.5	105
ME13FVT06		6(12)	9.6	115	Special served wire shield	300	1.5	105

③ Control cable for servo motor control panel

Catalog No.	Conductor cross section [mm²]	No. of cores	Finished O.D. [mm]	Weight [kg/km]	Shield structure	Rated voltage [V]	Allowable current [A]	Rated temperature [°C]
ME13FVT08	0.3sq	8(16)	11.1	145	Special served wire shield	300	1.5	105
ME13FVT10		10(20)	11.5	170	Special served wire shield	300	1	105
ME13FVT15		15(30)	11.9	210	Special served wire shield	300	1	105

Example of connection between servo motors and peripheral devices

There is growing demand for faster and more precise servo motors and peripheral devices, both key components in factory automation and for robots. The JUNFLON[®] robot cable series for servo motors and peripheral devices has been specially developed to ensure precise control of servo motors based on instructions issued from a control panel through an amplifier.



Option

UL-compliant products are also available.

Order information

All orders must include FOLLOWING.
Use the following color codes to specify the color.
(Standard length, no splices/ cut in 100m, coil)

Catalog number + Length

No.	1	2	3	4
color	black	white	red	green
color code	BK	W	R	GR

No.	1	2	3	4	5	6	7	8
color	brown white	red white	orange white	yellow white	green white	blue white	gray white	black white
color code	BN×W	R×W	O×W	Y×W	GR×W	BL×W	GY×W	BK×W

*The cables are identified by the repeated eight colors of the insulators.

Example ▶ ME12FVT03 100m×2