

**MARTINDALE**  
ELECTRIC

## Specification

MM68

## Digital Multimeter



### ELECTRICAL

All specified accuracies are at  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ,  $<75\%$  RH for 1 year.

**Temperature Coefficient:** 0.1 x (specified accuracy) per  $^{\circ}\text{C}$ . ( $0^{\circ}\text{C}$  to  $18^{\circ}\text{C}$ ,  $28^{\circ}\text{C}$  to  $50^{\circ}\text{C}$ )

### DC VOLTS

**Ranges:** 220mV, 2.2V, 22V, 220V, 1000V

**Resolution:** 0.01mV, 0.0001V, 0.001V, 0.01V, 0.1 V

**Accuracy:**  $\pm (0.05\%$  of rdg + 5 dgts)

**Input impedance:** 220mV:  $>100\text{M}\Omega$ ;

2.2V:  $10\text{ M}\Omega$ ; 22V to 1000V:  $9.1\text{M}\Omega$ .

**Overload protection:** 1000V DC or 750 AC rms.

### TRUE RMS AC VOLTS

**Ranges:** 220mV, 2.2V, 22V, 220V, 750V

**Resolution:** 0.01mV, 0.0001V, 0.001V, 0.01V, 0.1V

**Accuracy:** 220mV range (50 Hz to 500 Hz)  $\pm (1.2\%$  of rdg + 10 dgts)

2.2V to 220V ranges (50 Hz to 500 Hz)  $\pm (1.2\%$  of rdg + 10 dgts)

(500 Hz to 2 kHz)  $\pm (2.0\%$  of rdg + 20 dgts)

750V range (50 Hz to 500 Hz)  $\pm (2.0\%$  of rdg + 20 dgts)

AC coupled true rms specified from 5% to 100% of range

**Crest factor:**  $\leq 3$

**Input impedance:** 220mV:  $>100\text{M}\Omega$ ; 2.2V:  $10\text{M}\Omega$ ; 22V to 750V:  $9.1\text{M}\Omega$

**Overload protection:** 1000V DC or 750 AC rms



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#### DC CURRENT

**Ranges:** 220 $\mu$ A, 2200 $\mu$ A, 22mA, 220mA, 10A \*

**Resolution:** 0.01 $\mu$ A, 0.1 $\mu$ A, 0.001mA, 0.01mA, 0.001A

**Accuracy:** 220 $\mu$ A to 22mA ranges  $\pm$  (0.5% of rdg + 10 dgts)

220mA range  $\pm$  (1.0% of rdg + 10 dgts)

10A range  $\pm$  (2.0% of rdg + 10 dgts)

\* Current on 10 A range applied for 60 seconds max followed by a 10 minute cooling period

**Input protection:** 0.5A/500V fast blow ceramic fuse

10A/500V fast blow ceramic fuse

#### TRUE RMS AC CURRENT

**Ranges:** 220 $\mu$ A, 2200 $\mu$ A, 22mA, 220mA, 10A \*

**Resolution:** 0.01 $\mu$ A, 0.1 $\mu$ A, 0.001mA, 0.01mA, 0.001 A

**Accuracy:** 220 $\mu$ A to 220mA (50 Hz to 1 kHz)  $\pm$  (1.5% of rdg + 5 dgts)

10A range (50 Hz to 1 kHz)  $\pm$  (2.5% of rdg + 5 dgts)

\* Current on 10 A range applied for 60 seconds max followed by a 10 minute cooling period

AC coupled true rms specified from 5% to 100% of range

**Crest factor:**  $\leq 3$

**Input protection:** 0.5A/500V fast blow ceramic fuse

10A/500V fast blow ceramic fuse.

