

U10M

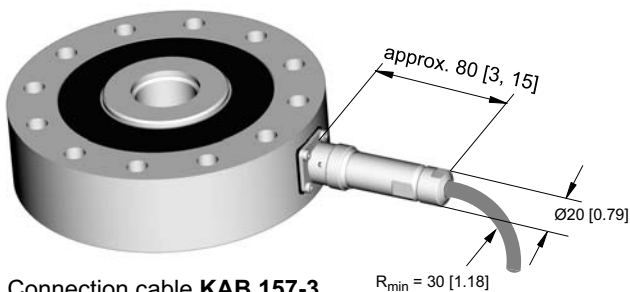
Force Transducer

Special features

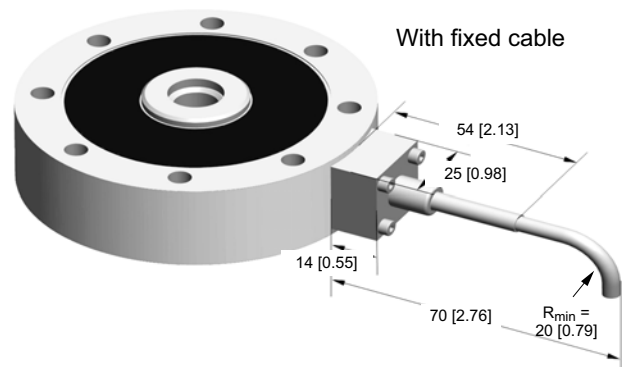
- Precise and robust tensile/compressive force transducer for static and dynamic measurement tasks
- High lateral force and bending moment stability, the effect of the bending moment is electrically compensated
- For forces up to 2.5 MN
- The numerous possible configurations (TEDS, double bridge, various electrical connections, etc.), mean that it can be flexibly adapted to many measurement tasks
- Made of rust-resistant materials, degree of protection IP68 on request
- High fundamental frequency - ideal for measuring fast processes



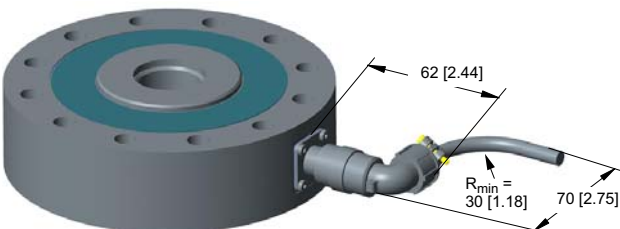
Mounting dimensions of the connection variants in mm [inch]



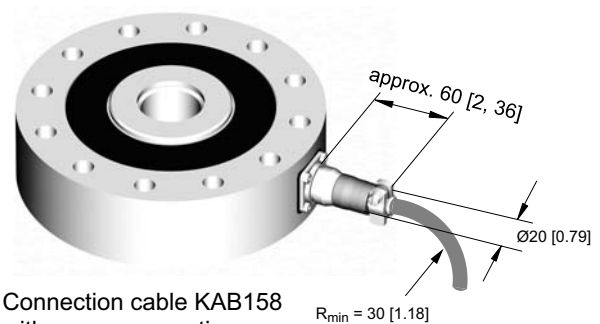
Connection cable **KAB 157-3** with **bayonet connection**, compatible with a MIL-C-26482 series 1 connector



With fixed cable



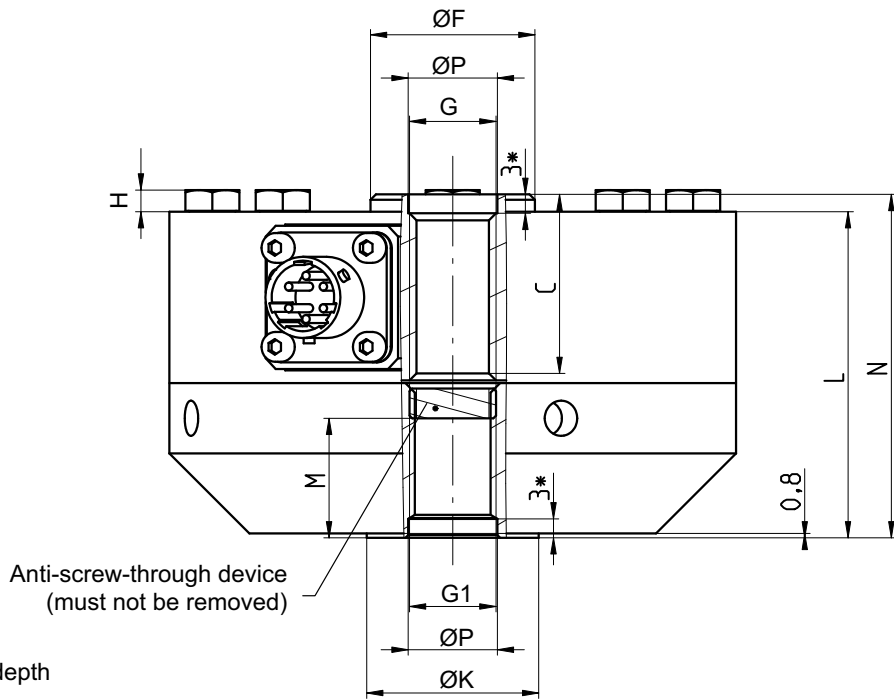
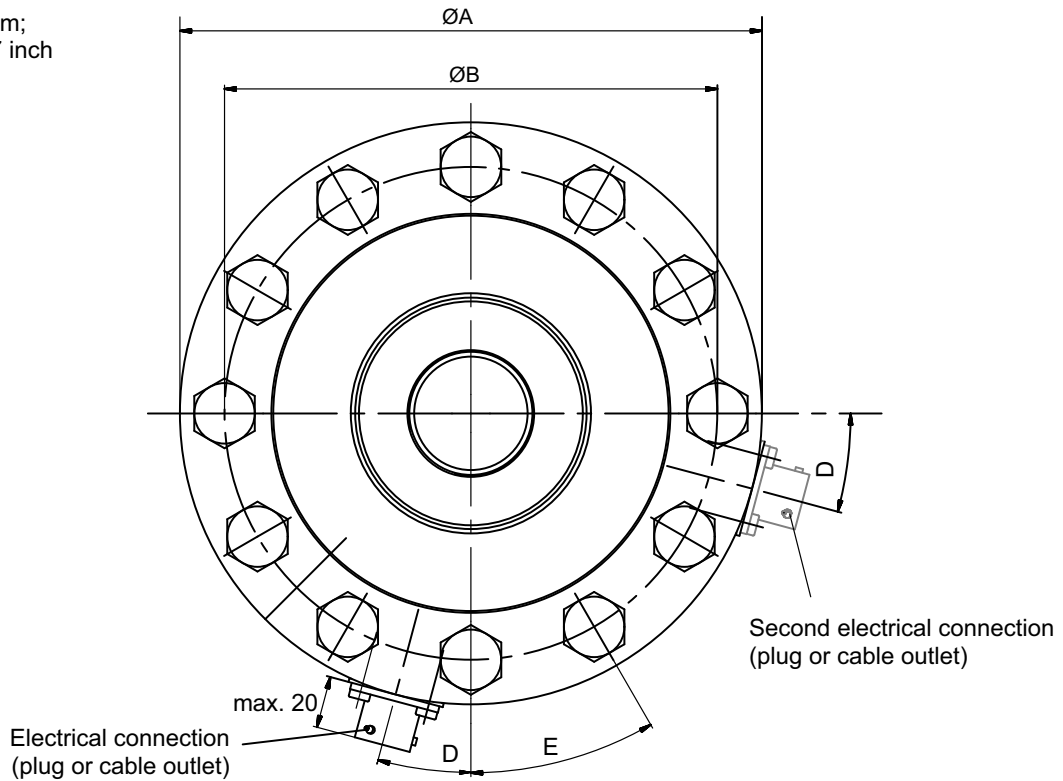
Configurable connection cable "K-CAB-F" with angled bayonet connector option, compatible with a MIL-C-26482 series 1 connector



