

## Force sensor for tension/ compression with analogue output



- Force range from 0...1kN to 0...500 kN
- Integrated 4-20mA or 0-10VDC signal
- <0.2% accuracy
- Stainless steel

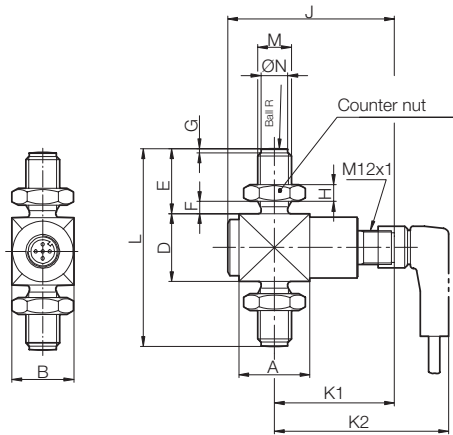
### Technical specification

<b>Output signal</b>	4...20mA, 0...10VDC
<b>Accuracy</b>	<0.2% of F.S. value
<b>Hysteresis</b>	≤0.1% of F.S.
<b>Creep</b>	0.1% of N.L. after 30 min.
<b>Response time</b>	<1 ms (within 10 to 90% of F.S.)
<b>Overload</b>	
<b>Limit load</b>	150% of N.L.
<b>Breaking load</b>	max. >300% of N.L.
<b>Dynamic load</b>	±50% of N.L. acc. to DIN 50100
<b>Vibration resistance</b>	20g 100h, 50...150 Hz acc. to DIN EN 60068-2-6
<b>Material</b>	Stainless steel (1.4542)
<b>Mounting</b>	2 x metric threads (see dimensions)
<b>Temperature ranges</b>	
<b>Nominal</b>	-20°C...+80°C
<b>Service</b>	-40°C...+80°C
<b>Storage</b>	-40°C...+85°C

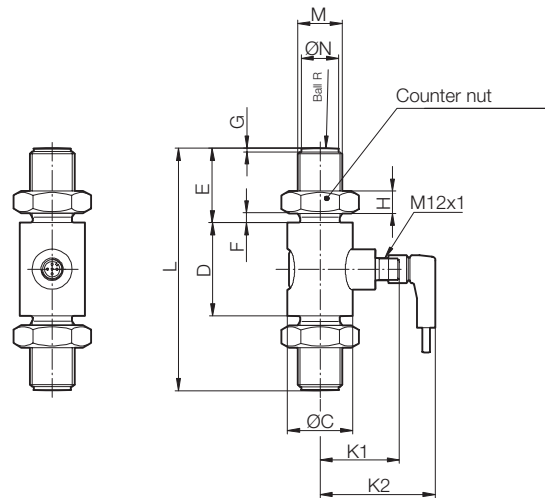
<b>Temperature influence</b>	±0.2% / 10K for zero and span
<b>Power supply</b>	10...30 VDC – 4-20mA 14...30 VDC – 0...10V
<b>Power consumption</b>	4-20mA signal current 0-10VDC, ca. 8mA
<b>EMC</b>	Emission acc. to EN61326 Interference acc. to EN61326
<b>Protection</b>	IP67 acc. to EN 60 259/IEC 529
<b>Electrical connection</b>	M12x1.4pin
<b>Electrical protection</b>	Reverse polarity, overvoltage and short circuit
<b>Weight</b>	From 0.11kg up to 12kg

