

**NEW**

**YOKOGAWA** 

# High Accuracy & Performance Digital Multimeter

**TY700 series Advanced Type TY720/Standard Type TY710**

## Most Reliable Handheld DMM

### •Highest Precision

- Basic accuracy 0.020%
- True RMS measurement

### •New Functions for Electronic and Industrial Use

- Simultaneous measurement and display of DC and AC
- Switchable RMS/MEAN detection\*
- Low-pass Filter (LPF)\*
- AC50mV range\*
- Lo-Power resistance measurement\*  
\*TY720 only

### •Full Support for Data Management

- A large-capacity logging-mode memory  
TY720: 10,000 data  
TY710: 1,000 data
- USB communication, application software  
(Optional DMM communication package)

### •Safe Design and Wide Temperature Range for Harsh Use

- Conforms to safety standards EN61010-1  
1000V CAT. III, 600V CAT. IV
- Safety shutters for preventing erroneous insertion of test leads into current measurement terminals
- Operating temperature range -20 to +55°C
- Storage temperature range -40 to +70°C

### •Closed Case Calibration

### •3-year Warranty



Advanced type

**TY720**

Standard type

**TY710**

Yokogawa Meters & Instruments Corporation

LF TY720/710-E

**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
Communication package for printer	97016	Printer adapter + Printer cable
Printer	97010	Thermal printer Paper width 112mm
AC adapter for printer	94005	AC 100V ± 10%
	94006	For Printer, Europe
Thermal printing paper	97080	10 rolls (1 set)
Test leads	98015	100V CAT III, 600V CAT IV Red/black (1 set)

Name	Model	Specification
Fuse	99015	440 mA/1000V (1 piece/1 unit)
	99016	10 A/1000 V (1 piece/1 unit)
TC-K temperature probe	90050	-50 to 600°C (For liquids)
	90051	-50 to 600°C (For liquids)
	90055	-20 to 250°C (For surfaces)
	90056	-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)

**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.

**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, EN61010-031, 1000V CAT III, 600V CAT IV, pollution level 2, indoor, 2000m max. above sea level  
 EMC: EN61326-1 Class B, EN55011 Class B Group 1

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

**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
500mV	0.01mV	0.02+2		
2400mV	0.1mV	0.025+5	10MΩ	1000V rms AC
5V	0.0001V	0.03+2		
50V	0.001V			
500V	0.01V			
1000V	0.1V			

CMRR: 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

**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)					Input Impedance	Maximum Input Voltage
		10 - 20Hz	20Hz - 1kHz	1k - 10kHz	10k - 20kHz	20k - 50kHz		
50mV	0.001mV	2+80 <sup>+2</sup>	0.4+40 <sup>+2</sup>	5+40 <sup>+2</sup>	5.5+40 <sup>+2</sup>	15+40 <sup>+2</sup>	11MΩ<50pF	1000V rms AC 1000V DC
500mV	0.01mV							
5V	0.0001V	1.5+30 <sup>+1</sup>	0.7+30 <sup>+1</sup>	2+50 <sup>+2</sup>	—	—	10MΩ<50pF	1000V rms AC 1000V DC
50V	0.001V	1+30 <sup>+1</sup>	0.4+30 <sup>+1</sup>	2+70 <sup>+2</sup>	—	5+200 <sup>+2</sup>		
500V	0.01V							
1000V	0.1V							

\*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) (-V)** AC coupling, Mean-value detection and RMS-value calibration (sinusoidal wave)

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

\*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

**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)						Input Impedance	Maximum Input Voltage
		DC, 10 - 20Hz	DC, 20Hz - 1kHz	DC, 1k - 10kHz	DC, 10k - 20kHz	DC, 20k - 50kHz	DC, 50k - 100kHz		
5V	0.0001V	1.5+10 <sup>+1</sup>	1+10 <sup>+1</sup>	2+10 <sup>+2</sup>	—	—	11MΩ<50pF	1000V rms AC 1000V DC	
50V	0.001V	1.5+10 <sup>+1</sup>	0.5+10 <sup>+1</sup>	1+10 <sup>+1</sup>	2+10 <sup>+2</sup>	—			
500V	0.01V					5+20 <sup>+2</sup>	10MΩ<50pF	1000V rms AC 1000V DC	
1000V	0.1V								

\*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

**Resistance Measurement (Ω)**

Range	Resolution	Accuracy		Maximum Testing Current	Open-circuit Voltage	Input Protection Voltage
		TY710	TY720			
500Ω	0.01Ω	0.1+2 <sup>+1</sup>	0.05+2 <sup>+1</sup>	<1mA	<2.5V	1000V rms
5kΩ	0.0001kΩ			<0.25mA		
50kΩ	0.001kΩ			<25μA		
500kΩ	0.01kΩ			<2.5μA		
5MΩ	0.0001MΩ			<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
50kΩ	0.01kΩ	<1.0μA			
500kΩ	0.1kΩ	<0.6μA			
5MΩ	0.001MΩ	<0.05μA			

**Continuity Check (⊘)**

Range	Resolution	Continuity Buzzer 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

**DC Current Measurement (±A)**

Range	Resolution	Accuracy TY710, TY720	Voltage Drop	Maximum Input Current
500μA	0.01μA	0.2+2	<0.11mV/μA	440mA fuse-protected
5000μA	0.1μA			
50mA	0.001mA	0.6+2	<4mV/mA	10A fuse-protected
500mA <sup>±</sup>	0.01mA			
5A	0.0001A			
10A	0.001A			

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

**AC Current Measurement (RMS) (-A)**

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

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

**DCA + ACA (±+)**

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

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.

**Diode Test (-K)**

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	Accuracy TY710, TY720	Input Protection Voltage
-200 - 1372°C	0.1°C	1+1.5°C	1000V rms

Temperature probe: Type K thermocouple sensor (optional)

**Capacitance (-H)**

Range	Resolution	Accuracy TY710, TY720	Input Protection Voltage
5nF	0.001nF	1+5 <sup>+1</sup>	1000V rms
50nF	0.01nF		
500nF	0.1nF		
5μF	0.001μF		
50μF	0.01μF		
500μF	0.1μF		
5mF	0.001mF		
50mF	0.01mF		

**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 <sup>+1</sup>
9,00 - 99,99Hz	0.01Hz	
90,0 - 999,9Hz	0.1Hz	
0,900 - 9,999kHz	0.001kHz	
9,00 - 99,99kHz	0.01kHz	

\*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

**YOKOGAWA**  
 Yokogawa Meters & Instruments Corporation

World Wide Web site at  
<http://www.yokogawa.com/MCC>

**NOTICE**  
 Before using the product, read the instruction manual carefully to ensure proper and safe operation.

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