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MODEL MA-2000 CLAMP-ON MA METER

PAGES 4-5

 Measures low-level dc and ac currents from 0 to 2,000 mA

· Allows measurements without breaking circuits

Basic dc accuracy of 1% of reading

Resolution as low as 0.1mA

 Built-in 3½-digit display • True RMS measurement

ac Range 0-200 mA (low)

0-2,000mA

(high) peak

dc Range 0.21" ±0-200 mA (5.3 mm) (low) ±0-2,000 mA (high)

Aperture

Output

1mV/mA BNC connection



MODEL CG-100A CLAMP-ON CURRENT PROBE (200 A) WITH ANALOG OUTPUT

PAGES 6-7

· Measures dc and ac currents

• Comfortable handshake grip for easy use

100% overrange capability

 Analog output for connection to voltmeter. oscilloscope or recorder through standard



Aperture Output 0.75" ±1V full scale (19 mm)



MODEL CG-100D CLAMP-ON CURRENT PROBE (200 A) WITH DISPLAY

PAGES 6-7

Measures dc and ac currents

■Built-in display for easy readings

Comfortable handshake grip for easy use

. Analog output for connection to voltmeter, oscilloscope or recorder through standard banana iacks

ac Range dc Range

Aperture 0.75" (19 mm)

Output ±2 V full sca.



MODEL CG-120A CLAMP-ON CURRENT PROBE (500 A) WITH ANALOG OUTPUT PAGES 6-7

200A

Measures dc and ac currents

Comfortable handshake grip for easy use

· Analog output for connection to voltmeter, oscilloscope or recorder through a built-in 5-foot cable with standard banana jacks

ac Range 500A

dc Range ±50A ±500A

±200A

Aperture 0.75* $(19 \, \text{mm})$

Output 0.5V full scale



MODEL UM-7900 LARGE APERTURE 9-IN-1 CURRENT/POWER METER

PAGES 8-9

Reads and displays 9 parameters

 Advanced display design for front-view reading

• Pushbutton selections and functions

• RS-232

 Performs 3-phase power measurement at 20% the cost of 3-clamp mechanisms

Measures

 dc current ac current

• True power

power (kVAR)

(kW)

Reactive

 Apparent power (VI) Power factor Phase angle

 ac voltage Frequency

(60.3 mm)

Aperture

RS-232. serial interface (1,200 baud)

Output



D

PAGES 8-9

0

R

Measures dc and ac current and ac power

• Reads up to 1,000 A, dc and ac

Power measurements up to 660kW

В

High accuracy

In-line display

MODEL UM-7700D CURRENT/POWER PROBE WITH DISPLAY

ac Range 1 to 1,000 Aac

U

dc Range Power Range ±1 to 1,000 Adc 1 to 660 kW

Aperture

Large $(60.3 \, \text{mm})$

MODEL UM-7700 LARGE APERTURE CURRENT/POWER PROBE WITH ANALOG OUTPUT

Measures

• dc current

PAGES 8-9

Large aperture

Reads up to 1,000 A, dc and ac

Power measurements up to 330kW

voltmeter, oscilloscope or recorder

High accuracy

Analog output for connection to a digital

· ac current

Aperture Large

Output ±1 mVdc/Adc ±1 mVac/Aac ±1 mVdc/kWac

Aperture

1 72"

(31 mm)

ac power

(60.3 mm)

MODEL UM-1000 LARGE APERTURE CURRENT PROBE (1,000 A) WITH ANALOG OUTPUT

PAGES 8-9

Measures dc and ac currents

• Reads up to 1,000 amps, dc and ac

High accuracy

· Analog output for connection to a digital voltmeter, oscilloscope or recorder

ac Range dc Range 1 to 1,000 Aac ±1 to 1,000 Adc

Voltage Range

200 Vac

750 Vac

±200Vdc

±1.000 Vdc

Output **Aperture** ±1mV/A Large (60.3 mm)

