Digital Multimeter Series

TY700/TY500/732/731 Series

- **TY700** Series of 4.5-digit Handheld Multimeters
- **TY500** Series of 3.5-digit Handheld Multimeters
- **732** Series of 3.5-digit Handheld Multimeters
- **73101** of 3.5-digit Pocket Digital Multimeter

Yokogawa Meters & Instruments Corporation
Digital multimeters (DMMs) employ an A/D converter with a dual-integration system, which determines the measurement value by converting the input voltage into time using an integration AD converter. The interval to perform an integral action periodically is referred to as the integral action time.

**Measurement Accuracy**

With DMMs, the measurement accuracy is generally expressed as: \( \pm_\% \) of reading \( \pm \) digits. ("Reading" refers to the reading value, and is abbreviated as "rdg"; "digits" refers to the number displayed in the smallest decimal place, and is abbreviated as "dgt"). This expresses the range of values that a DMM may measure or represent for a given actual value.

**Root Mean Square Value**

The value most directly related to the energy of a given waveform. Refers to the average of the squares of instantaneous values of a waveform over a single cycle. (See Table 1, Figures 1 and 2.)

**Mean Value**

Refers to the average of the sum of instantaneous values, determined for a current half-wave. It is equivalent to calculating the surface area of a waveform.

**Form Factor**

Ratio of RMS value with respect to average value. Form factor = RMS value/mean value (See Figures 1 and 2.)

**Crest Factor**

Ratio of maximum value to RMS value. Crest factor = maximum value/RMS value (See Figures 1 and 2.)

**Peak-to-Peak (P-P) value**

Refers to the distance between the smallest and largest amplitudes in a waveform (see Figure 1).

**Decibel**

A unit used for describing the change in electrical signal amplitude or noise level, or transmission systems in wired devices, etc. This parameter is also used to represent the level differences in voltage, current or related values, but is generally restricted to cases characterized by the relationship: \( (V_1/V_2)^2 = P_1/P_2 \). In the abbreviation "dB," "d" (decibel) denotes 1/10, and "B" (Bell) denotes logarithm.

**Measurement categories (CAT)**

In order to ensure the safety of the user, IEC 60664 defines the ranges of use of measuring instruments by classifying power levels into measurement categories II through IV and O (None, other). This is because the excessive impulse or surge levels induced in a power line vary depending on the location of measurement (category). Categories with higher numerals designate locations that include larger surge voltages. Instruments that are designed for category III can thus withstand higher surge voltages than instruments designed for category II.

### Glossary

**Integral Action Time**

**Frequency Characteristic**

Refers to a characteristic that shows variations in input, measurement, or response with frequency. When measuring alternating current signals, a measured signal does not have a simple frequency, but often includes various frequencies ranging from lower frequencies to higher harmonics. To measure such signals more accurately, it is preferable to use a measurement device that has a broader frequency characteristic range.

**Input Impedance**

To prevent the measured object from being influenced during voltage measurement, you should use a measurement device with an extremely high input impedance.

**Crest factor**

Maximum value/RMS value

**Form factor**

RMS value/mean value

**Root Mean Square Value**

Average of the sum of instantaneous values, determined for a current half-wave.
Digital Multimeter Selection Guide

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Max. Value</th>
<th>Display</th>
<th>Measurement Items</th>
<th>Additional Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>TY710</td>
<td>Handheld</td>
<td>50000</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>TY720</td>
<td>Pocket-sized</td>
<td>6000</td>
<td>•</td>
<td>•</td>
<td></td>
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<tr>
<td>TY520</td>
<td>Pocket-sized</td>
<td>6000</td>
<td>•</td>
<td>•</td>
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<tr>
<td>TY530</td>
<td>Pocket-sized</td>
<td>6000</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>73201</td>
<td>Pocket-sized</td>
<td>4300</td>
<td>•</td>
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<tr>
<td>73202</td>
<td>Pocket-sized</td>
<td>4300</td>
<td>•</td>
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<tr>
<td>73203</td>
<td>Pocket-sized</td>
<td>4300</td>
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<td>73204</td>
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<td>4300</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>73101</td>
<td>Pocket-sized</td>
<td>4300</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
</tbody>
</table>

