2792A Series
Standard Resistors

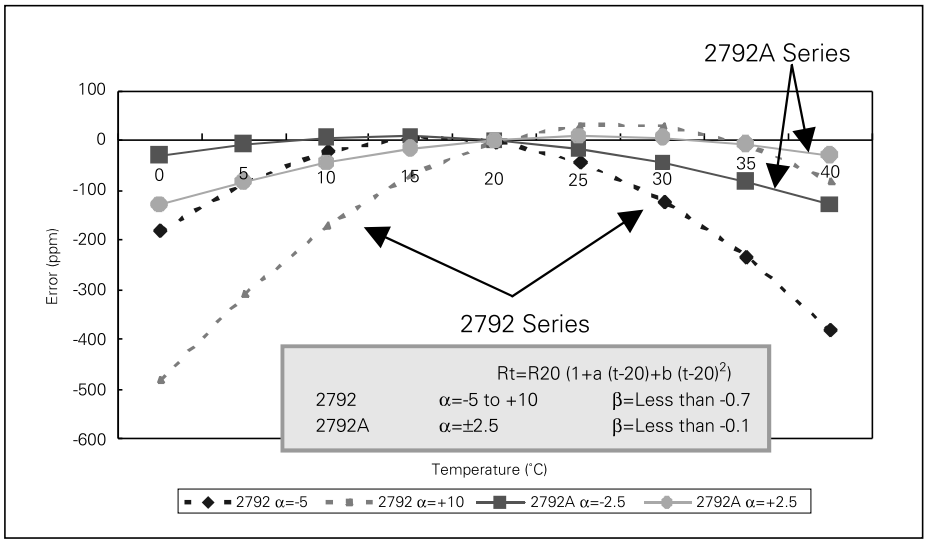
• **Accuracy 40% higher than our previous models! Temperature coefficient down 2/3!**

■ **Main Features**

- Traced to the national standard for high accuracy; test (calibrated) accuracy of ±5 ppm
- Resistance temperature coefficient
  Excellent temperature characteristics in the range of 0 -50°C; resistance temperature coefficient less than ±2.5 ppm/°C
- A variety of models
  Eight models with nominal resistance values ranging between 0.001 Ω and 10 kΩ
- Precision temperature control equipment, such as an oil bath, not needed for calibration due to marked improvement in resistance temperature coefficient
- Included document: Test certificate

The 2972A Series of standard resistors are metal foil resistors, while the previous 2972 Series were winding resistors. The error range of the 2972A Series is much smaller than those of the previous 2972 Series, as demonstrated by the resistance temperature coefficient curves (Graph 1). Precision temperature control equipment such as oil baths, are not needed for measurement and calibration. The 2972A can do these in an air environment.

At development sites, the 2972A serves many purposes, ranging from precision measurement to calibration of equipment. The main body of the 2972A employs the same plastic case as that of the previous series, and the 2972A has a damage-resistant and easy-to-connect terminal block. The 2972A can be even more effective in precision measurement when it is combined with our potentiometer and double bridge.



Graph 1 Error characteristics of the 2792 and 2792A Series with respect to temperature

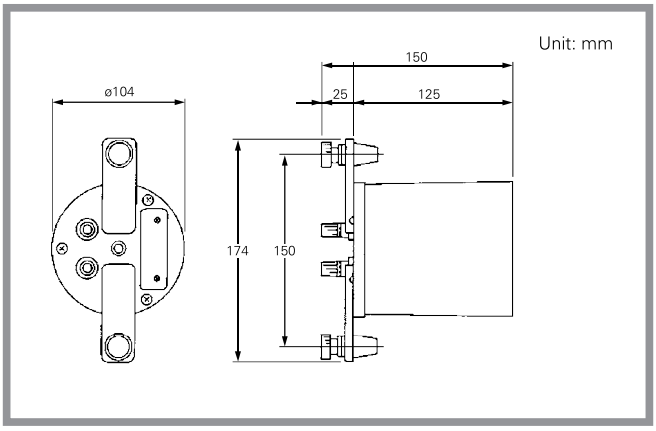
SPECIFICATIONS

Model	Nominal value	Accuracy 23°C±2°C	Temperature coefficient α23 (ppm/°C)	Temperature coefficient β(ppm/°C²)	Drift per year	Maximum allowable current (A)
2792A01	0.001 Ω	±100ppm	-5 to ±15	Less than -0.1	±100 ppm per year	54.7
2792A02	0.01 Ω	±75ppm	±10	Less than -0.1	±75 ppm per year	17.3
2792A03	0.1 Ω	±50ppm	±5	Less than -0.1	±50 ppm per year	5.47
2792A04	1 Ω	±30ppm	±2.5	Less than -0.1	±30 ppm per year	1.73
2792A05	10 Ω	±30ppm	±2.5	Less than -0.1	±30 ppm per year	0.547
2792A06	100 Ω	±30ppm	±2.5	Less than -0.1	±30 ppm per year	0.173
2792A07	1 kΩ	±30ppm	±2.5	Less than -0.1	±30 ppm per year	0.055
2792A08	10 kΩ	±30ppm	±2.5	Less than -0.1	±30 ppm per year	0.017

Standard test conditions: DC current, temperature: 23 ±2°C, power: below 0.1 W (2792A01) and below 0.01 W (2792A02-2792A08)

Operating temperature and humidity ranges
: 0-50°C / 20-80% RH
Storage temperature and humidity ranges
: -20-60°C / 20-80% RH
Maximum allowable power : 3 W
Test (calibrated) accuracy : ±5 ppm
Power characteristics : ±100 ppm/W
Insulation resistance : More than 1000 MΩ at 500 V DC
Withstand voltage : 1.5 kV for one minute between measurement terminal and casing
Terminal construction : 4 terminals
External dimensions : Approximately ø104 × 150 mm (current terminal width: approximately 174 mm)
Weight : Approximately 1.2 kg
Accessories : User'S Manual, One Test Certificate

• External Dimensions



OPERATING PRECAUTIONS

• Temperature

To maintain a high level of measurement accuracy, the Standard Resistor must be used in rooms with a constant ambient temperature or placed in a thermostatic chamber. Measure the ambient temperature accurately and perform compensation according to the temperature coefficient. Ensure that the instrument is not subjected to rapid changes in temperature during storage as changes in resistance or deterioration of the insulator may result. (Instrument can be operated stably for over two hours.)

• Temperature coefficients and resistance

The resistance at temperature *t* is expressed by the following equation:

$R_t = R_{23} \{1 + \alpha_{23}(t - 23) + \beta(t - 23)^2\}$

where

R_t : Resistance value at t°C
R_{23}: Resistance value at 23°C
α_{23}: 1st temperature coefficient at 23°C
β : 2nd temperature coefficient at 0 to 50°C

• Current

When electric current flows through the Standard Resistor, its resistance value changes due to the generated heat. To ensure accurate measurement, use the Standard Resistor below the maximum allowable current, which is one of the standard test conditions. When the applied current exceeds the maximum allowable current, the resistance could change, or the internal circuit could be broken.

• Thermal emf and Contact Resistance

To minimize the effects of thermal emf, connect the circuit with copper wire, and take the average of two readings obtained by reversing the direction of the current flowing through the current terminals. Incomplete contact between the lead wire and the terminals causes current change due to contact resistance, and temperature errors due to heat generation.

• Mechanical Shock and Vibration

Mechanical shock and vibration may cause distortion of the resistive elements, which results in instability and changes in the resistance value.