Digital Gauss/Tesla Meter

CYHT208

User's Manual

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The Gaussmeter CYHT208 can be used to measure DC/AC magnetic field strength of permanent magnet materials, motors, speakers, magnetic sensors/ transducers and other machines and instruments etc. with high resolution. It is powered with 4 pieces of batteries (+1.5VDC, No. 5) and can work for 100 hours continuously or for several weeks if the Auto Power off mode is used.

1. Characteristics

- Wide measuring range and high resolution
- A low-cost measuring device, which is easy to operate, portable and convenient to handle and store.
- Ideal for quick quality checks and comparative measurements, with built-in polarity display.

2. Technical Data

Measuring ranges:	DC: 0~200mT~2000mT; AC: 0~200mT~1000mT
Basic accuracy:	±2.0%, ±3 digits for ≤1000mT,
	±2.0%, ±5 digits for >1000mT
Resolution:	0.01mT for measuring range 0-200mT
	0.1mT for measuring range 0-1000mT/2000mT
Application:	Measuring DC/AC magnetic field
Frequency range:	DC ~ 200Hz
Functions:	Peak hold, Max hold,
	Automatic range Gs/mT selection
	N/S pole display for DC measurement
	Automatic probe zero adjustment
	Automatic change of measuring ranges
Display:	4 ½ LCD
Display Unit:	mT/Gs (1mT=10Gs)
Ambient temperature:	+5°C ~ +50°C
Storage temperature:	-20°C ~ +70°C
Relative humidity:	20% ~ 80%
Power supply:	4 x 1.5V batteries, No. 5
Dimensions:	160mm x 88mm x 37mm
Weight:	300g

3. Accessories

1. 4 x 1.5V DC batteries
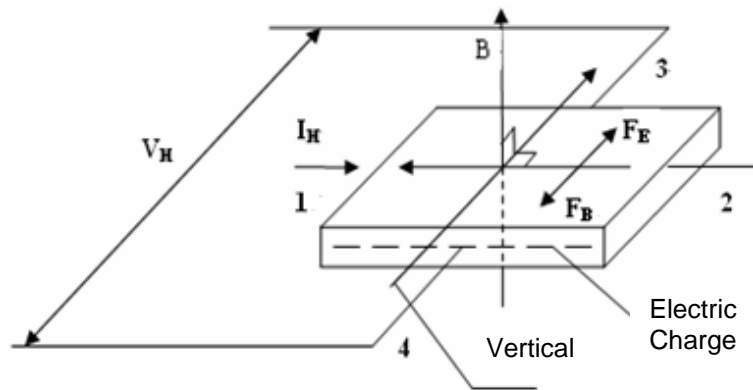2. Hall probe CYTP-T15B (transverse probe1.5 x 4 x 40mm)

4. Special probe

CYAP-D60B: axial probe Ø6 x 40mm

5. Measuring Principle

The Gauss/Tesla meter works with a Hall Effect sensor/probe. There are two kinds of Hall probes: transverse and axial probes, which are used for different magnetization directions.

Hall Effect and its Electrical Parameters

According to the Hall Effect, a voltage can be measured at right angle to the current path when a conductor or semiconductor with current flowing in one direction is introduced perpendicular to a magnetic field. The Hall voltage can be calculated from:
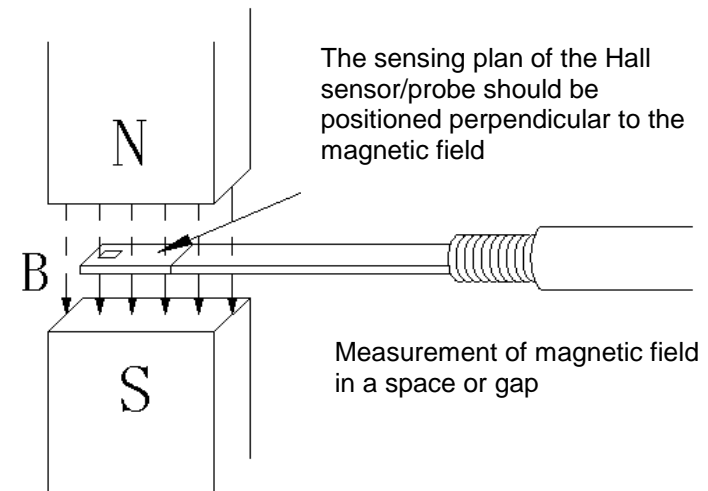
$$V_H = k_H I_H B$$