Resistance

Up to $2,000\Omega$

Range

MODEL C-600 HAND-HELD DIGITAL MULTIMETER

PAGE 10

. Measures dc and ac voltage/current and resistance

• Compact and fully portable

• 1% accuracy

• 31/2-digit display for easy reading

• IEC 348 safety rating

· Auto-zeroing for dc measuring

Audio continuity indicator

MODEL 4048 HAND-HELD DIGITAL GAUSS/TESLA METER

PAGE 11

• Measures dc and ac magnetic fields

 Self-calibration and auto or manual range switching

• 3½-digit custom-formatted LCD

 Switch-selectable Gauss and Tesla reading · Transverse probe, extension cable, chamber for

zeroing and four AA batteries included with standard model

Range 200 G (20 mT)

2kG (200mT) 20kG (2T)

Current Range

200 A

Basic dc accuracy ±2% of reading

MODEL 4060 ELF (EXTREME LOW FREQUENCY) METER PAGE 12

 Measures extreme low frequency magnetic fields from electrical equipment and transmission lines

Compact and lightweight

 Large, easy-to-read 3½-digit display ■ 100% solid-state F.W. Bell circuitry

(low) 0.01 to 5 G (high)

Range

1 to 1,999 mG

Resolution Accuracy 1mG (low) 1% reading 10mG (high)





A CLAMP-ON THAT MEASURES BELOW ONE MILLIAMPERE WITH RESOLUTION TO 0.1 MILLIAMPERE? YOU BET!

The Model mA-2000 is rapidly becoming the clamp-on meter of choice for measuring very low do and ac currents. And the reason is simple: most clamp-ons can only measure down to 1A. The Model mA-2000 measures to below 1mA with resolution of 0.1mA. That's a full 1,000 times better resolution than most other clamp-ons!

The revolutionary Model mA-2000 is today's only choice for troubleshooting 4-20 mA control loops. It belongs anywhere process control is critical — from the largest manufacturing environment to the most demanding R&D lab. Technicians rely on the Model mA-2000 for extremely accurate and inexpensive diagnostic measurements. And there are hundreds of other applications. It features an easy-to-read 31/2digit display and an analog output for connection to an oscilloscope or recorder. If your requirements include low-level dc and ac current measurements of any kind, you must look at the Model mA-2000. There's simply no clamp-on alternative.



FEATURES

- Measures low-level dc & ac current from 0 to 2,000 mA with resolution as low as 0.1 mA
- Basic dc accuracy of 1% of reading
- True RMS measurement
- Frequency range dc to 100 kHz
- Easy-to-read 3½-digit display
- BNC analog output for connection to oscilloscope or recorder
- Built to IEC 1010 safety standards*
- Supplied with a hard carrying case

APPLICATIONS

- Troubleshooting 4-20 mA control loops
- Isolating faults on electronic circuits
- · Verifying power supply current
- Automotive control diagnostics
- Measuring ground currents
- Low current measurements in R&D laboratories

SPECIFICATIONS

Measuring Circuit

Hiah Resolution on 200 mA range 0.1 mA on 2,000 mA range 1mA dc to 100 kHz Frequency Range ac Low

ac High –3 dB Accuracy (±3 counts)

ac up to 200 Hz ac 200 Hz to 400 Hz ac 400 Hz to 40 kHz ac 40kHz to 100kHz

Repeatability (±3 counts) Readout

Output

Analog Connector Noise

Influences on Accuracy

Temperature Coefficient Adjacent Conductor

General Information

Operating Temperature Storage Temperature

Battery Battery Life (typical)

Safety

Aperture Probe Size

Meter Size

*Approval pending.

0-200 mA dc or RMS 0-2,000 mA dc or ac peak

dc to 200 Hz 200 Hz to 100 kHz 200 kHz

1% reading 2% reading 4% reading 2% reading 3% reading 0.5% reading 31/2-digit LCD

1mV/mA BNC

0.01°C max

 $< 100 \,\mu V \text{ RMS}$

 $< 100 \,\mu\text{A/A}$

0°C to +50°C -25°C to +70°C

Two 9V alkaline (NEDA 1640 A) 15 hours

IEC 1010, Cat 2, 300V,

pollution degree 2* 0.21" (5.3mm)

Length 6.25" (159mm) Diameter 1.2" (30mm) 5.2" (132 mm)

