Tension/Compression force transducer with strain gauges
Miniature design, for rated forces up to 1,124 lb [5 kN]
Model F2220

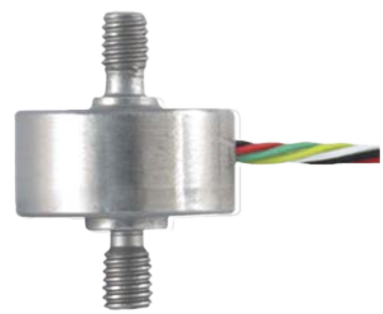
For further approvals, see page 4

Applications

- Equipment manufacturing
- Production lines and plants
- Measuring and control systems
- Fixture construction and special machine building
- Wire rope force measurement

Special features

- Rated forces from 0 ... 2.25 lb to 0 ... 1,124 lb [0 ... 10 N to 0 ... 5 kN]
- For static and dynamic measurement
- Force introduction via threaded bolts
- Tension/Compression calibration
- Compact miniature design, confined mounting situations



Tension/compression force transducer, model F2220

Description

The model F2220 tension/compression force transducer in miniature design with strain gauges is suitable for both static and dynamic force measurement in the direct force flow.

The force introduction is carried out via threaded bolts at both ends of the instrument. The force is thus transmitted centrally and evenly into the instrument. This enables precise measurement of the actual tension or compression forces in a wide variety of applications, for example to determine the actual tension forces in wire ropes or rod systems.

The measuring spring is elastically deformed by a tension or 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 compact miniature design, the instrument is suitable for use in confined mounting situations.

Smart in sensing

Data sheets showing similar products:
Tension/Compression force transducer, strain gauges; model F2221; see data sheet FO 51.26
Tension/Compression force transducer, strain gauges; model F2222; see data sheet FO 51.29
Tension/Compression force transducer, strain gauges; model F2226; see data sheet FO 51.51

Specifications

Basic informations	
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. 0.011 ... 0.066 lb [5 ... 30 g] depending on rated load/force

Measuring element	
Type of measuring element	Measuring spring with strain gauges
Input resistance R_e	350 Ω
Output resistance R_a	350 Ω
Rated displacement s_{nom}	0.002 ... 0.01 in [0.05 ... 0.25 mm]
Force introduction	Threaded bolts

Accuracy specifications	
Relative linearity error d_{lin}	±0.5 % F_{nom}
Relative repeatability error in unchanged mounting position b_{rg}	±0.1 % F_{nom}
Relative reversibility error v	±0.5 % F_{nom}
Relative creep, 30 min at F_{nom}	≤ ±0.1 % F_{nom}
Relative deviation of zero signal $d_{S,0}$	±2 % F_{nom}
Temperature effect on zero signal TC_0	≤ ±0.2 % / 10 K
Temperature effect on characteristic value TC_C	≤ ±0.4 % / 10 K
Reference conditions	
Calibration	Tension/Compression force

Measuring ranges, rated force F_{nom}

lb	N
2.25	10
5	22.24
10	44.48
25	111.21
50	222.41
100	444.82
250	1,112
500	2,224
1,124	5,000

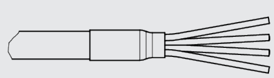
Measuring ranges, rated load F_{nom}

kg
1.02
2.268
4.536
11.34
22.68
45.36
113.4
226.8
453.6

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 2.25 lb [10 N]	1.5 mV/V
Rated force ≥ 5 lb [22.24 N]	2 mV/V
Voltage supply	DC 2 ... 5 V (max. 5 V)

Electrical connection	
Connection type	Cable outlet, shielded
Cable diameter	0.11 ... 0.24 in [2.8 ... 6.1 mm]
Cable length	59.06 in [1.5 m]
Material	PTFE
Insulation resistance R_{is}	> 2 GΩ

