YOKOGAWA

Test Equipment Depot - 800.517.8431 - 99 Washington Street Melrose, MA 02176 - TestEquipmentDepot.com

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

73101

Pocket DMM
73101

TY720

0.020% Maximum Measurement Accuracy
TY720

TY530

0.09% Accuracy RMS Measurement
TY530

73203

Low-end Model
73203

Communication Package
92015

Yokogawa Meters & Instruments Corporation

Glossary

Integral Action Time

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 integralaction time.

Measurement Accuracy

With DMMs, the measurement accuracy is generally expressed as: ±__% of reading + __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 square root of a value found by averaging 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).

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.

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: $(I_1/I_2)^2 = (V_1/V_2)^2 = P_1/P_2$. In the abbreviation "dB," "d" (deci) denotes 1/10, and "B" (Bell) denotes logarithm.

Table 1. RMS Value, Average Value, Waveform Factor and Crest Factor for a Typical Periodic Waveform

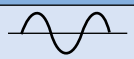
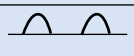
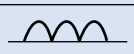
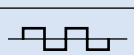
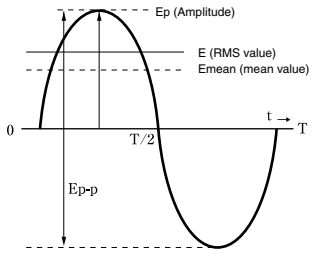
Item	Waveform	RMS	Mean value	Waveform factor	Crest factor
Sine wave		$\frac{1}{\sqrt{2}}$ =0.707	$\frac{2}{\pi}$ =0.637	$\frac{\pi}{2\sqrt{2}}$ =1.11	$\sqrt{2}$ =1.414
Half rectification wave		$\frac{1}{2}$ =0.5	$\frac{1}{\pi}$ =0.318	$\frac{\pi}{2}$ =1.571	2
Full rectification wave		$\frac{1}{\sqrt{2}}$ =0.707	$\frac{2}{\pi}$ =0.637	$\frac{\pi}{2\sqrt{2}}$ =1.11	$\sqrt{2}$ =1.414
Triangular wave		$\frac{1}{\sqrt{3}}$ =0.577	$\frac{1}{2}$ =0.5	$\frac{2}{\sqrt{3}}$ =1.155	$\sqrt{3}$ =1.732
Square wave		1	1	1	1

Figure 1. RMS and Mean Values of Sine Wave



RMS value

$$E=\sqrt{\frac{1}{T}\int_0^T e^2(t)\,dt} \quad \text{(energy)}$$

Mean value

$$Emean=\frac{1}{T}\int_0^T |e(t)|dt \quad \text{(surface area)}$$

Calibration of RMS value by mean value rectification

$$E=\frac{1}{\sqrt{2}}\,Ep=0.7071\cdot Ep$$

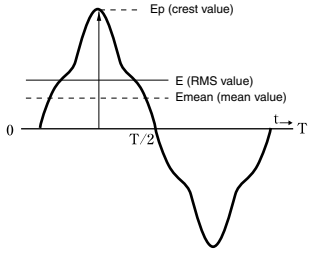
$$Emean=\frac{2}{\pi}\,Ep=0.6366\cdot Ep$$

$$E=\frac{\pi}{2\sqrt{2}}\,Emean=1.11\cdot Emean$$

P-P value

$$Ep\text{-}p=2\sqrt{2}\;E=2.828\cdot E$$

Figure 2. RMS of Distorted Waves



Instantaneous value and spectrum

$$e(t)=a_0+a_1\cos wt+\cdots+a_n\cos nwt+b_1\sin wt+\cdots+b_n\sin nwt$$

DC component — Fundamental wave component — Harmonic component

RMS of each spectrum

$$|En|=\frac{\sqrt{a_n^2+b_n^2}}{\sqrt{2}}$$

RMS value

$$E=\sqrt{E_0^2+|E_1|^2+|E_2|^2+\cdots+|E_n|^2}$$

Crest factor (CF)

$$CF=\frac{\text{Crest value}}{\text{RMS value}}$$

$$\text{Waveform factor}=\frac{\text{RMS value}}{\text{mean value}}$$

CE Mark

The products of Yokogawa Meters & Instruments Corporation are subjected to design and evaluation testing to ensure compliance with the safety and EMC standards in accordance with the directives issued by the EC.

