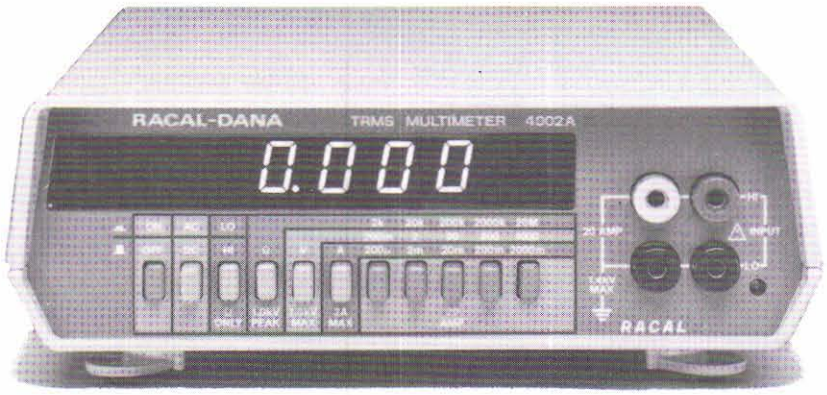
Digital Multimeters
4½, 5½ Digit Bench/Portable
Series 4000



TALKER GPIB

Four Models Provide Greater Accuracy for the Price

The Racal-Dana Series 4000 provides a broad choice of accuracy and performance for your portable and bench applications. The Series 4000 offers four models, permitting you to select the precise model for your requirement. Now you can purchase exactly the performance your applications require.

Model 4002A is a five function multimeter featuring true rms measurement on both AC voltage and current. It also offers a 200 millivolt range and GPIB output interface.

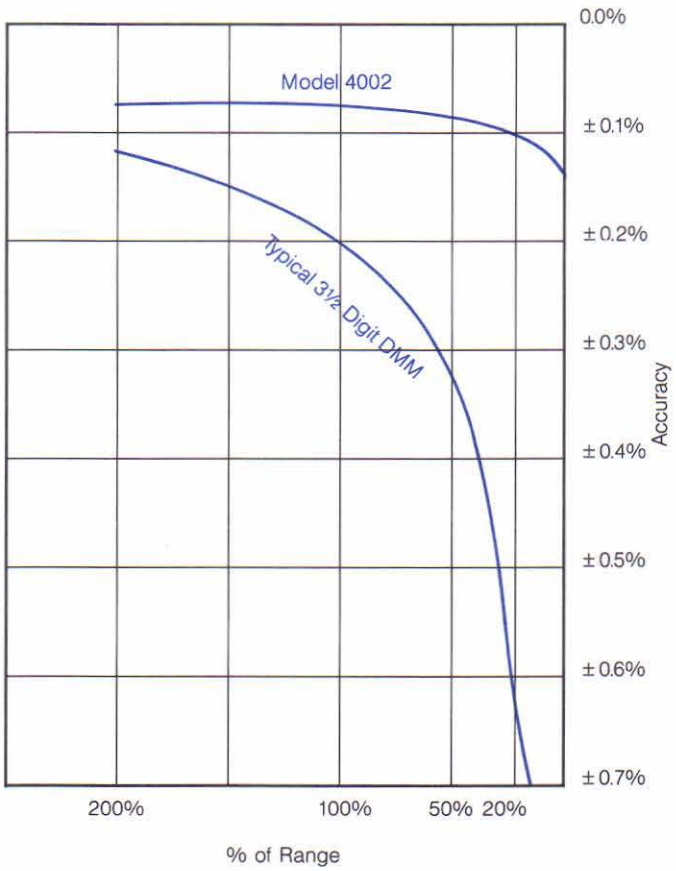
Model 4003 is designed for those applications requiring low level measurements. It features 20 millivolts DC range.

Model 4004 is an autoranging, high accuracy, five function multimeter. It features 4-terminal resistance measurement and full annunciation of functional settings.

Model 4005 provides 5½ digit performance at a price comparable to other 4½ digit multimeters. It offers DC voltage, AC voltage, and resistance measurements. It also features a null function for making offset or drift measurements.

