

# Portable Reference Measuring Chain with DAkkS Calibration Certificate for Compression Load from 20 N to 100 kN

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



72-REF EN

- Highest precision
- 12 force measurement ranges selectable from 20 N to 100 kN
- DAkkS calibration certificate for the full measuring chain
- Min/max peak values
- burster TEDS, automatic reading of the sensor data
- Sensor can easily be integrated into the flow of forces

## Application

The force measuring chain is an 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 DAkkS calibration certificate is included so that the force measuring chain can be traced back. The calibration is traceable through accreditation at the German Accreditation Body. The calibration certificate records the displayed values for mounting positions at 0°, 120° and 240°.

During calibration in field, 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.

A sensor with the option "burster TEDS" allows easy configuration of the used measuring chain, without values have to be entered manually. Thus, fast and simple, different sensors can be operated on TRANS CAL 7281 and the respective configuration is not necessary.

## Description

The TRANS CAL 7281 is a portable high-precision calibration and test instrument suitable for load cells based on strain-gauge technology. Thanks to the low error tolerance the display device 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 7281 measuring instrument and the 8527/8416 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 20 N up to 100 kN (in 12 stages).

The reference measuring chain is fully configured and calibrated. The DAkkS calibration accords with EN ISO 376. The optionally available PC software DigiCal permits an easy compilation of test certificates.

Additionally measurement results can be exported in Microsoft Excel format for their further processing.

The communication between TRANS CAL and PC is handled through USB interface.

## Technical Data 7281

### Operation mode reference measurement device

Linearity error:	< ± 0.001 %
Measuring rates:	0.1 ... 1200/s (DC); 0.1 ... 2/s (AC) (reduced at 50/s accuracy)
TC gain:	± 0.002 %/K
TC zero point:	< 0.2 µV/K
Cut-off frequency:	10 kHz (-3db)

### Strain gauge

Error limit:	± 0.02 % F.S.
Bridge resistance (full bridge):	120 Ω ... 10 kΩ
Connection type:	4- / 6 wire technology
Input voltage ranges (DC):	± 15 mV; ± 30 mV; ± 250 mV
Input voltage ranges (AC):	± 15 mV; ± 30 mV
Sensor excitation voltage (DC):	2.5 V; 5 V (at 120 Ω only 2.5 V)
Sensor excitation voltage (AC):	2.5 Veff / 5 Veff (from 350 Ω)
Sensor excitation current:	max. 30 mA
Electronic data sheet:	read from sensor EEPROMs

### General device data

A/D converter:	24 Bit
Real-time clock/data	
Interface:	USB 2.0, downwards compatible, opto-isolated
Nominal temperature range:	0 ... 40 °C
Storage temperature range:	- 20 ... 60 °C
Display:	LCD with white LED backlighting
Baud rate:	115200
Supply voltage:	4 x Mignon or 10 ... 28 VDC, integrated battery charging circuit

### Terminals

Measuring, equipment test, sensor test:	SUB-D female connector, 9 pin
Strain gauge simulator:	SUB-D male connector, 9 pin
USB interface:	type B male connector

### Housing

Material:	Aluminium (light gray, black)
Dimension (L x W x H):	220 x 100 x 52 [mm] with tilting foot and rubber feet
Weight:	approx. 850 g
Protection class:	IP40

For further information, please refer to data sheet 7281.

## Technical Data 8527/8416

Order Code	Measuring Range	ø D	H	Characteristics Linearity Error
8416-5020	0 ... 20 N	10.6	5	<±0.5 %
8416-5050	0 ... 50 N	10.6	5	<±0.5 %
8416-5100	0 ... 100 N	10.6	5	<±0.5 %
8416-5200	0 ... 200 N	10.6	5	<±0.5 %
8527-5500	0 ... 500 N	79	20	<±0.05 %
8527-6001	0 ... 1 kN	79	20	<±0.05 %
8527-6002	0 ... 2 kN	79	25	<±0.05 %
8527-6005	0 ... 5 kN	119	32	<±0.05 %
8527-6010	0 ... 10 kN	119	45	<±0.05 %
8527-6020	0 ... 20 kN	119	60	<±0.05 %
8527-6050	0 ... 50 kN	155	60	<±0.05 %
8527-6100	0 ... 100 kN	155	75	<±0.05 %

For further information, please refer to data sheet 8527 and 8416.

### Electrical values

Bridge resistance (full bridge):	foil strain gauge	350 Ω, nominal
Excitation voltage:		max. 5 VDC (8416), max. 10 VDC (8527)
Characteristic:		0.8 mV/V nominal (8416), 1.5 mV/V + 0.2 % (8527)

### DAkKS calibrations for force measuring chains

The DAkKS 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 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.

### Example

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

Page 4 of calibration certificate No

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 %

### Precision force check of press-in force measuring devices



### Order Information

#### Range 20 kN with DAkKS calibration in compressive direction and "burster TEDS"

Compressive load cell, range 20 kN	<b>Model 8527-6020</b>
Connector	<b>Model 9900-V229</b>
Connector mounting	<b>Model 99011</b>
Portable test instrument	<b>Model 7281-V0000</b>
DAkKS calibration of measurement chain, Calibration with 10 % increments in compressive direction, raising and sinking, according to EN ISO 376	<b>85DKD-85DX-6200</b>
PC software DigiCal	<b>Model 7281-P101</b>