Caledonian

VFD Cable

ADDISON

CONTENT

VFD-Shielded Power Cable

Application

These high performance VFD cables are for dynamic industrial applications that reduces the effects of electrical noise and corona discharge, while providing a low impedance path to ground to eliminate the potential damage.

Construction

Conductor	Stranded fine copper conductor.
Insulation	Oil resistant composite material, provide high dielectric, tensile and mechanical properties.
Color code	3 black cores+1 yellow/green.
Filler	Low friction, non-wicking fillers provide increased flexibility in dynamic applications.
Drain wire	Flat braid drain wire.
Braid	100% coverage aluminum foil, overall 80% coverage tinned copper braid.
Sheath	Special TPE compound, oil, ozone, UV resistant, flame and heat resistant. All-weather flexibility.

Technical Information

CSA – 1000 Volt

CSA – FT-4

TC-ER – 600 Volt

Rated temperature – 90C

Cable Parameter

No. of Cores	Cable Size	Stranding	Ampacity	Nominal O.D.	Weight Lbs/1000ft	Drain Wire
	AWG		(A)	(inch)	feet	AWG
4	16	65 x 34	18	0.465	145	18
4	14	105 x 34	25	0.509	158	16
4	12	165 x 34	30	0.606	247	14
4	10	105 x 30	40	0.683	308	14
4	8	168 x 30	55	0.887	528	14
4	6	266 x 30	75	1.020	753	14
4	4	413 x 30	95	1.190	1083	14

VFD-Shielded Power Cable with Brake & Signal Pairs

Application

These high performance VFD cables are for dynamic industrial applications that reduces the effects of electrical noise and corona discharge, while providing a low impedance path to ground to eliminate the potential damage.

Construction

Power Cores

Conductor	Stranded fine copper conductor.
Insulation	Oil resistant composite material, provide high dielectric, tensile and mechanical properties.
Color code	3 black cores+1 yellow/green.

Brake & Signal Pairs

Conductor	Stranded copper conductor
Insulation	Oil resistant composite material
Color code	Black and white with printed numbers
Shield	100% coverage aluminum/mylar foil with drain wire
Sheath	Oil resistant composite material, provide high dielectric, tensile and mechanical properties

Assembly

Fillers	Low friction, non-wicking fillers provide increased flexibility in dynamic applications.
Drain wire	Flat braid drain wire
Braid	100% coverage aluminum foil, overall 80% coverage tinned copper braid.
Outer sheath	Special TPE compound, oil, ozone, UV resistant, flame and heat resistant. All-weather flexibility.

Technical Information

CSA – 1000 Volt
CSA – FT-4
TC-ER – 600 Volt
Rated temperature – 90C

Cable Parameter

Wih single pair

No. of Cores	Power Conductor				Brake & Signal Pairs			Jacket Thickness (inch)	Nominal O.D. (inch)	Weight. (lbs/ 1000ft)
	AWG/ COND.	Stranding	Ampacity (A)	Drain Wire	AWG/ NO. PAIRS	Stranding	Drain Wire			
4	14/4	105x34	25	16	16/1	65x34	18	0.070	0.620	215
4	12/4	165x34	30	14	16/1	65x34	18	0.070	0.670	310
4	10/4	105x30	40	14	16/1	65x34	18	0.070	0.760	420
4	8/4	168x30	55	14	16/1	65x34	18	0.090	0.940	617
4	6/4	266x30	75	14	16/1	65x34	18	0.090	1.050	825
4	4/4	1050x34	67	18	14/1	105x30	16	0.115	1.390	1450

With two pairs

Power Conductor				Brake & Signal Pairs			Jacket Thickness (inch)	Nominal O.D. (inch)	Weight. (lbs/ 1000ft)
AWG/ COND.	Stranding	Ampacity (A)	Drain Wire	AWG/ NO. PAIRS	Stranding	Drain Wire			
14/4	105x34	25	16	16/2	65x34	18	0.070	0.695	280
12/4	165x34	30	14	16/2	65x34	18	0.070	0.745	370
10/4	105x30	40	14	16/2	65x34	18	0.070	0.860	505
8/4	168x30	55	14	16/2	65x34	18	0.090	1.000	800
6/4	266x30	75	14	16/2	65x34	18	0.090	1.110	1175

Type TC VFD power cable

Application

These cables are used to supply power to motors, or for connection to other power devices in industrial settings. Primary installations include cable trays, raceways, and outdoor locations where supported by a messenger wire.