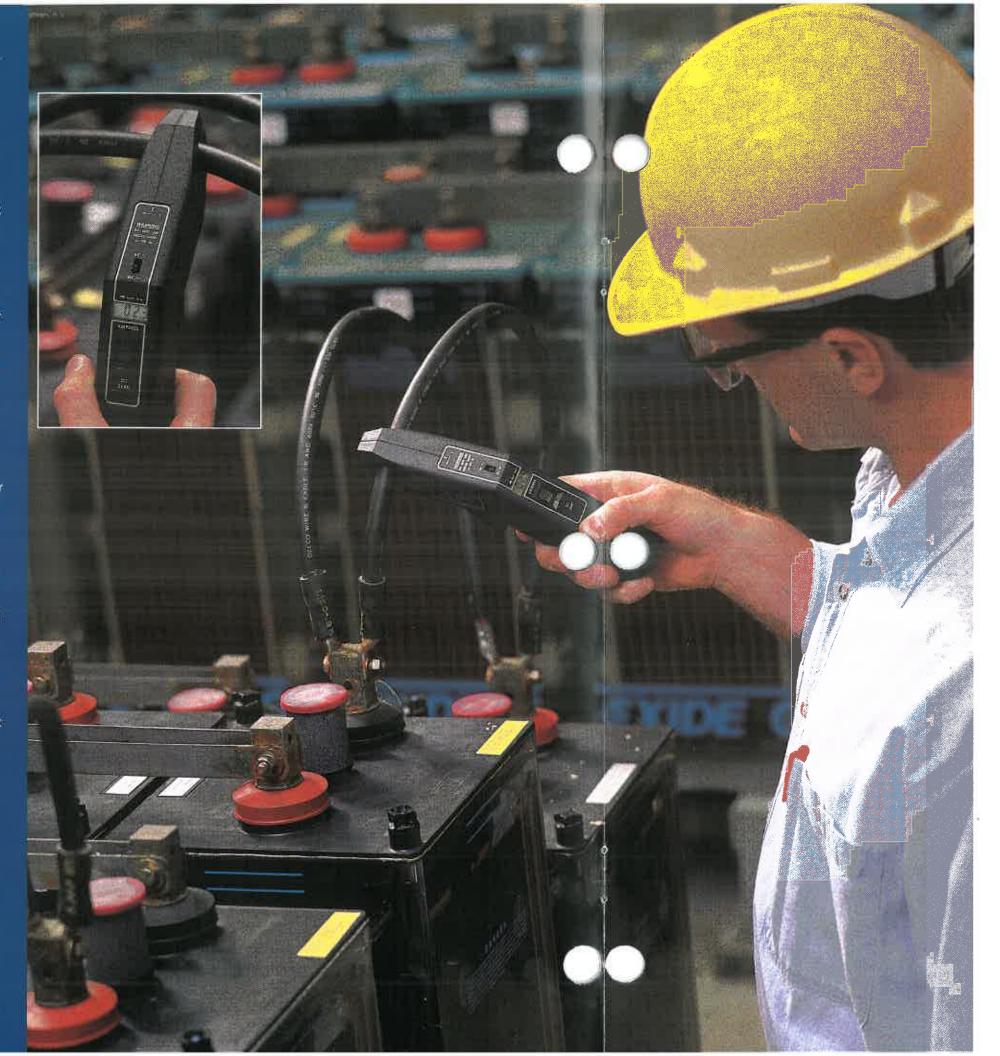
Length Width 5.3" (135 mm) Height 1.5" (38mm)



As SIMPLE As SHAKING SOMEONE'S HAND

The F.W. Bell CG Series is the most trusted and popular family of ac and dc clamp-ons in the industry. It features today's widest selection of dc units. Its ergonomic pistol design sets the standard for hand-held comfort.

The Model CG-100D features a 3 - digit LCD display located in the direct line of sight for ease of use. The CG-100A's low-end 0-10 A range sets it apart from the competition as the ideal clamp-on for measuring the lower currents of today's smaller, more efficient circuitry. All models measure both ac and dc current. And each can be used in conjunction with a digital multimeter, oscilloscope or recorder via analog output jacks. With unparalleled ease of use and accuracy in the widest range of applications, the F.W. Bell CG Series of meters and probes offers hands-down current measuring superiority. It's that simple.



