TH2690 Series

Femtoammeters / Picoammeters / Electrometers / High-Resistance Meters

Eight models built around a common 6½-digit measurement platform, for the weak-current and high-resistance measurements that general-purpose digital multimeters cannot reach. The electrometer/high-resistance family (TH2690/A/H, TH2695/A) resolves current down to **0.01 fA** and measures resistance up to **3 EΩ (10^{18} Ω)** using a built-in voltage source of up to ±3000 V; the compact TH2691/A/H family offers the same femtoamp-level ammeter core for cost-sensitive current-only applications. All models share a 5.0" capacitive touch colour display, live graph/histogram views, and a data reading rate up to 5000 readings/second.



8 models · Current range down to 2 pA (model-dependent) up to 20 mA · Resolution down to 0.01 fA (10^{-17} A) · Resistance to 3 EΩ (10^{18} Ω)

- **0.01 fA current resolution** — industry-leading sensitivity for weak-signal measurement
- Resistance measurement up to **3 EΩ (10^{18} Ω)** via built-in ±3000/±1500/±1000 V source
- 5.0" capacitive touch colour LCD, 6½-digit measurement resolution
- Four measurement modes: high-resistance meter, voltmeter, ammeter, electrometer
- Independent current and voltage measurement inputs
- Data reading rate up to **5000 readings/second**, with time-domain waveform capture
- Charge measurement down to a 2 nC range (1 fC resolution)
- Programmable voltage output: DC, single/double-step scan, list scan, square wave/pulse
- Dedicated temperature & humidity probe input; grading/sorting comparator (up to 7 limits)
- SCPI/MODBUS standard; RS232, USB Host/Device, LAN, HANDLER, INTERLOCK interfaces

Eight models, one platform

Model	TH2690	TH2690A	TH2690H	TH2691	TH2691A	TH2691H	TH2695	TH2695A
Functions	R / V / I / Q	R / V / I	R / V / I / Q	I	I	I	R / V / I / Q	R / V / I / Q
Current resolution	0.1 fA	1 fA	0.01 fA	0.1 fA	1 fA	0.01 fA	0.01 fA	0.01 fA
Max. resistance	100 PΩ	1 PΩ	1000 PΩ	—	—	—	3000 PΩ	1500 PΩ
Voltage source	±1000 V	±1000 V	±1000 V	—	—	—	±3000 V	±1500 V
Voltage measurement	1 µV – 20 V	1 µV – 20 V	1 µV – 20 V	—	—	—	30 mV – 3000 V	15 mV – 1500 V
Charge measurement	1 fC – 2 µC	—	1 fC – 2 µC	—	—	—	1 fC – 2 µC	1 fC – 2 µC
Temp. & humidity input	✓	✓	✓	—	—	—	✓	✓

R = high-resistance meter · V = voltmeter · I = ammeter · Q = electrometer (charge). All eight models share the 20 mA top current range and 6½-digit resolution; the lowest current range depends on the model (see page 2). **TH2691/A/H** are compact ammeter-only versions of the family for current-only measurement at lower cost.

Applications

Material characterization

Semiconductors, nanomaterials, polymers, dielectric and ferroelectric materials, graphene, ceramics, biological materials, rubber, thin films, metals and organic materials.

Component leakage & insulation

Leakage current and insulation-resistance testing of capacitors, resistors, diodes, transistors, sensors, TFT/CNT devices, opto-electronic and nano-devices, solar cells, switches and relays.

Resistivity & I–V testing

Volume/surface resistivity with the optional TH26090 test fixture; third-generation semiconductor I–V characterization; fast charge testing of capacitive devices.

