3.2 Accuracy

Test conditions:

Temperature and humidity: 23±5°C at 80%RH or less

Accuracy: ±(% of reading + digits)

Note: Each response time is a value to rated accuracy within selected range.

DC Voltage Measurement ⎓ V

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

NMRR: 80dB or more 50/60Hz ±0.1%
(70dB or more 50/60Hz ±0.1% when 50mV Range)

CMRR: 100dB or more 50/60Hz (Rs=1kΩ)

Response time: 0.3 sec max.

AC Voltage Measurement [RMS] ~ V
TY710

AC Coupling, Rms-value detection, Crest factor*: <3

Range	Resolution	Accuracy				Input Impe-dance	Maximum Input Voltage
		10 to 20Hz	20Hz to 1kHz	1k to 10kHz	10k to 20kHz		
500mV	0.01mV	1.5+30 *1	0.7+30 *1		2+50 *2	11MΩ <50pF	1000V rms AC
5V	0.0001V						
50V	0.001V					10MΩ <50pF	1000V DC
500V	0.01V						
1000V *	0.1V	*2	*2	3+30 *2	-		

*: Crest factor <1.5 at 1000V range

Accuracy *1: At 5 to 100% of range, *2: At 10 to 100% of range

CMRR: 80dB or more DC to 60Hz (Rs=1kΩ)

Response time: 1 sec max.

AC Voltage Measurement [RMS] ~ V

TY720

AC Coupling, Rms-value detection, Crest factor*: <3

<table>
<tr><th rowspan="2">Range</th><th rowspan="2">Reso-lution</th><th colspan="6">Accuracy</th><th rowspan="2">Input Impedance</th><th rowspan="2">Maximum Input Voltage</th></tr>
<tr><th>10 to 20Hz</th><th>20Hz to 1kHz</th><th>1k to 10kHz</th><th>10k to 20kHz</th><th>20k to 50kHz</th><th>50k to 100kHz</th></tr>
<tr><td>50mV</td><td>0.001mV</td><td>2+80 *2</td><td>0.4+40 *2</td><td>5+40 *2</td><td>5.5+40 *2</td><td colspan="2">15+40 *2</td><td rowspan="2">11MΩ <50pF</td><td rowspan="3">1000V rmsAC</td></tr>
<tr><td>500mV</td><td>0.01mV</td><td rowspan="4">1+30 *1</td><td colspan="2" rowspan="4">0.4+30 *1</td><td rowspan="4">1+40 *1</td><td rowspan="4">2+70 *2</td><td rowspan="4">5+200 *2</td></tr>
<tr><td>5V</td><td>0.0001V</td><td rowspan="3">10MΩ <50pF</td></tr>
<tr><td>50V</td><td>0.001V</td><td rowspan="2">1000V DC</td></tr>
<tr><td>500V</td><td>0.01V</td></tr>
<tr><td>1000V*</td><td>0.1V</td><td>*2</td><td>*2</td><td>3+30 *2</td><td colspan="3">-</td></tr>
</table>

*: Crest factor <1.5 at 1000V range

Accuracy *1: At 5 to 100% of range, *2: At 10 to 100% of range

CMRR: 80dB or more DC to 60Hz (Rs=1kΩ)

Response time: 1 sec max.

AC Voltage Measurement [MEAN] ~ V

TY720

AC Coupling, MEAN value detection, RMS value calibration (sine wave)

<table>
<tr><th rowspan="2">Range</th><th rowspan="2">Reso-lution</th><th colspan="3">Accuracy</th><th rowspan="2">Input Impedance</th><th rowspan="2">Maximum Input Voltage</th></tr>
<tr><th>10 to 20 Hz</th><th>20 to 500 Hz</th><th>500Hz to 1 kHz</th></tr>
<tr><td>50mV</td><td>0.001mV</td><td>4+80 *2</td><td>1.5+30 *2</td><td>5+30 *2</td><td rowspan="2">11MΩ <50pF</td><td rowspan="3">1000V rmsAC</td></tr>
<tr><td>500mV</td><td>0.01mV</td><td rowspan="4">2+30 *1</td><td rowspan="4">1+30 *1</td><td rowspan="4">3+30 *1</td></tr>
<tr><td>5V</td><td>0.0001V</td><td rowspan="3">10MΩ <50pF</td></tr>
<tr><td>50V</td><td>0.001V</td><td rowspan="2">1000V DC</td></tr>
<tr><td>500V</td><td>0.01V</td></tr>
<tr><td>1000V</td><td>0.1V</td><td>*2</td><td>*2</td><td>*2</td></tr>
</table>

Accuracy *1: At 5 to 100% of range, *2: At 10 to 100% of range

CMRR: 80dB or more DC to 60Hz (Rs=1kΩ)

Response time: 1 sec max.