FEATURES

- Clamp-on operation
- Automatic reading hold
- Output jacks for use with oscilloscope
- 3½-digit LCD readout
- Fully portable
- Battery operated
- Battery low indicator

APPLICATIONS

- Measure dc and ac currents
- Measure battery-charging currents
- Measure welder currents
- Measure ac and dc ground currents
- Measure power supply ripple
- Measure battery currents in UPS systems

SPECIFICATIONS	CG-100A	CG-100D	CG-120A
Measurement Range	10A, 100A	200 A	50 A, 500 A
Basic Accuracy	±2% range, ±0.9A	±3% reading	±5% readir ±5A
Overrange Capability	100%	none	300% (50 <i>A</i> range only)
Display Type	none	3½-digit LCD	none
Frequency Response	dc to 1,000 Hz	dc to 1,000 Hz	dc to 1,000 Hz
Resolution	-	0.1A	-
Full Scale Output	1V	2V	0.5V
Working Voltage	660 V RMS	660 V RMS	660V RMS
Withstand Capability (tested between core and probe output for 1 minute)	2,400 V (60 Hz)	2,400 V (60 Hz)	2,400 V (60 Hz)
Conoral Information			

General Information

Operating Temperature	+15°C to +35°C	+15°C to +35°C	-15°C to +50°C
Storage Temperature	-10°C to +50°C	−10°C to +50°C	-40°C to +60°C
Battery	4 AA cells	4 AA cells	one 9V
Battery Life (typical)	30 hours	30 hours	100 hours
	(alkaline)	(alkaline)	(alkaline)
Aperture	0.75"	0.75"	0.75"
	(19mm)	(19 mm)	(19 mm)
Weight (with batteries)	14 oz	16 oz	14 oz
	(400 g)	(500 g)	(400 g)



Application Notes

- Currents under 1A may be read with reasonable accuracy by looping a number of turns of the current-carrying conductor through the aperture, thus effectively "multiplying" the current by the number of turns.
- Connecting the analog output to an oscilloscope allows the user to see the actual current waveform.





TAKE CONTROL OF YOUR ENERGY COSTS

The extraordinary versatility of the UM-7900 Utility Master makes it the one instrument capable of handling most utility and plant measurement requirements. Lightweight, extremely rugged and featuring a 2 and aperture, it allows direct measurement of ac voltage, ac and dc current, frequency, power factor, phase angle, true power, apparent power and reactive power.

The UM 7900 provides an easy and economical way to check the efficiency of motors, heating elements and other large current devices. Use it to check plant capacity or adjust plant loads. And its optional RS-232 port lets you transfer data to a central computer. The UM-7900 is ideal for plant surveys in remote locations.

MULTI-PHASE POWER MEASUREMENTS AT A FRACTION OF THE COST OF OTHER POWER METERS

With the UM-7900, you can easily calculate the power of 3-phase, 3-wire circuits by first measuring two of the phases, then summing the total. For 3-phase, 4-wire circuits, you simply take three measurements and sum the total. This eliminates the need for more expensive multi-probe units.



UM-7900 FEATURES

- Liquid crystal display
- Peak/Hold
- Pushbutton selection of functions
- RS-232 interface port
- Large Aperture
- Fully portable
- Hard carrying case

APPLICATIONS

- Adjust motor loads
- Adjust plant loads
- Determine power factor correction capacitors
- Checking industrial and commercial power systems
- Plant maintenance and inspection
- Electrical utility inspections • Determine current balance between two wires
- Measuring transformer loads