Electromagnetic Compatibility (EMC)

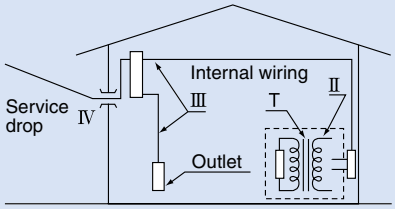
The parameters EMI and EMS are referred to as electromagnetic compatibility as they relate to compatibility within an electromagnetic environment.

Safety Standards

These standards lay out safety requirements that are to be met by a product with the objective of the preservation of human life and property. The applicable international standard is IEC 61010, and while a product must conform to this standard, there are also domestic standards laid out by individual countries. With these safety regulations, the range of use of a measurement device is specified by categorization in measurement categories I through IV to ensure the safety of the user. The designations "CAT II, 1000 V" or "CAT III, 600 V" at the input terminals of a measurement device, for example, indicates the applicable category and the maximum voltage for the device in terms of safety.

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.



Measurement category	Description	Remarks
O (None, other)	Other circuits that are not directly connect to MEAINS.	
CAT.II	For measurement performed on circuits directly connected to the low-voltage installation.	Appliances, portable equipments, etc.
CAT.III	For measurement performed in the building installation.	Switchboard, circuit breaker, etc.
CAT.IV	For measurement performed at the source of the low-voltage installation.	Overhead wire, cable systems, etc.

Digital Multimeter Selection Guide

Model	Type	Max. Value	Display: Dual	Display: Bar Graph	Display: Back-lit	Measurement Items: AC RMS	Measurement Items: Voltage	Measurement Items: AC + DC	Measurement Items: Current	Measurement Items: AC + DC A	Measurement Items: Resistance	Measurement Items: Continuity Check	Measurement Items: Diode Test	Measurement Items: Frequency	Measurement Items: Temperature	Measurement Items: Capacitance	Measurement Items: Filter	Additional Functions: Communication	Additional Functions: Data Memory	Additional Functions: Max./Min. Value Memory	Additional Functions: Relative Value Computation	Additional Functions: Logarithm Computation	Additional Functions: Data Hold	Additional Functions: Auto Hold	Additional Functions: Peak Hold	Additional Functions: Overvoltage Input Warning	Additional Functions: PC Connection	Additional Functions: Auto Power Off	External View
TY710	Handheld	50000	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	
TY720			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
TY520		6000		●	●	●	●		●		●	●	●	●	●	●	●			●		●	●		●			●	
TY530				●	●	●	●		●		●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	
73201		4300					●		●		●	●	●										●		◎		●	
73202							●		●		●	●	●			●							●		◎		●	
73203							●		●		●	●	●			●							●		◎		●	
73204							●				●	●	●										●		◎		●	
73101	Pocket-sized	4300					●				●	●	●										●				●	

◎ : Also functions as excessive current input warning.

TY700 Series

Most Reliable Handheld Digital Multimeters

Model

TY720
TY710

4.5 digits | 50,000 count | RMS | USB | Terminal shutters | 0.020% (DCV) | LPF (TY720) | AC50mV (TY720)

3-year Warranty

c UL us LISTED

CE

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 Ⅳ

Shutters prevent erroneous insertion of test leads into current measurementterminals (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

	Memory capacity	
Model	SAVE-mode memory*	Logging-mode memory*
TY710	100	1000
TY720		10000

* Saved data can be checked on the display.

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 insolated.

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

Loaded with Measurement Functions

Peak hold function (TY720, for DC V/A measurement)

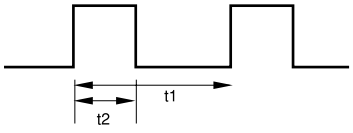
Supports waveforms of 1 ms or greater. You can capture instantaneous crest values not possible with ordinary maximum measurement functions.

Relative and percentage value computation

Can display the measured values as the values relative to a reference value (defined by the REL key; even after data hold) or as the percentages of the reference value.
Percentage calculation: (Measured value – reference value) / (reference value), expressed as percentage.

Duty ratio (%) measurement

Displays the duty ratio of a pulse waveform:
(High level period/1 cycle of waveform) x 100 = (t2/t1) x 100 [%]



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.

Minimum/maximum/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.

* Selectable standard resistance values:
4/8/16/32/50/75/93/110/125/135/150/200/250/300/500/600/800/900/1000/1200Ω

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.