Type TC - VFD is listed for direct burial or in underground ducts and for use in Class 1, Division 2 hazardous locations and Class 1 control circuits. This cable may be used in wet or dry locations at temperatures not to exceed 90°C.

Construction

Conductor	Class B stranded, uncoated annealed copper conforming to ASTM B-3 and B-8.
Insulation	Each conductor is insulated with black Crosslinked Polyethylene (XLP) conforming to UL Standard 44 for Type RHH/RHW-2.
Color code	Each conductor is black and printed with its conductor number.
Ground Wires	Three Class B stranded annealed copper conforming to ASTM B-3 and B-8
Filler	Non-hygroscopic fillers.
Shield	5 mil un-coated copper tape is helically wrapped over the twisted assembly with a 50% (nominal) overlap. The shield shall be in contact with the ground wire.
Sheath	A black, flame retardant Polyvinyl Chloride (PVC).

Technical Information

Rated voltage – 600/2000 Volt

CSA – FT-4

TC-ER – 600 Volt

Rated temperature – 90C

Cable Parameter

Conductors /Size	Number of Conductors	Stranding	Grounds /Size	Insulation Thickness (MILS)	Jacket Thickness (MILS)	NOMINAL O.D.	Ampacity 75°C	Ampacity 90°C	Cable Weight
14	3	7	3 x #18	60	60	0.549	20	25	241
12	3	7	3 x #16	60	60	0.588	25	30	263
10	3	7	3 x #14	60	60	0.638	35	40	332
8	3	7	3 x #14	70	60	0.743	50	55	417
6	3	7	3 x #12	70	80	0.819	65	75	622
4	3	7	3 x #12	70	80	0.959	85	95	783
2	3	7	3 x #10	70	80	1.081	115	130	1156
1/0	3	19	3 x #6	90	80	1.351	150	170	1815

Caledonian VFD Cables

Conductors /Size	Number of Conductors	Stranding	Grounds /Size	Insulation Thickness (MILS)	Jacket Thickness (MILS)	NOMINAL O.D.	Ampacity 75°C	Ampacity 90°C	Cable Weight
2/0	3	19	3 x #6	90	80	1.443	175	195	2587
3/0	3	19	3 x #5	90	80	1.554	200	225	2625
4/0	3	19	3 x #4	90	110	1.735	230	260	3241
250	3	37	3 x #2	105	110	1.899	255	290	3657
350	3	37	3 x #2	105	110	2.121	310	350	4958
500	3	37	3 x #1	105	110	2.400	380	430	6689

VFD Cable with EMC Screening

Application

EMC VFD cable has been specially designed for Variable Frequency Drive Motors and installations where it is necessary to limit the effects of electromagnetic interference (EMI).

Construction

Conductor	Electrolytic copper,class 5 (flexible),based on EN/IEC 60228
Grouding Conductor	The grounding conductor is divided into three conductors; the equivalent cross section is approximately 50% of the section of the phase conductor.
Insulation	Cross-linked polyethylene (XLPE) 4G grey + brown + black + Green/yellow (up to 4 mm2) 3x + 3G grey + brown + black + Green/yellow (3 x) (from 6 mm2 onwards)
Screen	Aluminium-polyester tape screen, helically placed over the insulated conductors. Over the tape there is a tinned copper braid screen. The tape and the braid act as a double screen to cut out all of the the electromagnetic interference. The screen has a cover of 100% and its total section is approximately 10% of one of the conductors.
Outer Jacket	Polyolefin LSZH outer sheath with ripcord to allows for ease of stripping of the outer jacket.