### Dimensions

Range 0...1 kN to 0...30 kN

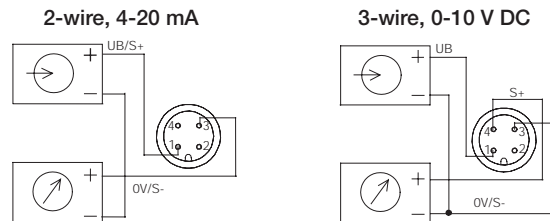


Range 0...50 kN to 0...500 kN



kN	A/ØC	B	D	E	F	G	H	J	K1	K2	L	M	ØN <sub>-0,1</sub>	Ball radius R	M <sub>A</sub> (Nm)
1	25.2	22	24	23	4.3	1.5	6	59	43	62	70	M12	9,5	60	60
2	25.2	22	24	23	4.3	1.5	6	59	43	62	70	M12	9,5	60	60
3	25.2	22	24	23	4.3	1.5	6	59	43	62	70	M12	9,5	60	60
5	25.2	22	24	23	4.3	1.5	6	59	43	62	70	M12	9,5	60	60
10	25.2	22	31	23	4.3	1.5	6	59	43	62	77	M12	9,5	80	60
20	25.2	26	33	34	3.8	2	10	59	43	62	101	M20x1,5	17	100	300
30	27.5	27.5	40	34	3.8	2	10	61.5	44	63	108	M20x1,5	17	120	300
50	35	-	50	40	5	2	12	-	43	62	130	M24x2	20	150	500
100	54	-	54	68	10	3	19.5	-	44	64	190	M39x3	34	200	2500
200	67	-	67	82	12	3	22.5	-	45	65	231	M45x3	40	250	4000
300	73	-	73	98	14	3	28	-	49	69	269	M56x4	50	300	6000
500	94	-	94	113	17	3	32	-	59	79	320	M64x4	58	400	9000

## Wiring connections

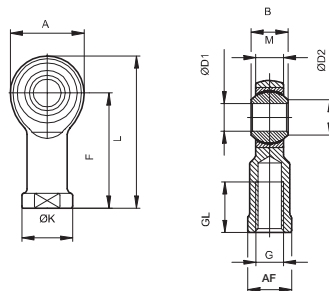


## Ordering information

Range	Part number					
	Tension 4-20 mA	0-10 V	Compression 4-20 mA	0-10 V	Tension/compression 4-20 mA	0-10 V
0...1 kN	3540102002	3540102102	3560102002	3560102102	3550102002	3550202102
0...2	3540202002	3540202102	3560202002	3560202102	3550202002	3550202102
0...3	3540302002	3540302102	3560302002	3560302102	3550302002	3550302102
0...5	3540502002	3540502102	3560502002	3560502102	3550502002	3550502102
0...10	3540103002	3540103102	3560103002	3560103102	3550103002	3550103102
0...20	3540203002	3540203102	3560203002	3560203102	3550203002	3550203102
0...30	3540303002	3540303102	3560303002	3560303102	3550303002	3550303102
0...50	3540503002	3540503102	3560503002	3560503102	3550503002	3550503102
0...100	3540104002	3540104102	3560104002	3560104102	3550104002	3550104102
0...200	3540204002	3540204102	3560204002	3560204102	3550204002	3550204102
0...300	3540304002	3540304102	3560304002	3560304102	3550304002	3550304102
0...500	3540504002	3540504102	3560504002	3560504102	3550504002	3550504102

## Accessory

### Swivel head



Range	Weight (kg)	A	B	ØD1	ØD2	F	G	GL	ØK	L	M	AF
2...10 kN	0.115	32	16	12	15,4	50	M12	22	22	66	12	19
20...30 kN	0.415	50	25	20	24,3	77	M20x1,5	33	34	102	18	32
50 kN	0.750	60	31	25	29,6	94	M24x2	42	42	124	22	36
100 kN	2	92	28	40	45	142	M39x3	65	65	188	23	55
200 kN	3.5	112	35	50	56	160	M45x3	68	75	216	30	65
300 kN	8.6	160	49	70	77,9	200	M56x4	80	98	280	42	85
500 kN	12	180	55	80	89,4	230	M64x4	85	110	320	47	100

## Ordering information

Thread	Part number	
	Steel	Stainless steel
M12	ZK01010018	ZK01010011
M20x1.5	ZK01010019	ZK01010012
M24x2	ZK01010020	ZK01010013
M39x3	ZK01010014	-
M45x3	ZK01010015	-
M56x4	ZK01010016	-
M64x4	ZK01010017	-

### Special versions

- 2 mV/V output part number 35x0xxx4xx
- 0.5...4.5V ratiometric output (0...5VDC supply)
- SIL3 approval
- Other connections and ranges available

