

TH0690 Current Transducer Integrated Measurement Analyzer



1. Summary

TH0690 is an intelligent instrument dedicated to the comprehensive performance evaluation of current transducers. It can accurately test the electrical characteristics such as ratio error (k) and phase displacement (δ) of I/I and I/V current transformers, and can also measure the AC magnetic characteristics of the transformer core. It solves the problem of complex calculation of the relationship between magnetic properties and electrical properties in the process of transducers design, and provides the most complete means for the analysis and measurement of current transformers.

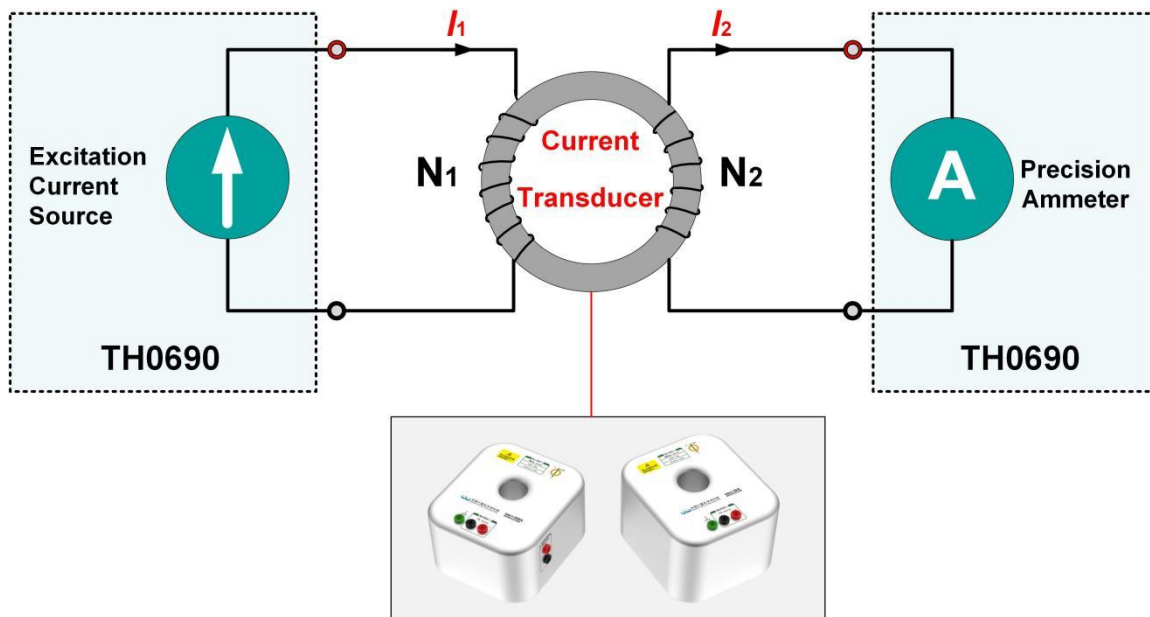
2. Feature

- AC Power Output/Measurement Accuracy: Class 0.005
- Working Frequency Range: 45 Hz~65 Hz.
- Support multi-frequency point measurement of ratio error (k) and phase displacement (δ)
- Draw frequency or current characteristic curve with the software.
- Support various magnetic characteristic parameter measurement and curve drawing.
- With automatic demagnetization function, it can evaluate the magnetic resistance of the transformer.
- Special Test Software (optional)

3. Application

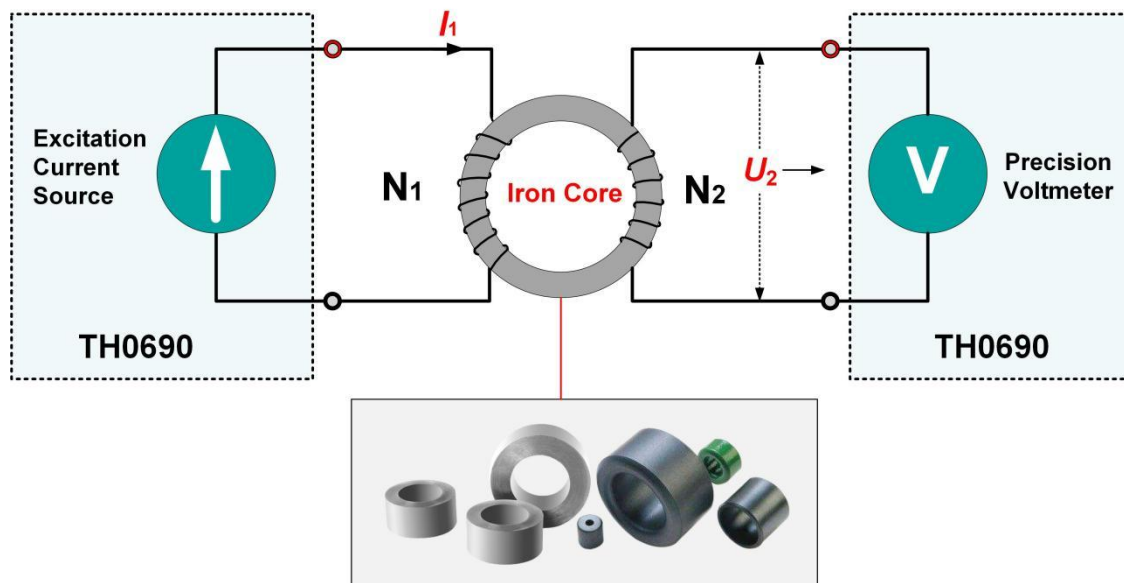
- Current transformer ratio error (k) and phase displacement (δ) calibration.
- Magnetic performance testing of finished transformers and semi-finished iron cores.
- Current transformer quality inspection, design verification, iron core pairing.
- Ratio error (k) and phase displacement (δ) measurement of the current measurement circuit.
- Anti-magnetic evaluation of current transformers.

