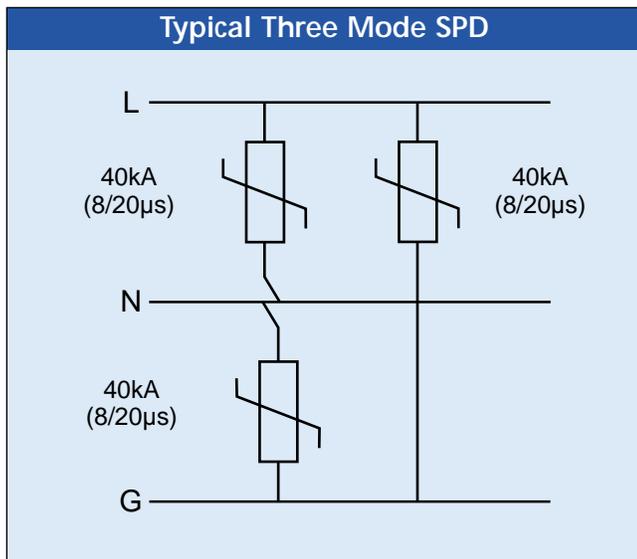


## Can I Compare Different Manufacturer's Surge Ratings?

As not all manufacturers follow NEMA LS1 recommendations which seek to standardize the methods of specifying an SPD, substantial confusion can occur when attempting to compare different products.

There are a number of issues that need to be considered in attempting such an exercise:

- First, are the stated ratings theoretical or tested?
- Second, are the stated surge ratings measured using the same current/voltage waveshape? For example, a 10kA 8/20 $\mu$ s impulse has approximately the same Joule energy as a 2kA 10/350 $\mu$ s impulse.
- Third, manufacturers use different methods for stating the surge rating of their products when they provide multiple modes of protection.



For example, the product shown above could be claimed as:

- An 80kA per line SPD (connected to each line are two 40kA devices)
- A 40kA per mode SPD with 3 modes of protection
- A 120kA SPD (simply the sum of all the individual modes)

Three claimed ratings are possible for exactly the same device. It is critical when comparing surge ratings for devices with multiple modes that it is fully understood how each manufacturer has arrived at their claimed ratings if a true comparison is to be realized. This may not always be easy, documentation may intentionally exclude such information where the intent is to make a product appear to have a higher rating than it actually does.

- Fourth, not all manufacturers have the surge generators capable of testing at the higher surge levels and may thus extrapolate their results from smaller level tests. For example, if a 100kA product is offered, but the manufacturer can only test up to 20kA, each one-fifth of the protection circuit may be connected in turn and tested to 20kA. The reasoning is that the full device should then be able to withstand 100kA. However, the common parts of the circuit which carry the full 100kA, such as the terminals and internal printed circuit board tracks etc., have not been able to withstand the full 100kA. Worse still, some manufactures will exclude the limiting effect of series fuses. It is not uncommon to find products on the market, which claim 80kA 8/20 $\mu$ s per mode, but which use internal fuses in series with each 80kA MOV module, which rupture at approximately 20kA 8/20 $\mu$ s.

As stated in other technical notes in this series, NEMA LS1 specifies that the surge rating of an SPD is determined from actual testing. It allows a surge rating to be claimed when the SPD does not exhibit more than a 10% change in clamping voltage before and after the test. ERICO recommends that you request test results from manufacturers, verifying the claimed maximum surge ratings per mode as per NEMA LS1.

