

# AMH-DC-T-S | SOFT MAGNETIC MATERIALS (RINGS)



## AMH-DC-T-S Permeameter

AMH-DC-T-S Permeameter is an automatic DC measuring system to characterize toroid shaped soft magnetic materials. Rings are the best shapes for such magnetic characterization: due to the naturally closed magnetic circuit, the demagnetizing field inside the material is zero.

**The AMH-DC-T-S meets the International Standards IEC 60404-4, ASTM A341 and ASTM A596.**

### KEY BENEFITS

- Automatic measurement of complete hysteresis loop, normal magnetization curve and permeability curve
- Initial permeability
- Remanence  $B_r$ , coercivity  $H_c$ , saturation values  $H_{sat}$ ,  $B_{sat}$ ,  $J_{sat}$ , cycle area, relative permeability, etc.
- Differential permeability

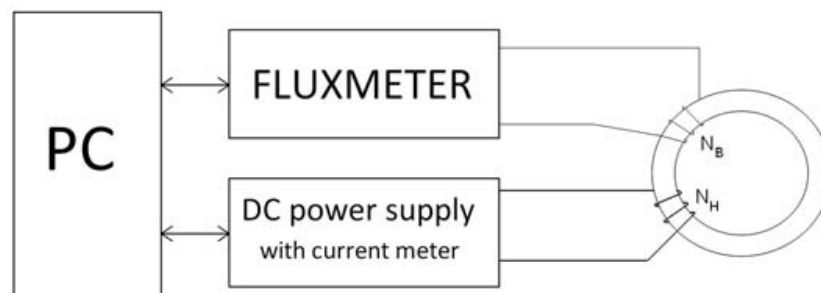
### STANDARD CONFIGURATION

Cabinet containing:

- Fluxmeter
- 2 DC Power Supplies (including precision current meters)
- Polarity switch
- Dedicated software Argon 1.0
- PC and printer
- Connection tool for ring samples
- Reference ring for day-to-day control

## HOW IT WORKS

The sample must be wound with a primary set of  $N_H$  turns for excitation. A secondary set of  $N_B$  turns must also be wound around the sample to record the magnetic flux. The H field is determined measuring the current  $i$  in the primary winding:  $H = N_H \cdot i / l$ , where  $l$  is the length of the magnetic path (i.e. the averaged ring circumference, when the ring O.D and I.D. are not too different similar). The B field is determined measuring the magnetic flux  $\Phi$  from the secondary winding:  $B = \Phi / (N_B A)$ , where  $A$  is the cross section of the specimen toroid.



The measuring cycle is fully automatic and is controlled by Laboratorio Elettrofisico exclusive software (Argon 1.0), resulting in complete characterization of the material under test.

Rings samples can be prepared in 3 different basic ways:

- As a monolithic piece of material, obtained by mechanical works or by casting, sintering
- Stacking several toroids with the same inside and outside diameter, that can be obtained by punching, or laser cutting
- A single thin strip wound as a clock-spring



One single piece



Stacked rings



Wound thin strip

## TECHNICAL SPECS

### GENERAL

Measurable materials	Measurable materials
Measurable quantities	Bsat, Jsat, Hsat, Br, Hc, cycle area, $\mu_{rel}$
Measurable shapes	Ring
Sample size Ring	No physical limitation (size affects the max H field)
Typical data accuracy	Hsat, Hc: $\pm 1\%$ ; Bsat, Br: $\pm 1\%$ ; $\mu_r$ : $\pm 2\%$
Test time	60-120 seconds (typical)
Operating temperature range	15 - 40 °C
Frequency	DC

### MAIN CABINET

Power Supply	220 Vac, 50/60 Hz, 16 A max absorption
Dimensions	L 543 x W 710 x H 628 mm - L 21.3" x W 28 x H 24.7"
Weight	60 kg - 132 lb

### POWER SUPPLY LPS

Power output	200 W: 8V/ 20 A or 20 V/10 A
Resolution	1 mV/1 mA
Current accuracy (reading)	0.15% + 5 mA

### POWER SUPPLY HPS

Power output	1500 W (60 V/25 A)
Resolution	8 mV/5 mA
Current accuracy (reading)	0.1% $\pm$ 15 mA

### FLUXMETER

Model	Digital Flux
Ranges	2000 x (1, 2, 5, 10, 20, 50, 100) $\mu Wb$
Resolution	1/2000 of range
Accuracy	$\pm 0,5\%$ of reading, $\pm 1$ digit

### PC AND SOFTWARE

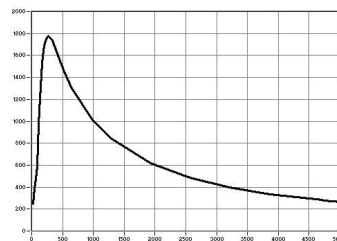
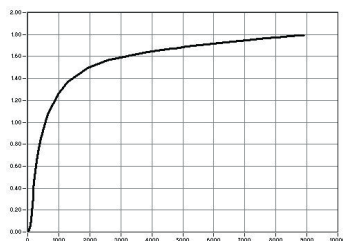
PC	PC, monitor, printer and all connection cables
Operating system	Windows
Software	Argon 1.0 (English or Italian)
Connection	LAN

### MANUALS AND DOCUMENTATION

Instruction manual (English or Italian)
Calibration certificate
CE mark

## AMH-SERIES SOFTWARE

Soft2015-P software automatically controls the measurements of the AMH-DC-T-S and AMH-DC-TB-S permeameters.