- : Also functions as excessive current input warning.
Maximum Measurement Accuracy
- 0.020% rdg + 2 dgt (DC voltage)
- True RMS measurement

Safe Design
Conforms to EN61010-1 safety standard
Conforms to measurement category 1000 V AC/DC, CAT III and 600 V AC/DC, CAT III

Shutters prevent erroneous insertion of test leads into current measurement terminals (terminal shutters)
The current terminals have terminal shutters that prevent erroneous setting of the measurement function and leadwire connections resulting from operational errors. The terminal shutters open and close according to the function switch position.

Closed Case Calibration
User calibration function
The TY series, simply performing special operations via front panel allows for quick and reliable adjustment. In addition, the series allows for one-touch adjustment of AC voltage- and AC current-to-frequency characteristics. The user calibration function leads to improved operation efficiency and cost reduction.
- External standard instrument required for calibration.

Full Support for Data Management
Two memory modes
- SAVE-mode memory
  A mode for manually saving any data
- Logging-mode memory
  A mode for automatically saving data at a specified interval
  Logging interval: 1 second to 30 minutes

Real-time measurement
The optional communication package*1 sold separately (Model 92015) allows you to connect to a PC for transmitting large amounts of data that cannot be saved in the DMM internal memory. You can transmit the saved data from the internal memory to a PC and process it using application software or spreadsheet software (Excel*2) for data management.
  - *1 Communication cable and application software are included.
  - *2 Excel is a registered trademark of Microsoft Corporation in the United States.
  - *3 The communication cable employs an infrared system, so the device is electrically insulated.

For details of the application software, refer to page 7.

Full Support for Data Management
Two memory modes
- SAVE-mode memory
  A mode for manually saving any data
- Logging-mode memory
  A mode for automatically saving data at a specified interval
  Logging interval: 1 second to 30 minutes

Min/Max/Average display
Allows recording of minimum, maximum and average values along with their respective times (time passed since the start of measurement)

Decibel calculation
Computes the logarithm of an alternating current, and uses it together with the relative value computation to display the relative value. You can select the standard resistance according to the application, such as audio or communication circuit signal measurement.

Full Display Functions
50,000-count, 51-segment bar graph display
Backlight provided as standard for when working in dark places.
Simultaneous display of frequency and voltage, frequency and duty ratio or decibels and voltage on the dual display.

AC+DC measurement
Measures RMS of a waveform in which ripple waveforms are superimposed on a direct current.

Auto hold
Automatically hold the data measured when the test leads are disconnected from the measured object, thus freeing both hands for performing reliable measurement.
**TY700 General Specifications**

**Measurement Functions**
- DC voltage, AC voltage, DC current, AC current, DCA, DCA, resistance, frequency, temperature, capacitance, duty cycle, digital calculation, continuity check, data hold, low-power measurements (TY720 only).

**Additional Features**
- Digital holdback level (TY720 only, range, hold function), maximum/minimum/average voltage, resistance, capacitance, relative and percentage value calculations, manual-mode memory, logging-mode memory, cursor power-off, 5-digit LED display.

**Display**
- 5-digit LCD; 7-segment.
- Data hold/auto hold/peak hold (TY720 only), range hold, maximum/minimum/average values.

**Measurement Rates**
- 6 times/sec (Frequency: 1 time/sec, Capacitance: max. 0.03 times/sec (50mF), Resistance: 4 times/sec).

**Dimensions**
- Approx. 100x102x4.485 mm.

**Weight**
- Approx. 680 g (including batteries).

**Battery Life**
- Approx. 120 hours (for continuous DC voltage measurement with alkaline cells).

**Emissions**
- EN61010-1, EN61010-2-030, EN61010-031, 1000V CAT.

**Compliance with Standards**
- AC coupling, RMS detection, crest factor for 1000V of range: 1.5; crest factor for ranges other than 1000V: 3.