Connection cable **KAB158** with screw connection, compatible with a MIL-C-26482 series1 connector

Dimensions of U10M with foot adapter

Dimensions in mm;
1 mm = 0.03937 inch



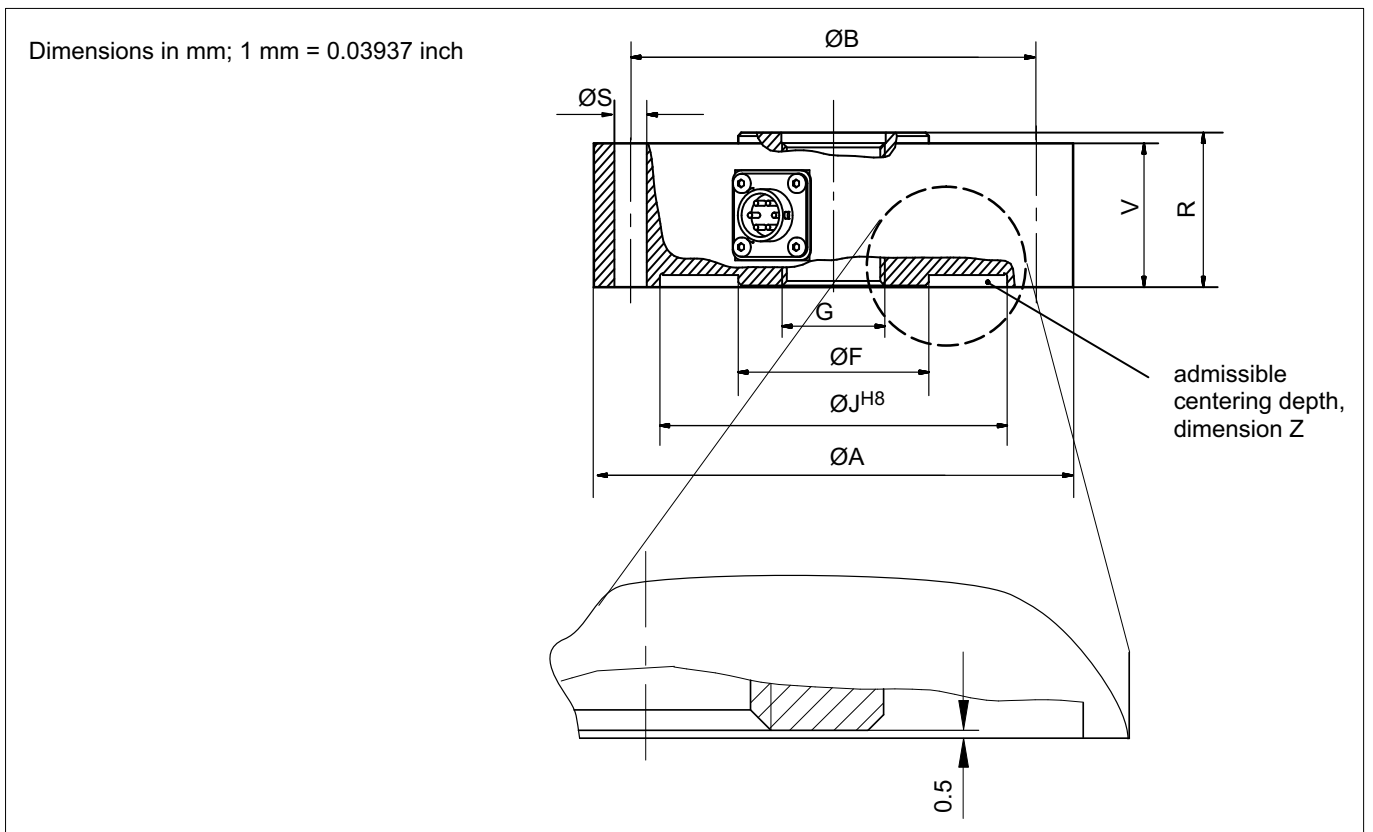
*)maximum centering depth

| Nominal (rated) force | Dimensions in | ØA | ØB | C | D | E | ØF | G | H | M |
|-----------------------|---------------|-------------|-------------|------|-------|-----|-------------|----------|------|------|
| 1.25 kN - 5 kN | mm | 104.8 | 88.9 | 33.3 | 22.5° | 45° | 30.4 | M16x2-4H | 4 | 22 |
| | inch | 4.13 | 3.5 | 1.3 | | | 1.2 | | 0.16 | |
| 12.5 kN - 25 kN | mm | 104.8 | 88.9 | 33.3 | 22.5° | 45° | 31.5 | M16x2-4H | 4 | 22 |
| | inch | 4.13 | 3.5 | 1.3 | | | 1.24 | | 0.16 | |
| 50 kN | mm | 153.9 | 130.3 | 42.9 | 15° | 30° | 61.2 | M33x2-4H | 10 | 35.5 |
| | inch | 6.06 | 5.13 | 1.69 | | | 2.41 | | 0.39 | |

| Nominal (rated) force | Dimensions in | ØA | ØB | C | D | E | ØF | G | H | M |
|-----------------------|---------------|-------|-------|------|--------|-------|-------|-----------|------|------|
| 125 kN | mm | 153.9 | 130.3 | 42.9 | 15° | 30° | 67.3 | M33x2-4H | 10 | 35.5 |
| | inch | 6.06 | 5.13 | 1.69 | | | 2.65 | | 0.39 | |
| 250 kN | mm | 203.2 | 165.1 | 61.9 | 11.25° | 22.5° | 95.5 | M42x2-4H | 12 | 44 |
| | inch | 8.00 | 6.51 | 2.4 | | | 3.76 | | 0.47 | |
| 500 kN | mm | 279 | 229 | 87.3 | 11.25° | 22.5° | 122.2 | M72x2-4H | 16 | 69.5 |
| | inch | 10.98 | 9.02 | 3.4 | | | 4.81 | | 0.63 | |
| 1.25 MN | mm | 390 | 322 | 125 | 7.5° | 15° | 190 | M120x4-4H | 22 | 112 |
| | inch | 15.35 | 12.68 | 4.92 | | | 7.48 | | 0.87 | |

