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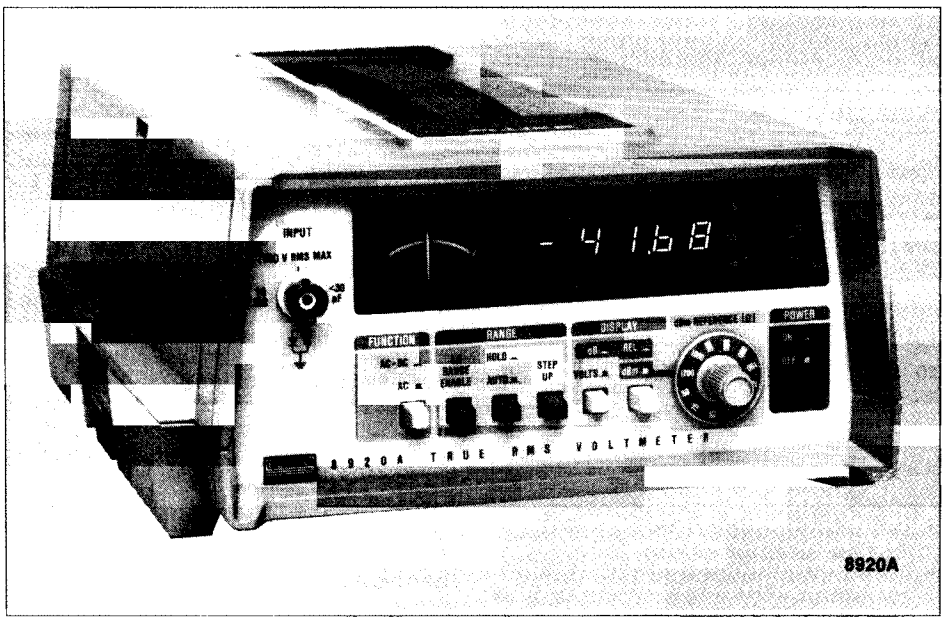
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8920A, 8921A & 8922A

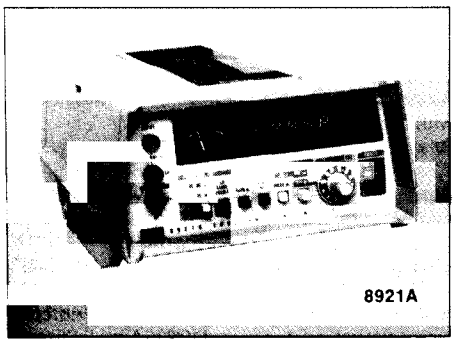
GPIB IEEE-488

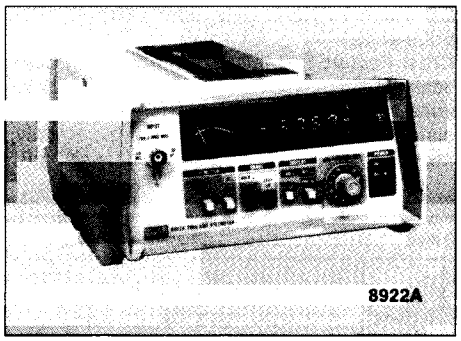


8920A

8920A, 8921A & 8922A Wideband

- True-rms ac with readout in volts or dB
- Ac or ac + dc measurements
- Autoranging
- Selectable dBm reference impedance
- Analog display for peak/null adjustments
- Rear panel linear analog output (Models 8920A & 8922A)
- Relative dB measurements
- 10 Hz to 20 MHz or 2 Hz to 11 MHz (Model 8922A)
- 180 μV to 700V


8921A


8922A

Choice of Bandwidth

Bandwidth capabilities of the 8920-Series Voltmeters encompass many applications, from testing high-frequency oscillators, attenuator flatness and amplifier frequency response to microphone levels, phono-pickup devices, vibration tests and wideband noise levels — to list only a few. Models 8920A and 8921A cover a bandwidth of 10 Hz to 20 MHz. The 8922A offers low-frequency capabilities in the 2 Hz to 11 MHz bandwidth and a switchable 200 kHz low pass filter which eliminates unwanted high-frequency noise from the measured signal.