**Safety**
- Four AA (R6) dry cells.

**Test Conditions**
- Temperature: 23 ± 5°C, 0% to 80% RH or less.

**Accuracy** (1) F.S ± dpp

**Input Impedance**
- DC voltage: 10 MΩ ± 5% (AT 5 to 100% of range, 10 to 100% for 10A range). Response time: 1 seconds or less.

**Input Voltage**
- 1000V rms DC.

**Input Current**
- 10A rms AC.

**AC Voltage Measurement (A)(B) (A)**
- AC coupling, RMS detection, crest factor for 1000V of range: 1.5; crest factor for ranges other than 1000V: 3.

**AC Current Measurement (A)**
- AC coupling, RMS detection, crest factor for 1000V of range: 1.5; crest factor for ranges other than 1000V: 3.

**DCA + AGA (1)**
- Maximum effective display: 100000, smallest unit: 1.

**Dichi Test**
- AC coupling, Maximum effective display: 100000, smallest unit: 1.

**Temperature Measurement (E)**
- AC coupling, Maximum effective display: 150°C.

**Capacitance (F)**
- Maximum effective display: 5000 µF.

**Low-power Measurement (P)**
- AC coupling, Maximum effective display: 300 µF.

**Resistor (J)**
- AC coupling, Maximum effective display: 100 kΩ.

**Optional Accessories**
- TY7100 Digital Multimeter
- TY720

**TY7100 Model and Specification Code**

**Measurement Functions**
- Same as TY700.

**Digital Multimeter**
- TY7100

**Measurement Rates**
- 5-digit LCD: 7-segment.

**Dimensions**
- Approx. 100x102x4.485 mm.

**Weight**
- Approx. 680 g (including batteries).

**Battery Life**
- Approx. 120 hours (for continuous DC voltage measurement with alkaline cells).

**EMC**
- EN61326-1 Class B, EN55011 Class B Group 1, EN61326-2-2.
Safe design and supports various maintenance applications.

**Maximum Reliability and Safety**

- **Reliability**
  - High accuracy and safety
  - Accuracy: 0.09% rdg + 2 dgt (DC voltage)
  - True RMS measurement
  - Only TY530 can switch RMS and mean detection.

**Safe Design**

- Conforms to EN61010-1 safety standard.
- Conforms to overvoltage category 1000 V AC/DC, CAT II and 600 V AC/DC, CAT IV.
- Shutter prevents erroneous insertion of test leads into current measurement terminals (terminal shutters).

If the function is switched to other than current measurement while a test lead remains inserted in a current measurement terminal, the fuse built into the DMM cannot protect the circuits. The terminal shutters prevent such accidental errors.

**Closed Case Calibration**

- User calibration function
  - The TY series, simply performing special operations via front panel allows for quick and reliable adjustment. In addition, the series allows for one-touch adjustment of AC voltage- and AC current-to-frequency characteristics. The user calibration function leads to improved operation efficiency and cost reduction.
  - External standard instrument required for calibration.

**Data Storage Method**

- Two memory modes (TY530 only)
  - Selectable from 2 types of memory mode to suit field needs.
    - **SAVE-mode memory**
      - A mode for manually saving any data
    - **Logging-mode memory**
      - A mode for automatically saving data at a specified interval

<table>
<thead>
<tr>
<th>Model</th>
<th>SAVE-mode memory</th>
<th>Logging-mode memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>TY530</td>
<td>100</td>
<td>1600</td>
</tr>
</tbody>
</table>

**Real-time measurement**

- The optional communication package*1 sold separately (Model 92015) allows you to connect to a PC for transmitting large amounts of data that cannot be saved in the DMM internal memory.
- You can transmit the saved data from the internal memory to a PC and process it using application software or spreadsheet software (Excel*2) for data management.

- Communication cable and application software are included.
- Excel is a registered trademark of Microsoft Corporation in the United States.
- The communication cable employs an infrared system, so the device is electrically insulated.

