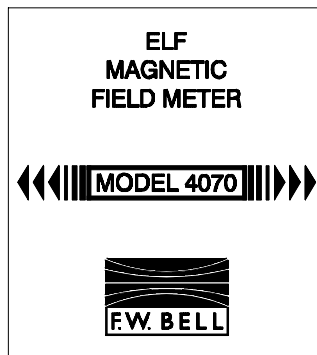


ELF Meter

Model 4070



Operating Instructions



GENERAL INFORMATION

The Sypris Test & Measurement Model 4070 magnetic field meters are low-cost, hand-held instruments that measure magnetic fields generated by power lines, computer terminals, household appliances, and a variety of other common electrical devices.

The Model 4070 is designed to monitor low-level ELF (Extremely Low Frequency) radiation by measuring the *magnetic flux density* in units of milligauss (mG), and to display the reading on a Liquid Crystal Display (LCD). The levels that can be measured range from 0.1 to 199.9 mG.

This instrument is both accurate and easy to use. It is a simple procedure to determine areas where ELF radiation is present. Once these areas are found, the Model 4070 can help the user in taking the steps necessary to reduce everyday exposure to ELF radiation.

Certain ill effects associated with exposure to ELF magnetic fields have been reported in scientific journals in recent years. Although evidence of a direct "cause-and-effect" link has not been established, many respected authorities (including the U.S. E.P.A.) are recommending "prudent avoidance" of ELF magnetic fields until further research leads to more conclusive results.

For more information on the potential health risks of ELF radiation, see the references listed at the end of the manual.

OPERATING INSTRUCTIONS

To operate the Model 4070, first turn the ON/OFF switch to the up (ON) position and move toward a source of ELF radiation.

Most appliances that plug into a standard wall socket will emit radiation when turned on.

When you begin using the Model 4070, you will often find that the ELF radiation is strongest in one particular area. For example, your computer screen at work may have its greatest radiation level directly in back of it, thus affecting those around you. A bedside clock radio may emit more around its side. You can effectively reduce your exposure to ELF magnetic fields by first locating the areas in your home or workplace where levels are the highest, and then by rearranging your living space in a way that minimizes your exposure.

Hold the meter in front of and around the source of radiation, and orient the meter at various angles until a maximum reading is obtained. Take the time to become familiar with this process and you will see that the reading displayed is greatly affected by the orientation of the meter. This is because the magnetic field not only has a strength or level associated with it but a *direction* as well. The meter responds to magnetic fields whose direction is across the meter face from left to right (or right to left). A very strong magnetic field in a direction from top to bottom or front to back will show little or no reading on the Model 4070 display.

Always keep these important points in mind when using the meter: (1) the position of the meter should be oriented in various directions until a maximum reading is obtained; and (2) it is the maximum reading that gives the true indication of field strength.

The above process can be repeated at various locations to determine the areas in your home or workplace where ELF fields are present. The Model 4070 can assist

you in locating the sources of ELF radiation in the home or workplace, and thus allow you to take positive steps to reduce your exposure.

Under normal operating conditions, the unit will provide over 250 hours of continuous use using a standard 9V alkaline battery. When the battery level falls below 5.3V, a *low battery indication* (signaled by a minus sign) will be made, and the battery should be replaced (alkaline only) as soon as possible.



Make sure the ON/OFF switch is in the "OFF" position before replacing the battery.

IMPORTANT NOTE

The Model 4070 is a "single-axis" meter. Although even a simple explanation of what this means can confuse most non-technical users, it is very important that you understand how this property affects the measurements you take.

A magnetic field has two basic properties: its strength (or level), measured in mG; and its direction. Most people have no trouble understanding that magnetic field levels are measured in units of mG. Informal research indicates, however, that the majority of measurements made with a single-axis meter by non-technical users are flawed. The problem arises from the fact that magnetic fields are directional (recall that it is the earth's magnetic field that causes a compass needle to always point north).

Most of the time, users simply point the meter "at" the objects they are trying to measure. Although it is possible that this

may lead to the "correct" measurement, it is much more likely that the level indicated by the meter will be lower than the actual level present.

Instead of pointing the meter "at" what is being measured, the user should try orienting the meter in different directions until a maximum level is indicated on the display. Turn the meter clockwise, counterclockwise, sideways, leaning forward, leaning backward, and all combinations of angles in between. Although this may seem a little awkward, it is absolutely necessary if accurate readings are to be obtained. If it is not possible to insure that this instrument will be used properly, upgrading to a 3-axis instrument (such as the Sypris Test & Measurement Model 4080 or 4090) should be considered.

REFERENCES

1. U.S. Congress Office of Technology Assessment, Biological Effects of Power Frequency Electric and Magnetic Fields-Background Paper, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989).
2. U.S. Environmental Protection Agency, Evaluation of the Potential Carcinogenicity of Electromagnetic Fields--Draft Review, EPA/600/6-90/005B.
3. N. Wertheimer and E. Leeper, Electrical Wiring Configurations and Childhood Cancer. *American Journal of Epidemiology*, Vol. 109, No. 3, pp. 273-284, 1979.
4. Electric and Magnetic Fields From 60 Hertz Electric Power: What Do We Know About Possible Health Risks? Department of Engineering and Public Policy, Carnegie-Mellon University, Pittsburgh, PA 15213.

SPECIFICATIONS

- Range.....0.1-199.9 mG
- Accuracy.....1% \pm 1 digit, (typical)
- Frequency Response.....30 Hz to 600 Hz
- Battery Life.....250 hours, (typical)
- Power.....One 9V battery, alkaline

- Weight.....4.9 oz.
- Dimensions.....4.7"L x 2.4"W x 1.0"D

WARRANTY

Sypris Test & Measurement warrants this product against defects in material and workmanship for a period of one year from the date of purchase. This warranty does not cover damage due to accidents, misuse or tampering, nor does it cover damage resulting from non-authorized repair. If a malfunction or failure occurs, send the unit insured and properly packaged to the address listed below. Sypris Test & Measurement will, at its option, repair or replace the unit and return it to the purchaser, with charges only for shipping. This warranty is limited to the original purchaser and is not transferable.

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Answers to any questions concerning the use of and authorized repair of this product may be obtained by writing:



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