| Nominal (rated) force | Dimensions in | G1 | ØK | L | N | ØP _{H8} |
|-----------------------|---------------|-----------------------|------|-------|-------|------------------|
| 1.25 kN - 25 kN | mm | M16x2-4H 22.1 mm deep | 31.8 | 60.3 | 63.5 | 16.5 |
| | inch | | 1.25 | 2.37 | 2.5 | 0.65 |
| 50 kN - 125 kN | mm | M33x2-4H 35.6 mm deep | 57.2 | 85.9 | 89 | 33.5 |
| | inch | | 2.25 | 3.38 | 3.5 | 1.32 |
| 250 kN | mm | M42x2-4H 54.6 mm deep | 76.2 | 108 | 114.3 | 43 |
| | inch | | 3 | 4.25 | 4.5 | 1.69 |
| 500 kN | mm | M72x2-4H 82.6 mm deep | 114 | 152.4 | 165.1 | 73 |
| | inch | | 4.49 | 6 | 6.5 | 2.87 |
| 1.25 MN | mm | M120x4-4H, 125 deep | 190 | 239 | 254 | 123 |
| | inch | | 7.48 | 9.41 | 10.0 | 4.84 |

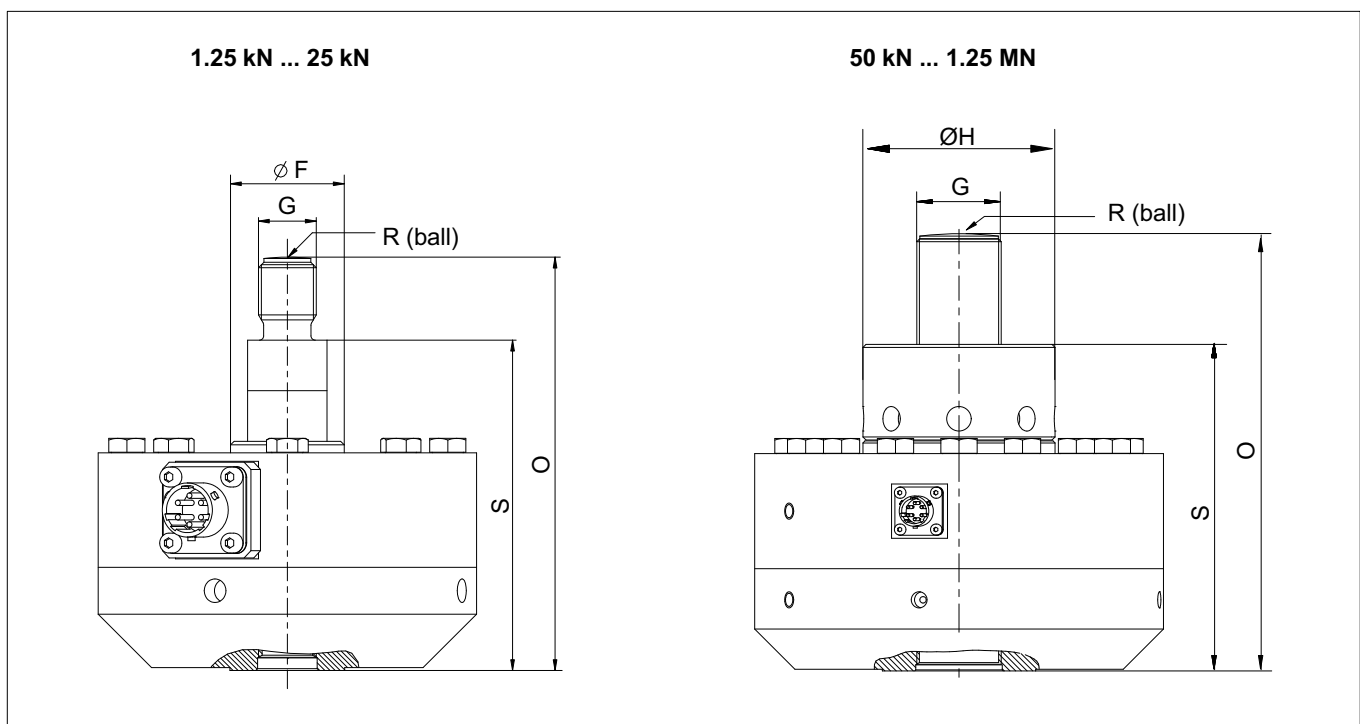
Dimensions of U10M without foot adapter



| Nominal (rated) force | Dimensions in | ØA | ØB | ØS | ØF | G | ØJ _{H8} | V | R | Z |
|-----------------------|---------------|-------|------|------|------|----------|------------------|------|------|-----|
| 1.25 kN - 5 kN | mm | 104.8 | 88.9 | 7.0 | 30.4 | M16x2-4H | 78 | 31.7 | 34.9 | 2.5 |
| | inch | 4.13 | 3.5 | 0.27 | 1.2 | | 3.07 | 1.25 | 1.37 | 0.1 |

