37-102 CIRVFD

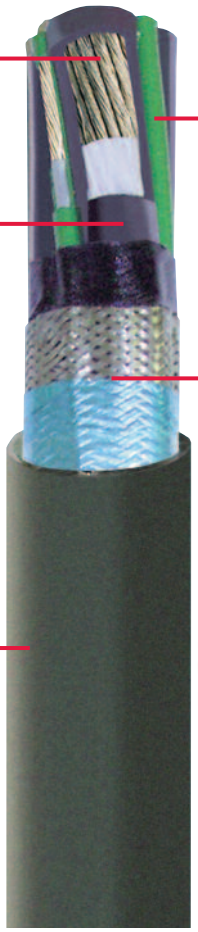
CIR® (Crush & Impact Resistant) VFD Power Cable Gexol® Insulated

Three Conductor • 2kV • Rated 90°C • UL Listed as Type TC-ER

Power Conductors (x3)
Soft annealed flexible stranded tinned copper per ASTM B-33.

Insulation
Gexol® chemically cross-linked, non-chlorinated flame retardant polyolefin meeting the requirements per UL 1277.
Color: Gray with printed phase I.D.

Jacket
Crush & impact resistant, flame retardant, oil, abrasion, chemical and sunlight resistant thermoplastic compound meeting UL 1277.



Ground Conductors (x3)
Soft annealed tinned copper per ASTM B-33 flexible stranding with 600/1000V Gexol® insulation sized per UL 1277. Color: Green

Shield
Overall tinned copper braid plus aluminum/polyester tape providing 100% coverage.

Safe to Handle
CIR® is a safe, flexible alternative to metal-clad cables.

Application

A flexible, braid and foil shielded, 2kV power cable specifically engineered for use in variable frequency AC motor drive (VFD) applications.

Features

- Specially engineered cable design produces a longer cable life in VFD applications.
- Overall braid plus foil shield is engineered with 100% coverage and a surface transfer impedance <50 milliohms at 10MHz to contain EMI.
- Symmetrical insulated ground conductors reduce induced voltage imbalances and carry common mode noise back to the drive.
- High strand count conductors and braid shield design is much more flexible, easier to install and more resistant to vibration than Type MC cable.
- Gexol's lower dielectric constant (standard XLPEs, EPRs and other Type P insulation materials have higher dielectric constants) reduces reflected wave peak voltage magnitudes. This allows for longer output cable distances and minimizes the effect of high frequency noise induced into the plant ground system.
- 2kV insulation thickness is used to resist the potential 2-3x reflected voltages experienced in 600V VFD applications.
- Passes the same stringent crush and impact testing required by UL 2225 for Type MC-HL
- Gas & vapor tight – impervious to water and air
- Smaller bend radius (up to 40% smaller) than Type MC
- Reduced tray fill (up to 35% less) compared to Type MC
- Considerably more flexible than Type MC
- Reduced installation time and cost compared to Type MC
- Glands for this product cost up to 50% LESS than those for Type MC

CIR® Ratings & Approvals

- 90°C temperature rating
- UL listed as Type TC-ER (E123629)
- Flame Retardant – IEEE 1202/FT-4
- Suitable for use in Class I, Div 2 and Zone 2 environments
- UL listed as Marine Shipboard Cable (E111461)
- Sunlight resistant
- Direct burial

37-102 CIRVFD • 2000 Volts • Crush & Impact Resistant

Size AWG/ kcmil	mm²	Part No. 37-102	Nominal Diameter Inches*	Weight (Lbs./ 1000 Ft.)	DC Resist. @ 25°C (Ohms/ 1000 Ft.)	AC Resist. @ 90°C, 60 Hz (Ohms/ 1000 Ft.)	Inductive Reactance (Ohms/ 1000 Ft.)	Voltage Drop @ 90°C (Volts/Amp/ 1000 Ft.)	Green Insulated Grounding* Size (AWG)	NEC Ampacities		
										In Free Air	In Cable Tray	In Conductor
14	2.1	-508CIRVFD	0.768	297	2.907	3.635	0.040	5.073	18	15	15	15
12	3.3	-516CIRVFD	0.792	376	1.826	2.283	0.038	3.199	18	20	20	20
10	5.2	-308CIRVFD	0.888	492	1.153	1.441	0.036	2.032	14	30	30	30
8	7.6	-309CIRVFD	0.926	560	0.708	0.885	0.037	1.263	14	65	55	48
6	12.5	-310CIRVFD	1.051	826	0.445	0.556	0.033	0.804	12	87	75	65
4	21	-312CIRVFD	1.093	945	0.300	0.376	0.031	0.552	12	114	95	89
2	34	-314CIRVFD	1.225	1298	0.184	0.230	0.029	0.348	10	152	130	119
1/0	54	-316CIRVFD	1.447	1908	0.117	0.147	0.029	0.234	10	205	170	163
2/0	70	-317CIRVFD	1.566	2287	0.093	0.117	0.028	0.192	10	237	195	186
4/0	109	-319CIRVFD	1.874	3360	0.058	0.075	0.027	0.132	8	316	260	253
262	132	-320CIRVFD	2.031	4200	0.048	0.063	0.027	0.115	6	362	297	286
373	189	-322CIRVFD	2.257	5634	0.034	0.045	0.025	0.088	6	449	364	357
535	273	-324CIRVFD	2.705	7853	0.024	0.033	0.026	0.072	6	556	446	441
777	394	-327CIRVFD	3.102	11137	0.016	0.025	0.025	0.060	4	688	546	537

