# End-of-Line Production HV Test

**Run high-voltage and withstand checks at production cadence, fully scripted over Ethernet, with arc detection and ramp control protecting every unit on the line.**

APPLICATION BRIEF · HVX-SERIES HIGH VOLTAGE POWER SUPPLIES · dc-62022201



Illustration: an automated production test line with a flying-probe station over a conveyor and an instrument rack beside it.

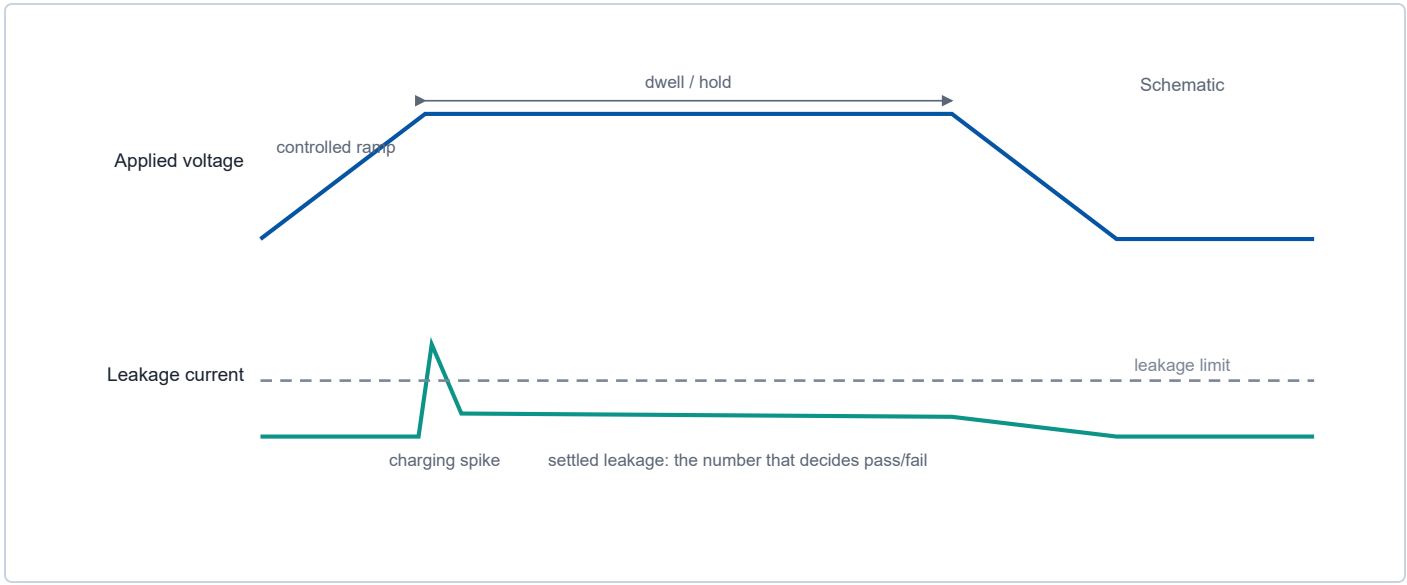
## End-of-Line Production HV Test



End-of-line test is the last gate before a product ships. For anything that carries high voltage in service, that gate includes a withstand or dielectric strength check: apply a defined voltage across the insulation, hold it for a set time, confirm the leakage stays inside limits, and pass or fail the unit. It is a safety test and a quality test at once, and it has to run on every unit, not a sample.

The defining constraint is throughput. A production line has a takt time, and the high-voltage step has to fit inside it. The supply has to ramp to test voltage, dwell, evaluate, and discharge fast enough that it is not the bottleneck. It also has to do this thousands of times a day without operator intervention, which means it lives entirely under software control inside a larger test sequencer. There is no front-panel knob-turning on a production line.

Safety and traceability sit alongside speed. A unit that flashes over during test has to be caught instantly, the energy removed, and the event recorded, both to protect the operator and the fixture and to feed the quality record. The result for every unit, with its time stamp and the conditions applied, has to be logged so the line can prove what it tested and when. A station that cannot produce that record cannot support an audit.




SCHEMATIC **Figure 1.** A withstand check. Controlled ramp, dwell at the test level, controlled ramp down; the settled leakage against its limit decides pass or fail, and arc detection trips the supply instead of scrapping the unit.

