



# Gopal Electronics

## Model EP400

## Digital Epstein Tester



### Key Features

- Basic Accuracy 0.05%
- Fully Automatic Testing with software
- Auto & Manual Test method
- 35Hz to 200Hz precision source
- 700 Turns standard bridge
- 28 Keys for easy operation
- Auxiliary supply protection till 440V
- Surge, Spike & Harmonics Protection

### Range

- 4 Range of source
- 8 Range of voltmeter
- 8 range of Ammeter
- 64 range power meter
- 35Hz to 200Hz (400Hz optional)

- Jumbo LCD Display
- Isolated USB 2.0 Port
- Multi Range source & Measure
- B/H Curve facility in software

### Options Available

- Ep400 - 2KG - 18000 A/m
- Ep400 - 1KG - 12000 A/m
- Ep400 - 500Gram-10000 A/m
- Ep400 - 250Gram-6000 A/m

### Complies to following standard

- BIS 649
- ASTM 343
- IEC 60404-2
- IEC 60404-3 (For SST 500x500)

## Scope of Measurement

- Iron Loss Watt/kg
- Ampere turns per meter
- AC magnetizing force
- Minimum AC magnetization
- AC permeability

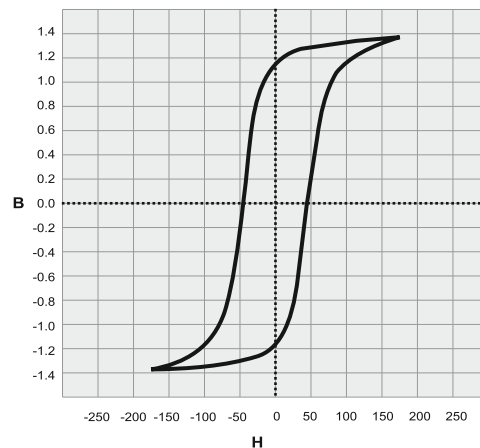
- Peak Permeability
- Hysteresis curve in software
- Bmax, Bmin, Hmax, Hmin of B/h Curve
- Amp Turns Vs Flux intensity measurement
- Graphical report of B/W, B/VA, B/Hrms, B/Hpeak, B/AC permeability, B/peak permeability

## Hysteresis Evaluation



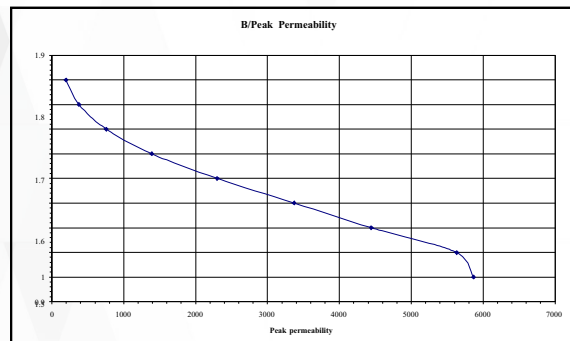
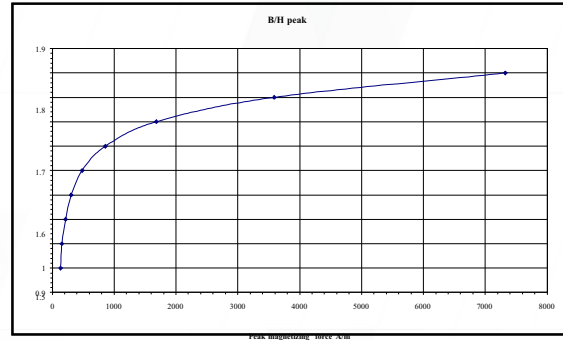
Calibration post provided so any electronics lab can calibrate the equipment

### Hysteresis Evaluation



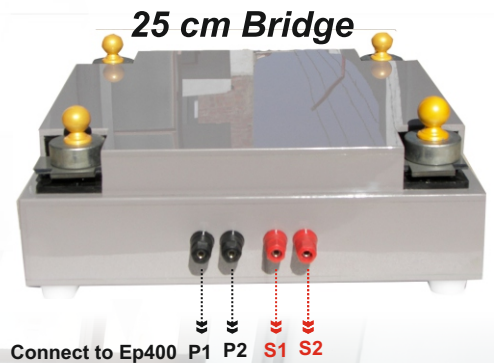
EP-400 is designed to measure AC magnetic properties of flat rolled magnetic materials at high frequency by using Watt-meter, Ammeter, Voltmeter and Source. Epstein bridge test method is a fundamental method for evaluating the magnetic performance of flat-rolled magnetic materials in either sheared or stress relief annealed condition. This test method is suitable for design, specification acceptance, service evaluation, and research and development.