ELECTRICAL				
Parameter	UM-7900	UM-7700D	UM-7700	UM-1000
ac Voltage	90 to 660Vac ±1.0% of reading, ±2V			
ac Current	1 to 25 Aac ±1.0% of reading, ±1.5 A 25 to 1,000 Aac ±1.5% of reading, ±3 A	1 to 1,000 Aac 1% of reading ±1.5 A (for 1 to 25 A) 1.5% of reading ±3 A (for 25 to 1,000 A)	1 to 1,000 Aac 1.5% of reading ±2 A	1 to 1,000 Aac 2.5% of reading ±2 A
dc Current	±1 to 25 Adc ±1.0% of reading, ±1.5 A ±25 to 1,400 Adc ±1.5% of reading, ±3 A	±1 to 1,000 Adc 1% of reading ±1.5 A (for 1 to 25 A) 1.5% of reading ±3 A (for 25 to 1,000 A)	±1 to 1,000 Adc 1.5% of reading ±2 A	±1 to 1,000 Adc 1.5% of reading ±2 A
Measuring Frequency	40 to 500Hz ±0.4% of reading	DC to 500 Hz	DC to 500Hz	DC to 500Hz
Frequency Response (-3	dB)		3.2 kHz	3.2 kHz
Output	RS-232, serial interface (1200 baud rate)		1mV/A for dc or ac current 1mVdc/kW	1 mV/A for dc or ac current
Working Voltage	660Vrms maximum at current-carrying conductor	600Vrms maximum at current or voltage inputs	600Vrms maximum at current or voltage inputs	600Vrms maximum at current-carrying conductor
Actual Power	1 to 660 kW < 10 kW: ±2% of reading, ±1 kW; > 10 kW: ±2% of reading, ±1.0% FS	1 to 660 kW < 10 kW: ±2% of reading, ±1 kW; > 10 kW: ±2% of reading, ±1.0% FS	0.1 to 330 kW ±3% of reading ±0.5 kW	
Safety	Built to IEC 1010 standards	Built to IEC 1010 standards	Built to IEC 1010 standards	Built to IEC 1010 standards
Phase Angle	0 to $\pm 60^{\circ}$ $\pm 6^{\circ}$ max.			
Power Factor	0.5 to 1.00 $\leq \pm 0.08$ max.			
Apparent Power (at ±60° ±1.75% worst case)	1 to 660 kVA < 10 kVA ±2% of reading, ±0.5 kVA 10 kVA to 100 kVA ±2% of reading, ±1 kVA > 100 kVA ±2% of reading	UM-7700D	UM-7700	UM-1000

GENERAL				
Operating Temperature	0°C to +50°C	0°C to +50°C	0°C to +50°C	0°C to +50°C
Storage Temperature	0°C to +60°C	-40°C to +60°C	-40°C to +60°C	-40°C to +60°C
Battery	One 9V alkaline (NEDA 1640)	One 9V alkaline (NEDA 1640)	One 9V alkaline (NEDA 1640)	One 9V alkaline (NEDA 1640)
Battery Life	8 hours	8 hours	100 hours	100 hours
Aperture	Oval, 2 ⁷ / ₈ " x 2 ³ / ₈ " (73 mm x 60 mm)	Oval, 2 ⁷ ⁄ ₈ " x 2 ³ ⁄ ₈ " (73 mm x 60 mm)	Oval, 2 ⁷ / ₈ " x 2 ³ / ₈ " (73 mm x 60 mm)	Oval, 2½" x 2½" (73 mm x 60 mm)
Weight	29 oz (822 g)	29 oz (822g)	29 oz (822 g)	29 oz (822g)

±2kVA

Reactive Power

(at 0° ±1.75%

worst case)

1 to 570 kVARS

±3% of reading, ±5kVARS



MULTI-FUNCTIONAL CURRENT, VOLTAGE AND RESISTANCE METER

The friendly feel and favorable price of the C-600 are only two of the reasons why it's among the world's most popular multimeters. Using advanced Hall-effect technology, the C-600 measures ac or dc current, ac or dc voltage and resistance. And it measures current without breaking the circuit or disturbing insulation. The C-600 features a 3 4-digit LCD and is accurate to ±1%. Fully IEC-348 compliant, it also features auto-zeroing, audio continuity indicator and display data hold. Versatile and easy to use, the C-600 is the one multimeter for electrical and electronic technicians in any industrial environment.

FEATURES

- Measures current up to 600 Adc and Aac
- Measures voltage up to 750 Vac or 1,000 Vdc
- Measures resistance up to 2.000Ω
- Auto-zeroing for dc current
- Display data hold
- 1% basic accuracy
- 15 to 400 Hz frequency range
- Large 3½-digit LCD display
- Audio continuity indicator

