



**Full-scale 40999, Max. sample rate 20 times/s, 4-1/2 digits**

- DCV, ACV,  $\Omega$ , DCA, ACV
- True RMS ACV/ACA
- Maximum sampling rate: 20 times/sec.
- AVG (averaging)

*This function is very effective for measurements when there is a high variance. Averaging 5, 10, 20, 50 and 100 times can be selected using the AVG n button.*

- REL (relative)

*The relative value with respect to a reference value is indicated, and the deviation and external thermoelectromotive force in low-voltage measurements can be eliminated by single-touch operations.*

## Specifications

### 1. DC voltage measurement DCV

Range	Resolution	Accuracy $\pm$ (% of reading + digits) (23-5°C, 80% Rh or less)	Input resistance
40 mV	1 $\mu$ V	0.08 + 7	100 M $\Omega$ or more
400 mV	10 $\mu$ V		1000 M $\Omega$ or more
4 V	100 $\mu$ V		
40 V	1 mV		
400 V	10 mV		
1000 V	100 mV		
Temperature coefficient	0°C – 18°C, 28°C – 50°C (Accuracy in the range x 1/10)/°C		Approx. 10 M $\Omega$
Max. allowable voltage	+1100 V DC (10 sec), +500 V DC (continuous)		
40V – 100V range	$\pm$ 1100 V DC (continuous)		
CMR	110 dB or more (1 k $\Omega$ unbalanced resistance, DC, 50/60 Hz $\pm$ 0.1%.)		
NMR	55 dB or more (1 k $\Omega$ unbalanced resistance 50/60 Hz $\pm$ 0.1%)		

### 2. AC voltage measurement ACV

AC function : Input exceeding 5%. or more of the range  
(in the 750 V range 100V or more)

Range	Resolution	Frequency	Accuracy $\pm$ (% of reading + digits) (23+5°C, 80% Rh or less)
400 mV	10 $\mu$ V	20 Hz–50 Hz	0.5 + 30*
4 V	100 $\mu$ V	50 Hz–10 kHz	0.25 + 30*
40 V	1 mV	10 kHz–30 kHz	0.4 + 30
400 V	10 mV	30 kHz–100 kHz	1.2 + 100
750 V	100 mV	20 Hz–20 kHz	1.5 + 30*

\* In the FAST sampling mode, accuracy is guaranteed at 200 Hz or more.

AC + DC function : Input exceeding 5%. or more of the range  
(in the 750 V range 100 V or more)

Range	Resolution	Frequency	Accuracy $\pm$ (% of reading + digits) (23+5°C, 80% Rh or less)
400 mV	10 $\mu$ V	15 Hz–50 Hz	0.5 + 40*
4 V	100 $\mu$ V	50 Hz–10 kHz	0.25 + 40*
40 V	1 mV	10 kHz–30 kHz	0.4 + 40
400 V	10 mV	30 kHz–100 kHz	1.2 + 100
750 V	100 mV	15 Hz–20 kHz	0.5 + 30*
Temperature coefficient	0°C to 18°C, 28°C to 50°C 400 mV – 400 V range (1/10 of each range and frequency/°C 750 V range (0.1% of rdg $\pm$ 7 d)/°C		
Conversion method	True rms (analog computation)		
Crest factor	3 or less (full scale)		
Input Impedance	Approx. 2 M $\Omega$ / 100 pF or less		
Max. tolerable voltage	780 Vrms (continuous) 1100V peak		
Response time (In the same range, within $\pm$ 10 counts from the final value)	SLOW: Max. 2 sec (20 Hz to 100 kHz) FAST: Max. 1 sec (200 Hz to 100 kHz)		

\* In the FAST sampling mode, accuracy is guaranteed at 200 Hz or more.

### 3. Resistance measurement $\Omega$

$\Omega$  function

Range	Resolution	Accuracy $\pm$ (% of reading + digits) (23 $\pm$ 5°C 80%. Rh or less)	Measuring current
40 $\Omega$	1 m $\Omega$	0.09 + 4	10 mA
400 $\Omega$	10 m $\Omega$		10 mA
4 k $\Omega$	100 m $\Omega$	0.08 + 2	100 $\mu$ A
40 k $\Omega$	1 $\Omega$		100 $\mu$ A
400 k $\Omega$	10 $\Omega$		10 $\mu$ A
4000 k $\Omega$	100 $\Omega$		1 $\mu$ A
40 M $\Omega$	1 k $\Omega$	0.50 + 5	100 nA
400 M $\Omega$	10 k $\Omega$	5.00 + 20	10 nA

\* In the 40, 400, 4 k $\Omega$  ranges, accuracy is given after zero  $\Omega$  adjustment by REL computation.

LO- $\Omega$  function

Range	Resolution	Accuracy $\pm$ (% of reading + digits) (23 $\pm$ 5°C 80%. Rh or less)	Measuring current
400 $\Omega$ *	10 m $\Omega$	0.3 + 5	100 $\mu$ A
4 k $\Omega$ *	100 m $\Omega$		100 $\mu$ A
40 k $\Omega$	1 $\Omega$		10 $\mu$ A
400 k $\Omega$	10 $\Omega$		1 $\mu$ A
4000 k $\Omega$	100 $\Omega$	0.5 + 10	100 nA
40 M $\Omega$	1 k $\Omega$	3.5 + 30	10 nA

\* In the 400, 4 k $\Omega$  ranges, accuracy is given after zero  $\Omega$  adjustment by REL computation.

