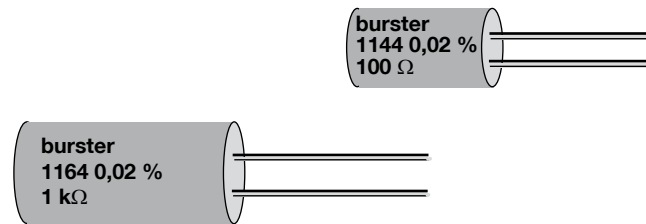


Precision Resistors

Series 1140
1160

Code:	1100 EN
Delivery:	ex stock (standard values)
Warranty:	36 months



1100 EN

- $TC \leq 10 \text{ ppm/K}$
- $\pm 0.02 \%$ or $\pm 0.05 \%$
- Production range from 3Ω ... $100 \text{ k}\Omega$
- Resistance material MANGANIN® or ISA-Ohm
- Standard values available from stock
- Custom resistance values available on request
- Minimum order per resistance value 10 pcs

Application

Precision resistors are used wherever the highest standards of temperature stability, error tolerance and durability are required.

Models 1164 and 1166 are available for higher loads up to 1 W.

Description

The resistors are supplied with two connections on the front end (suitable for mounting on circuit boards).

The precision resistors comprise low-capacitance, low-inductance wire coils made of MANGANIN®, which are encapsulated in small plastic cylinder housings.

Prior to trimming, the resistance bodies are exposed to a meticulous artificial aging procedure. This special process and trimming to approximately half of the nominal tolerance guarantee long-term stability of $< 0.02\%$ over the course of years.

Within the specified production range, any desired resistance value can be supplied.

Technical Data

Model	1146		1144		1166		1164	
	Order Code	Resistance Value	Order Code	Resistance Value	Order Code	Resistance Value	Order Code	Resistance Value
Standard values	1146-5005	5 Ω	1144-5100	100 Ω	1166-5005	5 Ω	1164-5100	100 Ω
	1146-5010	10 Ω	1144-5200	200 Ω	1166-5010	10 Ω	1164-5200	200 Ω
	1146-5020	20 Ω	1144-5500	500 Ω	1166-5020	20 Ω	1164-5500	500 Ω
	1146-5050	50 Ω	1144-6001	1 kΩ	1166-5050	50 Ω	1164-6001	1 kΩ
			1144-6002	2 kΩ			1164-6002	2 kΩ
			1144-6005	5 kΩ			1164-6005	5 kΩ
			1144-6010	10 kΩ			1164-6010	10 kΩ
			1144-6020	20 kΩ			1164-6020	20 kΩ
			1144-6050	50 kΩ			1164-6050	50 kΩ
		1144-6100	100 kΩ			1164-6100	100 kΩ	
Model	1146S		1144S		1166S		1164S	
Special values Manufacturing ranges for customized Ω values	4.00 Ω ... < 100 Ω		100.00 Ω ... 100.00 kΩ		3.00 Ω ... < 100 Ω		100.00 Ω ... 100.00 kΩ	
Error of tolerance	± 0.05 %		± 0.02 %		± 0.05 %		± 0.02 %	
Resistance material	MANGANIN®/ISA-Ohm							
Average temperature coefficient (+20 °C ... +60 °C)	≤ ± 10 ppm/K							
Ultimate load (environmental temperature)	0.7 W				1 W			
Long-term stability	0.02 % over years							
Thermal resistance	90 K/W				60 K/W			
Weight	approx. 3 g				approx. 8 g			
Dimensions [mm]								

Operating voltage: max. 500 V
 Calibration temperature: 23 °C
 Balance point: for connecting wire of 5 mm range
 Temperature operating range: 0 °C ... + 85 °C
 Short-time over load: approx. 10 % < 1 min.
 Specifications: according DIN 43783 part 1 (former VDE 410)

Temperature dependence

of MANGANIN®: $R_t = R_{20} (1 + \alpha_{20} (t - 20) + \beta (t - 20)^2)$
 $\alpha_{20} = 0 \dots 20 \cdot 10^{-6}$
 $\beta = -0,59 \cdot 10^{-6}$
 $R_{20} =$ Resistance value at 20 °C

Special values at extra charge

Minimum order quantity: 10 pcs of identical version.
 Customer-specific resistance values are possible at extra charge.
 Delivery: approx. 4 - 6 weeks

Order Code

8 pcs	1146-5005	5.00 Ω	(Standard model)
5 pcs	1166-5050	50.0 Ω	(Standard model)
10 pcs	1144-6100	100.0 kΩ	(Standard model)
12 pcs	1144S	153.88 Ω	(Special model)