☆ Current transformer ratio error and phase displacement calibration.



- Measure and calibrate the ratio error and phase displacement of the current transformer.
- Draw the frequency characteristic curve $k(f)$ 、 $\delta(f)$, current characteristic curve $k(I)$ 、 $\delta(I)$.

☆ Measuring the magnetic properties of core semi-finished products.



- It can measure the magnetic properties of finished transformers and semi-finished iron cores.
- Parameter Measurement: μ_i 、 μ_m 、 H_c 、 B_r 、 B_s 、 μ_a 、 B_m 、 H_m 、 δ etc.

4. Specifications

4.1 ACI Output/ I_1

Current Range	Short-term Stability (%/min)	Measurement Uncertainty ($k=2$, $\text{ppm} \cdot \text{RD} + \text{ppm} \cdot \text{RG}$) ^①			Maximum Load Voltage(V)	Distortion (%)
		24 h (23 ± 1)°C	90 days (23 ± 5)°C	1 year (23 ± 5)°C		
2 mA	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
5 mA	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
10 mA	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
20 mA	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
50 mA	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
100 mA	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
200 mA	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
500 mA	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
1 A	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
2 A	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
5 A	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
10 A	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
20 A	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
50 A	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
100 A	0.003	20 + 20	25 + 20	30 + 20	1.2	< 0.2
Note: ① RD is the reading value, RG is the range value, the same below.						

- ACI Output: 200 μA ~120 A, 7-digit display.
- Frequency range: 45 Hz~65 Hz; Adjustment Fineness: 0.0001 Hz; Measurement Uncertainty: 0.001 Hz
- Protection Function: short circuit protection, overload protection.

4.2 ACV Measurement /U₂ and ACI Measurement/I₂

AC	Range	Resolution	Measurement Uncertainty (k=2, ppm*RD +ppm*RG)		
			24 h (23±1)°C	90 days (23±5)°C	1 year (23±5)°C
ACV/U ₂	20 mV	10 nV	40 + 40	50 + 40	60 + 40
	50 mV	10 nV	20 + 20	25 + 20	30 + 20
	100 mV	100 nV	20 + 20	25 + 20	30 + 20
	200 mV	100 nV	20 + 20	25 + 20	30 + 20
	500 mV	100 nV	20 + 20	25 + 20	30 + 20
	1 V	1 μV	20 + 20	25 + 20	30 + 20
	2 V	1 μV	20 + 20	25 + 20	30 + 20
	5 V	1 μV	20 + 20	25 + 20	30 + 20
ACI/I ₂	200 μA	0.1 nA	20 + 20	25 + 20	30 + 20
	500 μA	0.1 nA	20 + 20	25 + 20	30 + 20
	1 mA	1 nA	20 + 20	25 + 20	30 + 20
	2 mA	1 nA	20 + 20	25 + 20	30 + 20
	5 mA	1 nA	20 + 20	25 + 20	30 + 20
	10 mA	10 nA	20 + 20	25 + 20	30 + 20
	20 mA	10 nA	20 + 20	25 + 20	30 + 20
	50 mA	10 nA	20 + 20	25 + 20	30 + 20
	100 mA	100 nA	20 + 20	25 + 20	30 + 20

- U₂ Measurement Range: 2 mV~5.5 V, 7-digit display.
- I₂ Measurement Range: 20 μA~110 mA, 7-digit display.
- Harmonic Measurement: 2nd to 63rd.

4.3 Ratio Error (k) and Phase Displacement (δ) Measurement

Ratio Error	Measurement Range	Current transformer input current like I_1 Current transformer output current like I_2
	Measurement Uncertainty (k=2)	0.01% @ 45 Hz ~ 65 Hz
Phase Displacement	Measurement Range	0.000°~359.999°
	Measurement Uncertainty (k=2)	0.001° @ 45 Hz~65 Hz

4.4 Measurement of Magnetic Parameters of Current Transformer Iron Core

Measured Parameters	Measurement Uncertainty (k=2)	Measurement Repeatability
μ_i	1.5%	4.0%
μ_m	1.0%	2.0%
H_c	0.5%	1.0%
B_r	0.3%	1.0%
B_s	0.3%	1.0%
μ_a	1.0%	3.0%
B_m	0.5%	1.0%
H_m	1.0%	2.0%
δ	1.5%	5.0%
H_c	1.0%	3.0%
B_r	1.0%	3.0%
μ'	1.0%	3.0%
μ''	1.0%	3.0%
μ_L	1.0%	3.0%

Note: The iron core should be demagnetized before the test, and the parameters of the iron core should be input as required. The measurement temperature T: (23±5)°C.