

Proper TVSS Installation to Avoid Ground Loops

In the first figure on the previous page you will see only one ground reference. Grounding a TVSS device can be necessary if it is an MOV device. A MOV (metal oxide varistor) is a variable resistor and it needs a ground reference to operate properly. MOVs shunt the over voltage to ground, or between lines. One of the most basic TVSS designs is to use only MOVs. Below you will see an example of the circuit and below that an explanation of how it works. We will use 30 volt MOVs in our example. They will be protecting a pair of 24 volt AC Power lines like the ones used to power video security cameras.

You see three 30 volt MOVs, most surge protectors of this type use 7 - 14 mm MOVs. Do you see the flaw in the circuit? Note, the MOV #1 & #2 are connected between the 24 volt AC lines and GROUND while MOV #3 is connected between the line pair. How would you like to add a ground loop at your camera location? Would you be doing that if you used this design TVSS device? Yes, this type TVSS requires ground to function properly and without ground what do you have? One MOV between the line pair is not going to give you much protection.

You do have the option of running a heavy ground wire back to your central grounding point, then you would not have a ground loop. Is that extra expense something you would like to have to the installation of a security camera system?

Would you rather have a TVSS device that could be used in a 24 VAC security camera line that does not require a ground reference? A TVSS device that does not need a ground connection to protect your equipment?

How would a TVSS device described above work? What would it do with the energy the MOV type shunts to ground?

