

Tension and Compression Load Cell

Model 8524

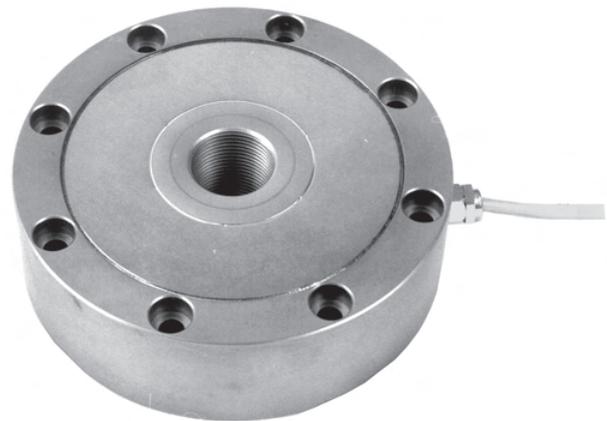
Code: 8524 E
 Manufacturer: burster
 Delivery: ex stock
 Warranty: 24 months

CAD data in 3D/2D available on
powerPARTS by web2CAD
 Info: data sheet 80-CD-ROM-E



Small measurement ranges

Option:
Overload protection
 for ranges up to 20 kN



Medium measurement ranges



Large measurement ranges

- Available ranges from 0 ... 500 N to 0 ... 200 kN
- Accuracy ≤ 0.25 % F.S.
- Accuracy 0.1 % F.S. up to range 0 ... 20 kN (option)
- Sensitivity 1.5 mV/V
- Material: stainless steel
- Universally applicable
- Overload protection up to range 0 ... 20 kN (option)

Application

Due to their compact design and construction, these tension-pressure load cells can be operated without any problems in laboratories as well as in industrial environments. Made of corrosion-resistant steel, these load cells can be integrated easily into existing structures, thanks to their standardized key ratings and simple assembly. In accordance with the measurement task involved, model 8524 can be used to measure static, quasi-static as well as dynamic tensile and compressive forces.

Areas of application include:

- Measurement of compression and insertion forces
- Measurement of spring forces
- Measurement of shearing and cutting forces
- Force measurement and control during assembly
- Measurement of pressure on drilling machines

A load-centering plate mounted on the load cell can be used to measure, for example, joint lugs, tensile forces in ropes, chains etc. (refer to page 4: load-centering plate).

Description

The bending plate inside the load cell is equipped with strain gauges which, on the exertion of a force, supply a bridge-output voltage directly proportional to the measurement variable. The centre axis of the tension-pressure load cells incorporates a continuous thread through which the measurement force needs to be introduced - free of transverse and torsional components - either via a load introduction button or an application-specific adapter. From measurement range of 0 ... 5 kN onwards, the measurement accuracy is ideal if the load cell has been mounted on a level, hard and polished base. This is not necessary in case of small measurement ranges of up to 0 ... 2 kN, thanks to 3 special bearing blades (refer to page 3, top).

Structural measures should be taken to avoid exposing the load cell to lateral forces (for instance, mounting on movable bearings, levers held by roller bearings). Attachment via the clearance bores integrated in the external ring allows simple handling of the sensor.

A dead serves as overload protection against damages caused by impermissible high compressive forces (option). Lateral forces of up to 5 % nominal strength only have little influence.