Accuracy vs % Full Scale

The graph illustrates the significant difference in accuracy between a 3½ digit DMM and the Series 4000. Accuracy is guaranteed one full year without recalibration. To reduce calibration time, calibration instructions are provided on the internal shield.



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Ultimate Convenience

The Series 4000 is designed for truly convenient operation. Pushbutton range and function selection, bright ½-inch LED readout, and built-in operating instructions assist even the inexperienced with fast completion of measurements. Non-skid feet keep every Series 4000 securely in place. An attached power cord with integral cord wrap means no lost or misplaced pieces.

A 16-position locking handle lets you adjust your instrument for maximum viewing comfort.

Practical Reliability

Conservative design, superior overload protection, and a rugged, high-impact case assure superior performance under adverse conditions.

Series 4000 Model Summary

Feature / Model	Resolution			DC/AC Current	True rms	Battery Option	4 Wire Ohms	Hi/Lo Ohms	Analog Output	Basic Accuracy	No. Digits
	DC Volts	AC Volts	Ohms								
4002A	10 μV	10 μV	0.1 Ω	X	X	X		X		0.05%	4½
4003	1 μV	10 μV	0.001 Ω	X	X	X			X	0.04%	4½
4004	10 μV	10 μV	0.01 Ω	X		X	X	X		0.02%	4½
4005	1 μV	10 μV	0.001 Ω				X			0.005%	5½

X = Standard Feature.

Specifications

DC Voltage

Range		Maximum Reading			Input Resistance		Maximum Input Voltage
Models 4002A, 4004, 4005	Model 4003	Models 4002A, 4003	Model 4004	Model 4005	Models 4002A, 4003	Models 4004, 4005	
—	20 mV	19.999	—	—	10 megohm ±0.1% All Ranges	—	1200 V peak[1]
200 mV	200 mV	199.99	299.99	199.999		>1000 megohm	1200 V peak[1]
2 V	2 V	1.9999	2.9999	1.99999		>1000 megohm	1200 V peak[1]
20 V	20 V	19.999	29.999	19.9999		10 megohm	1200 V peak
200 V	200 V	199.99	299.99	199.999		10 megohm	1200 V peak
1200 V	1200 V	1200.0	1200.0	1200.00		10 megohm	1200 V peak

1. 600 V continuous or 1200 V for 3 seconds

Specification	Model Number		
	4002A/4003	4004	4005
Normal (Series) Mode Rejection	>60 dB	>80 dB	>60 dB
Common Mode Rejection (1 Kilohm unbalance) DC, 50/60 Hz	>120 dB	>120 dB	>120 dB
Settling Time	1 Sec	1 Sec	0.5 Sec

Temperature Coefficients ±(% Reading + No. Digits)/°C

Models / Range	Models 4002A, 4003		Model 4004		Model 4005	
	% Reading	No. Digits	% Reading	No. Digits	% Reading	No. Digits
20 mV	0.006%	0.6	—	—	—	—
200 mV	0.006%	0.6	0.001%	0.1	0.0007%	1.6
2 V	0.006%	0.2	0.001%	0.1	0.0007%	0.2
20 V	0.006%	0.2	0.0015%	0.1	0.0008%	0.2
200 V	0.006%	0.2	0.0015%	0.1	0.0008%	0.2
1200 V	0.006%	0.2	0.0035%	0.1	0.0012%	0.2

Accuracy 1 year ±(% Reading + No. Digits)[1] ±5°C

Models / Range	Model 4002A		Model 4003		Model 4004		Model 4005	
	% Reading	No. Digits	% Reading	No. Digits	% Reading	No. Digits	% Reading	No. Digits
20 mV	—	—	0.04%	2	—	1	—	—
200 mV	0.04%	3	0.04%	1	0.015%	1	0.007%	+3[2]
2 V	0.04%	1	0.03%	1	0.015%	1	0.007%	+2
20 V	0.04%	1	0.03%	1	0.015%	1	0.01%	+2
200 V	0.04%	1	0.03%	1	0.015%	1	0.01%	+2
1200 V	0.04%	1	0.04%	1	0.015%	1	0.01%	+2

1. 1 digit error equals 0.005% of range on all models except 4005, where 1 digit equals 0.0005% of range
2. With zero set by Null function

