

# Miniature tension/compression force transducer

## For small measuring ranges from 1.5 N

### Model F2220

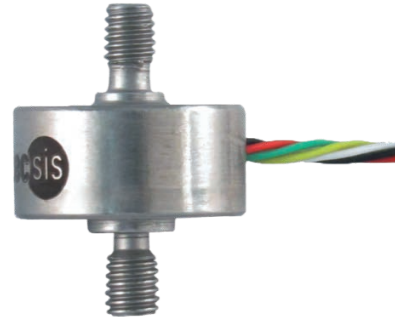
WIKA data sheet FO 51.16

#### Applications

- Construction and apparatus
- Production lines, manufacturing plant
- Measurement and control facilities
- Special equipment and machinery construction
- Cable force measurements

#### Special features

- Measuring ranges 0 ... 1.5 N up to 0 ... 5,000 N
- Ease of assembly
- Small geometries
- Stainless steel version



Miniature tension/compression force transducer,  
model F2220

#### Description

Miniature tension/compression force transducers are designed for static and dynamic measurement tasks in the direct flux of force. They determine the tension and compression forces in a wide scope of applications. It is possible, for example, to measure the actual force in ropes and rods.

The force is applied to this tension/compression force transducers via threaded bolts, which are located on each side of the cylindrical body.

The force transducers is available from a rated force of 1.5 N.

#### Note

To prevent overload, it is advantageous to connect up the force transducer electrically during installation and to monitor the measured value. In mounting the force transducer torsion and bending moments have to be avoided.

The force must be applied axial to the centre. Torsion and bending moments must be avoided.

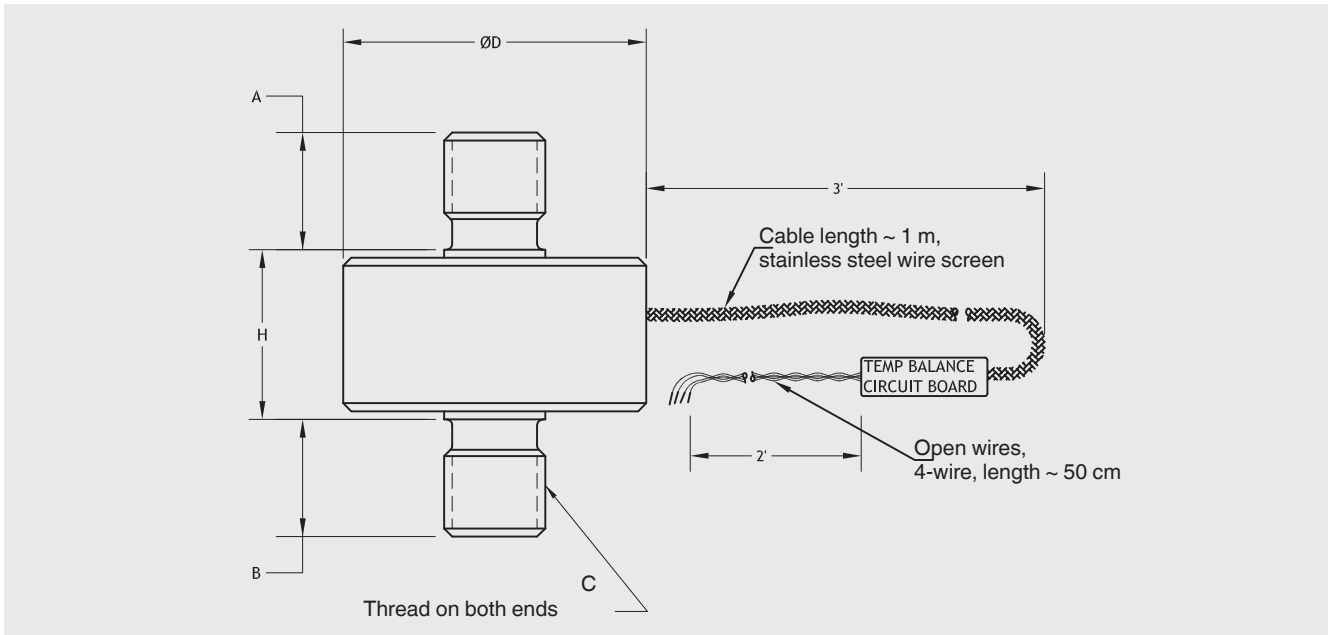
#### Option

- High temperature version up to 250 °C
- Cable amplifier 4 ... 20 mA or DC 0 ... 10 V output
- Other cable length