Display: V AC and V DC measurements

In addition to the above, the sub-display can display the reference value for differential calculation, memory storage numbers for measured data, minimum/maximum/average value recording times, and standard resistance during decibel calculation.

TY700 General Specifications

Measurement Functions :DC voltage, AC voltage, DCV+ACV, DC current, AC current, DCA+ACA, resistance, frequency, temperature, capacitance, duty cycle, decibel calculation, continuity check, diode test, low-power resistance (TY720 only)
For AC voltage/current, RMS/MEAN detection can be switched (TY720 only).
For AC voltage/current, the low-pass filter can be turned on/off (TY720 only).

Additional Functions :Data hold/auto hold/peak hold (TY720 only), range hold, maximum/minimum/average values resistance, capacitance zero, relative and percentage value calculation, manual-mode memory, logging-mode memory, auto power off, backlight (white LED)

Display :5-digit LCD: ····· 7-segment
Digital display: ····· Main display; [50,000] counts
Sub-display ; [50,000] counts
Bar graph display: ····· 51-segment
Polarity indicator: ····· "-" appears automatically when the polarity is negative
Overrange indicator: ····· "OL"
Low-battery indicator: ····· " ± − " appears at or below the minimum operating voltage.

Measuring Rate :6 times/sec (Frequency: 1 time/sec, Capacitance: max. 0.03 times/sec (50mF), Resistance: 4 times/sec)
Bar graph display: 15 times/sec

Operating Temp. and Humidity :-20 to 55°C; 80% RH or less (no condensation) 40 to 55°C: 70% RH or less

Storage Temp. and Humidity :-40 to 70°C; 70% RH or less (no condensation)

Temperature Coefficient :Add the accuracy 0.05/°C to the basic accuracy at a temperature within -20 to 18°C and 28 to 55°C. For continuous measurements, add 1 digit/°C for DC voltage (DCV) and DC current (DCA). (Add 3 digits/°C for 50mV, 5A, and 10A ranges)

Power Supply :Four AA (R6) dry cells

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

Withstanding Voltage :6.88kV for 5 seconds (between input terminals and casing)

Dimensions :Approx. 90(W) x 192(H) x 49(D) mm

Weight :Approx. 560g (including batteries)

Compliance with Standards :Safety EN61010-1, EN61010-2-030, EN61010-031, 1000V CAT Ⅲ, 600V CAT Ⅳ, pollution level 2, indoor, 2000m max. above sea level
UL 61010-1, CAN/CSA-C22.2 No. 61010-1,
UL 61010-031, CAN/CSA-C22.2 No. 61010-031
EMC: EN61326-1 Class B, EN55011 Class B Group 1, EN61326-2-2

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

Model and Specification Code

Name	Model
Digital Multimeter	TY710
	TY720

Optional Accessories

Name	Model	Specification
DMM communication package	92015	USB communication adapter + USB communication cable + Application software
Test leads	98073	1000V CAT Ⅲ, 600V CAT Ⅳ Red/black (1 set)
Test leads with Alligator Clip	99014	1000V CAT Ⅲ, 600V CAT Ⅳ Red/black (1 set)
Fuse	99015	440 mA/1000V (1 piece/1 unit)
	99016	10 A/1000 V (1 piece/1 unit)
TC-K temperature probe	90050B	-50 to 600°C (For liquids)
	90051B	-50 to 600°C (For liquids)
	90055B	-20 to 250°C (For surfaces)
	90056B	-20 to 500°C (For surfaces)
Current clamp probe	96001	For 400A, AC Output: 10mV/A, AC
Carrying case	93029	Hard type (Houses the DMM, the test leads and communication cable)

Performance

Test conditions: Temperature and humidity = 23 ± 5°C, 80% RH or less; Accuracy = ± (% rdg + dgt).
Note: A response time is the time required for achieving the accuracy specified for the corresponding range.

