

7000-09

The 7000-09 Calibration Kit is used to calibrate and adjust the QuadTech/IET Labs 7000 Series LCR Meters and consists of four calibration resistors, an open-circuit module and a short-circuit module.

The use of the 7000-09 Calibration Kit will bring the 7000 Series of LCR meters back to factory specification.

The R and Q values, at selected frequencies, are given on the enclosed Certification of Calibration traceable to an SI.

The 7000-09 Calibration Kit can also be used for calibration of the GenRad/IET 1689 and 1693 Digibridge RLC Meters.

Features:

- 4 Resistors, open and short
- 1 meter BNC Cable 1689-9602
- Rugged case
- Calibration Certificate
- Z-Foil Bulk Metal® Resistors



7000-09 Calibration Kit

SPECIFICATIONS

Nominal Values:

R1 - 95.3 k Ω

R2 - 5.97 k Ω

R3 - 374 Ω

R4 - 24.9 Ω

Open and Short

Initial Adjustment Accuracy: 0.1% of nominal value

Stability: $< \pm 25$ ppm/year; typically drift is less than 60 ppm total over 10 years

Temperature Coefficient: < 1.5 ppm/ $^{\circ}$ C

Calibration Accuracy:

These resistors are calibrated with a measurement uncertainty of better than 20 ppm at DC .

Measurement uncertainty of the nominal Q values are within 100 ppm at 1 KHz. All other R and Q values at other frequencies are mathematically calculated. All calibrations are made at $23^{\circ} \pm 2$ C $^{\circ}$.

ORDERING INFORMATION

STANDARD MODELS

7000-09 Calibration Kit
Includes: 1689-9602 BNC Cable
Calibration Certificate Traceable to SI



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INSTRUCTIONS

NOTE:

Instrument should be powered up for a minimum of 1 hour before calibration in a temperature stabilized room at $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$

Procedure:

The calibration kit includes a 1 meter BNC to BNC cable which is generally used for connecting the six calibration standards to the 7000 Meter. The exception to this occurs if an accessory cable of different length is to be used for testing, in such cases a cable of this length can also be used for calibration. It is important that the cable and standards remain in the same orientation and placement throughout the calibration procedure and in a controlled laboratory environment.

In all cases the six calibration standards should be connected to the LCR Meter correctly by matching labels on 1689-9602 BNC Cable. To reduce signal crosstalk and noise the IH (red) and IL (black) leads at both ends of the cable should be twisted (4 or 5 twists) before plugging onto the connectors, the PH (red/white) and PL (black/white) should be twisted in a similar manner.

On the 7X00 LCR Meter, select Calibration from the Utilities menu and press ENTER. The operator is

prompted by instructions on the instrument's display. Before proceeding with calibration a calibration code must be entered. Codes are based on 7x00225 for each 7000 Series instrument, i.e. 7400225 for the 7400 or 7600225 for the 7600.

1. The first standard to be connected is R3 (range 3) $374\ \Omega$ standard resistor used to perform a gain calibration lasting about 30 minutes after ENTER is pressed.

2. The second standard to be connected is the Open Circuit taking about 12 minutes to complete the calibration.

3. The third standard to be connected is the Short Circuit taking about 12 minutes to complete the calibration.

4. The fourth standard connected is the R1 (range 1) $95.3\ \text{k}\Omega$ standard resistor. The resistance value in ohms and Q value in ppm must be entered from the Report of Calibration at the frequencies indicated in response to the instrument prompts. If a value is entered incorrectly it is possible to re-enter it by pressing CNCL if the ENTER key has not been pressed. If the ENTER key has already been pressed the operator is given another chance to cancel before accepting the entered values for each standard. The calibration time for this standard and the next three standards require about 10 minutes each.

5. The fifth standard connected is the R2 (range 2) $5.97\ \text{k}\Omega$ standard resistor. Again, the resistance value in ohms and Q value in ppm must be entered from the Report of Calibration at the frequencies indicated.

6. The sixth standard connected is the R3 (range 3) $374\ \Omega$ standard resistor. Again, the resistance value in ohms and Q value in ppm must be entered from the Report of Calibration at the frequencies indicated.

7. The final standard connected is the R4 (range 4) $24.9\ \Omega$ standard resistor. Again, the resistance value in ohms and Q value in ppm must be entered from the Report of Calibration at the frequencies indicated.

8. Following calibration of the last standard the display will ask the operator to respond Y (yes) or N (no) if the time and date shown are correct. N allows the operator to enter correctly, refer to the instrument instruction manual if further instructions are needed.

9. Following confirmation of the time and date, the display will ask the operator to respond Y or N to save the calibration data. Y completes the calibration process and N allows the above process to be repeated.

This completes the process of gain calculation and alignment of all 4 ranges.

