

MULTIMÈTRE-ÉLECTROMÈTRE KEITHLEY 610 C

FICHE N° 34

PRÉSERVER
SAUVEGARDER
VALORISER

Période de fabrication : 1950-1974

Fabricant : Keithley

Domaines : Physique

Sous-domaines : Electronique, Electricité

Organisme : Université de Rennes, Campus de Beaulieu

Ville : Rennes

Modèle : 610 C

Matériaux : Métal, Cuir, Plastique

Description

Le multimètre-électromètre KEITHLEY 610C se présente sous la forme d'une boîte métallique et est un appareil très performant encore utilisé dans les laboratoires. Il permet en particulier de mesurer des quantités de charges électriques très faibles (unités = coulombs) avec une impédance d'entrée très élevée. De couleur grise, en métal, muni d'une documentation en anglais, il possède aussi de nombreuses fonctions accessibles sur la face arrière. Cet instrument analogique (à transistors à effet de champ) portable est à aiguille et mesure les tensions continues, courants continus, quantité de charge électrique, résistances. Il possède un sélecteur rotatif pour définir les grandeurs-calibres, un sélecteur rotatif pour les multiplicateurs et un réglage de zéro. A l'arrière de l'appareil, une sortie "Output" de la mesure effectuée est disponible. Il est alimenté par le secteur de 117 V à 234 V.

Utilisation

Le multimètre-électromètre KEITHLEY est un appareil très performant encore utilisé dans les laboratoires de la faculté des sciences de Rennes. Cet appareil de mesure très performant (excellente stabilité du zéro) était destiné aux laboratoires de recherche et aux milieux professionnels de l'électronique et à l'enseignement.

TO OPERATE: SET LINE SWITCH TO 117 OR 234, METER SWITCH TO POWER OFF, AND CONNECT LINE CORD. LOCK ZERO CHECK. SET THE RANGE SWITCH TO VOLTS, AND SET THE MULTIPLIER SWITCH TO 1.0. TURN METER SWITCH TO CENTER ZERO. METER SHOULD READ NEAR THE CENTER ZERO. IF NOT, ADJUST COARSE, MEDIUM, AND FINE ZERO CONTROLS WHILE INCREASING VOLTAGE SENSITIVITY WITH THE MULTIPLIER SWITCH. SET METER SWITCH TO +, -, OR CENTER ZERO AS REQUIRED.

INPUT CONNECTION: NORMALLY, INPUT LEADS SHOULD BE POLYETHYLENE OR TEFLON COAX. INPUT CONNECTOR IS TEFLON-INSULATED UHF TYPE. THE MODEL 6101B SHIELDED TEST PROBE IS USEFUL FOR MOST MEASUREMENTS.

VOLTAGE MEASUREMENT: SET RANGE SWITCH TO VOLTS FOR 10^{14} OHM INPUT RESISTANCE. SET FEEDBACK SWITCH TO NORMAL. SET FULL SCALE VOLTAGE RANGE WITH MULTIPLIER SWITCH. CONNECT INPUT AND UNLOCK ZERO CHECK SWITCH. (ROTATING RANGE SWITCH TO AMPERES POSITION GIVES AN INPUT RESISTANCE EQUAL TO THE RECIPROCAL OF AMPERES FULL SCALE RANGE.)

HIGH VOLTAGE MEASUREMENT: MODEL 6102A 10:1 DIVIDER EXTENDS THE RANGE TO 1000 V, 3% ACCURACY OVERALL, 10^{10} OHMS INPUT. MODEL 6103A 1000:1 DIVIDER EXTENDS THE RANGE TO 30 KV, 5% ACCURACY OVERALL, 10^{12} OHMS INPUT. USE DIVIDERS WITH RANGE SWITCH AT VOLTS. VOLTS FULL SCALE EQUALS DIVIDER RATIO TIMES MULTIPLIER SETTING.

RESISTANCE MEASUREMENT: SET RANGE SWITCH TO OHMS, METER SWITCH TO +, FEEDBACK TO NORMAL, MULTIPLIER TO HIGHEST SETTING POSSIBLE AND LOCK ZERO CHECK. CONNECT UNKNOWN AND RELEASE ZERO CHECK. MULTIPLIER TIMES OHMS RANGE IS FULL SCALE RANGE. SHIELD INPUT IF RESISTANCE EXCEEDS 1 MEGOHM. MODEL 6104 TEST SHIELD IS SUGGESTED. SEE MANUAL FOR GUARDED MEASUREMENTS.

CURRENT MEASUREMENT WITH SHUNT RESISTOR: SET RANGE SWITCH TO AMPERES, FEEDBACK TO NORMAL, MULTIPLIER TO SMALLEST SETTING POSSIBLE AND UNLOCK ZERO CHECK. MULTIPLIER TIMES AMPERES RANGE IS FULL-SCALE RANGE. MULTIPLIER SETTING IS FULL-SCALE INPUT VOLTAGE DROP. (SEE INSTRUCTION MANUAL FOR EFFECT OF INPUT VOLTAGE DROP ON MEASUREMENT.) OBSERVE MAXIMUM VOLTAGE LIMITS ON RANGE SWITCH. BELOW 10^{-13} AMPERE, SUBTRACT OFFSET CURRENT FROM READING.

CURRENT MEASUREMENT WITH REDUCED VOLTAGE DROP AND INCREASED SPEED: BELOW 10^{-8} AMPERE, NEGATIVE FEEDBACK DECREASES INPUT VOLTAGE DROP AND INCREASES RESPONSE SPEED. SET FEEDBACK TO FAST, MULTIPLIER TO 1.0 IF POSSIBLE. OPERATE AS ABOVE. DO NOT USE IN THIS POSITION TO MEASURE CAPACITOR LEAKAGE. NEITHER SIDE OF 3 V OR 1 MA OUTPUT IS GROUND IN FAST POSITION.

CHARGE MEASUREMENT: SET RANGE SWITCH TO COULOMBS, FEEDBACK TO FAST, AND UNLOCK ZERO CHECK. MULTIPLIER TIMES COULOMBS RANGE IS FULL-SCALE RANGE. OFFSET CURRENT ADDS A MAXIMUM OF 5×10^{-15} COULOMBS PER SECOND.

RECORDER OUTPUT: AMPHENOL 80-MC2M CONNECTOR FITS OUTPUT FOR 1 MA RECORDER. SET SWITCH AT 1 MA AND ADJUST 1 MA CAL FOR FULL SCALE RECORDER DEFLECTION WHEN METER READS FULL SCALE. WITH SWITCH AT 3 V, OUTPUT IS 3 VOLTS FOR FULL SCALE METER DEFLECTION. SWITCH MUST BE AT 3 V WHEN RECORDER IS NOT ATTACHED.

CAUTION: ALWAYS TURN METER SWITCH TO OFF BEFORE DISCONNECTING LINE CORD OR POWER.

610C ELECTROMETER

COARSE ZERO

X1 OUTPUT
100 μ A MAX.

GUARD

50-1000 CPS
117/234 VOLTS

1 MA CAL

1 MA

3 V

OUTPUT

3AG 1/4 A SB

3AG 1/4 A SB

KEITHLEY MADE IN U.S.A.

396921





610C SOLID STATE ELECTROMETER

 KEITHLEY INSTRUMENTS

ZERO
FINE •
MEDIUM ○



METER
+ -
OFF
POWER OFF
CENTER ZERO



INPUT



ZERO
CHECK



FAST ☒ NORMAL
FEEDBACK



TO OPERATE: SET LINE SWITCH TO 117 OR 234, **METER SWITCH** TO **POWER OFF**, AND CONNECT LINE CORD. LOCK **ZERO CHECK**, SET THE RANGE SWITCH TO **VOLTS**, AND SET THE MULTIPLIER SWITCH TO 1.0. TURN **METER SWITCH** TO **CENTER ZERO**. METER SHOULD READ NEAR THE CENTER ZERO. IF NOT, ADJUST **COARSE**, **MEDIUM**, AND **FINE ZERO** CONTROLS WHILE INCREASING VOLTAGE SENSITIVITY WITH THE MULTIPLIER SWITCH. SET **METER SWITCH** TO +, -, OR **CENTER ZERO** AS REQUIRED.

INPUT CONNECTION: NORMALLY, INPUT LEADS SHOULD BE POLYETHYLENE OR TEFLON COAX. INPUT CONNECTOR IS TEFLON-INSULATED UHF TYPE. THE MODEL 6101B SHIELDED TEST PROBE IS USEFUL FOR MOST MEASUREMENTS.

VOLTAGE MEASUREMENT: SET RANGE SWITCH TO **VOLTS** FOR 10^{14} OHM INPUT RESISTANCE. SET **FEEDBACK** SWITCH TO **NORMAL**. SET FULL SCALE VOLTAGE RANGE WITH MULTIPLIER SWITCH. CONNECT INPUT AND UNLOCK **ZERO CHECK** SWITCH. (ROTATING RANGE SWITCH TO **AMPERES** POSITION GIVES AN INPUT RESISTANCE EQUAL TO THE RECIPROCAL OF **AMPERES** FULL SCALE RANGE.)

HIGH VOLTAGE MEASUREMENT: MODEL 6102A 10:1 DIVIDER EXTENDS THE RANGE TO 1000 V, 3% ACCURACY OVERALL, 10^{10} OHMS INPUT. MODEL 6103A 1000:1 DIVIDER EXTENDS THE RANGE TO 30 KV, 5% ACCURACY OVERALL, 10^{12} OHMS INPUT. USE DIVIDERS WITH RANGE SWITCH AT **VOLTS**. VOLTS FULL SCALE EQUALS DIVIDER RATIO TIMES MULTIPLIER SETTING.

RESISTANCE MEASUREMENT: SET RANGE SWITCH TO **OHMS**, **METER SWITCH** TO +, **FEEDBACK** to **NORMAL**, MULTIPLIER TO HIGHEST SETTING POSSIBLE AND LOCK **ZERO CHECK**. CONNECT UNKNOWN AND RELEASE **ZERO CHECK**. MULTIPLIER TIMES **OHMS** RANGE IS FULL SCALE RANGE. SHIELD INPUT IF RESISTANCE EXCEEDS 1 MEGOHM. MODEL 6104 TEST SHIELD IS SUGGESTED. SEE MANUAL FOR GUARDED MEASUREMENTS.

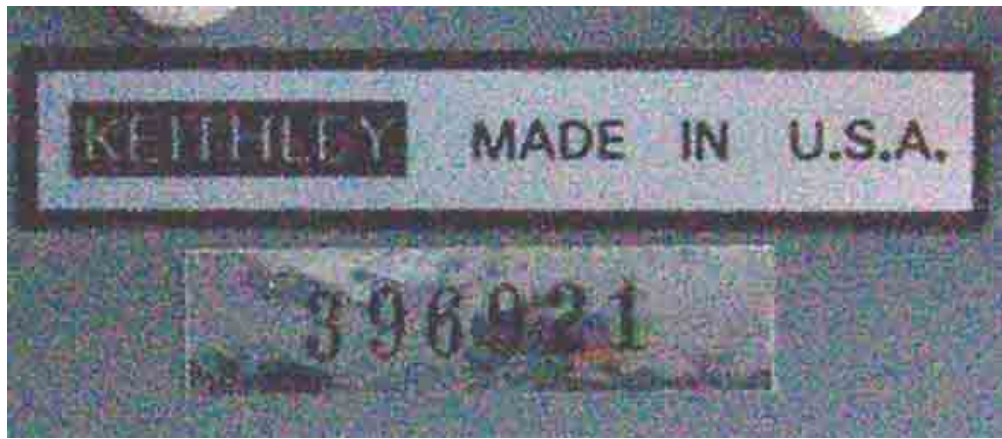
CURRENT MEASUREMENT WITH SHUNT RESISTOR: SET RANGE SWITCH TO **AMPERES**, **FEEDBACK** TO **NORMAL**, MULTIPLIER TO SMALLEST SETTING POSSIBLE AND UNLOCK **ZERO CHECK**. MULTIPLIER TIMES **AMPERES** RANGE IS FULL-SCALE RANGE. MULTIPLIER SETTING IS FULL-SCALE INPUT VOLTAGE DROP. (SEE INSTRUCTION MANUAL FOR EFFECT OF INPUT VOLTAGE DROP ON MEASUREMENT.) OBSERVE MAXIMUM VOLTAGE LIMITS ON RANGE SWITCH. BELOW 10^{-13} AMPERE, SUBTRACT OFFSET CURRENT FROM READING.

CURRENT MEASUREMENT WITH REDUCED VOLTAGE DROP AND INCREASED SPEED: BELOW 10^{-5} AMPERE, NEGATIVE FEEDBACK DECREASES INPUT VOLTAGE DROP AND INCREASES RESPONSE SPEED. SET **FEEDBACK** TO **FAST**, MULTIPLIER TO 1.0 IF POSSIBLE. OPERATE AS ABOVE. DO NOT USE IN THIS POSITION TO MEASURE CAPACITOR LEAKAGE. NEITHER SIDE OF 3 V OR 1 MA OUTPUT IS GROUNDED IN **FAST** POSITION.

CHARGE MEASUREMENT: SET RANGE SWITCH TO **COULOMBS**, **FEEDBACK** TO **FAST**, AND UNLOCK **ZERO CHECK**. MULTIPLIER TIMES **COULOMBS** RANGE IS FULL-SCALE RANGE. OFFSET CURRENT ADDS A MAXIMUM OF 5×10^{-15} COULOMBS PER SECOND.

RECORDER OUTPUT: AMPHENOL 80-MC2M CONNECTOR FITS OUTPUT. FOR 1 MA RECORDER, SET SWITCH AT 1 MA AND ADJUST 1 MA CAL FOR FULL SCALE RECORDER DEFLECTION WHEN METER READS FULL SCALE. WITH SWITCH AT 3 V, OUTPUT IS 3 VOLTS FOR FULL SCALE METER DEFLECTION. SWITCH MUST BE AT 3 V WHEN RECORDER IS NOT ATTACHED.

CAUTION: ALWAYS TURN **METER SWITCH** TO **OFF** BEFORE DISCONNECTING LINE CORD OR POWER.



Pour nous citer :

Base de la Mission nationale de sauvegarde et de valorisation du patrimoine scientifique et technique contemporain, PATSTEC, Multimètre-électromètre Keithley 610 C (Keithley), <https://www.patstec.fr/ressources/objets/detail?id=15102>, consulté le 2026-07-27