

Compression force transducer with strain gauges

For rated forces up to 500,000 lb [2,224 kN]

Model F1227

WIKA data sheet FO 51.62



For further approvals,
see page 4

Applications

- Equipment manufacturing
- Production lines and plants
- Measuring and control systems
- Automation technology
- Fixture construction and special machine building

Special features

- Rated forces from 0 ... 5 lb to 0 ... 500,000 lb
[0 ... 22.24 N to 0 ... 2,224 kN]
- For static and dynamic measurement
- Force introduction via the spherical cap
- Compression calibration
- Robust design, easy integration, long-term stability



Compression force transducer, model F1227

Description

The model F1227 compression force transducer with strain gauges offers high accuracy and is suitable for both static and dynamic force measurement in the direct force flow.

The spherical cap with spherical surface, also known as load introduction button, serves to absorb compression forces and ensures axial, perpendicular and centred force introduction. The force is thus transmitted centrally and evenly into the instrument. This enables precise measurement of the actual compression forces in a wide variety of applications.

The measuring spring is elastically deformed by a compression force introduced in the force direction. The resulting mechanical tensions are measured by the strain gauges, converted into an electrical output signal and output as an mV/V signal.

With its robust design, the instrument ensures excellent stability and durability under high loading and is ideally suited for harsh operating conditions in industrial automation, test bench construction as well as production plants.

Due to its low installation height, the instrument is suitable for use in confined mounting situations and can be easily integrated into existing plants.

The tightly hermetically sealed instrument made of stainless steel is splash-proof and guarantees reliable operation even under harsh operating conditions.

Specifications

Basic information	
Standard	In accordance with directive VDI/VDE/DKD 2638
Material of the measuring body	Stainless steel
Ingress protection (per DIN IEC/EN 60529)	IP66
Weight	Approx. 6 ... 14 lb [approx. 2,722 ... 6,350 g]

Measuring element	
Type of measuring element	Strain gauges
Range of use	For static or dynamic force measurement
Input resistance R_e	350 Ω
Output resistance R_a	350 Ω
Rated displacement s_{nom}	< 0.004 in [< 0.1 mm]
Force introduction	Compression force on spherical cap

Accuracy specifications	
Relative linearity error d_{lin}	
Rated force ≤ 25 lb [≤ 0.111 kN]	± 0.2 % F_{nom}
Rated force ≥ 50 lb [≥ 0.222 kN]	± 0.1 % F_{nom}
Relative reversibility error v	
Rated force ≤ 25 lb [≤ 0.111 kN]	± 0.1 % F_{nom}
Rated force ≥ 50 lb [≥ 0.222 kN]	± 0.08 % F_{nom}
Relative repeatability error in unchanged mounting position b_{rg}	
Rated force ≤ 25 lb [≤ 0.111 kN]	± 0.1 % F_{nom}
Rated force ≥ 50 lb [≥ 0.222 kN]	± 0.03 % F_{nom}
Relative deviation of zero signal $d_{s,0}$	$\leq \pm 1$ % F_{nom}
Temperature effect on zero signal TC_0	$\leq \pm 0.05$ % / 10 K
Temperature effect on characteristic value TC_C	$\leq \pm 0.05$ % / 10 K

Measuring ranges, rated force F_{nom}

lb	
5	50,000
25	100,000
50	150,000
1,000	200,000
2,000	300,000
5,000	400,000
7,500	500,000
30,000	

kN [N]	
0.0222 [22.24 N]	222.41
0.111 [111.21 N]	444.82
0.222 [222.4 N]	667.24
4.448	889.65
8.896	1,334.5
22.24	1,779
33.36	2,224
133.45	

Measuring ranges, rated load F_{nom}

kg	
2.268	22,680
11.34	45,359
22.68	68,039
453.6	90718,5
907	136,078
2,268	181,437
3,402	226,796
13,608	

Further details on the rated force	
Force limit F_L	150 % F_{nom}
Breaking force F_B	> 300 % F_{nom}
Vibration stress F_{rb} per DIN 50100	70 % F_{nom}

Output signal	
Rated characteristic value C_{nom}	
Rated force ≤ 25 lb [≤ 0.111 kN]	2 mV/V ± 0.50 % F_{nom}
Rated force ≥ 50 lb [≥ 0.222 kN]	3 mV/V ± 0.50 % F_{nom}
Voltage supply	DC 10 V (max. DC 15 V) for mV/V output

