TH8020 Soft Magnetic Material DC Magnetic Meter Calibration System

1. Summary

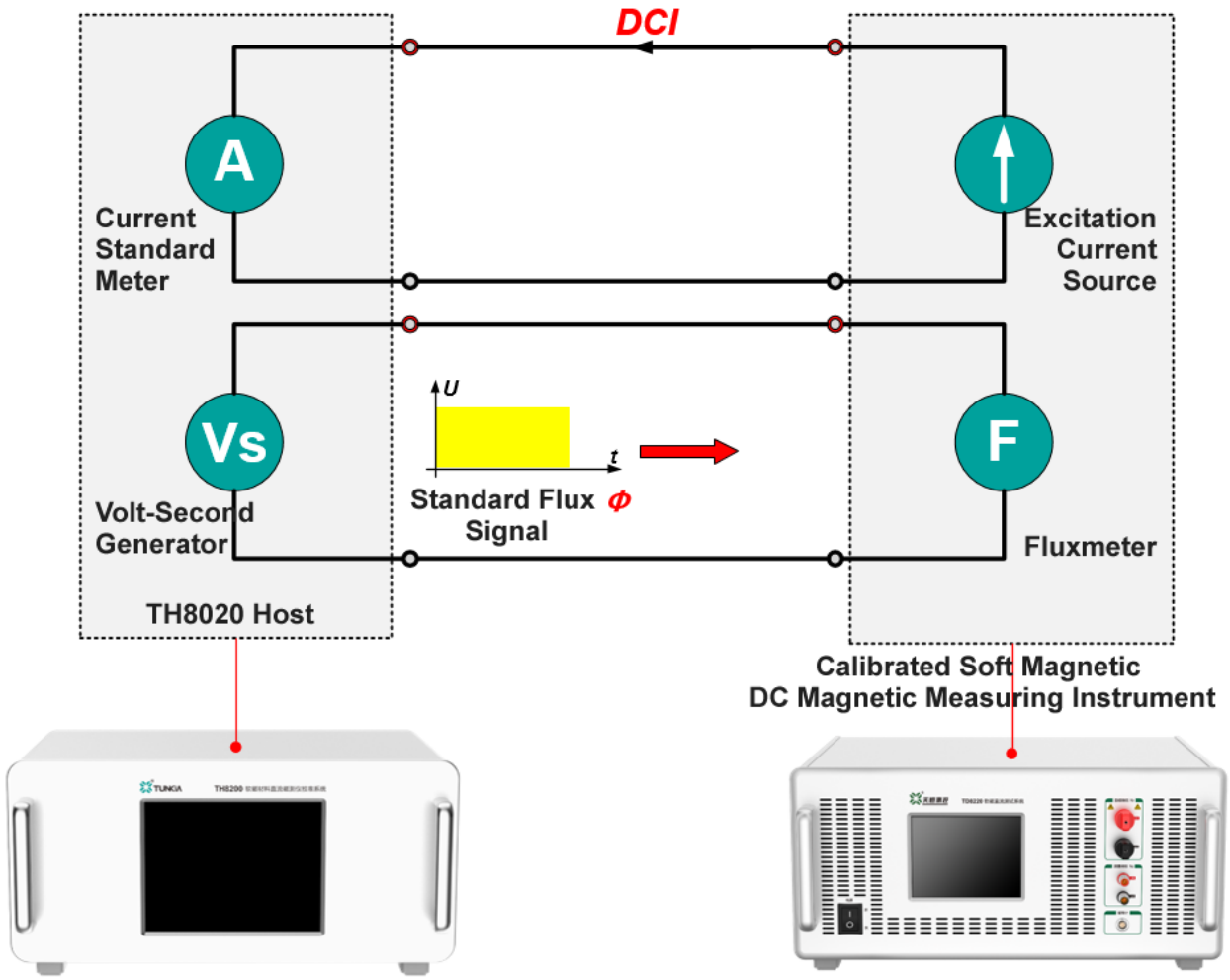
TH8020 is a system specialized to calibrating DC magnetic properties measuring instruments for soft magnetic materials. It can complete the calibration of the primary current I, magnetic flux Φ, DC magnetic characteristic parameters of the magnetometer being calibrated, and the magnetic field non-uniformity of the permeability meter.