Where: V_H: Hall voltage in volts
        B: the applied field in Gauss
        k_H: sensitivity of the element in volts/Gauss
        I: bias working current in amperes

The initial use of this discovery was for the classification of chemical samples. The development of indium arsenide semiconductor compounds in the 1950's led to the first useful Hall Effect magnetic instruments. Hall Effect sensors allowed the measurement of DC or static magnetic fields with requiring motion of the sensor.
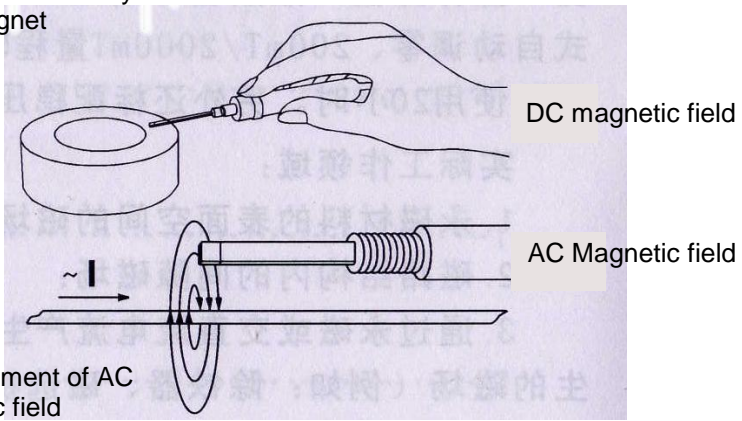
6. Measuring Method

The magnetic lines of the measured magnetic field should perpendicularly pass through the Hall Effect element of the Hall probe.

The sensing plan of the Hall sensor/probe should be positioned perpendicular to the magnetic field

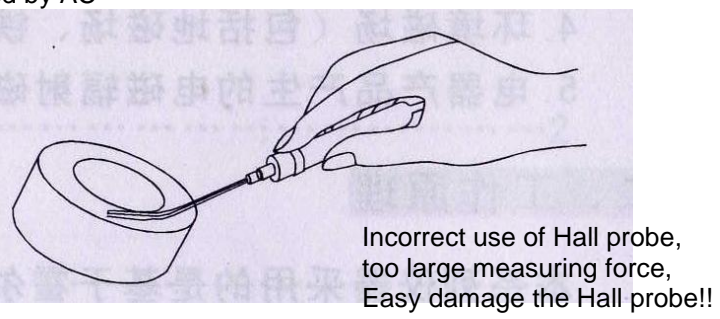Measurement of magnetic field in a space or gap

