## MM-200 MULTIMETER

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TESTING | TROUBLESHOOTING | ACCURACY
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## Product Features:

Equipped with all the measurement features you're likely to need, the MM-200 from Tempo Communications is a workhorse multimeter for most technicians.

Built to international safety standards, the MM-200 performs all the tests any electrician would want from a multimeter. Features like "BeepJack" help prevent damage when leads are attached to the wrong terminals for the type of test selected. Fully auto-ranging or manual-the choice is yours. The backlit LCD helps when testing in those awkward cupboards.

Supplied with a zipper case and high-quality safety test leads:

1. Fast response 24 segment "bar-graph"
2. 6000 Count large digit LCD
3. Core accuracy better than 0.5\%
4. Average responding AC measurements
5. Measurements

- Voltage (ac or dc)
- Current (ac or dc)
- Continuity
- Resistance
- Diode
- Frequency
- Electric Field (EF) voltage detector

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## Specifications:

| Display: | LCD (6000) and 24-segment bar graph |
| :---: | :---: |
| Polarity: | Automatic |
| Sampling Rate: | Numeric Display: 5 per second |
|  | Bar Graph Display: 40 per second |
| Temperature Coefficient: | Nominal $0.15 \times$ (specified accuracy) per ${ }^{\circ} \mathrm{C}$ below 18 ${ }^{\circ} \mathrm{C}$ or above $28^{\circ} \mathrm{C}$ |
| Automatic Power Off: | After 34 minutes of inactivity |
| Noise Rejection*: | Normal Mode Rejection Ratio > 60 dB at 50 Hz and 60 Hz when measuring DCV |
|  | Common Mode Rejection Ratio > 60 dB from OHz to 60 Hz when measuring ACV |
|  | Common Mode Rejection Ratio > 100 dB at $\mathrm{OHz}, 50$ Hz and 60 Hz when measuring DCV |
| Operation Conditions | $0^{\circ} \mathrm{C}$ to $40^{\circ} \mathrm{C}\left(32^{\circ} \mathrm{F}\right.$ to $\left.104^{\circ} \mathrm{F}\right)$ |
| Relative Humidity (non-condensing): | $80 \%$ maximum for temperatures up to $31^{\circ} \mathrm{C}\left(88^{\circ} \mathrm{F}\right)$, decreasing linearly to $50 \%$ maximum at $40^{\circ} \mathrm{C}(104$ ${ }^{\circ} \mathrm{F}$ ) |
| Altitude: | 2000 m (6500') maximum |
| Pollution Degree: | 2 |
| Storage Conditions: | $-20^{\circ} \mathrm{C}$ to $60^{\circ} \mathrm{C}\left(-4^{\circ} \mathrm{F}\right.$ to $\left.140^{\circ} \mathrm{F}\right)$ |
| Battery: | Two 1.5 V batteries (AAA, NEDA 24A or IEC LRO3) |
| Volts \& AutoCheck: | 1000 V DC/AC rms |
| $\mathrm{mV}, \Omega$, and Others: | 1000 V DC/AC rms |
| $\mu \mathrm{A}$ and mA : | $0.4 \mathrm{~A} / 1000 \mathrm{~V}$ DC/AC rms, IR 30kA @ 1000 V DC/AC rms; Dimension: $6 \times 32 \mathrm{~mm}$ |
| A: | 11A/1000V DC/AC rms, IR 20kA @ 1000 V DC/AC rms; Dimension: $10 \times 38 \mathrm{~mm}$ |
| V/ohms/mA/A to COM: | CAT III 600V and CAT IV 300V AC \& DC. |
| E.м.C: | Meets EN61326-1:2013 |

*Noise rejection is the ability to reject unwanted signals, or noise.