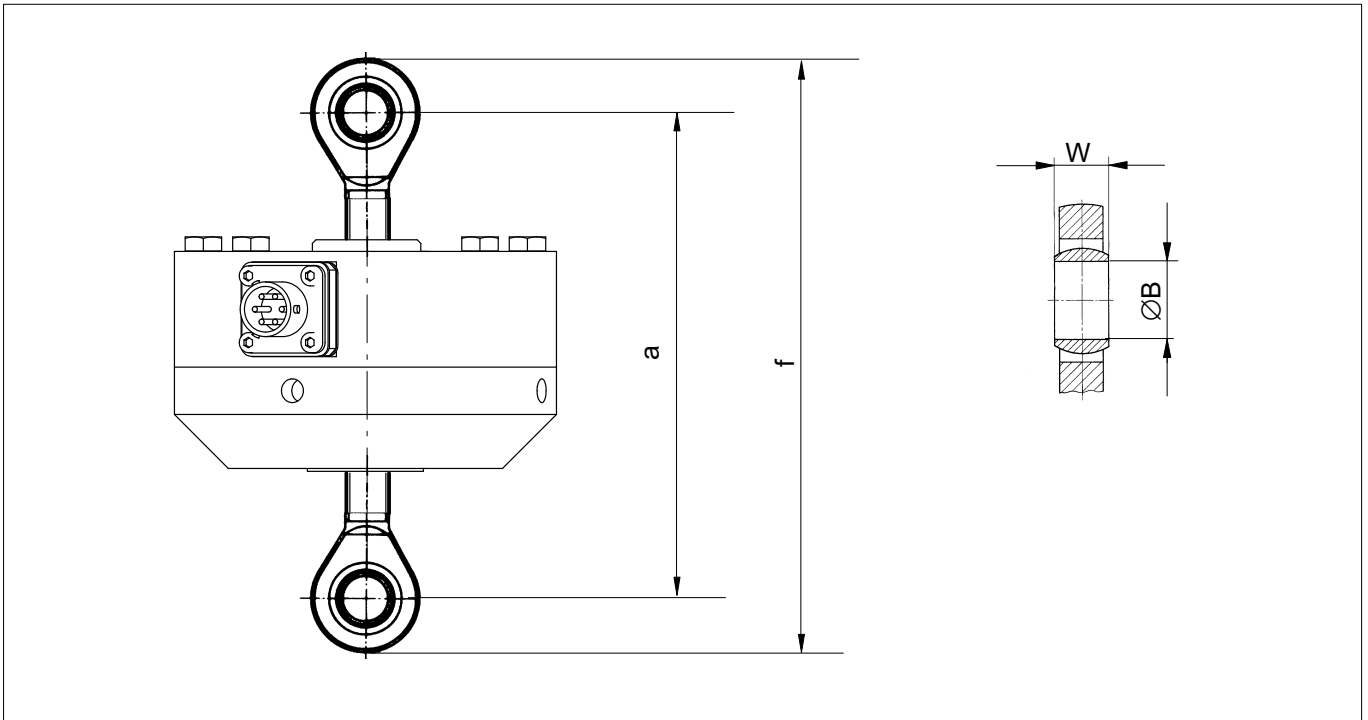
| Nominal (rated) force | Dimensions in | ØA | ØB | ØS | ØF | G | ØJ ^{H8} | V | R | Z |
|-----------------------|---------------|-------|-------|------|-------|-----------|------------------|------|------|------|
| 12.5 kN - 25 kN | mm | 104.8 | 88.9 | 7.0 | 31.5 | M16x2-4H | 78 | 31.7 | 34.9 | 2.5 |
| | inch | 4.13 | 3.5 | 0.27 | 1.24 | | 3.07 | 1.25 | 1.37 | 0.1 |
| 50 kN | mm | 153.9 | 130.3 | 10.5 | 61.2 | M33x2-4H | 111.5 | 41.4 | 44.5 | 2.5 |
| | inch | 6.06 | 5.13 | 0.41 | 2.41 | | 4.39 | 1.63 | 1.75 | 0.1 |
| 125 kN | mm | 153.9 | 130.3 | 10.5 | 67.3 | M33x2-4H | 111.5 | 41.4 | 44.5 | 2.5 |
| | inch | 6.06 | 5.13 | 0.41 | 2.65 | | 4.39 | 1.63 | 1.75 | 0.1 |
| 250 kN | mm | 203.2 | 165.1 | 13.5 | 95.5 | M42x2-4H | 143 | 57.2 | 63.5 | 3.5 |
| | inch | 8.00 | 6.51 | 0.53 | 3.76 | | 5.63 | 2.25 | 2.5 | 0.14 |
| 500 kN | mm | 279 | 229 | 17.0 | 122.2 | M72x2-4H | 175 | 76.2 | 88.9 | 6 |
| | inch | 10.98 | 9.02 | 0.66 | 4.81 | | 6.89 | 3 | 3.5 | 0.24 |
| 1.25 MN | mm | 390 | 322 | 23 | 190 | M120x4-4H | 262 | 112 | 127 | 6 |
| | inch | 15.35 | 12.68 | 0.91 | 7.48 | | 10.31 | 4.41 | 5.08 | 0.24 |

Dimensions of U10M with force application and foot adapter



| Nominal (rated) force | Dimensions in | ØF | G | ØH | S | O | R |
|-----------------------|---------------|-------|-----------|------|-------|-------|-----|
| 1.25 kN - 5 kN | mm | 30.4 | M16x2 | - | 91.5 | 114.5 | 60 |
| | inch | 1.2 | | | 3.6 | | |
| 12.5 kN - 25 kN | mm | 31.5 | M16x2 | - | 91.5 | 114.5 | 60 |
| | inch | 1.24 | | | 3.6 | | |
| 50 kN | mm | 61.2 | M33x2-6g | 67.3 | 131.5 | 174.5 | 160 |
| | inch | 2.41 | | 2.65 | 5.18 | | |
| 125 kN | mm | 67.3 | M33x2-6g | 67.3 | 131.5 | 174.5 | 160 |
| | inch | 2.65 | | 2.65 | 5.18 | | |
| 250 kN | mm | 95.5 | M42x2-6g | 95.5 | 162.3 | 217.3 | 160 |
| | inch | 3.76 | | 3.76 | 6.39 | | |
| 500 kN | mm | 122.2 | M72x2-6g | 135 | 230.1 | 307.3 | 400 |
| | inch | 4.81 | | 5.31 | 9.06 | | |
| 1.25 MN | mm | 190 | M120x4-6g | 190 | 351.5 | 465.3 | 600 |
| | inch | 7.48 | | 7.48 | 13.84 | | |

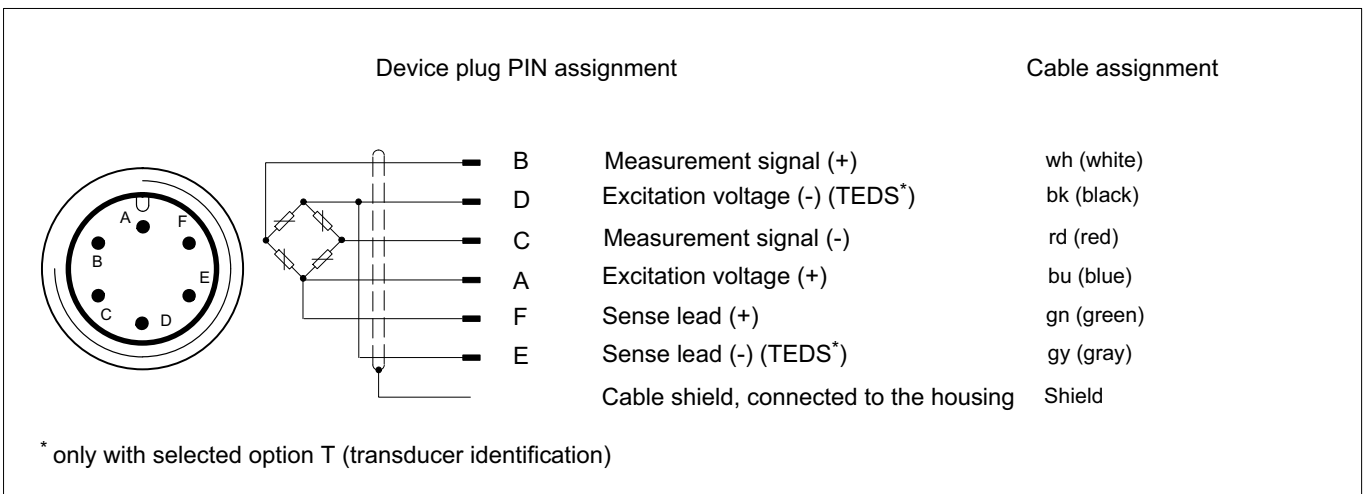
Dimensions of U10M with knuckle eyes



| Nominal (rated) force | Ordering number for knuckle eye | a (approx.) | | f (approx.) | | W | | ØB | |
|-----------------------|---------------------------------|-------------|-------|-------------|------|----|-------|----|-------|
| | | mm | inch | mm | inch | mm | inch | mm | inch |
| 1.25 kN - 25 kN | 1-Z4/20kN/ZGUW | 150 | 5.9 | 192 | 7.5 | 21 | 0.827 | 16 | 0.630 |
| 50 kN - 125 kN | 1-ZGAM33F | 263 | 10.35 | 392 | 15.4 | 35 | 1.387 | 50 | 1.969 |
| 250 kN | 1-ZGAM42F | 301 | 11.85 | 437 | 17.2 | 44 | 1.732 | 60 | 2.362 |
| 500 kN | 1-ZGAM72F | 439.5 | 17.3 | 643.5 | 25.3 | 60 | 2.362 | 90 | 3.543 |