DCV+ACV ⎓ + ∼
TY710

Maximum Reading 50000, Crest factor*: <3

Range	Resolution	Accuracy				Input Impedance	Maximum Input Voltage
		DC, 10 to 20Hz	DC, 20Hz to 1kHz	DC, 1k to 10kHz	DC, 10k to 20kHz		
5V	0.0001V	1.5+10 *1	1+10 *1		2+10 *2	11MΩ <50pF	1000V rms AC
50V	0.001V					10MΩ <50pF	1000V DC
500V	0.01V						
1000V*	0.1V	*2	*2	-			

DCV+ACV ⎓ + ∼
TY720

Maximum Reading 50000, Crest factor*: <3

Range	Resolution	Accuracy						Input Impedance	Maximum Input Voltage
		DC, 10 to 20Hz	DC, 20Hz to 1kHz	DC, 1k to 10kHz	DC, 10k to 20kHz	DC, 20k to 50kHz	DC, 50k to 100kHz		
5V	0.0001V	1.5+10 *1	0.5+10 *1		1+10 *1	2+10 *2	5+20 *2	11MΩ <50pF	1000V rms AC
50V	0.001V							10MΩ <50pF	1000V DC
500V	0.01V								
1000V*	0.1V	*2	*2	-					

*: Crest factor <1.5 at 1000V range
Accuracy *1: At 5 to 100% of range, *2: At 10 to 100% of range
CMRR: 80dB or more DC to 60Hz (Rs=1kΩ)
Response time: Approx. 2 sec

DC Current Measurement ⎓ A

Range	Resolution	Accuracy	Voltage Drop	Maximum Input Current
		TY710, TY720		
500μA	0.01μA	0.2+5	<0.11mV/μA	440mA Protected by a 440mA/1000V fuse.
5000μA	0.1μA			
50mA	0.001mA		<4mV/mA	
500mA*3	0.01mA			
5A	0.0001A	0.6+10	<0.1V/A	10A Protected by a 10A/1000V fuse.
10A	0.001A	0.6+5		

*3: Maximum measurement current : 440mA at 500mA range
Response time: 0.3 sec max.
Note : After measuring over 500mA DC (especially 10A DC), "Zero error" occurs for a while. In that case, please wait for a while at zero input until the value stabilizes before measuring again.

AC Current Measurement [RMS] ~ A
TY710

Rms-value detection, Crest factor: <3

Range	Resolution	Accuracy		Voltage Drop	Maximum Input Current
		10 to 20Hz	20Hz to 1kHz		
500µA	0.01µA	1.5+20	1+20	<0.11 mV/µA	440mA Protected by a 440mA/ 1000V fuse.
5000µA	0.1µA				
50mA	0.001mA			<4mV/mA	
500mA*3	0.01mA				
5A	0.0001A			<0.1V/A	10A Protected by a 10A/1000V fuse.
10A	0.001A				

AC Current Measurement [RMS] ~ A
TY720

Rms-value detection, Crest factor: <3

Range	Resolution	Accuracy			Voltage Drop	Maximum Input Current
		10 to 20Hz	20Hz to 1kHz	1k to 5kHz		
500µA	0.01µA	1+20	0.75 +20	1+30	<0.11 mV/µA	440mA Protected by a 440mA/ 1000V fuse.
5000µA	0.1µA					
50mA	0.001mA				<4 mV/mA	
500mA *3	0.01mA					
5A	0.0001A	1.5+20	1+20	2+30	<0.1 V/A	10A Protected by a 10A/1000V fuse.
10A	0.001A					

Model TY710/720

Accuracy At 5 to 100% of range, At 10 to 100% of range for 10A Range

*3: Maximum measurement current : 440mA at 500mA range

Response time: 1 sec max.

AC Current Measurement [MEAN] ~ A
TY720

MEAN value detection, RMS value calibration (sine wave)

Range	Resolution	Accuracy			Voltage Drop	Maximum Input Current
		10 to 20Hz	20 to 500Hz	500Hz to 1kHz		
500µA	0.01µA	2+20	1.5 +20	2+30	<0.11 mV/µA	440mA Protected by a 440mA/ 1000V fuse.
5000µA	0.1µA					
50mA	0.001mA				<4 mV/mA	
500mA*3	0.01mA					
5A	0.0001A	3+20	2+20	4+30	<0.1 V/A	10A Protected by a 10A/ 1000V fuse.
10A	0.001A					

Accuracy At 5 to 100% of range, At 10 to 100% of range for 10A Range

*3: Maximum measurement current : 440mA at 500mA range

Response time: 1 sec max.

DCA+ACA ⎓ + ~
TY710

Maximum Reading 50000, Crest factor: <3

Range	Resolution	Accuracy		Voltage Drop	Maximum Input Current
		DC, 10 to 20Hz	DC, 20Hz to 1kHz		
500µA	0.01µA	2+10	1.5+10	<0.11 mV/µA	440mA Protected by a 440mA/1000V fuse.
5000µA	0.1µA				
50mA	0.001mA			<4mV/mA	
500mA*3	0.01mA				
5A	0.0001A			<0.1V/A	10A Protected by a 10A/1000V fuse.
10A	0.001A				

Accuracy At 5 to 100% of range, At 10 to 100% of range for 10A Range

*3: Maximum measurement current : 440mA at 500mA range

Response time: 2 sec max.