## Specifications in accordance with VDI/VDE/DKD 2638

| Model F2220  |   |
|--|---|
| Rated force $F_{nom}$ N  | 1.50 / 2.50 / 5 / 10 / 20 / 50 / 100 / 200 / 500 / 1,000 / 2,000 / 5,000  |
| Relative linearity error $d_{lin}$<br>■ Tension or compression       | $\pm 0.5 \% F_{nom}$  |
| Relative creep, 30 min.  | $< \pm 0.1 \% F_{nom}$  |
| Relative reversibility error $v$                                     | $\pm 0.5 \% F_{nom}$  |
| Relative deviation of zero signal $d_{S,0}$                          | $\pm 2 \% F_{nom}$  |
| Relative repeatability error in unchanged mounting position $b_{rg}$ | $\pm 0.1 \% F_{nom}$  |
| Temperature effect on zero signal $TK_0$                             | $< \pm 0.2 \% / 10 K$   |
| Temperature effect on characteristic value $TK_C$                    | $< \pm 0.4 \% / 10 K$   |
| Force limit $F_L$  | $150 \% F_{nom}$  |
| Breaking force $F_B$   | $> 300 \% F_{nom}$  |
| Permissible oscillation stress acc. to DIN 50100 $F_{rb}$            | $70 \% F_{nom}$   |
| Rated displacement $s_{nom}$   | $< 0.1 mm$  |
| Material   | Stainless steel   |
| Rated temperature range $B_{T, nom}$                                 | 15 ... 70 °C (optional 15 ... 120 °C or 15 ... 250 °C)<br>Others on request   |
| Operating temperature range $B_{T, G}$                               | -54 ... +121 °C   |
| Output signal (rated output) $C_{nom}$                               | 2.0 mV/V (up to 5 N: 15 mV/V, from 10 N: 15 mV/V)   |
| Input-/output resistance $R_e/R_a$                                   | 350 $\Omega$ (up to 5 N: 500 $\Omega$ )   |
| Insulation resistance  | $> 2 G\Omega$   |
| Electrical connection  | Cable 1.5 m, open wires, 4-wire   |
| Supply voltage<br>■ Standard<br>■ Option                             | DC 2 ... 5 V (max. 5 V)<br>DC 12 ... 28 V (for optional integrated or cable amplifier mA/V)<br>Integrated or cable amplifier<br>0(4) ... 20 mA<br>DC 0 ... 10 V |
| Protection (acc. to IEC/EN 60529)                                    | IP65  |
| Weight   | 5 g up to 30 g depending on rated force   |
| Calibration (standard)   | Positive in tension   |

## Dimensions

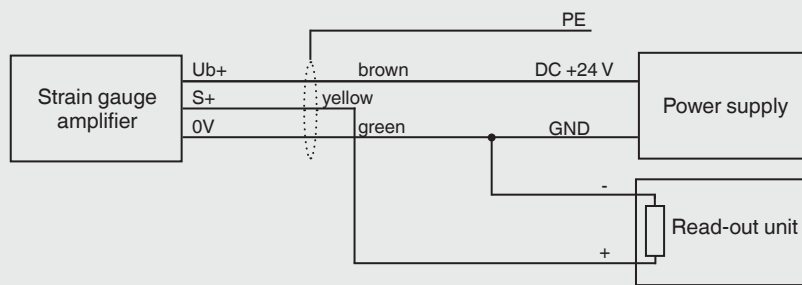


| Rated force<br>in N            | Dimensions in mm |     |     |     |          |
|--------------------------------|------------------|-----|-----|-----|----------|
|                                | $\varnothing D$  | H   | A   | B   | C        |
| 1.5 / 2.5 / 5                  | 12.7             | 7.4 | 4.8 | 4.6 | M3 x 0.5 |
| 10 / 20 / 50 / 100 / 200 / 500 | 12.7             | 7.4 | 4.8 | 4.6 |          |
| 1,000 / 2,000 / 5,000          | 19.1             | 9.7 | 7.9 | 7.9 | M6 x 1.0 |

## Pin assignment

| Electrical connection  |       |
|------------------------|-------|
| Excitation voltage (+) | Red   |
| Excitation voltage (-) | Black |
| Signal (+)             | White |
| Signal (-)             | Green |

### Pin assignment for integrated amplifier or cable amplifier



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