DC Voltage Measurement(⎓V)

Range	Resolution	Accuracy TY710,TY720	Input Resistance	Maximum Input Voltage
50mV	0.001mV	0.05+10	Approx. 100MΩ	1000V DC 1000V rms AC
500mV	0.01mV	0.02+2		
2400mV	0.1mV			
5V	0.0001V	0.025+5	10MΩ	
50V	0.001V	0.03+2		
500V	0.01V			
1000V	0.1V			

NMRR: 80dB or greater for 50/60Hz ± 0.1%At 50mV of range, 70dB or greater for 50/60Hz ± 0.1%
CMRR: 100dB or greater for 50/60Hz(Rs=1kΩ) Response time: 0.3 seconds or less

DC Current Measurement (⎓A)

Range	Resolution	Accuracy TY710,TY720	Voltage Drop	Maximum Input Current
500µA	0.01µA	0.2+5	<0.11mV/µA	440mA fuse-protected
5000µA	0.1µA			
50mA	0.001mA		<4mV/mA	
500mA *3	0.01mA			
5A	0.0001A	0.6+10	<0.1V/A	10A fuse-protected
10A	0.001A	0.6+5		

Response time: 0.3 seconds or less *3: Maximum testing current at 500mA of range is 440mA

AC Voltage Measurement [RMS] (~V) AC coupling, RMS detection, crest factor for 1000V of range: 1.5 ; crest factor for ranges other than 1000V: 3

Range	Resolution	Accuracy (Upper: TY710; Lower: TY720; the display of "—" is not specified) 10 - 20Hz	20Hz - 1kHz	1k - 10kHz	10k - 20kHz	20k - 50kHz	50k - 100kHz	Input Impedance	Maximum Input Voltage
50mV	0.001mV	— 2+80*2	— 0.4+40*2	— 5+40*2	— 5.5+40*2	— 15+40*2		11MΩ<50pF	1000V rms AC 1000V DC
500mV	0.01mV								
5V	0.0001V	1.5+30*1	0.7+30*1		2+50*2	—	—		
50V	0.001V	1+30*1	0.4+30*1		1+40*1	2+70*2	5+200*2		
500V	0.01V							10MΩ<50pF	
1000V	0.1V	*2 *2	*2 *2	3+30*2 3+30*2	—				

*1: At 5 to 100% of range *2: At 10 to100% of range CMRR: 80dB or greater for DC to 60Hz(Rs= 1kΩ) Response time: 1 second or less

AC Current Measurement [RMS] (~A) RMS detection crest factor: 3

Range	Resolution	Accuracy (Upper: TY710; Lower: TY720; the display of "—" is not specified) 10 - 20Hz	20Hz - 1kHz	1k - 5kHz	Voltage Drop	Maximum Input Current
500µA	0.01µA	1.5+20 1+20	1+20 0.75+20	— 1+30	<0.11mV/µA	440mA fuse-protected
5000µA	0.1µA					
50mA	0.001mA				<4mV/mA	
500mA *3	0.01mA					
5A	0.0001A	1.5+20	1+20	—	<0.1V/A	10A fuse-protected
10A	0.001A	1.5+20	1+20	2+30		

Shown above is the accuracy at 5 to 100% of range (10 to 100% for 10A range). Response time: 1 second or less
*3: Maximum testing current at 500mA of range is 440mA.

AC Voltage Measurement [MEAN] (~V) AC coupling, Mean-value detection and RMS-value calibration (sinusoidal wave)

Range	Resolution	Accuracy TY720 10 - 20Hz	20 - 500Hz	500 - 1kHz	Input Impedance	Maximum Input Voltage
50mV	0.001mV	4+80*2	1.5+30*2	5+30*2	11MΩ<50pF	1000V rms AC 1000V DC
500mV	0.01mV	2+30*1	1+30*1	3+30*1		
5V	0.0001V					
50V	0.001V				10MΩ<50pF	
500V	0.01V					
1000V	0.1V	*2	*2	*2		

*1: At 5 to 100% of range *2: At 10 to 100% of range CMRR: 80dB or greater for DC to 60Hz (Rs= 1kΩ) Response time: 1 second or less

AC Voltage Measurement [MEAN] (~A) Mean-value detection and RMS-value calibration (sinusoidal wave)

Range	Resolution	Accuracy TY720 10 - 20Hz	20 - 500Hz	500Hz - 1kHz	Voltage Drop	Maximum Input Current
500µA	0.01µA	2+20	1.5+20	2+30	<0.11mV/µA	440mA fuse-protected
5000µA	0.1µA					
50mA	0.001mA				<4mV/mA	
500mA *3	0.01mA					
5A	0.0001A	3+20	2+20	4+30	<0.1V/A	10A fuse-protected
10A	0.001A					

Shown above is the accuracy at 5 to 100% of range (10 to 100% for 10A range). Response time: Approx. second or less
*3: Maximum testing current at 500mA of range is 440mA.

