INSTRUCTION MANUAL

MT990

VOLTAGE/CURRENT CALIBRATOR

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1. FEATURES

1. Portable instrument for calibrating process devices and measuring process signals.
2. Adjustable 0-24mA current source.
3. Adjustable -199.9mV to +199.9mV DCV source.
4. Current calibrator drives loads up to 500 ohms.
5. The instrument powers or measures a two-wire current loop.
6. Four function provide the quality and accuracy of handheld calibrator:
   1. Precision current source,
   2. Measurement of a current signal,
   3. Power and measurement of two wire loop,
   4. Precision DC mV source.

2. SPECIFICATIONS

2.1. GENERAL SPECIFICATIONS

Function	Range
Display	LCD display, max display counts 1999.
Function	1. Current source
	2. Current measurement
	3. Power and current measurement of
	4. DC mV source
Sampling Time	Approx. 0.4 second
Over input Indication	Indication of "1".
Operating Environment	0°C to 50°C (32°F to 122°F). at < 70 % relative humidity.
Power Supply	DC9V, NEDA1604/IEC6F22 battery or equivalent. Alkaline type or heavy duty type.
Power Consumption	Current measurement: Approx. DC 12mA
	Power and current measurement: Approx. DC 33mA
	Current source (under 10 mA signal output): Approx. DC 33mA
	DC mV source (under 100mV signal output): Approx. DC 12mA
Dimensions	150 (H) x 70 (W) x 40 (D) mm
Weight	Approx.:232g (including battery.)

3. ELECTRICAL SPECIFICATIONS (23±5°C)

3.1. CURRENT SOURCE

Range	Display Resolution	Accuracy
0-19.99mA	0.01mA	±(0.25%FS+1d)
0-24mA	0.1mA	±(0.5%FS+1d)

*Output 0 to 24mA current for loads up to 500 ohms.
Output >20mA current for loads up to 400 ohms.
*FS:full scale

3.2. CURRENT MEASUREMENT

Range	Display Resolution	Accuracy
0-19.99mA	0.01mA	±(0.25%FS+1d)
0-24mA	0.1mA	±(0.5%FS+1d)

*FS:full scale

3.3. POWER AND CURRENT MEASUREMENT OF TWO WIRE LOOP

Range	Display Resolution	Accuracy
0-19.99mA	0.01mA	±(0.25%FS+1d)
0-24mA	0.1mA	±(0.5%FS+1d)

*Provides power DC 12V ±2V to the loop and measures current.
*FS:full scale

3.4. DC mV SOURCE

Range	Display Resolution	Accuracy
-199.9mV to +199.9mV	0.1mV	±(0.25%FS+1d)

*Output measured load impedance should>1K ohms.
*FS:full scale

Remark:
The above specifications are tested under the environment RF Field Strength less than 3V/M & frequency less than the30 MHz only.

4. MEASURING PROCEDURE

4.1. CURRENT SOURCE

1. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (mV-mA) jack.
2. Set the Function Switch to the "CURRENT (mA) source" position.
3. Press the "0~19.9mA" key for getting the 0.01mA display resolution (max display is 19.99mA); press the "0~24mA" key for getting the 0.1mA display resolution
4. Adjust the "Calibration Adjust knob" to generate the current output same as the display value.

4.2. CURRENT MEASUREMENT

1. insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (mV-mA) jack.
2. Set the Function Switch to the "CURRENT (mA) measure" position.
3. Press the "0~19.9mA" key for getting the 0.01mA display resolution (max display is 19.99mA); press the "0~24mA" key for getting the 0.1mA display resolution
4. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
5. Touch the black test probe tip to the negative side of the circuit. Touch the red test probe tip to the positive side of the circuit, and read the current value in the display.

4.3. POWER AND CURRENT MEASUREMENT OF TWO WIRE LOOP.

1. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (mV-mA) jack.
2. Set the Function Switch to the "POWER/mA measure" position.
3. Press the "0~19.9mA" key for getting the 0.01mA display resolution (max display is 19.99mA); press the "0~24mA" key for getting the 0.1mA display resolution
4. Open up the circuit in which is to be measured and connect the red test probe and the black test probe securely in series with the load in which the current is to be measured.

4.4. DC mV SOURCE

1. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (mV-mA) jack.
2. Set the Function Switch to the "Voltage (mV) source" position.
3. Adjust the "Calibration Adjust knob" to generate the voltage (mV) output same as the display value.

5. REPLACING THE BATTERY

WARNING: To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery cover.

1. When the batteries become exhausted or drop below the operating voltage, "BAT" will appear in the left-hand side of the LCD display. The battery should be replaced.
2. Follow instructions for installing battery. See the Battery Installation section of this manual.
3. Dispose of the old battery properly.

WARNING: To avoid electric shock, do not operate your meter until the battery cover is in place and fastened securely.

6. BATTERY INSTALLATION

WARNING: To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery cover.

1. Disconnect the test leads from the meter.
2. Open the battery cover by loosening the screw using a Phillips head screwdriver.
3. Insert the battery into battery holder, observing the correct polarity.
4. Put the battery cover back in place. Secure with the two screws.

WARNING: To avoid electric shock, do not operate the meter until the battery cover is in place and fastened securely.

NOTE: If your meter does not work properly, check the battery to make sure that they are still good and that they are properly inserted.

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