FAQ# 940-1F060

AMCI Frequently Asked Question

What Transducer Cable Can I Use In High Temp or High Flex Applications?

The specifications for AMCI's standard cable are given below in order to have a comparison baseline for the special cables. Note that these standard cables can be used in almost all applications.

	Belden Cable Number		
	9873	9730	9731
Used in AMCI Cables	CT, C1T, C2T, C3T, C4T, C1TP	CT, C1T, C2T, C3T, C4T, C1TP	CTT, C2TT
Number of Wire Pairs	3	3	6
Maximum Cable Length	100 ft	1,000 ft	600 ft
Wire Gauge	20 AWG (7x28 Stranded)	24 AWG (7x32 Stranded)	24 AWG (7x32 Stranded)
Jacket Insulation Material	PVC	PVC	PVC
Wire Insulation Material	Polyethylene	Foam Polyolefin	Foam Polyolefin
Temperature Rating	–20ºC to +60ºC	–20ºC to +60ºC	–20ºC to +60ºC
Capacitance per foot	30.0 pF	12.5 pF	12.5 pF

NOTE

1) The limiting factor on the cable length is its capacitance, not its resistance (wire gauge). The capacitance is the limiter because each winding of the resolver has a significant inductance value that can form a resonant circuit with the cable's capacitance. This is why Belden 9873 cable should not be used for cable lengths greater than 100 feet.

2) The low end temperature rating is limited by the PVC jacket insulation. The high end temperature rating is shared by both the jacket and wire insulation.

High Temperature Cable

If your application exposes the transducer cable to temperatures above +60ºC for extended periods of time, consider using a plenum rated cable with foamed Teflon insulation. The part numbers and specifications are given below.

	Belden Cable Number	
	89730	89731
Used in AMCI Cables	CT, C1T, C2T, C3T, C4T, C1TP	CTT, C2TT
Number of Wire Pairs	3	6
Maximum Cable Length	1,000 ft	600 ft
Wire Gauge	24 AWG (7x32 Stranded)	24 AWG (7x32 Stranded)
Jacket Insulation Material	Flurocopolymer	Flurocopolymer
Wire Insulation Material	Foamed FEP Teflon	Foamed FEP Teflon
Temperature Rating	–20ºC to +125ºC	–20ºC to +125ºC
Capacitance per foot	12.5 pF	12.5 pF

NOTE

1) The Foamed FEP insulation is very stiff. The cable should not be used in flexing applications.

2) The limiting factor on the temperature rating is the jacket material. The Foamed FEP Teflon wire insulation is rated from –70ºC to +200ºC.

High Flex Cable

The polyethylene wire insulation used in the AMCI standard cables is an excellent insulation material, with a high insulation resistance and a low and stable dielectric constant over a wide frequency range. However, it is relatively stiff, which limits its use in applications when the cable is constantly moving, such as some types of overhead cranes. In these applications, use the Belden cables listed below.

	Belden Cable Number	
	1510B	1218B
Used in AMCI Cables	CT, C1T, C2T, C3T, C4T, C1TP	CTT, C2TT
Number of Wire Pairs	4	6
Maximum Cable Length	100 ft	400 ft
Wire Gauge	24 AWG (7x32 Stranded)	22 AWG (7x30 Stranded)
Jacket Insulation Material	PVC	Flurocopolymer
Wire Insulation Material	Polyolefin	Polyolefin
Pair Insulation Material	PVC	PVC
Temperature Rating	–20ºC to +60ºC	–20ºC to +60ºC
Capacitance per foot	31 pF	19 pF

NOTE

1) Because of its capacitance, consider only using this cable on the section of the run that actually flexes unless you run is less than 100 feet. You can run this cable to a junction box and splice it to our standard cable for the rest of the run. This is especially important for the multi-turn installations that use the 1218B cable.

2) If you splice the cable, treat the shields as a signal carrying conductor. Do Not attach the shield to earth ground at the junction box. The shield must only be grounded at the controller.

Wire Color Cross Reference Table (Single-Turn)

Unfortunately, the cables do not have a common wire color code. The table below is the suggested cross reference when wiring single-turn cables.

Pair	Resolver Designations	9873 or 9730	89730	1510B	
				Pair	Wire
1	R1	Black	Wht/Blu	Brown	Black
	R2	Red	Blu/Wht	Brown	Red
2	S1	White	Orn/Wht	Red	Red
	S3	Black	Wht/Orn	Red	Black
3	S2	Black	Wht/Grn	Orange	Black
	S4	Green	Grn/Wht	Orange	Red
4†	R1			Yellow	Black
	R2			Yellow	Red

† Only the 1510B has a fourth twisted pair in the cable. When installing this cable, wire the first and fourth pairs in parallel, similar to what is specified on the CTT cables.

Wire Color Cross Reference Table (Multi-Turn)

Like the single-turn cable, the multi-turn cables do not have a common wire color code. The table below is the suggested cross reference when wiring multi-turn cables.

Pair	Resolver Designations	9731	89731	1218B	
				Pair	Wire
1	CR1	Black	Wht/Blu	Brown	Black
	CR2	Red	Blu/Wht	Brown	Red
2	CS1	White	Orn/Wht	Red	Red
	CS3	Black	Wht/Orn	Red	Black
3	CS2	Black	Wht/Grn	Orange	Black
	CS4	Green	Grn/Wht	Orange	Red
4	FR1	Black	Wht/Brn	Yellow	Black
	FR2	Brown	Brn/Wht	Yellow	Red
5	FS1	Yellow	Gry/Wht	Green	Red
	FS3	Black	Wht/Gry	Green	Black
6	FS2	Blue	Blu/Red	Blue	Red
	FS4	Black	Red/Blu	Blue	Black