

# Compression force transducer with strain gauges

## Miniature design for rated forces from 2.25 lb [10 N]

### Model F1222

WIKA data sheet FO 51.11



For further approvals,  
see page 3

#### 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 ... 2.25 lb to 0 ... 1,124 lb [0 ... 10 N to 0 ... 5,000 N]
- For static and dynamic measurement
- Force introduction via the spherical cap
- Compression calibration
- Compact miniature design, low installation height



Compression force transducer, model F1222

Standard  
articles



#### Description

The model F1222 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 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. 0.011 lb [approx. 5 g]

Measuring element	
Type of measuring element	Strain gauges
Range of use	For static and dynamic measurement
Input resistance $R_e$	350 $\Omega$
Output resistance $R_a$	350 $\Omega$
Rated displacement $s_{nom}$	< 0.006 in [ $< 0.015$ mm]
Force introduction	Compression force on the 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 $TC_0$	$\leq \pm 0.2 \% / 10$ K
Temperature effect on characteristic value $TC_C$	$\leq \pm 0.4 \% / 10$ K

## Measuring ranges, rated force $F_{nom}$

lb
2.25
5
10
25
50
100
250
500
1,124

N
10
22.24
44.48
111.21
222.41
444.82
1,112
2,224
5,000

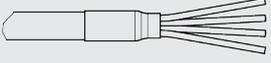
## Measuring ranges, rated load $F_{nom}$

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	
<b>Rated characteristic value <math>C_{nom}</math></b>	
Rated force 2.25 lb [10 N]	1.0 mV/V
Rated force $\geq 5 \dots 1,124$ lb [20 N ... 5 kN]	2.0 mV/V
<b>Voltage supply</b>	DC 5 V (max. DC 5 V) for mV/V output

Electrical connection	
<b>Connection type</b>	Cable outlet, shielded (sheathed with stainless steel braid) → Customer-specific cable outlet on request
<b>Cable length</b>	59.06 in [1.5 m] → Other cable lengths on request
<b>Insulation resistance <math>R_{is}</math></b>	$> 2 \text{ G}\Omega$
<b>Material</b>	PTFE

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

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

#### Legend

Exc<sub>+</sub> Positive excitation voltage    Sig<sub>+</sub> Positive signal output  
 Exc<sub>-</sub> Negative excitation voltage    Sig<sub>-</sub> Negative signal output

Operating conditions	
<b>Rated temperature range <math>B_{T, nom}</math></b>	-65 ... +250 °F [-54 ... +121 °C] High-temperature version up to 482 °F [250 °C]
<b>Compensated rated temperature range</b>	59 ... 159,8 °F [15 ... 71 °C]
<b>Operating temperature range <math>B_{T, G}</math></b>	-65 ... +250 °F [-54 ... +121 °C]
<b>Reference temperature <math>T_{ref}</math></b>	73 °F [23 °C]
<b>Storage temperature range</b>	-65 ... +250 °F [-54 ... +121 °C]
<b>Humidity</b>	35 ... 85 % relative humidity
<b>Condensation</b>	Non-condensing
<b>Operating altitude</b>	$\leq 8,202$ ft [2,500 m] above sea level

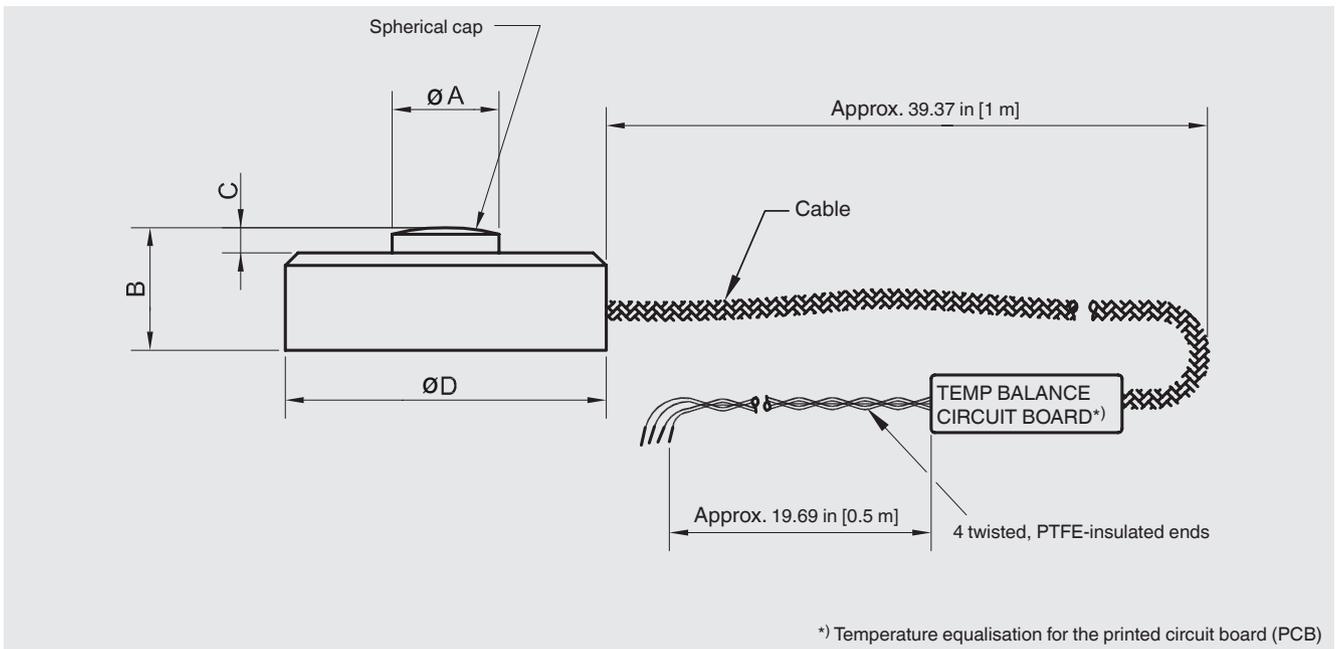
Packaging and instrument labelling	
<b>Packaging</b>	Individual packaging
<b>Instrument labelling (product label)</b>	→ See operating instructions 14505085

## 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	N	$\varnothing A$	B	C	$\varnothing D$
2.25 ... 50	1 ... 22.68	10 ... 222.41	0.09	0.12	0.02	0.38
100 ... 250	51 ... 113.4	444.82 ... 1,112	0.12	0.15	0.02	0.50
500 ... 1,124	204 ... 453.6	2,224 ... 5,000	0.25	0.25	0.02	0.75

Rated load/force $F_{nom}$			Dimensions in mm			
lb	kg	N	$\varnothing A$	B	C	$\varnothing D$
2.25 ... 50	1 ... 22.68	10 ... 222.41	2.3	3.3	0.5	9.7
100 ... 250	51 ... 113.4	444.82 ... 1,112	3.0	3.8	0.5	12.7
500 ... 1,124	204 ... 453.6	2,224 ... 5,000	6.4	6.4	0.5	19.1

### Ordering information

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



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