



R&J Measurement
The Producer of High Quality Measuring
Instruments

MAG-RJJ-6.0

THE COMPUTERIZED MEASURING SYSTEM DESIGNED TO MEASURE THE DYNAMIC MAGNETIC PROPERTIES OF THE SOFT MAGNETIC MATERIALS IN ALTERNATING FIELDS



The computerized measuring system MAG-RJJ-6.0, which works under WINDOWS, is designed to measure dynamic magnetic properties of the soft magnetic materials.

Under alternating magnetic field the magnetic properties can be measured in the range of frequency from 3 to 10 000Hz.

The system uses the following test circuits:

- Epstein Frame 25 cm, 0.5 kg
- Epstein Frame 25 cm, 1.0 kg
- Single Sheet Tester (500 x 500) mm
- JM280 Yoke
- JM100 Yoke.

There is also a possibility to use another test circuits according to customer's requests.

The computerized measuring system MAG-RJJ-6.0 is also adapted to measure the dynamic magnetic properties of the soft magnetic materials as a function of temperature in automatic mode by means of one or two sensors simultaneously. The measurement of temperature can be realized by means of thermo-couple by no-touch method or by means of laser pyrometer by touch method. Setting of measurement conditions consists in determining the required area of temperature changes, its tolerance and the step of change for measurements of dynamic magnetic properties for the required value of magnetic quantity.

The MAG-RJJ-6.0 system also allows setting the strictly determined temperature values. Obtained results are presented in the numeric and graphic mode.

The MAG-RJJ-6.0 system provides the opportunity of a tabular and graphic presentation of the obtained data, which can be presented by means of:

- monitor,
- printer or plotter.

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1. EQUIPMENT

The MAG-RJJ-6.0 system contains:

- PC computer AMD ATHLON XP 2 GHz, HDD 120GB, FDD 1.44MB, RAM 512 MB, 6*USB2.0, 2*RS232, GEFORCE 128MB,
- CDRW or DVDRW recorder,
- PC monitor 17" or LCD 19",
- Laser printer,
- anti-disturbing filter,
- connections cable,
- control and measurement units,
- the printer table and compounded of the table,
- CD ROM with installation software,
- DTR – 2 pieces.

The control and measurement unit contain:

- measurement block,
- functional block – digital and analogue,
- about 700W amplifier,
- supply unit.

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2. TEST CIRCUITS

- Epstein frame 25 cm, 0.5 kg or 1.0kg,
- Toroidal samples,
- JM50 Yoke for beam samples,
- Single Sheet Tester,
- JM100 Yoke,
- JM280 Yoke,
- Open sample.

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3. THE MAG-RJJ-6.0 SYSTEM PROVIDES MEASURING AND DETERMINATION OF:

- peak value of magnetic field strength Hm [A/m]
- effective value of magnetic field strength Heff [A/m]
- coercive field strength Hc [A/m]
- peak value of induction Jm [T]
- peak value of polarization Bm [T]
- effective value of polarization Jeff [T]
- remanence Jr [T]
- specific core losses Ps [W/kg]
- specific apparent losses Ss [VA/kg]
- loss separation of:
 - hysteresis losses Ph [W/kg]
 - eddy-current losses Pw [W/kg]
- initial permeability in Epstein frame 25 cm for:
 - Hm = 0.4 A/m; f = 50 Hz $\mu_{A_{pocz}}$
 - Hm = 1.6 A/m; f = 50 Hz
- amplitudal relative magnetic permeability μ_A
- differential relative magnetic permeability μ_r
- hysteresis loop for required value of:
 - polarization,
 - magnetic field strengthwith full description of the parameters
- the set of hysteresis loops for different values of polarization and magnetic field strength with full description of the parameters for each data point
- anisotropy of induction (polarization) AJ [T]
- anisotropy of losses APs [%]
- Fourier series distribution with full description and spectral lines diagram (for each measuring point) for function of:

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- magnetic field strength
 - induction (polarization)
 - specific core losses
 - specific reactive losses
 - specific apparent losses
- with determination of deformation losses
- signals of voltage proportional to the sample induction (polarization) and current as a function of time with full description of the parameters for each data point
 - signals of induction (polarization) and magnetic field strength as a function of time with full description of the parameters for each data point
 - peak factor of field strength ks
 - form factor of field strength kk
 - automatic samples mass measurement
 - final setting of obtained results.

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4. THE PARAMETERS OF MAGNETIC MEASUREMENTS

- the range of induction J_m [T] (0.005÷2.5)
- the range of magnetic field strength H_m for:
 - Epstein frame 25cm [A/m] (0.1÷15 500)
 - JM50 Yoke [A/m] (250÷7 500)
 - JM100 and JM280 Yoke [A/m] (2÷11 000)

In case of toroidal samples the maximum values of magnetic field strength, for specific number of coils, are dependent on sample dimensions and acceptable current density in magnetising winding.

