

High-Precision Resistance Decade and Calibrator

Model 1408
Model 1409
Model 1406
Model 1407
Model 1405

Code: 1400 E
 Manufacturer: burster
 Delivery: ex stock
 Warranty: 24 months
 Issue: 1.9.2003



■ Range	1406/08	10	mΩ to 100 kΩ
■ Range	1407/08	100	mΩ to 1 MΩ
■ Range	1405	10	mΩ to > 3 kΩ
■ Accuracy	1408/09:	0.01 %	
	1405/06/07:	0.02 %	
■ Temperature coefficient	1408/09:	≤ 2	ppm/K
	1405/06/07:	≤ 10	ppm/K
■ Stability	< 0.01 % resp. < 0.02 % over years		

1400-E

Application

The range of application for the high-precision resistance decades model 1408 and 1409 stretches from reference standard for precision measurements up to simulation of a host of measuring transducers.

The field of application of the precision decade model 1406/07 reaches from general precision measuring to simulation of a variety of measuring transducers, such as for example strain gage transducers, resistance thermometers, hygrometers and others.

The model 1405 tests and calibrates quickly and easily displays, in control and process technology which is working on a resistance thermometer basis.

Description

The decade resistors are wire-wound resistors and consist of low-capacity and low-conductivity wire coiling made of ZERANIN® resp. MANGANIN®. An especially developed precision stepping switch with high-quality contact materials and optimal brush construction guarantees very good reproducibility.

The high-precision resistance decades model 1408/09 are designed to meet the highest demands with regard to precision, temperature and long-term stability.

As regards accuracy, stability and reliability, the decades model 1406/07 are designed to meet high-standard requirements.

The design of the decade model 1405 enables its use not only as precision decade resistor but also precision calibrator for all standard commercial thermometers. Two fixed series resistors of 1 kΩ serve the simulation of Pt 1000 and Pt 2000 resistance thermometers. The four connection sockets provide the possibility of simple simulation of resistance thermometers operated in four-wire technology.

Technical Data

Resistance ranges:	model 1406/08	10 mΩ ... 100 kΩ
	model 1407/09	100 mΩ ... 1 MΩ
	model 1405	10 mΩ ... > 3 kΩ
Zero resistance of the complete resistance box:	model 1408/09	7 mΩ ± 1 mΩ
	model 1405/06/07	< 10 mΩ
Resistance tolerance:	model 1408/09	± 0.01 %
	model 1405/06/07	± 0.02 %
	in the main steps (see table below)	
Calibration:	in Ohm absolute at 23 °C	
Resistance material:	model 1408/09	ZERANIN®
	model 1405/06/07	MANGANIN® or ISAOHM®
Temperature coefficient:	model 1408/09	≤ 2 ppm/K
	model 1405/06/07	≤ 10 ppm/K
Long-term stability:	model 1408/09	< 0.01 %
	model 1405/06/07	< 0.02 %
Power dissipation:	0.4 W per step = 4 W/decade	
Operating voltage:	500 V max.	
Test voltage:	2 kV _{rms} /50 Hz versus housing	
Design and construction:	according to DIN EN 61010-1	
Switching arrangement:	short-circuiting between two neighbouring	
Switch positions:	12, limited to 11 steps	
Contact material:	Ag plated on E-Cu, slider pack, solid silver	
Operating moment:	approx. 0.1 Nm	
Dimensions (length by height by depth):	433 x 95 x 120 [mm]	
Weight:	approx. 2.8 kg	

Order Information

High-precision resistance decade	model 1408
High-precision resistance decade	model 1409
Precision resistance decade	model 1406
Precision resistance decade	model 1407
Precision resistance decade	model 1405
Assembly set for 19" rack mounting	model 1491
Leather case	model 1495

DKD Calibration Certificate

(DKD stands for DEUTSCHER KALIBRIERDIENST = German Calibration Service).

burster präzisionsmeßtechnik maintains a calibration station which is affiliated to the Deutscher Kalibrierdienst (DKD). Supervised by the Physikalisch-Technische Bundesanstalt (PTB) of Braunschweig, the calibration station at burster's is authorized to issue Calibration Certificates.

The Calibration Certificate shows the values for the resistance in 10 switch positions of each decade and the inherent relative uncertainty. As experience has shown, the relative uncertainty in the upper decades amounts to only 1/5 to 1/20 of the respective error tolerance. More precise knowledge of resistance values thus means a veritable increase in value of the instrument.

Order code	14 DKD-1408,	14 DKD-1409,
	14 DKD-1406,	14 DKD-1407 or
	14 DKD-1405	

Accessories

Assembly set for 19" rack mounting **model 1491**

Manufacturer Calibration Certificate

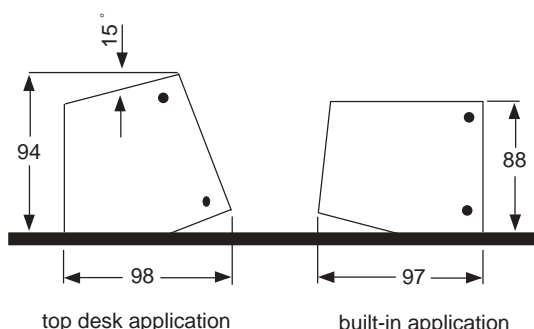
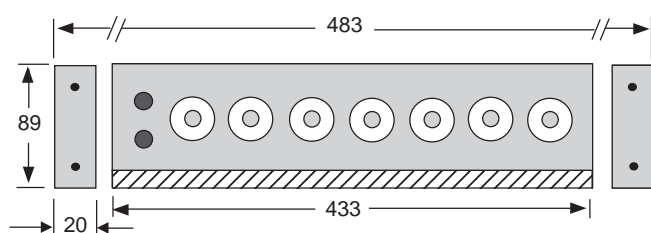
Please refer to DKD Calibration, but with a higher uncertainty.

Order code	14 WKS-1406,	14 WKS-1407 or
	14 WKS-1405	

Error tolerance, load

1405	1406	1407	1408	1409	Value	Tolerance 1408/09	Tolerance 1405/06/07	Rated current [mA]
X	X		X		10 x 0.01 Ω	± 2 %	± 5 %	2000
X	X	X	X	X	10 x 0.1 Ω	± 0.5 %	± 0.5 %	2000
X	X	X	X	X	10 x 1.0 Ω	± 0.05 %	± 0.1 %	600
X	X	X	X	X	10 x 10 Ω	± 0.01 %	± 0.05 %	200
X	X	X	X	X	10 x 100 Ω	± 0.01 %	± 0.02 %	60
	X	X	X	X	10 x 1 kΩ	± 0.01 %	± 0.02 %	20
	X	X	X	X	10 x 10 kΩ	± 0.01 %	± 0.02 %	6
		X		X	10 x 100 kΩ	± 0.01 %	± 0.02 %	2

Housing



Dimensions given in mm.