Put the concave side, i.e. the side with a small circle mark of the probe on the surface of the measured magnet or at the measuring point of a magnetic field carefully.
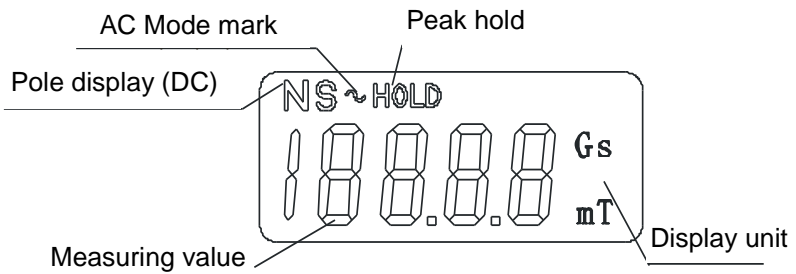
Measurement of
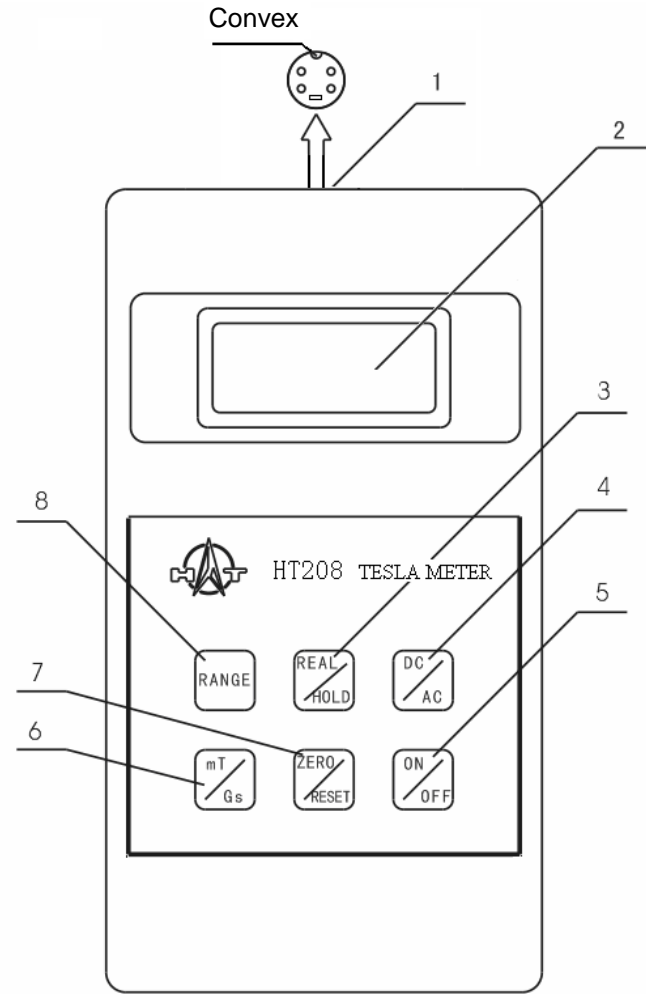surface flux density
of a magnet

DC magnetic field

AC Magnetic field

~ I

Measurement of AC
magnetic field
generated by AC
current

Incorrect use of Hall probe,
too large measuring force,
Easy damage the Hall probe!!

7. Part and Functions

AC Mode mark   Peak hold

Pole display (DC)

N S ~ HOLD

Gs

mT

Measuring value

Display unit

Front Panel

Convex

HT208 TESLA METER

RANGE

REAL
HOLD

DC
AC

mT
Gs

ZERO
RESET

ON
OFF

|		
1:	Socket-outlet with 4 pins	2: LED display
3:	Peak max/min hold	4: AC/DC Mode
5:	Power switch ON/OFF	6: Unit select mT/Gs
7:	Zero/peak reset	8: measuring range

Back Panel

Battery Compartment
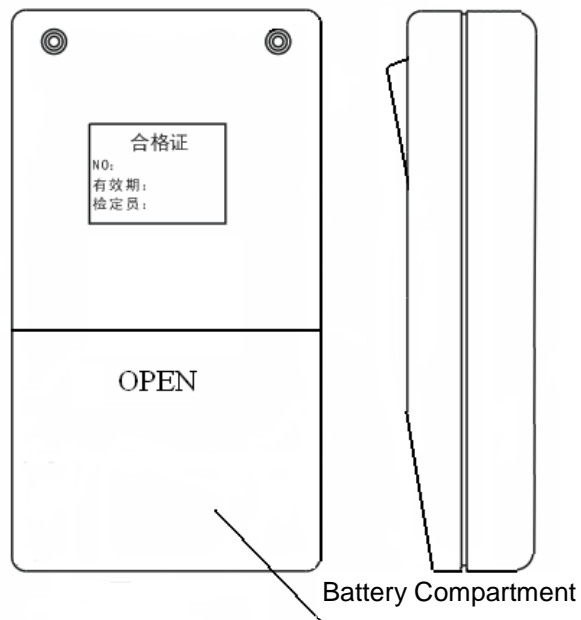
Functions:

