



The CESCO Gauss Measurement System

gauss, n., after Karl Gauss (1777-1855), a unit used in measuring magnetic intensity equal to one line of force per square centimeter.

consists of:

- 1) **The Gauss Meter**, Serial Number _____ - is composed of two switches: The On-Off switch which includes a peak hold and an offset knob. This unit was calibrated when it left the factory.
- 2) **48" Flexible Probe** - One end of the probe plugs into the top of the gauss meter, the other end contains a very small (.2mm x .2mm) flat magnetic sensor beneath shrink wrap plastic.
- 3) **Magnetic Viewing Paper** - Allows you to "see-through" the stainless enclosure to locate "magnetic areas". You can see if individual magnets are broken or displaced. Depending upon the magnetic arrangement, places of maximum magnetism show as light colored lines against the darker paper.

The Gaussmeter

The gaussmeter measures magnetic flux density* from -19,999 to +19,999 gauss, a range capable of measuring all permanent magnet fields. A standard 9 Volt Alkaline battery powers the unit and is replaceable by removing the back panel. Battery is good for about 40 hours of run time. The display shows "LOWBATT" when approximately 1 hour of battery life remains.

The Flexible Probe

Plug the connector end into the top of the Gauss Meter. The magnetic sensor is located on one side of probe end, at the other end of the 48" long wire. It is 4mm wide and 1.5mm thick shows as a slight bulge beneath the covering shrink wrap. **The side with the bulge should be placed against or perpendicular to the item being measured, depending upon the setup.** Plus and minus readings are inconsequential, as they merely indicate North or South polarity.

The OFFSET Knob

This unit was calibrated at the factory using gap magnet #F062-10K (see accompanied certification sheet). Assuming the unit is in zero magnetic field with the probe inserted into its socket and the unit turned on, a 0.0 should appear on the digital display. With an ambient magnetic field, the offset knob can be used to adjust up to ± 10 Gauss to bring the starting point to zero. Factory calibration is valid for 10 years.

Magnet Notes

Today's magnets lose their strength at the rate of about 1/2% every 100 years. If yours has lost strength it is probably due to one of three primary reasons:

- 1) The unit has been dropped and the magnets inside are broken, or have shifted. When using the viewing paper this shows up as an uneven line(s).
- 2) The magnets have been exposed to excessive heat. Maximum allowable temperature limits vary.
- 3) The magnetic element has developed a crack that has allowed liquid or air inside.

The result of any of the above conditions can decrease or kill the magnetism, all or in part. Only measure the magnets at ambient temperature. Anticipate readings to decrease slightly during the first months as the magnets get "worked". After that, the readings should stabilize and provide similar readings year after year, if the readings are taken at the same place.

Accuracy

The accuracy of the unit is +/- 2% over the temperature range of 30 to 110° Fahrenheit (0°C—43°C) in the dynamic range of 0 to +/- 20,000 Gauss. Minimum usable resolution is 0.1 gauss. Peak Hold capture time is 0.2 seconds. The Certification Sheet for this instrument is also included with the unit.

* Technically, gauss and tesla are units of "magnetic flux density", not "magnetic field strength".
However, "field strength" is used here when talking about gauss.

MAGTRAPS & GRATES WITH MAGNETIC TUBES

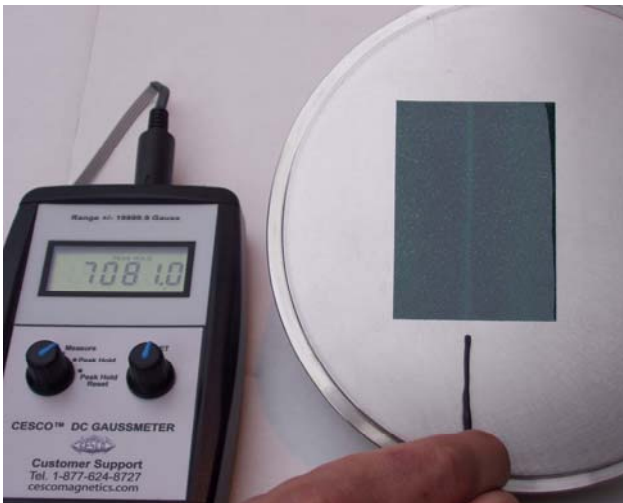
Each magnetic tube contains multiple magnets. To check for broken magnets place the viewing paper around a tube. Look for crisp lines. The highest gauss readings lie midway between the lines on the paper. Place the probe (as shown), with the sensor side flat against the tube. The Peak Hold setting will display the strongest field (positive or negative). To reset the number, turn knob to “Peak Hold Reset” for ¼ second or more. If the knob is kept at “Peak Hold Reset”, the meter will display the actual field, just as it does when set to “Measure”. Readings will not be the same because each magnet in the tube has slightly different individual strength.

Tips: Rather than measuring every magnetic place, select one measurement point - the centerline tube, at the bottom of the tube tip, typically about 1 1/4”(3.2 cm) from the bottom of the tube, measure and record the gauss shown at that point. This assumes there is no damage to other tubes that may require measuring. If dropped and the tube is unbroken, check the magnets with the viewing paper. The lines should be sharp. If the lines are not straight, contact CESCO.



MAGTRAPS WITH MAGNETIC PLATES

Rare earth units have two “measuring lines” (one is shown by the viewing paper). Units with ceramic magnets contain a single “line”. On rare earth units, the “lines” are about 1” on either side of the centerline. On ceramic magnets, the “line” is slightly off center. Place the special paper at the center and move it around to locate the line(s). One or two lines will appear on the special paper. If the lines appear broken or are not straight, please contact CESCO. If the lines appear broken or uneven, the unit has been dropped and the magnets have been broken or rearranged and the original strength will probably not be attainable. With the measuring probe perpendicular to the surface, move it along the “line” on the surface until you locate the point of highest reading using the “Peak Hold” setting on the meter. Disregard the + and – sign on the display, they only indicate “north” or “south” poles.



MAGNETIC PLATES

Magplates are usually in two forms – flat face or stepped faced. Move the special paper until you “see” a “line” (there may be more than one). “Lines” appear at the places to be measured (above picture), and in the “step” of stepped units (shown at left). On flat areas, hold the gaussmeter probe perpendicular to the face of the magnet. In the “step”, hold the probe at a 45° angle in the step as shown at right. Move the probe along the “line” until you obtain a satisfactory reading and note where you took measurements.

MAGNETIC GRATES

Measure them the same as described in the Magtrap tubes section at the top of the page. Make note of the places where you take the measurements.



CESCO has produced many custom units that may not conform with these suggestions, however, these instructions should allow you to locate the places to measure your unit. Use the special paper to find the “magnetic lines”, or move a paperclip around on the magnet to indicate the places of maximum magnetism.

Should you have questions or need help, please call CESCO at 877-624-8727