

Standard Resistor

Series 1220

Code:	1220 EN
Delivery:	ex stock/6 weeks
Warranty:	24 months



1220 EN

- Resistance values of 100 $\mu\Omega$... 100 k Ω
- Calibration standard
- Reference measuring point in measurement circuit
- Reference resistor in bridge circuit
- Shunt, etc.

Composition and connections

The housing is made from a light metal alloy. At the base and at the upper flange there are openings which allow air to circulate or that oil flows through when used in an oil bath. The black surface offers optimum heat exchange characteristics. Four connections are fitted to the plastic cap. Copper terminals guarantee a low-thermoelectric voltage takeoff. Current is fed in via two strong screw terminals.

There is a hole in the center of the cap into which a thermometer can be inserted.

Description

MANGANIN® or ZERANIN® is used as the resistance material. Values of 100 Ω , 1 k Ω , 10 k Ω and 100 k Ω produced as low-capacitance, low-inductance wire coils on a brass reel. Resistance values of 0.1 Ω , 1 Ω and 10 Ω are implemented as bifilar wire coils, with an insulated mounting on a cylindrical brass winding core. The low-ohm versions of 0.1 to 10 m Ω are made from Manganin bars or coils, which are secured to two 12 mm brass power rails.

Technical Data

Model	Resistance Value*	Tolerance	Specified Measurement Uncertainty in Works Certificate**	TC typ. 15 ... 25°C	max. Load		Temperature Alteration upon Loading		Typical Time Constant	Material***
					in air	at oil bath	in air	in oil		
1220	0.0001 Ω	± 0.02 %	± 200 ppm	20 ppm/K	1 W 100 A	4 W 200 A	8 K/W	1.6 K/W	nur für DC	M
1221	0.001 Ω	0.01 %	± 50 ppm	25 ppm/K	1 W 32 A	4 W 60 A	8 K/W	1.6 K/W	nur für DC	M
1222	0.01 Ω	0.01 %	± 25 ppm	10 ppm/K	1 W 10 A	4 W 20 A	8 K/W	1.6 K/W	nur für DC	M
1223	0.02 Ω	0.01 %	± 50 ppm	10 ppm/K	1 W 7 A	4 W 14 A	8 K/W	1.6 K/W	nur für DC	M
1224	0.05 Ω	0.01 %	± 50 ppm	10 ppm/K	1 W 4.5 A	4 W 9 A	8 K/W	1.6 K/W	nur für DC	M
1225	0.1 Ω	0.003%	± 25 ppm	10 ppm/K	1 W 3 A	4 W 6 A	4 K/W	0.8 K/W	nur für DC	M
1226	1 Ω	0.003 %	± 25 ppm	10 ppm/K	2 W 1.4 A	10 W 3 A	4 K/W	0.8 K/W	+ 0.34 μH/Ω	M
1227	10 Ω	0.003 %	± 25 ppm	10 ppm/K	2 W 0.44 A	10 W 1 A	4 K/W	0.8 K/W	+ 0.18 μH/Ω	M
1228	100 Ω	0.003 %	± 25 ppm	3 ppm/K	1 W 0.1 A	10 W 0.3 A	7.5 K/W	1.5 K/W	+ 0.03 μH/Ω	Z
1229	1 kΩ	0.003 %	± 25 ppm	3 ppm/K	1 W 0.03 A	10 W 0.1 A	7.5 K/W	1.5 K/W	+ 0.04 μH/Ω	Z
1230	10 kΩ	0.003 %	± 25 ppm	3 ppm/K	1 W 0.01 A	10 W 0.03 A	7.5 K/W	1.5 K/W	+ 0.6 μH/Ω	Z
1231	100 kΩ	0.003 %	± 25 ppm	3 ppm/K	1 W 0.003 A	1 W 0.003 A	10 K/W	3 K/W	nur für DC	Z

* Other resistance values within the specified range are also available.

** A value certificate is supplied with every resistor that states the resistance values at 15, 20 and 25 °C. For the measurement uncertainty of the specified resistance values, please refer to the table.

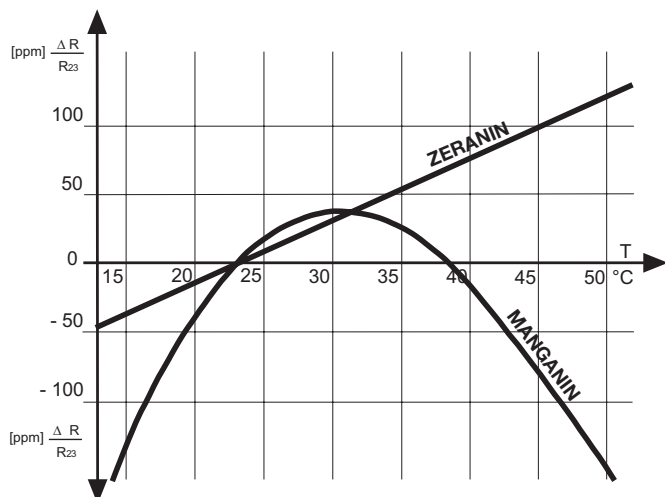
*** Resistance material M = MANGANIN®, Z = ZERANIN®

Long-term stability

The standard resistors are thermally aged over a lengthy period of time taking into account many years of experience. Stability is approximately 10 ppm/year, provided that our specified load limits are not exceeded. For the greatest measurement accuracy we recommend regular annual calibration. Experience shows that the history of calibration values will show a reduction of long-term drift over the years.

Temperature coefficient

Change in resistance ΔR % as a function of the temperature T in °C.



The graph above shows the theoretical relationship between the temperature coefficients and the change in resistance as a function of the temperature, i.e. the ideal characteristics for MANGANIN® and ZERANIN®. We constantly strive to manufacture resistors with similar characteristics through the careful selection and appropriate processing of the MANGANIN® or ZERANIN®.

Dimensions

Housing container made of aluminium: diameter 90 mm
height approx. 160 mm
Weight: approx. 0.9 kg

DKD Calibration Certificate

burster präzisionsmesstechnik in Gernsbach, Germany, has set up a calibration center for electrical measurements that is affiliated to the Deutscher Kalibrierdienst (DKD), an association of calibration laboratories. This calibration center is accredited by PTB, the German metrology institute, which is based in Braunschweig. Our calibration center issues calibration certificates that are recognized throughout Europe as part of the WECC (Western Europe Calibration Cooperation).

The measurement results and measurement uncertainties that are documented in the calibration certificates are found using calibration standards that are derived from the "ohm" international unit (RK-90) through regular comparison with the PTB's national calibration standards.

Calibration is performed for nominal values up to 1 kΩ in an agitated oil bath at (23 ± 0.1) °C.

Higher nominal values are calibrated in air at (23 ± 0.5) °C and relative humidity of (50 ± 10)%.

Specified measurement uncertainties of 5 ppm and more are dependent on the nominal value.

Order code 12 DKD-1220