For details of the application software, refer to page 7.
**TY500 General Specifications**

- **Measurement Function:** DC Voltage, AC voltage, DC current, AC current, resistance, frequency, temperature, capacitance, continuity check, direct test for AC voltage/current, RMS/DCV detection can be switched (TY50S only).
- **Data hold/autot/hold/-range hold, maximum/minimum/memory values (TY50S only), residual,holds and percentage value calculation, memory function (TY50S only), communication function (TY50S only), logging/reduce memory (TY50S only), auto power-off (lightload)
- **Display:** 3.5-digit LCD, ~7-segment
- **Digital display:** ~300 points
- **Bar graph display:** ~37 segments
- **Polarity indicator:** ~300 points
- **Overload indication:** ~300 points
- **Low battery indicator:** ~300 points

**Measuring Rate**

- DC Voltage, AC voltage, DC current, AC current, resistance, temperature, capacitance, continuity check

**Measurement Functions**

- **Operating Temp. and Humidity:**
  - Operating Temp.: -10 to 55°C; 80% RH or less (no condensation)
  - High temperature operation: -25 to 60°C; 80% RH or less

**Power Supply**

- Free AA (R6) dry cells: 4
- Test lead set (98015): 1
- Fuse (installed): 440mA/1000V and 10A/1000V
- Instruction manual: 1

**Standard Accessories**

- 6.88kV for 5 seconds (between input terminals and casing)
- Withstanding Voltage: Approx. 570g (including batteries)

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**TY500**

**DC Current Measurement**

- **Range:** 0.01A to 10A
- **Accuracy:** ±3.5% of reading + 2% of F.S.
- **Input Voltage Range:** 0.01V to 1000V

**AC Current Measurement**

- **Range:** 0.01A to 10A
- **Accuracy:** ±3.5% of reading + 2% of F.S.
- **Input Voltage Range:** 0.01V to 1000V

**Capacitance**

- **Range:** 0.01µF to 1000µF
- **Accuracy:** ±3.5% of reading + 2% of F.S.
- **Input Voltage Range:** 0.01V to 1000V

**DC Voltage Measurement**

- **Range:** 0.01V to 1000V
- **Accuracy:** ±3.5% of reading + 2% of F.S.
- **Input Voltage Range:** 0.01V to 1000V

**Frequency Measurement**

- **Range:** 0.01Hz to 10MHz
- **Accuracy:** ±3.5% of reading + 2% of F.S.
- **Input Voltage Range:** 0.01V to 1000V

---

**Table:**

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Input Voltage Range</th>
<th>Maximum Input Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01V</td>
<td>0.001V</td>
<td>±3.5%</td>
<td>0.01V to 1000V</td>
<td>1000V DC</td>
</tr>
</tbody>
</table>

**Optional Accessories**

- **Carrying case:** 93029 (Houses the DMM, the test leads and communication cable)
- **Test leads with Alligator Clip:** 99014 (1000V CAT III)
- **Communication cable + Application software:** DMM communication package (TY50S only)

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**Features**

- A compact, light, and portable device with 12-mm caliber useful for tangled wiring.
- When used with this probe, the DMM can measure and display current (which it otherwise cannot do by itself).
- The TY500 series can directly read up to 60 A when used with the probe (in sensor mode).

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**Specifications**

- **Model:** 96095
- **Number of measurable contacts:** 10
- **Current Range:** 0.01A to 10A
- **Input Voltage Range:** 0.01V to 1000V
- **Accuracy:** ±3.5% of reading + 2% of F.S.
- **Battery Life:** Approx. 5 hours
- **Dimensions and Weight:** 127(L) x 42(W) x 22(D) mm, 2.2 kg
- **Specifications:**
  - **Temperature and Humidity:** -10 to 55°C; 80% RH or less
  - **Power Supply:** 9V alkaline battery or 1.5V alkaline battery
  - **Battery life:** Approx. 50 hours
  - **Dimensions:** 127(L) x 42(W) x 22(D) mm
  - **Weight:** Approx. 220g
  - **Safety:** Class II construction, tamper-resistant probe

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**NEW Accessory**

**AC/DC clamp-on probe (Model 96095)**

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**Digital Multimeter**

- **Model:** TY50S
- **Specifications:**
  - **Input Voltage Range:** 0.01V to 1000V
  - **Accuracy:** ±3.5% of reading + 2% of F.S.
  - **Battery Life:** Approx. 50 hours
- **Features:**
  - **Zero offset calibration:** ±3.5% of reading + 2% of F.S.
  - **Battery life:** Approx. 50 hours
  - **Specifications:**
    - **Input Voltage Range:** 0.01V to 1000V
    - **Accuracy:** ±3.5% of reading + 2% of F.S.
Communication Functions and Application Software Allow Analyses and Management of Measurement Data

Data management by dedicated application software

Data saved in the DMM can be managed by the dedicated application software (Model 92015).