Technical Information

Electrical performance	LOW VOLTAGE 0.6/1 KV
Standrd	IEC 60502-1 / IEC 60092-353
Thermal performance	Maximum service temperature: 90ºC. Maximum short-circuit temperature: 250ºC (max. 5 s). Minimum service temperature: -40ºC (fixed and protected installations).
Fire performance	
Flame non-propagation	based on UNE-EN 60332-1 and IEC 60332-1.
Fire non-propagation	based on UNE-EN 60332-3 and IEC 60332-3.
LSZH(Low Smoke Zero Halogen)	based on UNE-EN 60754-1 and IEC 60754-1.
Low smoke emission	based in UNE-EN 61034 and IEC 61034:Light transmittance>60%
Low corrosive gases emission	based on UNE-EN 60754-2 and IEC 60754-2.
Mechanical performance	
Minimum bending radius:	x10 cable diameter.
Impact resistance:	AG2 Medium severity.
Chemical performance	Chemical & Oil resistance: Good.
Water performance	Water resistance: AD5 Jets.
Installation conditions	Open Air. Buried. In conduit.
Applications	Industrial use. Variable Frequency Drive (VFD)

Cable Parameter

No.of cores x cross section	Nom.O.D.	Copper weight	Cable weight approx.	AWG
n x mm2	mm	kg/km	kg/km	
4G1.5	10.6	95	230	16
7G1.5	12.9	151	362	16
4G2.5	12.3	150	300	14
7G2.5	14	265	450	14
4G4	14.5	235	485	12
4G6	16.2	320	633	10
4G10	19.2	533	863	8
4G16	22	789	1291	6
4G25	27	1236	1862	4
4G35	30	1662	2611	2
4G50	35	2345	2955	1
4G70	40.8	3196	3953	2/0
4G95	45.8	4316	5304	3/0
4G120	49.7	5435	6604	4/0
4G150	57	6394	7043	250 MCM
4G185	61.1	7639	8384	350 MCM
4G240	67	10013	11010	450 MCM
4G300	71.5	12570	13800	550 MCM
3x1.5+3G0.25	10.2	86	140	16/24
3x2.5+3G0.5	11.4	144	220	14/20
3x4+3G0.75	13	224	323	12/19
3x6+3G1	15	298	420	10/18
3x10+3G1.5	18.4	491	615	8/16
3x16+3G2.5	21.6	723	819	6/14
3x25+3G4	25.3	1000	1200	4/12
3x35+3G6	27.8	1350	1600	2/10
3x50+3G10	32.6	2208	2399	1/8
3x70+3G10	39	2871	3080	2/0/8
3x95+3G16	44.3	3953	4180	3/0/6
3x120+3G16	46.3	4300	4700	4/0/6
3x150+3G25	53.5	5450	5900	250 MCM/4
3x185+3G35	59.5	6969	7189	350 MCM/2
3x240+3G42.5	65.2	8850	9540	450 MCM/1
3x300+3G50	69.5	10700	11560	550 MCM/1

Armoured VFD Cable with EMC Screening

Application

These cables are used for fixed installation in most areas and on open deck in ships. Design to meet requirements for Variable Frequency Drivers (VFD). Suitable for voltage peaks to 3kV (for cables ≥ 10mm2).

Construction

Conductor	Stranded copper conductor conforming to IEC60288 Class 5.
Insulation	XLPE insulation conforming to IEC60092-351.
Filler	Non-hygroscopic filler tape.
Shield	Copper tape
Armor	Copper wire braid, coverage > 90%.
Sheath	A black, polyolefine plastic, SHF1 conforming to IEC 60092-359.
Sheath	Special TPE compound, oil, ozone, UV resistant, flame and heat resistant. All-weather flexibility.

Technical Information

Rated voltage 1,8/3kV (3,6kV)
Maximum conductor temperature + 90 °C
Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C
Flame-retardant IEC 60332-1-2 -test for single insulated wire and cable
IEC 60332-3-22 -test for bunched wires and cables,category A
Halogen-free IEC 60754
Smoke emission IEC 61034
Transfer impedance IEC 61196-1 (typical value 26dB over 1mΩ/m at 100MHz [20mΩ/m])

Cable Parameter

Number of conductors & cross-section	Cross- section of screen	Nominal outer diameter	Approx-imate weight	Current rating	Min. bending radius fixed installation
No. x mm2	mm2	mm	kg/km	A	mm
1x16	5,2	13,5	340	96	85
1x25	5,8	15,0	455	127	90
1x35	11,5	16,5	625	157	100
1x50	9,8	18,0	740	196	110
1x70	10,9	20,0	990	242	120
1x95	12,1	22,0	1275	293	135
1x120	13,2	23,5	1535	339	145

