Specifications

Handy Digital Multimeters VOAC21 (Discontinued)

Electrical Performance

Temperature and Humidity	23 ±5°C, 80%RH or less
Accuracy	±(% reading + digit) *The response time indicates the time until the accuracy is achieved in each range.

DC Volt (DCV)

Range	Resolution	Accuracy	Input Resistance	Max. Input Voltage
50mV	0.001mV	0.05+10	approx. 100MW	1,000V DC 1,000Vrms AC
500mV	0.01mV	0.02+2		
2,400mV *	0.1mV			
5V	0.0001V	0.025+5	10MW	1,500V peak
50V	0.001V			
500V	0.01V	0.03+2		
1,000V	0.1V			

*: Maximum valid display in the 2,400mV range: 24,000

NMRR	80dB or greater, 50/60Hz ±0.1% 70dB or greater and 50/60Hz ±0.1% in the 50mV range
CMRR	120dB or greater, 50/60Hz (Rs = 1kW)
Response Time	within 1 sec.

AC Volt (ACV)

Crest factor for valid value detection: < 3

Range	Resolution	Accuracy					Input RC	Max. Input Voltage
		10 to 20Hz	20Hz to 1kHz	1k to 10kHz	10k to 20kHz	20k to 50kHz	50k to 100kHz	
500mV	0.01mV	1+30 *1	0.4+30 *1		1+40 *1	2+70 *2	5+200 *2	11MW < 50pF	1,000Vrms AC 1,500V peak
5V	0.0001V								
50V	0.001V								
500V	0.01V							10MW < 50pF	1,000V DC
1,000V	0.1V	1+30 *2	0.4+30 *2	3+30 *2	-				

Accuracy	*1	5 to 100% of the range
	*2	10 to 100% of the range
CMRR	80dB or greater, DC to 60Hz (Rs=1kW)	
Response Time	within 2 sec.	

DCV+ACV

Maximum valid display: 5,000; crest factor for valid value detection: < 3

Range	Resolution	Accuracy						Input RC	Max. Input Voltage
		DC, 10 to 20Hz	DC, *3 20Hz to 1kHz	DC, *3 1k to 10kHz	DC, 10k to 20kHz	DC, 20k to 50kHz	DC, 50k to 100kHz		
5V	0.001V	1.5+10 *1	0.5+10 *1		1+10 *1	2+10 *2	5+20 *2	11MW < 50pF	1,000Vrms AC 1,500V peak
50V	0.01V								
500V	0.1V							10MW < 50pF	1,000V DC
1,000V		1.5+10 *2	0.5+10 *2	3+10 *2	-				

Accuracy	*1	5 to 100% of the range
	*2	10 to 100% of the range
CMRR	80dB or greater, DC to 60Hz (Rs=1kW)	
Response Time	within 2 sec.	

50V	0.01V	1.5+10 *1	*1	*1	*2	*2		
500V	0.1V							
1,000 V	1V	1.5+10 *2	0.5+10 *2	-			10MW < 50pF	1,500V peak 1,000V DC

Accuracy	*1	5 to 100% of the range
	*2	10 to 100% of the range
	*3	Input with DC only included.
CMRR	80dB or greater, DC to 60Hz (Rs=1kW)	
Response Time	approx. 5 sec.	

DC Current (DCA)

Range	Resolution	Accuracy	Voltage Drop	Max. Input Current
500mA	0.01mA	0.2+2	< 0.11mV/mA	Protection with 500mA fuse
5,000mA	0.1mA			
50mA	0.001mA		< 4mV/mA	
500mA	0.01mA			
5A	0.0001A	0.6+2	< 0.1V/A	Protection with 15A fuse
10A	0.001A			

AC Current (ACA)

Crest factor for valid value detection: < 3

Range	Resolution	Accuracy 10 to 20Hz	Accuracy 20Hz to 1kHz	Accuracy 1k to 5kHz	Voltage Drop	Max. Input Current
500mA	0.01mA	1+20	0.75+20	1+30	< 0.11 mV/mA	Protection with 500mA fuse
5,000mA	0.1mA					
50mA	0.001mA				< 4 mV/mA	
500mA	0.01mA					
5A	0.0001A	1.5+20	1+20	2+30	< 0.1 V/A	Protection with 15A fuse
10A	0.001A					

Accuracy
5 to 100% of the range; 10 to 100% in the 10A range.
Response time: within 2 sec.

DCA+ACA

Crest factor for valid value detection: < 3

Range	Resolution	Accuracy DC, 10 to 20Hz	Accuracy DC, 20Hz to 1kHz *	Accuracy DC, 1k to 5kHz	Voltage Drop	Max. Input Current
500mA	0.1mA	1.5+10	1+10	1.5+10	< 0.11 mV/mA	Protection with 500mA fuse
5,000mA	1mA					
50mA	0.01mA				< 4 mV/mA	
500mA	0.1mA					
5A	0.001A	2+10	1.5+10	3+10	< 0.1 V/A	Protection with 15A fuse
10A	0.01A					

Accuracy
*: Input with DC only included.
5 to 100% of the range; 10 to 100% in the 10A range.
Response time: approx. 5 sec.

Resistance

Range	Resolution	Accuracy	Max. Measurement Current	Open Voltage	Input Protection Voltage
500W	0.01W	0.05+2	< 1mA	< 2.5V	600V rms
5kW	0.0001kW		< 0.25mA		
50kW	0.001kW		< 25mA		
500kW	0.01kW		< 2.5mA		
5MW	0.0001MW	0.5+2	< 1.5mA		
50MW	0.001MW	1+2	< 0.13mA		

The above accuracy values assume that zero adjustment has been done for

5MW	0.0001MW	0.5+2	< 1.5mA
50MW	0.001MW	1+2	< 0.13mA

The above accuracy values assume that zero adjustment has been done for resistance.
Response time: 500W to 500kW ... within 3 sec., 5M to 50MW ... within 10 sec.