1) **Socket-outlet**: to connect the Hall sensor/probe to the measuring instrument
2) **LCD display**: to display the field strength and pole direction ("N" north pole, "S" south pole) and ~ AC mode mark etc.
3) **Peak max hold**: to display and hold the peak/max value
4) **AC/DC Mode**: to select the measurement of AC or DC magnetic field
5) **Power switch**: to switch ON/OFF the measuring instrument
6) **Unit select**: to select the measuring and display unit (Gauss or mT)
7) **Zero/peak reset**: to reset the measuring value and peak mode.
8) **Range select**: to select the measuring range 0-200mT or 0-2000mT
9) **Plug of Hall probe**: to connect the Hall probe to the measuring instrument

10) **Measuring circle mark**: the side with this mark is the measuring side of the Hall sensor. You should use this side to measure the surface magnetic field of permanent magnet. This side should be positioned perpendicular to the magnetic field
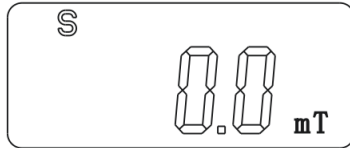
Hall sensor/probes
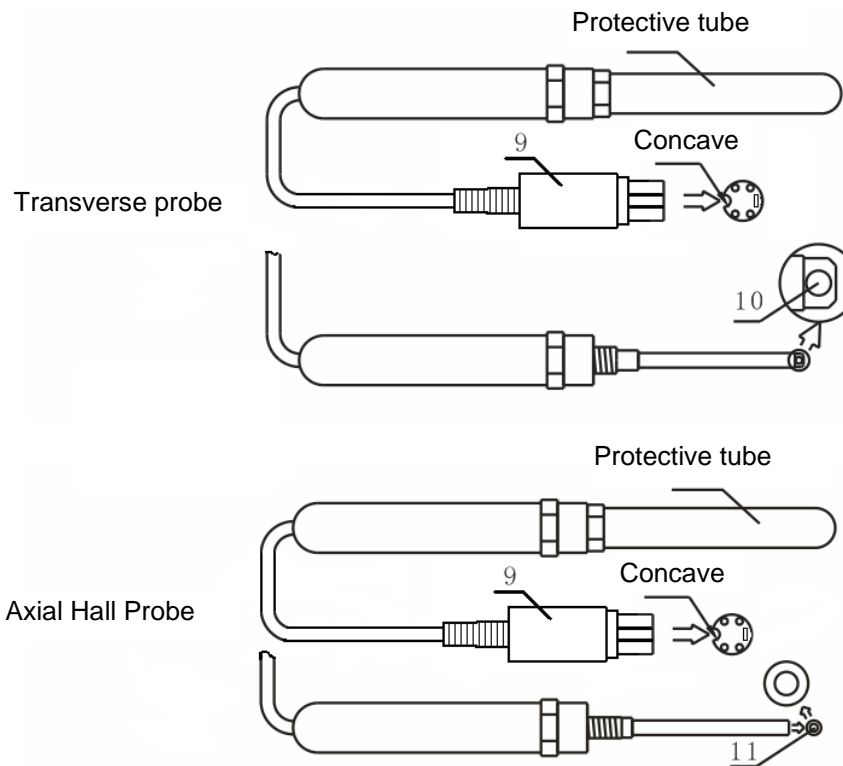
9: Plug of Hall probe   10: Measuring circle mark
11: Measuring contact position

8. Measuring Procedure

1) Install the 4x1.5V battery to the battery compartment of the measuring instrument
2) Connect the Hall sensor/probe to the measuring instrument
3) Switch on the power of measuring instrument by pressing button (5), LCD display shows 0.0mT

4) **Select measuring range** by pressing the button (8), the measuring range changes between 0-200mT and 0-2000mT as follows:
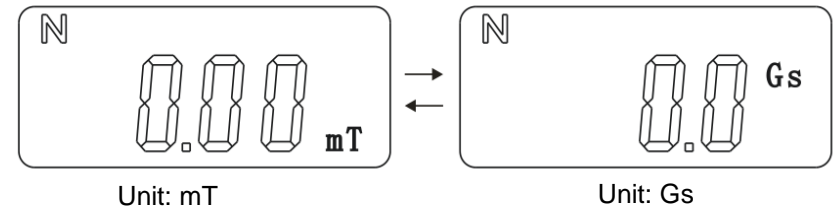

