

SPECIFICATIONS

DC VOLTAGE

RANGE	MAXIMUM READING	ACCURACY (12 months) 18°-28°C ±(% rdg + digits)	MAXIMUM ALLOWABLE INPUT
2V	1.9999	0.04% + 1d	1200V momentary
20V	19.999	0.04% + 11d	1200v
200 v	199.99	0.04% + 11d	1200v
1200v	1200.0	0.04% + 11d	1200v

Temperature Coefficient (0°-18° and 28°-55°C):
 +(0.006% + 0.2 digit)/°C

Input Resistance: 10 MΩ ± 0.1%

Settling Time: 1 second to within 1 digit of final reading.

Normal Mode Rejection Ratio:

Greater than 60dB at 50Hz and 60Hz.

Common Mode Rejection Ratio (1kΩ unbalance):

Greater than 120dB at DC, 50Hz and 60Hz.

AC VOLTAGE

RANGE	MAXIMUM READING	ACCURACY (12 months) (above 2000 counts) 18°-28°C; 100Hz-10k Hz ±(% rdg + digits)	TEMPERATURE COEFFICIENT 0°-18° and 28°-55°C ±(% rdg + digits)/°C	TEMPERATURE COEFFICIENT 45Hz-10kHz	TEMPERATURE COEFFICIENT 10kHz-20kHz
2 v	1.9999	0.4% + 15d	0.04% + 0.5d	0.09% + 0.5d	
20 v	19.999	0.3% + 15d	0.01% + 0.5d	0.03% + 0.5d	
200 v	199.99	0.3% + 15d	0.01% + 0.5d	0.03% + 0.5d	
1000 v	1000.0	0.3% + 15d	0.01% + 0.5d	0.03% + 0.5d	

Extended Frequency Accuracy:

(45Hz-100Hz) ±(0.5% + 15 digits)

(10kHz-20kHz) ±(1.0% + 15 digits)

Response: Average responding calibrated in rms of a sine wave.

Settling Time: 2.5 seconds to within 10 digits of final reading.

Input Impedance:

1MΩ + 1% shunted by less than 75pF.

Maximum Allowable Input Voltage:

1000V rms, 1400V peak, 10⁷V-Hz maximum.

Common Mode Rejection Ratio (1kΩ unbalance):

60dB at DC, 50Hz and 60Hz.

RESISTANCE

RANGE	MAXIMUM READING	ACCURACY (12 months) 18°-28°C ±(% rdg + digits)	TEMPERATURE COEFFICIENT 0°-18° and 28°-55°C ±(% rdg + digits)/°C	NOMINAL APPLIED CURRENT
2 kΩ	1.9999	0.04% + 2d	0.003% + 0.2d	1mA
20 kΩ	19.999	0.04% + 1d	0.003% + 0.2d	100μ A
200 kΩ	199.99	0.04% + 1d	0.003% + 0.2d	10μ A
2000 kΩ	1999.9	0.04% + 1d	0.003% + 0.2d	1μ A
20MΩ	19.999	0.10% + 1d	0.02 % + 0.2d	0.1μ A

Maximum Allowable Input: 250V rms sine, 350Vpeak.
 Maximum Voltage Across Unknown: 2V within range,
 5V open circuit.

Settling Time: 1 second to within 1 digit of final reading except 2 seconds on the 20MΩ range.

GENERAL

DISPLAY: Five 0.5" LED digits, appropriate decimal position and polarity indication.

CONVERSION PERIOD: 400 milliseconds.

ENVIRONMENT:

Operating: 0°C to 55°C;

0% to 80% relative humidity up to 40°C.

Storage: -25°C to +65°C.

POWER: 105-125 or 210-250 volts (switch selected), 90-1 10V available. 50-60Hz, 7 watts.

Optional 6 hour battery pack, Model 1788.