Caledonian VFD Cables

Number of conductors & cross-section	Cross- section of screen	Nominal outer diameter	Approx-imate weight	Current rating	Min. bending radius fixed installation
No. x mm2	mm2	mm	kg/km	A	mm
1x150	14,3	25,5	1830	389	155
1x185	15,4	27,5	2210	444	165
1x240	17,1	30,0	2830	522	180
1x300	18,6	33,0	3470	601	200
3x16	16,1	26,0	915	67	160
3x25	16,5	29,0	1215	89	175
3x35	18,2	31,5	1570	110	190
3x50	25,1	35,5	2040	137	215
3x70	35,0	39,0	2820	169	235
3x95	35,0	44,0	3645	205	265
3x120	38,1	48,0	4465	237	290
3x150	41,2	51,5	5335	272	310
3x95+3x16	35,0	44,0	4565	205	265
3x120+3x25	38,1	48,0	5190	237	290
3x150+3x25	41,2	51,5	6055	272	310

VFD Power Cable, 2kV

Application

These 2kV power cables specifically engineered for use in variable frequency AC motor drive (VFD) applications. Suitable for use in Class I, Division 1 and Zone1 environments (armored and sheathed).

Construction

Conductor	Soft annealed flexible stranded tinned copper per IEEE 1580Table 11.
Insulation	Cross linked flame retardant polyolefin, meeting the requirements for Type P of IEEE 1580 and Type X110 of UL 1309/CSA 245.
Color	Gray with printed phase I.D. (Black-White-Red)
Filler	Non-hygroscopic filler tape.
Shield	Overall tinned copper braid plus aluminum/polyester tape providing 100% coverage.
Inner Sheath	A black, arctic grade, flame retardant, oil, abrasion, chemical and sunlight resistant thermosetting compound meeting UL 1309/CSA 245 and IEEE 1580.(otional)
Armor	Tinned copper basket weave wire armor per IEEE 1580and UL 1309/ CSA 245(otional)
Outer Sheath	A black, arctic grade, flame retardant, oil, abrasion, chemical and sunlight resistant thermosetting compound meeting UL1309/CSA 245 and IEEE 1580.

Technical Information

Rated voltage 2kV

Maximum conductor temperature + 90 °C

Minimum recommended installation temperature -15 °C

Severe cold durability: exceeds CSA coldbend/cold impact (-40°C/-35°C)

Flame-retardant: IEC 60332-3-22 -test for bunched wires and cables, category A

Cable Parameter

		Unarmored		Armored				Ampacity			
Size AWG/ kcmil	Number of Conductors	Nominal Diameter (inch)	Weight Lbs./ 1000 Ft.	Nominal Diameter (inch)	Weight Lbs./ 1000 Ft.	Voltage Drop at 90°C Volts/ Amp/ 1000 Ft.	Grounding Conductor (AWG)	110°C	100°C	90°C	75°C
4	3	1.094	925	1.262	1128	0.584	3 x 12	99	92	83	70
2	3	1.235	1271	1.393	1512	0.368	3 x 10	131	122	111	93
1	3	1.341	1585	1.509	1836	0.301	3 x 10	153	143	131	110
1/0	3	1.450	1869	1.615	2137	0.246	3 x 10	176	164	150	126

Caledonian VFD Cables

		Unarmored		Armored				Ampacity			
Size AWG/ kcmil	Number of Conductors	Nominal Diameter (inch)	Weight Lbs./ 1000 Ft.	Nominal Diameter (inch)	Weight Lbs./ 1000 Ft.	Voltage Drop at 90°C Volts/ Amp/ 1000 Ft.	Grounding Conductor (AWG)	110°C	100°C	90°C	75°C
2/0	3	1.580	2311	1.792	2660	0.202	3 x 10	201	188	173	145
4/0	3	1.900	3457	2.101	3864	0.139	3 x 8	270	252	232	194
262	3	2.050	4177	2.258	4661	0.120	3 x 6	315	294	273	228
313	3	2.130	4786	2.354	5288	0.105	3 x 6	344	321	298	249
373	3	2.275	5521	2.483	6052	0.092	3 x 6	387	361	332	277
444	3	2.425	6440	2.633	6994	0.083	3 x 6	440	411	382	319
535	3	2.643	7848	2.931	8478	0.075	3 x 6	498	443	407	340
646	3	2.920	9213	3.178	9888	0.068	3 x 4	553	516	474	396
777	3	3.102	10909	3.390	11803	0.062	3 x 4	602	562	516	431

