BEAM DIAGNOSTIC COMPONENTS
National Electrostatics Corp.

Low Current Beam Profile Monitor

NEC now offers a beam profile monitor that can detect beam current down to the Femto Amp range.

The original NEC low current beam profile monitor, Model BPM90-LC.

Applications

The Low Current BPM, Model BPM90-LC, is based on the NEC Model BPM90. As with all NEC BPM models, the BPM90-LC can be used with both positive and negative ions, electrons, and neutral beams. The BPM90-LC is ideal for applications requiring measurement of beams with current densities less than 1 μA/cm2.

Design

The BPM90-LC utilizes a uniquely modified design of the standard NEC BPM collection method. The design of the standard NEC BPM relies on the collection of secondary electrons from a grounded scanning wire. In contrast, the BPM90-LC utilizes a biased wire and collection area at high voltage. There are 7 gain stages to select from ranging from 0.5 kV to 7 kV. This bias allows the electrons to be focused by a shield into a SSB detector. The detector, coupled with a preamp and amplifier, magnifies the electron signal from the wire. This magnified signal can then be directly displayed on an oscilloscope.

Specifications

Overall Length: 6.7” (17.15cm) - 7.38” (18.73cm) dependent on flange type.

Standard Housing Flanges: 6.0” or 8.0” OD CF; 6.0” OD NEC; 4.0” O.D. Dependex. Other flange size and type available upon request

Beam aperture: 1.0” (2.54cm) dia. molybdenum

Scanning wire: 0.020” (0.5mm) dia molybdenum other wire diameters may be available upon request.

Maximum beam power: 12 μA

Minimum detectable beam current: ≤ 1 pA demonstrated

Accessories

For a complete system, an SSB detector, signal preamp, and amplifier are required.

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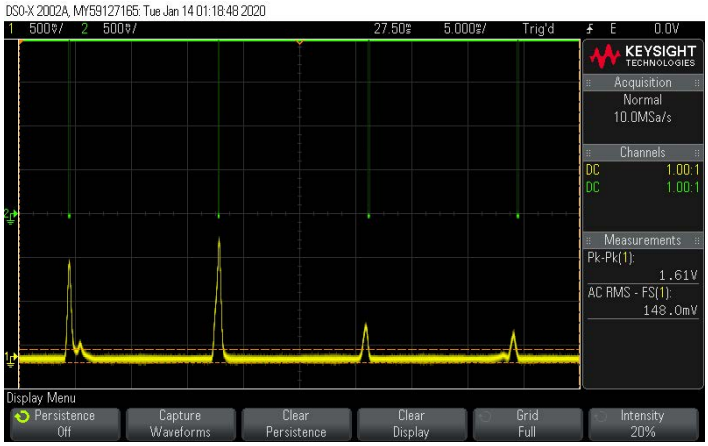
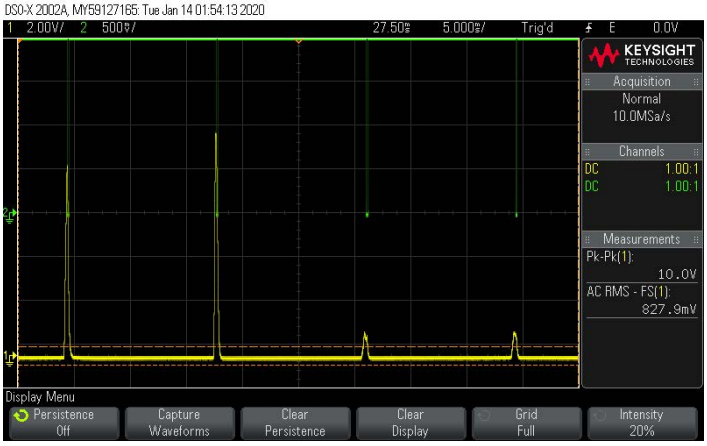
Below are four graphs showing the BPM90-LC display for various beam currents.

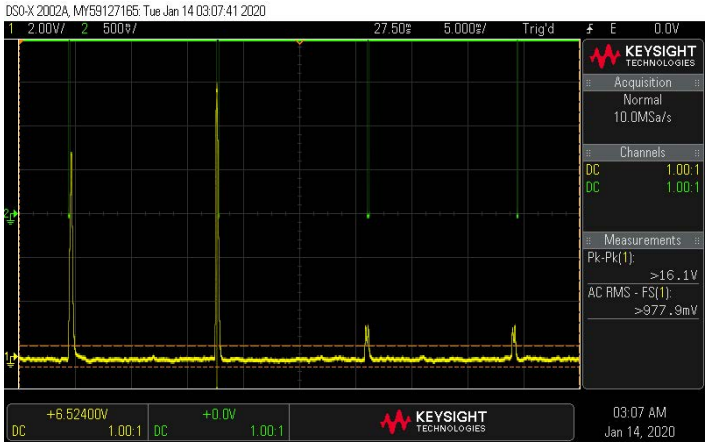
100 nA



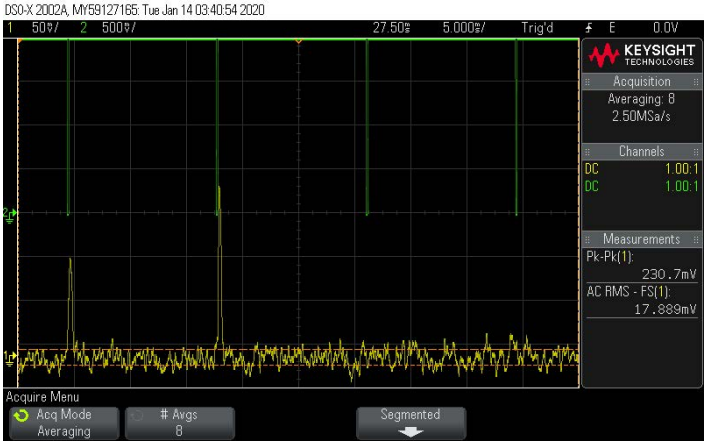
1 nA



10 pA



10 fA



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