

# TH0104 Advanced DC Voltage Reference Standard



## 1. Summary

**TH0104** is a set of dc voltage reference standards, consisting of four **TH0100** DC Voltage Reference Standards that are electrically and mechanically completely independent of each other, as well as a cabinet. The dc voltage reference standards can be used to calibrate precision DC voltage instruments such as high precision digital voltmeters and voltage sources standard. It has the characteristics of high stability, high accuracy, high-drive capability, low temperature-drift, small size for easy portability. It is especially suitable for maintaining the traceability of national standards, and transferring the standard voltage to provincial and municipal metrology institutes, electric power research institutes, metrology stations at all levels, and enterprise metrology laboratories.

## 2. Features

- TH0104 consists of four TH0100, which are mechanically independent and electrically isolated from each other. Even as time passes, periodic calibration of one or more units can be performed by comparing them to each other in order to improve and ensure overall uncertainty.
- Each dc voltage reference standard has outputs of 10V, 1V, and 0.1V. Compared to other voltage reference standards that only have 10V output, it is easier to measure voltage with TH0100 as 1V and 0.1V output voltages do not require external voltage dividers.

- The volume design of each Dc Voltage Reference Standard is very compact, and the weight is light enough to be carried around, and it is convenient for the task of transferring quantity value across regions.
- With the built-in battery power supply, it can work continuously for 72 hours in a fully charged state, so it can be carried to all parts of the country without power outage, no need to consider the problem of power supply.
- The built-in design has a constant temperature box to ensure that the device has strong temperature adaptability and is not or less affected by the working environment temperature.
- Strong load capacity, 10V voltage output can drive a maximum current of 12mA, even instruments with low input impedance can also be used together.
- The initial accuracy can be set by digital display write command without adjustment by potentiometer.
- **TH0100** DC Voltage Reference Standard is used in conjunction with TH0320 Reference Resistance Standard to provide reliable original device calibration for high-precision multi-function calibrators and digital reference multimeters.

### 3. Specifications

#### 3.1 Stability and Noise

Output Voltage	Stability( $\pm \mu V/V$ )			Output Noise ( $\pm \mu V/V$ rms)
	30Days	90Days	1Year	
10 V	0.3	0.8	2.0	0.06
1 V	0.6	1.2	3.0	0.15
0.1 V	1.2	2.9	9.8	1.00

#### 3.2 Output Noise, Output Current, Output Impedance and Temperature Coefficient

Output Voltage	Maximum Output Current	Output Impedance	Temperature Coefficient ( $\pm \mu V/V/^\circ C$ )	Altitude Change ( $\pm \mu V/V/100m$ )
10 V	12mA	$\leq 1m\Omega$	0.04	0.02
1 V	1.2mA	$\leq 1m\Omega$	0.1	0.03
0.1 V	20pA	$\leq 100\Omega$	0.2	0.06

#### 3.3 Return Error and Warm-up Stabilization Time after Power Failure

Power Outage Time	10V Output Change	Power Outage Time	Warm-up Stabilization Time
$\leq 10$ minutes	0.1	none	No need
10 minutes ~ 24 hours	0.25	<1 hour	at least 1 hour
24 hours ~ 14 days	0.25	>1 hour	at least 24 hour

#### 3.4 Load Adjustment Rate

10V Output Load	10V Output Maximum Change( $\pm \mu V/V$ )
0~12mA	1
0~2mA	0.1

#### 4. General Specifications

<b>Power supply</b>	AC 220V $\pm$ 22V, 50Hz $\pm$ 2Hz
<b>Built-in Battery</b>	It can work continuously for 72 hours when fully charged, and the charging time is <24 hours, equipped with a charger
<b>Temperature and Humidity performance</b>	Working temperature: 15° C~35° C, 20%~80% R • H, non-condensing Storage temperature:-20° C~70° C, <80% R • H, non-condensing