0-2000mT   0-200mT
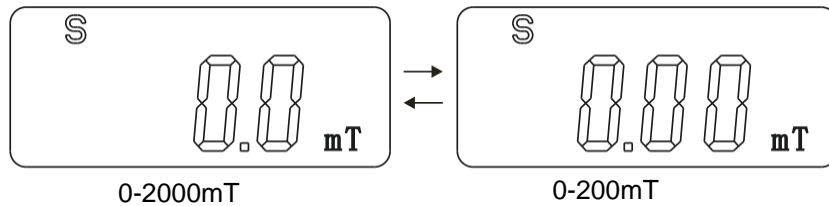
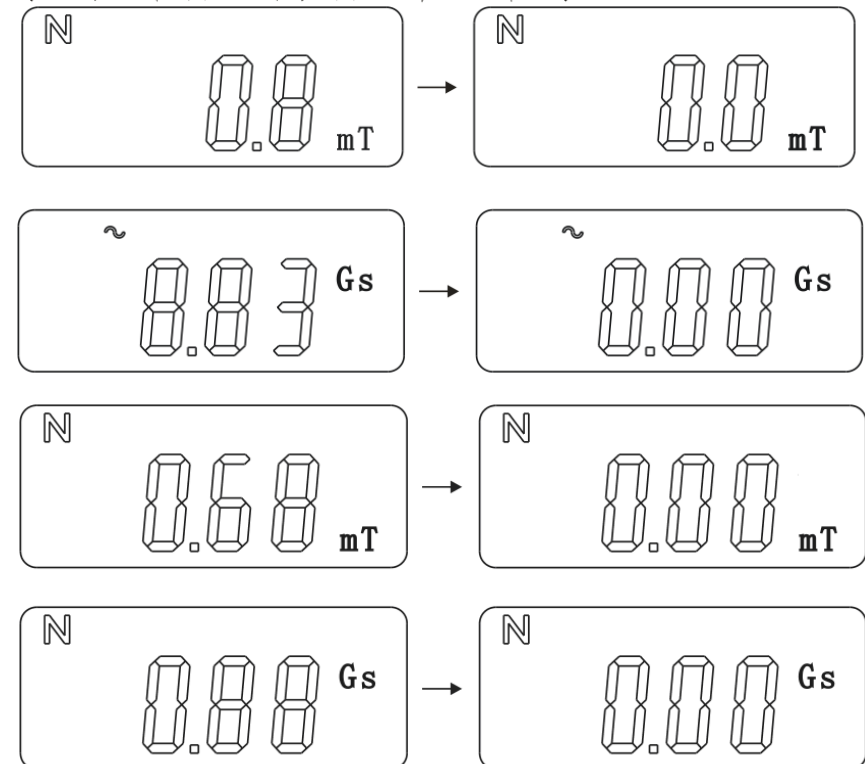5) **Select AC/DC Mode** by using the button (4), the display shows the following DC or AC measuring mode:

DC magnetic field   AC magnetic field
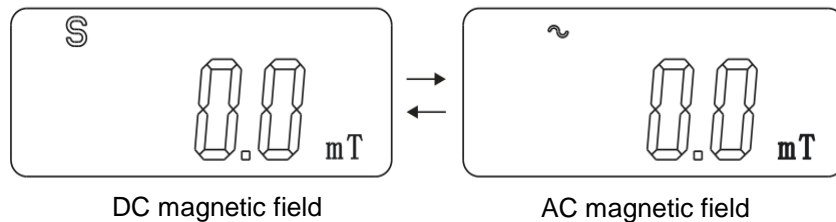
"N" north pole, "S" south pole for DC magnetic field

6) **Select unit** by pressing (6), unit changes between Gs and mT


Unit: mT   Unit: Gs

7) **Reset Gaussmeter**. Keep the Hall probe faraway from magnetic field, LCD display shows zero after pressing button (7) :

Note: You must reset the Gassmeter before you start a new measurement after you have changed the measuring range (8) and AC/DC Mode (4).

