SOFT MAGNETIC MATERIALS
RING COIL

Measuring tool easy characterization of the assembled stator cores, to be used in combination with our AMH-Series power unit.

RING COIL
SOFT MAGNETIC MATERIALS

DESCRIPTION

Electric motor performance is dependent on several parameters, including the magnetic characteristics of the stator. One of the major drawbacks in effectively predicting the motor behaviour is that the magnetic characteristics of the material are generally provided or measured not on the finished product, but on laminations before cutting or assembly, operations that can degrade or otherwise change their quality. With increased focus on efficiency of the electric motors, it is imperative that the magnetic property along with the losses associated with stator core are correctly and rapidly evaluated.

The classical method consists of simplifying the shape of the rotor as a ring and make manual measuring and excitation windings on it. This operation is time-consuming and can be done only in laboratory on selected products.

LE's latest offering 'Ring Coil' eliminates the need of manual winding operation, allowing the operator to measure the stator magnetic characteristics 100% in line, during automated production. The result from the software gives complete magnetic information of each stator and permits comparative and statistical analysis of the production.

KEY BENEFITS

- No more manual windings
- Reduce the time of measurements
- Safety because it is not necessary to handle large stators for winding
- No counting errors in the number of turns
- Multiple winding selection to optimize low/high frequency or level measurements.
- Automatic measurement of complete DC or AC hysteresis loop, normal magnetization curve, permeability curve
- The measuring cycle is fully automatic and is controlled by Laboratorio Elettrofisico exclusive software (Neon), resulting in complete characterization of the material under test
- Remanence Br, coercivity Hc, saturation values Hsat, Bsat, Jsat, cycle area, relative permeability, losses, losses separation, etc.
- International Standards: IEC 60404-4, IEC 60404-6, ASTM A596, ASTM A927

RING COIL
SOFT MAGNETIC MATERIALS

SYSTEM CONFIGURATION

The complete system is composed by the Ring Coil and a power unit.

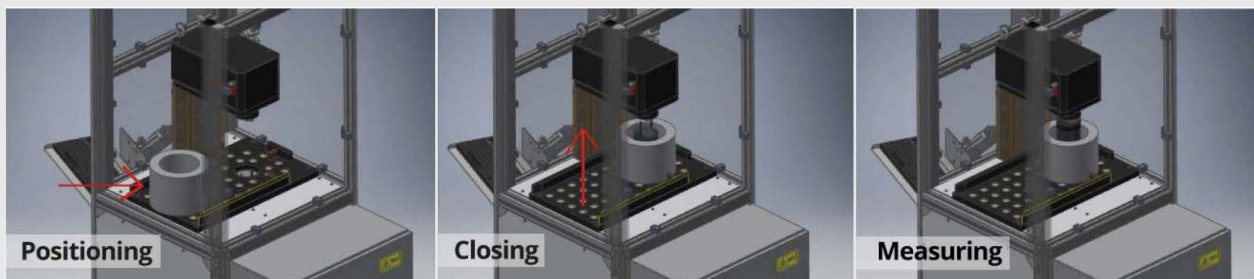Ring coil, model **RC-100-250-150**

- Selectable measurement and magnetization windings with power connector
- Station for easy loading of the stators
- Automatic movement
- Protective optical barriers
- PC, monitor touch, keyboard, and mouse on rigid support + software (Neon)

Power unit (suggested **AMH-50K-S**)

