

Ring force transducer

For screw forces up to 1,500 kN

Model F6215

WIKA data sheet FO 51.28

Applications

- Preload force measurement for screw connections
- Plant construction
- Special machine building and tool making
- Measuring and control plants
- Experimental setups

Special features

- Measuring ranges 0 ... 15 kN to 0 ... 1,500 kN
- Measuring washer
- Compact design, easy installation
- Ingress protection IP65
- Relative linearity error 1 % F_{nom}



Ring force transducer, model F6215

Description

Ring force transducers are suitable for static measuring tasks. They serve for determining compression forces in diverse fields of application.

The force transducers in miniature design have been designed specifically for small dimensions and developed for measuring compression and preload forces.

Due to its compactness, this force transducer is usable in the widest range of industrial and laboratory applications. Fields of application include the simple determination of bolt preloads where the force transducer is used as a measuring washer or where a ring geometry in a compact form is needed. The series is designed for screw sizes from M6 (15 kN) up to M52 (1,500 kN).

Note

To avoid overloading, it is advantageous to connect the force transducer electrically during assembly and to monitor the measured value.

The measuring force must be initiated through the centre and without any shear force. When installing the force transducer, care should be taken that the support surface is flat, ground and sufficiently hard. Due to its small geometry, this force transducer reacts very sensitively to changing or different mounting positions. 2 polished adapter discs are supplied as accessories for protection and optimised force introduction.

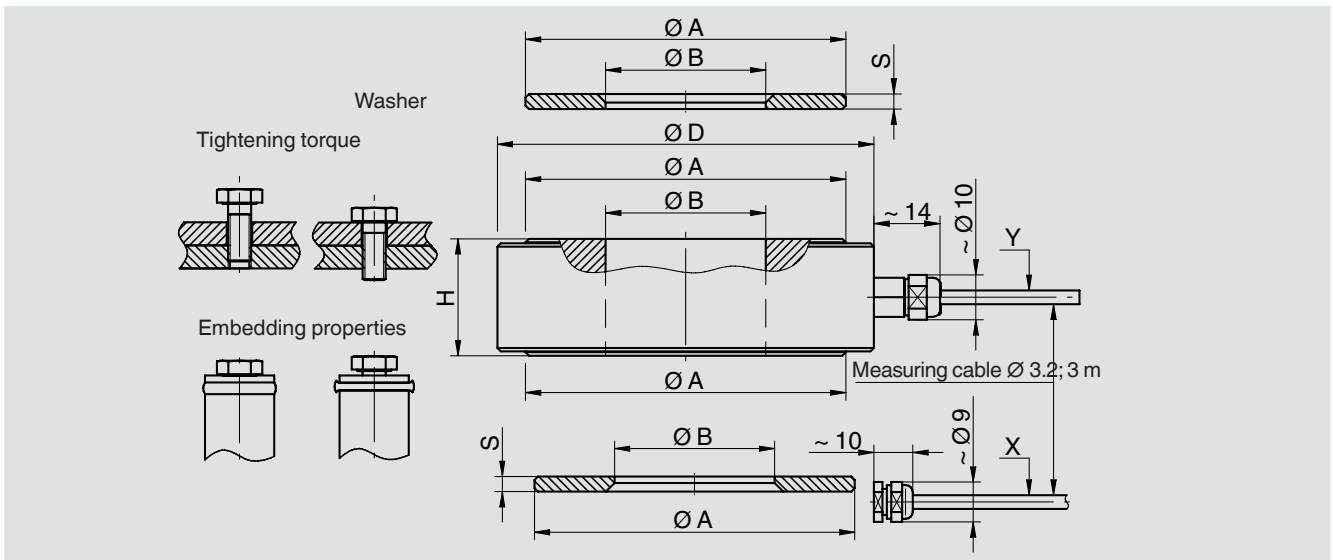
Options

- Control function 100 % signal
- Sensitivity calibration 1 mV/V
- Cable amplifier with 4 ... 20 mA or 0 ... 10 V output

