



Miniature Ring Load Cell



1. Application

The miniature ring load cell of this series have been specially designed to have small external dimensions.

Small diameters and low assembly heights make these units suitable for installation in structures where the measured force is routed directly through the sensor after separation.

Examples of this are force measurements on

- bolts,
- screws,
- plate and cover fastenings,
- bearing contacts,
- spot welding machines,
- cutting tools.

2. Description

The measured force must be introduced or ejected via the inner and outer bands of the sensor respectively. For example, when the outer band is the contact surface, the measured force is introduced via the part attached to the inner band.

The conversion of the acting force to an electrical output signal is performed by strain gauges connected together in a full bridge circuit.

To achieve optimal accuracy, the base of the sensor should rest on a smooth, level surface. Lateral forces should be avoided, as they distort the measurement results.

During the installation, ensure that the cable outlet and the sensor cable are not subjected to excessively high tensile or bending forces.

3. Special features

- Central clearance hole
- Available ranges from 0 ... 20 N up to 0 ... 200 kN
- Flat, disc design
- Made of stainless steel
- Load cell completely welded together
- Optional standardization of output characteristics
- Allows measurement of force at screw connections

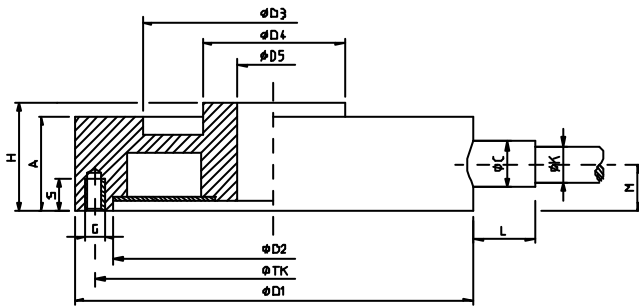
07.01.2001

Miniature Ring Load Cell

108438/02

4. Dimensions

Meas. range	Article-No.	Dimensions [mm]													
		ØD1	ØD2	ØD3	ØD4	ØD5	A	H	ØC	L	ØK	M	S	ØTK	G
0...20 N	12940	25,4	21,6	20,6	6,6	5,1	6,4	7,1	4,8	8,0	1,4	3,0	-	-	-
0...50 N	12941	25,5	21,6	20,6	6,6	5,1	6,4	7,1	4,8	8,0	1,4	3,0	-	-	-
0...100 N	12942	28,0	25,0	22,0	9,0	5,5 ^{HB}	7,0	8,0	2,2	8,0	1,9	2,5	-	-	-
0...200 N	12943	28,0	25,0	22,0	9,0	5,5 ^{HB}	7,0	8,0	2,2	8,0	1,9	2,5	-	-	-
0...500 N	12944	28,0	25,0	22,0	9,0	5,5 ^{HB}	7,0	8,0	2,2	8,0	1,9	2,5	-	-	-
0...1 kN	12945	38,0	29,0	25,0	13,5	7,0 ^{HB}	9,0	10,0	3,6	8,0	3,0	3,0	3,0	33,5	M 2,5x0,45
0...2 kN	12946	38,0	29,0	25,0	13,5	7,0 ^{HB}	9,0	10,0	3,6	8,0	3,0	3,0	3,0	33,5	M 2,5x0,45
0...5 kN	12947	38,0	29,0	25,0	13,5	7,0 ^{HB}	9,0	10,0	3,6	8,0	3,0	3,0	3,0	33,5	M 2,5x0,45
0...10 kN	12948	38,0	29,0	25,0	13,5	7,0 ^{HB}	9,0	10,0	3,6	8,0	3,0	3,0	3,0	33,5	M 2,5x0,45
0...20 kN	12949	49,0	41,0	35,0	23,0	14,0 ^{HB}	15,0	16,0	3,6	8,0	3,0	4,5	3,0	45,0	M 2,5x0,45
0...50 kN	12950	49,0	41,0	35,0	23,0	14,0 ^{HB}	15,0	16,0	3,6	8,0	3,0	4,5	3,0	45,0	M 2,5x0,45
0...100 kN	12951	78,0	60,0	54,0	42,0	27,0 ^{HB}	24,0	25,0	5,6	10,0	5,0	6,5	5,5	69,0	M 4,0x0,7
0...200 kN	12952	78,0	60,0	54,0	42,0	27,0 ^{HB}	24,0	25,0	5,6	10,0	5,0	6,5	5,5	69,0	M 4,0x0,7



5. Technical Data

5.1 Electrical specifications:

Bridge resistance (full bridge):
Meas. range $\geq 0 \dots 20$ N Foil SG 350 Ω , nominal*

Excitation:
Meas. range $\leq 0 \dots 500$ N max. 5 V DC
Meas. range $\geq 0 \dots 1$ kN max. 10 V DC

Sensitivity:
Meas. range 0 ...20 N and 0...50 N 2 mV/V, nominal*
Meas. range $\geq 0 \dots 100$ N 1.0 mV/V, nominal*
Meas. range $\geq 0 \dots 200$ N 1.5 mV/V, nominal*

* nominal, deviations from the stated value are possible
Option: sensitivity 1,0 mV/V
supplementing of Art.-No.: ...“1”

5.2 Environmental conditions:

Operating temperature range: 0 °C ... + 85 °C
Temperature compensated: + 15 °C ... + 70 °C
Temperature influence
on the zero signal: $\leq \pm 0.03$ % F.S./ K
on the characteristic value: $\leq + 0.03$ % Rdg./ K

5.3 Mechanical specifications:

Non-linearity: ≤ 1 % F.S.
Relative hysteresis: ≤ 0.75 % F.S.

Non-repeatability with unchanged assembly position: $\leq 0,25$ % v.E.

Operating force max.: 150 % of capacity

dynamic load capacity: recommended: 50 % of capacity
max: 70 % of capacity

Material: stainless steel 1.4542

Weight (depending on the measuring range):
approx. 5 g to 900 g

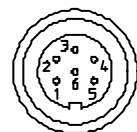
Protection class (according to DIN 40050):
Meas. range $\leq 0 \dots 50$ kN IP 54
Meas. range $\geq 0 \dots 100$ kN IP 65

5.4 Electrical connection:

4-wire, shielded, teflon coated cable, length approx. 2m, with connection plug, 6-poles

Measuring range:
 $\leq 0 \dots 500$ N Bending radius: ≥ 20 mm
 $\geq 0 \dots 1$ kN bis 0... 50 kN additionally with anti-kink coil
 $\geq 0 \dots 100$ kN additionally with anti-kink coil

IPin connection: Meas. range $\leq 0 \dots 50$ N / $\leq 0 \dots 100$ N



Top view
connection plug

Pin	wire	signal	
1	black / brown	excitation	-
2	red / white	excitation	+
3	(blank)	shield	
4	white / green	signal output	+
5	green / yellow	signal output	-

6. Order information

z.B. Miniature ring load cell, 0...100 kN

108438/02 - 100 kN - 12938 1
Data sheet | Meas. range | Article No. | Option 1,0 mV/V

For signal amplifiers and display units please refer to the data sheets of product group 4.