Analog Meter Anti-Static Procedure

Purpose:

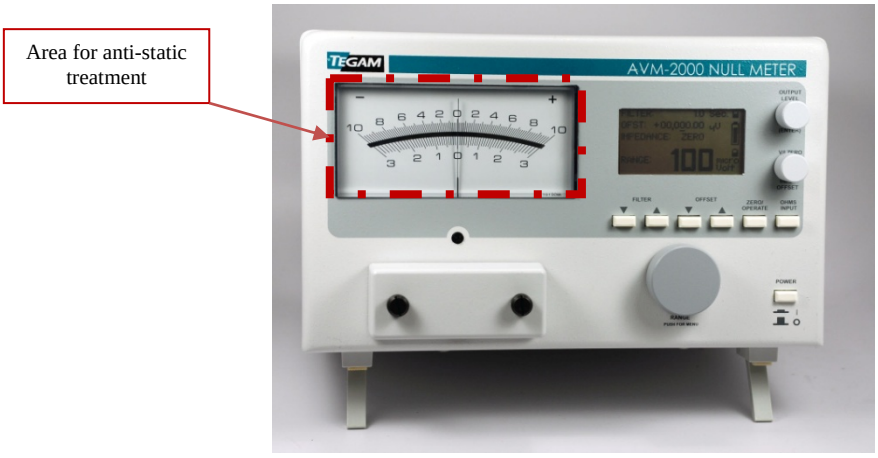
This Application Guide discusses the need and procedure for using an anti-static control solution on sensitive analog meter movements such as the one found in the TEGAM AVM-2000 Nullmeter. Although common knowledge when most instruments used analog meter movements, the need to remind users of this procedure compensates for techniques lost in the world of digital displays.

Background:

The pointer deflection of a high-sensitivity analog meter movement should be directly proportional to the current flowing in the meter movement coil and nothing else. As the mass of the pointer assembly is very low and as the pointer assembly is often insulated from the balance of the meter movement, the pointer deflection can also be subject to forces developed by electro-static charges on the meter movement window. These electro-static charges, which may be non-uniformly distributed across the meter movement window, can cause the pointer deflection to be non-linear with respect to the current in the meter movement coil, can cause the pointer to fail to return to the same point on the meter scale (i.e. introduce lack of repeatability), or can cause the pointer to appear to "stick" at certain points on the scale. To alleviate this condition, it is recommended that the meter movement window be wiped with an anti-static solution.

Technique:

1. The area addressed by the anti-static process is the exterior plastic window (surrounded by a dotted red line) covering the instrument meter movement as shown below:



2. Use a pad consisting of a "micro-fiber" lens cloth (such as used to clean eyeglasses) or a square of clean, white cheese cloth. DO NOT USE paper towels, paper-based wipes or the like as these potentially can scratch the meter movement window and can cause static buildup.
3. Moisten the pad thoroughly with either a commercially available anti-static spray (for example, Heavy Duty Staticide by ACL Staticide) or with distilled water.
4. Clean the outside surface of the window with the pad and allow the meter movement window to dry thoroughly being sure not to touch the window with bare skin.

Summary:

The anti-static procedure should be repeated any time A) the instrument has been stored for a long time; B) the instrument has been shipped (it is recommended that when shipping, the instrument be enclosed in an anti-static bag to reduce the accumulation of static from shipping materials); or C) any time instrument operation indicates issues such as meter non-linearity, meter "sticking" or lack of pointer repeatability. Refer too American National Standard C39.1, paragraph 5.19 for additional information on measuring the influence of electrostatic charges on meter movements.