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MSI-95 Gaussmeter Instructions

Your MSI gaussmeter has three main parts:
1) METEX high quality Digital Multimeter, colored yellow.
2) MAGCHECK Magnetic Field Probe, colored blue.
3) Coax cable with connector or banana plugs on ends, colored black (may already be connected to the blue probe).

Other items included are the carrying case, the "MSI Magnetic Field Guide" booklet, the Metex digital multimeter operating manual (under meter), and this instruction sheet. A pair of red-and-black test leads with pointed tips are not needed for the gaussmeter but are included so you can also use the METEX digital multimeter as an electronics test instrument for measuring voltages, currents, and resistances.

GAUSSMETER OPERATING INSTRUCTIONS

1. Rotate the large yellow dial of the meter to the "200m" position in the "ACV" section (if it isn't already at that position: located near where "5 o'clock" would be on a clock). You can leave the dial there when not using the meter.

2. Connect the coax cable to the probe: slide the BNC connectors together, turn to lock them.

3. Plug the banana plugs located on the end of the coax cable into the meter. The plug with a small tab or minus sign "-" engraved next to it in the plastic goes into "COM" socket, the other plug goes into the "V/Ω" socket.

4. Push the "ON" button to turn the meter on. When finished measuring push again to turn off to conserve battery.

5. Hold or place the probe at the location you want to check for magnetic field strength. It does not matter where the meter is held as long as it is correctly connected to the probe by the cable, but the probe must be at the location to be checked.

6. Turn the probe in different directions and check the readings displayed. Find the probe direction which gives the largest reading, which is the magnetic field strength in milliGauss (mG) at that location. You may need to hold the probe still for a couple of seconds while you read the meter. Don't forget there is a decimal point shown, so 0.5 is ½ mG. If the reading increases over the 200mG maximum, turn the meter dial counter-clockwise to the next higher AC voltage scale so the meter now reads Gauss instead of milligauss since the scale is on Volts instead of millivolts. Jerking the probe quickly can cause false high readings for about one second which can be ignored (induced by probe motion through the earth's DC magnetic field). Sometimes you won't see exactly the same reading when you check the same location again, this is usually because the probe is not back to exactly the same spot and pointing direction. If readings are very erratic or over 10 mG, be sure the banana plugs are inserted all the way, also sharp bending or yanking of the cable can break the wires inside the cable which is also seen as erratic readings. The enclosed Magnetic Field Guide includes additional information.

BATTERY REPLACEMENT/ SPARE FUSE

The meter comes with battery installed and a spare fuse stored inside the meter. A battery shaped symbol appears on the diplay screen when the battery needs to be changed. It takes one 9 Volt battery. To access the battery, remove the screw and the back cover of the meter.

ADDITIONAL TECHNICAL INFORMATION

The following is for technically interested users, it is not necessary to read this to successfully use the gaussmeter: The probe provides an AC voltage that is proportional to the AC magnetic field strength within the frequency bandwidth of the probe, and parallel to the coil axis of the probe. The probe is calibrated for 1mV=1mG. The coil axis of the probe is parallel to the longest dimension of the probe case. Since only magnetic fields parallel to this axis will produce an output voltage it is necessary to rotate the probe to find the maximum reading. A single axis gaussmeter probe therefore gives you the direction of the maximum magnetic field as well as the field strength. In elliptically polarized fields the maximum reading is the major axis of the polarization ellipse. A single axis gaussmeter or probe avoids an error that can sometimes occur measuring homes and offices using triple axis gaussmeters in elliptically polarized magnetic fields: 3-axis meters may read as much as 41% too high because the formula used by almost all 3-axis meters is accurate for linearly polarized fields only, not for elliptically polarized fields (formula is root of sum of squares of amplitudes of each axis, no phase information is used). So a single axis meter is actually more reliable if used correctly than a 3-axis meter. A frequency response curve for your probe can be provided upon request. If your multimeter has a frequency setting, you can read the predominant frequency. This feature will kick in at the minimum threshold for your meter, often this is around 10 mG (mV). On an oscilloscope you will see the waveform of the magnetic field you are measuring. You can also use the probe with a data logger which accepts AC volts.

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