8) **Select peak hold.** You can select peak holding mode or normal measuring mode by using button (3).


Normal Measuring Mode   Peak Holding Mode
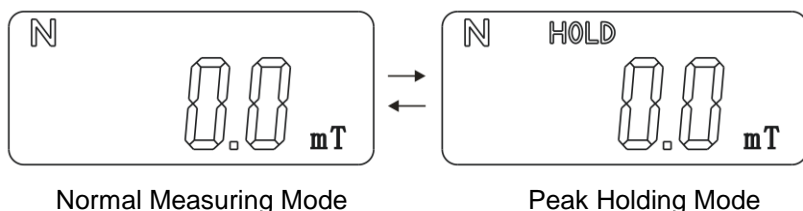
9) Take off the protective tube of the Hall sensor/probe, position the measuring circle mark (10) on the surface of the measuring object (such as permanent magnet), and read the display value (measuring value and pole display "N" or "S").

   Note: the measuring circle mark (10) is measuring point of the Hall sensor. The pole is N pole if the display is "N" when this mark orients to the measuring object.

10) **Reset peak hold mode**. Under the peak holding mode the display changes only when the actual measuring value is larger than the last peak value (displayed). Therefore you must reset the peak holding mode by using button (7) if you need to measure smaller magnetic field than the peak value. The device works still in peak holding mode after resetting.

   Sample: last peak value: 1500mT, actual peak value 800mT after reset the peak holding mode
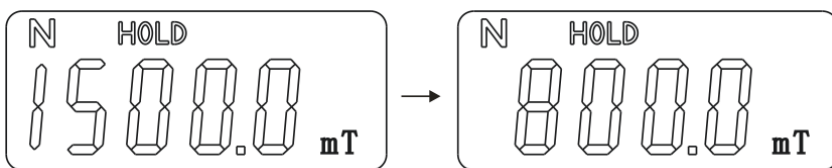
11) The battery should be changed if the low battery pattern is shown on the display
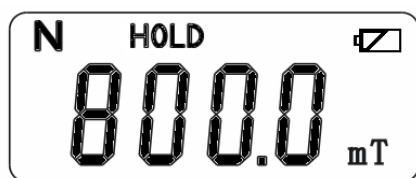
12) **Auto Power Off Mode.** The Gaussmeter is set in the Auto Power Off Mode, namely, the power source is turned off automatically when one doesn't press any key of the Gaussmeter within 5 minutes and the Gaussmeter is not in the measurement mode, i.e., the display value is lower than 0.1mT. The life time of the battery can be lengthened in this way.

   One can do the following operations in order to cancel the Auto Power Off Mode:

   Restart the Gaussmeter again. Press the key "mT/Gs" (6) before the pattern "- - - -" appears on the display. Hold down the key (6) until "N HOLD" and the battery pattern appear on the display. Then let loose the pressed key after the pattern "- - - -" is disappeared.
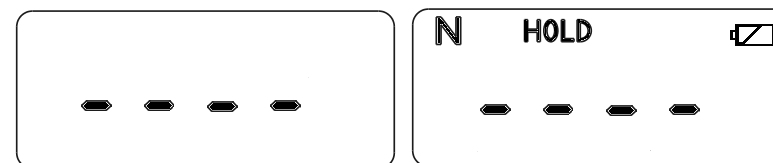
   One can setup the Auto Power Off Mode using the following operations again:

   Restart the Gaussmeter again. Press the key "RANGE" (8) before the pattern "- - - -" appears on the display. Hold down the key (8) until "HOLD" and the battery pattern appear on the display. Then let loose the pressed key (8) after the pattern "- - - -" is disappeared.

13) After the measurement please put the protective tube on the Hall probe in order to protect the Hall element and switch off the power

14) The Hall probes delivered are compatible. The measuring accuracy under using other changed Hall probes is ±2%.

9. Warranty

Measuring instrument: 12 months
Hall sensor/probe: no guarantee. However we offer you
                                Replacement for reduced price (10%
                                discount)

10. Service

Please contact us for technical questions, repairing and replacement etc: