

KMR

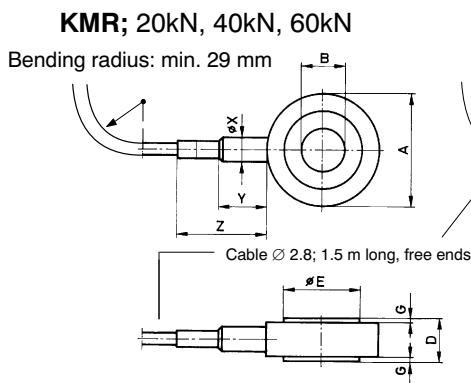
Force washer for monitoring tasks

Special features

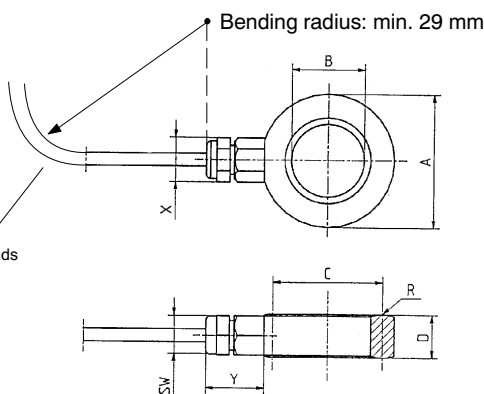


- Measuring washer
- Nominal (rated) force 20 kN ... 400 kN
- Degree of protection IP 67
- Stainless steel
- Good reproducibility

Dimensions (in mm; 1 mm = 0.03937 inches)

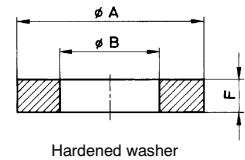


KMR; 100 kN, 200 kN, 300 kN and 400 kN
(with PG gland and sphere radius R)



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	$\varnothing A_{-0.1}$	$\varnothing B^{+0.1}$	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

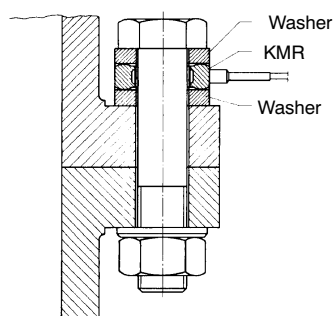
Specifications

Type		KMR						
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						
Non-linearity	%	10						
Relative reversibility error, rel. to full scale value	%	10						
Repeatability	%	1						
constant mounting position	%	10						
different mounting positions	%	10						
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 40 050		IP 67						

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

Example applications

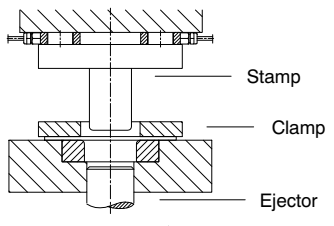
Monitoring a screw preload



Washer
KMR
Washer

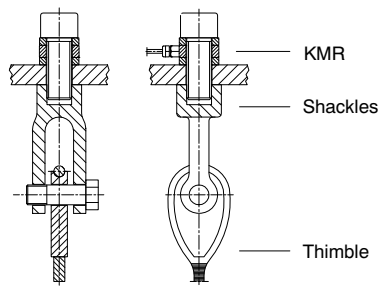
Fig. 1: The pre-stressing curve is measured with a repeatability of $\lt; \pm 1\%$.

Monitoring of forces



Stamp
Clamp
Ejector

Fig. 2: The force washer monitors the set deep-draw pressing force with a repeatability of $\lt; \pm 1\%$.



KMR
Shackles
Thimble

Fig. 3: Monitoring of cable forces.

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

Modifications reserved.

All product descriptions are for general information only. They are not to be understood as a guarantee of quality or durability and do not constitute any liability whatsoever.

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