- Power amplifier
- Arbitrary function generator
- Acquisition unit
- Fluxmeter

HOW IT WORKS

The measuring and excitation turns are fixed in an openable connector, that easily permits the insertion of the stator. The insertion of the stator can be done manually or automatically by the production line, while the closure, selection of turns and measure are completely managed by the Ring-Coil bench. The total turns can be switched in different sets, so that their number match in the best way to the different measuring conditions (low/high frequency, low/high field levels). Everything is done in complete safety way, with protections preventing any possible danger to the operators or the equiment.
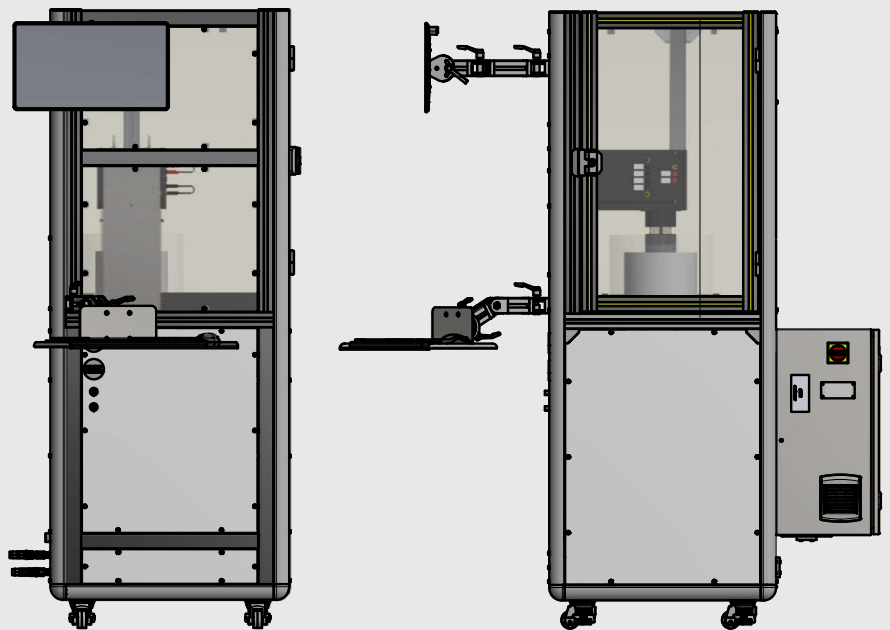

Positioning

Closing

Measuring

RING COIL
MODEL DIMENSIONS

RC-100-250-150

Size
- L693 X W960 X H1796 mm
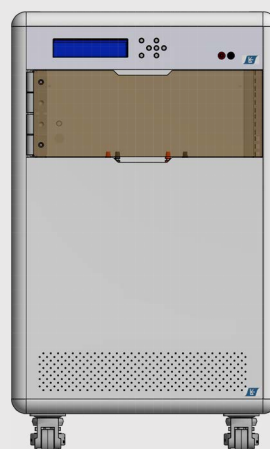
Weight
- 200 kg

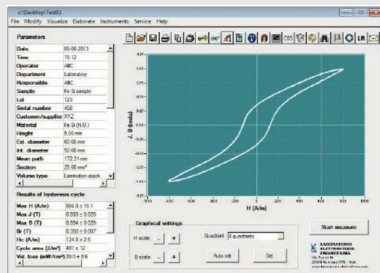

AMH-50K-S

Size
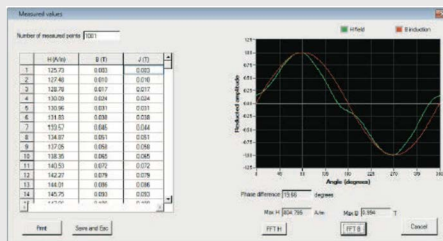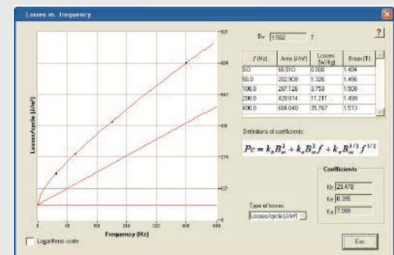- L543 X W830 X H889 mm

Weight
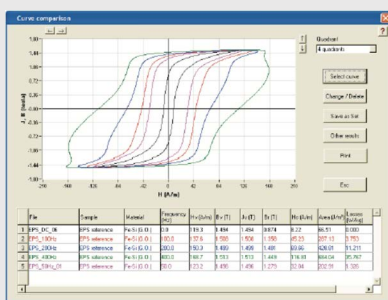- 160 kg

RING COIL
SOFTWARE NEON

Main panel with example of measurement (at 50 Hz)

Measured points

Losses separation and relative coefficients

Comparison of curves with same Bv at different frequencies, wich allows the user to evaluate the losses separation and relative coefficients

Our proprietary Neon software automatically manages measurements for the soft magnetic materials, including comparison of different curves and statistical analysis. The software helps ensure the measuring process is accurate and absolute and helos prevent improper setting of the sample's parameters.

