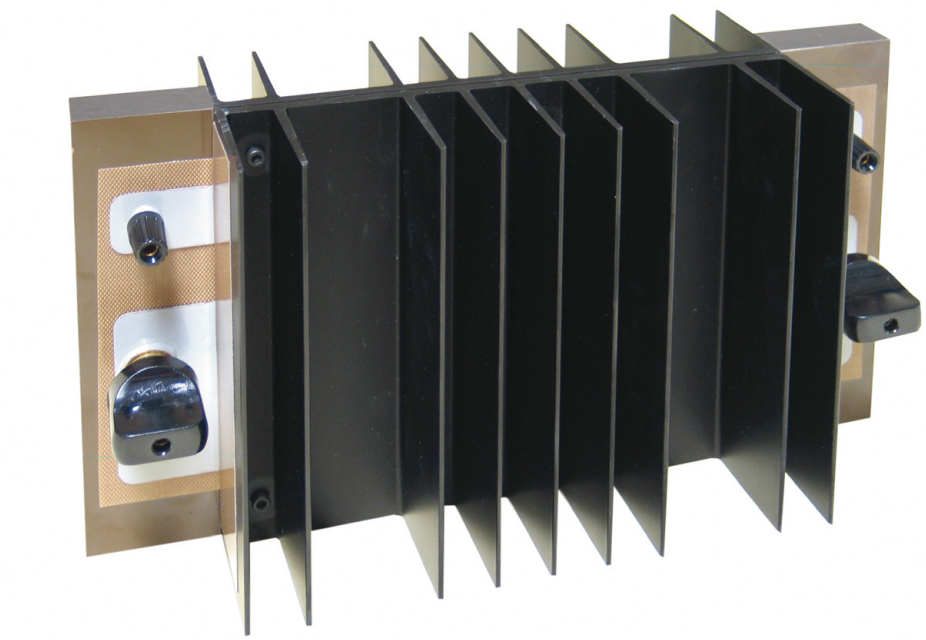
Precision High Capacity Resistors

Model 1282

Code:	1282 EN
Delivery:	ex stock/16 weeks
Warranty:	24 months



1282 EN

- **Temperature coefficient ≤ 20 ppm/K**
- **Nominal load 20 W**
- **Ranges 1 mΩ ... 100 mΩ**
- **Four-terminal measurement principle**
- **Accuracy 0.02 %**
- **For technical frequency 50 Hz**

Application

In connection with very precise digital voltmeters the model 1282 resistors are used as measuring resistors for accurate registration of direct and alternating currents up to 200 A. The compact construction supports universal application. The exceptional low temperature coefficient extends the scope of application a second time.

A typical application is the wide range of quality and reliability testing. Regular measurements give a reliable information of the quality level of parts, instruments and systems.

Description

Technologies already approved with our precision and calibration resistors - which especially guarantee a secure conduction of the dissipation heat - have been transferred to the precision high capacity resistors. Those are designed on four-wire measurement principle. The voltage path is equalized to the customized value and to an accuracy of 0.02 %, (with reference temperature = 23 °C).
At maximum load a temperature increase within the resistor occurs. This temperature increase is compensated by a large surface area of the cooling body. The heat resistance of the resistors described is 1 K/W: The temperature of the resistor rises 1 K per Watt of supplied energy. All power and limiting values of the diagrams overleaf refer to the resistor material MANGANIN®. Unfavourable installation with insufficient possibility of ventilation and cooling have to be taken into consideration accordingly.
The potential tap is effected via brass terminals with 4 mm hole. The screw-terminals for the current feed are dimensioned according to the maximum capacity.

burster praezisionsmesstechnik gmbh & co kg · Tel. +49-7224-6450 · Fax 64588
Talstr. 1-5 · DE-76593 Gernsbach · **www.burster.com** · **info@burster.com**

Technical Data

Resistance ranges:	1 mΩ ... 100 mΩ, any resistance value within this range is available
Resistance tolerance:	0.02 %
Calibration temperature:	23 °C
Resistance material:	MANGANIN®
Temperature coefficient:	TCR20/60 ±20 ppm/K
Temperature dependence:	$R_t = R_{20} (1 + a_{20} (t - 20) + b (t - 20)^2)$ $a_{20} = 0 ... 20 \cdot 10^{-6}$ $b = - 0.59 \cdot 10^{-6}$
Long-term stability:	< 0.01 % over years
Long-term load:	20 W
Short-time over load:	approx. 90 W < 1 min
Ultimate load:	60 W at 25 °C environmental temperature
Current limit (at 1 mΩ):	200 A
Surface temperature:	max. 85 °C, results from heat resistance + ambient temperature
Thermal resistance:	1 K/W

Construction:
Resistance element is made of a MANGANIN® sheet with four terminal connection. It is installed free of mechanical tension between two cooling bodies, current junction is realized via screw terminals, potential tap is made via brass terminals.

