

RS9020A-X

wekomm

Ultra stable, high load capable Resistance Standards

Technical Data

Applications

- Transfer Standards
- Working Standards
- Reference Resistors
- Calibration

Features

- Mechanically robust and stable
- No special requirements for operation temperatures
- No oil bath required
- Long term stability better 1ppm / year
- Low impacted from temperature hysteresis
- Temperature stability better than $1 \mu\Omega / \Omega / ^\circ\text{C}$
- Wide operational range from 20°C to 30°C
- Custom resistance values on special order
- Made in Germany



With our new resistance standards series 9020A-X we have made a new dimension of precision possible. In experiments our 1Ω standard exposed a maximum of $0.8 \mu\Omega/\Omega$ change when being loaded with 1A or 1W. This is an unrivaled performance in the industry and opens a whole new field for precision measurements.

Several National Metrology Institutes use the RS9020A-X resistors for improving their current and power measurement capabilities. The resistors extreme stability under load allows a metrology lab to reduce the relevant uncertainties by at least the factor of 10 in comparison to the standard measurements.

The excellent load stability is just one factor to provide such outstanding performance. The 9020A-X resistor series offer two integrated temperature sensors, mounted very close to the resistive elements. One of those sensors is a selected PT-100 type to measure the absolute temperature of the whole system. A very sensitive thermistor recognizes even the tiniest temperature change. Both sensors can be connected conveniently through the front panel mounted connector. When taking the temperature measurements into ac-

count, the calculated precision of the resistor can be furthermore improved.

A highly engineered fixation and carefully selected insulation materials make sure, that our resistors withstand mechanical stress and keep their electrical values throughout the years. The massive aluminum case warrants the ruggedness of the components and provides excellent shielding when guarding comes into play. Specific manufacturing processes help thermal buffering capabilities so that short term temperature changes have no effect on the actual measurement. In addition, our resistance elements are extremely stable over a temperature range from 20°C to 30°C . This warrants a trouble free operation even outside standard cal lab environments. Internally our resistance standards are build completely neutral regarding thermal voltage. The chosen combination of materials does not allow any thermal voltages to build up. For connecting wires, high quality „Low Thermal“ binding posts, built from directly gold plated copper-tellurium will give you the best possible electrical contact. All these features make the RS9020A-X series resistors to one of the best products in it's class.

Each resistance standard is calibrated by a calibration laboratory. The measured resistance value is printed on the back side of the resistance standard. The issued certificate of calibration is part of delivery. On special request, a calibration by an accredited (ISO 17025) or national metrology institute (PTB) can be arranged at additional costs. The following table lists the available standard values of resistance. Customer specific values are available on request.

| Model | Nominal value Ω | Adjustment to nominal $\mu\Omega/\Omega$ | Calibration uncertainty *1 | Temperature-coefficient *2 $\mu\Omega/\Omega / ^\circ\text{C}$ | Drift *3 $\mu\Omega/\Omega / \text{year}$ | maximum voltage (Volt) | maximum current (mA) |
|-------------|---------------------------|---|----------------------------|---|--|---------------------------|-------------------------|
| RS9020A-1 | 1,0 | 20 | *1 | 1 | 1 | 1 | 1000 |
| RS9020A-10 | 10,0 | 20 | *1 | 1 | 1 | 3 | 300 |
| RS9020A-100 | 100,0 | 20 | *1 | 1 | 1 | 10 | 100 |

*1 Uncertainty depending on CalLab - for specifications or requirements contact us prior to ordering

*2 Does not contain power coefficient, which can be corrected numerically

*3 After sufficient stabilization time, typical one year

Temperature sensors:

PT100 selected, Class B/10, four wire measurement

Thermistor 5k Ω , precision 0,03 $^\circ\text{C}$, two wire measurement

Operation temperature:

20 $^\circ\text{C}$ to 30 $^\circ\text{C}$

Storage temperature:

0 $^\circ\text{C}$ to 40 $^\circ\text{C}$

repetitive Error (Hysteresis):

30 $^\circ\text{C}$ to 20 $^\circ\text{C}$ to 30 $^\circ\text{C}$:

neglectable Error

Size:

10cm (H) x 20cm(W) x 11,5cm(D)

Weight:

5 kg - 7 kg

depending on model

Ordering Information

Model:

RS9020A-1 1 Ω resistance standard

RS9020A-10 10 Ω resistance standard

RS9020A-100 100 Ω resistance standard

RS9020A-CASE transport case



wekomm engineering GmbH
Robert-Koch-Str. 7
D-82152 Planegg
Germany
Tel.: +49 89 9041151-0

www.wekomm.de
www.wekomm.com
info@wekomm.de

Okt. 2022
© 2022 wekomm engineering GmbH

Information contained in this data sheet is up-to-date and correct as at the date of issue. As wekomm engineering GmbH cannot control or anticipate the conditions under which this product may be used, each user should review the information in specific context of the planned use. To the maximum extent permitted by law, wekomm engineering GmbH will not be responsible for damages of any nature resulting from the use or reliance upon the information contained in this data sheet. No express or implied warranties are given other than those implied mandatory by law. We reserve the right to alter our products without notice. This also applies to products already on order provided that such changes do not change the functionality of the product