The Automatic Assistant notifies the operator and makes suggestion for the appropiate procedures or settings. The software also provides automatic creation for printing reports, database search feature and curve comparison.

FEATURES

TYPE OF MEASUREMENT	• Hysteresis loop, normal magnetization curve and relative permeability, in DC and AC conditions • Sinusoidal B and H condition • Demagnetization of the sample
SETTING OF MEASURING PARAMETERS	• Manual or automatic settings of magnetizing and demagnetizing field, speed, resolutions and many other parameters • Setting of acceptance limit for direct quality control

RING COIL SOFTWARE NEON

FEATURES

RESULTS

- Hsat, Bsat, Jsat, Br, Hc, loop area, relative permeability, specific power losses, losses separation, Steinmetz coeffient and many advanced results
- Magnetic units in SI and CGS, measures in mm and inches, temperature in °C and °F

DATA ELABORATION

- Curve comparison
- Curve's interpolation, automatic or using a mathematical function from a list
- Automatic control of the Fluxmeter
- 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 losses separation and determination of Steinmetz coefficients

TECHNICAL SPECIFICATIONS

RC-100-250-150

ORDERING CODE	0FT00-0469
MEASURABLE PARTS	Stators, ring cores
MINIMUM-MAXIMUM SIZES	ID min 100 mm, OD max 300 mm, height max 200 mm
MAX WEIGHT	200 kg
MEASURABLE MATERIALS	Soft magnetic materials (electrical steels, etc.)
MEASURABLE QUANTITIES	Hysteresis loop (sinB), normal magnetization curve (Br, Hc, loop area, specific losses, apparent losses, losses separation, relative permeability)
MAXIMUM CURRENT	20 A peak
FREQUENCY RANGE	DC-50 kHz
NUMBER OF TURNS NH	Selectable, up to 62
NUMBER OF TURNS NB	Selectable, up to 10
TEST TIME	Depending on conditions (typ. 1-2 minutes)
PC	Latest Windows O.S.
MONITOR	21" (optional: touch)
SOFTWARE	Neon
RECOMMENDED POWER UNIT	AMH-50K-S
CONNECTIONS TO POWER UNIT	LAN port + power cable
DIMENSIONS	693 x 960 x 1796 mm
WEIGHT	200 kg
ELECTRICAL POWER	220 Vac 2P+G, 50/60 Hz, 16A

AMH-50K-S

FREQUENCY RANGE	DC- 50 kHz
MAX POWER	6600 VA peak
ACQUISITION UNIT	12 bits, 2 GS/s, input voltage ±20 V
FUNCTION GENERATOR	Arbitrary waveforms, 14 bits, 20 Vp-p with 4 digits resolution, frequency from 1 µHz to 20 MHz
FLUXMETER	Digital Flux, from 1 µWb to 200 000 µWb, accuracy ±0.5 %, drift less than 1 digit/minute
ELECTRICAL POWER	380 Vac, 3 phase + neutral + ground, 50/60 Hz, 32 A absorption

EUROPE HEADQUARTERS

📍 Italy, Nerviano (Milan)

📞 +39 0331 589 785

✉️ italy@elettrofisico.com

USA

📍 Michigan, Lake Orion

📞 +1 248 340 7040

✉️ usa@elettrofisico.com

CHINA

📍 Shanghai, Chang Shou Lu

📞 +86 135 2439 6693

✉️ china@elettrofisico.com

VIETNAM

📍 Hanoi, Anh Minh Building

📞 +84 964 174 291

✉️ vietnam@elettrofisico.com

CONTACT US

www.laboratorio.elettrofisico.com