## Load pin with analogue output



- Force range from 0...5 kN to 0...200 kN
- Stainless steel
- Accuracy 2% or 0.5%
- 4-20mA, 0-10VDC or switch output

### Technical specification

<b>Output signal</b>	4...20mA, 0...10VDC
<b>Accuracy</b>	Model 3510: <2% of F.S. value Model 3511: <0.5% of F.S. value
<b>Hysteresis</b>	Model 3510: <0.5% of F.S. value Model 3511: <0.2% of F.S. value
<b>Creep</b>	0.1% of N.L. after 30 min.
<b>Response time</b>	<1 ms (within 10-90% of F.S.)
<b>Overload</b>	
<b>Limit load</b>	150% of N.L.
<b>Breaking load</b>	>300% of N.L.
<b>Dynamic load</b>	±50% of N.L. acc. to DIN 50100
<b>Vibration resistance</b>	20 g, 100 h, 50...150 Hz acc. to DIN EN 60068-2-6
<b>Material</b>	Stainless steel

### Temperature ranges

<b>Nominal</b>	-20°C...+80°C
<b>Service</b>	-40°C...+80°C
<b>Storage</b>	-40°C...+85°C
<b>Temperature influence</b>	±0.2% / 10K for zero and span

<b>Power supply</b>	10...30 VDC – 4-20mA 14...30 VDC – 0...10V
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<b>Power consumption</b>	4-20mA signal current 0-10VDC, ca. 8mA
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### EMC

Emission acc. to EN61326
Interference acc. to EN61326

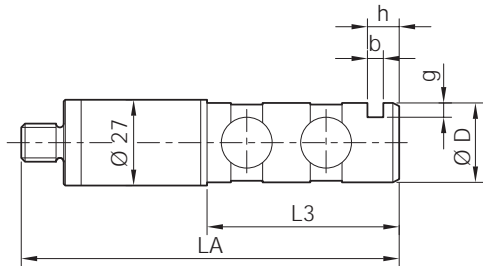
<b>Protection</b>	IP67 acc. to EN 60 529/IEC 529
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<b>Electrical connection</b>	M12x1.4pin
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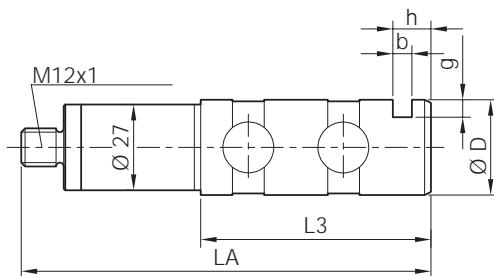
<b>Electrical protection</b>	Reverse polarity, overvoltage and short circuit
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### Dimensions

