Reference Measuring Chain with DKD Calibration Certificate for Press-in Forces from 500 N to 100 kN

Code:	72-REF EN
Delivery:	3 - 4 weeks
Warranty:	24 months

Deutscher DKD-K-02101 Kalibrierdienst

72-REF EN

- **8 force measurement ranges selectable from 500 N to 100 kN**
- **DKD calibration certificate for the full measuring chain**
- **Min/max memory**
- **RS232 interface (option)**
- **Sensor can easily be integrated into the flux**

Application

The force measuring chain is a universal reference measuring chain for the calibration of press-fit force measuring equipment. It finds applications in the quality assurance, commissioning and equipment monitoring fields. A DKD calibration certificate is included so that the force measuring chain can be traced back. The calibration is traceable through accreditation at the PTB (German national metrology institute). The calibration certificate records the display figures for mounting positions at 0°, 120° and 240°.
During on-site calibration, the reference load cell is inserted in line with the flux of the press-fit measuring equipment. The force application is of central significance here for the quality of the measurement. Special force application parts are required, so that the line of action of the force agrees as exactly as possible with the geometrical axis of the load cell that is to be measured (central loading). It is, furthermore, very important that neither transverse forces nor torques reach the load cell.
When load cells have to be changed frequently, user-friendly software provides a facility for quickly and simply carrying out device configurations and backups. This allows the sensor and device data to be called back at any time without difficulty.

Description

The digital display in the model 9180 desktop housing supports load cells based on strain gauges. The value presently being measured is displayed on the 14 mm-high main LED display, while the peak value, for instance, can be read on a second display immediately underneath. Thanks to the low measuring errors, the indicator is particularly suitable where high accuracy is required. The tare function allows any base load that may be present to be cancelled out. The force measuring chain consists of a model 9180 measuring instrument and the 8527 load cell and can be used to measure compressive forces up to 100 kN (depending on the force range). With the help of the fastening holes located around the circumference and of the undulation on the engaging surface, the sensor can relatively easily be adapted to existing manufacturing and production systems. Depending on the existing compression force, the user can select a measuring range from 500 N up to 100 kN (in 8 stages).
The reference measuring chain is fully configured and calibrated. The DKD calibration accords with EN ISO 376.

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Technical Data 9180

Connectable sensors

Strain gauges

Connection technology:	4 wire
Bridge resistance:	120 ... 1000 Ω
Bridge voltage:	15/ 30/ 60/ 300 mV, selection via menu
Sensor excitation:	10 V/ 120 mA, automatic selection 5 V/ 120 mA

Standard function

Peak-to-Peak memory

Minimum or maximum value shown on an extra display, delete per RESET key or digital control input

HOLD function

Holding of the measurement value in the main display.

Activated: by an external HOLD signal

TARE

Taring of an offset value.

This value can be shown at an extra display

Activated: by key or external TARA signal

General Data

Accuracy

Resolution:	15 bit
Measuring error:	0.1 % F.S. ± 3 digits
Temperature coefficient:	50 ppm/K
Heating period:	10 minutes

Display

Main display (LED): - 99999 ... + 99999,	Height 14 mm
Auxiliary display (LED): - 99999 ... + 99999,	Height 8 mm
Decimal point:	programmable

Measurement rate: 16/s

Environment

Operation temperature:	0 ... 50 °C
Relative humidity:	< 95 %
Protection class:	Front panel IP65

Weight and dimensions

Panel version

Dimensions [W x H x D]:	96 x 48 x 120 [mm]
Mounting depth with connector:	approx. 150 mm
Cut-out in panel	92 x 44 mm
Weight:	600 g
Material of housing:	plastic

Auxiliary energy 115/230 V AC 50 Hz

Please refer to data sheet 9180, for further information.

Technical Data 8527

Order Code	Measuring Range	ø D	H	Accuracy
8527-5500	0 ... 500 N	79	20	< 0.05 % of final value
8527-6001	0 ... 1 kN	79	20	
8527-6002	0 ... 2 kN	79	25	
8527-6005	0 ... 5 kN	119	32	
8527-6010	0 ... 10 kN	119	45	
8527-6020	0 ... 20 kN	119	60	
8527-6050	0 ... 50 kN	155	60	
8527-6100	0 ... 100 kN	155	75	

For further information, please refer to data sheet 8527.

Electrical values

Bridge resistance (full bridge):	foil strain gauge	350 Ω, nominal*
Excitation voltage:		max. 10 V DC or AC
Characteristic:		1.5 mV/V
		positive output voltage for compressive forces

DKD calibrations for force measuring chains

The DKD calibration of force measuring chains is carried out according to EN ISO 376. The load cells are calibrated over their full measuring range in steps of 10 %. A minimum of three measuring cycles are carried out in different mounting positions, e.g. rotated by 0°, 120° and 240° around the sensor's axis of symmetry. The calibration certificate remains valid for a maximum of 26 months. Recalibration is required immediately if overload > 100 % of the nominal force occurs.

You will find the measurement results for the DKD calibration of a 50 kN reference measuring chain in the DKD calibration certificate shown below on page 4.

German Calibration Service (DKD) DKD-K-

Page 4 of calibration certificate Date of calibration

Table 4: Relative resolution at measurement points, relative error of the display in relation to the measurement value or final value. The errors are determined using the absolute values displayed.

Load in kN	Display in kN	Relative Resolution	Relative Error of Display in Relation to Measurement Value	Relative Error of Display in Relation to Final Value
15.0	14.98	0.07 %	- 0.16 %	- 0.06 %
20.0	19.97	0.05 %	- 0.17 %	- 0.07 %
25.0	24.97	0.04 %	- 0.12 %	- 0.06 %
30.0	29.97	0.03 %	- 0.10 %	- 0.06 %
35.0	34.98	0.03 %	- 0.07 %	- 0.05 %
40.0	39.98	0.03 %	- 0.06 %	- 0.05 %
45.0	44.99	0.02 %	- 0.02 %	- 0.02 %
50.0	50.01	0.02 %	- 0.02 %	- 0.02 %

Table 5: Relative zero drift

a) at load rejection after preload

Installation position	0 Degree	120 Degrees	240 Degrees
Relative zero drift	0.00 %	0.00 %	0.00 %

b) at load rejection after series of measurements

Series of measurements:	1	2	3/3'	4/4'
Relative zero drift:	0.02 %	0.00 %	0.00 %	0.00 %

Table 5: Classification and relative measurement uncertainty

Range of Load (kN) from	to	Calculated Measurement Uncertainty	Measurement Uncertainty for Classification	Classification acc. to ISO 376
15.0	50.00	0.12 %	- 0.16 %	1
20.0	50.00	0.16 %	- 0.16 %	1
25.0	50.00	0.10 %	- 0.16 %	1

Order Information

Range 20 kN with DKD calibration in compressive direction

Tensile and compressive load cell , range 20 kN,	**Model 8527-6020**
Connector	**Model 9941**
Connector mounting	**Model 99004**
Indicator, desktop version	**Model 9180-V3000**
Compensation	**Model 91ABG**
Load insertion button	**Model 8580-V012**

DKD calibration of measurement chain,
Calibration with 10 % increments in compressive direction, raising and sinking, according to EN ISO 376.
Model 85DKD-8527