## How the BNC HVX-Series line solves it

The BNC HVX-Series is built to drop into an automated line. Every function is reachable over **Ethernet** and RS232 through a standard **SCPI** command set, so the supply takes its voltage setpoint, ramp, dwell, and read-back commands from the station controller and reports state without a person in the loop. That is what lets the high-voltage step run at line cadence and stay synchronized with the rest of the sequence.

Two retrofittable options carry the safety and repeatability load. **Arc Detection** watches for flashover, reports it immediately, and can shut the output off the moment it sees one, which protects the operator and the fixture and flags the failing unit cleanly. **Ramp Control** applies the test voltage at a defined gradient, from 1 V/s up to ten times nominal per second, so every unit sees the same controlled rise and the test is repeatable across shifts and across stations. The supply's own no-load discharge takes 60 seconds typical and up to 120 seconds depending on the model, which is longer than a production takt, so a station that resets in seconds discharges the device under test through its own switched discharge path and interlocks the fixture on a measured zero rather than on elapsed time.

The supply itself is fully digitally regulated, so the applied test voltage is stable and repeatable: 16-bit setting resolution, line regulation tighter than plus or minus 0.01 percent of nominal, and reproducibility of 0.1 percent of nominal from one unit to the next. The leakage decision is made by the station's current measurement in the return path against the limit the test specification sets; the supply's own current limit, settable from 0.01 percent of nominal upward, caps the current if the product fails. The front panel keeps a time-tagged event log, and configurable code protection locks the recipe so a line operator cannot alter it. The 2U enclosure racks into the test station.

## Which HVX-Series models and options fit

The right model follows the withstand voltage the product requires. Pick the lowest class that clears the test level with margin: the lower-voltage classes have the smaller ripple floor and the finer setting step, and their higher current rating charges a capacitive product faster on the ramp. Discharge is handled by the station, not by the supply's current rating.

**Table 1.**

| Withstand level | Recommended HVX-Series model | Rating |
|---|---|---|

| Withstand level | Recommended HVX-Series model | Rating |
|---|---|---|
| **Up to ~1.5 kV, high cadence** | HVX-1500-2000 | 1.5 kV, 2000 mA, reversible |
| **Mid-voltage assemblies** | HVX-5000-600 | 5 kV, 600 mA, reversible |
| **High-voltage products** | HVX-10000-300 | 10 kV, 300 mA, reversible |
| **Withstand levels to 20 kV** | HVX-20000-25 | 20 kV, 25 mA, positive or negative |

For end-of-line work, specify both options on every station. **Arc Detection** with output shut-off is the safety and pass/fail mechanism. **Ramp Control** gives the safe, repeatable voltage sequencing the recipe depends on. Use the reversible variant where the product is tested in both polarities; otherwise a fixed-polarity unit is sufficient and keeps the configuration simple.

## Recommended configuration

For a typical line testing assemblies at a few kilovolts, a **HVX-5000-600** is the practical anchor. It clears withstand levels to 5 kV with margin and carries the current to ramp a capacitive product quickly; with Ramp Control at its maximum gradient of ten times nominal per second, the output reaches 3 kV in 60 ms. Add **Arc Detection** with output shut-off and **Ramp Control**, lock the recipe with the configurable code protection, and drive everything over Ethernet with SCPI from the station controller. Log the time-tagged event record the supply keeps for traceability.

Lines testing low-voltage, high-volume products should use the **HVX-1500-2000** for its current headroom and fast cycle. Products that demand higher withstand levels move to the **HVX-10000-300** or **HVX-20000-25**, accepting the lower current ceiling. Rack the 2U enclosure into the station and replicate the same configuration across parallel test cells so every gate behaves identically.

## Talk to an application engineer

Berkeley Nucleonics can help you match a HVX-Series model and option set to your production test line. Call **800-234-7858** or email info@berkeleynucleonics.com.

For a quick question, chat with an engineer at berkeleynucleonics.com.

**Ask now →** Chat with our assistant and get an answer in seconds.

**Berkeley Nucleonics Corp.**
Test, Measurement and Nuclear Instrumentation since 1963
For details: info@berkeleynucleonics.com or 800-234-7858

**Application Brief**
HVX-Series High Voltage Power Supplies | dc-62022201