

Compression force transducer with strain gauges

Miniature design for rated forces from 250 lb [1.112 kN]

Model F1224

WIKA data sheet FO 51.12



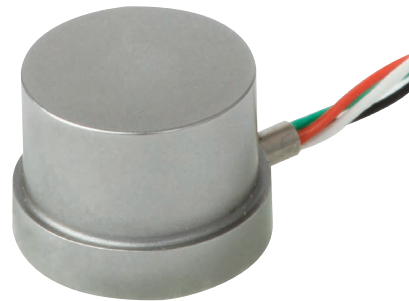
For further approvals,
see page 4

Applications

- Equipment manufacturing
- Production lines and plants
- Measuring and control plants
- Automation technology and experimental setups
- Monitoring of press-fit and joining forces

Special features

- Rated forces from 0 ... 250 lb to 0 ... 100,000 lb
[0 ... 1.112 kN to 0 ... 444.82 kN]
- For static and dynamic measurement
- Force introduction via the spherical cap
- Compression calibration
- Compact miniature design, low installation height



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Compression force transducer, model F1224

Description

The model F1224 compression force transducer in miniature design with strain gauges 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.

Thanks to its very compact miniature design, the instrument is particularly suitable for use in confined installation situations. It can be mounted both horizontally and vertically.

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)	IP65
Weight	Approx. 0.168 lb [approx. 76 g]

Measuring element	
Type of measuring element	Strain gauges
Range of use	For static and dynamic measurement
Input resistance R_e	350 Ω
Output resistance R_a	350 Ω
Rated displacement s_{nom}	< 0.002 in [< 0.05 mm]
Force introduction	Compression force on spherical cap

Accuracy specifications	
Relative linearity error d_{lin}	$\pm 1 \% F_{nom}$
Relative reversibility error v	$\pm 0.25 \% F_{nom}$
Relative repeatability error in unchanged mounting position b_{rg}	$\pm 0.1 \% F_{nom}$
Relative deviation of zero signal $d_{s,0}$	$\pm 2 \% F_{nom}$
Temperature effect on zero signal TC_0	$\leq \pm 0.1 \% / 10$ K
Temperature effect on characteristic value TC_C	$\leq \pm 0.1 \% / 10$ K

Measuring ranges, rated force F_{nom}

lb	kN
250	1.112
500	2.224
1,000	4.448
2,000	8.896
3,000	13.34
4,000	17.79
5,000	22.24
7,500	33.36
10,000	44.48
50,000	222.41
100,000	444.82

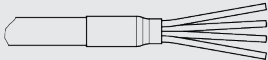
Measuring ranges, rated load F_{nom}

kg
113.4
226.8
453.6
907
1,361
1,814
2,268
3,402
4,536
22,680
45,359

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}	1.5 mV/V
Voltage supply	DC 5 V (max. DC 5 V) for mV/V output

Electrical connection	
Connection type	Cable outlet, shielded → Customer-specific cable outlet on request
Cable diameter	0.114 in / 0.098 in [2.9 mm / 2.5 mm]
Cable length	59.06 in [1.5 m] → Other cable lengths on request
Insulation resistance R_{is}	> 5 G Ω for 50 V
Material	PTFE

Cable outlet, shielded, 4-wire		
	4-wire	
	Exc ₊	Red (RD)
	Exc ₋	Black (BK)
	Sig ₊	White (WH)
	Sig ₋	Green (GN)
	Shield $\oplus$	Green-yellow (GNYE)

Cable colours are only valid when using the standard WIKA cables.

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] High-temperature version up to 482 °F [250 °C]
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	≤ 8,202 ft [2,500 m] above sea level