- Normal mode voltages are AC signals that can cause inaccurate DC measurements NMRR (Normal Mode Rejection Ratio) is a measure of the ability to filter out these signals.
Common mode voltages are signals present at the COM and + input terminals, with respect to ground, that can cause digit rattle or offset in voltage measurements. CMRR (Common Mode Rejection Ratio) is a measure of the ability to filter out these signals


## Accuracy:

| AC VOLTAGE |  |  |
| :---: | :---: | :---: |
| Range ( 50 Hz to 400 Hz ) | Accuracy |  |
| 60.00 mV | $\pm(0.12 \%+0.02 \mathrm{mV})$ |  |
| 600.0 mV | $\pm(0.06 \%+0.2 \mathrm{mV})$ |  |
| 6.000 V | $\pm(0.08 \%+0.002 \mathrm{~V})$ |  |
| 60.00 V | $\pm(0.08 \%+0.02 \mathrm{~V})$ |  |
| 600.0 V | $\pm(0.08 \%+0.2 \mathrm{~V})$ |  |
| 1000 V | $\pm(1.0 \%+5 \mathrm{~V})$ |  |
| DC VOLTAGE |  |  |
| Range | Accuracy |  |
| 60.00 mV | $\pm(0.4 \%+0.05 \mathrm{mV})$ |  |
| 600.0 mV | $\pm(0.2 \%+0.3 \mathrm{mV})$ |  |
| 6.000 V | $\pm(0.2 \%+0.003 \mathrm{~V})$ |  |
| 60.00 V | $\pm(0.2 \%+0.03 \mathrm{~V})$ |  |
| 600.0 V | $\pm(0.2 \%+0.3 \mathrm{~V})$ |  |
| 1000 V | $\pm(0.2 \%+3 \mathrm{~V})$ |  |
| AC CURRENT |  |  |
| Range ( 50 Hz to 400 Hz ) | Accuracy | Burden Voltage (typical) |
| $600.0 \mu \mathrm{~A}$ | $\pm(1.0 \%+0.3 \mu \mathrm{~A})$ | $0.1 \mathrm{mV} / \mathrm{\mu A}$ |
| $6000 \mu \mathrm{~A}$ | $\pm(1.0 \%+3 \mu \mathrm{~A})$ |  |
| 60.00 mA | $\pm(1.0 \%+0.03 \mathrm{~mA})$ | $1.7 \mathrm{mV} / \mathrm{mA}$ |
| 600.0 mA | $\pm(1.0 \%+0.3 \mathrm{~mA})$ |  |
| 6.000 A | $\pm(1.2 \%+0.006 \mathrm{~A})$ | $0.03 \mathrm{~V} / \mathrm{A}$ |
| $10.00 \mathrm{~A}^{*}$ | $\pm(1.8 \%+0.006$ A $)$ |  |
| DC CURRENT |  |  |
| Range | Accuracy | Burden Voltage (typical) |
| $600.0 \mu \mathrm{~A}$ | $\pm(0.5 \%+0.5 \mu \mathrm{~A})$ | $0.1 \mathrm{mV} / \mathrm{\mu A}$ |
| $6000 \mu \mathrm{~A}$ | $\pm(0.5 \%+3 \mu \mathrm{~A})$ |  |
| 60.00 mA | $\pm(0.5 \%+0.05 \mathrm{~mA})$ | $1.7 \mathrm{mV} / \mathrm{mA}$ |
| 600.0 mA | $\pm(0.5 \%+0.3 \mathrm{~mA})$ |  |
| 6.000 A | $\pm(1.2 \%+0.006 \mathrm{~A})$ | $0.03 \mathrm{~V} / \mathrm{A}$ |
| $10.00 \mathrm{~A}^{*}$ | $\pm(1.8 \%+0.006$ A $)$ |  |

*10 A continuous, > 10 A to 20 A for 30 second max with 5 minutes cool down interval