Capacity C_R:	< 4 nF, resistance element to cooling body
Electrical strength:	test voltage 1950 VDC
Max. potential:	42 V against cooling body insulated mounting required for higher voltages
Isolation resistance R_{IS}:	100 MΩ, cooling body against resistance element
Specifications:	according DIN EN 60477
Dimensions (W x H x D):	265 x 100 x 150 [mm]
Weight:	ca. 2.3 kg

Order Information

Precision high capacity resistors

Resistance value 1 mΩ	**Model 1282-0.001**
Resistance value 10 mΩ	**Model 1282-0.01**
Resistance value 100 mΩ	**Model 1282-0.1**
Any value in the range 1 ... 100 mΩ	**Model 1282S**

Delivery: 12 weeks

DAkkS Calibration Certificate for model 1282	**12DKD-1282**
Manufacturer calibration certificate for model 1282	**12WKS-1282**

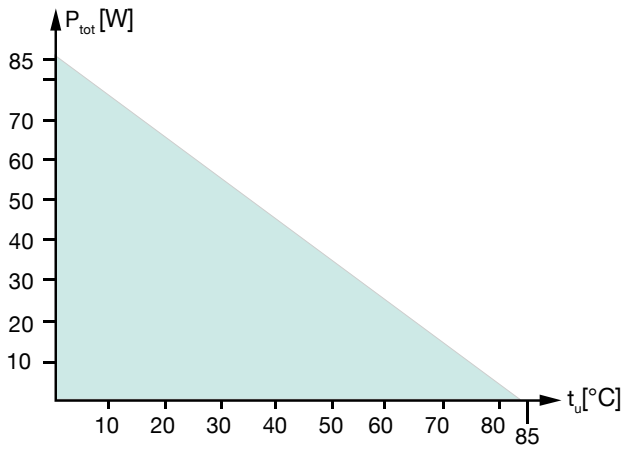
DAkkS Calibration Certificate

The calibration laboratory D-K-15141-01-00 at burster praezisionsmesstechnik is supervised by DAkkS (Deutsche Akkreditierungsstelle GmbH) according to ISO 17025. It can prove its status by a certificate and is authorized to issue calibration certificates with the DAkkS logo and with the DKD logo (Deutscher Kalibrierdienst). These calibration certificates are internationally approved by multilateral contracts.
Precision high capacity resistors series 1282 can be deliverd with a DAkkS calibration certificate. The calibration is made with max. 10 A_{DC} AT 23° C.

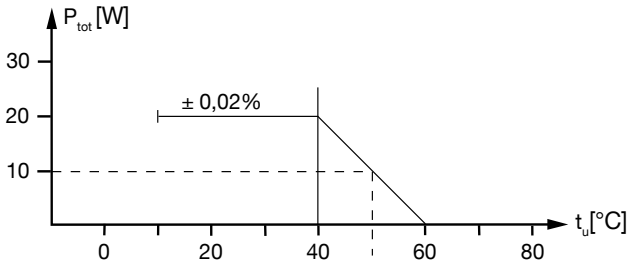
Manufacturer Calibration Certificate

The high capacity resistors can also be delivered with a manufacturer calibration certificate. It confirms the traceability of the used secondary voltage and resistance standards to the national standards as well as the logging of the measured value and its uncertainty.

Load limit curve

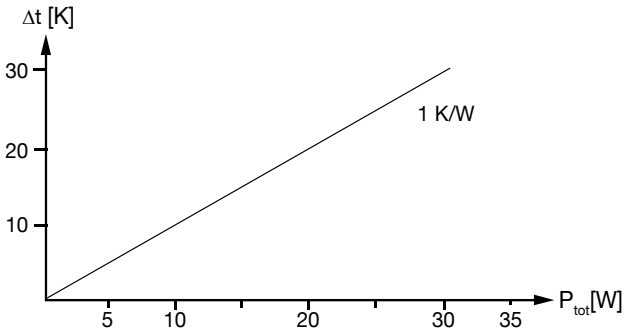


Load reduction curve



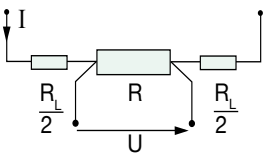
The max. load capacity with different ambient temperature as a function of the warm-up error can be taken from the load reduction curve.
Example: Ambient temperature: max. 50°C; accepted Δ R by temperature influence: max. 0.02 %; max. permissible load: 10 W.

Characteristic load as a function of excessive temperature



Cooling body temperature = ambient temperature + excessive temperature.

P_{tot} = dissipation power
t_u = ambient temperature
Δt = temperature elevation over ambient temperature



at R = 1 mΩ → $R_L \leq$ 6 mΩ
at R = 10 mΩ → $R_L \leq$ 8 mΩ
at R = 100 mΩ → $R_L \leq$ 12 mΩ