



R&J Measurement
The Producer of High Quality Measuring
Instruments

MAG-TD200

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



The computerized measuring system MAG-TD200, which works under WINDOWS, is designed to measure dynamic magnetic properties of the soft magnetic materials under alternating and rotational field.

Under alternating magnetic field the magnetic properties can be measured in the range of frequency from 3 to 2 000 Hz. However under rotational field - from 20 to 400Hz.

The system uses the following test circuits under alternating field:

- 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.

The system uses the following test circuits under rotational field:

- JM-XY Yoke,
- JM-XY10 Yoke.

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

In case of rotational field the measurement of magnetic field strength is realized by direct method by means of following sensors: flat coil, Rogowski coil or Hall's sensor.

The MAG-TD200 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.

"R&J Measurement" Electronic Instruments and Computerized Systems

55-093 BOROWA,
ul. Jasminowa 2
POLAND,

e-mail: bajorek@rjmeasurement.com.pl

phone +48 0 691 255 202
+48 0 517 970 407

www.rjmeasurement.com.pl

page 1 of 8



R&J Measurement
The Producer of High Quality Measuring
Instruments

1.EQUIPMENT

The MAG-TD200 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.

"R&J Measurement" Electronic Instruments and Computerized Systems

55-093 BOROWA,
ul. Jasminowa 2
POLAND,

e-mail: bajorek@rjmeasurement.com.pl

phone +48 0 691 255 202
+48 0 517 970 407

www.rjmeasurement.com.pl

page 2 of 8



R&J Measurement
The Producer of High Quality Measuring
Instruments

2.THE SYSTEM USES THE FOLLOWING 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,
- XY or XY10 Yoke.

"R&J Measurement" Electronic Instruments and Computerized Systems

55-093 BOROWA,
ul. Jasminowa 2
POLAND,

e-mail: bajorek@rjmeasurement.com.pl

phone +48 0 691 255 202
+48 0 517 970 407

www.rjmeasurement.com.pl

page 3 of 8



3. THE MAG-TD200 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: $\mu_{A_{pocz}}$
 - Hm = 0.4 A/m; f = 50 Hz
 - 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 strength
 with 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:

"R&J Measurement" Electronic Instruments and Computerized Systems

55-093 BOROWA,
 ul. Jasminowa 2
 POLAND,

phone +48 0 691 255 202
 +48 0 517 970 407

e-mail: bajorek@rjmeasurement.com.pl

www.rjmeasurement.com.pl



R&J Measurement
The Producer of High Quality Measuring
Instruments

- 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.

Under rotational field the measurement are realised in both direction simultaneously. Moreover, under rotational field, the MAG-TD200 system provides measurements and determination of:

- rotational losses Pr [W/kg]
- the angle between H and J vector PhaXY [°]
- peak value of magnetic field strength HmPeak [A/m]
- peak value of induction JmPeak [T]
- hysteresis loop for setting magnetic induction
 - $J_x = f(H_x)$
 - $J_y = f(H_y)$
 - $J_y = f(J_x)$
 - $H_y = f(H_x)$
 - $J_y = f(J_x)$ and $H_y = f(H_x)$ simultaneously

with full description of the parameters

"R&J Measurement" Electronic Instruments and Computerized Systems

55-093 BOROWA,
ul. Jasminowa 2
POLAND,

e-mail: bajorek@rjmeasurement.com.pl

phone +48 0 691 255 202
+48 0 517 970 407

www.rjmeasurement.com.pl



4. THE PARAMETERS OF MAGNETIC MEASUREMENTS

- the range of induction J_m [T] (0.01÷2.5)
- the range of magnetic field strength H_m for:
 - Epstein frame 25cm [A/m] (2÷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
 - for alternating field [Hz] (3÷2 000)
 - for rotational field [Hz] (20÷400)
- minimal resolution of frequency Δf_b [Hz] 0.01
- setting accuracy of frequency
 - setting accuracy of induction J_m [%] < 0.1
 - for alternating field:

$0 < J_m \leq 0.5 \text{ T}$	[%]	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
 - for rotational field:

$0 < J_m \leq 0.5 \text{ T}$	[%]	1.0
$0.5 \text{ T} < J_m \leq 0.9 \text{ T}$	[%]	0.5
$0.9 \text{ T} < J_m < 2.5 \text{ T}$	[%]	0.3
- The measurements are performed with preservation of sinusoidal signal of magnetic induction differential. Allowed deviation of the form factor from sinusoid does not exceed:
 - for alternating field:

$0 < J_m \leq 0.2 \text{ T}$	[%]	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
 - for rotational field

