

AUTORANGE CAPACITANCE METER

CM-3300

Operation

Manual

INTRODUCTION

The Autoranging Capacitance Meter measures capacitance from 0.1pF to 99900uF in 10 different ranges automatically. The autoranging feature of the UNIT is capable of selecting the range with the highest resolution and giving a 3-digit reading. With the range HOLD feature, a direct 4-digit reading of capacitance is possible. The range HOLD feature also enables faster batch testing of large value capacitors. The UNIT is a valuable instrument in electronic engineering labs, production lines, quality control department, service centres and technical institutes to check tolerance, sort precision values, measure unmarked capacitors, select matched pairs and measure cable or switch capacitance.

SPECIFICATIONS

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| RANGE..... | 10 ranges, fully automatic with range HOLD. Full scale value from 99.9pF to 99.9mF. AUTO: between 79 and 999 counts. HOLD: between 0 and 999 counts. |
| RESOLUTION | 0.1pF on the lowest range and 0.1% of full scale on all ranges. |
| ACCURACY..... | 0.5% of full scale \pm 1 digit to 99.9uF. 1% of full scale \pm 1 digit to 99.9mF. |
| OVERRANGE INDICATION..... | The OVERRANGE LED is lit steadily or blinking. |
| ZERO ADJUST..... | External knob adjustment of the zero display value. |

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| FRONT PANEL CONTROL..... | Power ON-OFF switch, Range AUTO*HOLD switch and Zero Adjust knob. |
| DISPLAY | 3-digit 0.5" (13mm) LED. Unit Indicators – pF, nF, uF & mF. |
| POWER SOURCE..... | 240V AC, 50Hz. |
| DIMENSIONS & WEIGHT | 180 x 70 x 220mm, 2 KG. |

OPERATING INSTRUCTIONS

1. Set the POWER switch to the ON position and the RANGE switch to the AUTO position.
2. Zero the display by adjusting the zero knob until the reading is changing between 00.0 and 00.1.
3. Caution before measurement:
 - a. Observe polarity when connecting polarized capacitors.
 - b. Full discharge the capacitor to be measured.
 - c. Never apply voltage to the test jacks, or serious damage may result.
4. Insert the capacitor to the test jacks, and read the capacitance value directly from the LED display and its accompanying UNIT indicator.

Notes: The meter always starts on the lowest range automatically goes to the range that gives maximum resolution.

CONSIDERATIONS

1. Measurement of a batch of similar value capacitors especially of large values is faster if the RANGE switch is set to the HOLD position before the first measured capacitor is removed. The meter then locks on that particular range. Subsequent measurements do not require the automatic upranging sequence before a reading is obtained.
2. A shorted capacitor will cause overrange. If the meter is in the AUTO mode, it will range upward to the highest range (99.9mF) and the OVERRANGE indicator will blink.
3. An open capacitor will read a few picofarads in the AUTO mode, or zero if the meter is in the HOLD mode and locked on a higher range.
4. A 4-digit resolution reading of capacitance is possible indirectly in two measurements.
 - a. Measure the capacitor with a normal procedure in AUTO mode. A 3-digit reading of the capacitance is obtained.
 - b. Then measure the capacitor again in the HOLD mode but with the range which is one position lower. (It is possible to set the meter with the range one position lower by using a capacitor with capacitance one order lower, i.e. 1/10, of the capacitor to be measured.) Another 3-digit reading of the capacitance is obtained. Combining with the higher-order 3-digit reading in step 'a', a 4-digit reading of capacitance is thus obtained.

ADJUSTMENT PROCEDURES

1. The AUTO/HOLD switch is set to AUTO position.
VR1 is set to its max. resistance position. If not, there will be no reset signal to the IC 14553.
2. The Cap-meter should be in the lowest range, 99.9pF range. If not, try to fix it before doing the calibration procedures.
3. If the Cap-meter is in the lowest range, adjust VR3 & VR2 to bring the display to zero.
4. Connect a calibrated cap (less than 100pF, say 56pF). Adjust VR5 so that the Cap-meter reading equals to the value of the calibrated capacitor.
5. Connect another calibrated cap, say 470nF (494) to the Cap-meter. The Cap-meter should switch to the 999nF range automatically. Press the Hold switch (i.e. the cap-meter is in the Hold Mode). Disconnect the 470nF cap, adjust the VR1 for the zero (lowest) reading by a calibrated 4-5nF (472) cap and the cap-meter display 004-005nF. Reconnect the 470nF cap, adjust the VR6 so that Cap-meter reading equals to the value of the calibrated capacitor.
6. Connect a large cap (greater than 1mF), so the meter is in the highest range, 99.9mF, adjust VR4 for calibration.

NOTE: Do not use test lead wire when measuring below 500pF, use clip terminals.