Frequency - Hz (Line) at ACV, DCV,
Current, AutoCheck ${ }^{\text {T }}$ Mode

| Function | Sensitivity (Sine RMS) | Range | RESISTANCE |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | Range | Accuracy |
| 6 V | 0.4 V | 10 Hz to 10 kHz | 600.0 ת | $\pm(0.5 \%+0.4 \Omega)$ |
| 60 V | 4 V | 10 Hz to 50 kHz | 6.000 kR | $\pm(0.5 \%+0.004 \mathrm{k} \Omega)$ |
|  |  |  | $60.00 \mathrm{k} \Omega$ | $\pm(0.5 \%+0.04 \mathrm{k} \cap)$ |
| 600 V | w40 V | 10 Hz to 50 kHz | 600.0 kn | $\pm(0.5 \%+0.4 \mathrm{k} \Omega)$ |
| 1000 V | 400 V | 45 Hz to 1 kHz | $6.000 \mathrm{M} \Omega$ | $\pm(0.7 \%+0.004 \mathrm{Mn})$ |
| $600 \mu \mathrm{~A}$ | $40 \mu \mathrm{~A}$ | 10 Hz to 10 kHz | $60.00 \mathrm{M} \Omega$ | $\pm(1.2 \%+0.04 \mathrm{Mn})$ |
|  |  |  | ACCURACY OF FREQUENCY RANGES |  |
| $6000 \mu \mathrm{~A}$ | $400 \mu \mathrm{~A}$ | 10 Hz to 10 kHz | Display Range | Accuracy |
| 60 mA | 4 mA | 10 Hz to 10 kHz | 10.00 Hz to 65.53 Hz | $\pm(0.03 \%+0.03 \mathrm{~Hz})$ |
| 600 mA | 40 mA | 10 Hz to 10 kHz | 65.5 Hz to 655.3 Hz | $\pm(0.03 \%+0.3 \mathrm{~Hz})$ |
|  |  |  | 0.655 kHz to 6.553 kHz | $\pm(0.03 \%+0.003 \mathrm{kHz})$ |
| 6 A | 1 A | 10 Hz to 1 kHz | 6.55 kHz to 50.00 kHz | $\pm(0.03 \%+0.03 \mathrm{kHz})$ |
| 10 A | 6 A | 10 Hz to 1 kHz | 6.000 A | $\pm(1.2 \%+0.006 \mathrm{~A})$ |
|  |  |  | 8.00 A* | $\pm(1.8 \%+0.006 \mathrm{~A})$ |


| FREQUENCY - LOGIC LEVEL Hz (mV FUNCTION) |  |  |
| :---: | :---: | :---: |
| Range | Accuracy | Sensitivity (square wave) |
| 5.0 Hz to 6.553 Hz | $\pm(0.03 \%+0.002 \mathrm{~Hz})$ | $3 \vee$ peak |
| 6.55 Hz to 65.53 Hz | $\pm(0.03 \%+0.02 \mathrm{~Hz})$ |  |
| 65.5 Hz to 655.3 Hz | $\pm(0.03 \%+0.2 \mathrm{~Hz})$ |  |
| 0.655 kHz to 6.553 kHz | $\pm(0.03 \%+0.002 \mathrm{kHz})$ |  |
| 6.55 kHz to 65.53 kHz | $\pm(0.03 \%+0.02 \mathrm{kHz})$ |  |
| 65.5 kHz to 500.0 kHz | $\pm(0.03 \%+0.2 \mathrm{kHz})$ |  |
| 500.0 kHz to 655.3 kHz | $\pm(0.03 \%+0.2 \mathrm{kHz})$ | 5 V peak |
| 0.655 MHz to 1.000 MHz | $\pm(0.03 \%+0.002 \mathrm{MHz})$ |  |
| NON-CONTACT ELECTRIC FIELD DETECTION (EF) |  |  |
| Typical Voltage | Bar Graph Indication | Frequency Range |
| 10 V to 36 V | - | 50 Hz to 60 Hz |
| 23 V to 83 V | -- |  |
| 59 V to 165 V | --- |  |
| 124 V to 330 V | ---- |  |
| 250 V to 1000 V | ---- |  |

