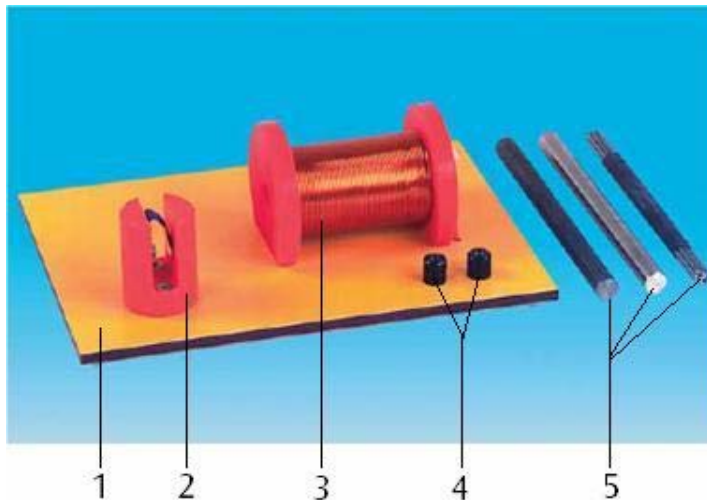


## Equipment set - coil for measuring hysteresis 8496112

### Instruction sheet

08/06/DML



- 1 Base plate
- 2 Retainer for Hall probe
- 3 Coil
- 4 4-mm sockets
- 5 Iron samples

### 1. Safety instructions

Caution:

- To avoid damaging the coil by overheating, do not exceed the maximum allowable current of 3 A DC.

### 2. Description

The for measuring hysteresis equipment set coil is for recording hysteresis curves (magnetic flux density  $B$  as a function of magnetic field strength  $H$ ) for various ferromagnetic core materials.

The cylindrical coil consists of 600 compact turns in several layers mounted on a base plate. Three different iron samples can be interchanged to form the core of the coil. A retainer on the base plate accommodates the field probe.

### 3. Technical data

Wire diameter:	1 mm
Number of turns:	600
Internal impedance:	1.5 $\Omega$
Inductance without core:	3.5 mH
Dimensions:	200 x 145 x 65 mm <sup>3</sup>
Iron samples:	140 mm x 10 mm $\varnothing$
Material:	Construction steel, carbide metal, iron (stainless)
Total weight:	950 g approx.

### 4. Operation

To record hysteresis curves, the following apparatus is additional required:

1 AC/DC power supply	8521131
1 Teslameter	8533981
1 Axial/tangential field probe	8533997
1 Escola 10 multimeter	8531160
Experiment leads	

- Connect the power supply, coil and ammeter in series (see Fig. 1).
- Place a core inside the coil.
- Secure the field probe in its retainer so that the tangential probe is against the coil core.
- Turn on the power supply and increase the current to the coil until the magnetic flux density  $B$  approaches saturation. Make sure the current to the coil does not exceed its 3-amp limit.
- Determine the magnetic field strength  $H$  from the current to the coil  $I$ , the number of turns  $n$ , and the length of the coil  $s$ .

$$H = \frac{n \cdot I}{s}$$

- Read the magnetic flux density  $B$  from a teslameter.
- Set the current back to zero, reverse the polarity to the coil and conduct measurements in the negative current range.
- Plot the magnetic flux density as a function of the magnetic field strength.
- Repeat the experiment with various iron samples.

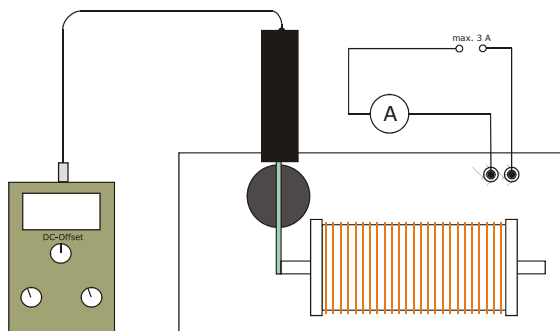


Fig.1 Obtaining a hysteresis curve

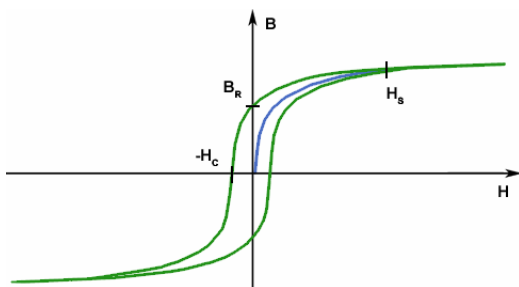


Fig. 2 Example of a hysteresis curve