

INSTRUCTIONS FOR TYPE M2 METERTESTER

SPECIAL BUY
RE-INSPECTION REQUIRED
BEFORE INSTALLATION
IN ARTICLE FOR
CUSTOMER ACCEPTANCE

The Model M2 Metertester is a portable standard, for the precise calibration of DC electrical indicating instruments, including tests for current and-or voltage sensitivity, and electrical resistance. It is designed for use on 110-125 volt, 50-60 cycle alternating current and should be connected to a source within these limits. The red and black test leads should be connected to the terminals of the instrument to be tested.

I CONTROLS AND THEIR FUNCTIONS:

Range Selector: Set to approximate sensitivity of meter to be tested. If sensitivity unknown set to .025 and turn up calibration control, repeating procedure on progressive ranges a step at a time, until both the standard meter and meter to be tested can be advanced to full scale with the calibration control.

Variable Resistance: (Helipot). Rotate as indicated by null indicator until bridge is balanced. Leave in this position until test of instrument is complete. Use locking lever to prevent accidental change of setting.

Resistance Range Selector: Resistance multiplier used in conjunction with Helipot to obtain balance on null indicator. When balance is obtained, use first digit of range selected to prefix dial reading of Helipot.

On Off Switch: and fine adjustment vernier for voltage control.

Test Switch: Make resistance measurements in ohm position; calibration, current and sensitivity measurements in plus or minus position. In plus position red test lead is positive. In minus position leads are reversed and red is negative.

Null Indicator: Bridge is balanced when pointer is at zero.

Calibration, or Voltage Control: Clockwise rotation supplies increasing voltage to standard meter and meter under test.

II OPERATION

FOR RESISTANCE MEASUREMENTS the test leads must be connected to the instrument or resistor under test. The RANGE SELECTOR should be set to the full scale value of the instrument, or in the case of a resistor, to 5 MA. Set TEST switch to ohms. The CALIBRATION CONTROL should be turned clockwise until the NULL INDICATOR shows substantial deflection. Then adjust the VARIABLE RESISTANCE and RESISTANCE RANGE selector (increase or decrease) as indicated on dial until NULL INDICATOR reads zero (bridge balance). Increase or decrease standard meter reading with CALIBRATION CONTROL to secure fine or coarse adjustment of bridge balance as desired. Read resistance value from VARIABLE RESISTANCE and RESISTANCE RANGE selector. Example: Range setting 2-3K, Helipot reads 239, = 2239 ohms, resistance of unit under test.

FOR SENSITIVITY MEASUREMENTS. In order to obtain maximum accuracy of sensitivity measurement, it is necessary to first measure the internal resistance of the meter under test. After this measurement is made, the resistance measuring controls should be left in the "bridge balanced" position. When this is done, the millivolt drop of the instrument under test is properly compensated in the sensitivity measuring circuit. Then select appropriate range on RANGE SELECTOR, set TEST switch to plus or minus as required, and rotate CALIBRATION CONTROL clockwise to obtain full scale deflection. Use vernier control to make fine adjustment. Read deviation from Standard as a percentage of this value, on the standard meter.

FOR VOLTAGE MEASUREMENTS set RESISTANCE RANGE selector on 4-5K position and VARIABLE RESISTANCE at 1000 ohms. Set RANGE SELECTOR to 100 volts. Set TEST switch to plus or minus as required. Use CALIBRATION control to obtain readings as in Sensitivity measurements.

FOR USE AS A "LIMIT BRIDGE" set RANGE SELECTOR and TEST switch as in Resistance Measurements, then adjust the RESISTANCE RANGE selector and VARIABLE RESISTANCE to the standard or nominal value of resistors to be tested. Use a resistor which represents the upper or lower desired tolerance limit connected to the test clips. Rotate the CALIBRATION CONTROL until the pointer on the NULL INDICATOR deflects to the end of the green block left or right. Note the reading of the standard meter and maintain that reading for limit bridge tests to this tolerance. If a change in tolerance limits for the same resistance value is desired, it may be easily obtained by halving the standard meter reading to double the tolerance, or doubling the standard meter reading to halve the tolerance, etc. Various other adaptations of the limit bridge will become apparent with use.

III MAINTENANCE

1. Frequently check the zero setting of the standard meter and correct with zero adjusting screw. Do not make this adjustment with power on.
2. If the calibration control will not bring the standard meter up to full scale, check the line voltage to be sure that it is within the required range. Also check the 6X5 and 6N7 tubes for emission, and replace if necessary.
3. If the calibration control will not bring the standard meter to zero on the scale, check the 6N7 tube for gas, and replace if necessary.
4. If the instrument does not operate satisfactorily after the above, it should be returned to the factory for repair and adjustment.

CERTIFICATE FOR MARION METERTESTER TYPE M2 Serial No. 1468

This is to certify that this instrument has been hand calibrated and checked by the Potentiometer and Standard Cell method and found to have an accuracy within $\frac{1}{4}$ of one percent at 25°C. The resistance bridge has been calibrated and checked against N.B.S. type standard resistors and has an accuracy of $\frac{1}{2}$ percent, or $\frac{1}{2}$ ohm, whichever is greater.

Date 3-25-60

Calibrated by R.C.L.

Checked by M.C.

MARION ELECTRICAL INSTRUMENT CO.
MANCHESTER, NEW HAMPSHIRE., U. S. A.

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