AC Hipot Inductive Input Compensation

Minimizing the Input Current Needed

When testing with AC voltage, most loads appear capacitive, drawing high capacitive charging currents. To compensate for this, the **PFT Series of AC hipots** are made with a fixed air-gapped transformer core to increase its *inductance to counter the capacitance* of the load, **thus minimizing the input primary current to the hipot when testing**. A hipot rated to test up to 3 kVA of load, which would draw 25 amps with a 120 volt input, only draws 14 – 15 amps. The added inductive impedance is designed to reduce the input capacitive current draw of the hipot by ~ 50%, permitting a 3 kVA hipot to be plugged into a regular 120 V @ 20 A outlet.

Consider the Most Popular AC Hipot

Example: The PFT-503CM is rated for 0 - 50 kVac @ 3 kVA. By rating it could deliver 60 mA of output current. However, this rating can only be achieved at the full output voltage of 50 kVac and only if the load capacitance is rated such that it would draw 60 mA at 50 kVac. As this is never the case, the user can realistically **expect to be able to draw 40 – 45 mAac maximum**. Other models are available without this feature, permitting higher output currents to be achieved, but they are larger, heavier, and require higher input power.

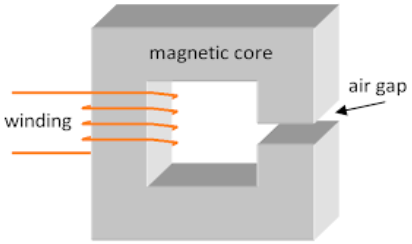
Calculation of Available Output Current

The current overload on the PFT series is based on the input primary current, and is set to 15 amps on 120 volt input models and 7.5 amps on 230 volt models. To calculate the maximum current achievable at any output voltage, use: **(Test V/Full V x 50% of mA rating) + 50% of mA rating = Overload Current**

For example, the PFT-503CM, rated for 50 kVac @ 60 mAac used at a 27 kV test voltage, would provide: **(27/50 x 30) + 30 = 46 mA maximum output current** on the meter before overload current is reached and the instrument “trips” off.

Capacitive Load Properties When AC Testing

Summary: Due to built-in inductive compensation to counter the capacitive nature of the load, done to minimize the input current, means that nameplate full current ratings will not be achieved before the hipot trips off due to primary current overload. A user can expect 70% - 75% of maximum rated current to be deliverable from the hipot. Below is how the effects of this circuit are described in the PFT Series Portable AC Hipot brochure.



L = Inductance of Transformer

C = Capacitance of Load

Gapped Core Effect

The air gap creates additional Inductance into the circuit, designed to equal and cancel out ½ the capacitance of the load. This reduces the input Current & Power needed

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