- Saved data can be transmitted from the internal memory to a PC.
- Data collected in SAVE-memory mode or logging-memory mode can be monitored on a PC in real time.
- Large amounts of data that cannot be saved in the DMM internal memory can be transmitted to a PC in real time.
- Data can be written to an Excel* spreadsheet.
- Maximum number of real-time data transmission: 32767
- Measurement data can be laid out in an Excel spreadsheet.
- Graphs can be automatically created on a spreadsheet.

* Excel is a registered trademark of Microsoft Corporation in the United States.

92015 Communications Package Specifications

- **Specifications**
  - Communication cable: IR communication adapter, USB communication cable: 1
  - Cable length: 2 m
  - Interface: USB 1.1
  - Supported models: TY710, TY720, TY530

- **Application software**
  - **System requirements of PC**
    - Operating system: WindowsXP/Vista™/7
    - CPU: Pentium 133 MHz or higher
    - Memory: 64 MB or larger
    - Storage device: Hard disk with 10 MB or more free space
    - CD-ROM drive: 1
    - Excel: Excel2003 or later (*)
    - Contents: CD-ROM software: 1
      - Communication cable (communication adapter included): 1
      - User’s manual
  
  * Windows and Excel is a registered trademark of Microsoft Corporation in the United States.

Optional Accessories*

* For TY710, TY720, and TY530 only

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMM communication package</td>
<td>92015</td>
<td>USB communication cable (adaptor included), application software</td>
</tr>
</tbody>
</table>
Low-cost Handheld DMM

- Compact size, ideal for carrying
- Large display for easy viewing
- Safe design allows measurement in excess of 20 A (excluding 73204)
- Special model for voltage measurement (73204)
- Simple auto hold function
- Capacitors can be checked (73202/73203)

Performance

DC Voltage Measurement (± V)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resistance</th>
<th>Maximum Input Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>±10 V</td>
<td>5%</td>
<td>&gt;15 kΩ</td>
<td>0.75 mA</td>
</tr>
<tr>
<td>±20 V</td>
<td>10%</td>
<td>&gt;50 kΩ</td>
<td>3 mA</td>
</tr>
<tr>
<td>±50 V</td>
<td>20%</td>
<td>&gt;200 kΩ</td>
<td>10 mA</td>
</tr>
</tbody>
</table>

Resistance Measurement (Ω)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resistance</th>
<th>Maximum Input Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>±10 kΩ</td>
<td>1%</td>
<td>&gt;15 kΩ</td>
<td>0.75 mA</td>
</tr>
<tr>
<td>±20 kΩ</td>
<td>2%</td>
<td>&gt;50 kΩ</td>
<td>3 mA</td>
</tr>
<tr>
<td>±50 kΩ</td>
<td>5%</td>
<td>&gt;200 kΩ</td>
<td>10 mA</td>
</tr>
</tbody>
</table>

Capacitor Check (µF)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resistance</th>
<th>Maximum Input Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>±1 µF</td>
<td>1%</td>
<td>&gt;100 pF</td>
<td>10 µA</td>
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<tr>
<td>±10 µF</td>
<td>10%</td>
<td>&gt;1 kΩ</td>
<td>100 µA</td>
</tr>
<tr>
<td>±100 µF</td>
<td>100%</td>
<td>&gt;10 kΩ</td>
<td>10 mA</td>
</tr>
</tbody>
</table>