- Cable diameters are subject to a +/- 5% manufacturing tolerance
- Ampacity In Free Air: Based on 90°C conductor temperature and 30°C ambient temperature per 2008 NEC Table B.310.3
- Ampacity In Cable Tray: Based on 90°C conductor temperature and 30°C ambient temperature per 2008 NEC Table 310.16
- Ampacity In Conduit: Based on 90°C conductor temperature and 30°C ambient temperature per 2008 NEC Table B.310.1

*3 Grounding Conductors – Green Insulated

*Cable diameters are subject to a +/- 5% manufacturing tolerance

NEC ampacities are based on Table 310.15 (B) (16) of the National Electrical Code (NEC) for conductors rate 90°C, in a multi-conductor cable, at an ambient temperature of 30°C. The 75°C column is provided for additional information. The ampacities shown apply to open runs of cable, installation in any approved raceway. Derating for more than three current carrying conductors within the cable is in accordance with NEC Table 310.15 (B) (3) (a). The ampacities shown also apply to cables installed in cable tray in accordance with NEC Section 392.80.

CIR VFD Stranding Profile

Size AWG/kcmil	Number of Strands	Closest IEEE 45 Std. Size	Equivalent Metric Size (mm2)	Uninsulated Conductor Dia. (inches)
14	19	4	2.08	0.074
12	19	6	3.29	0.093
10	37	10	5.23	0.113
8	37	16	7.57	0.136
6	61	26	12.49	0.175
4	133	41	21.11	0.258
2	133	66	33.51	0.324
1	209	83	42.79	0.361
1/0	266	106	54.45	0.407
2/0	342	133	70.01	0.461
3/0	418	168	85.57	0.510
4/0	532	212	108.91	0.575
262	646	262	132.25	0.654
313	777	313	159.06	0.720
373	925	373	189.36	0.785
444	1110	444	227.23	0.860
535	1332	535	272.68	0.941
646	1591	646	325.70	1.029
777	1924	777	393.87	1.132

37-108VFD

Flexible TC-ER VFD Power Cable

Three Conductor • 90°C • 600V

Power Conductors (x3)

Soft annealed flexible stranded tinned copper per ASTM B-33

Insulation

Cross-linked, flexible, low dielectric constant compound rated 90°C.

Sizes larger than 4/0 AWG – individual conductors colored black with conductor number surface printed in contrasting ink.

Sizes 4/0 AWG and smaller – individually colored conductors – red, white,black.

Jacket

Flame retardant, moisture and sunlight resistant Polyvinyl Chloride (PVC). Colored black.

Symmetrical Ground Conductors (x3)

Three symmetrically placed flexible stranded tinned copper conductors in direct contact with the shield.

Metallic Shield

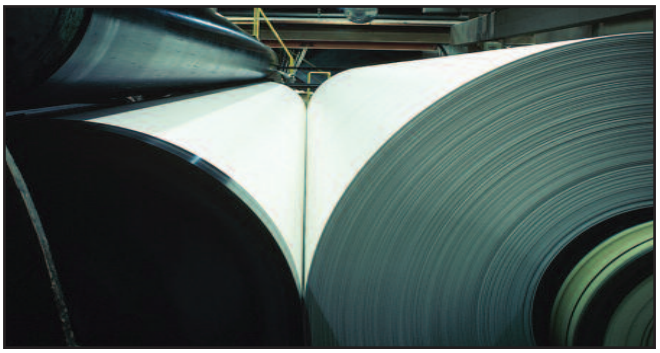
Sizes 8 AWG and Larger – Helically applied bare copper tape.