Cable outlet, shielded, 4-wire		
		4-wire
	Exc_+	Red (RD)
	Exc_-	Black (BK)
	Sig_+	Green (GN)
	Sig_-	White (WH)
	Shield ⏚	Green-yellow (GNYE)

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

Legend

Exc_+ Positive excitation voltage
Exc_- Negative excitation voltage
Sig_+ Positive signal output
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

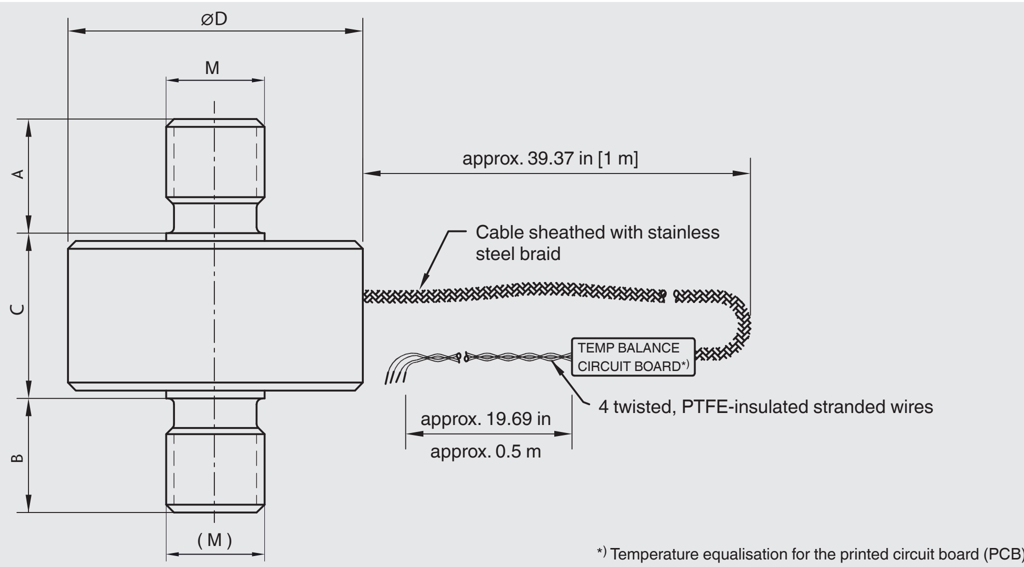
Packaging and instrument labelling	
Packaging	Individual packaging
Instrument labelling (product label)	→ See operating instructions, item number 79106250

Approvals

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

→ For approvals and certificates, see website

Dimensions in inch [mm]



*) Temperature equalisation for the printed circuit board (PCB)

Rated load/force F_{nom}			Dimensions								
			A		B		C		ØD		M
lb	kg	N	in	mm	in	mm	in	mm	in	mm	
2.25	1.02	10	0.189	4.8	0.181	4.6	0.291	7.4	0.5	12.7	M3 x 0.5
5	2.268	22.24	0.189	4.8	0.181	4.6	0.291	7.4	0.5	12.7	M3 x 0.5
10	4.536	44.48	0.189	4.8	0.181	4.6	0.291	7.4	0.5	12.7	M3 x 0.5
25	11.34	111.21	0.189	4.8	0.181	4.6	0.291	7.4	0.5	12.7	M3 x 0.5
50	22.68	222.41	0.189	4.8	0.181	4.6	0.291	7.4	0.5	12.7	M3 x 0.5
100	45.36	444.82	0.189	4.8	0.181	4.6	0.291	7.4	0.5	12.7	M3 x 0.5
250	113.4	1,112	0.311	7.9	0.311	7.9	0.382	9.7	0.752	19.1	M6 x 1
500	226.8	2,224	0.311	7.9	0.311	7.9	0.382	9.7	0.752	19.1	M6 x 1
1,124	453.6	5,000	0.311	7.9	0.311	7.9	0.382	9.7	0.752	19.1	M6 x 1

Ordering information

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

WIKA

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