Please note the information in the operating manual

Pin and cable assignment



Specifications (for 100% calibration)

| Nominal (rated) force: | F_{nom} | kN | 1.25 | 2.5 | 5 | 12.5 | 25 | 50 | 125 | 250 | 500 | |
|---|---------------|------------|------------------|-----|---|-------|-----------|-------|-----|-----|------|-------------|
| | | MN | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | |
| Accuracy class | | | 0.02 | | | 0.03 | | 0.04 | | | 0.05 | |
| Relative reproducibility and repeatability errors without rotation | b_{rg} | % | 0.02 | | | | | | | | | |
| Hysteresis error at 0.4 F_{nom}, rel. to the full scale value | $v_{0.4}$ | % | 0.02 | | | 0.03 | | 0.04 | | | 0.05 | |
| Linearity deviation | d_{lin} | % | 0.02 | | | 0.025 | | 0.035 | | | 0.05 | |
| Rel. zero point return | v_{w0} | % | 0.008 | | | | | | | | | |
| Relative creep | $d_{cr, F+E}$ | % | 0.02 | | | | | | | | | |
| Effect of the bending moment at 10% $F_{nom} * 10mm$ | d_{Mb} | % | 0.01 | | | | | | | | | |
| Effect of lateral forces (lateral force = 10% of F_{nom}) | d_Q | % | 0.01 | | | | | | | | | |
| Temperature coefficient of the rated output | TC_S | % / 10 K | 0.015 | | | | | | | | | |
| Temperature coefficient of zero signal | TC_0 | % / 10 K | 0.015 | | | | | | | | | |
| Rated electrical output | | | | | | | | | | | | |
| Rated output (nominal) | C_{nom} | mV/V | 1 | | | | 2 | | | | | |
| Relative zero signal error | $d_{S,0}$ | % | 1 | | | | | | | | | |
| Deviation of the rated output (with "adjusted rated output" option) | d_C | % | 0.1 | | | | | | | | | |
| Rated output range (without "adjusted rated output" option) | C | mV/V | 1 ... 1.5 | | | | 2 ... 2.5 | | | | | |
| Tension/compression rated output variation | d_{ZD} | % | 0.2 | | | | | | | | | |
| Input resistance | R_i | Ω | >345 | | | | | | | | | |
| Output resistance (without "adjusted rated output" option) | R_o | Ω | 280 ... 360 | | | | | | | | | |
| Output resistance (with "adjusted rated output" option) | R_o | Ω | 365 | | | | | | | | | 280 ... 360 |
| Tolerance of the output resistance in the "adjusted rated output" option | d_{Ra} | % | $\pm 0.5 \Omega$ | | | | | | | | | - |
| Insulation resistance | R_{is} | G Ω | >2 | | | | | | | | | |
| Operating range of the excitation voltage | $B_{U,G}$ | V | 0.5 ... 12 | | | | | | | | | |
| Reference excitation voltage | U_{ref} | V | 5 | | | | | | | | | |
| Connection | | | 6-wire circuit | | | | | | | | | |

Specifications (for 100% calibration)

| | | | | | | | | | | | | | | |
|--|-------------|----------------|---|------|-----|------|------------------------------------|-------|------|-------|-------|--------|------|-------|
| Nominal (rated) force: | F_{nom} | kN | 1.25 | 2.5 | 5 | 12.5 | 25 | 50 | 125 | 250 | 500 | | | |
| | | MN | | | | | | | | | | | 1.25 | |
| Temperature | | | | | | | | | | | | | | |
| Reference temperature | T_{ref} | °C | 23 | | | | | | | | | | | |
| | | °F | 73.4 | | | | | | | | | | | |
| Nominal temperature range | $B_{T,nom}$ | °C | -10 ... +45 | | | | | | | | | | | |
| | | °F | 14 ... 113 | | | | | | | | | | | |
| Operating temperature range | $B_{T,G}$ | °C | -30 ... +85 | | | | | | | | | | | |
| | | °F | -22 ... +185 | | | | | | | | | | | |
| Storage temperature range | $B_{T,S}$ | °C | -30 ... +85 | | | | | | | | | | | |
| | | °F | -22 ... +185 | | | | | | | | | | | |
| Characteristic mechanical quantities | | | | | | | | | | | | | | |
| Maximum operating force | F_G | % of F_{nom} | 240 | | | | | | | | | | | |
| Force limit | F_L | | 240 | | | | | | | | | | | |
| Breaking force | F_B | | >400 | | | | | | | | | | | |
| Torque limit | $M_{G,max}$ | N*m | 30 | 60 | 125 | 315 | 635 | 1270 | 3175 | 5715 | 11430 | 28575 | | |
| Bending moment limit | $M_{b,max}$ | | 30 | 60 | 125 | 315 | 635 | 1270 | 3175 | 5715 | 11430 | 28575 | | |
| Static lateral force limit | F_Q | % of F_{nom} | 100 | | | | | | | | | | | |
| Nominal (rated) displacement | s_{nom} | mm | 0.02 | | | 0.03 | | | 0.04 | 0.05 | 0.06 | 0.09 | | |
| Fundamental frequency | f_G | kHz | 4.5 | 5.9 | 9.3 | 6.6 | 9.2 | 6.5 | 8.1 | 6.6 | 6.1 | 3.8 | | |
| Relative permissible oscillatory stress | f_{rb} | % of F_{nom} | 200 | | | | | | | | | | | |
| Rigidity | F/S | 10^5 N/mm | 0.625 | 1.25 | 2.5 | 4.17 | 8.33 | 16.7 | 31.3 | 50 | 83.3 | 140 | | |
| General information | | | | | | | | | | | | | | |
| Degree of protection as per EN 60529, with bayonet connector (standard version), socket connected to sensor | | | IP67 | | | | | | | | | | | |
| Degree of protection as per EN 60529, with "threaded connector" option | | | IP64 | | | | | | | | | | | |
| Degree of protection as per EN 60529, with "integrated cable" option | | | IP67 | | | | IP68 ¹⁾ | | | | | | | |
| Spring element material | | | Aluminum | | | | Stainless steel | | | | | | | |
| Measuring point protection | | | Tightly sealed measuring body | | | | Hermetically welded measuring body | | | | | | | |
| Cable (only with "integrated cable" option) | | | Six-wire connection, TPE electrical insulation. Outside diameter 5.4 mm | | | | | | | | | | | |
| Cable length | m | 6 or 15 | | | | | | | | | | | | |
| Mechanical shock resistance as per IEC 60068-2-6 | | | | | | | | | | | | | | |
| Number | n | 1000 | | | | | | | | | | | | |
| Duration | ms | 3 | | | | | | | | | | | | |
| Acceleration | m/s^2 | 1000 | | | | | | | | | | | | |
| Vibrational stress as per IEC 60068-2-27 | | | | | | | | | | | | | | |
| Frequency range | Hz | 5 ... 65 | | | | | | | | | | | | |
| Duration | min | 30 | | | | | | | | | | | | |
| Acceleration | m/s^2 | 150 | | | | | | | | | | | | |
| Weight (with adapter) | m | kg | 1.2 | | | 3 | | 10 | | 23 | | 60 | | 186 |
| | | lbs | 2.65 | | | 6.61 | | 22.05 | | 50.71 | | 132.28 | | 409.2 |
| Weight (without adapter) | m | kg | 0.5 | | | 1.3 | | 5 | | 11 | | 28 | | 77 |
| | | lbs | 1.1 | | | 2.87 | | 11.02 | | 24.25 | | 61.73 | | 169.4 |