Sizes Smaller than 8 AWG – tin-coated copper braid plus aluminum/polyester tape.

Both shielding systems provide 100% coverage.

TC-ER Ratings & Approvals

- UL Listed as Type TC-ER 600V
- UL Listed as 1000V flexible motor supply cable (up to 4/0 AWG)
- 90°C Temperature Rating
- FT-4 and IEEE 1202 flame ratings
- Sunlight resistant
- Direct burial



Application

A flexible, shielded power cable specifically engineered for use in variable frequency AC motor drive (VFD) applications.

Features

- Specially engineered cable design produces a longer cable life in VFD applications.
- Overall shield provides 100% coverage containing VFD EMI emissions.
- Symmetrical ground conductors reduce induced voltage imbalances and carry common mode noise back to the drive.
- High strand count design is much more flexible, easier to install and more resistant to vibration than Type MC cable.
- Meets crush and impact requirements for Type MC cable.
- AmerCable's specially formulated insulation material has a lower dielectric constant (standard XLPE and EPR insulation materials have higher dielectric constants) which withstands reflected voltages. This allows for longer output cable distances and minimizes the effect of high frequency noise induced into the plant ground system.
- Permitted for Exposed Run ("ER") use in accordance with the NEC.
- Permitted for use in Class I, Division 2 and Zone 2 industrial hazardous locations per the NEC.
- Gas and vapor tight – impervious to water and air.
- Reduced tray fill (up to 35% less) than Type MC.
- Reduced installation time and cost compared to Type MC.
- Glands for this product cost up to 50% LESS than those for Type MC.
- Bend radius 12X O.D.

Manufactured by Nexans AmerCable • (870) 862-4919 • (800) 643-1516 • Fax (870) 862-9613

37-108 VFD • Flexible TC-ER VFD • 600 Volts

Size AWG/kcmil	Size (mm2)	Part No. 37-108	Nominal Diameter (inches)	Weight (lbs/1000ft)	DC Resistance at 25°C (ohms/1000ft)	AC Resistance 90°C, 60Hz (ohms/1000ft)	Inductive Reactance (ohms/1000ft)	Voltage Drop 90°C, 60Hz (Volts/Amp/1000ft)	Grounding Conductor (x3) Size (AWG)	Ampacity		
										In Free Air	In Cable Tray	In Conduit
14	2.08	-508VFD	0.466	158	2.907	3.635	0.036	5.069	18	15	15	15
12	3.29	-516VFD	0.509	199	1.826	2.283	0.034	3.195	16	20	20	20
10	5.23	-308VFD	0.522	258	1.153	1.441	0.032	2.028	14	30	30	30
8	8.30	-309VFD	0.653	368	0.708	0.885	0.036	1.262	14	65	55	48
6	13.21	-310VFD	0.737	517	0.445	0.556	0.034	0.804	12	87	75	65
4	21.17	-312VFD	0.956	814	0.300	0.376	0.031	0.552	12	114	95	89
2	35	-314VFD	1.103	1178	0.184	0.230	0.030	0.349	10	152	130	119
1	42.52	-315VFD	1.221	1462	0.147	0.184	0.031	0.287	10	177	150	137
1/0	50	-316VFD	1.447	1714	0.117	0.147	0.030	0.235	10	205	170	163
2/0	66.12	-317VFD	1.538	1951	0.093	0.117	0.029	0.193	10	237	195	186
4/0	95	-319VFD	1.883	3102	0.058	0.075	0.028	0.133	8	316	260	253
262	120	-320VFD	1.981	3642	0.048	0.063	0.026	0.114	6	362	297	286
313	150	-321VFD	2.082	4185	0.040	0.053	0.026	0.100	6	404	328	324
373	185	-322VFD	2.215	4834	0.034	0.045	0.025	0.088	6	449	364	357
444	240	-323VFD	2.371	5634	0.028	0.039	0.025	0.079	6	497	402	396
535	272.68	-324VFD	2.616	7592	0.024	0.033	0.025	0.071	6	556	446	441
646	300	-326VFD	2.878	9183	0.020	0.028	0.025	0.065	4	617	496	489
777	400	-327VFD	3.089	10834	0.016	0.025	0.025	0.060	4	688	546	537

- Cable diameters are subject to a +/- 5% manufacturing tolerance
- Ampacity In Free Air: Based on 90°C conductor temperature and 30°C ambient temperature per 2008 NEC Table B.310.3
- Ampacity In Cable Tray: Based on 90°C conductor temperature and 30°C ambient temperature per 2008 NEC Table 310.16
- Ampacity In Conduit: Based on 90°C conductor temperature and 30°C ambient temperature per 2008 NEC Table B.310.1