EP-400 has digital controlled crystal accurate 16 Bit sine wave Generator, which provides 35 Hz to 200 Hz harmonics free non distorted power for testing of specimen. It has in built measuring meter, like Flux Voltmeter, RMS Voltmeter, RMS Ammeter, Peak Ammeter, Watt-meter and Power Factor meter with digital sampling method. These measuring devices are (temper proof) precisely calibrated to achieve high accuracy and long term stability. Accuracy and stability of EP-400 is better than specified in national and international standards. (Reference to ASTM: 343, IEC: 60404-2, BIS: 649



### Epstein Bridge Specification

1. Bridge Size = 25 cm ( 94 cm mean length )
2. Number of turns = 700 ( Primary = Secondary )
3. Specimen size = 30mm x 280 to 305 mm
4. Specimen weight = as per bridge size 250gram / 500gram / 1Kg
5. Bridge weight = 7.3 Kg approx.
6. Dimension = 35 x 32.5 x 11.5 cm
7. Air flux compensating coil mounted inside the Bridge

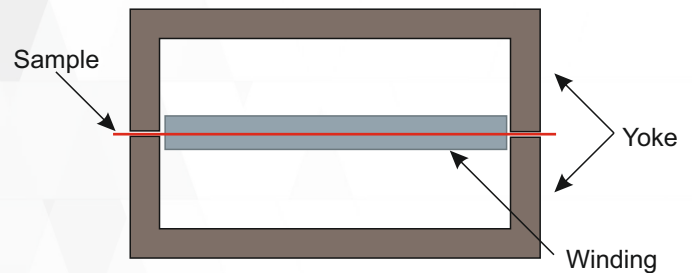


## SST 500 x 500 (Optional Probe)

Gopal Make single sheet tester SST is developed as per IEC 60404-3. It can be attached as probe to Ep400 Main unit and user can test specific total loss, specific apparent power, and r.m.s value of magnetic field strength as well as B/h curve in the software.

The single sheet tester with the test specimen represent as unloaded transformer, the total loss of which is measured by use of flux coil and two U Shape precision low loss yoke. User friendly mechanism is provided to up lift the upper yoke and to easily insert the sample in between two yoke and winding. Testing is done automatically by using Ep400 main unit & software

SST Probe is optional and not included in Ep400 main unit.



### Specification of SST 500x500 Optional Probe

1. Minimum Sample size = 500mm x 300mm
2. Standard Sample size = 500mm x 600mm
3. Weight of Probe Unit = Approx. 300kg
4. Specimen weight = Maximum 1kg
5. Dimension = Approx L62 x W42 x H65 inch
6. Air flux compensating coil mounted inside SST Unit





# Fully Automatic Test Method



Enter only five parameter in Software

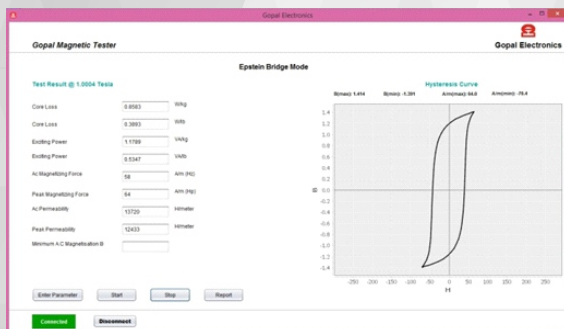
1. Weight of specimen
2. Length & Thickness of Specimen
3. Frequency
4. Density
5. Eddy Current

User have to just click on “START” after feeding all input parameter. EP-400 starts taking result for selected test points automatically. For testing at each test point, frequency, flux volt & induction automatically set using digital sampling method by micro controller. After completion of testing, software generates report in pdf.

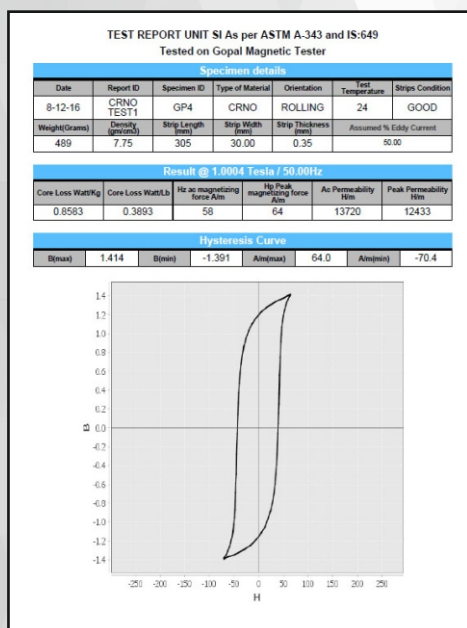
Benefits

- No need to set Frequency every day
- No need to set Flux volt manually
- No need to set Induction manually
- No need to Write down input & Result data
- No chance of human error
- Best accuracy of result
- Save time

“Gopal Magnetic Tester” is advanced software provided with EP-400 for fully automatic testing. User can test a specimen with eleven different Inductions and generate complete report within fifteen minutes. Test report provides hysteresis curve, B/W, B/VA, B/Hrms, B/Hpeak, B/AC permeability, B/peak permeability etc.. at possible points to analyze magnetic property.



USER FRIENDLY operation and multiple use of EP- 400 , make it world leader of magnetic measurement. It has four operation modes one is standard 25 cm Bridge mode which can be operate by hardware and software both. Other three are User mode, Transformer mode and toroid mode which can only operate by hardware. USER MODE is provided as complimentary function for R&D purpose of user.



