

AC Hipots > 50 kVac: No Shielded Output Cable

Design Explanation

The use of a **ground shielded cable output**, making load connections very easy and safe, is available on HVI AC Hipots rated **only up to a 50 kVac output**. Higher voltage models, and some lower, are designed with either a bushing output or toroidal spinning termination. For these higher voltage models, High Voltage, Inc. **does not provide a high voltage output cable**. It is the **user's responsibility** to provide the proper cable and a safe test set-up. There are many options for the output connection from the hipot to the load. HVI will help you in this area.



What to Use - Sizing the Output Cable

The current output on most hipots is low, perhaps 10 mAac – 10 mAac, requiring only a small size wire to connect to the load. Once the minimum necessary conductor size is settled, consideration should be given to the output test voltage needed. Generally, larger wire sizes and/or duct encasings, along with proper noise suppression devices at the connection points, will reduce the corona discharge in the local area and provides for more stable output voltage and leakage current readings. Following are a few suggestions for what to use.

- ⚡ In most cases, a **simple bare wire or test lead** can be used but **must be insulated from any ground points to avoid arcing**. To **minimize corona**, or electrical emissions discharged from the surface of the wire at high voltages, a larger diameter wire than the load current requires should be used and be electrically shielded on each end with some sort of corona suppressing method.
- ⚡ If the distance is short and a direct line between the hipot and test object, a **solid or hollow aluminum pipe** can be used to connect the toroid or bushing output of the test set to the device under test.
- ⚡ Another method to try is to run the **wire selected inside rigid or flexible aluminum ducting**, like used on a clothes dryers. Both will be at high voltage potentials and must be isolated from ground



Why Shielded Output Cable is Not Possible

Since these are AC output hipots, a shielded output cable is not recommended, nor possible in most cases. If a shielded output cable were used, the capacitive charging current of the cable would consume much of the current rating of the test set. For example, the HVI model PFT-503CM, rated 0 - 50 kVac @ 3 KVA, uses an 18'6m ground shielded EPR output cable to make load connections very simple and safe. At 50 kVac output, 20 mAac of charging current is consumed by just the cable. Even if the excessive charging currents were not an issue, it is difficult to find a shielded cable at the higher voltage ratings light and flexible enough.

