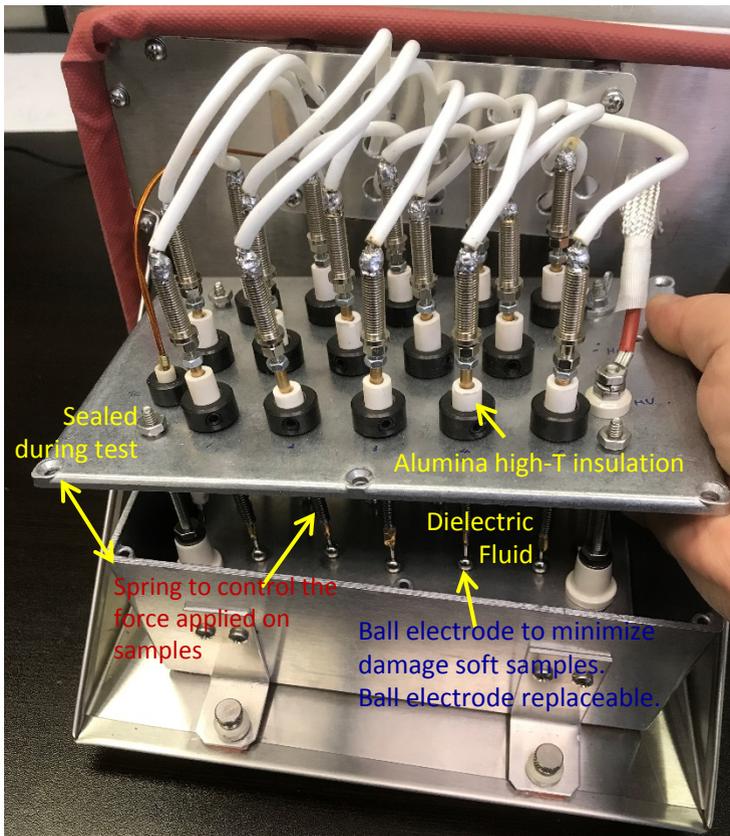
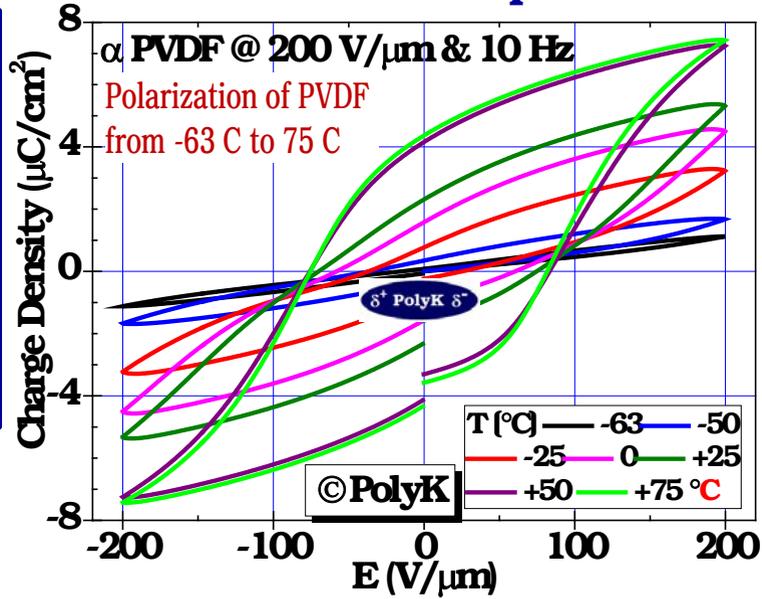


# Cryogenic Temperature High Voltage Test Fixture PK-CryoHV for Dielectric Breakdown and Polarization Loop

## Typical Performance

1. Voltage: up to 15 kV.
2. Temperature: -184 C to 250 C [require liquid nitrogen cooling].
3. Number of channels: 15. Multiple specimens loaded in one batch to save time for temperature stabilization and minimize moisture condensation.
4. Dry nitrogen (or air) purge connectors