Specifications per VDI/VDE/DKD 2638

| Model F6215 | | | | | | | | | | | | | |
|--|--|----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| Rated force F_{nom} kN | 15 | 30 | 60 | 80 | 120 | 160 | 350 | 500 | 600 | 720 | 1,000 | 1,200 | 1,500 |
| For thread size | M6 | M8 | M10 | M12 | M16 | M20 | M24 | M30 | M36 | M39 | M42 | M48 | M52 |
| Relative linearity error d_{lin} | $\leq \pm 1 \% F_{nom}$ | | | | | | | | | | | | |
| Relative span in unchanged mounting situation b_{rg} | $\leq \pm 0.3 \% F_{nom}$ | | | | | | | | | | | | |
| Relative creep, 30 min. | $\leq \pm 1 \% F_{nom}$ | | | | | | | | | | | | |
| Temperature effect on the zero signal TK_0 | $\leq \pm 0.3 \% / 10 \text{ K}$ | | | | | | | | | | | | |
| Temperature effect on the characteristic value TK_C | $\leq \pm 0.3 \% / 10 \text{ K}$ | | | | | | | | | | | | |
| Limit force F_L | 150 % F_{nom} | | | | | | | | | | | | |
| Breaking force F_B | $> 300 \% F_{nom}$ | | | | | | | | | | | | |
| Permissible vibration loading per DIN 50100 F_{rb} | 70 % F_{nom} | | | | | | | | | | | | |
| Rated displacement s_{nom} | $< 0.1 \text{ mm}$ | | | | | | | | | | | | |
| Material of the measuring body | Stainless steel | | | | | | | | | | | | |
| Rated temperature range $B_{T, nom}$ | $-10 \dots +70 \text{ }^\circ\text{C}$ | | | | | | | | | | | | |
| Service temperature range $B_{T, G}$ | $-30 \dots +80 \text{ }^\circ\text{C}$ | | | | | | | | | | | | |
| Storage temperature range $B_{T, S}$ | $-50 \dots +95 \text{ }^\circ\text{C}$ | | | | | | | | | | | | |
| Reference temperature T_{ref} | 23 $^\circ\text{C}$ | | | | | | | | | | | | |
| Output signal (rated characteristic value) C_{nom} | 1.0 mV/V $\pm 20 \%$ | | | | | | | | | | | | |
| Input-/ Output resistance R_e/R_a | 350 Ω | | | | | | | | | | | | |
| Insulation resistance R_{is} | $> 2 \text{ G}\Omega$ | | | | | | | | | | | | |
| Electrical connection | <ul style="list-style-type: none"> ■ Standard Measuring cable, PUR, 3 m with bare cable ends ■ Option 6-wire | | | | | | | | | | | | |
| Excitation voltage $B_{U, nom}$ | DC 2 ... 6 V | | | | | | | | | | | | |
| Voltage supply | <ul style="list-style-type: none"> ■ Standard DC 12 ... 28 V ■ Option Integrated or cable amplifier 0(4) ... 20 mA DC 0 ... 10 V | | | | | | | | | | | | |
| Ingress protection (per IEC/EN 60529) | IP65 | | | | | | | | | | | | |
| Control function (option) | 100 % signal | | | | | | | | | | | | |
| Weight in kg | <ul style="list-style-type: none"> ■ 15 kN 0.1 ■ 30 kN 0.1 ■ 60 kN 0.2 ■ 80 kN 0.2 ■ 120 kN 0.3 ■ 160 kN 0.3 ■ 350 kN 0.6 ■ 500 kN 0.9 ■ 600 kN 1.1 ■ 720 kN 1.3 ■ 1,000 kN 1.9 ■ 1,200 kN 2.3 ■ 1,500 kN 3.1 | | | | | | | | | | | | |

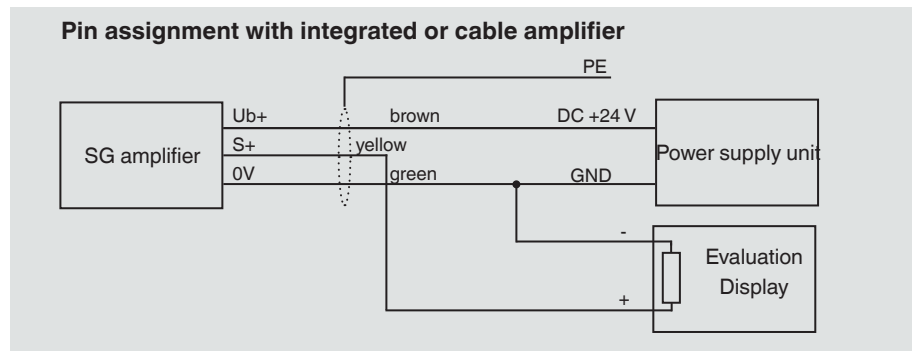
Dimensions in mm



| Rated force in kN | Dimensions in mm | | | | | | | |
|-------------------|------------------|-----|------|-----|----|-----|---|---|
| | For screw | ØA | ØB | ØD | H | S | X | Y |
| 15 | M6 | 12 | 6.3 | 24 | 12 | 2 | X | - |
| 30 | M8 | 16 | 8.3 | 27 | 12 | 2 | X | - |
| 60 | M10 | 22 | 10.3 | 33 | 12 | 2 | X | - |
| 80 | M12 | 26 | 12.3 | 37 | 15 | 2.5 | X | - |
| 120 | M16 | 33 | 16.3 | 44 | 15 | 2.5 | X | - |
| 160 | M20 | 39 | 20.3 | 50 | 15 | 3 | X | - |
| 350 | M24 | 54 | 24.5 | 65 | 22 | 3 | X | - |
| 500 | M30 | 66 | 30.8 | 79 | 27 | 3 | - | X |
| 600 | M36 | 74 | 37 | 87 | 27 | 3.5 | - | X |
| 720 | M39 | 80 | 40 | 93 | 27 | 4 | - | X |
| 1,000 | M42 | 93 | 43 | 106 | 30 | 4 | - | X |
| 1,200 | M48 | 103 | 49 | 116 | 30 | 4.5 | - | X |
| 1,500 | M52 | 114 | 53.5 | 127 | 35 | 4.5 | - | X |

Pin assignment

| Electrical connection | |
|------------------------|--------|
| Excitation voltage (+) | Brown |
| Excitation voltage (-) | Green |
| Signal (+) | Yellow |
| Signal (-) | White |
| Control | Grey |
| Shield ⊕ | Shield |



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