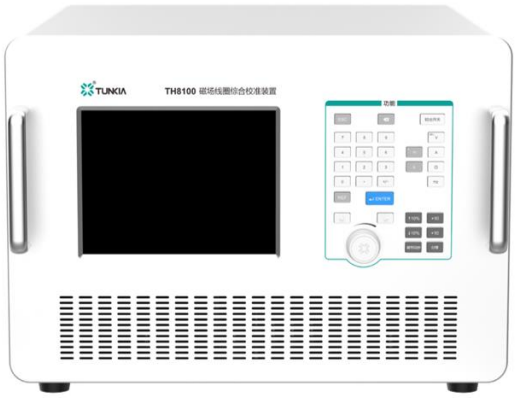
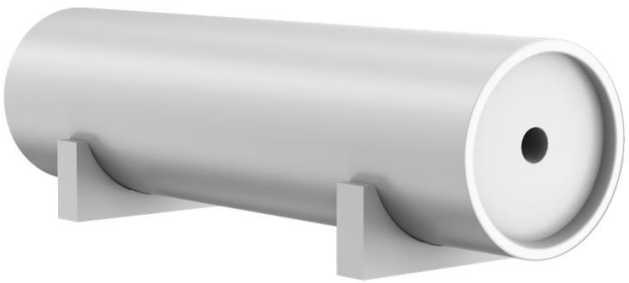
TH8100 Magnetic Field Coil Comprehensive Calibration Device





1. Summary

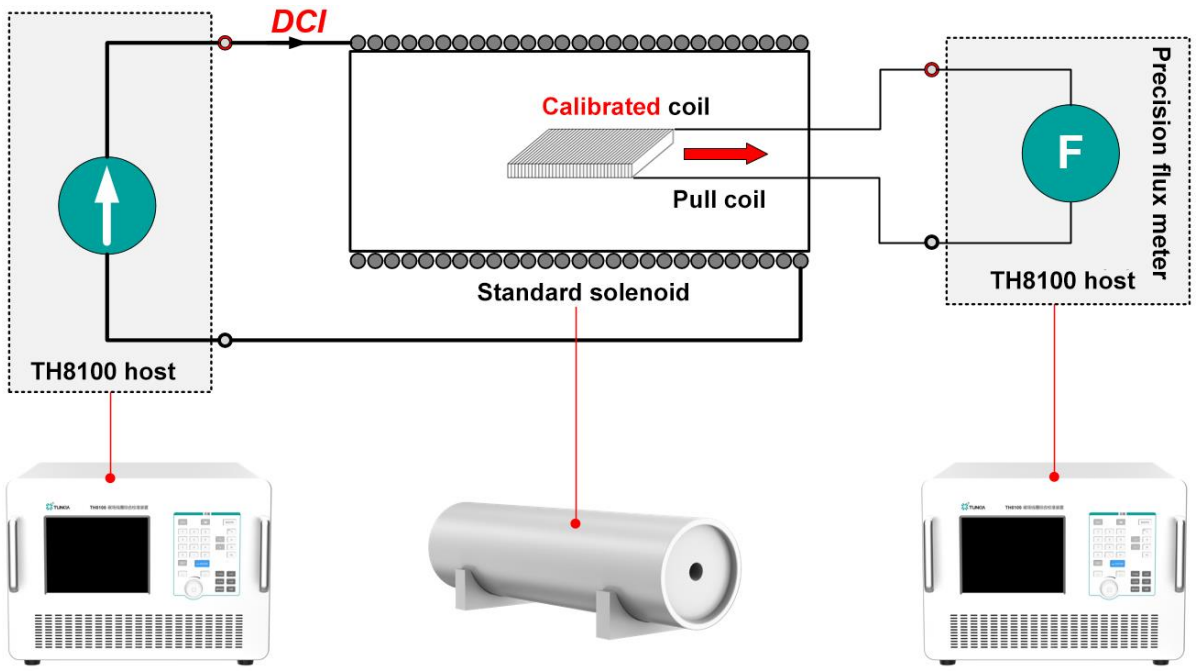
TH8100 is a set of devices specially used to calibrate the fluxmeter coil constants of DC magnetic properties measuring instruments for soft magnetic materials. Please refer to *JJF1830-2020* "*Calibration Specifications for DC Magnetic Properties Measuring Instruments for Soft Magnetic Materials*", it can use the pull method or low-frequency AC Method to calibrate the coil constant NS of the magnetic permeability meter.

2. Features

- Supports two calibration methods: pull-out method and low-frequency AC method.
- Built-in precision DC current source, accuracy class 0.005.
- Built-in precision AC current source, accuracy class 0.01.
- Built-in precision magnetic flux meter, accuracy class 0.05.
- Built-in precision AC voltmeter, accuracy class 0.05.
- Equipped with standard solenoid for generating standard magnetic field.
- Communication interfaces: RS232, USB, LAN
- Equipped with specialized calibration software.