Temperature coefficient	0°C to 18°C, 28°C to 50°C $\Omega$ 40 $\Omega$ to 4000 k $\Omega$ , LO- $\Omega$ 400 $\Omega$ to 400 k $\Omega$ range (Accuracy in the range or rate x 1/10)/°C $\Omega$ 40 M $\Omega$ to 400 M $\Omega$ , LO- $\Omega$ 4000 k $\Omega$ to 400 M $\Omega$ range (Accuracy in the range or rate x 1/10) $\pm$ (0.1% of rdg $\pm$ 3 d)/°C
Terminal open-circuit voltage	6.8 V or less
Max. protective voltage	$\pm$ 500 V DC

### 4. DC current measurement DCA

Range	Resolution	Accuracy $\pm$ (% of reading + digits) (23 + 5°C, 80%. Rh or less)	Voltage drop across input terminals (full scale)
400 $\mu$ A	10 nA	0.2 + 7	500 mV or less
4 mA	100 nA		
40 mA	1 $\mu$ A		1.1 V or less
400 mA	10 $\mu$ A		
4 A	100 $\mu$ A	0.3 + 7	200 mV or less
10 A	1 mA	0.4 + 5	
Temperature coefficient	0°C to 18°C, 28°C to 50°C (Accuracy in the range or rate x1/10)/°C		
Max. allowable current	400 $\mu$ A to 400 mA range: 0.5 A DC (continuous), 4 A, 10 A range: 10 A DC (continuous)		
Auto ranging	Possible only for the same input terminals (not possible with auto ranging between 400 mA and 4 A range)		

## 5. AC current measurement ACA

AC function : Input exceeding 5% of the range  
(1A or more in the 10A range)

Range	Resolution	Accuracy ± (% of reading + digits) (23 ± 5°C, 80% Rh or less)		Voltage drop across input terminals (full scale)
		20 Hz – 50 Hz*	50 Hz – 1 kHz*	
400 µA	10 nA	0.8 + 30	0.6 + 30	500 mVrms or less
4 mA	100 nA			
40 mA	1 µA			
400 mA	10 µA			1.1 Vrms or less
4 A	100 µA	1.5 + 30	1.2 + 30	200 mVrms or less
10 A	1 mA			

DC + AC function : Input exceeding 5% of the range  
(1A or more in the 10A range)

Range	Resolution	Accuracy ± (% of reading + digits) (23 ± 5°C, 80% Rh or less)		Voltage drop across input terminals (full scale)
		20 Hz – 50 Hz*	50 Hz – 1 kHz*	
400 µA	10 nA	0.8 + 40	0.6 + 40	500 mVrms or less
4 mA	100 nA			
40 mA	1 µA			
400 mA	10 µA			1.1 Vrms or less
4 A	100 µA	1.5 + 40	1.2 + 40	200 mVrms or less
10 A	1 mA			
Temperature coefficient		0°C to 18°C, 28°C to 50°C (Accuracy in the range or frequency x 1/10) °C		
Conversion method		True rms (analog computation)		
Crest factor		3 or less (full scale)		
Max. allowable current		400 µA to 400 mA range: 0.5 A DC + AC (continuous), 4 A, 10 A range: 10 A DC + AC (continuous)		
Auto ranging		Range shift between 400 mA and 4 A ranges is not possible		
Response time (in the same range, within + 10 counts from the final value)		SLOW: Max. 2 sec (20 Hz - 1 kHz) FAST: Max. 1 sec (200 Hz - 1 kHz)		

\* In the FAST sampling mode, accuracy is guaranteed at 200 Hz or more.

### Sampling rate

SLOW approx. 4 times sec  
FAST approx. 20 times sec

## Arithmetic operations

### Averaging (shift averaging)

The shift averaging of 5, 10, 20, 50 and 100 times is performed. When the GP-IB unit is used, averaging from 2 to 255 times can be specified using a command.

### REL operation

The relative value with respect to the reference measured value is indicated.

Y = X-A (X and Y are the same function)  
where A: reference measured value  
X: measured value

### Continuity test

Range Same as resistance measurement  
Threshold value: 1700 ±1000 counts  
Accuracy in measurement (Accuracy in resistance measurement) x 2  
Sampling rate Approx. 20 times/sec fixed

### Others

#### A/D conversion

Converting method: Triple integration  
Input integrating time  
SLOW/FAST: 20 msec during 50 Hz  
16.67 msec during 60 Hz  
In the AC operation, 50/60 Hz is automatically set.  
50 or 60 Hz can also be set using the LINE f key.

### Battery backup

When the setup is on, the multimeter is automatically set to the previous state when the power is switched on.

What are to be backed up include

- Functions when the power is switched OFF
- Arithmetic ON/OFF, sampling rate per function
- Number of averaging in AVG operation
- Standard measured value in REL operation

### General specifications

#### Indication

#### Full scale

7-segment LED, letter height 11 mm  
40999 (A/D conversion full scale)  
99999 (REL operation full scale)

#### Over indication

#### Operation method

#### Polarity indication

#### Range selection

UUUUU (A/D conversion/operation over)  
Drift compensation type triple integration  
“—” is indicated when the polarity is negative

#### Function selection

#### Auto ranging

#### Withstand voltage

#### Power requirements

#### Power consumption

#### Operating temperature range

#### Operating humidity range

AUTO/MANUAL or external control  
(when an optional unit is used)  
MANUAL or external control (when an optional unit is used)  
UP level: when 40999 counts is exceeded  
DOWN level: less than 03600 counts  
±500 VDC  
AC100V ±10%, 50/60 Hz  
Options 117V, 217V or 234V AC  
6 W or less  
0°C to 50°C  
80% Rh or less (0°C to 40°C)  
60% Rh or less (40°C to 50°C)

#### Dimensions

#### Weight approx.

#### Accessories

191 ±2W x 80±2H x 260±2L mm  
1.8 kg  
Power cord (1), fuse (4), measuring leads  
(one set), alignment tool (1), bag to store  
accessories (1), Instruction manual (1)