DCV + ACV (⎓+~) AC coupling, RMS detection crest factor for 1000V of range: 1.5 ; crest factor for ranges other than 1000 V: 3

Range	Resolution	Accuracy (Upper: TY710; Lower: TY720; the display of "—" is not specified) DC,10 - 20Hz	DC,20Hz - 1kHz	DC,1k - 10kHz	DC,10k - 20kHz	DC,20k - 50kHz	DC,50k - 100kHz	Input Impedance	Maximum Input Voltage
5V	0.0001V	1.5+10*1	1+10*1		2+10*2	—	—	11MΩ<50pF	1000V rms AC 1000V DC
50V	0.001V	1.5+10*1	0.5+10*1		1+10*1	2+10*2	5+20*2		
500V	0.01V							10MΩ<50pF	
1000V	0.1V	*2 *2	*2 *2	—					

*1: At 5 to 100% of range *2: At 10 to 100% of range CMRR: 80dB or greater for DC to 60Hz (Rs = 1kΩ) Response time: Approx. 2 seconds

DCA + ACA (⎓+~) Maximum effective display: 50,000, crest factor: 3

Range	Resolution	Accuracy (Upper: TY710; Lower: TY720; the display of "—" is not specified) DC,10 - 20Hz	DC,20Hz - 1kHz	DC,1k - 5kHz	Voltage Drop	Maximum Input Current
500µA	0.01µA	2+10 1.5+10	1.5+10 1+10	— 1.5+10	<0.11mV/µA	440mA fuse-protected
5000µA	0.1µA					
50mA	0.001mA				<4mV/mA	
500mA *3	0.01mA					
5A	0.0001A	2+10	1.5+10	—	<0.1V/A	10A fuse-protected
10A	0.001A	2+10	1.5+10	3+10		

Shown above is the accuracy at 5 to 100% of range (10 to 100% for 10A range). Response time: Approx. 2 seconds *3: Maximum testing current for 500mA of range is 440mA.

Resistance Measurement (Ω)

Range	Resolution	Accuracy TY710	Accuracy TY720	Maximum Testing Current	Open-circuit Voltage	Input Protection Voltage
500Ω	0.01Ω	0.1+2*1	0.05+2*1	<1mA	<2.5V	1000V rms
5kΩ	0.0001kΩ			<0.25mA		
50kΩ	0.001kΩ			<25µA		
500kΩ	0.01kΩ			<2.5µA		
5MΩ	0.0001MΩ	0.5+2		<1.5µA		
50MΩ	0.001MΩ	1+2		<0.13µA		

*1: Accuracy after zero calibration Response time: 1 second or less for 500Ω to 500kΩ, 5 seconds or less for 5MΩ to 50MΩ

Low-power Resistance Measurement (LP-Ω) Maximum effective display: 5000

Range	Resolution	Accuracy TY720	Maximum Testing Current	Open-circuit Voltage	Input Protection Voltage
5kΩ	0.001kΩ	0.2+3	<10µA	<0.7V	1000V rms
50kΩ	0.01kΩ		<1.0µA		
500kΩ	0.1kΩ		<0.6µA		
5MΩ	0.001MΩ	1+3	<0.05µA		

Continuity Check (•))))

Range	Resolution	Continuity Beeper TY710, TY720	Testing Current	Open-circuit Voltage	Input Protection Voltage
500Ω	0.1Ω	Buzzer sounds at 100 ± 50Ω or less.	Approx. 0.5mA	<5V	1000V rms

Diode Test (→|←)

Range	Resolution	Accuracy TY710,TY720	Testing Current (Vf = 0.6 V)	Open-circuit Voltage	Input Protection Voltage
2.4V	0.0001V	1 + 2	Approx. 0.5mA	<5V	1000V rms

Temperature Measurement (TEMP)

Range	Resolution	AccuracyTY710,TY720	Input Protection Voltage
-200 - 1372°C	0.1°C	1+1.5°C	1000V rms

Temperature probe: Type K thermocouple sensor (optional)

Capacitance (⊣⊢) Maximum effective display:5000

Range	Resolution	AccuracyTY710,TY720	Input Protection Voltage
5nF	0.001nF	1+5*1	1000V rms
50nF	0.01nF		
500nF	0.1nF		
5µF	0.001µF		
50µF	0.01µF		
500µF	0.1µF	2+5	
5mF	0.001mF	3+5	
50mF	0.01mF		