$0 < J_m \leq 2.5 \text{ T}$	[%]	1.0
------------------------------	-----	-----

"R&J Measurement" Electronic Instruments and Computerized Systems

55-093 BOROWA,
 ul. Jasminowa 2
 POLAND,

phone +48 0 691 255 202
 +48 0 517 970 407

e-mail: bajorek@rjmeasurement.com.pl

www.rjmeasurement.com.pl



R&J Measurement
The Producer of High Quality Measuring
Instruments

- setting accuracy of magnetic field strength H_m
 - for alternating field:

$0 < H_m \leq 10 \text{ A/m}$	[%]	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:
 - for alternating field:

$0 < H_m < 10 \text{ A/m}$	[%]	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

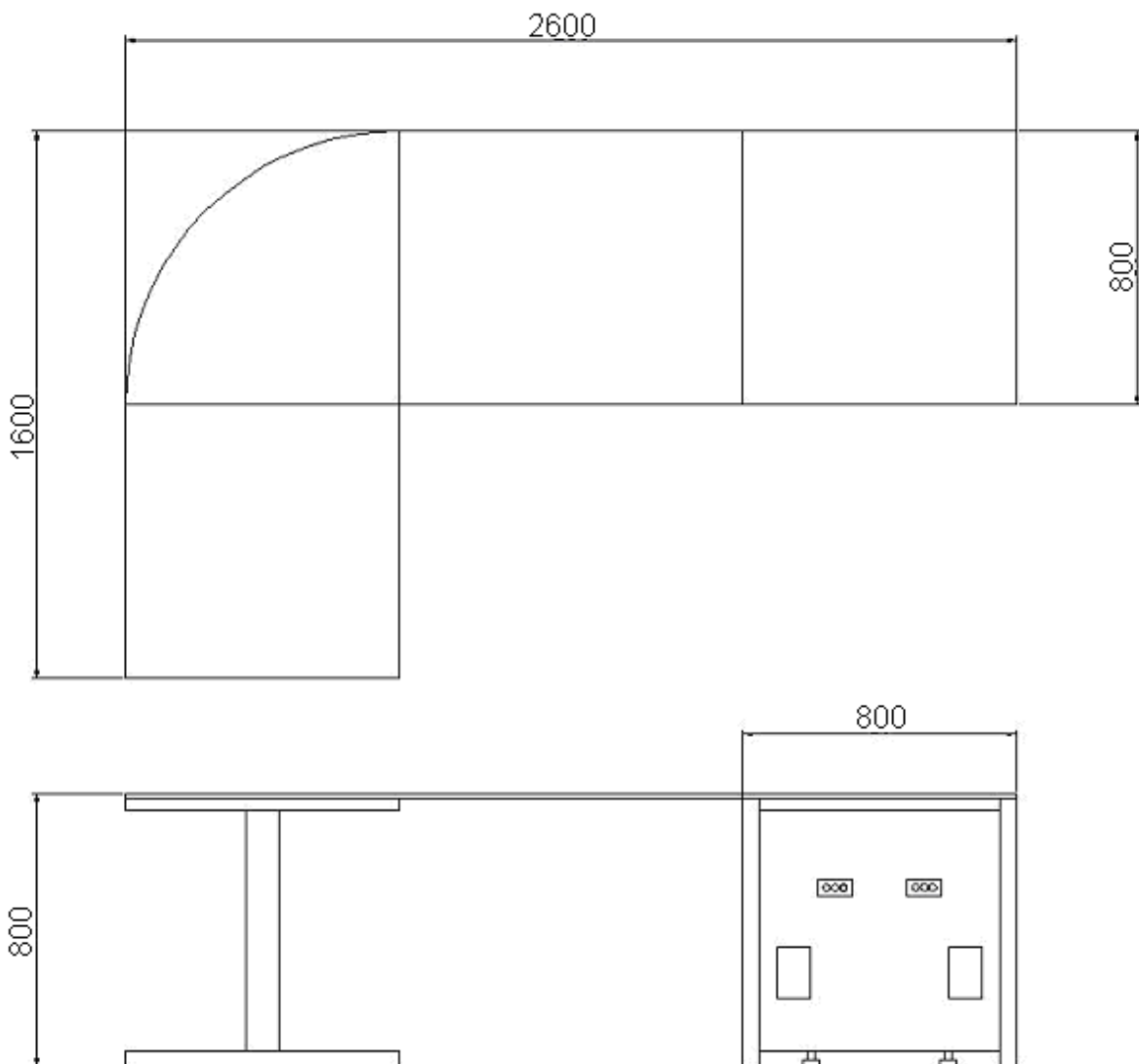


R&J Measurement
The Producer of High Quality Measuring Instruments

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

"R&J Measurement" Electronic Instruments and Computerized Systems

55-093 BOROWA,
ul. Jasminowa 2
POLAND,

e-mail: bajorek@rjmeasurement.com.pl

phone +48 0 691 255 202
+48 0 517 970 407

www.rjmeasurement.com.pl

page 8 of 8