Delivery: ex stock | Warranty: 24 months

Portable High-Precision Calibrator and Testing Device

Strain gage simulator / Sensor test / Precision voltage source

MODEL **TRANS CAL 7281**



NEW
Can now be automated via interface as well.



Reference measuring chain



Extensive accessories









Sensor types:

- Strain gage sensors
- Standard signal ±5 V or ±10 V
- Potentiometric sensors

Highlights

- Precision measuring chain
- Portable data-logger for up to 30.000 measured values
- Ultra-low non-linearity of less than 0.001 % F.S.
- Up to 16 measuring programs can be configured and saved
- Easy sensor configuration by burster TEDS
- Wheatstone full bridge simulator
- Sensor test
- High-precision voltage source 0 to 10 V DC
- DAkkS/factory calibration certificate available for the device or the entire measuring chain (optional)

Applications

- High-precision system calibrations of presses and assembly lines
- Service and maintenance
- Checking and readjusting presses, production systems and testing machines

Product description

The TRANS CAL 7281 can be fitted with standard or rechargeable batteries for portable use or can run from an external power supply for stationary use for a longer period of time. In conjunction with a sensor, the device can be used flexibly as a reference measuring chain, e.g. for force, torque and pressure measurement, and is particularly suitable for service technicians for calibrating and, if necessary, adjusting different systems.

The choice of sensors includes strain gage, normalized signal ±5 V/ ±10 V and potentiometric sensors. The graphical LCD display shows the current measured value. The bar display below shows the level of the measuring range. In addition, information about the percentage of the electrical input voltage range used is also shown. It also supports display functions such as data-logger, tared value in percent and upper/lower limit for the comparator with simultaneous indicator (> = <) of the evaluation result.

With the extended sensor test and strain gage simulator functions and the precision voltage source, you have the most important tools for regularly checking your complete system and quickly localizing faults and calibrating instrumentation amplifiers.

DAkkS calibration certificates/factory calibration certificates are optionally available. The TRANS CAL configuration and data-collection software provides useful display and reporting functions.

Technical data

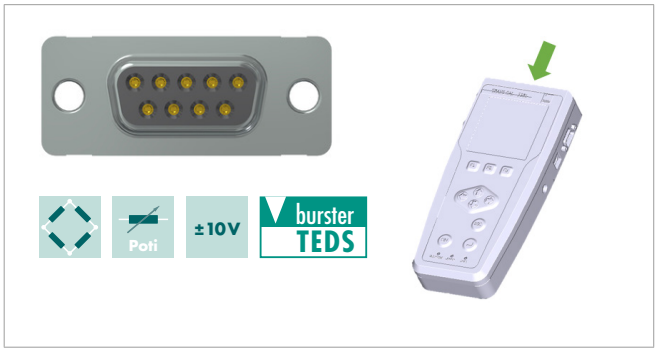
Reference tester operating mode	
Non-linearity	< ±0.001 % F.S.
Analog/digital conversion	24-bit
Measurement rates	0.1 to 1200/s (DC); 0.1 to 2/s (AC or clocked DC voltage/2 kHz) (reduced accuracy from 50/s)
Temperature coefficient amplification	±0.001 %/K
Temperature coefficient zero point	< 0.2 µV/K
Cut-off frequency	10 kHz (–3 dB)
Units	Freely selectable
Compatible sensors	
Full-bridge strain gage	
Measurement error	≤ 0.02 % F.S.
Bridge resistance (full bridge)	120 Ω to 10 kΩ
Connection options	4- or 6-conductor technology
Input voltage ranges (DC)	±15 mV; ±30 mV; ±250 mV
Sensor excitation voltage (DC)	2.5 V, 5 V (at 120 Ω, only 2.5 V)
Input voltage ranges (AC)	±15 mV; ±30 mV
Sensor excitation voltage (AC)	2.5 Vrms/5 Vrms (from 350 Ω)
Sensor excitation current	Max. 30 mA
Electronic datasheet (TEDS)	Read from sensor EEPROM
Potentiometric sensors	
Measurement error	≤ 0.05 % F.S.
Track resistance	500 Ω to 10 kΩ
Connection options	3- or 5-conductor technology
Excitation voltage	5 V DC
Excitation current	< 30 mA
Measurement range	±5 V
Transmitters or sensors and devices with voltage output	
Measurement error	≤ 0.02 % F.S.
Excitation voltage	12 V DC ±5 %
Excitation current	< 100 mA
Input voltage range	±10 V
Strain gage simulator operating mode (model 7281-V0011 only) ➔ Note: Not suitable for amplifiers with carrier frequency methods.	
Measurement error	≤ 0.01 % F.S.
Excitation voltage	≤ ±10 V (DC)
Measurement of excitation voltage	0 to 10 V DC
Rated outputs (infinitely adjustable simulation values)	0 to ±3 mV/V to 0 to ±50 mV/V
Resolution	16-bit
Bridge resistance	350 Ω
Temperature coefficient	±0.002 %/K
Sensor test operating mode (model 7281-V0011 only)	
Temperature coefficient	±0.005 %/K
Calibration offset	
Measurement error	≤ 0.25 % F.S.
Shunt resistors	59 kΩ; 80 kΩ; 100 kΩ; 150 kΩ; 300 kΩ
Input and output resistance of the sensor	
Measurement error	≤ 0.25 % F.S.
Measurement range	120 Ω to 10 kΩ

