

SEE BELOW FOR
RESISTANCE VALUES

THE MILLENNIUM RANGE

Hermetically sealed, oil filled unit
Low temperature coefficient and ultra-high stability

Model 456 Temperature Controlled Fixed AC/DC Resistors

FEATURES

- **Nominal Temperature Coefficient of Resistance:** +0.02ppm/°C (with temperature control on) 18 to 25°C.
- **Power Rating:** 0.5 watt at +25°C
- **Resistance Tolerance (Initial Resistance Accuracy):** ±0.005%
- **Resistance Range:** 5 ohms to 3.3 megaohms
- **Current Noise:** <0.010μV (RMS) / Volt of Applied Voltage.
- **Thermal EMF:** 0.1μV/°C Max;
0.05μV/°C Typical
- **The most precise and stable resistors available.**
- **Impervious to harmful environments - oil filled.**

SPECIFICATION

Dimensions	144 x 110 x 96mm (in box)
Weight	1Kg (including box) 550g (excluding box)
Rating	0.5 watt
Stability	Typically 1ppm per year at 1mA
Traceability	A Traceable Certificate accompanies your 456 to the 2 sigma uncertainties shown below.
Induction	0.08μH typical
Capacitance	0.5pf

HOW TO ORDER

MODEL TYPE

456 STANDARD VALUE Ω

SPECIAL VALUE Ω

CERTIFICATION

NAMAS CERTIFICATE

OPTIONS

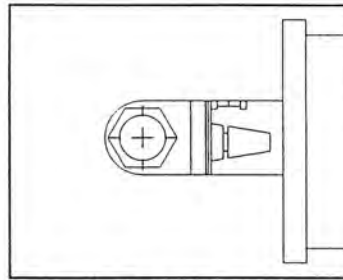
D.C. SUPPLY

PLEASE NOTE

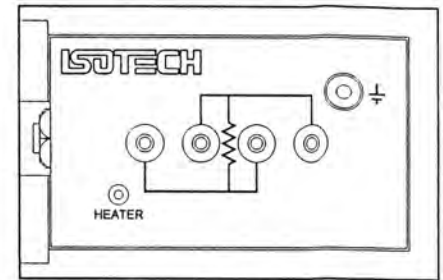
We offer other Resistor Ranges including the Model 836, the SRA and the SRB ranges.

CONTACT ISOTECH FOR MORE DETAILS

Isotech is always willing to give technical advice and assistance where appropriate. Equally, because of the programme of continual development and improvement we reserve the rights to amend or alter characteristics and design without prior notice. This publication is for information only.



Side View, Lid in Place



Top View, Lid Removed

Sketch of Model 456

By temperature controlling an otherwise very stable resistor a performance close to the very best available World-wide can be achieved at a surprisingly low price. The resistor itself is oil filled and hermetically sealed.

The function of hermetic sealing is to eliminate the ingress of moisture and oxygen both of which play a roll in the long term degradation of unsealed resistors. A further enhancement in both short and long term stability is achieved by oil filling. The oil also acts as a thermal conductor allowing the device to accept short periods of overload without degradation.

With accuracies of ±0.005% and a resistance range from 5 ohms to 3.3 megaohms and long term drift of less than 5ppm, these devices are virtually secondary standards that can be kept in a laboratory as references to calibrate other devices.

The Resistor is held in a temperature controlled environment heated to 30±0.1°C, other temperatures are available to special order. The heater requires 2 watts at 5V which can be supplied by a battery or an unregulated DC supply. In an ambient of 20°C the Resistor's heater will warm up in typically 30 minutes, and LED shows when the temperature has been reached. A test pocket is provided so that the resistors' temperature can be monitored if required.

0.1ppm/month or better stability can be expected.

RESISTANCE VALUES

We can supply the value you choose ±0.1% between a minimum of 5 ohms and a maximum of 3.3 megaohms. However we bulk buy and keep in stock the following standard values:

10Ω, 25Ω, 100Ω, 1000Ω, 10,000Ω

NAMAS CALIBRATION

For the highest quality traceability we recommend that the 456 be NAMAS Certified. We can offer the following 2 Sigma Uncertainties:

Measured Quantity Instrument or Gauge	Range/ Frequency	Best measurement Capability expressed as an Expanded Uncertainty (k=2)	Remarks
DC RESISTANCE			
0.1 Ω to 10 Ω		±0.3ppm+0.1μΩ	Resistors suitable for oil immersion can be measured over the range 10°C to 30°C
10 Ω to 250 Ω		±0.3ppm+2.5μΩ	
250 Ω to 1000 Ω		±0.4ppm+10μΩ	
1 KΩ to 1 MΩ		±20ppm	
1 MΩ to 10 MΩ		±55ppm	
AC RESISTANCE			The uncertainties can only be realized for resistors of suitable AC characteristics
2.5 Ω to 400 Ω	75 Hz	±15ppm	
400 Ω to 1000 Ω	75 Hz	±100ppm	

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