## FEATURES

### Type of measurement

- Hysteresis loop, normal magnetization curve and relative permeability
- Demagnetization of the sample

### Results

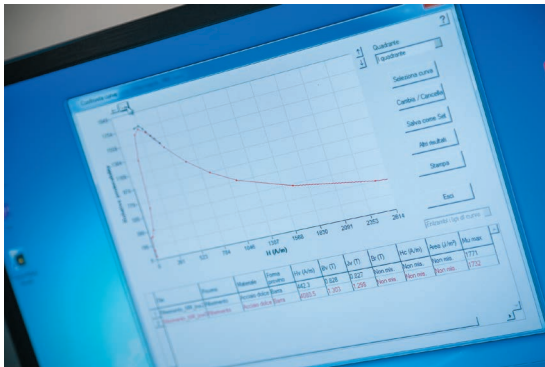
- Hsat, Bsat, Jsat, Br, Hc, loop area, relative permeability
- Magnetic units in SI and CGS, measures in mm and inches, temperature in °C and °F

### Setting of measuring parameters

- Manual or automatic settings of magnetizing and demagnetizing field, speed, resolutions and many other parameters

### Data elaboration

- Curve comparison
- Curve's interpolation, automatic or using a mathematical function from a list
- Automatic control of the Fluxmeters
- Merging of different curves



### Printing a report

- 3 pre-set reports with different sizes and contents
- Customized report option for changing the information and the language between English and Italian
- The report can be opened and saved with other word processor programs, like Microsoft Word™

### Data base and file searching

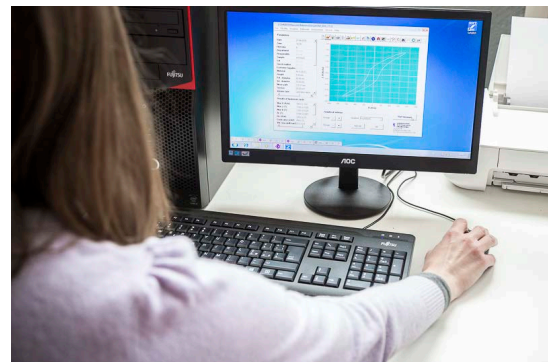
- Data base of measuring files with fast search options, ordering, selection, etc.
- Full compatibility with other spreadsheet programs, such as Microsoft Excel™

### Protection

Password protection for restricting access according to selected parameters

### Set of measures

Ability to group together different measurements in the same graph. The software recognizes the group type and provides additional results such as statistical data for example the average, standard deviation, etc.



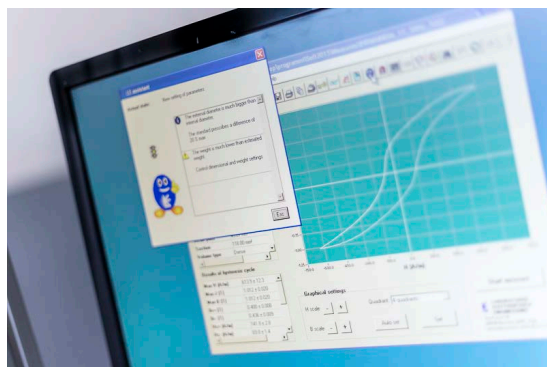
### Personalized training

Rely on our team of experts for personal training during the acceptance period at Laboratorio Elettrofisico. After delivery, additional training maybe arranged at your facility. We'll be happy to create a custom training plan to fit your needs.



### Real-time help

The LE Assistant monitors your system in real time and provides suggestions and error messages to improve performance. The LE Assistant is automatically activated if messages or warnings exceed a certain level.



### Seamless support

With LE, you're only one button away from expert help. Access support online through TeamViewer screen sharing, Skype us - or send a request for technical assistance directly through your equipment's software. Seamless support for LE equipment is built in.







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### MAGNETIZING SYSTEMS FOR INDUSTRY 4.0 AND MEASURING EQUIPMENT FOR ALL MAGNETIC MATERIALS

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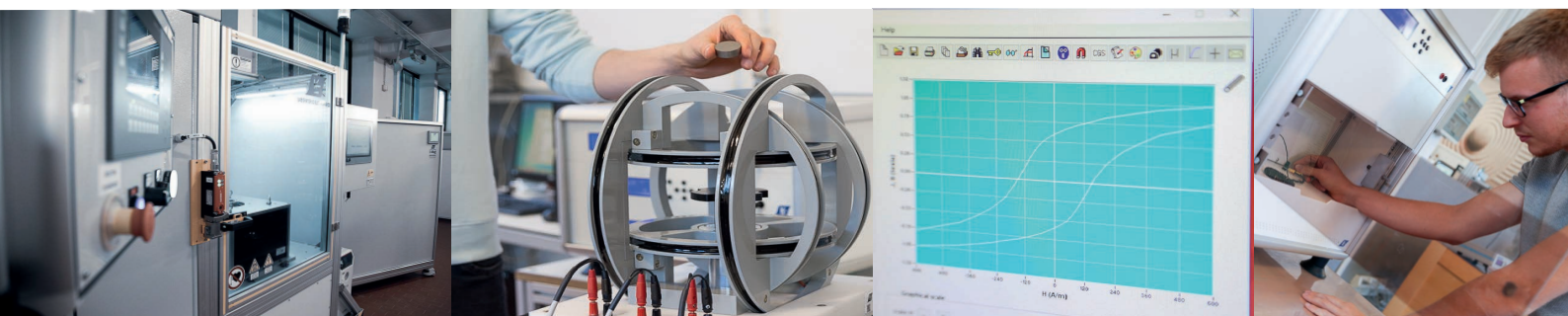
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Founded in 1959, Laboratorio Elettrofisico is a global company specializing in the engineering, design, and manufacture of the world's most precise magnetizing and magnetic measuring equipment.

Headquartered in Milan, LE has laboratories, testing facilities, support staff, and services centers in the United States, India, and China.

We reserve the right to make changes to these specifications without notice.  
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