8524-E

Technical Data

Dim. tolerances acc. ISO 2768-f

| Order Code | Measuring Range | Dimensions [mm] | | | | | | | | | Thread T | Number of Holes on G | Natural Frequency [kHz] | Mass [kg] | Wrench Torque for Mounting Screws 12.9 |
|------------|-----------------|-----------------|-----|------|------|----|-----|------|----|------|----------|----------------------|-------------------------|-----------|--|
| | | øD1 | øD2 | øD3 | øD4 | H | øG | øX | øY | W | | | | | |
| 8524-5500 | 0 ... ±0.5 kN | 54.5 | 15 | 35.5 | 33.5 | 16 | 45 | 4.5 | 8 | 11.4 | M 8x1.25 | 3 | > 2 | 0.25 | 3 Nm |
| 8524-6001 | 0 ... ±1 kN | 54.5 | 15 | 35.5 | 33.5 | 16 | 45 | 4.5 | 8 | 11.4 | M 8x1.25 | 3 | > 3 | 0.25 | 3 Nm |
| 8524-6002 | 0 ... ±2 kN | 54.5 | 15 | 35.5 | 33.5 | 16 | 45 | 4.5 | 8 | 11.4 | M 8x1.25 | 3 | > 5 | 0.25 | 3 Nm |
| 8524-6005 | 0 ... ±5 kN | 54.5 | 15 | 35.5 | 34.5 | 16 | 45 | 4.5 | 8 | 11.4 | M 8x1.25 | 6 | > 8 | 0.25 | 3 Nm |
| 8524-6010 | 0 ... ±10 kN | 54.5 | 15 | 35.5 | 34.5 | 16 | 45 | 4.5 | 8 | 11.4 | M 8x1.25 | 6 | > 12 | 0.25 | 3 Nm |
| 8524-6020 | 0 ... ±20 kN | 79 | 22 | 59 | 58.6 | 25 | 68 | 4.5 | 8 | 20.4 | M 12x1.5 | 8 | > 4 | 0.65 | 3 Nm |
| 8524-6050 | 0 ... ±50 kN | 119 | 44 | 94 | 92.6 | 35 | 105 | 6.6 | 11 | 28.2 | M 24x1.5 | 8 | > 3 | 2 | 10 Nm |
| 8524-6100 | 0 ... ±100 kN | 155 | 60 | 109 | 107 | 50 | 129 | 13.5 | 20 | 36.5 | M 36x3 | 8 | > 3 | 5 | 100 Nm |
| 8524-6200 | 0 ... ±200 kN | 155 | 60 | 109 | 107 | 50 | 129 | 13.5 | 20 | 36.5 | M 36x3 | 8 | > 5 | 5 | 100 Nm |

Electrical Values

Bridge resistance (full bridge circuit) of foil strain gauge:
 350 Ω, nominal*
 Excitation: max. 10 V DC or AC
 Sensitivity: 1,5 mV/V ± 0,25 %
 positive output at compression
 Calibration Resistor (burster model 1148-6080): 80 kΩ ± 0.1 %
 The bridge output signal resulting from a shunt of this value is shown in the calibration certificate.

* Deviations from stated values are possible.

Environmental Conditions

Temperature compensated: 15 °C ... 70 °C
 Temperature operating: - 30 °C ... 80 °C
 Temperature effect zero shift: ≤ 0.02 % F.S./K
 Temperature effect span shift: ≤ 0.02 % Rdg./K

Mechanical Values

Accuracy:
 combined value for non-linearity, hysteresis and repeatability
 < ± 0.25 % F.S.
 Kind of measurement: Tension and compression, calibration in compression direction
 Deflection-full scale: approx. 80 μm
 Overload-safe: 150 % over capacity
 Overload-burst: > 250 % over capacity
 Dynamic performance:
 recommended 70 % of capacity
 maximum 100 % of capacity
 Material: stainless steel 1.4542
 Protection class: according to EN 60529 ≤ 10 kN IP 52
 ≥ 20 kN IP 67

Electrical termination: shielded, high flexible cable with bare ends for soldering, length approx. 2 m

Ranges up to 10 kN: Cable diameter 5 mm
 Radial cable output
 Metal tube length 10 mm
 diameter 6 mm
 Protection against buckling with shrinking hose length 30 mm
 diameter 5.5 mm
 bending radius min. 25 mm
 (see drawings 1 and 2)

Ranges 20 kN and 50 kN: Cable diameter 5 mm
 bending radius min 20 mm
 radial cable output
 PG screw connection on flange angle
 Module for output 1.5 mV/V
 Integrated in cable
 (see drawing 3)

Ranges 100 kN and 200 kN: Cable diameter 7 mm
 bending radius min 35 mm
 tangential cable output
 PG screw connection on flange angle
 (see drawing 4)

Wiring code:

| | | | |
|--------|------------|------------|---------------------------------|
| white | Excitation | (positive) | } On application of compression |
| brown | Excitation | (negative) | |
| yellow | Output | (positive) | |
| green | Output | (negative) | |

Dimensions: see table and scale drawing
 Units with range ≤ 0 ... 2 kN are equipped with bearing edges within clearance holes, therefore they are 1.5 mm higher.

Weight: 250 g ... 5 kg, see table

Assembly:
 Measuring ranges ≤ 0 ... 2 kN 3 clearance holes with edges for three-point-support
 (see drawing 1)

Measuring ranges ≥ 0 ... 5 kN 6 resp. 8 clearance holes
 (see drawings 2 - 4)

The entire bearing area of the sensor must be mounted on a base which is hardened (60 HRC), flat, polished or - better still - lapped.

