

Opto 22 Application Note

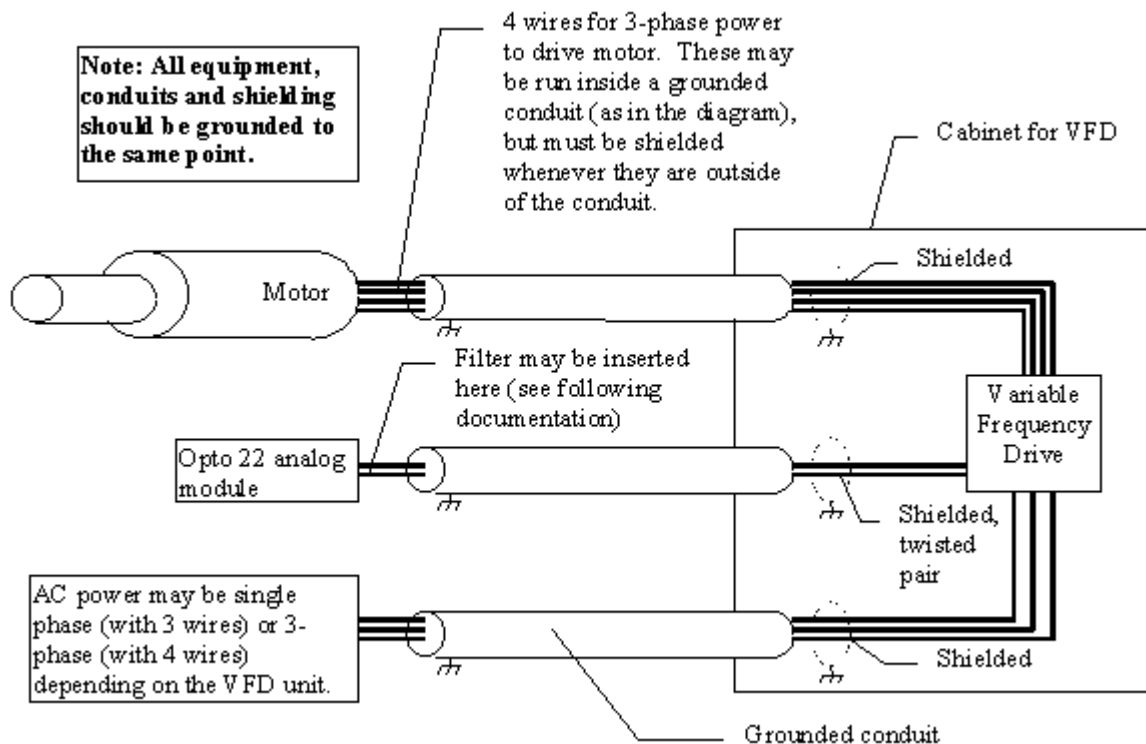
AN9808

Using Opto 22 Analog Modules to Interface with Variable Frequency Drives

Variable Frequency Drives (VFDs) are inherently noisy devices. When an Analog module is used to interface with a VFD, the noise from the VFD can sometimes cause interference with the analog module. The VFD adds high frequency distortion to the signal that the Opto 22 analog module expects. The best solution to this noise problem is to shield and ground each cable of the VFD installation. An alternate solution would be to add a low-pass filter to the analog signal circuit (as close as possible to the analog module).

Review the installation manual for the VFD being used for recommendations to minimize noise. All of the wiring going into and out of the VFD's terminal strip should be shielded, and the shields should be grounded to the same earth point. Shielding the wiring up to the VFD cabinet enclosure is not enough; the shielding must be continued inside the VFD enclosure all the way up to the VFD terminal strip to minimize the noise effects. Also, *separate* grounded conduits or shielded cables must be used for the power feeding the VFD, the power from the VFD to the motor, and the analog signal wires between the analog module and the VFD. Ensure that all equipment is tied in close proximity to the same earth ground. The figure below illustrates the instructions for minimizing the high frequency interference from the VFD.

Figure 1

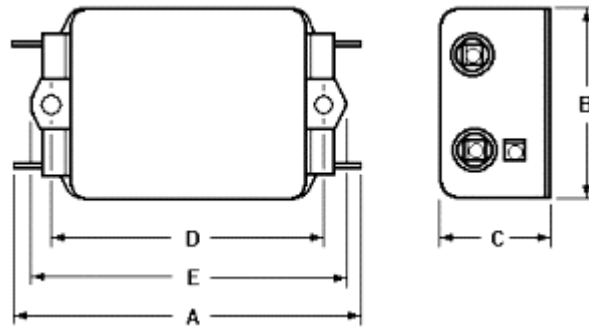


If shielding all of the cables to ground doesn't lower the VFD's noise effects enough, a low-pass filter should be added between the VFD and the Opto 22 analog module. Radio Frequency Interference (RFI) power line filters can be used and are readily available. One filter that has been used for this purpose is Corcom part number 1VR1 (Figure 2) which may be purchased through Newark Electronics (Newark part number 81F4553). The two line terminals on the filter are connected to the output of the Opto 22 module,

and the two load terminals are connected to the analog input of the VFD. The ground terminal on the filter must also be grounded with all other equipment. As noted in Figure 1, this filter should be inserted as close as possible to the Opto 22 analog module in order to minimize noise passed to the module.

Figure 2

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Metric shown in *italics*.

A	B	C	D	E
			+/-	
(max)	(max)	(max)	.015	(max)
			+/- .38	
3.35	1.81	1.16	2.375	2.78
<i>85.1</i>	<i>46.0</i>	<i>29.5</i>	<i>60.33</i>	<i>70.6</i>