1) Test condition: 1 m water column, 100 hours

Specifications (for 200% calibration)

| | | | | | | | | | | | | |
|--|---------------|-------------|------------------|-----|----|-------|-----------|-------|------|-----|-------------|--|
| Nominal (rated) force: | F_{nom} | kN | 1.25 | 2.5 | 5 | 12.5 | 25 | 50 | 125 | 250 | 500 | |
| | | MN | | | | | | | | | | |
| Calibration force | F_{cal} | kN | 2.5 | 5 | 10 | 25 | 50 | 100 | 250 | 500 | 1000 | |
| | | MN | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | |
| Accuracy class | | | 0.02 | | | 0.03 | | 0.04 | | | 0.05 | |
| Relative reproducibility and repeatability errors without rotation | b_{rg} | % | 0.02 | | | | | | | | | |
| Hysteresis error at 0.4 F_{cal} | $v_{0.4}$ | % | 0.02 | | | 0.03 | | 0.04 | | | 0.05 | |
| Linearity deviation | d_{lin} | % | 0.02 | | | 0.025 | | 0.035 | | | 0.05 | |
| Rel. zero point return | | | 0.01 | | | | | | 0.02 | | | |
| Relative creep | $d_{cr, F+E}$ | % | 0.02 | | | | | | | | | |
| Effect of the bending moment at 10% F_{cal} * 10mm | d_{Mb} | % | 0.01 | | | | | | | | | |
| Effect of lateral forces (lateral force = 10% of F_{cal}) | d_Q | % | 0.01 | | | | | | | | | |
| Temperature coefficient of the rated output | TC_S | % / 10 K | 0.015 | | | | | | | | | |
| Temperature coefficient of zero signal | TC_0 | | 0.0075 | | | | | | | | | |
| Rated electrical output | | | | | | | | | | | | |
| Rated output (nominal) | C_{nom} | mV/V | 2 | | | | 4 | | | | | |
| Relative zero signal error | $d_{S,0}$ | % | 1 | | | | | | | | | |
| Rated output range | | mV/V | 2 ... 3 | | | | 4 ... 4.9 | | | | | |
| Deviation of the rated output with "adjusted rated output" option | d_C | % | 0.1 | | | | | | | | | |
| Tension/compression rated output variation | d_{ZD} | % | 0.2 (typ. 0.1) | | | | | | | | | |
| Input resistance | R_i | Ω | >345 | | | | | | | | | |
| Output resistance (without "adjusted rated output" option) | R_o | Ω | 280 ... 360 | | | | | | | | | |
| Output resistance (with "adjusted rated output" option) | R_o | Ω | 365 | | | | | | | | 280 ... 360 | |
| Tolerance of the output resistance with "adjusted rated output" option | d_{R_o} | % | $\pm 0.5 \Omega$ | | | | | | | | - | |
| Insulation resistance | R_{is} | G Ω | >2 | | | | | | | | | |
| Operating range of the excitation voltage | $B_{U,G}$ | V | 0.5 ... 12 | | | | | | | | | |
| Reference excitation voltage | U_{ref} | V | 5 | | | | | | | | | |
| Connection | | | 6-wire circuit | | | | | | | | | |
| Temperature | | | | | | | | | | | | |
| Reference temperature | T_{ref} | $^{\circ}C$ | 23 | | | | | | | | | |
| | | $^{\circ}F$ | 73.4 | | | | | | | | | |
| Nominal temperature range | $B_{T,nom}$ | $^{\circ}C$ | -10 ... +45 | | | | | | | | | |
| | | $^{\circ}F$ | 14 ... 113 | | | | | | | | | |
| Operating temperature range | $B_{T,G}$ | $^{\circ}C$ | -30 ... +85 | | | | | | | | | |
| | | $^{\circ}F$ | -22 ... +185 | | | | | | | | | |
| Storage temperature range | $B_{T,S}$ | $^{\circ}C$ | -30 ... +85 | | | | | | | | | |
| | | $^{\circ}F$ | -22 ... +185 | | | | | | | | | |


Specifications (for 200% calibration)

| Nominal (rated) force: | F_{nom} | kN | 1.25 | 2.5 | 5 | 12.5 | 25 | 50 | 125 | 250 | 500 | |
|---|--------------|------------------|---|------|------|------|------------------------------------|------|-------|--------|-------|-------|
| | | MN | | | | | | | | | | |
| Calibration force | F_{cal} | kN | 2.5 | 5 | 10 | 25 | 50 | 100 | 250 | 500 | 1000 | |
| | | MN | | | | | | | | | | |
| Characteristic mechanical quantities | | | | | | | | | | | | |
| Maximum operating force | F_G | % of F_{nom} | 240 (120% of the calibration force) | | | | | | | | | |
| Force limit | F_L | | 240 (120% of the calibration force) | | | | | | | | | |
| Breaking force | F_B | | >400 (200% of the calibration force) | | | | | | | | | |
| Torque limit | $M_{G\ max}$ | N*m | 30 | 60 | 125 | 315 | 635 | 1270 | 3175 | 5715 | 11430 | 28575 |
| Bending moment limit | $M_{b\ max}$ | | 30 | 60 | 125 | 315 | 635 | 1270 | 3175 | 5715 | 11430 | 28575 |
| Static lateral force limit | F_Q | % of F_{nom} | 100 | | | | | | | | | |
| Nominal (rated) displacement | s_{nom} | mm | 0.02 | | 0.03 | | | 0.04 | 0.05 | 0.06 | 0.09 | |
| Fundamental frequency | f_G | kHz | 4.5 | 5.9 | 9.3 | 6.6 | 9.2 | 6.5 | 8.1 | 6.6 | 6.1 | 3.8 |
| Relative permissible oscillatory stress | f_{rb} | % of F_{nom} | 200 (100% of the calibration force) | | | | | | | | | |
| Rigidity | F/S | 10^5 N/mm | 0.625 | 1.25 | 2.5 | 4.17 | 8.33 | 16.7 | 31.3 | 50 | 83.3 | 140 |
| General information | | | | | | | | | | | | |
| Degree of protection as per EN 60529, with bayonet connector (standard version), socket connected to sensor | | | IP67 | | | | | | | | | |
| Degree of protection as per EN 60529, with "threaded connector" option | | | IP64 | | | | | | | | | |
| Degree of protection as per EN 60529, with "integrated cable" option | | | IP67 | | | | IP68 ¹⁾ | | | | | |
| Spring element material | | | Aluminum | | | | Stainless steel | | | | | |
| Measuring point protection | | | Tightly sealed measuring body | | | | Hermetically welded measuring body | | | | | |
| Cable (only with "integrated cable" option) | | | Six-wire connection, TPE electrical insulation. Outside diameter 5.4 mm | | | | | | | | | |
| Cable length | | m | 6 or 15 | | | | | | | | | |
| Mechanical shock resistance as per IEC 60068-2-6 | | | | | | | | | | | | |
| Number | | n | 1000 | | | | | | | | | |
| Duration | | ms | 3 | | | | | | | | | |
| Acceleration | | m/s ² | 1000 | | | | | | | | | |
| Vibrational stress as per IEC 60068-2-27 | | | | | | | | | | | | |
| Frequency range | | Hz | 5 ... 65 | | | | | | | | | |
| Duration | | min | 30 | | | | | | | | | |
| Acceleration | | m/s ² | 150 | | | | | | | | | |
| Weight (with adapter) | m | kg | 1.2 | | 3 | | 10 | | 23 | 60 | 186 | |
| | | lbs | 2.65 | | 6.61 | | 22.05 | | 50.71 | 132.28 | 409.2 | |
| Weight (without adapter) | m | kg | 0.5 | | 1.3 | | 5 | | 11 | 28 | 77 | |
| | | lbs | 1.1 | | 2.87 | | 11.02 | | 24.25 | 61.73 | 169.4 | |