#### RESISTANCE

**Ranges:** 220 $\Omega$ , 2.2k $\Omega$ , 22k $\Omega$ , 220k $\Omega$ , 2.2M $\Omega$ , 22M $\Omega$ , 220M $\Omega$

**Resolution:** 0.01 $\Omega$ , 0.0001k $\Omega$ , 0.001k $\Omega$ , 0.01k $\Omega$ , 0.0001M $\Omega$ , 0.001M $\Omega$ , 0.1M $\Omega$

**Accuracy:** 220 $\Omega$  to 220k ranges  $\pm$  (0.5% of rdg + 10 dgts)

2.2M $\Omega$  range  $\pm$  (1.0% of rdg + 10 dgts)

22M $\Omega$  range  $\pm$  (2.0% of rdg + 10 dgts)

220M $\Omega$  range  $\pm$  (5.0% of rdg + 10 dgts)



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**Open circuit voltage:** -0.45 V DC (-1.2 V DC on 220 $\Omega$  range)

**Overload protection:** 500 V DC or AC rms

### CAPACITANCE

**Ranges:** 22nF, 220nF, 2.2 $\mu$ F, 22 $\mu$ F, 220 $\mu$ F, 2.2mF, 22mF

**Resolution:** 0.001nF, 0.01nF, 0.0001 $\mu$ F, 0.001 $\mu$ F, 0.01 $\mu$ F, 0.0001mF, 0.001mF

**Accuracy:** 22nF range  $\pm$  (3.0% of rdg + 80 dgts)

220nF to 220 $\mu$ F ranges  $\pm$  (3.0% of rdg + 5 dgts)

2.2mF to 22mF range  $\pm$  (5.0% of rdg + 20 dgts)

**Overload protection:** 500 V DC or AC rms

### FREQUENCY

**Ranges:** 22Hz, 220Hz, 22kHz, 220kHz, 2.2MHz, 22MHz

**Resolution:** 0.01Hz, 0.1Hz, 0.001kHz, 0.01kHz, 0.0001MHz, 0.001MHz

**Accuracy:**  $\pm$  (0.1% of rdg + 3 dgts)

**Input sensitivity:** 2Hz ~ 2.2MHz: >2.5Vrms. 2.2MHz ~ 22MHz: >2.5Vrms and <5Vrms

**Minimum input:** 22Hz range > 2Hz. 220Hz range > 20Hz

**Minimum pulse width:** > 25ns

**Duty cycle limits:** > 30% and < 70%

**Overload protection:** 500VDC or AC rms

### DUTY CYCLE

**Range:** 10% to 95%

**Resolution:** 0.01%

**Pulse width:** >10us

**Frequency range:** 10% to 95% (40Hz to 20kHz)

**Accuracy:** (5V logic)  $\pm$  (2.0% rdg + 5 dgts)

**Overload protection:** 500V DC or AC rms



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## CONTINUITY

**Audible indication:**  $< 30\Omega$

**Response time:** 500ms

**Overload protection:** 500V DC or AC rms

## DIODE TEST

**Test current:** 1.2mA approx

**Resolution:** 0.1mV

**Accuracy:**  $\pm (2.0\% \text{ rdg} + 5 \text{ dgts})$

**Audible indication:**  $< 0.25\text{V}$

**Open circuit voltage:** 3.0V DC typical

**Overload protection:** 500V DC or AC rms

## GENERAL


**Display:**  $4\frac{1}{2}$  digit liquid crystal display with a maximum reading of 22000.

**Analog bargraph:** 22 segments with measurement 20 times per second.

**Polarity:** Automatic, positive implied, negative polarity indication

**Overrange:** (OL) or (-OL) is displayed

**Zero:** Automatic

**Low battery indication:**  symbol is displayed when the battery voltage drops below the operating level

**Measurement rate:** 3 times per second, nominal

**Auto power off:** After approx 30 minutes

**Operating environment:**  $0^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  at  $< 70\% \text{ RH}$

**Storage temperature:**  $-20^{\circ}\text{C}$  to  $60^{\circ}\text{C}$  at  $< 80\% \text{ RH}$

**Altitude:** Up to 2000m

**Power:** Single standard 9 volt battery, NEDA 1604, JIS006P, IEC 6F22.

**Battery Life:** 150 hours typical with carbon-zinc



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**Dimensions:** 165mm (H) x 78mm (W) x 42.5mm (D)

**Weight:** Approx. 285g

**Includes:** TL16 test leads, 1 x spare fuse, 9V battery (installed) and instructions

### **SAFETY:**

Conforms to BS EN 61010-1, CAT III 600 V, CAT II 1000V

Class II Double Insulation

Pollution Degree: 2 for indoor use

TL16 test leads conform to BS EN 61010-031, CAT III 1000V, CAT IV 600V, 10A.

**EMC:** Conforms to BS EN 61326.