True RMS Converter

The heart of all 8920-Series Voltmeters is Fluke's monolithic thermal converter which can measure rms values of an ac signal. This patented semiconductor circuit balances the heating power of a dc feedback signal against the heating power of the ac input voltage, producing a *true* rms equivalent dc output. This unique converter enables Fluke voltmeters to provide wideband, low-noise, accurate measurements at a low cost.

Selectable dBm Reference Impedance

Fluke's 8920-Series Voltmeters permit an operator to select any one of 12 reference impedances from 50Ω to 1200Ω and to digitally read out dB values referenced to the selected level. Input impedance is constant at 10 MΩ for all settings of the dB reference control. This minimizes circuit loading and allows the operator to add the appropriate termination externally. Zero dB corresponds to 1 mW for each of the selectable levels.

AC or AC + DC Functions

The input coupling capabilities of the 8920-Series Voltmeters help solve difficult measurement problems. Without these features, whenever an operator is required to measure a signal which (1) is not symmetrical, (2) has unequal excursions above and below zero, or (3) has a dc component, it is necessary to go through a series of computations to determine the actual rms voltage value. First, the signal has to be measured with a dc voltmeter (providing its ac rejection is sufficient) and then with an ac voltmeter. Finally, the sum of the squares of the two readings must be calculated and the square-root extracted from the result. Failure to consider the dc component by using only an ac-coupled meter can result in substantial error.

Relative dB Measurements

The relative reference feature of the 8920-Series Voltmeters allows direct readings of gain or attenuation. Depressing the REL switch sets the existing dB reading to zero, establishing the input voltage level as the relative dB reference. Subsequent readings of higher voltages will be displayed as +dB, lower voltages as -dB.

8920A, 8921A & 8922A

Autoranging

Fluke's autoranging feature allows you to carry out your testing without having to change ranges manually. A range can be placed on HOLD or manually stepped up to a higher range. On HOLD, the meter will remain in a given range regardless of changes in input levels. On STEP UP, the meter will increase ranges step-by-step until the switch is released.

Peaking/Dipping Meter

In addition to an accurate digital display, all Fluke Voltmeters in the 8920-Series feature an analog meter for peak and null voltage adjustments. The meter indicates 0 to 100 percent full scale in each range.

Linear Analog Output

Models 8920A and 8922A are equipped with a rear panel output for driving X-Y or strip chart recorders, delivering voltages proportional to the display count. A 2-volt level equals 2000 counts, a 1-volt level equals 1000 counts, etc. This feature is not available on Model 8921A.

Accuracy

Fluke Digital Voltmeters avoid the possibilities for error so common in analog meters. The digital displays eliminate the likelihood of misreading the meter due to viewing angle problems of parallax common with analog meters. Also, the accuracy of 8920-Series Voltmeters is specified as a percent of reading rather than as percent of full scale.

Percent of reading accuracy does not degrade for measurements at the low end of a scale. Front panel switching offers a choice of readings in dB or volts.

Specifications

Technical Specifications

The accuracy specifications below apply from 9% to 100% of full scale and from 18°C to 28°C for 90 days. For six-month specifications multiply figures by 1.5.

AC Accuracy: ± % of voltage reading or ±dB (8920A/8921A)

Range	2 Hz	10 Hz	20 Hz	50 Hz	10 kHz	200 kHz	1 MHz	2 MHz	10 MHz	20 MHz
700V 200V	Not Specified									
20V 2V 200 mV		Not Specified	5% or 0.5 dB	1% or 0.15 dB	0.5% or 0.1 dB	0.7% or 0.15 dB	3% or 0.35 dB		5% or 0.5 dB	
20 mV				2% or 0.25 dB	1% or 0.15 dB	2% or 0.25 dB	4% or 0.4 dB			
2 mV				3% or 0.35 dB	2% or 0.25 dB	3% or 0.35 dB				

AC Accuracy: ± % of voltage reading or ±dB (8922A)

Range	2 Hz	10 Hz	20 Hz	50 Hz	10 kHz	200 kHz	1 MHz	2 MHz	11 MHz
	FILTER IN					FILTER OUT			
700V 200V	3% or* 0.35 dB	1% or* 0.15 dB 5% or 0.5 dB	1% or 0.15 dB	0.5% or 0.1 dB		0.7% or 0.15 dB	Not Specified		
20V 2V 200 mV							3% or 0.35 dB	5% or 0.5 dB	
20 mV		2% or* 0.25 dB 5% or 0.5 dB	2% or 0.25 dB	1% or 0.15 dB		2% or 0.25 dB			
2 mV	5% or* 0.5 dB**	5% or 0.5 dB	3% or 0.35 dB	2% or 0.25 dB	4% or 0.4 dB				