2. Features

- Built-in precision ammeter, accuracy class 0.01.
- Built-in volt-second generator, accuracy class 0.02.
- Built-in precision magnetic flux meter, accuracy class 0.05.
- Built-in precision magnetometer, accuracy class 0.05.
- Built-in precision temperature and humidity meter to measure the temperature and humidity of the on-site environment.
- Built-in three-axis fluxgate magnetometer to measure the on-site environmental magnetic field.
- It can optionally be equipped with a precision DC current source to calibrate the magnetic field non-uniformity of the permeameter.
- Equipped with an intelligent probe positioning device, which controls the movement and positioning of the probe through software.
- Communication interfaces: RS232, USB, LAN
- Equipped with specialized calibration software.

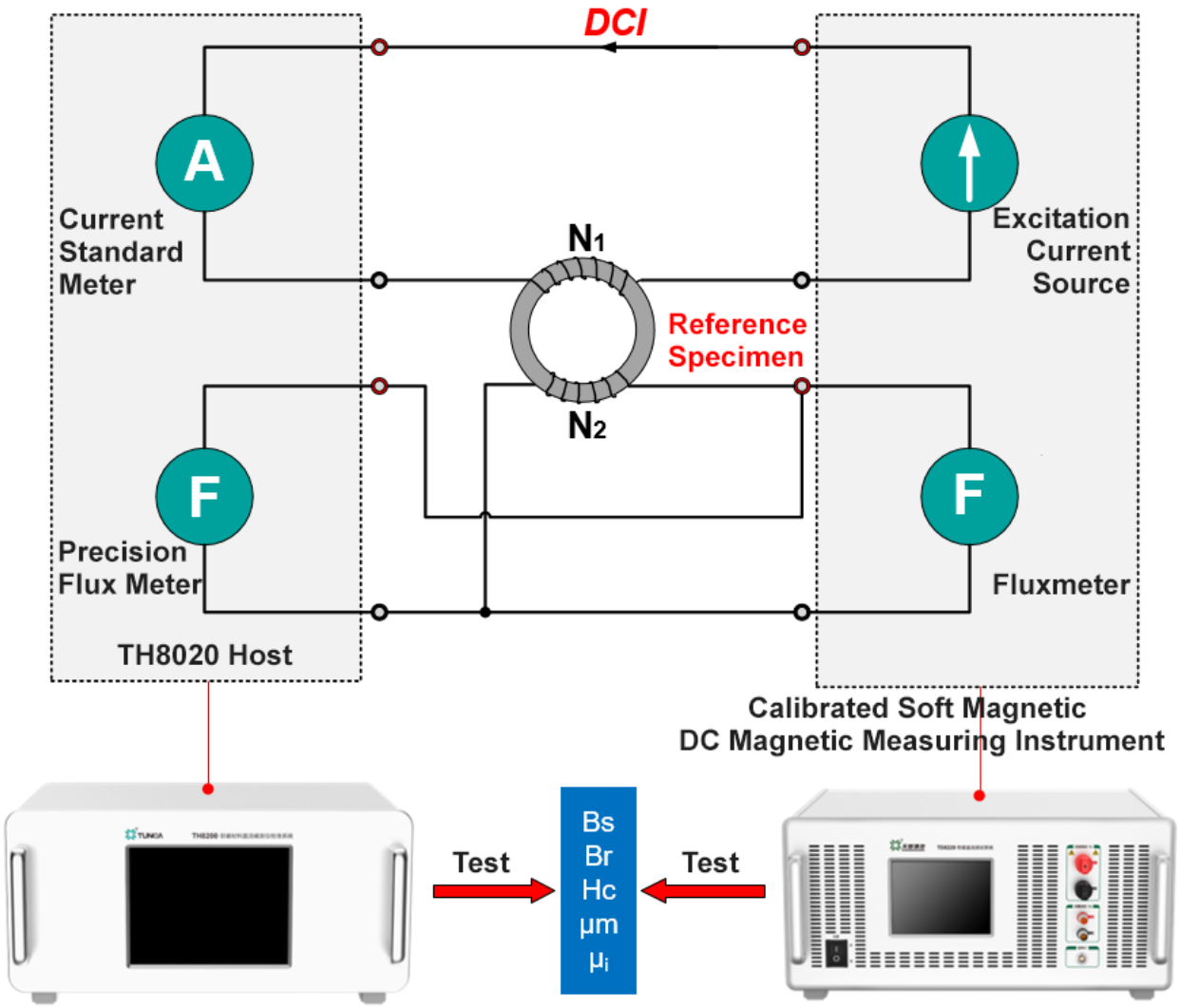
3. Application

☆ Calibrate Primary Current I, Magnetic Flux Φ



