

# Load Cell

## For hand and pneumatic operated presses

### Model 8451

Code:	8451 EN
Delivery:	ex stock
Warranty:	24 months

CAD data 2D/3D for this sensor:  
Download directly at [www.traceparts.com](http://www.traceparts.com)  
Info: refer to data sheet 80-CAD-EN



#### Application

The load cell model 8451 was developed for the work forces arising on smaller manually operated presses. With its small dimensions in height of only 75 mm, it is mounted in place of the tool's upper part into the stamp borehole. On its lower side it features the same 10 H<sup>7</sup> or 20 H<sup>7</sup> borehole used for adapting the tool as the stamp. As a result, the actual compression force on the axis of the stamp is measured. This load cell is therefore suitable for application on all standard manual presses with a stamp borehole of 10 H<sup>7</sup> and 20 H<sup>7</sup>.

The vertically arranged compression body makes the load cell less vulnerable to rapidly rising forces as well as relatively sturdy against load from lateral forces or torsion.

The mounting of this load cell in the press is very simple and does not require additional mechanical parts that are needed when using other sensors to keep the force on the sensor axis.

Manual presses can be configured for left and right hand workers as the connecting cable can be taken out of the press to the other side of the work zone by simply turning the load cell.

The construction of the load cell  $\leq 0 \dots 5$  kN fulfils the protection class IP67 with its high-strength cable gland and use of O-ring seals to cover the measuring element. Therefore it is also suitable for working places where lubricating and cooling liquids are used.

Load cells with measuring range  $\leq 0 \dots 2$  kN have a mechanical overload protection up to 5 fold of the measuring range.

- Measuring ranges from 0 ... 500 N up to 0 ... 100 kN
- Simplest mounting on press stamp
- Compact and very robust construction
- Hermetically sealed construction
- Small measuring ranges with overload protection
- Suitable for all standard manual presses with stamp holes of 10 H<sup>7</sup>
- Adaption to right and left handed users is possible

#### Description

Load cell model 8451 is a compression element with strain gauges applied to both sides. The measuring element is a horizontally arranged membrane for measuring ranges  $\leq 0 \dots 2$  kN. The full bridge consisting of wired strain gauges supplies a bridge output voltage in direct proportion to the physical measurement value. A stable reference supply voltage is required for this.

The load cell measures the compression forces between the ring-shaped contact area to the press stamp and the press tool. The opposite areas must be flat, polished and hardened. The pin on the top side and the borehole on the bottom serve only for mechanical mounting and aligning the components correctly. The pin has two flat surfaces on opposite sides, which help to fasten the sensor in the stamp borehole with its cable outlet in the required direction. The tool is fastened in the borehole of the sensor body with the help of a clamping screw. The integrated sensor connecting cable is approx. 1 m long and designed for many motion cycles as a robot cable.

**Technical Data**

Order Code	Measurement Range	Max. Overload [kN]	Measuring Range* [%F.S.]	Nominal Characteristic [mV/V]	Influence of Temperature		Resonance Frequency [kHz]	Weight [g]
					on Zero Signal [%F.S./K]	on Characteristic [%Rdg./K]		
8451-5500	0 ... 0.5 kN	2.5	≤ ± 0.5	1.2	0.02	0.02	> 2	500
8451-6001	0 ... 1 kN	5	≤ ± 0.5	1.2	0.02	0.02	> 3	500
8451-6002	0 ... 2 kN	10	≤ ± 0.5	1.2	0.02	0.02	> 5	500
8451-6005	0 ... 5 kN	30	≤ ± 2.0	0.35	0.1	0.1	> 20	220
8451-6010	0 ... 10 kN	30	≤ ± 2.0	0.7	0.05	0.05	> 20	220
8451-6020	0 ... 20 kN	30	≤ ± 1.0	1.5	0.03	0.03	> 20	220
8451-6050	0 ... 50 kN	75	≤ ± 1.0	1.0	0.03	0.03	> 20	900
8451-6100	0 ... 100 kN	150	≤ ± 1.0	1.0	0.03	0.03	> 20	900

\* Error consisting of relative non-linearity, relative hysteresis and relative variation

**Electrical values**

Bridge resistance: 350 Ω, nominal\*  
 Reference excitation voltage: max. 10 V DC  
 Nominal sensitivity: refer to table  
 Isolation resistance: > 10 MΩ

\* Deviations from stated value are possible.