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Resistance

Range				Maximum Reading			Maximum Voltage Across Unknown					
Model 4002A	Model 4003	Model 4004	Model 4005	Models 4002A/4003	Model 4004	Model 4005	Model 4003	Model 4002A		Model 4004		Model 4005
								Lo	Hi	Lo	Hi	
—	20 Ω	—	—	19.999	—	—	5 V	—	—	—	—	—
—	200 Ω	200 Ω	200 Ω	199.99	299.99	199.999	5 V	—	—	0.3 V	—	0.4 V
2 kΩ	2 kΩ	2 kΩ	2 kΩ	1.9999	2.9999	1.99999	5 V	0.2 V	—	0.3 V	3 V	4 V
20 kΩ	20 kΩ	20 kΩ	20 kΩ	19.999	29.999	19.9999	5 V	0.2 V	2 V	0.3 V	3 V	4 V
200 kΩ	200 kΩ	200 kΩ	200 kΩ	199.99	299.99	199.999	5 V	0.2 V	2 V	0.3 V	3 V	4 V
2000 kΩ	2000 kΩ	2 MΩ	2000 kΩ	1999.9	2.9999	1999.99	5 V	0.2 V	2 V	0.3 V	3 V	4 V
20 MΩ	20 MΩ	20 MΩ	20 MΩ	19.999	29.999	19.9999	5 V	—	2 V	0.3 V	3 V	4 V
—	—	200 MΩ	—	—	299.99	—	—	—	—	—	3 V	—

Maximum Input Voltage
Model 4002A: 450 V rms
Model 4003: 350 V peak
Models 4004, 4005: 250 V rms

Configurations
Models 4002A, 4003: 2-wire
Models 4004, 4005: 4-wire or 2-wire

Accuracy ±(% Reading + No. Digits)[1] 1 year ±5°C

Model / Range	Model 4003	Model 4002A		Model 4004		Model 4005
		Lo Ohms	Hi Ohms	Lo Ohms	Hi Ohms	
20 ohm	0.05% + 3	—	—	—	—	—
200 ohm	0.05% + 2	—	—	0.035% + 1	—	0.012% + 3[2]
2 kilohm	0.04% + 1	0.15% + 15	—	0.035% + 1	0.035% + 1	0.012% + 2
20 kilohm	0.04% + 1	0.15% + 15	0.04% + 1	0.035% + 1	0.035% + 1	0.012% + 2
200 kilohm	0.04% + 1	0.15% + 15	0.04% + 1	0.045% + 1	0.035% + 1	0.012% + 2
2000 kilohm	0.04% + 1	0.15% + 15	0.04% + 1	0.15% + 1	0.05% + 1	0.03% + 2
20 megohm	0.10% + 1	—	0.10% + 1	0.80% + 1	0.18% + 1	0.08% + 2
200 megohm	—	—	—	—	1.5% + 1	—

1. 1 digit error equals 0.005% of range on all models except 0.0005% of range on 4005.
2. With zero set by Null function.

DC/AC Current

Frequency Range
Models 4002A, 4003: 45 Hz to 10 kHz
Model 4004: 50 Hz to 5 kHz

Current Ranges
Model 4002A: 200 μA, 2 mA, 200 mA, 2 A, 20 A
Model 4003: 20 μA, 200 μA, 2 mA, 20 mA, 200 mA, 2000 mA
Model 4004: 200 μA, 2 mA, 20 mA, 200 mA, 2 A

Full Scale Reading
Models 4002A, 4003: 19999
Model 4004: 29999

Fuse Protection
Model 4002A: 2 A, 250 V DC or AC rms (except 20 A range)
Model 4003: 2 A, 250 V DC or AC rms
Model 4004: 3 A, 250 V DC or AC rms

Accuracy ± (% Reading + No. Digits) 1 year ± 5°C

Model / Range	Model 4002A		Model 4003		Model 4004	
	DC	AC[1]	DC	AC[1]	DC	AC[1]
≤ 2A	0.2% + 2	1% + 15	0.2% + 2	0.8% + 15	0.1% + 2	0.3% + 18
20A	0.5% + 2	1% + 15	—	—	—	—

1. Above 2000 counts

AC Voltage

Models 4002A, 4003: True rms
Models 4004, 4005: Average responding calibrated to the rms of a sinewave