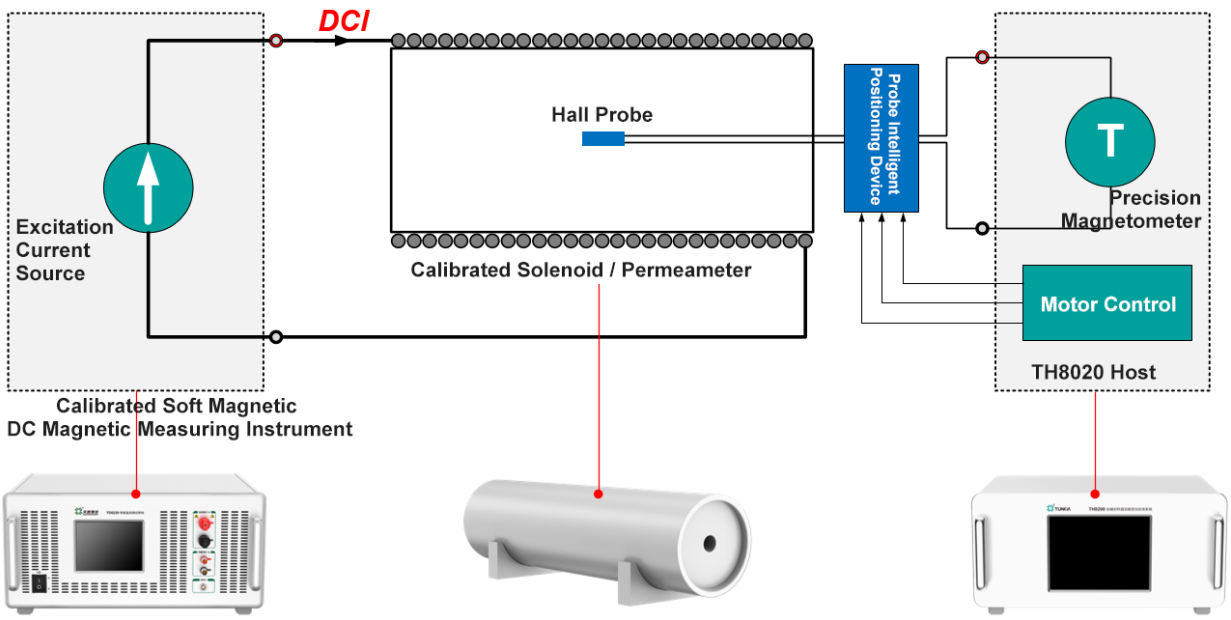
- **Calibrate primary current I:** TH8020 has a built-in precision current standard meter, which can calibrate the current output of the magnetic meter being calibrated.
- **Calibrating magnetic flux Φ:** TH8020 has a built-in precision volt-second generator, which can calibrate the flux meter of the magnetic meter being calibrated.

☆ Calibrate Magnetic Characteristic Parameters



- Use the reference specimen as the load, set the calibration point through the magnetometer to be calibrated, and output the excitation current.
- Use TH8020 to simultaneously measure the saturation magnetic flux density Bs, remanence *Br*, coercivity *Hc*, maximum magnetic permeability a_m, and initial magnetic permeability μ_i of the reference specimen with the magnetometer being calibrated to achieve calibration of DC magnetic characteristic parameters.

