Pedal Load Cell
for pedal operating forces
Model 8400-B001

Application
With its flat construction this force sensor is specially designed to be fitted to a pedal. By this, the operator’s forces for each respective action, for example brake tests, can be measured directly and the reaction of the vehicle or machine can be designated. This applies to real test drives, as well as in driving simulators. Due to the special construction of the membrane, it is irrelevant whether an upright or hanging pedal is concerned. The sensor is designed in a way that unavoidable lateral forces have as little impact on the measurement result as possible. Using a central internal thread on the control surface, various machine-related adaptor parts can be easily mounted. Because the pedal is convex-shaped on its surface, the pedal force sensor has a very rigid base plate and therefore can easily be applied to various geometrics. The mounting can even take place on a pedal with an elastomer covering.

Description
With a height of only 17 mm, this sensor is particularly flat and, in its assembled state, does not interfere with the operation task of the pedal. Additionally, its diameter of less than 60 mm makes this sensor suitable for almost all forms of pedals. The sensor is screwed together in a safe and stable way with a suitable bracket which goes under the pedal. Due to various pedal designs, this bracket is not included in the delivery scope and has to be manufactured separately to fit to the pedal. The connection cable is specially protected, it sturdily holds using PG cable glands and is suitable for robots: Therefore lots of movements in realistic, dirty and damp areas are guaranteed. On the measurement membrane in addition to its stable mechanics several bridges formed by strain gauges protect the sensor from additional transverse forces. The operator provides, from personal factors such as foot position, habits or various shoes, inevitably off-centre forces on the operating part of the sensors, which need to be compensated.

- Very flat design
- Insensitive to forces traverse to the operating direction
- Easy changeable, ergonomical operating plate
- Temperatures from -40 °C to 120 °C
- In combination with TRANS CAL 7281, can be used portably and network-independent
- Option: available as dual range version
### Technical Data

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<thead>
<tr>
<th>Order Code</th>
<th>Measuring Range</th>
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</thead>
<tbody>
<tr>
<td>8400-B001-6001</td>
<td>0 ... 1000 N</td>
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<tr>
<td>8400-B001-6002</td>
<td>0 ... 2000 N</td>
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</tbody>
</table>

#### Electrical values
- Bridge resistance: 700 Ω
- Excitation voltage: 10 VDC
- Sensitivity: 2 mV/V ± 0.5 %
- Calibrator resistor: 100 kΩ

#### Environmental conditions
- Nominal temperature range: -30 °C ... +60 °C
- Range of operating temperature: -30 °C ... +80 °C
- Influence of temperature on zero: 0.02 % F.S./K
- Influence of temperature on sensitivity: 0.02 % F.S./K

#### Mechanical values
- Accuracy: relative non-linearity 0.5 % F.S., acc. to VDE 2638
- Kind of measurement: load cell
- Deflection: > 80 µm
- Overload safe: 150 % of capacity
- Overload: 250 % of capacity
- Dynamic load:
  - recommended: 70 % of capacity
  - possible: 100 % of capacity
- Material: stainless steel 1.4542
- Protection class: IP67, acc. to DIN 60529
- Electrical connection: suitable for drag chain, 4 leaded
- TPE isolated cable, length 1.5 m
- Bending radius:
  - fixed: 10 mm
  - by movement: 30 mm
- Wiring code:
  - white: excitation voltage positive
  - brown: excitation voltage negative
  - yellow: signal output positive
  - green: signal output negative
- Dimensions:
  - refer to scale drawing
- Weight: 600 g

#### Option
- Better accuracy:
  - < ± 0.25 % F. S.
- For additional standardised output signal then with rated output tolerance ± 0.25 %

#### Dual range version
- additional calibration point at 200 N or 500 N on request

#### Order Information
- Pedal load cell, measuring range 1000 N
- Model 8400-B001-6001

### Accessories
- **burster TEDS**
- 9-pin male sub-D connector and memory chip for the electronic sensor datasheet, for connecting strain-gauge load cells to the TRANS CAL 7281 model 9900-V229
- High-precision calibrator for mechanical measurements TRANS CAL - reference measurement device model 7281-V0000

### Technical Data 7281
- **Operation mode: Reference measurement device**
- Non-linearity: < ± 0.001 %
- Measuring rates:
  - 0.1 ... 1200/s (DC); 0.1 ... 2/s (AC)
  - (reduced accuracy at 50/s)
- TC gain: ± 0.001 %/K
- TC zero point: < 0.2 µV/K
- Cut-off frequency: 10 kHz (-3db)
- **Strain gauge**
  - Error limit: ± 0.02 % v.E.
  - 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 25 V)
- Sensor excitation voltage (AC):
  - 2.5 Veff / 5 Veff (from 350 Ω)
- Sensor excitation current: max. 30 mA
- Electronic data sheet (TEDS): read from sensor EEPROMs

### Factory Calibration Certificate (WKS)
- Calibration of a load cell separately as well as connected to an indicator. Standard is a certificate with 11 points, starting at zero, running up and down in 20% increments covering the complete measuring range for preferential direction. Special calibrations on request. Calculation of costs by base price plus additional costs per point.

#### Order Code 84WKS-84...

### General device data
- **A/D converter:** 24 Bit
- **Real-time clock/date:**
- **Interface:** USB 2.0, downwars compatible, opto-isolated
- **Nominal temperature range:** 0 °C ... 40 °C
- **Storage temperature range:** -20 °C ... 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, device test, sensor test: SUB-D female 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.