4783-007281EN-5699-041530

Insulation resistance		
Accuracy		±5 % of reading
Measurement range		20 MΩ to 1 GΩ
Resolution		1 MΩ
Temperature coefficient		±0.1 %/K
Precision voltage source operating mode (model 7281-V0011 only)		
Measurement error		≤ 0.02 % F.S.
Infinitely adjustable simulation values		0 to +10 V
Resolution		1 mV
Temperature coefficient		± 0.005 %/K
General device data		
Supply voltage (external)		10 to 28 V DC
Rated temperature range		0 to +40 °C
Storage temperature range		–20 to +60 °C
Display		LCD with white LED backlighting
Housing material		Aluminum (light gray/black)
Housing dimensions (L x W x H)		220 x 100 x 52 mm
Degree of protection		IP40
Weight		Approx. 850 g
Connections		
Reference measure-ment, strain gage simulator, sensor test		SUB-D 9-pin, socket
Strain gage simulator		SUB-D 9-pin, pins
PC interface		USB 2.0, type B connector, backwards compatible, opto-isolated
Baud rate		115200 Bd
Supply voltage		4 x Mignon or 10 to 28 V DC, integrated battery charging circuit

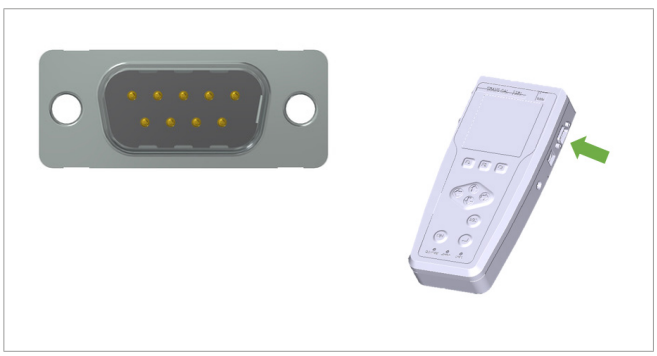
Electrical connection

D-SUB 9-pin socket (measurement, sensor test and voltage source)



Pin	Meaning
1	+ excitation, strain gage, potentiometer; voltage source output
2	+ sensor line, strain gage, potentiometer
3	+ transmitter excitation (+12 V DC)
4	– sensor line, strain gage, potentiometer
5	– excitation, strain gage, potentiometer; voltage source output
6	+ strain gage signal input, standard signal, potentiometer
7	burster TEDS
8	– transmitter excitation
9	– strain gage signal input, standard signal, potentiometer

D-SUB 9-pin connector (device test and strain gage simulator)



Pin	Meaning
1	+ excitation, strain gage, potentiometer
2	+ sensor line
3	n.c.
4	– sensor line
5	– excitation, strain gage, potentiometer
6	+ signal output
7	n.c.
8	n.c.
9	– signal output

Application

Basic version 7281-V0010

High-precision calibration/reference measuring chain:

The multipurpose TRANS CAL 7281 digital indicator can be used wherever there is a need to perform high-precision, in-situ measurement and calibration of sensing components used in equipment such as presses, torque tools and pressure-regulating systems.
With a DAkkS or factory calibration certificate for the entire measuring chain, the data-logger is ideal for use as a mobile or stationary reference. This enables you to evaluate your system quickly, regularly and cost effectively at any time and to document the measurement results in a traceable way using the software.

✓ Quality assurance
✓ Research & development



Plus version 7281-V0011 (additional functions)

Strain gage sensor test:

If a reference measurement of the sensors in the system is not possible, functional testing can be carried out. The sensor test checks the zero point, the input/output resistance as well as the insulation resistance of the sensor. A shunt calibration with an unloaded transducer (targeted unbalancing of the strain gage full bridge) provides you with the calibration step characteristic value specified on the test certificate and therefore the information of a still-intact characteristic curve slope.

✓ Service & maintenance



Strain gage simulator up to ±50 mV/V

(manual or NEW via USB interface):

The strain gage simulator allows you to simulate a sensor by specifying the exact characteristic value (mV/V) in order to test the downstream electronics and readjust them if necessary. In addition, the excitation voltage is measured and displayed so the supply voltage can also be effectively evaluated. Precise strain gage simulation values can be output cyclically via interface operation, enabling fully automated testing or calibration of the downstream electronics.