APPLICATIONS

200A, 600A

15 to 400 Hz

±1% of range, ±5 digits

±200 Vdc, ±1,000 Vdc

±1% of reading, ±3 digits

±1% of reading, ±1 digit

Buzzer sounds below $500\,\Omega$

Tested at 6,000 V, 50 Hz for

200 Vac, 750 Vac

15 to 400 Hz

0.1A

0.17

 $10 M\Omega$

 $2,000\Omega$

500Vac/dc

1,000 Vrms

0°C to +40°C

-20°C to +60°C

One 9V alkaline (NEDA 1640 A)

50 hours

with battery removed

 1Ω

±20%

1V

- Measure ground current dc and ac
- Pinpoint bad grounds and shorts
- Locate excessive current drains
- Determine voltage drops
- · Automotive electrical system maintenance
- Electric vehicle maintenance
- General plant maintenance

SPECIFICATIONS

Measuring Circuit

dc and ac Current Ranges

Resolution (200A range) Resolution (600A range)

Accuracy

ac Frequency Range dc and ac Voltage

Ranges (dc) Ranges (ac) Resolution (200 V range)

Resolution (1,000 V range) Accuracy ac Frequency Range

Input Impedance

Resistance Range Resolution Accuracy

Accidental Input Protection

Continuity Accuracy

Withstand Capabilities

Voltage Withstand

Maximum Voltage Between

Insulated Current-Carrying Conductor and Ground

General Information

Operating Temperature Storage Temperature

Battery (not included)

Battery Life (typical)

Dimensions

Aperture 1.22" (31 mm) 8.15 "L x 2.52 "W x 1.06 "H

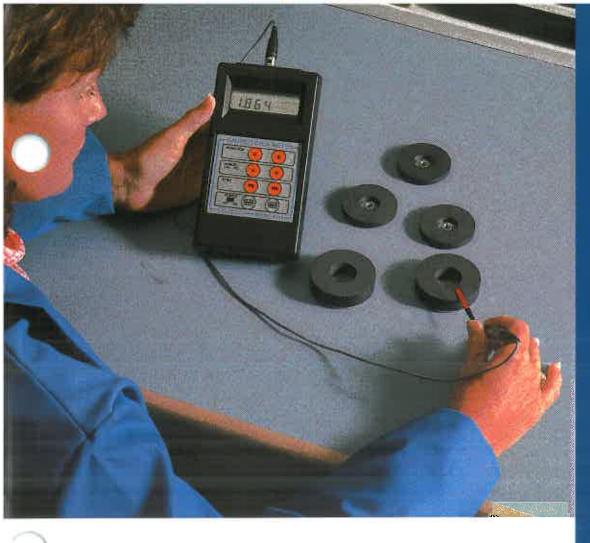
(207 mm x 64 mm x 27 mm)

Weight 10.2 oz (290 g)

Note

Accuracies are stated at 23°C ± 1°C







- Auto or manual range switching
- Instant one-button probe zeroing
- User-friendly display prompts
- 3½-digit custom-formatted LCD
- Scale suppression
- · dc and ac field response
- True RMS ac response to 12 kHz
- dc and ac peak holds
- Gauss/Tesla reading, switch-selectable

APPLICATIONS

- Testing, sorting, classifying magnets
- · dc and ac motor testing
- Loudspeaker testing
- Relay and solenoid testing
- TV deflection coil testing
- · Pipe weld inspection
- NDT compliance testing (MIL-STD 1949A and ASTM E 709)

SPECIFICATIONS Measuring Circuit

Ranges Resolution (200 G range) Accuracy (±2 counts)

dc ac

Temperature Effect

Peak Hold Accuracy ac Acquisition Time dc Acquisition Time Storage Time

General Information

Operating Temperature Storage Temperature Battery

Battery Life Meter Size

Probe Stem Size Transverse T-4048-001

Axial A-4048-002

X-4048-003 Extension Cable Weight 200 G (20 mT), 2 kG (200 mT), 20 kG (2 T) 0.1 G (10 μ T)

±2% of reading (45 to 100 Hz) (100 Hz to 3 kHz) (3 kHz to 5 kHz)

±2.5% of reading ±2% of reading ±6% of reading

0.075%/°C

(from 25°C, including probe)

Same as above 150 ms 110 ms Indefinite (digital hold)

0°C to +50°C -20°C to +60°C

Four 1.5V AA alkaline batteries

> 60 hours 4"W x 1.75"H x 7"D

(101.6 mm x 44.5 mm x 177.8 mm)