Counterbores in compliance with DIN 74-Km, in compliance with DIN 912 for Allen screws.

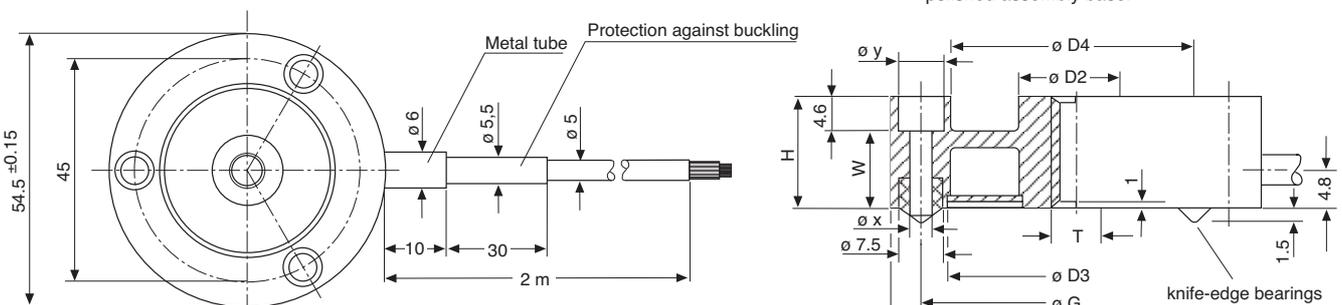
Mechanical strength of screws: 12.9. or better

Also refer to the accessories comprising load-centering plates and load-introduction buttons (page 4).

Scale Drawing 1

Measuring ranges 0 ... 0.5 kN to 0 ... 2 kN

The three bearing blades eliminate the need for a polished assembly base.



Pull plates

A pull plate extends the range of application of flat-design tension-pressure load cells to include the measurement of tensile forces in freely movable arrangements (rope tension, joint tension ...). A pull plate has roughly the same dimensions as the sensor body and is mounted on the load cell (see diagram). The central tapped holes allow an installation of customer-specific or standard threaded components (for example, joint heads).

| Order Code | for Nominal Load [kN] | Centric Thread | Mass [kg] | max. Wrench Torque for Screws 12.9 |
|------------|-----------------------|----------------|-----------|------------------------------------|
| 8590-V002 | to 10 | M 8 x 1.25 | 0.28 | 3 Nm |
| 8590-V003 | 20 | M 12 x 1.5 | 0.70 | 3 Nm |
| 8590-V004 | 50 | M 24 x 1.5 | 2.2 | 10 Nm |
| 8590-V005 | 100, 200 | M 36 x 3 | 5.5 | 10 Nm |

Screws of strength class 12.9 are required for attaching the pull plates to the load cells.

Strain gauge simulator serves as appliance for the controlled generation of strain gauge sensor signals 0/0.5/1/1.5/2/3 mV/V for the adjustment or verification of amplifiers or indicator devices

Model 9405

Refer to product section 9 of the catalog

Mating connector:

- 12-pole for burster desktop devices **Model 9941**
- 9-pole for 9235 and DIGIFORCE® 9310 **Model 9900-V209**

Mounting of mating connector

on sensor cable upon prevalent use of the load cell

- a) in compression direction (load cell is calibrated in compression direction, output signal is positive in compression direction) **order code: 99004**
- b) in tension direction (output signal is positive in tension direction) **order code: 99007**

Options

- **Overload stop** compression direction (Option)

| Load cell with option overload stop for compression direction | | | | | | |
|---|-----------------|-----------------|----------------|----|----|--|
| Order Code | Measuring Range | Protected up to | Dimensions[mm] | | | |
| | | | D1 | H1 | H | |
| 8524-5500-V400 | 0 ... 500 N | 2.5 kN | 54.5 | 19 | 15 | |
| 8524-6001-V400 | 0 ... 1 kN | 5 kN | 54.5 | 19 | 15 | |
| 8524-6002-V400 | 0 ... 2 kN | 10 kN | 54.5 | 19 | 15 | |
| 8524-6005-V400 | 0 ... 5 kN | 20 kN | 54.5 | 19 | 15 | |
| 8524-6010-V400 | 0 ... 10 kN | 30 kN | 54.5 | 19 | 15 | |
| 8524-6020-V400 | 0 ... 20 kN | 80 kN | 79 | 25 | 25 | |

The overload stop protects the load cell against damages resulting from loads higher than the operating load value (150 % of the nominal load). The overload stop is realized through a dead stop limiting the displacement of the spring bellow upon load application to max. 130 % of the nominal load. The measurement of tension forces is possible also with mounted overload stop. For this reason the overload stop has the same external mounting bores like the sensor itself.