*1: Accuracy after zero calibration

Frequency Measurement (Hz) AC coupling, Maximum effective display: 9999

Range (auto-ranging)	Resolution	Accuracy TY710,TY720
2.000 - 9.999Hz	0.001Hz	0.02+1*1
9.00 - 99.99Hz	0.01Hz	
90.0 - 999.9Hz	0.1Hz	
0.900 - 9.999kHz	0.001kHz	
9.00 - 99.99kHz	0.01kHz	*2

*1: At 10 to 100% of input voltage or current range
*2: At 40 to 100% of input voltage or current range

Duty Cycle (%)

Range	Resolution	Accuracy TY710,TY720
10 - 90%	1%	± 1%*1

*1: For input of a square wave with a frequency within 10.00 to 500.0Hz At 40 to 100% of input voltage or current range

Peak Hold Function (PH) TY720 only Maximum effective display: 5000

Range	Accuracy TY720	Response Time
DCV, DCA	± 100 digit	>250µs

Optional Accessories and Spare Parts

Name	Model	Specification	Applicable DMM Models	Appearance
DMM communication package	92015	USB communication adapter + USB communication cable + Application software	TY700 series TY530	
Test leads	98073	1000V CAT.III 600V CAT.IV Red/black (1set)	All models except 73101	
	RD031	L-plug, Red/black (1set)	732 series	
Test leads with Alligator Clip	99014	1000V CAT.III 600V CAT.IV Red/black (1set)	All models except 73101	
Alligator clips	B9646HF	Red/black(1set)	All models	
Fuse	F02	15A/250V (3pcs/1set)	73201/73202/73203	
	F05	500mA/250V(3pcs/1set)		
	99015	440mA/1000V(1pc/1set)	TY700/TY500 series	
	99016	10A/1000V(1pc/1set)		
Rubber case	93007		732 series	
Carrying case	B9646GB	Hard case		
	93029	Hard case (Houses the DMM, the test leads and communication cable)	TY700/TY500 series	
Temperature (thermocouple type K) probe	90050B	-50°C to 600°C(for liquid)	TY700/TY500 series	
	90051B	-50°C to 600°C(for liquid)		
	90055B	-20°C to 250°C(for surface)		
	90056B	-20°C to 500°C(for surface)		
Current clamp probe	96001	For 400A AC; 10mV/A AC output	All models except 73101 (with TY500 series upto 60A can be read directly)	
	96095	For 130A AC/180A DC; 10mV/A AC/DC output		

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

Name	96036	96033	96030	96031
Current Clamp Probe				
Measurable Conductor Diameter	dia. 40mm	dia. 18mm	dia. 30mm	dia. 30mm
Measurement Range	2A,AC	50A,AC	200A,AC	500A,AC
Output Voltage	50mV,AC	500mV,AC	500mV,AC	500mV,AC
Accuracy *varies according to input/Amplitude	±0.5% of rdg	±0.5% of rdg	±0.5% of rdg	±0.5% of rdg
Frequency Range	20Hz - 5kHz	20Hz - 20kHz	20Hz - 20kHz	20Hz - 5kHz
Maximum Circuit Voltage	50V,AC	300V,AC	600V,AC	600V,AC

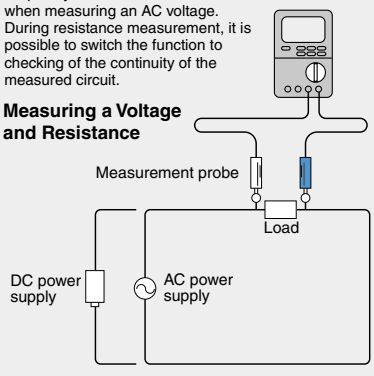
Note:Use AC voltage range of the DMM.
Note:Need to covert the meter reading except TY500series.

Basic Usage Digital Multimeters

Voltage/Resistance Measurement

The COM terminal and V/Ω 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 of the continuity of the measured circuit.

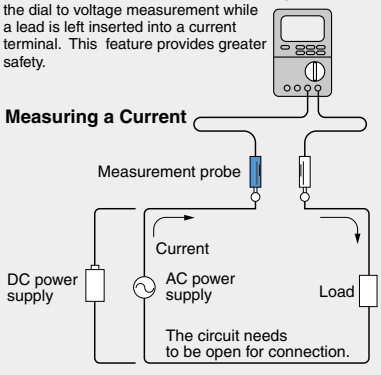
Measuring a Voltage and Resistance



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 Current



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.

Checking the Polarity of a Diode