Stranding Profile

Size AWG/kcmil	Size (mm2)	Number of Strands	Uninsulated Conductor Diameter (inch)
14	2.08	19	0.074
12	3.29	19	0.093
10	5.23	37	0.113
8	8.30	133	0.159
6	13.21	133	0.201
4	21.17	259	0.255
2	35	259	0.321
1	42.52	259	0.361
1/0	50	266	0.413
2/0	66.12	323	0.455
4/0	95	532	0.584
262	120	646	0.654
313	150	777	0.720
373	185	925	0.785
444	240	1110	0.860
535	272.68	1332	0.941
646	300	1591	1.029
777	400	1924	1.132

37-105VFD

MMV-VFD Power Cable

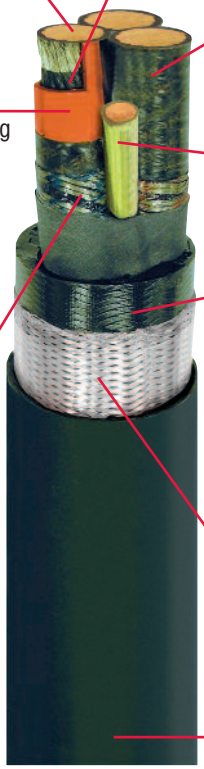
Three Conductor: 8kV - 15kV • 133% Insulation Level • Rated 90°C

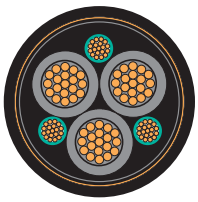
Conductors (3)
Soft annealed flexible stranded tinned copper per IEEE 1580 Table 11.

Insulation
Extruded thermosetting 90°C Ethylene Propylene Rubber (EPR), meeting UL 1309 (Type E), IEEE 1580 (Type E) and UL 1072.

Insulation Shield
Composite shield consisting of 0.0126" tinned copper braided with nylon providing 60% copper Shielded coverage meeting UL 1309, IEEE Std. 1580, and UL 1072. The nylon is colored for easy phase identification (three conductor = black, blue, red) without the need to remove the shield to find an underlying colored tape.

Low smoke halogen-free jacket available.
Contact your AmerCable rep.





Conductor Shield
A combination of semi-conducting tape and extruded thermosetting semi-conducting material meeting UL 1309, IEEE 1580 and UL1072.

Insulation Shield
Semi-conducting layer meeting UL 1309, IEEE 1580 and UL 1072.

Symmetrical Insulated Grounding Conductors (3)
Soft annealed flexible stranded tinned copper conductor per IEEE 1580 Table 11. Gexol Insulation sized per Table 23.2 of UL1072. Color: Green

Jacket
A black, arctic grade, flame retardant, oil, abrasion, chemical and sunlight resistant thermosetting compound meeting UL 1309/ CSA 245, IEEE 1580, and UL 1072. This jacket allows for isolation between the insulation shields and overall shield. Shields can then be terminated on opposite ends to minimize circulating currents.

Armor/EMI Shield
Overall tinned copper braid plus aluminum/ polyester tape provides 100% coverage. This braid serves as both an armor and EMI shield meeting both IEEE 1580 and UL 1307/CSA 245.

Sheath (optional)
A black, arctic grade, flame retardant, oil, abrasion, chemical and sunlight resistant thermosetting compound meeting UL 1309/CSA 245, IEEE 1580, and UL 1072. Colored jackets for signifying different voltage levels are also available on special request (orange = 8kV and red = 15kV).

Ratings & Approvals

- UL Listed as Marine Shipboard Cable (E111461)
- American Bureau of Shipping (ABS)
- Det Norske Veritas (DNV) Pending
- Lloyd's Register of Shipping (LRS) Pending
- 90˚C Temperature Rating
- Voltage Rating – 8kV to 15kV (25kV available on request)

Applications

A flexible, braid and foil shielded, power cable specifically engineered for use in medium voltage variable frequency AC drive (VFD) applications.

Features

- Flexible stranded conductors and braided shields. Suitable for applications involving repeated flexing and high vibration.
- Small minimum bending radius (8x OD) for easy installation.
- Insulation has a very low dielectric constant. This allows for longer output cable distances and minimizes common mode current.
- Overall braid plus foil shield is engineered with 100% coverage and a surface transfer impedance <50 milliohms at 10MHz to contain EMI.
- Symmetrical insulated ground conductors reduce induced voltage imbalances and carry common mode noise back to the drive.
- High strand count conductors and braid shield design is much more flexible, easier to install and more resistant to vibration than Type MC cable.
- Severe cold durability: exceeds CSA cold bend/cold impact (-40˚C/-35˚C).
- Flame retardant: IEC 332-3 Category A and IEEE 1202.
- Suitable for use in Class I, Division 1, and Zone 1 environments.