VFD Power Cable, Crush & Impact Resistant

Application

These 2kV power cables specifically engineered for use in variable frequency AC motor drive (VFD) applications. Suitable for use in Class I, Division 2 and Zone 2 environments.

Construction

Conductor	Soft annealed flexible stranded tinned copper per ASTM B-33.
Insulation	Chemically cross-linked, non-chlorinated flame retardant polyolefin meeting the requirements per UL 1277.
Color	Gray with printed phase I.D.
Filler	Non-hygroscopic filler tape
Shield	Overall tinned copper braid plus aluminum/polyester tape providing 100% coverage.
Outer Sheath	Crush & impact resistant, flame retardant, oil abrasion, chemical and sunlight resistant thermoplastic compound meeting UL 1277.

Technical Information

Rated voltage 2kV
Maximum conductor temperature + 90°C
Flame-retardant: IEEE 1202/FT-4

Cable Parameter

Size AWG/ kcmil	Number of Cond-uctors	Nominal Diameter (inch)	Weight (Lbs./ 1000 Ft.)	DC Resist. @25°C (Ohms/ 1000 Ft.)	AC Resist. @90°C, 60 Hz (Ohms/ 1000 Ft.)	Voltage Drop @90°C (Volts/ Amp/ 1000 Ft.)	Green Insulated Grounding Size (AWG)	IEEE Ampacity 90°C	NEC Ampacity 90°C	IEEE Ampacity 75°C	NEC Ampacity 75°C
14	3	0.768	297	2.907	3.635	5.073	3 x 18	24	15	20	15
12	3	0.792	376	1.826	2.283	3.199	3 x 18	29	20	24	20
10	3	0.888	492	1.153	1.441	2.032	3 x 14	38	30	32	30
8	3	0.926	560	0.708	0.885	1.263	3 x 14	48	55	41	50
6	3	1.051	826	0.445	0.556	0.804	3 x 12	65	75	54	65
4	3	1.093	945	0.300	0.376	0.552	3 x 12	83	95	70	85
2	3	1.225	1298	0.184	0.230	0.348	3 x 10	111	130	93	115
1	3	1.341	1602	0.147	0.184	0.285	3 x 10	131	145	110	130
1/0	3	1.447	1908	0.117	0.147	0.234	3 x 10	150	170	126	150
2/0	3	1.566	2287	0.093	0.117	0.192	3 x 10	173	195	145	175
4/0	3	1.874	3360	0.058	0.075	0.132	3 x 8	232	260	194	230
262	3	2.093	4200	0.048	0.063	0.115	3 x 6	273	297	228	262
313	3	2.130	4787	0.040	0.053	0.100	3 x 6	298	328	249	292

Caledonian VFD Cables

Size AWG/ kcmil	Number of Cond-uctors	Nominal Diameter (inch)	Weight (Lbs./ 1000 Ft.)	DC Resist. @25°C (Ohms/ 1000 Ft.)	AC Resist. @90°C, 60 Hz (Ohms/ 1000 Ft.)	Voltage Drop @90°C (Volts/ Amp/ 1000 Ft.)	Green Insulated Grounding Size (AWG)	IEEE Ampacity 90°C	NEC Ampacity 90°C	IEEE Ampacity 75°C	NEC Ampacity 75°C
373	3	2.257	5634	0.034	0.045	0.088	3 x 6	332	364	277	322
444	3	2.400	6410	0.028	0.039	0.080	3 x 6	382	402	319	355
535	3	2.705	7853	0.024	0.033	0.072	3 x 6	407	446	340	394
646	3	2.898	9368	0.020	0.028	0.065	3 x 4	474	496	396	438
777	3	3.102	11137	0.016	0.025	0.060	3 x 4	516	546	431	483

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