DIMENSIONS, WEIGHT: 85mm high x 235mm wide x 275mm deep (3-1/2 in. x 9-1/4 in. x 10-3/4 in.). Net weight: 1.7kg (3lbs., 13 oz).

OVERRANGE INDICATION: Display blinks all zeros above 19999 counts.

MAXIMUM COMMON MODE VOLTAGE: 1400V peak.

- 2-7. OPERATING INSTRUCTIONS.** Refer to Figure 2-3 and operate the DMM as follows:
- Turn on the power by depressing the ON/OFF pushbutton.
 - Select the function with the DCV, ACV or Ω pushbutton.
 - Select the range by depressing the appropriate pushbutton. For ac and dc voltage measurements there are four ranges available. For resistance measurements there are five ranges. The pushbuttons are interlocked to avoid improper settings.
 - Connect the source to the INPUT terminals.

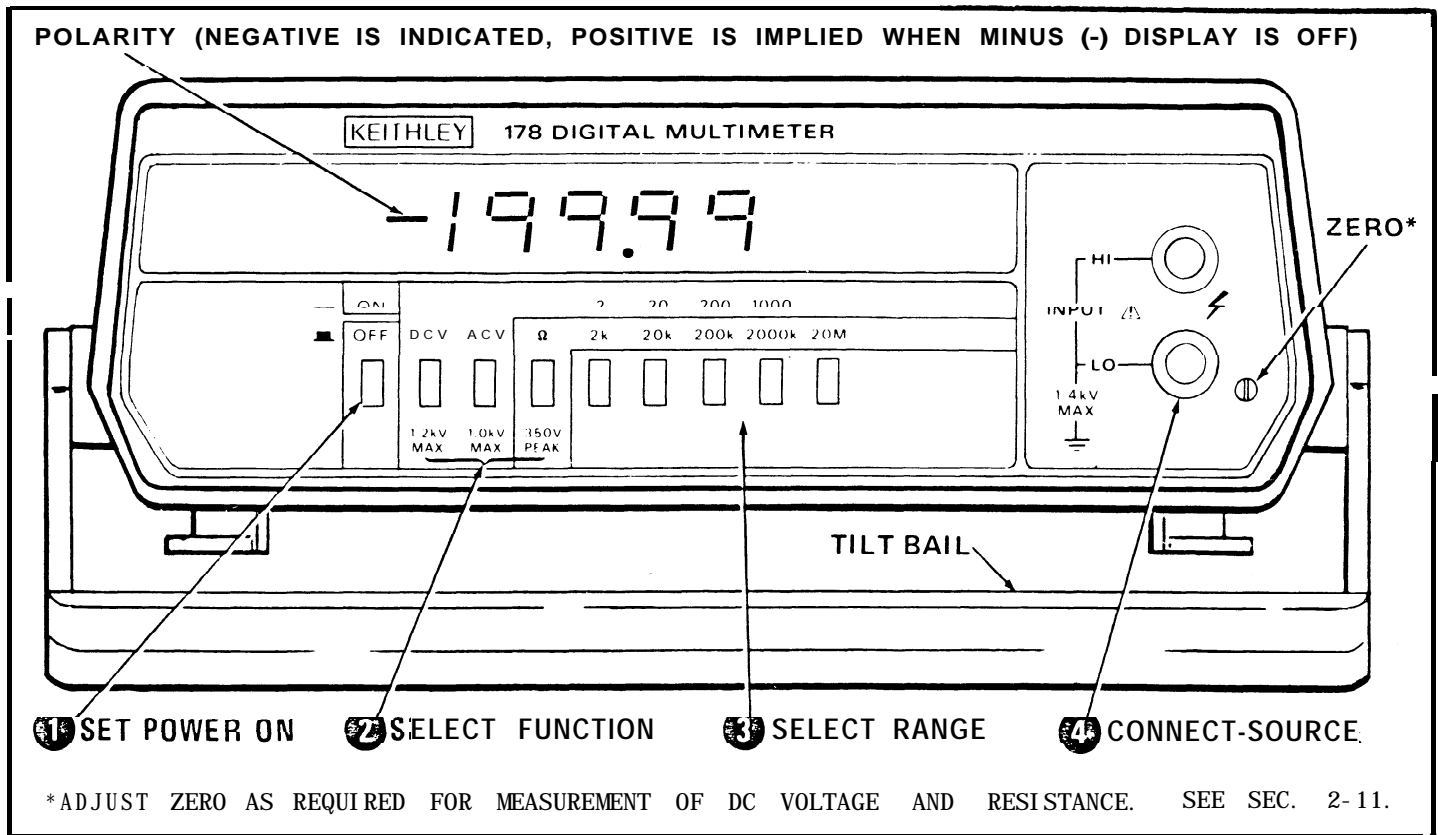


FIGURE 2-3. Operating Controls.

CAUTION

MAXIMUM RATINGS:

- DCV: (2V): 450V rms continuous; 1200V peak, for 8 seconds per minute.
 (20-1200V): 1200V peak.
- ACV: (All Ranges): 1000V rms; 10⁷V·Hz.
- Ω : (All Ranges): 250V rms sine wave or 350V peak.

2-8 DC VOLTAGE MEASUREMENT. Use the Model 178 DMM to measure dc volts as follows:

- a. Turn on power and depress the DCV pushbutton.
- b. Select the desired range from the four ranges available. The maximum reading is 19999. Over range is indicated by a flashing 0000 except on the 1000-volt range.

CAUTION



Do not exceed the maximum ratings. Instrument damage may occur.

- c. Negative polarity is displayed automatically. Positive polarity is implied when the minus (-) display is off.
- d. Zero the instrument as described in Paragraph 2-11 before the first use, whenever the instrument is used outside the temperature range of 18° to 28°C, and approximately weekly during normal use.

2-9. AC VOLTAGE MEASUREMENT. Use the Model 178 DMM to measure ac volts as follows:

- a. Turn on power and depress the ACV pushbutton.

CAUTION



Do not exceed the maximum ratings. Instrument damage may occur.