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Three Conductor Type MMV-VFD Medium Voltage – 8kV • 133% Insulation Level

Size AWG/ kcmil	mm2	Part No. 37-105	Nominal Diameter (inches)	Weight (Lbs./ 1000 Ft.)	Ampacity: In Free Air (amps)	Ampacity: Single Banked in Trays (amps)	DC Resistance at 25°C (ohms/1000 Ft.)	AC Resistance at 90°C, 60Hz (ohms/1000 Ft.)	Inductive Reactance (ohms/ 1000 Ft.)	Voltage Drop (Volts per amp per 1000 Ft.)	Green Insulated Grounding Conductor (3x) Size (AWG)
6	12.5	-332TSVFD	1.687	1634	88	75	0.445	0.556	0.048	0.820	10
4	21	-333TSVFD	1.868	2074	116	99	0.300	0.376	0.043	0.564	10
2	34	-334TSVFD	2.071	2625	152	129	0.184	0.230	0.040	0.359	10
1	43	-335TSVFD	2.161	3022	175	149	0.147	0.184	0.038	0.294	8
1/0	54	-336TSVFD	2.262	3373	201	171	0.117	0.147	0.037	0.242	8
2/0	70	-337TSVFD	2.381	3826	232	197	0.093	0.117	0.036	0.199	8
3/0	86	-338TSVFD	2.489	4411	266	226	0.074	0.094	0.035	0.166	6
4/0	109	-339TSVFD	2.631	5093	306	260	0.058	0.075	0.033	0.139	6
262	132	-340TSVFD	3.857	5993	348	296	0.048	0.063	0.032	0.121	6
313	159	-341TSVFD	3.030	6867	386	328	0.040	0.053	0.032	0.106	6
373	189	-342TSVFD	3.164	7810	429	365	0.034	0.045	0.031	0.094	4
444	227	-343TSVFD	3.319	8855	455	387	0.028	0.039	0.030	0.085	4
535	273	-344TSVFD	3.492	9905	528	449	0.024	0.033	0.030	0.076	4

• Cable diameters are subject to a +/- 5% manufacturing tolerance

Three Conductor Type MMV-VFD Medium Voltage – 15kV • 133% Insulation Level

Size AWG/ kcmil	mm2	Part No. 37-105	Nominal Diameter (inches)	Weight (Lbs./ 1000 Ft.)	Ampacity: In Free Air (amps)	Ampacity: Single Banked in Trays (amps)	DC Resistance at 25°C (ohms/1000 Ft.)	AC Resistance at 90°C, 60Hz (ohms/1000 Ft.)	Inductive Reactance (ohms/ 1000 Ft.)	Voltage Drop (Volts per amp per 1000 Ft.)	Green Insulated Grounding Conductor (3x) Size (AWG)
2	34	-357TSVFD	2.403	3231	156	133	0.184	0.230	0.0440	0.364	10
1	43	-358TSVFD	2.468	2959	178	151	0.147	0.184	.0430	0.299	8
1/0	54	-359TSVFD	2.596	4090	205	174	0.117	0.147	.041	0.246	8
2/0	70	-360TSVFD	2.714	4615	234	199	0.093	0.117	0.0390	0.203	8
3/0	86	-361TSVFD	2.875	5306	269	229	0.074	0.094	.038	0.170	6
4/0	109	-362TSVFD	3.028	6131	309	263	0.058	0.075	0.037	0.142	6
262	132	-363TSVFD	3.260	7074	352	299	0.048	0.063	0.035	0.124	6
313	159	-364TSVFD	3.363	7787	389	331	0.040	0.053	0.034	0.109	6
373	189	-365TSVFD	3.500	8703	432	367	0.034	0.045	0.034	0.097	4
444	227	-366TSVFD	3.652	9912	456	388	0.028	0.039	0.033	0.080	4

• Cable diameters are subject to a +/- 5% manufacturing tolerance

• Ampacity in Free Air: Based on 105°C conductor temperature and 40°C ambient temperature per 2008 NEC Table 310.71

• Ampacity in Conduit Air: Based on 105°C conductor temperature and 40°C ambient temperature per 2008 NEC Table 310.75