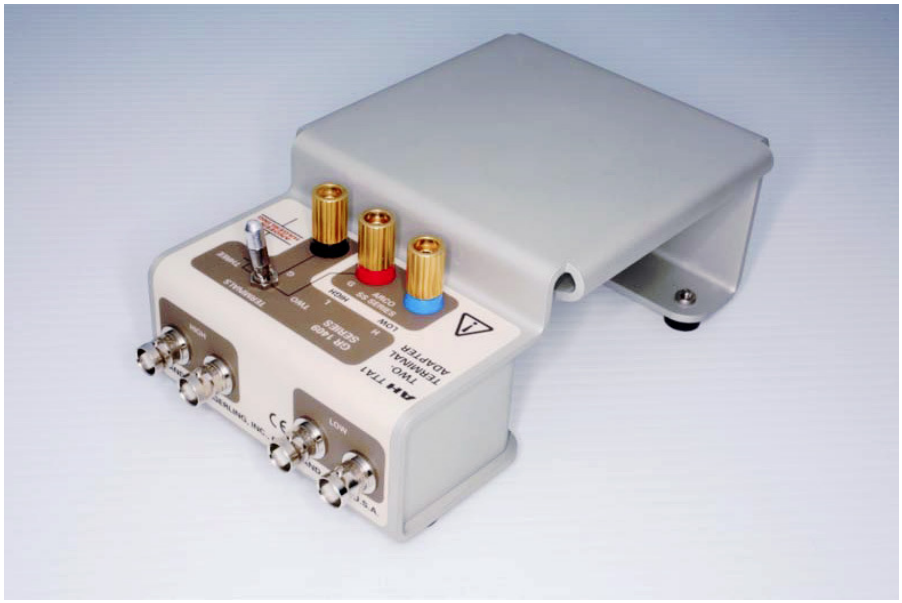
ANDEEN-HAGERLING

AH TTA1 Two-Terminal to Three-Terminal Test Adaptor

The AH TTA1 test adaptor provides the means to connect ARCO SS-32 and GR1409 style two-terminal standard capacitors to a three-terminal bridge or meter. It also accommodates leaded components and other capacitors having banana plugs with standard spacing. The adaptor can be used with Andeen-Hagerling capacitance/loss bridges or with other commercial test instrumentation using three- or four-terminal connections.

Prior to the introduction of the AH TTA1, the GR1620 capacitance bridge provided the only standardized commercial fixture to measure two-terminal standard capacitors. The AH TTA1 provides a common platform for measurement comparisons in an easy to use, clearly-labelled fixture that reduces the chances of improper measurements, *e.g.*, by incorrect capacitor insertion. The exceptionally well-characterized inherent capacitance and measurement repeatability of the AH TTA1 allow the user to assess the DUT's true capacitance value and eliminate the uncertain characteristics and behaviours associated with "home made" fixtures.



Features of the AH TTA1

- Locking switch allows GR1409 standard capacitors to be measured in either two- or three-terminal mode.
- Three- or four-terminal BNC jacks accommodate connection to a bridge or meter.
- 5-way binding posts provide convenient connections to components with wire leads.
- Orientation-dependent labelling helps to guide the proper insertion of standard capacitors.
- Emulates GR1620 *de facto* standard connection configuration for making two-terminal standard capacitor measurements.
- Additivity of capacitance of stacked GR1409 capacitors is optimized for accuracy.
- Full three-terminal shielding of all internal connections.
- Three year warranty.

Application Examples

Measuring ARCO SS Series Standard Capacitors

AH TTA1 with Arco capacitor installed

After connecting the AH TTA1 to the measurement instrument, orient the AH TTA1 so the wording "Arco SS Series" faces you. On the Arco capacitor to be measured, identify the side with the label containing a "G" in the lower left hand corner. Insert the Arco capacitor such that the "G" on the label aligns with the banana jack marked "G" in the Arco SS Series shaded area. Both banana plugs must be in the "Arco SS Series" designated jacks. Make sure the capacitor is plugged in all the way and that the barrels are fully screwed down, or the readings will be higher than they should be.

Measuring GR1409 Standard Capacitors

AH TTA1 with GR1409 capacitor installed

The GR1409 to be measured must have banana plugs screwed into its three underside terminals. After connecting the AHTTA1 to the measurement instrument, orient the AHTTA1 such that the wording "GR 1409 Series" faces you. Determine whether you wish to make a two-terminal or three-terminal measurement and adjust the terminals switch accordingly. Insert the GR1409 in the AH TTA1 such that the "H", "L", and "G" markings on the 1409 align with the light-coloured "H", "L" and "G" letters on the AHTTA1.

Measuring Other Two-Terminal Capacitors

AH TTA1 with a leaded capacitor installed

Other two-terminal capacitors can be measured by connecting them to the High and Low 5-way binding posts on the AHTTA1. Leaded capacitors are easily connected by inserting the leads into the horizontal holes in the binding posts and tightening the barrels down on the leads.

Measuring surface-mount chip capacitors

AH TTA1 with a chip capacitor installed

Tiny components such as surface-mount chip capacitors can be measured if leads are attached. Short leads might be soldered to both ends of the capacitor. A more versatile solution could be devised to hold tiny capacitors with one or two spring clips so that no soldering is needed.

Specifications

Connector type to bridge or meter:
Two pairs of BNC jacks. A three-terminal connection uses one of each pair.

Connector type to standard capacitor:
Three 5-way binding post banana jacks with standard spacing (0.75 inch or 19 mm).

Test Cable:
The AH TTA1 is compatible with the cables supplied with AH bridges.

Nominal stray high-to-low capacitance and loss [1]:
Two-terminal mode: 0.18 pF, -0.0001 nS @ 1 kHz [2]
Three-terminal mode: 0.17 pF, -0.0001 nS @ 1 kHz

Stray high-to-low capacitance and loss with banana jacks fully shielded:
Two- and three-terminal mode: < 3 aF, < 0.00002 nS @ 1 kHz

Nominal High terminal capacitance to ground:
Two-terminal mode: 12 pF @ 1 kHz
Three-terminal mode: 8 pF @ 1 kHz

Nominal Low terminal capacitance to ground:
Two- and three-terminal mode: 7 pF @ 1 kHz

Measurement modes:
Two- or three-terminal using a manual switch. All measurements connect the High and Low terminals of the capacitance bridge to the L and H terminals of the GR1409, respectively. In two-terminal mode, the G terminal of the GR1409 is connected to the High terminal of the bridge. In three-terminal mode, the G terminal of the GR1409 is grounded. For Arco SS-32 standard capacitors, there is little difference between two- and three terminal modes since these capacitors have only two terminals.

Power requirements:
None.

Temperature range:
-40° to +75°C while operating or in storage.

Humidity:
0 to 85% operating and storage relative humidity, non-condensing.

Packaging:
The adaptor is 2.5 inches (6.4 cm) high, 4.0 inches (10.2 cm) wide and 6.5 inches (16.5 cm) long.

Weight:
1.1 lbs (0.5 kg)

[1] All capacitance and loss specifications assume that the banana jacks are screwed down all the way.
[2] Small negative losses result from exposure of the binding post insulators to fields from both the High and Low terminals.