- b. Select the desired range from the four ranges available. The maximum reading is 19999. Overrange is indicated by a flashing 0000 except on the 1000-volt range. The instrument reads the root mean square value of a sine wave with a frequency of 45 to 20 kHz.
- c. The Model 1682 RF Probe (see Paragraph 2-12e) should be used to measure ac voltages with a frequency of 20kHz to 100MHz.

2-10. RESISTANCE (R) MEASUREMENT. Use the 178 DMM to measure resistance as follows:

- a. Turn on power and depress the Ω pushbutton.

CAUTION



Do not exceed the maximum ratings. instrument damage may occur.

- b. Select the desired range from the five ranges available. The maximum reading is 19999. Overrange is indicated by a flashing 0000. The letter k refers to kilohms, and M refers to megohms.
- c. The HI input terminal is positive and causes forward conduction of semiconductor junctions.
- d. Two volts is applied at full range with 5 volts maximum under open circuit conditions.
- e. Zero the instrument as described in Paragraph 2-11 before the first use whenever the instrument is used outside the temperature range of 18° to 28°C, and approximately weekly during normal use.

2-11. ZERO ADJUSTMENT. The zero adjustment nulls input offset on the 20, 200 and 1200 volt ranges and on all resistance ranges. Typically, this adjustment need not be performed more often than once a week unless the instrument is operated at ambient temperatures outside the range of 18° to 28°C. Zero adjustment may also be used for lead compensation on the Ω function. Zero the instrument as follows:

- a. Turn on the power and select DCV and the 20 range.
- b. Plug in test leads and short them. Adjust the zero adjust (pot R132) from the front panel with a small screwdriver to obtain a reading of 0000 or -0000.

2-12. ACCESSORIES. A wide range of accessories is available to facilitate use of the Model 178 DMM, extend its range and adapt it for additional uses.