¹⁾ Test condition: 1 m water column, 100 hours

U10M versions and ordering numbers

| Code | Measurement range | Ordering number |
|------|-------------------|-----------------|
| 1k25 | 1.25 kN | 1-U10M/1.25kN |
| 2k50 | 2.5 kN | 1-U10M/2.5kN |
| 5k00 | 5 kN | 1-U10M/5kN |
| 12k5 | 12.5 kN | 1-U10M/12.5kN |
| 25k0 | 25 kN | 1-U10M/25kN |
| 50k0 | 50 kN | 1-U10M/ 50kN |
| 125k | 125 kN | 1-U10M/125kN |
| 250k | 250 kN | 1-U10M/250kN |
| 500k | 500 kN | 1-U10M/500kN |
| 1M25 | 1.25 MN | 1-U10M/1.25MN |

 Preferred version, available at short notice

The ordering number for the preferred types is 1-U10M..., the ordering number for customized versions is K-U10M...

| No. of meas. bridges | Rated output | Calibration | Transducer identification | Mechanical design | Plug protection | El. connection Bridge A | El. connection Bridge B | Force application | Plug version for the Bridge A "fixed cable" option | Plug version for the Bridge B "fixed cable" option |
|----------------------------|--------------------------|--------------------------|---------------------------|-----------------------------|---------------------|--------------------------------|-------------------------|---------------------|--|--|
| Single bridge SB | Not adjusted N | 100% (dyn.) 1 | Without TEDS S | With adapter W | Without U | Bayonet connector B | | Without O | Free ends Y | |
| Double bridge DB | Adjusted J | 200% (stat.) 2 | With TEDS T | Without adapter N | With P | Threaded connector G | | With L | D-sub connector, 15-pin F | |
| | | | | | | Fixed cable (6 m) K | | | HD-sub connector, 15-pin Q | |
| | | | | | | Fixed cable (15 m) V | | | Plug ME3106PEMV N | |
| | | | | | | | | | ODU connector, 15-pin P | |
| | | | | | | | | | M12 cable coupling, 8-pin M | |

Ordering example:

| K-U10M- | 25k0- | DB- | N- | 2- | T- | N- | U- | V- | V- | O- | M- | M |
|--|-------|------------------|-----------------|--|--------------|--------------------|------------------------------------|--|--|---|---|---|
| U10, 25 kN nominal (rated) force | | Double bridge | Not adjusted | Calibrated at 200% of nominal (rated) force | With TEDS | Without adapter | Without plug protecti- on | Bridge A: fixed cable, 15 m long | Bridge B: fixed cable, 15 m long | Without load application bolts | With M8 cable coupling (for connection to PAD) | With M8 cable coupling (for connection to PAD) |

| | |
|---------------------------------------|---|
| Number of measuring bridges | For reasons of redundancy, it is necessary in devices relevant to safety to check the plausibility of the measurement signal with a second measuring bridge (installed on the same measuring body). The signals are independently conditioned and evaluated using two separate measuring amplifiers. It is therefore also possible to connect two amplifiers with different characteristics. |
| Rated output | The exact rated output (nominal) is specified on the type plate. The transducer can also be adjusted to an exact rated output of 1.0 mV/V or 2.0 mV/V (if 200% calibration selected: 2 mV/V or 4 mV/V). The rel. rated output deviation is then 0.1% of the rated output (nominal). The rated output range of an unadjusted transducer lies between 1 and 1.5 or 2 and 2.5 mV/V. See Specifications for details. |
| Calibration | In the standard version, the transducer is designed for dynamic application up to an oscillation of $\pm 100\% F_{nom}$. For quasi-static applications, the transducer can be used up to $200\% F_{nom}$. The option is available to calibrate accordingly to $200\% F_{nom}$. |
| Transducer identification | Integration of TEDS (integrated electronic data sheet) as per IEEE1451.4. If the relevant amplifier electronics are provided, the measuring chain will parameterize itself. |
| Mechanical design | The U10 can also be ordered as a flange assembly option. This version does not include a screwed-on adapter. During installation, please observe the instructions in the Operating Manual |
| Plug protection | Mechanical protection through the installation of an additional square profile around the connector. Dimensions in mm approx.: WxHxB: 30x30x20 |
| Electrical connection Bridge A | The standard version is the device plug with a bayonet connection (PT02E10-6P-compatible). The option is also available to install a screw-fitting device plug (PC02E10-6P-compatible). A third variant where the force transducers are fitted with a fixed cable is also available. In this version, all U10 achieve degree of protection IP68 with a nominal (rated) force equal to or greater than 12.5 kN. |
| Electrical connection Bridge B | The standard version is the device plug with a bayonet connection (PT02E10-6P-compatible). The option is also available to install a screw-fitting device plug (PC02E10-6P-compatible). Both of the connection variants are often used for differentiation in the double-bridge version. A third variant where the force transducers are fitted with a fixed cable is also available. In this version, all U10 achieve degree of protection IP68 with a nominal (rated) force equal to or greater than 12.5 kN. |