* *Valid when AC + DC DAMPING is selected and input has no dc components.*

** *Below 2 mV add number of digits (N) to ±5% voltage readings, where N = 5 ÷ mV input. Or, for dB readings, add N to ±0.5 dB, where N = 0.5 ÷ (mV input)²*

AC+DC Accuracy: Add to AC accuracy specifications (above) ±10 digits or ±0.5 dB above 2 mV, or ±100 digits or ±5.0 dB below 2 mV. For dc only, add above digits to 50 Hz to 10 kHz specifications

Functions: True RMS measurements only. AC or AC + DC (8920A and 8921A); AC or AC + DC with damping (8922A)

Maximum Input: 700V rms or 1000V peak, not to exceed a volt-hertz product of 1 x 10^8 on any range

Maximum Common Mode Voltage

8920A and 8922A: 400 mV rms or 600 mV peak

8921A: 500V rms or 700V peak

AC Common Mode Rejection: ≥60 dB at 50 and 60 Hz with 100Ω unbalance

DC Common Mode Rejection: ≥100 dB, 100Ω unbalance

Crest Factor: 7 at full scale, increasing down scale by 7 times the voltage range divided by the voltage input. Degrades below 10 Hz, annunciated when capability exceeded (8922A only)

Input Impedance: 10 MΩ shunted by <30 pF

Voltage Ranges: 2 mV, 20 mV, 200 mV, 2V, 20V, 200V, 700V

Ranging: Autoranging with HOLD to defeat autoranging and STEP UP for manual ranging. Ranges up at 2000 counts and ranges down at 180 counts

Decibel Ranges: In the autorange mode, the instrument appears as though it has a single range spanning 131 dB

dBm Reference: Twelve user-selectable impedances are provided to reference a 0 dBm, 1 mW level (50Ω, 75Ω, 93Ω, 110Ω, 124Ω, 135Ω, 150Ω, 300Ω, 600Ω, 900Ω, 1000Ω, and 1200Ω) (dBV = 1000Ω)

Relative dB Reference: A voltage input present when this button is pushed is held as "0 dB" reference point. Subsequent readings indicate ±deviations from this point

Voltage Resolution: 0.05% of ranges (3½ digits)

Decibel Resolution: 0.01 dB (4½ digits)

Typical-3 dB Points: 40 MHz on 20 mV thru 20V ranges and 4 MHz on 2 mV range (8920A/8921A); 22 MHz on 2 mV to 20V ranges (8922A)

Low Pass Filter: Approximately 200 kHz -3 dB point, on 8922A only

Reading Rate: 2.5/s or 1/s with ac + dc with damping (8922A)

Autorange Rate: <950 ms or <3.5s with ac + dc with damping (8922A)

Response Time: (To rated accuracy) <1.6s or <7s with ac + dc with damping (8922A)

Readout: Panel-select able for volts or dB, automatic decimal point location: analog peaking/dipping meter

LED Annunciators: Indicate "mV," "V," "dB," "REL REF," and "2 MHz MAX" for 2 mV range (8920A and 8921A) and "UNCAL" when crest factor limitation exceeded (8922A)

Overrange: Flashes maximum reading for that range

Underrange: Flashes decimal

Linear Analog Output: (8920A and 8922A only) Linear output of 2000 mV dc for a 2000-count readout; ±1.0% relative to display; essentially 0Ω output into a ≥10 kΩ load; non-isolated, with output common same as input common

8920A, 8921A & 8922A

Option Specifications

Counter Output Option (-03)

Drives frequency counters. Converts input signal into a 100 mV peak square wave. Greater dynamic range extends the sensitivity of counters to 180 μV at the low end and 700V at the high end. Impedance is 50Ω. Used with the 8921A, counter can measure signals elevated to 500V rms.

Logarithmic Analog Output Option (-04)

For 8920A and 8922A only. Provides an analog output voltage proportioned to the logarithm of the input voltage. Plots logarithmically-scaled graphs, dB variations. Zero volts and zero dB on the output correspond with 200 μV on input. A 13.1V output corresponds to 700V or 131 dB on the input. Therefore, 2V on the output equals 20 dB, 6V equals 60 dB, etc., making it easy to relate voltage to dB. The option provides a low-cost way of using an X-Y recorder to plot graphs as one continuous curve over any part of the 131 dB range.