**Environmental conditions**

Operation temperature range: -20 °C ... 80 °C  
 Nominal temperature range: 15 °C ... 70 °C  
 Influence of temperature on zero: refer to table  
 Influence of temperature on sensitivity: refer to table

**Mechanical values**

Deflection: < 50 μm  
 Maximum static operation load or resp. overload: refer to table  
 Dynamic load: recommended 70 % of nominal load  
 Overload protection: refer to table  
 Material: 1.4542  
 Resonance frequency: refer to table

Electrical connection: shielded, 4 wire, TPE isolated cable, length approx. 1m with open ends for soldering, outer diameter 3 mm  
 Bending radius: > 30 mm  
 Protection class: according to EN 60529  
 measurement range ≤ 0 ... 2 kN IP65  
 measurement range ≥ 0 ... 5 kN IP67

Wiring code:  
 white excitation voltage positive  
 brown excitation voltage negative  
 yellow output signal positive  
 green output signal negative

Dimensions: refer to dimensional drawing  
 General tolerance of dimensions: according to ISO 2768-f  
 Weight: refer to table

**Mounting Instruction**

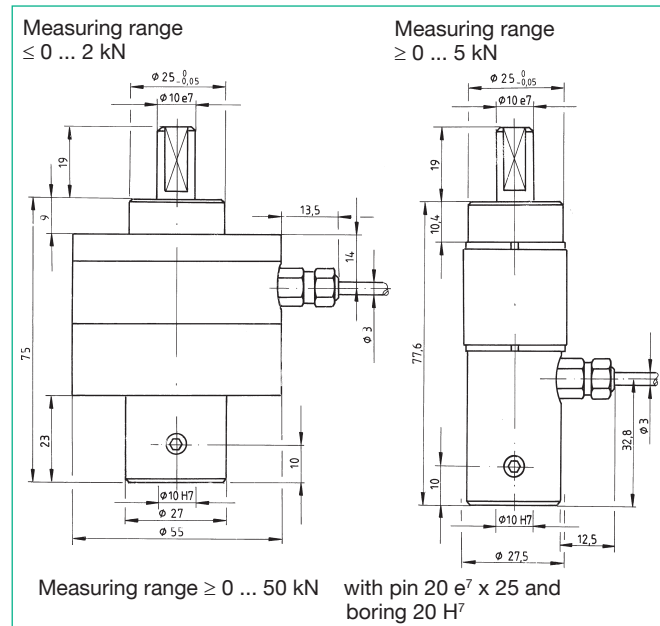
The cylindrically shaped body of the load cell has to be mounted until it's block touches the ring shaped contact areas of the press stamp. A good fit and a homogenous force distribution is assured this way. For the specific measuring accuracy and long-life stability an axial introduction of the force is recommended.

The immersing pin, flattened on both sides of the upper end, has to be mounted to the press stamp by means of a screw with flat surface. The two parallel flattened surfaces on the pin allow the alignment of the cable outlet in a way that left handed workers as well as right handed workers may operate the press.

The tool will be fastened in the boring of the sensor body (M 6) by a clamping screw.

The sensor cable must not be exposed to tensile or buckling stress. Because of this, install the cable with enough space.

**Dimensional drawing model 8451**



The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.

Download via [www.burster.com](http://www.burster.com) or directly at [www.traceparts.com](http://www.traceparts.com). For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

**Order Information**

Load cell, measuring range 0 ... 2 kN, **8451-6002**

**Accessories**

Connector  
 9 pin, suitable for DIGIFORCE® 9310 **Model 9900-V209**  
 12 pin, suitable for model 9163, 9181 desktop version **Model 9941**  
 Mounting of a connector to the sensors cable **Order Code: 99004**

only for connection to SENSORMASTER model 9163 desktop version **Order Code: 99002**

Strain gauge simulator as an auxiliary tool used for generating strain gauge sensor signals in order to adjust or check amplifiers and indicators. **Model 9405**

Force displacement controlled hand lever presses like series 5501, evaluation electronics or process control units like 9163, 9181 and DIGIFORCE® model 9310

refer to section 5 and 9 of the catalog.

**Option**

For measurement ranges ≤ 0 ... 2 kN thanks to the use of a ball track, version without radial clearance **...-V401**