*Modification can be made upon customer request.*

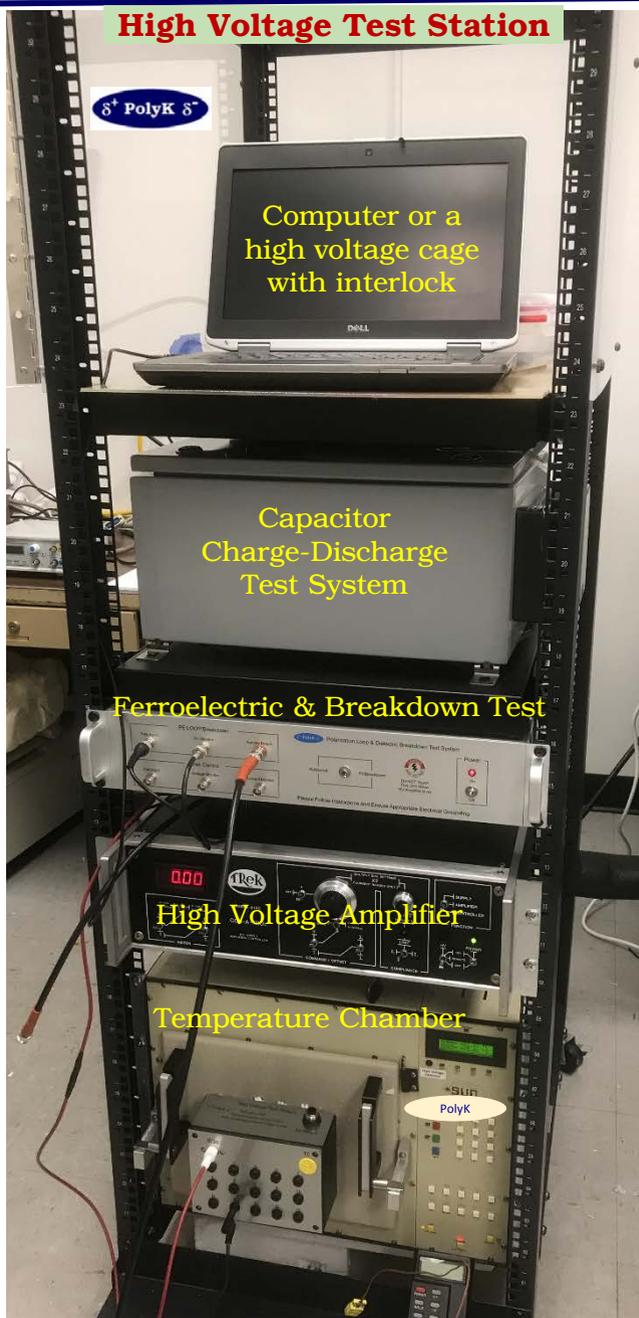


## Comparison with “Stage”-based Probe Test Systems

1. High voltage interlock for operator safety: HV output from amplifier automatically turned off when the fixture is removed from the temperature chamber.
2. HV test in **dielectric oil** to avoid corona of air breakdown typically occurred in ‘stage’ based HV test system. This can significantly improve the dielectric breakdown and energy density of the sample.
3. Thermocouple directly measuring local oil temperature.
4. HV test in **dielectric oil** to ensure **uniform** and **accurate** temperature of sample (and oil). “Stage”-system: temperature gradient from stage to sample to air, impossible to define sample temperature.
5. HV connections: polished ball electrode is designed for soft polymer samples. Sharp probe in “stage”-system may damage sample and/or reduce dielectric breakdown field.
6. Ball electrodes can be easily replaced by user (no tool required) to ensure always polished surface in contact with sample.
7. Spring-loaded top electrode with adjustable force on sample.
8. Temperature chamber can also be shared with other test systems (dielectric, TSDC, ).
9. Cost significantly lower than stage-system (>\$15K).



# PVDF Film Test: 14 $\mu\text{m}$ thick, $\alpha$ phase, 10 Hz $\delta^+$ PolyK $\delta^-$



Room temperature test fixture to measure  $C_p$  &  $DF$  (0.1%) of thin polymer film and ceramic disc.