AC Voltage Measurement (V)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resistance</th>
<th>Maximum Input Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>±1 V</td>
<td>&lt;0.5%</td>
<td>&gt;100 kΩ</td>
<td>10 µA</td>
</tr>
<tr>
<td>±2 V</td>
<td>1%</td>
<td>&gt;500 kΩ</td>
<td>70 µA</td>
</tr>
<tr>
<td>±5 V</td>
<td>2%</td>
<td>&gt;2 MΩ</td>
<td>1 mA</td>
</tr>
</tbody>
</table>

AC Current Measurement (A)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resistance</th>
<th>Maximum Input Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.1 A</td>
<td>0.7%</td>
<td>&gt;100 kΩ</td>
<td>0.75 mA</td>
</tr>
<tr>
<td>±1 A</td>
<td>1%</td>
<td>&gt;500 kΩ</td>
<td>70 µA</td>
</tr>
<tr>
<td>±5 A</td>
<td>2%</td>
<td>&gt;2 MΩ</td>
<td>1 mA</td>
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AC Voltage Measurement (V)

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<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resistance</th>
<th>Maximum Input Current</th>
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<tbody>
<tr>
<td>±1 V</td>
<td>&lt;0.5%</td>
<td>&gt;100 kΩ</td>
<td>10 µA</td>
</tr>
<tr>
<td>±2 V</td>
<td>1%</td>
<td>&gt;500 kΩ</td>
<td>70 µA</td>
</tr>
<tr>
<td>±5 V</td>
<td>2%</td>
<td>&gt;2 MΩ</td>
<td>1 mA</td>
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</table>

AC Current Measurement (A)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resistance</th>
<th>Maximum Input Current</th>
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</thead>
<tbody>
<tr>
<td>±0.1 A</td>
<td>0.7%</td>
<td>&gt;100 kΩ</td>
<td>0.75 mA</td>
</tr>
<tr>
<td>±1 A</td>
<td>1%</td>
<td>&gt;500 kΩ</td>
<td>70 µA</td>
</tr>
<tr>
<td>±5 A</td>
<td>2%</td>
<td>&gt;2 MΩ</td>
<td>1 mA</td>
</tr>
</tbody>
</table>
## Pocket DMM with Superb Portability

### General Specifications

**Model:** 73101

- **Additional Functions:** Auto hold, Display
- **Display:** Digital display: 4300-count digital reading
- **Measuring Rate:** Auto range: Approx. 2 times/sec
- **Operating Temp. and Humidity:** -20°C to 50°C, 80% RH or less (no condensation)
- **Storage Temp. and Humidity:** -25°C to 55°C, 70% RH or less (no condensation)
- **Power Supply:** Two LR44 dry cells
- **Battery Life:** Approx. 380 hours (for continuous DC voltage measurement)
- **Auto Power Off:** The power is automatically turned off when no operation is made for approx. 20 minutes (can be disabled).
- **Dimensions:** 78 mm x 117 (H) x 18 (D) mm
- **Weight:** Approx. 110 g (including batteries)
- **Compliance with Standards:** Safety: EM61010-2-02, EM61010-031, EM61010-1 (300 V, CAT II; contamination level 2)
  - EMC: EN61326-1, EN61326-2-2, EN55011 Class B Group 1
- **Standard Accessories:** User's manual: 1, LR44 dry cells: 2

### Performance

**Test conditions:** Temperature and humidity = 23°C ± 5°C, 80% RH or less; Accuracy = ±% of reading + digits.

#### DC Voltage Measurement (V DC)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resistance</th>
<th>Maximum Input Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.0 mV</td>
<td>±1.2%</td>
<td>&gt;10 MΩ</td>
<td>600 V</td>
</tr>
<tr>
<td>4.000 mV</td>
<td>±2.0%</td>
<td>&gt;1 MΩ</td>
<td>600 V</td>
</tr>
<tr>
<td>40.00 mV</td>
<td>±1.2%</td>
<td>&gt;10 MΩ</td>
<td>600 V</td>
</tr>
<tr>
<td>400 V</td>
<td>±2.0%</td>
<td>&gt;1 MΩ</td>
<td>600 V</td>
</tr>
</tbody>
</table>