For example user wants to test small transformer, EI core, Torrid Core, Ring type core, and any different shape of core, then user mode provide facility to set source and set required Voltage and Frequency within Instruments specifications, and simultaneously displays Flux Volt, RMS Volt, RMS Amp, Peak Amp, Watt and Power Factor so user can analyses by self, what is Iron Loss, A/m, Magnetizing force and permeability. Normally this type of operation required technical person, to calculate various parameters, like core area effective weight, Flux Volt, Watt per kg etc.

## Specification

Sine wave Generator	35 to 200 Hz (400Hz optional)
Accuracy of frequency	0.03% which instrument can set
Maximum Source capacity	(30A for 2kg, 22A for 1kg, 16A for 500gram & 250 gram) Amp Peak @ 50Hz
Source max. Voltage	66 Volt RMS @ 50Hz =2kg, 44V=1kg, 20V=500gm, 10V=250gm
Distortion of Sine wave	0.025% @ 50Hz
Protection (Auto)Source	As per source capacity, no connection, short circuit, overload , low pf
Protection of power input	Electronics over voltage & under voltage protection
Input voltage	230V @ 50 Hz $\pm$ 10% or 110V @ 60 Hz $\pm$ 10%
Operation temperature	20° to 30° Celsius
Operation humidity	less than 70% for Bridge & Main Unit, less than 50% for SST
Dimensions	Wide = 580mm Depth =620mm Height =180 mm +Leg
Weight	> 30 Kg
Accuracy of Voltmeter	0.05% True Rms Volt @ 50Hz <b>(8 Range)</b>
Accuracy of Flux meter	0.05% Rectified mean Volt @ 50Hz <b>(8 Range)</b>
Accuracy of Ammeter	0.05% True Rms @ 50Hz <b>(8 Range)</b>
Accuracy of Peak Ammeter	0.1% @ 50Hz
Accuracy of Power meter	0.1% @ UPF 50Hz
Accuracy of PF meter	0.1% From 0.15PF to 1.00PF @ 50Hz

## COMPARISON OF ACCURACY OF EP-400 WITH DIFFERENT STANDARDS REQUIREMENT

Parameter	Accuracy of EP-400 $\pm$ %	Accuracy required by		
		ASTM-343 $\pm$ %	IEC-60404-2 $\pm$ %	IS:649 $\pm$ %
RMS Voltmeter	0.05	0.25	0.2	0.2
RMS Ammeter	0.05	1.00	0.2	1.0
Watt meter	0.10	0.25	0.5	0.3
Flux Voltmeter	0.05	0.25	0.2	0.2
Peak Ammeter	0.10	1.00	0.5	0.3
Repeatability	0.25	1.00	1.0	1.0

## Standard Accessories

1. 25 CM Epstein Bridge	= 1	5. Mains AC Wire	= 1
2. Bridge interface wire	= 4	6. USB interface wire	= 1
3. Standard corner weight	= 4	7. Operation manual	= 1
4. Standard test sample	= 1	8. Calibration certificate(our lab)	= 1
		9. Software CD	= 1

## About Us

Gopal Electronics was established in 1989 by Mr. Gangaram Panchal in Ahmedabad (India), who has over 40 years of experience in magnetic measurement of soft and hard magnetic material. He invented the first product that was the single sheet iron loss tester for iron loss measurement



of motor stamping and EI type laminations. That product proves as very good solutions for the traders and suppliers of electrical stamping to evaluate their material grade. We setup our new manufacturing unit at naroda, Ahmedabad in 1995. Then the development chain starts and we developed range of products like Digital Iron Loss Tester, Holiday Detector, 3 Phase Power Analyzer Epstein tester, Franklin Tester, Turns ratio meter etc. Our range of products is world renowned. These instruments are endorsed by reputed companies like ABB, BHEL, Tata Steel, Emco Ltd, Alstrom (Areva), Crompton Greaves (Germany) etc.



## Exporting to More than 45 Countries



## Few of our Valued Customers

Tata Steel  
Essar Steel  
Ajanta Group  
Orient Electric  
Arev T&D  
BHEL  
Pitti Lamination  
ABB  
Crompton Greaves

Jindal's  
Orpat  
Su-Kam Power  
Hero steel  
Poggenamp  
Schneider Electric  
Uttam Bharat Electric  
Transformer & Rectifier  
Mangal Electric

Kotsons  
Alstom  
BRG  
Emco  
Navkar Transcore  
Danke Electric  
Electrotherm  
Vilas Transcore  
Galaxy Stampings

Enpay Transformers  
Pressmatic Engineering  
Elgi Equipments  
Kirlosker  
Lubi Pumps  
Wilo-Mather&Platt  
Sabar pumps  
Unnati pumps  
La-gajjar Pumps

Weg  
Vijay Electric Ltd  
Bajaj Electrical  
Kryfs  
MKS Transformer  
Polmot motor  
Rajastan transformer  
SR Electrosteel  
Voltec



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