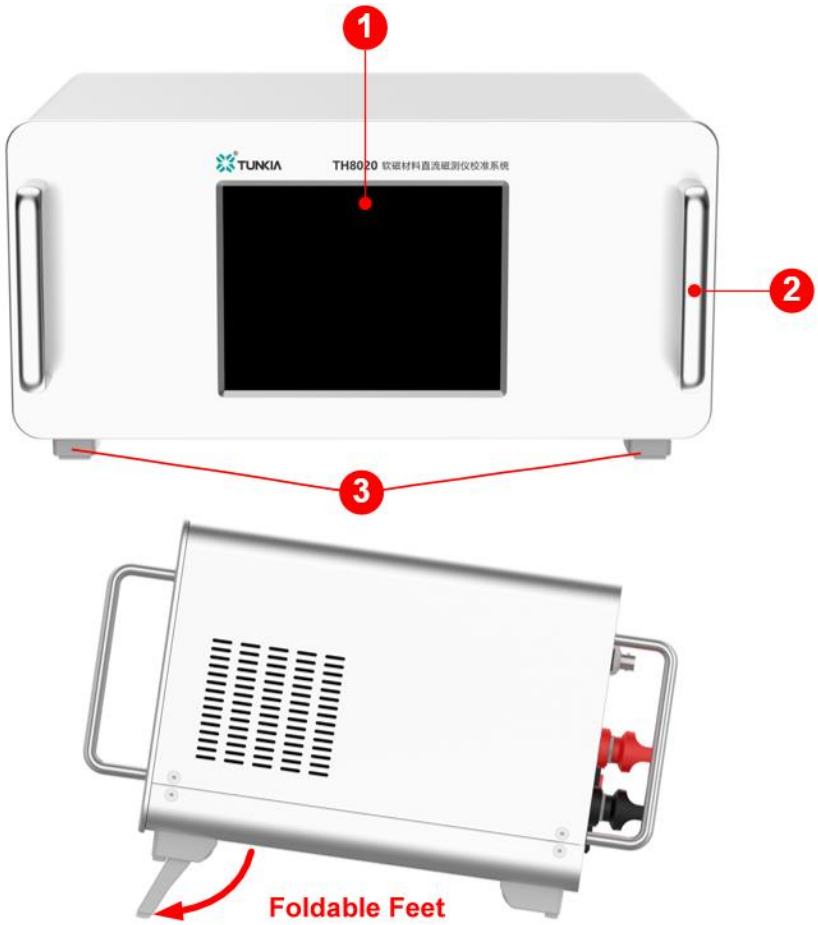
☆ Calibrating Permeameter/Solenoid Magnetic Field Non-Uniformity



- Set the excitation current through the magnetometer to be calibrated, so that the solenoid or permeability meter to be calibrated generates a magnetic field.
- Place the probe of the precision magnetometer into the solenoid or permeameter to be calibrated.
- The host controls the intelligent positioning device of the probe to move the probe slowly to measure the magnetic field non-uniformity of the permeameter/solenoid.

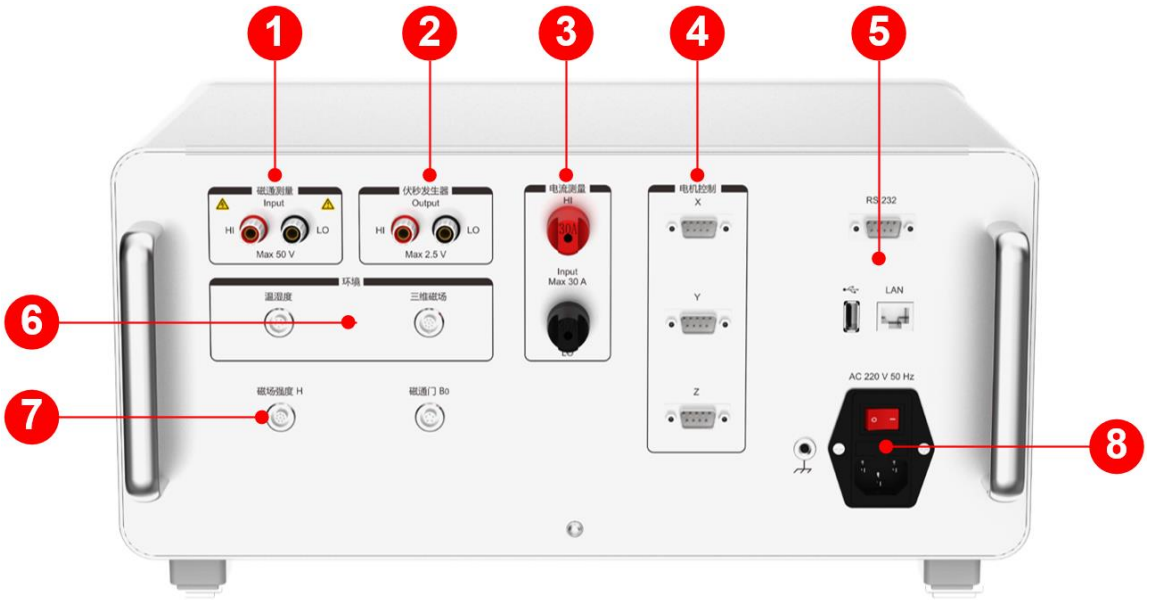
4. Appearance

☆ Front Panel



S/N	Function
1	LCD touch screen.
2	Handle.
3	Foldable feet.