#### AC Voltage Measurement (V AC)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resistance</th>
<th>Maximum Input Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 V</td>
<td>±1.5%</td>
<td>&gt;10 MΩ, &lt;0.01 µF</td>
<td>600 V</td>
</tr>
<tr>
<td>40.00 V</td>
<td>±2.0%</td>
<td>&gt;10 MΩ, &lt;0.01 µF</td>
<td>600 V</td>
</tr>
</tbody>
</table>

#### Resistance Measurement (Ω)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Maximum Testing Current</th>
<th>Input Protection Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 MΩ</td>
<td>±2.0%</td>
<td>&lt;0.5 mA</td>
<td>&lt;0.7 V</td>
</tr>
<tr>
<td>4.000 MΩ</td>
<td>±5.0%</td>
<td>&lt;1.0 mA</td>
<td>&lt;0.7 V</td>
</tr>
<tr>
<td>40.00 MΩ</td>
<td>±7.0%</td>
<td>&lt;7 µA</td>
<td>&lt;0.7 V</td>
</tr>
</tbody>
</table>

#### Continuity Check (Ω)

<table>
<thead>
<tr>
<th>Range</th>
<th>Continuity Beep</th>
<th>Open-circuit Voltage</th>
<th>Input Protection Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 MΩ</td>
<td>50 ± 20 Ω</td>
<td>&gt;0.7 V</td>
<td>&lt;0.7 V</td>
</tr>
</tbody>
</table>

#### Diode Test (V DC)

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Testing Current</th>
<th>Open-circuit Voltage</th>
<th>Input Protection Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 V</td>
<td>±1.5%</td>
<td>&lt;1.0 mA</td>
<td>&gt;0.7 V</td>
<td>&lt;0.7 V</td>
</tr>
</tbody>
</table>

#### Additional Functions

- Auto hold
- Display: Digital display: 4300-count digital reading
- Measuring Rate: Approx. 2 times/sec
- Operating Temp. and Humidity: -20°C to 50°C, 80% RH or less (no condensation)
- Storage Temp. and Humidity: -25°C to 55°C, 70% RH or less (no condensation)
- Power Supply: Two LR44 dry cells
- Battery Life: Approx. 380 hours
- Auto Power Off: The power is automatically turned off when no operation is made for approx. 20 minutes (can be disabled).
## Optional Accessories and Spare Parts

<table>
<thead>
<tr>
<th>Name</th>
<th>Model</th>
<th>Specification</th>
<th>Applicable DMM Models</th>
<th>Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMM communication package</td>
<td>92015</td>
<td>USB communication adapter + USB communication cable + Application software</td>
<td>TY700 series TY530</td>
<td></td>
</tr>
<tr>
<td>Test leads</td>
<td>98073</td>
<td>1000V CAT.III 600V CAT.IV Red/black (1set)</td>
<td>All models except 73101</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RD031</td>
<td>L-plug, Red/black (1set)</td>
<td>732 series</td>
<td></td>
</tr>
<tr>
<td>Test leads with Alligator Clip</td>
<td>99014</td>
<td>1000V CAT.III 600V CAT.IV Red/black (1set)</td>
<td>All models except 73101</td>
<td></td>
</tr>
<tr>
<td>Alligator clips</td>
<td>B9646HF</td>
<td>Red/black (1set)</td>
<td>All models</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F02</td>
<td>15A/250V (3pcs/1set)</td>
<td>73201/73202/73203</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F05</td>
<td>500mA/250V (3pcs/1set)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>99015</td>
<td>440mA/100V (1pc/1set)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>99016</td>
<td>10A/1000V (1pc/1set)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuse</td>
<td>93007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B9646GB</td>
<td>Hard case (Houses the DMM, the test leads and communication cable)</td>
<td>TY700/TY500 series</td>
<td></td>
</tr>
<tr>
<td>Test leads</td>
<td>93029</td>
<td>Hard case (Houses the DMM, the test leads and communication cable)</td>
<td>TY700/TY500 series</td>
<td></td>
</tr>
<tr>
<td>Calibrating temperature type K probe</td>
<td>90050</td>
<td>-50°C to 600°C (for liquid)</td>
<td>TY700/TY500 series</td>
<td></td>
</tr>
<tr>
<td></td>
<td>90055</td>
<td>-20°C to 250°C (for surface)</td>
<td>TY700/TY500 series</td>
<td></td>
</tr>
<tr>
<td></td>
<td>90056</td>
<td>-20°C to 50°C (for surface)</td>
<td>TY700/TY500 series</td>
<td></td>
</tr>
<tr>
<td>Test leads</td>
<td>90001</td>
<td>400A AC; 10mV/A AC output</td>
<td>All models except 73101</td>
<td></td>
</tr>
<tr>
<td>Current clamp probe</td>
<td>96095</td>
<td>130A AC/180A DC; 10mV/A AC output</td>
<td>All models except 73101</td>
<td></td>
</tr>
<tr>
<td></td>
<td>96001</td>
<td>For 400A AC; 10mV/A AC output</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Current Clamp Probe: TY700/TY500 series (Direct reading is possible for TY500 series)