Electrical connection	
Connection type	
Rated force $\leq 5,000$ lb [22.24 kN]	Circular connector, PTIH-10-6P
Rated force > 5,000 lb [22.24 kN]	Circular connector, MS3102E-14S-6P → Customer-specific cable outlet on request
Cable length	39.37 in [1 m]
Insulation resistance R_{is}	> 2 G Ω
Material of the electrical connection at cable output	
Rated force $\leq 5,000$ lb [22.24 kN]	PVC
Rated force > 5,000 lb [22.24 kN]	PUR

Circular connector		
		6-pin
	Exc ₊	A, B
	Exc ₋	C, D
	Sig ₋	E
	Sig ₊	F

Legend

Exc₊ Positive excitation voltage Sig₊ Positive signal output
Exc₋ Negative excitation voltage Sig₋ Negative signal output

Operating conditions	
Rated temperature range $B_{T, nom}$	-65 ... +250 °F [-54 ... +121 °C] → Other rated temperature ranges on request
Compensated rated temperature range	59 ... 159.8 °F [15 ... 71 °C]
Operating temperature range $B_{T, G}$	-65 ... +250 °F [-54 ... +121 °C]
Reference temperature T_{ref}	73 °F [23 °C]
Storage temperature range	-65 ... +250 °F [-54 ... +121 °C]
Humidity	35 ... 85 % relative humidity
Condensation	Non-condensing
Operating altitude	$\leq 8,202$ ft [2,500 m] above sea level

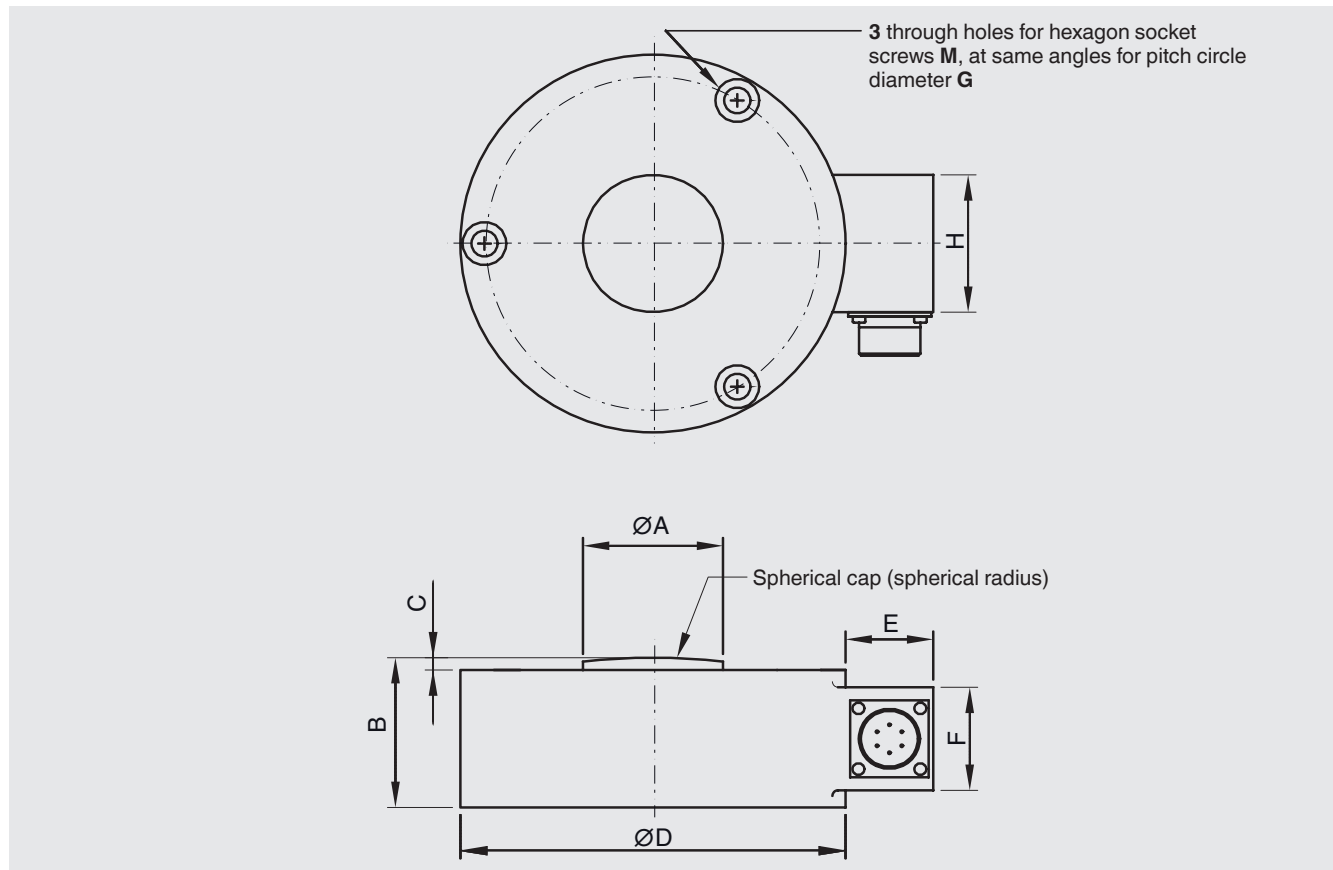
Packaging and instrument labelling	
Packaging	Individual packaging
Instrument labelling (product label)	→ See operating instructions 14505085

