

Series V Cable for Variable-Frequency Drives



Get control of VFD applications

Variable-frequency drives (VFD) enable sophisticated control of motors by allowing their speed and torque to be precisely adjusted. While variable-frequency techniques provide an excellent way to control a motor's speed and torque, they create several phenomena that can affect the voltage, create noise, reduce the life of the cable, and disrupt operation of the drive system. These phenomena may include standing waves from impedance mismatches, corona discharges from the intense electrical fields around the cable's conductors, harmonic distortion, and high in-rush currents at startup.



By specifying a cable explicitly designed for VFD applications, the problems of system performance and signal disruption may be reduced. Generic cables can degrade over time so that the system experiences faults and imprecise operation.

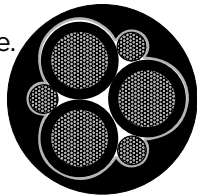
Advantages of Series V cables

- *Symmetrical geometry for uniform electrical properties*
- *Low-capacitance construction for improved signal transmission and extended cable run*
- *Resists potential effects of harmonics, power distortion, and transient noise*
- *Outstanding oil, solvent, chemical, and fuel resistance*
- *Round geometry helps ensure a liquid-tight installation per IP67 or NEMA 6*
- *Double shielded for superior EMI performance*
- *Specially formulated XLPE conductor insulation will not degrade under heavy electrical load*
- *NFPA 79-compliant UL TC/ER*
- *Capable of handling the effects of wave reflections on long cable runs*
- *Suited for applications up to 200 hp at 480 V*



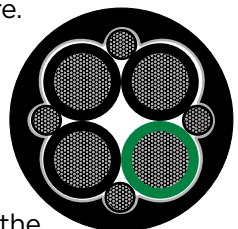
3- and 4-conductor configurations

Three-conductor cables are smaller and offer advantages in improved ground path that helps reduce both common-mode and differential noise. This minimizes the potential of noise-induced motor damage. Having the bare drain wires in contact with the shield also increases shielding effectiveness by providing an improved impedance path to ground and reduces the possibility of transient voltages ending up on the motor shaft or bearings and causing premature equipment failure.



Four-conductor cables use one or four insulated ground wires to minimize the effects of EMI during a component failure.

The insulation isolates the ground wire from the shield so that transient currents will be blocked by the overall shield and nearby communication cables and other equipment won't be disrupted.



Specifications

Materials

<i>Conductors</i>	Stranded tinned copper
<i>Ground wires</i>	Stranded tinned copper
<i>Insulation</i>	Cross-linked polyethylene
<i>Shielding</i>	16 - 4 AWG: aluminum/polyester/ aluminum foil and tinned copper braid with 85% coverage 2 - 4/0 AWG: double-layer copper tape
<i>Jacket</i>	Premium PVC, black

Electrical/Environmental

<i>Voltage</i>	600 V (UL TC-ER) 1000 V (UL Motor Supply)
<i>Temperature</i>	-40°C to +90°C

Approvals

UL RHW-2 (16 - 2 AWG)	CSA AWM I/II A/B FT4
UL XHHW-2	CE LVD 73/23/EEC Amendment 93/68/EEC
UL TC-ER	Pennsylvania MHSA
UL 1000 V Flexible Motor Supply Cable	Suitable for use in Class I, Division 2 locations per Article 501 of the National Electric Code
UL Direct Burial	
UL Sunlight Resistant	

Series V cables are also approved by major drive manufacturers

Choosing the Right Cable

3-Conductor Cable

- Recommended where an insulated ground wire is not required (generally dry, one-phase fault conditions)
- Round construction and fewer materials enables cost and size savings with easier routing

4-Conductor Cable

- Insulated ground conductor for best EMI performance in all conditions
- Color-coded, insulated ground conductor makes for easier installation