<table>
<thead>
<tr>
<th>Name</th>
<th>96026</th>
<th>96033</th>
<th>96030</th>
<th>96031</th>
<th>96032</th>
<th>96034</th>
<th>96035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Clamp Probe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measureable Conductor Diameter</td>
<td>dia. 40mm</td>
<td>dia. 18mm</td>
<td>dia. 30mm</td>
<td>dia. 30mm</td>
<td>dia. 65mm</td>
<td>dia. 65 x 100mm</td>
<td>dia. 170mm</td>
</tr>
<tr>
<td>Output Voltage</td>
<td>50mV, AC</td>
<td>500mV, AC</td>
<td>500mV, AC</td>
<td>500mV, AC</td>
<td>250mV, AC</td>
<td>500mV, AC</td>
<td>500mV, AC</td>
</tr>
<tr>
<td>Accuracy (varies according to input/amp)</td>
<td>±0.5% of rdg</td>
<td>±0.5% of rdg</td>
<td>±0.5% of rdg</td>
<td>±0.5% of rdg</td>
<td>±1.0% of rdg</td>
<td>±1.0% of rdg</td>
<td>±1.0% of rdg</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>20Hz - 5kHz</td>
<td>20Hz - 20kHz</td>
<td>20Hz - 20kHz</td>
<td>20Hz - 5kHz</td>
<td>45Hz - 66Hz</td>
<td>30Hz - 1.5kHz</td>
<td>10Hz - 2kHz</td>
</tr>
<tr>
<td>Maximum Circuit Voltage</td>
<td>50V, AC</td>
<td>300V, AC</td>
<td>600V, AC</td>
<td>600V, AC</td>
<td>600V, AC</td>
<td>600V, AC</td>
<td>1000V, AC (pri)</td>
</tr>
</tbody>
</table>

Note: Use AC voltage range of the DMM.
Note: Need to convert the meter reading except TY500 series.

## Basic Usage Digital Multimeters

### Voltage/Resistance Measurement

The COM terminal and VΩ terminal are used. To measure a voltage, set the dial to voltage measurement. To measure a resistance, set the dial to resistance measurement. Some DMM models can also display the frequency and calculated decibel value at the same time when measuring an AC voltage. During resistance measurement, it is possible to switch the function to checking the continuity of the measured circuit.

### Current Measurement

The COM terminal, and A µA or mA terminal are used. Some models have shutters for preventing erroneous insertion into the current terminals and allow a contact of a lead to a current terminal only when the dial is set to current measurement. For these models, you cannot set the dial to voltage measurement while a lead is left inserted into a current terminal. This feature provides greater safety.

### Measuring a Voltage and Resistance

- **Measurement probe**
  - DC power supply
  - AC power supply

### Diode Test

A current flows through a diode when the power supply is connected as (1) below, while, almost no current flows when the power supply is connected as (2). The diode test function applies an adequate forward voltage across a diode to make a constant current flow and measures the voltage drop in the forward direction to determine the forward and reverse directions of the diode.

### Measuring a Current

- **Measurement probe**
  - DC power supply
  - The circuit needs to be open for connection.