☆ Rare Panel



S/N	Function
1	Precision magnetic flux measurement terminal, connected to the N2 winding of the reference sample when calibrating magnetic characteristic parameters.
2	Terminal block for volt-second generator, flux meter for calibrating DC magnetic meter.
3	Current measurement terminal block, calibrate the primary current I of the DC magnetic meter.
4	Motor control interface controls the XYZ axis of the probe's intelligent positioning device.
5	Communication interfaces: RS232, USB, and LAN.
6	Temperature, humidity, and three-axis magnetic field probe interface.
7	Magnetic field strength probe interface to calibrate the magnetic field non-uniformity of the solenoid.
8	Power interface: AC 220V power input interface with switch and fuse.

5. Specifications

5.1 Precision DC Ammeter

Range	±(10 μA~30A)
Measurement Uncertainty (k=2)	0.006%*RD+0.004%*RG [1]
Range Switching	Manual / Automatic range switching
Note	【1】RD is the reading value, RG is the range value. The same below.

5.2 Precision Volt-Second Magnetic Flux Calibrator

Voltage Output	**Voltage Range**	2 mV、20 mV、200 mV、2V
	Measurement Uncertainty (k=2)	0.01%*RD+0.005%*RG or 0.01%*RD + 0.2 μV choose the larger value of the two
	Adjustment Fineness	0.005%*RG
	Protect Function	Short circuit protection, overload protection
Adjustable timer	**Pulse Width Range**	0.1 s~5 s
	Measurement Uncertainty (K=2)	0.005%*RG
Flux output	**Magnetic Flux**	Combination of voltage and time
	Range	0.1 mWb~10 Wb
	Display Digits	7-digit decimal display
	Measurement Uncertainty (K=2)	200 ppm*RD + 0.1μWb

5.3 Precision Flux Meter

Magnetic Flux Measurement Range	0.2mWb～10 Wb。
Minimum Resolution	10 nWb
Magnetic Flux Measurement Uncertainty (K=2)	0.05%*RD + 5 μWb
Zero Drift Typical Value	0.5 μWb/min
Display Digits	6-digit display

5.4 Precision Magnetometer

Range	Resolution	Measurement Uncertainty (k=2) *A%*RD^{②}+B*	Temperature Coefficient *± ppm/℃*	Zero Drift *± μT/h*
3 mT	1 nT	0.1% + 100 μT	50	15
30 mT	10 nT	0.05% + 100 μT	50	20
300 mT	100 nT	0.05% + 100 μT	50	50
2500 mT	1 μT	0.05% + 150 μT	50	75

5.5 Environmental Parameter Measurement

Temperature And Humidity Measurement	**Probe**	Temperature and humidity probe
Environmental Magnetic Field Measurement	**Range**	1 mT
	Display Digits	5 digit display
	Probe	Three-dimensional magnetic field sensing probe
	Measurement Uncertainty (k=2)	0.5%

6. General Specifications

Power Supply	*AC (220 ± 22) V, (50 ± 2) Hz*
Temperature Performance	Working temperature: 0°C～50°C Storage temperature: *-20*°C～*70*°C
Humidity Performance	Working humidity: *40%～80% R·H,* no-condensing Storage humidity: < *80% R·H*, no-condensing

7. Configuration List

S/N	Name	Quantity	Configuration	Note
1	TH8020 Test Host	1	Standard	
2	Probe Intelligent Positioning Device	1	Standard	
3	Temperature and Humidity Probe	1	Standard	
4	Three-Dimensional Magnetic Field Sensing Probe	1	Standard	
5	Reference Specimen	1	Standard	
6	Automatic Calibration Software	1	Standard	
7	Set of Test Leads and Power Cable	1	Standard	
8	Precision DC Current Source	1	Optional Accessory	
9	Workbench	1	Optional Accessory	Third party product
10	Computer	1	Optional Accessory	Third party product
11	Printer	1	Optional Accessory	Third party product

Note: The above is for reference only, the specific configuration list is subject to the technical agreement.