✓ Production & commissioning
✓ Quality assurance
✓ Service & maintenance



Precision voltage source

(manual or NEW can be operated via USB interface):

PLC analog inputs, instrumentation amplifiers and external display devices often need to be adjusted. The voltage source can be used to generate precise specified values so the electronics can be tested and adjusted.

✓ Production & commissioning
✓ Service & maintenance



Accessories

Order code		
7281-Z001		Power pack, 100 – 240 V AC, 50/60 Hz, 12 V DC, 1.5 A included with device
7281-Z005		Battery set of 4 x Mignon AA included with device
7200-CASE		Aluminum case for TRANS CAL 7281 and accessories
7281-P101		**PC software for TRANS CAL 7281 – Basic version:** Measurement display, editing device parameters, making settings via the configuration interface, generating reports from data-logger values, data export, processing metadata
7281-P100		**PC software for TRANS CAL 7281 – Plus version:** Measurement display, editing device parameters, making settings via the configuration interface, generating reports from data-logger values and sensor test data, data export, processing metadata, remote control of the strain gage simulator and the precision voltage source
9900-K349		USB connection cable
9900-V209 (+ 99004: standard connector mounting)		9-pin SUB-D connector (standard sensor connection)
9900-V229 (+ 99011: standard plug mounting with TEDS programming)		9-pin SUB-D connector (sensor connection with TEDS option)
99609-000E-0150010		Connection cable for strain gage simulation/device test Length 1 m, 6 wire, 9-pin socket of model 9900-V609 at one end, loose solder ends at other
99209-540A-0110010		Adapter cable for sensors with 12-pin round plug 9941 Length 1 m/12-pin coupling socket model 9940 to 9-pin SUB-D connector of model 9900-V209

4783-007281EN-5699-041530

Calibration of the measuring chain

Calibration		
72ABG		Calibration of the 7281 display unit with standard sensors (inc. ABG calib. report)
72ABG-2 (for TEDS)		Calibration of the 7281 display unit with TEDS sensors (inc. ABG calib. report)

Calibration certificate with accreditation symbol

Calibration certificate with accreditation symbol for the TRANS CAL 7281. Calibration is based on the accreditation of calibration laboratory D-K-15141-01-00 for the scope of parameters listed in the annex of the accreditation certificate. Traceability to national standards and wide international recognition is therefore assured (DAkkS is a signatory to the EA, ILAC and IAF Multilateral Recognition Arrangements).

DAkkS
Deutsche
Akkreditierungsstelle
D-K-15141-01-00

burster calibration services according to the accredited scope of services

Device calibration

Standard factory calibration certificate for the device (WKS)		
72WKS-7281-00		ISO/factory calibration for TRANS CAL model 7281-V0010 (11 measured values in total)
72WKS-7281-01		ISO/factory calibration for TRANS CAL model 7281-V0011 (20 measured values in total)
Calibration certificate with accreditation symbol for the device (DKD)		
72DKD-7281-00		Calibration certificate with accreditation symbol (DAkkS) for TRANS CAL model 7281-V0010 (36 measured values in total)
72DKD-7281-01		Calibration certificate with accreditation symbol (DAkkS) for model 7281-V0011 (61 measured values in total)

Calibration of measuring chains

Standard factory calibration certificate for a reference measuring chain (WKS)		
Optionally available		Our standard factory calibration certificate generally contains measurement points that are recorded in five stages starting from zero (distributed as evenly as possible over the measuring range) until the sensor's rated value is reached. The physical input variable is changed with increasing and decreasing signals without changing the installation position of the sensor. Calibration is carried out in conjunction with a transducer (sensor) for physical variables and follows the procedure specified on the sensor data sheet.
Special factory calibration certificate for measuring chains (WKS)		
On request		We are happy to calibrate sensors and measuring chains to the customer's specifications.
Calibration certificate with accreditation symbol for a reference measuring chain (DKD)		
Optionally available		Our ISO 17025 accredited calibration laboratory (DAkkS) offers accredited calibration certificates in accordance with its scope of services. The calibration procedures used can also be found on the data sheet for the transducer (sensor) used. Calibration is carried out in conjunction with a transducer (sensor) for physical variables.

Example order

Item number		
8527-6010-N0T0S000		Reference compression load cell with TEDS connector 9900-V229
7281-V0011		Plus version (reference tester/strain gage simulator/sensor test/precision voltage source)
72ABG-2		Calibration of the measuring chain

Order code

Item number		
7281-V0010		Basic version (reference tester)
7281-V0011		Plus version (reference tester/strain gage simulator/sensor test/precision voltage source)