



~ELECTRONIC DESIGN & MANUFACTURE ~

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PTE0050 Lightning Arrestor

What is it?

The PTE0050 lightning arrestor is a multi-stage surge protection device, designed to properly protect your electric fence energiser against lightning strikes on the fence side. A surge protection device protects against electrical surges and spikes. In an electric fence, the source of the surge will be a lightning strike directly on the fence, on the ground or a nearby tree or pole. This can cause a very large, fast voltage surge to travel along the fence to the energiser which can damage or destroy the electronics.

Why have multiple stages?

The Pakton PTE0050 Lightning Arrestor is called a multi-stage surge protection device because there are three different kinds of protection that work together. Most other lightning protection devices on the market only use a single stage of protection.

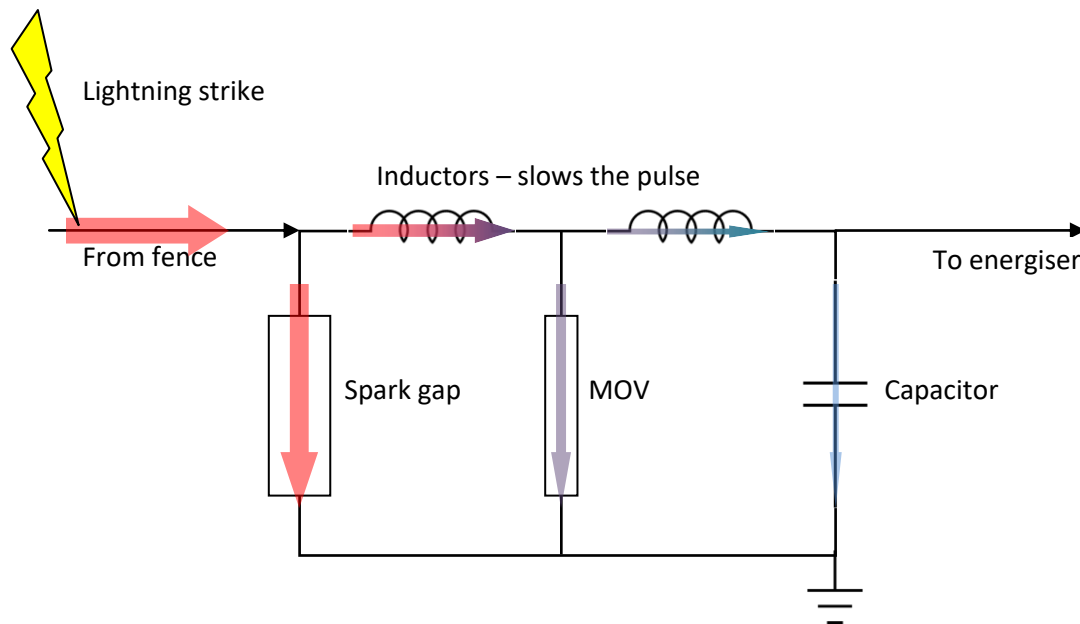
Imagine your fence is a river. Normally the river is quiet, and the water flows slowly. If a surge comes as a flood, you can see how it is far better to have three floodgates and levees than rely on a single dam; should water get past the first, it will be stopped by the second and third stages.

What are the three stages?

The three surge protection devices used in the Pakton PTE0050 are a **spark gap**, a **metal-oxide varistor** and an **inductor filter**. The spark gap is simple, effective, can handle an almost unlimited number of large surges, but is slow. Most competitors' lightning arrestors only employ a spark gap. The problem with only using this device for surge protection is that the initial surge will get past the lightning arrestor and cause damage to your energiser, before the spark gap activates. Metal oxide varistors (MOVs) are newer, much faster surge protection devices, and you will see small versions in most household surge protectors. They can't be used alone in a lightning arrestor because they can't withstand the full load of multiple lightning strikes. Instead, the Pakton PTE0050 uses the MOV to capture the initial surge, until

the spark gap has time to activate and handle the bulk of the energy. The inductive filter is used to slow the energy of the surge, to ensure the spark gap activates before the surge overwhelms the MOV, and clean up any residual energy that might escape past the MOV and spark gap.

Circuit diagram



A good surge protector will divert or absorb the energy of the surge. It is much better to divert the energy to a good earth, sparing the components in the lightning arrestor. Here, lightning strikes somewhere on the fence, and the red arrow represents the surge of energy flowing toward the energiser. The MOV is actually the first device to divert the surge to ground. The inductor ensures the current rises slowly, so that the MOV is not at full capacity before the spark gap begins to divert the majority of the energy. Meanwhile, another inductor and capacitor form a filter which cleans up any residual energy that might escape.

Why is the Pakton PTE0050 better than the rest?

Competitors' devices—using only a spark gap or a spark gap and a coil or inductor—will never be able to completely divert all the energy of a lightning strike. The Pakton PTE0050 is designed to do the job properly, to the best of the currently available technology. This is why in the Australian market Pakton offers a 3 year guarantee against lightning damage to the energisers if our lightning arrestor is used—we know that it works. This design has now been on the market in Australia for 10 years and has proven itself to be very reliable.