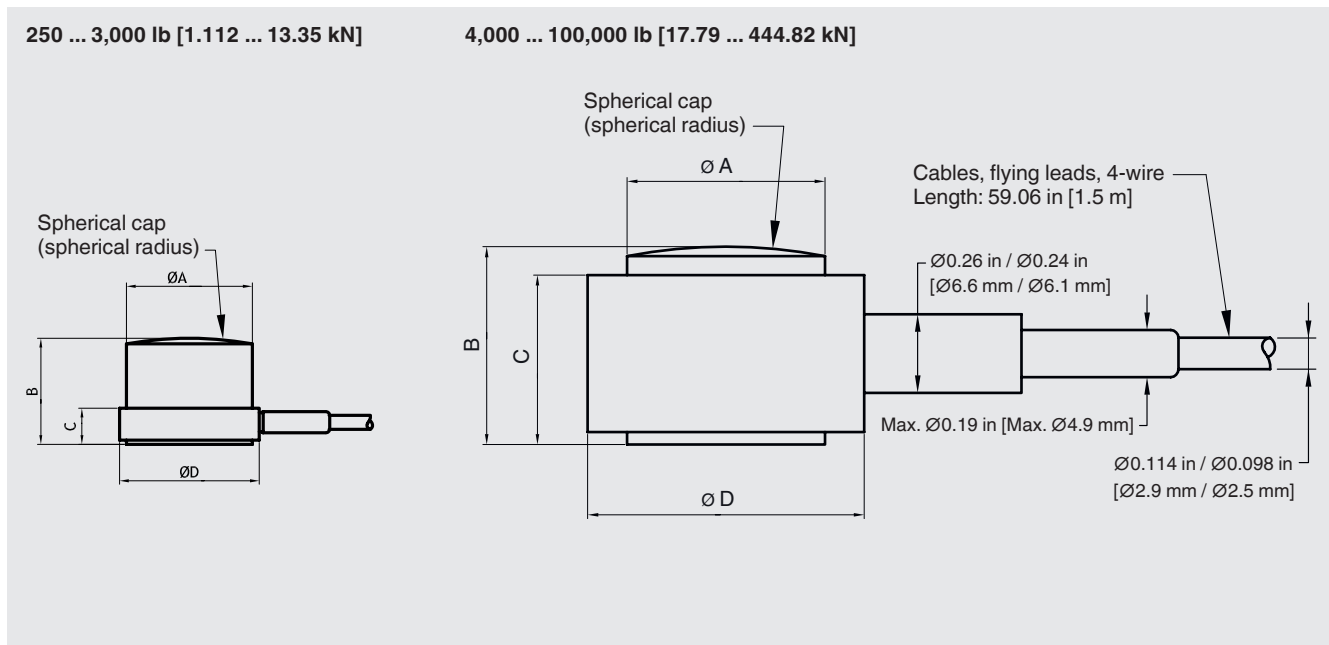
Packaging and instrument labelling	
Packaging	Individual packaging
Instrument labelling (product label)	→ See operating instructions 14505085

Approvals

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

→ For approvals and certificates, see website

Dimensions in Inch [mm]



Rated load/force F_{nom}			Dimensions in Inch			
lb	kg	kN	ØA	B	C	ØD
250	113.4	1.112	0.27	0.37	0.13	0.5
500	226.8	2.224	0.28	0.37	0.13	0.5
1,000	453.6	4.448	0.31	0.37	0.13	0.5
2,000	907	8.896	0.41	0.37	0.13	0.5
3,000	1,361	13.35	0.49	0.6	0.23	0.62
4,000	1,814	17.79	0.53	0.6	0.23	0.62
5,000	2,268	22.24	0.53	0.6	0.23	0.62
7,500	3,402	33.36	0.75	0.63	0.54	0.88
10,000	4,536	44.48	1.25	1.38	1.25	1.75
50,000	22,680	222.41	1.25	1.38	1.25	1.75
100,000	45,359	444.48	1.5	1.63	1.5	2

Rated load/force F _{nom}			Dimensions in mm			
lb	kg	kN	ØA	B	C	ØD
250	113.4	1.112	6.9	9.65	3.3	12.7
500	226.8	2.224	7.1	9.65	3.3	12.7
1,000	453.6	4.448	7.9	9.65	3.3	12.7
2,000	907	8.896	10.4	9.65	3.3	12.7
3,000	1,361	13.35	12.4	15.24	5.8	16.0
4,000	1,814	17.79	13.5	15.24	5.8	16.0
5,000	2,268	22.24	13.5	15.24	5.8	16.0
7,500	3,402	33.36	19.3	16.0	13.7	22.35
10,000	4,536	44.48	31.75	35.1	31.75	44.45
50,000	22,680	222.41	31.75	35.1	31.75	44.45
100,000	45,359	444.82	38.1	41.4	38.1	50.8

Ordering information

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

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