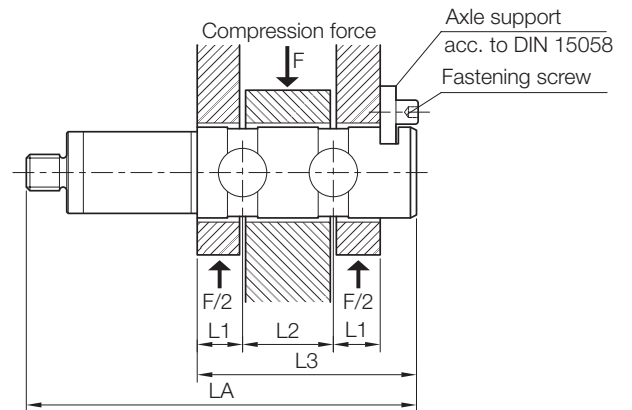
Range 0...5 kN to 0...10 kN



Range 0...20 kN to 0...200 kN

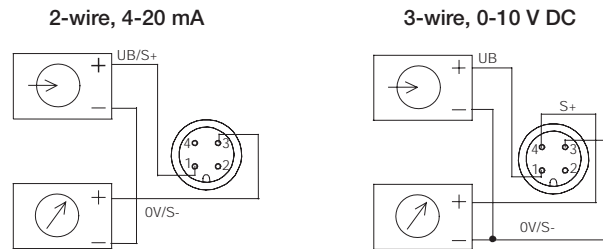


Mounting position in fork bearing



kN	ØD	LA	L1	L2	L3	a	b	c1	c2	Ød	f	g	h
5	20	105	10	20	50,5	20	5	60	36	9	16	4	10
10	25	115	12,5	25	60,5	20	5	60	36	9	18	4,5	10
20	30	125	15	30	72,5	25	6	80	50	11	22	5,5	12
30	35	135	17,5	35	82,5	25	6	80	50	11	24	6	12
50	40	150	22,5	40	97,5	25	6	80	50	11	26	6,5	12
100	50	165	23	50	112,5	30	8	100	70	13	33	7	16
200	70	213	35	70	160,5	40	10	140	100	17	45	10	20

## Wiring connections



## Ordering information

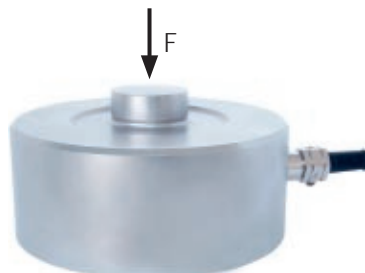
Model 3510 (2 %)	Part number	
	4-20 mA	0-10 V
0...5 kN	3510502002	3510502102
0...10	3510103001	3510103101
0...20	3510203001	3510203101
0...30	3510303001	3510303101
0...50	3510503001	3510503101
0...100	3510104001	3510104101
0...200	3510204001	3510204101

Model 3511 (0.5 %)	Part number	
	4-20 mA	0-10 V
0...5 kN	3511502002	3511502102
0...10	3511103001	3511103101
0...20	3511203001	3511203101
0...30	3511303001	3511303101
0...50	3511503001	3511503101
0...100	3511104001	3511104101
0...200	3511204001	3511204101

### Special versions

- 2 PNP or NPN switched outputs
- SIL3 approval
- CANopen option
- Other dimensions and outputs available

Model 3087

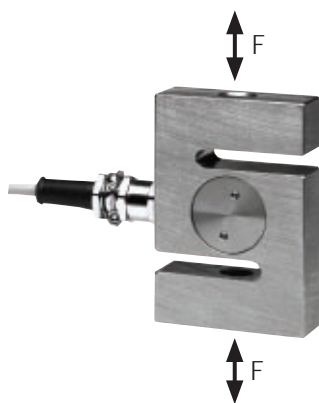


## Load cell (for compression)

### Technical specification

Range	0...0.1 to 0...1000 kN
Output signal	2.0 mV/V
Power supply	2...12V (max. 15V)
Accuracy	<0.2% of F.S.
Material	Stainless steel
Nominal temperature	-10°C...+70°C
Protection	IP67

Model 3089

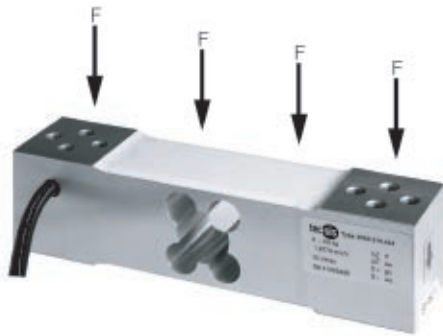


## S type, (for tension/compression)

### Technical specification

Range	0...0.02 to 0...50 kN
Output signal	2.0 mV/V Option 4...20mA / 0...10V
Power supply	2...12V (max. 15V)
Accuracy	<0.2% of F.S.
Material	Stainless steel
Nominal temperature	-10°C...+70°C
Protection	IP67

Model 3060



Single point load cell  
(for compression)

#### Technical specification

Range	0...0.006 to 0...2.0 kN
Output signal	2.2 mV/V
Power supply	10V (max. 15V)
Accuracy	<0.025% of F.S.
Material	Aluminium
Nominal temperature	-10°C...+40°C
Protection	IP65

Model 3096



Shear beam  
(for compression)

#### Technical specification

Range	0...5.0 to 0...100 kN
Output signal	1.8...2.2 mV/V
Power supply	10V (max. 15V)
Accuracy	<0.2% of F.S.
Material	Stainless steel
Nominal temperature	-10°C...+40°C
Protection	IP67

Model 3555



S type with adjustable measuring range (for tension/compression)