Continuity Test
Maximum valid display: 5,000

Range	Resolution	Operating Range	Max. Measurement Current	Open Voltage	Input Protection Voltage
500W	0.1W	An alarm sounds at 100±50W or less	approx. 0.5mA	< 5V	600V rms

Diode Test

Range	Resolution	Accuracy	Measurement Current (Vf=0.6V)	Open Voltage	Input Protection Voltage
2.4V	0.0001V	1+2	approx. 0.5mA	< 5V	600V rms

Temperature
TEMP

Range	Resolution	Accuracy	Input Protection Voltage
-50 to 800°C	0.1°C	1+1.5°C	600V rms

A temperature measuring probe (optional K-type thermocouple) was used.
The above accuracy does not include that of the temperature measuring probe.
Broken line approximation was calculated according to JIS-C1602-1995.

Capacitance
Maximum valid display: 5,000

Range	Resolution	Accuracy	Input protection voltage
5nF	0.001nF		
50nF	0.01nF		
500nF	0.1nF	1+5	
5mF	0.001mF		600V rms
50mF	0.01mF		
500mF	0.1mF	2+5	
5mF	0.001mF	3+5	
50mF	0.01mF		

The above accuracy values assume that zero adjustment has been done for capacitance.

Frequency [Hz]
AC Couple, Maximum valid display: 9,999

Range (AUTO)	Resolution	Accuracy
2.000 to 9.999Hz	0.001Hz	
9.00 to 99.99Hz	0.01Hz	0.02+1
90.0 to 999.9Hz	0.1Hz	*1
900 to 9,999Hz	1Hz	
9.00 to 99.99kHz	0.01kHz	*2

Accuracy
*1: 10 to 100% of the voltage and current ranges
*2: 40 to 100% of the voltage and current ranges
The frequency range differs depending on the frequency range of each voltage and current range.

Duty Cycle [%]

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

Accuracy

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

Accuracy
*: 10.00Hz to 500.0Hz, square wave input
40 to 100% of the voltage and current ranges

Peak Hold [P-H]
Maximum valid display: 5,000

Range	Accuracy	Detectable Time
DCV, DCA	±100 digit	> 1m sec.

General

Functions	Measures DC voltage and current, AC voltage and current, resistance, frequency, temperature, capacitance, duty ratio, and decibels. Calculates from the reference measurement relative value (RELD), minimum value (MIN), maximum value (MAX), average value (AVG), range hold (R-H), data hold (D-H), auto hold (A-H), and peak hold (P-H). Performs continuity tests, zero adjustment (capacitance, resistance), and diode tests. Comes with memory and backlight.
Operation Method	⊿Σ modulation method
Display	5-digit LCD (liquid crystal) display Maximum valid display: 50,000 Polarity display: automatic display ("-" (minus) sign only). Overrange display: "OL" Battery voltage display: The symbol "  " is displayed when the battery voltage is at or below the operating voltage.
Measurement (Display) Cycle	Digital display: 3 times/sec. At frequency measurement: 1 time/sec. At capacitance measurement: 2 to 0.03 times/sec. Bar graph display 10: times/sec.
Operation Temperature and Humidity	-10 to 40°C, 80%RH or less (no condensation) or 40 to 50°C, 70%RH or less.
Storage Temperature and Humidity	-25 to 60°C, 70%RH or less (no condensation) This encompasses the operation temperature and humidity.
Temperature Coefficient	Accuracy at 23 ±5°C x 0.05/°C in the ranges of -10 to 18°C and 28 to 50°C
Maximum Operating Altitude	2,000m above sea level
Power Supply	2 AA batteries (R6 or LR6 ("AA" shape), 1.5V)
Battery Life	approx. 120 hrs. (in the case of alkaline batteries used for DC voltage measurement) Note: Battery life depends on the use (measurement) conditions and other factors.
Withstand Voltage	AC5.5kV, 1 min. (between input terminal and case)
Size	approx. 85W x 191H x 40L mm
Weight	approx. 450g
Compatible Specifications	Safety standards EN61010-1:1995, EN61010-2-031:1995 Overvoltage category AC/DC600V CAT.III AC/DC1,000V CAT.II Pollution level 2
Accessories	Operation manual (x1), test leads (x1 pair), size AA battery (housed in the main unit) (x2), fuse (housed in the main unit) (2 types x2)

Options (PC operating environment for communication package SC-532)

Accessories	(housed in the main unit) (x2), fuse (housed in the main unit) (2 types x2)

Options (PC operating environment for communication package SC-523)

Supported OS	Windows® 95, 98, Me, 2000, NT4.0
CPU	Pentium® 100MHz or more
Memory	16MB or more
Storage	HDD with 10MB or more free space, 3.5" FDD
EXCEL	EXCEL97 or higher
Receiving	Save memory, logging memory, realtime data
Processing	Data display, graph display, save, load, and data transfer to EXCEL
Size	approx. 46W x 22H x 16L mm
Cable Length	approx. 1.5m
Weight	approx. 70g

Note 1. Windows is either a registered trademark or a trademark of Microsoft Corporation in the United States and/or other countries.

Note 2. Pentium is a trademark or a registered trademark of Intel Corporation or its subsidiaries in the United States and other countries.