Technical specifications

Display

Display device	5.0" capacitive touch colour LCD · 6½-digit measurement resolution

Current measurement — applicable range depends on model, see Page 1 selection table

Range	Accuracy	Resolution	Applicable models
2 pA	±(1% + 3 fA)	0.01 fA	TH2695 / TH2695A / TH2690H / TH2691H
20 pA	±(0.5% + 3 fA)	0.1 fA	TH2695 / TH2695A / TH2690 / TH2690H / TH2691 / TH2691H
200 pA	±(0.5% + 5 fA)	0.1 fA	TH2695 / TH2695A / TH2690 / TH2690H / TH2691 / TH2691H
2 nA	±(0.2% + 50 fA)	1 fA	All models
20 nA	±(0.2% + 3 pA)	10 fA	All models
200 nA	±(0.2% + 5 pA)	100 fA	All models
2 µA	±(0.1% + 50 pA)	1 pA	All models
20 µA	±(0.05% + 500 pA)	10 pA	All models
200 µA	±(0.05% + 5 nA)	100 pA	All models
2 mA	±(0.05% + 50 nA)	1 nA	All models
20 mA	±(0.05% + 500 nA)	10 nA	All models

Resistance measurement — TH2691 / TH2691A / TH2691H do not offer resistance measurement

Range	Accuracy	Resolution	Applicable models
1 MΩ	±(0.135% + 1 Ω)	1 Ω	TH2695 / TH2695A / TH2690 / TH2690A / TH2690H
10 MΩ	±(0.135% + 10 Ω)	10 Ω	TH2695 / TH2695A / TH2690 / TH2690A / TH2690H
100 MΩ	±(0.185% + 100 Ω)	100 Ω	TH2695 / TH2695A / TH2690 / TH2690A / TH2690H
1 GΩ	±(0.285% + 1 kΩ)	1 kΩ	TH2695 / TH2695A / TH2690 / TH2690A / TH2690H
10 GΩ	±(0.41% + 10 kΩ)	10 kΩ	TH2695 / TH2695A / TH2690 / TH2690A / TH2690H
100 GΩ	±(0.41% + 100 kΩ)	100 kΩ	TH2695 / TH2695A / TH2690 / TH2690A / TH2690H
1 TΩ	±(0.45% + 1 MΩ)	1 MΩ	TH2695 / TH2695A / TH2690 / TH2690A / TH2690H
10 TΩ	±(0.75% + 10 MΩ)	10 MΩ	TH2695 / TH2695A / TH2690 / TH2690H
100 TΩ	±(2.6% + 100 MΩ)	100 MΩ	TH2695 / TH2695A / TH2690 / TH2690H

Each resistance range applies a fixed internal test-current range and voltage-source level: e.g. 1 MΩ uses 200 µA / 20 V, 1 GΩ uses 200 nA / 20 V, 1 TΩ uses 2 nA / 200 V, and 100 TΩ uses 20 pA / 200 V. Max. measurable resistance: **TH2695** 3000 PΩ (3 EΩ) · **TH2695A** 1500 PΩ · **TH2690** 100 PΩ · **TH2690A** 1000 TΩ (1 PΩ) · **TH2690H** 1000 PΩ.

Voltage measurement — independent input, TH2691/A/H not equipped

Range	Accuracy	Resolution	Applicable models
2 V	±(0.05% + 40 µV)	1 µV	TH2690 / TH2690A / TH2690H
20 V	±(0.05% + 400 µV)	10 µV	TH2690 / TH2690A / TH2690H
150 V	±(0.05% + 300 µV)	100 µV	TH2695A
300 V	±(0.05% + 600 µV)	100 µV	TH2695
1500 V	±(0.05% + 300 µV)	1 mV	TH2695A
3000 V	±(0.05% + 6 mV)	1 mV	TH2695

Input impedance: >200 TΩ (TH2690 / TH2690A / TH2690H) · 100 MΩ (TH2695) · 50 MΩ (TH2695A).