PTI Interface Option (-521)

To use the 8920-Series DVM's with Fluke's own addressable Portable Test Instrument (PTI) byte-serial data bus. Output to Fluke printers, typically. Supplied with 2-foot ribbon cable Y7203.

1120A Interface Option (-522)

A "personality card" that fits in the Fluke 1120A IEEE-488 Translator.

IEEE-488 Interface Option (-529)

The 8920-Series Voltmeters can be made compatible with IEEE Std 488-1978 by using Option -529 in combination with the Fluke Model 1120A Translator. A single 1120A will interface three Fluke instruments to the bus. Option -529 is electrically equivalent to Option -521 plus Option -522. Supports subsets SH1, AH1, T3, TE3

General Specifications

Temperature: -40°C to +75°C, non-operating
Relative Humidity: <80%
Shock: MIL-T-28800 all classes
Vibration: MIL-T-28800, classes 2, 3 & 4
MTBF: >10,000 hours
Power: 100V, 120V, 220V ac ±10% or 240V ac +4%, -10%, selected by internal switches, 50 to 400 Hz, 10W max
Size: 32.6 cm L x 20.3 cm W x 10.5 cm H (12.9 in L x 8.0 in W x 4.3 in H)
Weight: 2.47 kg (5.44 lb)
Included: Manual, power cord, serialized and dated calibration certificate

Ordering Information

Models

January 1988 prices

8920A DVM, BNC Input, 10 Hz-20 MHz	$1700
8921A DVM, Banana Jack Input, 10 Hz-20 MHz	1700
8922A DVM, BNC Input, 2 Hz-11 MHz	1700

Options (for above Models)

-03 Counter Output	220
-04* Logarithmic Output (not for 8921A)	220
-521 PTI Interface	190
-521K PTI Interface field-installable	220
-522K 1120A Interface field-installable	135
-529** IEEE-488 Interface	275

** Not compatible with -521, -521K, -529*

*** The -529 Option can be ordered and installed at time of manufacture only. For existing instruments which do not have -529 Option installed, an IEEE-488 Interface can be added by ordering -521K and -522K (1120A required).*

Accessories (Also see page 125)

1120A IEEE-488 Translator	550
Y7203 2 ft PTI Ribbon Cable	50
Y7204 5 ft PTI Ribbon Cable	65
Y2014 5¼" Rack Adapter, Single	95
Y2015 5¼" Rack Adapter, Dual	95
Y2020 Panel Mount Kit	95
Y2024 3-Module Power Cord	21
A90 6-Range Current Shunt	682
80J-10 10 Amp Current Shunt	35
Y9100 BNC 50Ω Attenuator (6 dB)	55
Y9101 BNC 50Ω Attenuator (14 dB)	55
Y9102 BNC 50Ω Attenuator (20 dB)	55
Y9103 50 Ohm Feedthrough Terminator	35
Y9107 BNC "T"	15
Y9109 Banana to BNC Adapter	20
Y9111 3-foot BNC to BNC Cable	20
Y9112 6-foot BNC to BNC Cable	20

Service & Support

Warranty

One-year product warranty. See page 453 for further information on warranty terms and conditions.

Extended Warranty

SC1-8920A Repair (w/calibration)	180
SC1-8920A Repair (cal w/in or out data)	215
SC1-8920A Repair (cal w/in and out data)	250
SC2-8920A Cal (1 yr recommended)	252
SC2-8920A Cal (1 yr w/in or out data)	392
SC2-8920A Cal (1 yr w/in and out data)	532
SC1-8921A Repair (w/calibration)	180
SC1-8921A Repair (cal w/in or out data)	215
SC1-8921A Repair (cal w/in and out data)	250
SC2-8921A Cal (1 yr recommended)	252
SC2-8921A Cal (1 yr w/in or out data)	392
SC2-8921A Cal (1 yr w/in and out data)	532
SC1-8922A Repair (w/calibration)	193
SC1-8922A Repair (cal w/in or out data)	228
SC1-8922A Repair (cal w/in and out data)	263
SC2-8922A Cal (1 yr recommended)	252
SC2-8922A Cal (1 yr w/in or out data)	392
SC2-8922A Cal (1 yr w/in and out data)	532

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