Useful information

- Overload stop for compression only.
- Overload stop mounting by factory only.
- Tolerance of standardized output of load cell at overload stop is ± 0.5 %.
- It is not allowed to introduce overload on load cell by thread (allowed are load button, see accessories or similar parts).
- Better accuracy ± 0.1 F.S. (only for ranges up to 0 ... 5 kN) **- V502**
- Change of the nominal characteristic ± 0.1 % F.S. (only for ranges up to 0 ... 5 kN) **- V010**
- Cable length 5 m **- V206**
- Highly flexible cable, length 3 m **- V203**

Change of the nominal characteristic from 1.5 mV/V (standard) to 1 mV/V; the module for 1 mV/V (length approx. 70 mm, diameter approx. 8 mm) is integrated in the cable

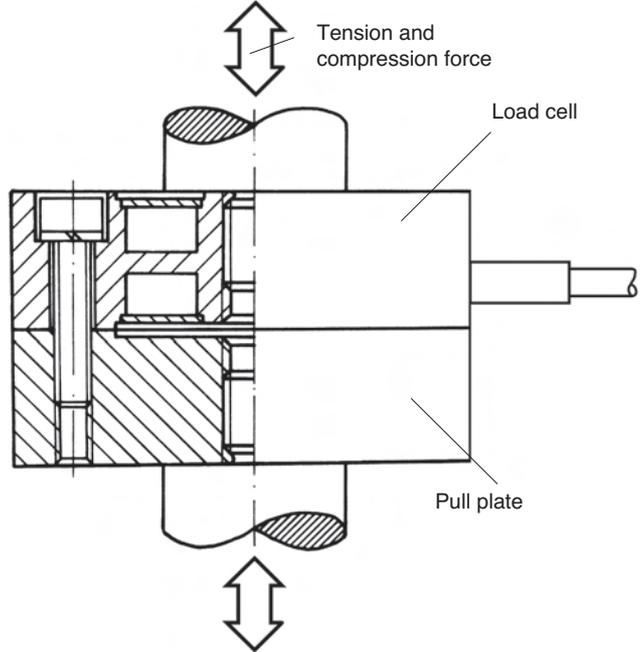
Order Code -V010
Order Code -V206

Cable length 5 m

Order Information

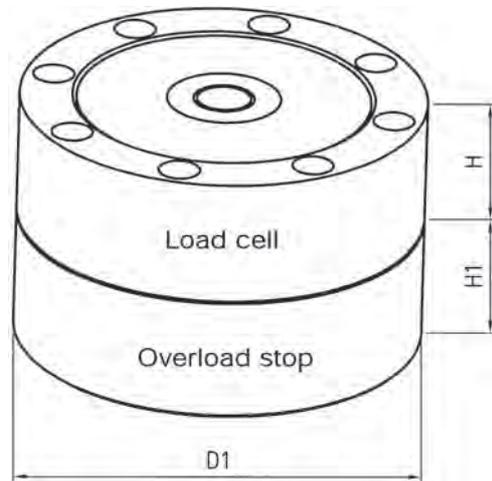
Tension and compression, range 0 ... 20 kN **Model 8524-6020**
Tension and compression, range 5 kN cable length 5 m **Model 8524-6005-V206**

Sensor with pull plate



Sensor with overload protection

Drawing ranges 20 kN



Signal Conditioning

Supply units, amplifiers and process-monitoring devices, such as model 9243 modular amplifier, model 9180 digital indicator or model 9714 process interface **refer to section 9 of catalog.**

Special Calibration Certificate (WKS)

Load cell with or without measuring device (amplifier or monitor)

Calibration at 20% steps of the measuring range, up and down

Variants: Tension and/or compression direction.

Examples: 1. Calibration in 20% steps, compression up and down (11 measurement points).

2. Calibration in 20% steps, tension and compression up and down (22 measurement points).