

KMR

Force washer for monitoring tasks

Special features

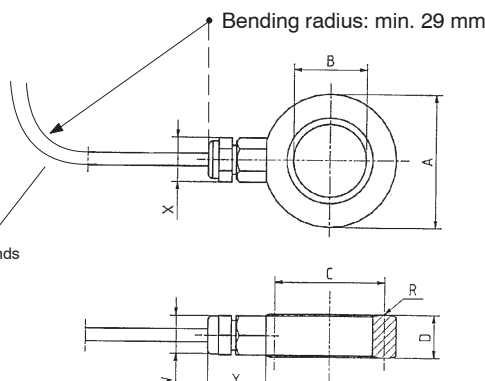
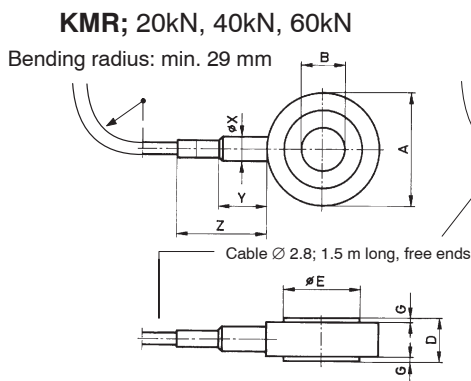


- Measuring washer
- Nominal (rated) force 20 kN ... 400 kN
- Degree of protection IP 67
- Stainless steel
- Good reproducibility

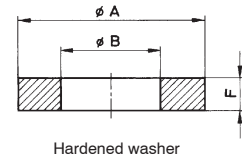
Dimensions (in mm; 1 mm = 0.03937 inches)

KMR; 100 kN, 200 kN, 300 kN and 400 kN
(with PG gland and sphere radius R)

KMR cable assignment



| Assignment | Cable wire color |
|-------------------------------|------------------|
| Measurement signal (+) | white |
| Measurement signal (+) | red |
| Bridge excitation voltage (+) | blue |
| Bridge excitation voltage (-) | black |
| Shielding | yellow |



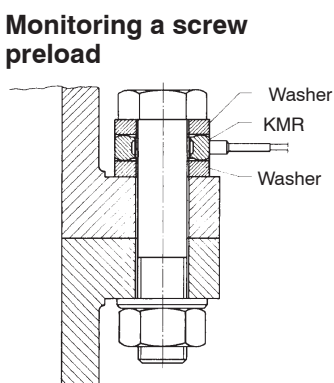
| Nominal (rated) force in kN | Ø A _{0,1} | Ø B ^{+0.1} | C | D | E | F | G | R | X | Y | N | for screws | SW |
|-----------------------------|--------------------|---------------------|-------|------|----|---|-----|----|-------------|-------------|------------|------------|----|
| 20 | 17 | 6.5 | - | 6 | 9 | 3 | 0.5 | - | approx. 6 | approx.11.5 | approx. 25 | M6; 1/4" | - |
| 40 | 21 | 8 | - | 6 | 13 | 3 | 0.5 | - | approx. 6 | approx.11.5 | approx. 25 | M8; 5/16" | - |
| 60 | 24 | 10 | - | 8 | 16 | 4 | 0.5 | - | approx. 6 | approx.11.5 | approx. 25 | M10; 3/8" | - |
| 100 | 26.5 | 12.7 | 19.75 | 10 | - | 5 | - | 6 | approx.10.5 | approx.14.5 | - | M12; 1/2" | 9 |
| 200 | 31 | 16 | 25.5 | 10 | - | 6 | - | 8 | approx.10.5 | approx.14.5 | - | M16; 5/8" | 9 |
| 300 | 37 | 21 | 31.5 | 10.5 | - | 6 | - | 9 | approx.10.5 | approx.14.5 | - | M20; 3/4" | 9 |
| 400 | 46 | 25 | 38 | 12.5 | - | 8 | - | 10 | approx.10.5 | approx.14.5 | - | M24; 7/8" | 9 |

Specifications

| Type | | KMR | | | | | | |
|--|-------|---------------------------|------|------|------------|------|------|------|
| | | 20 | 40 | 60 | 100 | 200 | 300 | 400 |
| Nominal (rated) force | kN | 20 | 40 | 60 | 100 | 200 | 300 | 400 |
| Sensitivity range | mV/V | 1.7 ... 2.3 ^{*)} | | | | | | |
| Effect of temperature on sensitivity per 10 K in the nominal (rated) temperature range | % | 1 | | | | | | |
| Temperature effect on the zero signal/10 K in the nominal (rated) temperature range | % | 0.5 | | | | | | |
| Repeatability constant mounting position | % | 1 | | | | | | |
| Creep over 30 min., at room temp. | % | 2 | | | | | | |
| Input resistance at room temp. | Ohm | > 345 | | | | | | |
| Output resistance at room temp. | Ohm | 300 ... 400 | | | | | | |
| Insulation resistance | GOhms | > 5 | | | | | | |
| Reference excitation voltage | V | 5 | | | | | | |
| Operating range of excitation voltage | V | 0.5 ... 5 | | | 0.5 ... 12 | | | |
| Nominal (rated) temperature range | °C | -10 ... +70 | | | | | | |
| Operating temperature range | °C | -10 ... +70 | | | | | | |
| Storage temperature range | °C | -30 ... +85 | | | | | | |
| Limit force | % | 150 | | | | | | |
| Breaking force | % | > 500 | | | | | | |
| Relative static lateral limit force | % | 20 | | | | | | |
| Nominal (rated) displacement ± 15 % | mm | 0.06 | 0.06 | 0.06 | 0.08 | 0.11 | 0.21 | 0.32 |
| Natural frequency ± 15 % | kHz | 22 | 45 | 47 | 27 | 22 | 18 | 15 |
| Weight without cable | g | 5 | 7 | 12 | 32 | 40 | 50 | 70 |
| Permissible dynamic loading (vibration bandwidth in accordance with DIN 30100) | % | 50 | | | | | | |
| Degree of protection as per DIN EN 60529 | | IP 67 | | | | | | |

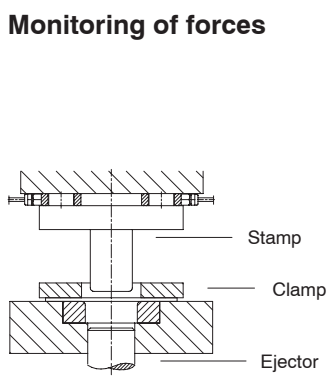
*) The sensitivity of the force washer lies, dependent on the installation situation, between 1.7 ... 2.3 mV/V.

Example applications



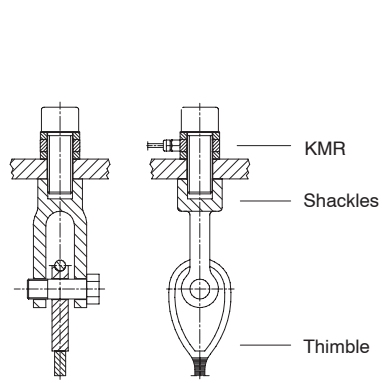
Monitoring a screw preload

Fig. 1: The pre-stressing curve is measured with a repeatability of <math>< \pm 1\%</math>.



Monitoring of forces

Fig. 2: The force washer monitors the set deep-draw pressing force with a repeatability of <math>< \pm 1\%</math>.



Monitoring of cable forces

Fig. 3: Monitoring of cable forces.

Scope of delivery: KMR force washer, two hardened washers, mounting instructions

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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