Three-Conductor VFD Cable with Foil/Braid or Tape Shielding

Part No.	Wire Size		Stranding		Shielding	Insulation Thickness		Jacket Thickness		Nominal Diameter	
	AWG	mm ²	AWG	mm		Inch	mm	Inch	mm	Inch	mm
V16316	16	1.32	26/30	26 x 0.25	Foil/Braid	0.046	1.17	0.050	1.27	0.468	11.89
V16314	14	2.09	41/30	41 x 0.25	Foil/Braid	0.046	1.17	0.065	1.65	0.538	13.67
V16312	12	3.31	65/30	65 x 0.25	Foil/Braid	0.046	1.17	0.065	1.65	0.578	14.68
V16310	10	5.37	105/30	105 x 0.25	Foil/Braid	0.047	1.19	0.065	1.65	0.642	16.31
V16308	8	8.53	133/29	133 x 0.28	Foil/Braid	0.061	1.55	0.065	1.65	0.798	20.27
V16306	6	13.57	133/27	133 x 0.36	Foil/Braid	0.061	1.55	0.085	2.15	0.924	23.47
V16304	4	21.58	133/25	133 x 0.45	Foil/Braid	0.061	1.55	0.085	2.15	1.050	26.67
V16302	2	34.32	133/23	133 x 0.57	Tape	0.061	1.55	0.085	2.15	1.157	29.39
V16001	1	43.28	133/22	133 x 0.64	Tape	0.056	1.42	0.085	2.15	1.197	30.48
V16000	1/0	54.58	133/21	133 x 0.72	Tape	0.056	1.42	0.085	2.15	1.294	32.77
V16020	2/0	68.85	133/20	133 x 0.81	Tape	0.056	1.42	0.085	2.15	1.399	35.56
V16030	3/0	86.9	133/19	133 x 0.91	Tape	0.056	1.42	0.085	2.15	1.517	38.53
V16040	4/0	109	133/18	133 x 1.02	Tape	0.056	1.42	0.085	2.15	1.653	41.98

Four-Conductor VFD Cable with Foil/Braid Shielding

Part No.	Wire Size		Stranding		Ground Wires	Insulation Thickness		Jacket Thickness		Nominal Diameter	
	AWG	mm ²	AWG	mm		Inch	mm	Inch	mm	Inch	mm
V16016	16	1.32	26/30	26 x 0.25	1	0.047	1.19	0.065	1.65	0.547	13.89
V16014	14	2.09	41/30	41 x 0.25	1	0.047	1.19	0.065	1.65	0.584	14.83
V16012	12	3.31	65/30	65 x 0.25	1	0.047	1.19	0.065	1.65	0.633	16.08
V16010	10	5.37	105/30	105 x 0.25	1	0.047	1.19	0.085	2.15	0.746	18.95
V16008	8	8.53	133/29	133 x 0.28	4	0.061	1.55	0.086	2.15	0.920	23.37
V16006	6	13.57	133/27	133 x 0.36	4	0.061	1.55	0.086	2.15	1.017	25.83
V16004	4	21.58	133/25	133 x 0.45	4	0.061	1.55	0.086	2.15	1.157	29.39
V16002	2	34.32	133/23	133 x 0.57	4	0.061	1.55	0.088	2.15	1.308	33.22

Four-Conductor VFD Cable with Foil/Braid Shielding and 14 AWG (2.09 mm²) Brake Pair

Part No.	Wire Size		Stranding		Ground Wires	Insulation Thickness		Jacket Thickness		Nominal Diameter	
	AWG	mm ²	AWG	mm		Inch	mm	Inch	mm	Inch	mm
V16116	16	1.32	26/30	26 x 0.25	1	0.047	1.19	0.065	1.65	0.717	18.21
V16114	14	2.09	41/30	41 x 0.25	1	0.047	1.19	0.065	1.65	0.743	18.87
V16112	12	3.31	65/30	65 x 0.25	1	0.047	1.19	0.065	1.65	0.785	19.94
V16110	10	5.37	105/30	105 x 0.25	1	0.047	1.19	0.085	2.15	0.875	22.23
V16108	8	8.53	133/29	133 x 0.28	4	0.061	1.55	0.085	2.15	1.032	26.21

The cables you trust. The service you deserve.

Every application is critical and cable failure is not an option when the performance of your equipment and the safety of your personnel is paramount. Specify Alpha Series V cable for demanding VFD applications, since the integrity of your system is only as robust as the products you use.

Superior availability

Alpha offers VFD cables from stock in most sizes and constructions, in both small and large put-ups, so you can order it when you need it. Our products are available for same-day shipment, eliminating long lead times.

Service and support, second-to-none

Selecting the correct cable for your unique application is essential to overall system reliability, performance, and safety. So we make it easy for you select the right Alpha cable for your specific application. Our online resources include a wire and cable selection guide, technical information, full product catalog, and a distributor locator to make it easy to select and get the cable you need. Can't find what you're looking for? Design the cable to your specification. It's easy, just visit **www.alphawire.com**!

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