



## MF-5D / DP - Portable Fluxmeter

The **MF-5D** and **MF-5DP** are portable precision electronic integrating fluxmeters designed to measure the magnetic flux coupling within a coil or loop of wire. These instruments integrate the volt-second signals induced across a coil by the flux coupling to the coil. The output is representative of the change in flux coupling during the integrating period.



The instrument controls are organized so as to display the average flux density across the area of a coil or the total flux within that coil. A three decade input dial, adjustable from one to 999, provides for setting in either the area turns of the coil for flux density or the number of turns for total flux.

The MF-5D and MF-5DP integrating fluxmeters employ a precision ultra-low drift operational amplifier circuit as an integrator. Scale sensitivity and ranges are controlled by selecting appropriate values for the integrating capacitor and input resistors. Any uncompensated thermocouple voltages, which may be present at the instrument's input, are removed by adjusting a drift control. A null push-button switch provides for increased sensitivity while adjusting the drift.

Both instruments use a 3½ digit bipolar LCD display which provides increased accuracy and 100% overrange capability. In addition, the MF-5DP will sense and display the most recent peak magnetic field level.

Designed for production and laboratory applications, the MF-5D and MF-5DP portable fluxmeters provide the user with a flexible and convenient means of accurately measuring total flux and flux density.

Total flux and flux density ranges can be easily scaled for direct reading. The direct reading ranges for total flux are from  $\pm 1$  kilomaxwell turn to  $\pm 9.99 \times 10^4$  kilomaxwell turns full scale with 100% over-range; for flux density, the direct reading ranges are  $\pm 1$  kilogauss,  $\pm 10$  kilogauss and  $\pm 100$  kilogauss with 100% over-range. However, these instruments can be used to measure fields from a few milligauss to several hundred thousand gauss with select sense coils. Readings are displayed on a 3½ digit bipolar LCD meter.

These instruments have three distinct measurement modes of operation, DC, RMS and AC. The MF-5DP has an additional peak measuring mode.

**DC MODE:** The instrument displays the magnitude of the magnetic field for static and slowly changing fields. The instrument output is the analog of the magnetic field from DC to 100 kHz.

**RMS MODE:** The instrument displays the true RMS value of the composite DC/AC magnetic field up to 100 kHz. The instrument output is the same as in the DC mode.

**AC MODE:** The DC field component is removed leaving only the analog of the AC field component at the output and to be displayed as a true RMS value.

MF-5 fluxmeters have a 1 V  $\pm 0.25\%$  full scale analog output with 100% over-range which is proportional to the measured flux from DC to 100 kHz.

In the Peak Mode, the MF-5DP will sense and display the most recent peak magnetic field level from DC to 20 kHz.

This instrument can be set to either detect the peak value when the field is bipolar (varying from positive to negative) or it can be set to exclusively detect either the positive peak or the negative peak of a varying field. Because of the digital circuit design, there is no field decay in the peak mode.

The MF-5D and MF-5DP operate from either AC or sealed lead acid batteries. During AC operation, the batteries receive a floating charge which keeps them fresh until the instrument is required for portable use. Freshly charged batteries will continuously operate each instrument for 12 to 15 hours.

### Features

- ✧ Very Low Drift for Accurate DC Measurements
- ✧ High Frequency Response for AC Measurements to 100 kHz
- ✧ Flexible Scale to Read Either Flux or Flux Density
- ✧ Measure with Assurance of Complete Linearity
- ✧ Sensing Element - A few turns of wire for most applications
- ✧ Rugged-Not sensitive to vibrations or positioning
- ✧ Positive and/or Negative Peak Reading (MF-5DP)
- ✧ No Field Decay in Peak Mode (MF-5DP)
- ✧ Operates with Either AC or Battery; Fully Portable
- ✧ High Impact Plastic Case with Carrying Handle

### Accessories

**Standard Calibrated Search Coil:** Model MS-1 100 cm<sup>2</sup> turns; to aid in instrument calibration and for routine measurements.

**Fluxmeter Calibrator:** Model MTC-1 Where the optimum performance of a fluxmeter is required, the Model MTC-1 Volt-Second Generator provides a calibrated volt-second impulse of high accuracy without recourse to reference magnets or mutual inductors. The MTC-1 accuracy is  $\pm 0.05\%$ .

**Standard Reference Magnets:** Where nominal instrument calibration accuracy is satisfactory. Accuracy to  $\pm 0.5\%$ .

### Optional Threshold Control Unit

### Specifications



<b>Range</b> Organized for direct reading of total flux or flux density	TOTAL FLUX: $\pm 1$ kilomaxwell turn to $9.99 \times 10^4$ kilomaxwell turns full scale with 100% over-range.  FLUX DENSITY: $\pm 1$ kG, $\pm 10$ kG and $\pm 100$ kG full scale with 100% over-range  Lower full scale ranges can be set by factoring the decade setting.
<b>Display</b>	3M digit bipolar LCD (liquid crystal display)
<b>Input</b>	100 Ohms x decade setting, 19 mA maximum current, 100 volts maximum input voltage
<b>Instrument Accuracy</b>	DC reading $\pm 0.25\%$ of range $\pm 1$ count when calibrated with fluxmeter calibrator Model MTC-1. Drift $\pm 100$ maxwell turns per minute maximum.  RMS reading 3 Hz - 10 Hz $\pm 1\%$ of range $\pm 1$ count, 10 Hz-100 kHz $\pm 0.5\%$ of range $\pm 1$ count  Peak Reading $\pm 1\%$ of range 0 - 20 kHz (MF-5DP only)
<b>Analog Output</b>	$\pm 1.000$ V, full scale with 100% over-range 2 kOhm minimum load impedance  Accuracy: $\pm 0.25\%$ of range DC - 100 kHz  AC: 100-125 V/50-60 Hz, 200-240 V/50-60 Hz  DC: 12 V sealed lead acid rechargeable battery. Battery life exceeds 15 hours continuous operation (12 hours for MF-5DP) with fully charged batteries, charge time is 12 hours maximum.

**Physical:**

SIZE: 2.75" H x 8.5" W x 9.25" L (6.98cm H x 21.6cm W x 23.5cm L)

NET WEIGHT: 5 lbs (2.3 kg)

SHIPPING WEIGHT: 6.25 lbs (2.8 kg)

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