DCA+ACA ⎓ + ∼
TY720

Maximum Reading 50000, Crest factor: <3

Range	Resolution	Accuracy			Voltage Drop	Maximum Input Current
		DC, 10 to 20Hz	DC, 20Hz to 1kHz	DC, 1k to 5kHz		
500μA	0.01μA	1.5+10	1+10	1.5+10	<0.11 mV/μA	440mA Protected by a 440mA/ 1000V fuse.
5000μA	0.1μA					
50mA	0.001mA				<4 mV/mA	
500mA*3	0.01mA					
5A	0.0001A	2+10	1.5+10	3+10	<0.1 V/A	10A Protected by a 10A/1000V fuse.
10A	0.001A					

Accuracy At 5 to 100% of range, At 10 to 100% of range for 10A Range

*3: Maximum measurement current : 440mA at 500mA range

Response time: Approx. 2 sec

Resistance Measurement Ω

Range	Resolution	Accuracy		Maximum Measuring Current	Open-loop Voltage	Input Protective Voltage
		TY710	TY720			
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 is specified after zero adjustment (resistance).

Response time: 1 sec max. at 500Ω to 500kΩ

5 sec max. at 5MΩ to 50MΩ

LowPower-Ω LP-Ω

Maximum Reading 5000

Range	Resolution	Accuracy	Maximum Measuring Current	Open-loop Voltage	Input Protective Voltage
		TY720 only			
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		

LowPower-Ω: Measures resistance under lowmeasurement current.

Continuity Check ·))

Maximum Reading 5000

Range	Resolution	Range of Operation	Measuring Current	Open-loop Voltage	Input Protective Voltage
500Ω	0.1Ω	The buzzer turns on for resistances lower than 100±50Ω.	Approx. 0.5mA	<5V	1000V rms

Diode Test ⊣◁⊢

Range	Resolution	Accuracy	Measuring Current (Vf=0.6V)	Open-loop Voltage	Input Protective Voltage
2.4V	0.0001V	1+2	Approx. 0.5mA	<5V	1000V rms

Temperature Measurement TEMP

Range	Resolution	Accuracy	Input Protective Voltage
-200 to 1372°C	0.1°C	1+1.5°C	1000V rms

Use optional Temperature Probe: Thermocouple Type K

Capacitor Measurement ⊣|⊢

Maximum Reading 5000

Range	Resolution	Accuracy	Input Protective 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 is specified after zero adjustment (capacitor).

Frequency Measurement Hz

AC Coupling, Maximum Reading 9999

Range (AUTO)	Resolution	Accuracy
2.000 to 9.999Hz	0.001Hz	0.02+1 *1
9.00 to 99.99Hz	0.01Hz	
90.0 to 999.9Hz	0.1Hz	
0.900 to 9.999kHz	0.001kHz	
9.00 to 99.99kHz	0.01kHz	*2

Accuracy

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

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

Duty cycle ratio %

Range	Resolution	Accuracy
10 to 90%	1%	±1%*1

Accuracy

*1: At 10.00Hz to 500.0Hz, square wave

At 40 to 100% of input voltage or current range

Peak Hold P•H

Model TY720 only

Maximum Reading 5000

Range	Accuracy	Response Time Maximum
DCV, DCA	±100 digit	>250μS

1) Function switch

Turns off the power or select the measurement mode (function).

OFF	Turns off the power.	Ω	Resistance measurement
~ V	AC voltage (V) measurement	⊣⊢	Capacitor measurement
~ mV	AC voltage (mV) measurement	TEMP	Temperature measurement
⎓ V	DC voltage (V) measurement	μA mA A	DC/AC current measurement
⎓ mV	DC voltage (mV) measurement		
⊣◁ ·))	Continuity check, Diode Test		

2) SELECT key

Pressing this key in each measurement modes (function) described above selects other measurement modes (function).

~ V, ~ mV	1	HzV	: Frequency measurement (Voltage value is displayed.)
	2	Hz%	: Frequency measurement (Duty cycle ratio)
	3	dBV	: dBV measurement (Voltage value is displayed.)
	4	dBm	: dBm measurement
⎓ V	⎓ + ~ (DC+AC) measurement, (DC, AC) Dual display		
Ω	LP-Ω (Model TY720 only)		
·))	⊣◁ Diode Test		
μA/mA/A	Pressing this key in each measurement modes (function) described above selects other measurement modes (function).		
	1	~	: AC voltage measurement
	2	⎓ + ~	: (DC+AC) measurement
	3	⎓ • ~	: (DC, AC) Dual display
	4	Hz%	: Frequency measurement (Duty cycle ratio)