3. Application

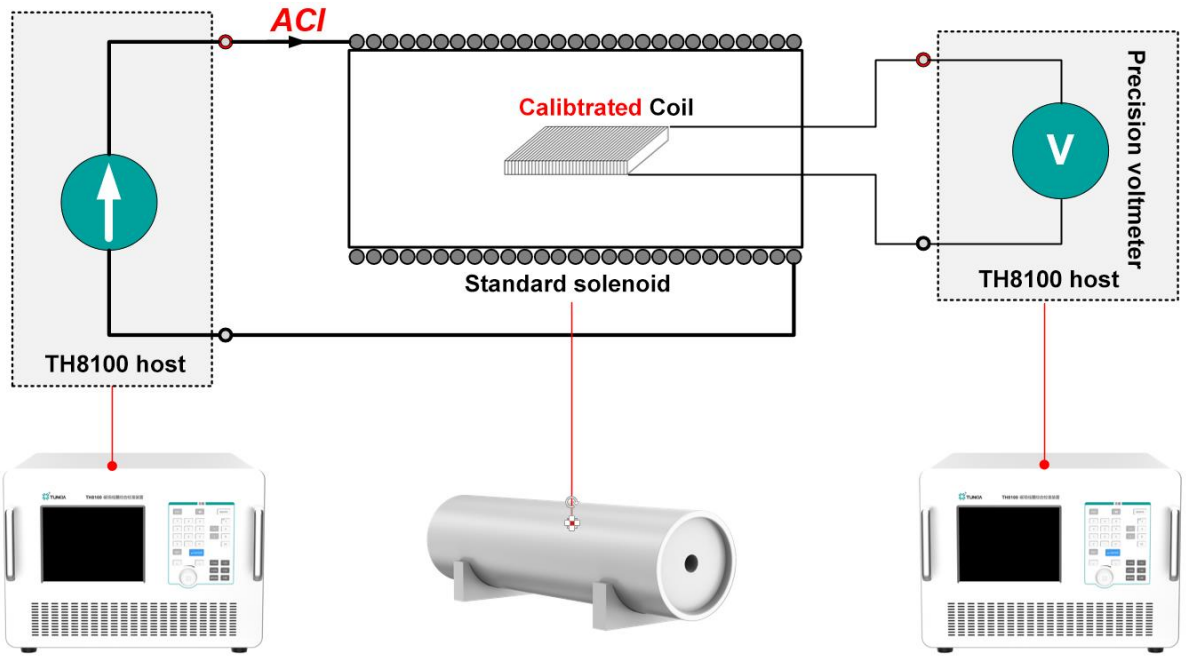
☆ Calibration Coil Constant NS (Pull-Out Method)



- The TH8100 host outputs precision DC current to the standard solenoid to generate a standard magnetic field H_0 (H_0=K*I, H is the coil constant of the standard solenoid, which is given by the superior measurement department.)
- The output end of the coil under test is connected to the precision flux meter of the host computer, and adjust the zero drift of the flux meter and clear it to zero.
- Pull the coil quickly, read the indication value Φ_H of the flux meter, and obtain the constant reference value of the coil under test through the following formula.

$$(NS)_0 = \frac{\emptyset_H}{\mu_0 H_0}$$

☆ Calibration Coil Constant NS (Low-Frequency AC Method)



- TH8100 host outputs precision AC current to standard solenoid.
- The output end of the coil under test is connected to the precision voltmeter of the host computer.
- Read the effective value U_2 of the voltmeter and obtain the constant reference value of the coil under test through the following formula.

$$(NS)_0 = \frac{U_2}{2\pi f \mu_0 K I}$$

4. Specifications

4.1 Precision AC and DC Current Source

DC Current Standard Source DCI	Maximum Output Current	± 25A
	Measurement Uncertainty (k=2)	0.005%*RG①
	Output Mode	Bipolar output
AC Current Standard Source ACI	Maximum Output Current	$25A_{pk}$
	Frequency Range	10 Hz~1 kHz
	Measurement Uncertainty (k=2)	0.01%*RG
Note		①: RG is the range value, the same below

4.2 Precision voltmeter

Measurement Range	5 mV~ 5V
Measurement Uncertainty (k=2)	0.05%

4.3 Precision Fluxmeter

Magnetic Flux Measurement Range	0.2mWb～10 Wb。
Minimum Resolution	10 nWb
Voltage Measurement Uncertainty (k=2)	0.02%*RD + 0.02%*RG
Integration Time Measurement Uncertainty (k=2)	0.005%
Magnetic Flux Measurement Uncertainty (k=2)	0.05%*RD + 5 μWb

Zero Drift Typical Value Display Digits	0.5 μWb/min
Display Digits	6-digit

4.4 Standard Solenoid

Maximum Current	25 A
Maximum Constant Magnetic Field	60 kA/m
Size	Φ95mm×980mm
Quality	Approx 260 kg

5. 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,* non-condensing Storage temperature: < *80% R·H,* non-condensing

6. Configuration List

S/N	Name	Quantity	Configuration	Note
1	TH8100 test host	1	Standard	
2	Standard solenoid	1	Standard	
3	Automatic calibration software	1	Standard	
4	Complete set of test leads and power cords	1	Standard	
5	Workbench	1	Optional	Third party product
6	Computer	1	Optional	Third party product

7	Printer	1	Optional	Third party product

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