Ranges
Models 4002A, 4003, 4004: 200 mV, 2 V, 20 V, 200 V, 1000 V AC rms
Model 4005: 2 V, 20 V, 200 V, 1000 V AC rms

Full Scale Reading
Models 4002A, 4003: 19999
Model 4004: 29999
Model 4005: 199999 (1000 V rms maximum)

Maximum Input: 1000 V rms, sinewave or DC (2×10^7 V•Hz maximum)

Settling Time: Zero to full scale step
Models 4002A, 4003: 2.5 seconds to 0.1% of final reading
Models 4004, 4005: 1.3 seconds to 0.5% of final readings

Input Impedance
Models 4002A, 4003: 1 megohm shunted by 75 pF
Models 4004, 4005: 2 megohm shunted by 50 pF

Common Mode Rejection: 1 kilohm unbalance; DC, 50/60 Hz
Models 4002A, 4003, 4005: > 60 dB
Model 4004: >100 dB

Crest Factor
Models 4002A, 4003: 3:1

Accuracy ± (% Reading + No. Digits) 1 Year ± 5°C

Model / Range	4002A[1]	4003[1]	4004[2]		4005[3]	
	100 Hz-10 kHz		50 Hz - 20 kHz	20 Hz - 50 Hz & 20 kHz - 100 kHz	50 Hz-20 kHz	20 Hz-50 Hz & 20 kHz-100 kHz
200 mV	0.7% + 15	0.5% + 15	0.20% + 6***	1.0% + 20	—	—
2V	0.6% + 15	0.5% + 15	0.20% + 6	1.0% + 20	0.10% + 10	1.0% + 20
20V	0.5% + 15	0.5% + 15	0.20% + 6	1.0% + 20	0.10% + 10	1.0% + 20
200V	0.5% + 15	0.5% + 15	0.20% + 6	1.0% + 20	0.10% + 10	1.0% + 20
1000 V	0.5% + 15	0.5% + 15	0.25% + 6*	1.0% + 20**	0.15% + 10*	1.0% + 20**

1. For readings >2000 counts
2. From 0.3 to 100% of full scale reading
3. For readings >1000 counts

* 50 Hz - 10 kHz
** 20 Hz-50 Hz & 10 kHz-20 kHz
*** With input shorted, display reads approximately 0.2mV

General

Power Requirements
Voltage: 105 to 125 or 210 to 250 V AC switch selected; 90-110 V AC optional. Rechargeable battery pack optional all models except 4005
Frequency: 50 or 60 Hz
Consumption
Models 4002A, 4003: 8 W
Model 4004: 20 VA
Model 4005: 25 VA

Maximum Common Mode Voltage: 1400 V peak

Ranging: Pushbutton control

Display: 0.5 inches LED digits, appropriate decimal position and polarity indication

Temperature Range
Operating: 0°C to +55°C
Storage: −25°C to +65°C

Humidity: 0 to 80% RH up to 35°C

Weight
Models 4002A, 4003: 1.7 kg (4 lb)
Models 4004, 4005: 2.3 kg (5 lb)

Dimensions: 85H x 235W x 275D mm (3.5H x 9.25W x 10.75D inches)

Options

GPIB Interface Option 55T

Applicable Models: 4002A, 4003
Description: Provides output of data only. See GPIB Instrument Section

BCD Output Option 51

Applicable Models: 4002A, 4003, 4004
Description: Provides 4 line per decade parallel BCD output.

Battery Pack Option 06

Applicable Models: 4002A, 4003, 4004
Description: Rechargeable battery pack provides up to six hours operation

Ordering Information

Model 4002A: Five function Digital Multimeter, 4½ digit
Model 4003: High sensitivity Digital Multimeter, 4½ digit
Model 4004: Autoranging Digital Multimeter, 4½ digit
Model 4005: High resolution Digital Multimeter, 5½ digit

Options

55T*: GPIB interface (talker output) 4002A, 4003
51*: BCD output (4002A, 4003, 4004)
06*: Battery pack (4002A, 4003, 4004)
60: Single rack mount

Accessories—See DMM Accessories

*Instrument will accept only one of these options simultaneously.