Charge measurement — indicators valid within 1 s; TH2690A / TH2691 / TH2691A / TH2691H not equipped

Range	Accuracy	Resolution	Applicable models
2 nC	±(0.5% + 50 fC)	1 fC	TH2695 / TH2695A / TH2690 / TH2690H
20 nC	±(0.5% + 500 fC)	10 fC	TH2695 / TH2695A / TH2690 / TH2690H
200 nC	±(0.5% + 5 pC)	100 fC	TH2695 / TH2695A / TH2690 / TH2690H
2 µC	±(0.5% + 50 pC)	1 pC	TH2695 / TH2695A / TH2690 / TH2690H

Built-in voltage source — TH2691 / TH2691A / TH2691H not equipped

Range	Accuracy	Resolution	Max. output current	Applicable models
20 V	±(0.05% + 2 mV)	1 mV	±20 mA	TH2690 / TH2690A / TH2690H / TH2695A
40 V	±(0.05% + 4 mV)	1 mV	±20 mA	TH2695
200 V	±(0.05% + 20 mV)	1 mV	±10 mA	TH2695A
400 V	±(0.05% + 40 mV)	1 mV	±10 mA	TH2695
1000 V	±(0.05% + 100 mV)	1 mV	±1 mA	TH2690 / TH2690A / TH2690H
1500 V	±(0.05% + 150 mV)	1 mV	±10 mA	TH2695A
3000 V	±(0.05% + 300 mV)	1 mV	±10 mA	TH2695

Source functions: DC, scan (single-step, double-step, list scan), ARB (square wave with pulse output, 10 ms min. pulse width, 1 ms resolution).

Temperature probe input

Range	Accuracy
−40 to −10 °C	±1 °C
10 to 55 °C	±0.5 °C
55 to 80 °C	±1 °C

Humidity probe input

Range	Accuracy
0–20% RH	±4%
20–80% RH	±3%
80–100% RH	±4%

Dedicated TH2690_THS digital temperature & humidity probe (standard accessory, TH2691/A/H not equipped) — applicable to TH2690 / TH2690A / TH2690H / TH2695 / TH2695A. View modes: meter, graph (I-t, V-t, R-t, Q-t, I-R), histogram, scroll.

Interfaces

RS232	USB Host	USB Device	LAN	HANDLER	INTERLOCK	SCPI / MODBUS	Analog / D-A out
standard	standard	standard	standard	standard	standard	standard	±2 VFS

Voltage input terminal: triaxial BNC (high-voltage BNC on TH2695/TH2695A). Current input terminal: triaxial BNC. GROUND terminal: banana jack. Temperature/humidity sensor input and INTERLOCK input apply to TH2690 / TH2690A / TH2690H / TH2695 / TH2695A.

General specifications

Power supply	AC 90–264 V, 50/60 Hz or DC 127–370 V · 60 W
Operating / storage environment	0–45 °C, 30–80% RH (no condensation) / −20–60 °C, 10–90% RH (no condensation)
Accuracy-rated environment	23 °C ± 5 °C, 30–80% RH · warm-up 1 hour · calibration cycle 1 year
Dimensions — TH2695	Rack mount 215(W) × 88(H) × 480(D) mm · Bench 235(W) × 111(H) × 590(D) mm · 5.5 kg
Dimensions — TH2695A	Rack mount 215(W) × 88(H) × 335(D) mm · Bench 235(W) × 111(H) × 440(D) mm · 4 kg
Dimensions — TH2690/A/H, TH2691/A/H	Rack mount 215(W) × 88(H) × 335(D) mm · Bench 235(W) × 111(H) × 440(D) mm · 3.5 kg

Standard accessories

Item	Description
—	EU power cable (Schuko, CEE 7/7)
TH26017	USB interface cable
TH26058F	φ4 alligator clip (red/black)
TH26058D	Connecting cable
TH2690_THS	Temp. & humidity probe (TH2691/A none)

Optional accessories

Item	Description
TH26090	Resistivity test fixture (Φ26/38/50 mm electrodes)
TH26076B	Shielding box
TH26058B	Triaxial-to-alligator-clip cable (1.5 m)
TH26058S	High-voltage BNC RF test cable (TH2695/TH2695A)

More fixtures and adapters available on request — ask your Techmize contact or authorized distributor.

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