- the range of frequency f_b [Hz] (3÷10 000)
- minimal resolution of frequency Δf_b [Hz] 0.01
- setting accuracy of frequency [%] < 0.1
- setting accuracy of induction J_m

$0 < J_m \leq 0.5 \text{ T}$	[%]	0.5
$0.5 \text{ T} < J_m \leq 0.9 \text{ T}$	[%]	0.3
$0.9 \text{ T} < J_m < 2.5 \text{ T}$	[%]	0.1
- The measurements are performed with preservation of sinusoidal signal of magnetic induction differential. Allowed deviation of the form factor from sinusoid does not exceed:

$0 < J_m \leq 0.2 \text{ T}$	[%]	1.0
$0.2 \text{ T} < J_m \leq 0.5 \text{ T}$	[%]	0.5
$0.9 \text{ T} < J_m < 2.5 \text{ T}$	[%]	0.1
- setting accuracy of magnetic field strength H_m

$0 < H_m \leq 10 \text{ A/m}$	[%]	0.3
$0 < H_m \leq 50 \text{ A/m}$	[%]	1.0
$50 \text{ A/m} < H_m \leq 1000 \text{ A/m}$	[%]	0.5
$1000 \text{ A/m} < H_m$	[%]	0.4
- The measurements are performed with preservation of sinusoidal signal of magnetic field strength. Allowed deviation of the form factor from sinusoid does not exceed:

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	$0 < H_m < 10 \text{ A/m}$	[%]	1.0
	$10 \text{ A/m} < H_m \leq 90 \text{ A/m}$	[%]	0.5
	$90 \text{ A/m} < H_m$	[%]	0.1
➤ number of measurement points		[--]	1÷150

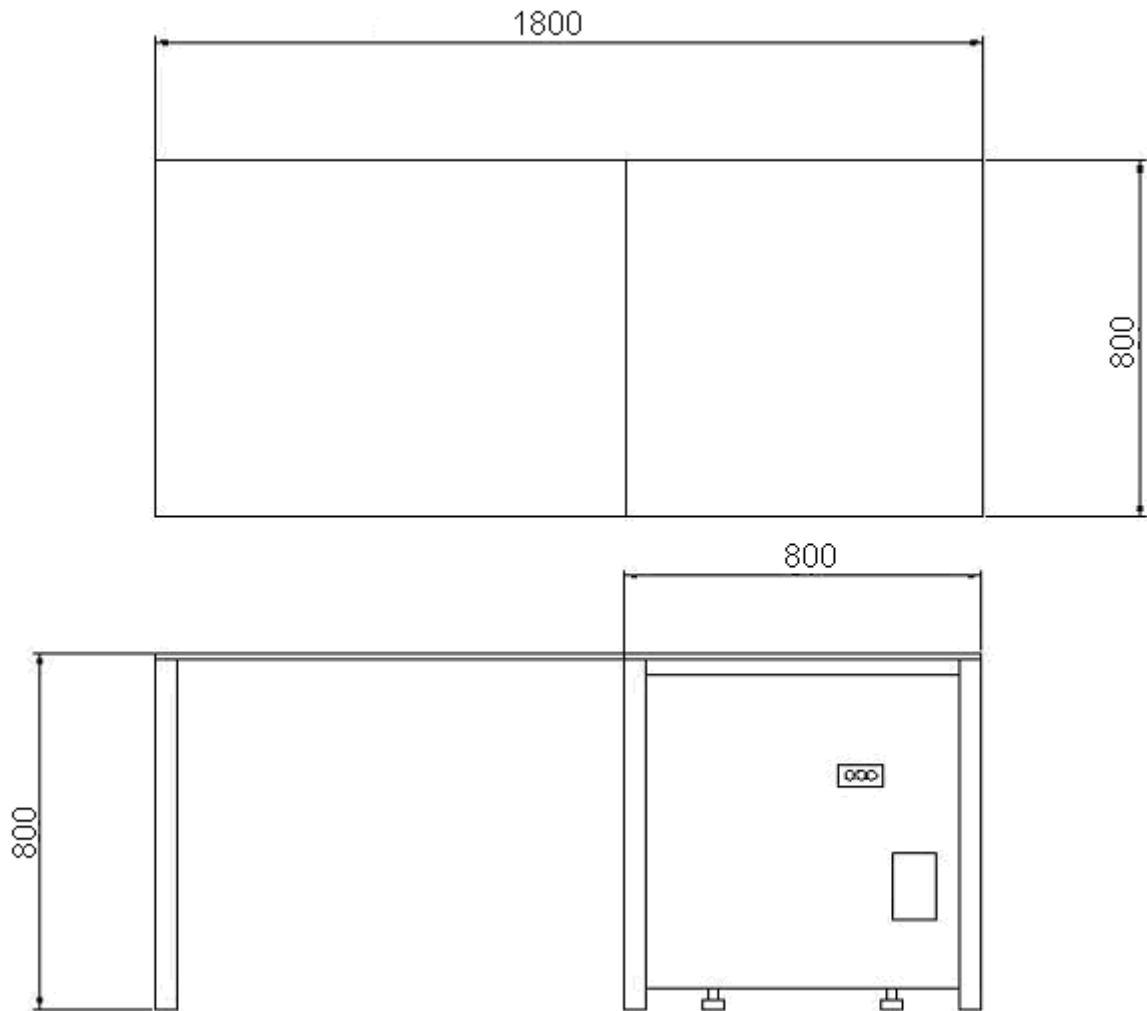


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5. SUPPLY

- 3 phase power supply 3*400V, +5%, -10%,
- 1 phase power supply 230V, +5%, -10%,
- Frequency 50 Hz
- Maximum power 2 kVA

6. DIMENSION



all dimensions in mm