0.165 " $W \times 2.5$ " $L \times 0.057$ " thick (4.19 mm $\times 63.5$ mm $\times 1.45$ mm) 0.165 " $W \times 2.5$ " $L \times 0.090$ " thick (4.19 mm $\times 63.5$ mm $\times 2.29$ mm)

39" long (1m)

1 lb (450g) net, 2 lb (900g) shipping



THE ADVANTAGES OF A MORE EXPENSIVE, BENCH-STYLE INSTRUMENT IN A HAND-HELD PACKAGE

Fully portable, easy to use and equipped with features found in units more than twice its size, the Model 4048 hand-held gaussmeter towers above any other gaussmeter in its class. Its customformatted 31-digit LCD provides a large readout of the magnetic field as well as all other information relative to the reading, instrument function and battery condition. And it comes with everything you need: transverse probe, probe extension cable, zero gauss chamber, four AA batteries and a carrying pouch. Only the world leader in gaussmeter technology could offer so many features for such a low price.

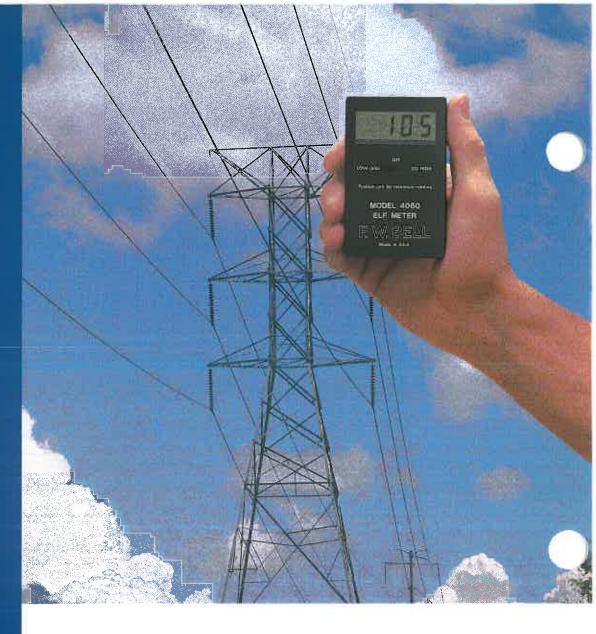


MODEL 4060 ELF METER

The Model 4060 ELF Meter is designed to measure extremely low frequency magnetic fields produced by electrical devices ranging from transmission lines to electric blankets. And the Model 4060 is a single-axis device, so you know exactly where the field you're measuring is coming from. Compact and lightweight, the pocket-sized Model 4060 is all the ELF meter you will ever need.

WHEN QUALITY MATTERS MOST

Since our founding over 50 years ago, no company has done more to put quality in the hands of its customers than F.W. Bell. And nowhere is this more evident than in our family of hand-helds. From our revolutionary mA-2000 Milliammeter to our Model 4060 ELF Meter, expect a level of performance, satisfaction and support that can come only from a world leader. Look to us for your most demanding measurement requirements. Look to F.W. Bell when quality matters most.



FEATURES

- Compact
- Lightweight
- Large easy-to-read 3½-digit display
- Only one switch on/off and high/low positions
- Made by the world's leader in magnetic measuring instruments

APPLICATIONS

- Power transmission lines
- Computers
- Electric blankets
- Motors
- Microwave ovens
- Transformers
- Electrical machinery

SPECIFICATIONS

Measuring Circuit

 Ranges
 1 to 1,999 mG

 Low
 0.01 to 5 G

 Resolution
 1 mG

 Low
 1 mG

 High
 10 mG

 Accuracy (typical)
 ±1% of reading

 Frequency
 60 Hz (Item No. 114060)
 60 Hz ± 1.0 Hz

General Information

50 Hz (Item No. 114050)

Operating Temperature -10°C to +50°C

Battery 9V carbon/zinc

Battery Life 230 hours

Size 2.4"W x 3.8"L x 1"D
(61 mm x 96.5 mm x 25.4 mm)

-i-l-+ 6 -i+l- l--++--- 4.5 -- (43.5 --)

 $50 Hz \pm 1.0 Hz$

Weight (with battery) 4.5 oz (126g)

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