Approvals

Logo	Description	Region
	EU declaration of conformity	European Union
	RoHS directive	
	EAC	Eurasian Economic Community
	RoHS directive	

→ For approvals and certificates, see website

Dimensions in Inch [mm]



Rated load/force F_{nom}			Dimensions in inch								
lb	kg	kN [N]	$\varnothing A$	B	C	$\varnothing D$	E	F	$\varnothing G$	H	M
5 ... 25	2.268 ... 11.34	22.24 N ... 111.12 N	2.50	0.98	0.018	0.37	0.82	0.75	2.00	38.1	[1/8]
50 ... 1,000	22.68 ... 453.6	222.41 N ... 4,448 N	3.00	1.18	0.018	0.56	0.82	0.75	2.25	38.1	[1/4]
2,000 ... 5,000	907 ... 2,268	8.896 ... 22.24 kN	3.50	1.18	0.018	0.69	0.82	0.75	2.62	38.1	[5/16]
7,500 ... 30,000	3,402 ... 13,608	33.36 ... 133.45 kN	4.50	2.00	0.018	1.50	1.25	1.50	3.79	50.8	[3/8]
50,000 ... 100,000	22,680 ... 45,359	222.41 ... 444.82 kN	4.50	2.00	0.018	1.50	1.25	1.50	3.79	50.8	[3/8]
150,000 ... 200,000	68,039 ... 90,719	667.24 ... 889.65 kN	5.50	2.18	0.018	2.00	1.25	1.50	4.81	50.8	[3/8]
300,000	136,078	1,334.5 kN	7.0	2.68]	0.018	2.50	1.25	1.50	6.00	50.8	[3/8]
400,000	181,437	1,779 kN	7.50	2.68	0.018	2.50	1.25	1.50	6.75	50.8	[3/8]
500,000	226,796	2,224 kN	11.0	4.50	0.018	4.75	1.25	1.50	9.50	50.8	[3/4]

Rated load/force F_{nom}			Dimensions in mm								
lb	kg	kN [N]	ØA	B	C	ØD	E	F	ØG	H	M
5 ... 25	2.268 ... 11.34	22.24 N ... 111.12 N	63.5	24.89	0.46	9.40	20.83	19.1	50.8	38.1	[1/8]
50 ... 1,000	22.68 ... 453.6	222.41 N ... 4,448 N	76.2	29.97	0.46	14.2	20.83	19.1	57.15	38.1	[1/4]
2,000 ... 5,000	907 ... 2,268	8.896 ... 22.24 kN	88.9	29.97	0.46	17.5	20.83	19.1	66.68	38.1	[5/16]
7,500 ... 30,000	3,402 ... 13,608	33.36 ... 133.45 kN	114.3	50.8	0.46	38.1	31.75	38.1	96.27	50.8	[3/8]
50,000 ... 100,000	22,680 ... 45,359	222.41 ... 444.82 kN	114.3	50.8	0.46	38.1	31.75	38.1	96.27	50.8	[3/8]
150,000 ... 200,000	68,039 ... 90,719	667.24 ... 889.65 kN	139.7	55.37	0.46	50.8	31.75	38.1	122.2	50.8	[3/8]
300,000	136,078	1,334.5 kN	177.8	68.07	0.46	63.5	31.75	38.1	152.4	50.8	[3/8]
400,000	181,437	1,779 kN	190.5	68.07	0.46	63.5	31.75	38.1	171.5	50.8	[3/8]
500,000	226,796	2,224 kN	279.4	114.3	0.46	120.7	31.75	38.1	214.3	50.8	[3/4]

Ordering information

Model / Material / Accuracy / Rated force / Output signal / Electrical connection / Operating conditions / Approvals / Dimensions

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