

# DIGITAL VOLTMETERS

## True RMS Voltmeter

Model 3403C

- DC and 2 Hz to 100 MHz
- 3½ digit



### Description

The Model 3403C is usable from dc to 100 MHz. True rms is especially valuable for measurements of noise, multiplexed signals, modulated waves and signals with high harmonic content.

### dB Display

The dB display option provides readings directly in dB, a major convenience to ac users. The dB reference to which the measurement is made is conveniently adjustable from the front panel to provide referenced dB measurements, or to provide a convenient means to offset the reading by as much as 13 dB for unreferenced measurements.

### Specifications

#### Ranges

**Full range display:** 10.00 mV (ac only); 100.0 mV; 1.000 V; 10.00 V; 100.0 V; 1000 V.

**Overrange:** >90% on all ranges except as limited by max input voltage.

**Ranging information:** front panel annunciators indicate overrange (approximately 190% of full range), or underrange (approximately 17% of full range) conditions.

#### Performance

##### AC Frequency Range

**Slow response:** 2 Hz to 100 MHz.

**Fast response:** 25 Hz to 100 MHz.

##### Response Time

**Fast response:** 1 s.

**Slow response:** 10 s.

Instrument reads final reading  $\pm 0.1\%$  of input change in stated response time.

##### Display Rate

**Fast response:** 4 readings per s.

**Slow response:** 2 readings per s.

##### Functions

**DC:** responds to dc component of input signal.

**AC:** responds to true rms value of ac coupled input signal.

**AC+ DC:** responds to true rms value of dc and ac input signal; reading is  $\sqrt{(dc)^2 + (ac \text{ rms})^2}$

**Temperature coefficient:**  $\pm (0.1 \times \text{reading accuracy} / ^\circ\text{C})$  outside the  $25^\circ\text{C} \pm 5^\circ\text{C}$  temperature range.

**Accuracy:** 90 days ( $25^\circ\text{C} + 5^\circ\text{C}$ , <95% RH, 17% of range to 190% of range).

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$$\text{READING ACCURACY} = \pm(\% \text{ OF RANGE} + \% \text{ OF READING})^{**}$$

RANGE	% OF RANGE (VOLTS)			% OF READING (VOLTS)						
	DC	DC + AC	AC	DC	2 Hz	25 Hz	100 kHz	1 MHz	10 MHz	100 MHz
1000V	.3	.3	.3	.2	.4*	.2	[Cross-hatched area]			
100V	.2	.2	.2	.2	.4*	.2				
10V	.2	.2	.2	.2	.4*	.2	.5	1	[Cross-hatched area]	
1V	.2	.2	.2	.2	.4*	.2	.5	1		
100mV	.6	.6	.2	.2	.4*	.2	.5	2	2.5	10
10mV			.2			.3	1.2	3	[Cross-hatched area]	

CAUTION: frequencies and ranges in this area may result in invalid readings without ranging indication.

\* DC + AC function and slow response time only

\*\* % of reading specification is representative of typical flatness.

### Input Characteristics

**Input impedance:** (< 10 MHz)

**1 V to 1000 V range:**  $10 \text{ M}\Omega \pm 10\%$  shunted by  $24 \text{ pF} \pm 10\%$ .

**10 mV and 100 mV range:**  $20 \text{ M}\Omega \pm 10\%$  shunted by  $20 \text{ pF} \pm 10\%$ .

### Maximum Input Voltage

**High to low:** 1000 V rms, 1500 peak or  $10^8 \text{ V-Hz}$  on any range. Maximum dc voltage in ac mode: 500 V dc.

**Low to chassis:**  $\pm 500 \text{ V}$  dc, when floated with special banana to BNC adapter.

### Options:

#### Autoranging (3403C option 001)

**Automatic ranging:** uprange at approximately 190% of full range; downranges at approximately 17% of full range.

**Autorange time:** fast response: 1 s per range change. Slow response: 10 s per range change.

**Remote control + digital output + autoranging (3403C option 003):** Provides remote control of all front panel functions, ranges, digital output and autoranging.

#### dB Display (3403C option 006)

**Measurement range:** 108 dB ( $-48 \text{ dBV}$  to  $+60 \text{ dBV}$ ).

**Calibrated dB reference:** 0 dB = 1.000 V; reference level may be set for 0 dBm ( $600\Omega$ ) by adjusting front panel dB calibration adjustment.

**Variable dB reference:** reference level may be shifted downward from calibrated position >13 dB.

### General

#### Operating Conditions

**Temperature range:**  $0^\circ\text{C}$  to  $50^\circ\text{C}$ .

**Humidity:** <95% RH.

#### Recorder Output

**Output voltage:** 1 V dc open circuit for full range input.

**Output resistance:**  $1 \text{ k}\Omega \pm 10\%$ .

**Power:** 115 V or 230 V  $\pm 10\%$ , 48 Hz to 440 Hz, 35 VA max. (including all options).

**Input terminals:** BNC front panel connector standard for low to high terminals; rear panel connector available by internally reversing position of ac converter module.

**Weight:** including all options: net, 5 kg (11 lb). Shipping, including all options: Net, 7.2 kg (16 lb).

**Size:** 127 H x 234.9 W x 196.8 mm D (5" x 9.25" x 7.75").

**Accessories furnished:** floating adapter-banana to BNC.

### 3403C True RMS Voltmeter

**Opt 001** autoranging

**\$4000**

add \$205

**\*Opt 003** remote control + digital output + autoranging

add \$405

**\*Opt 006** dB display

add \$380

\*Options 003 and 006 are available only as factory installed options.