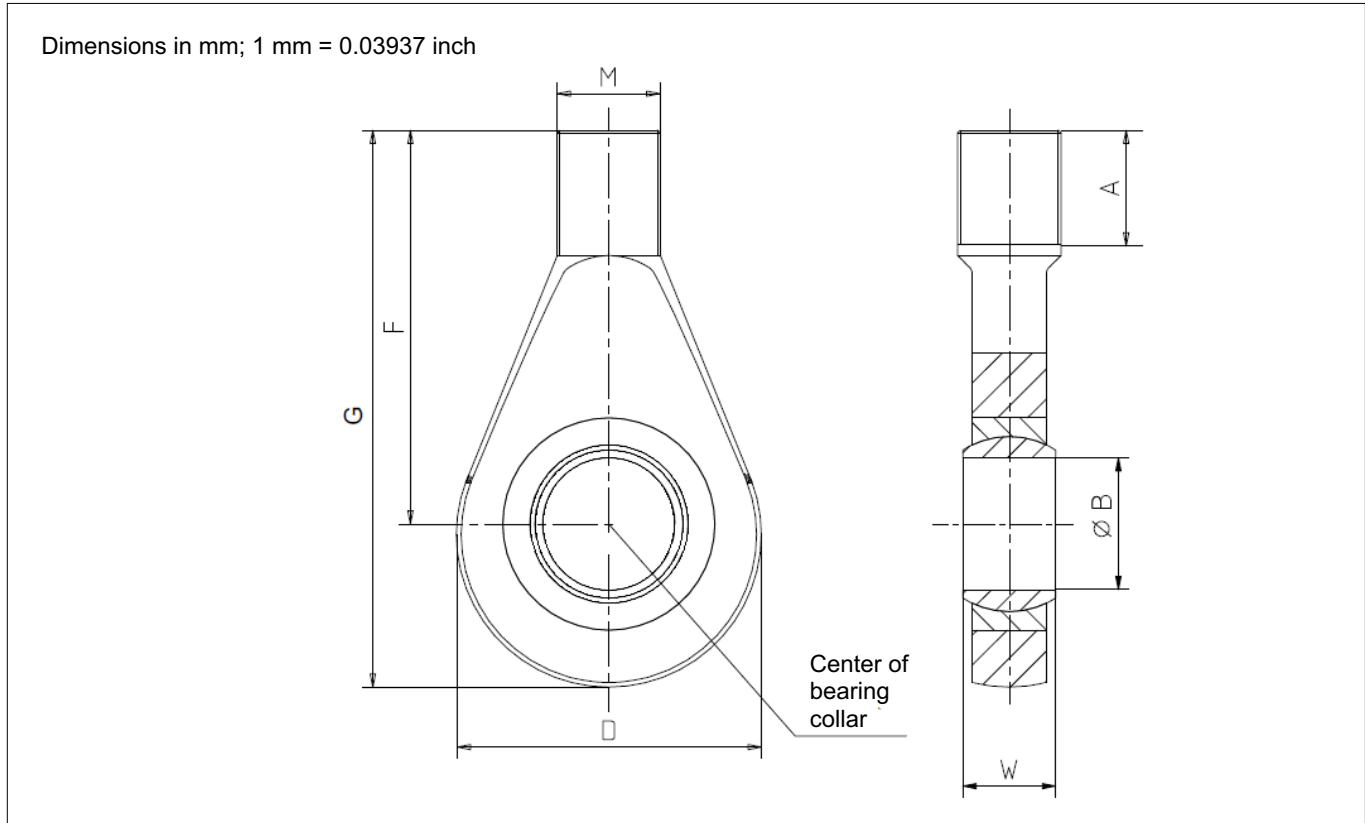
| | |
|--|---|
| Force application | Mounted force application. Force application is not supplied as standard, although a force application bolt can be mounted upon request. Dimensions, see Page 4. |
| Plug selection for the "fixed cable" option | When ordering the U10M with an integrated cable, you can also order the connector assembly at the end of the cable, so that the force sensor can be directly connected to an amplifier. Y = free ends, no connector assembly F = D-sub connector, 15-pin, for connection to MGC+ (e.g. AP01) Scout Q = HD-sub connector, 15-pin, for connection to many HBM amplifiers of the Quantum series (MX410, Mx440, MX840) N = MS plug, for connection to HBM amplifiers such as MGC+ (Ap03) DMP or DK38 P = ODU connector, 14-pin. Degree of protection IP68. For connection to all HBM amplifiers of the Somat XR series suitable for measuring full bridge circuits. M = M8 cable coupling for connection to HBM PAD sensor-oriented electronics |

Accessories (to be ordered separately)

| Cables/plugs | Ordering number |
|--|-----------------|
| Connection cable KAB157-3; IP67 (with bayonet connection); 3 m long, TPE outer sheath; 6 x 0.25 mm ² ; free ends, shielded, outside diameter 6.5 mm | 1-KAB157-3 |
| Connection cable KAB158-3; IP54 (with screw locking); 3 m long, TPE outer sheath; 6 x 0.25 mm ² ; free ends, shielded, outside diameter 6.5 mm | 1-KAB158-3 |
| Cable, configurable with different plugs and lengths | K-CAB-F |
| Loose cable socket (bayonet connection) | 3-3312.0382 |
| Loose cable socket (screw locking) | 3-3312.0354 |
| Ground cable (400 mm long) | 1-EEK4 |
| Ground cable (600 mm long) | 1-EEK6 |
| Ground cable (800 mm long) | 1-EEK8 |
| Knuckle eye, M16 external thread | 1-Z4/20kN/ZGUW |
| Knuckle eye, M33x2 external thread | 1-ZGAM33F |
| Knuckle eye, M42x2 external thread | 1-ZGAM42F |
| Knuckle eye, M72x2 external thread | 1-ZGAM72F |
| Knuckle eye, M16 internal thread | 1-Z4/20kN/ZGOW |
| Knuckle eye, M33x2 internal thread | 1-ZGIM33F |
| Knuckle eye, M42x2 internal thread | 1-ZGIM42F |
| Knuckle eye, M72x2 internal thread | 1-ZGIM72F |

Accessories - Knuckle eyes

ZGUW / ZGAM



| Nominal (rated) force | Knuckle eye ordering no. | A | $\varnothing B$ | D | F | G | M | W | Weight |
|-----------------------|--------------------------|------|----------------------|-----|------|-------|-------|----|---------|
| 1.25 kN - 25 kN | 1-Z4/20kN/ZGUW | 41.7 | 16 ^{+0.018} | 42 | 67.7 | 88.7 | M16 | 21 | 0.2 kg |
| 50 kN - 125 kN | 1-ZGAM33F | 35 | 50 ^{-0.012} | 115 | 118 | 182.5 | M33x2 | 35 | 2.5 kg |
| 250 kN | 1-ZGAM42F | 45 | 60 ^{-0.015} | 126 | 134 | 202 | M42x2 | 44 | 3.8 kg |
| 500 kN | 1-ZGAM72F | 70 | 90 ^{-0.02} | 190 | 203 | 305 | M72x2 | 60 | 12.6 kg |

Knuckle eyes are only suitable for static tensile loading.

Subject to modifications.
All product descriptions are for general information only. They are not to be understood as a guarantee of quality or durability.

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