**Technical specification**

<b>Range</b>	0.75...2.0 to 2...50 kN
<b>Output signal</b>	4-20mA or 0-10V
<b>Power supply</b>	10...30VDC for 4-20mA 14...30VDC for 0-10V
<b>Accuracy</b>	<0.2% of F.S.
<b>Material</b>	Stainless steel
<b>Nominal temperature</b>	-20°C...+80°C
<b>Protection</b>	IP67

Model KPS 35

Chain hoist testing kit



**Technical specification**

<b>Range</b>	40...3,500 kg
<b>Accuracy</b>	<1 kg
<b>Handheld indicator</b>	
<b>Display</b>	5 digit LCD display
<b>Battery life</b>	8 hours (per recharge)
<b>Display functions</b>	MIN, MAX, HOLD, Average, Tare, light
<b>Storage function</b>	99 data sets
<b>Weight</b>	<7 kg
<b>Chain adapter and sleeves</b>	2 pieces for chain size from 3x9mm up to 11x31mm acc. to EN 818-2) and 3x center sleeves
<b>Temperature range</b>	-20°C...+60°C
<b>Protection</b>	Force transducer IP67, indicator IP40



## Attachable display for M12 connection

- 4 digit LED, 7mm high
- For mA and V-signals
- Bottom or rear connection
- 2 transistorised outputs
- Signal supplied by analogue loop
- IP65

### Ordering information

Output	Connection	Part number
0-10V	Rear	<b>ZE55002003</b>
0-10V	Bottom	<b>ZE55002005</b>
4-20mA	Rear	<b>ZE55002007</b>
4-20mA	Bottom	<b>ZE55002009</b>



## Panel mount display

- 5 digit LED, 14mm high
- For mV/V and V-signals
- Choice of 2 or 4 limit values and/or 4-20mA or 0-10V outputs
- Min/max value display
- Power supply 85...250VDC
- IP65 (front panel)

### Ordering information

Output	Part number
mv/V	<b>1930400030</b>
(0) 4-20mA or 0-10VDC	<b>1931400030</b>
(0) 4-20mA or 0-10VDC, 2 channel	<b>1931402030</b>



## Portable handheld instrument

- 4 1/2 digit LDC display
- For load cells with mV/V signal
- Integrated battery charger
- Maximum value memory
- Automatic switch off, 15 minutes
- Calibration control switch
- Signal conversion switch
- IP40

### Ordering information

Part number
<b>3906100001</b>



Model 3099



Compact version  
(for compression)

**Technical specification**

Range	0...160 N to 0...320 kN
Area cm <sup>2</sup>	10-80
Accuracy	<1.6% of F.S.
Material	Stainless steel
Nominal temperature	-25°C ... +50°C

Model 3099.030



For measurement in  
small gaps  
(for compression)

**Technical specification**

Range	0...250 N to 0...36 kN
Accuracy	<1.6% of F.S.
Material	Stainless steel
Nominal temperature	-10°C ... +50°C

Model 3099.001



For level measurement with  
electrical output  
(for compression)

**Technical specification**

Range	0...50 kg to 0...8000 kg
Output	4-20mA
Power supply	8...30VDC
Accuracy	<1.0% of F.S.
Material	Stainless steel
Nominal temperature	-25°C ... +85°C

Model 3081-3084



Heavy duty version  
(for compression)

#### Technical specification

Range	0...0.1 kN to 0...2500 kN
Area cm <sup>2</sup>	10-250
Accuracy	<1% of F.S.
Material	Stainless steel
Nominal temperature	-25°C ... +90°C

Model 3085



Ring version  
(for compression)

#### Technical specification

Range	0...0.4 N to 0...2500 kN
Area cm <sup>2</sup>	40-410
Accuracy	<1% of F.S.
Material	Stainless steel
Nominal temperature	-25°C ... +90°C

Model 3099.010



Compact ring version  
(for compression)

#### Technical specification

Range	0...160 N to 0...120 kN
Area cm <sup>2</sup>	10-20
Accuracy	<1.6% of F.S.
Material	Stainless steel
Nominal temperature	-10°C ... +50°C