

KMR

Force Washers

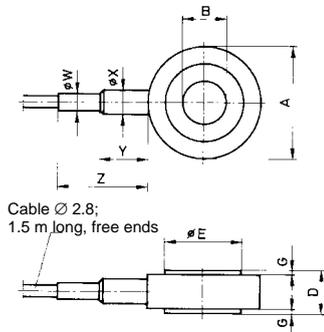
Special features

- Force washers
- Nominal forces 20 kN ... 400 kN
- protection to IP 67
- Stainless steel
- High repeatability

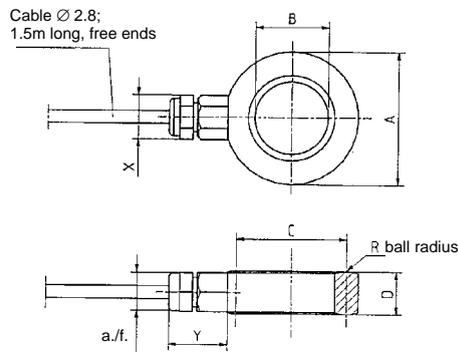


Dimensions (in mm)

KMR; 20 kN, 40 kN, 60 kN

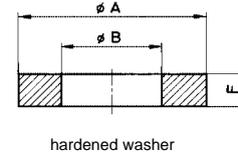


KMR; 100 kN, 200 kN, 300 kN and 400 kN (with PG gland and ball radius R)



Cable assignment KMR

Assignment	Cable core colour
Measurement signal (+)	white
Bridge excitation voltage (-)	black
Bridge excitation voltage (+)	blue
Measurement signal (-)	red
Shield	yellow



Nom. force in kN	$\varnothing A_{-0.1}$	$\varnothing B^{+0.1}$	C	D	E	F	G	R	W	X	Y	Z	for screw	a./f.
20	17	6.5	-	6	9	3	0.5	-	5.8 ^{*)}	6 ^{*)}	11.5 ^{*)}	30 ^{*)}	M6; 1/4 "	-
40	21	8	-	6	13	3	0.5	-	5.8 ^{*)}	6 ^{*)}	11.5 ^{*)}	30 ^{*)}	M8; 5/16 "	-
60	24	10	-	8	16	4	0.5	-	5.8 ^{*)}	6 ^{*)}	11.5 ^{*)}	30 ^{*)}	M10; 3/8 "	-
100	26.5	12.7	19.75	10	-	5	-	6	-	10.5 ^{*)}	14.5 ^{*)}	-	M12; 1/2 "	9
200	31	16	25.5	10	-	6	-	8	-	10.5 ^{*)}	14.5 ^{*)}	-	M16; 5/8 "	9
300	37	21	31.5	10.5	-	6	-	9	-	10.5 ^{*)}	14.5 ^{*)}	-	M20; 3/4 "	9
400	46	25	38	12.5	-	8	-	10	-	10.5 ^{*)}	14.5 ^{*)}	-	M24; 7/8 "	9

Specifications

Type		KMR							
Nominal force	kN	20	40	60	100	200	300	400	
Sensitivity range	mV/V	1.7...2.3 ¹⁾							
Temperature coefficient of the sensitivity in the nominal temperature range	%/10 K ²⁾	≤ ± 1							
Temperature coefficient of the zero signal in the nominal temperature range	%/10 K	≤ ± 0.5							
Repeatability									
identical mounting position	%	≤ ± 1							
modified mounting position	%	≤ ± 10							
Creep over 30 min.	%	≤ ± 2							
Input resistance	Ohm	560 ± 190							
Output resistance	Ohm	350 ± 5 400 ± 5							
Insulation resistance	GOhm	> 5							
Service range of the excitation voltage	V	0.5...12 ³⁾							
Nominal temperature range	°C [°F]	-10...+70 [+14...+158]							
Operating temperature range	°C [°F]	-10...+70 [+14...+158]							
Storage temperature range	°C [°F]	-30...+85 [-22...+185]							
Breaking force	%	500							
Nominal displacement ± 15 %	mm	0.06		0.08		0.11		0.21 0.32	
Natural frequency	kHz	22	45	47	27	22	18	15	
Permissible oscillation amplitude (DIN 50 100)	%	50							
Protection to EN 60 529		IP 67							

1) Depending on the selected mounting arrangement, the sensitivity of a force washer is 1.7 ... 2.3 mV/V. With identical mounting position (fixed position), the force readings are repeatable with an error of < ± 1%.

2) All %-values refer to full scale.

3) For nominal forces of 20 kN, 40 kN, 60 kN: 0.5 V...5 V

Examples for application

Monitoring a screw preload

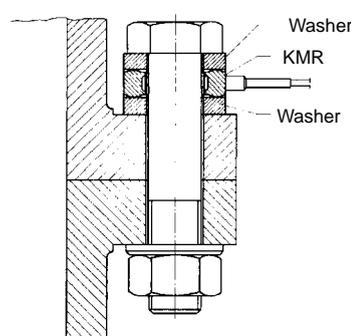


Figure 1: The preload is measured with a repeatability of < ± 1 %.

Force monitoring

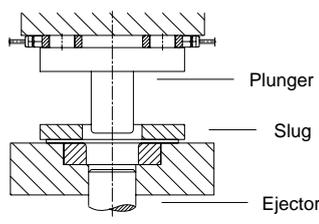


Figure 2: The KMR is used for monitoring of the adjusted deep-draw pressing force with a repeatability of < ± 1 %.

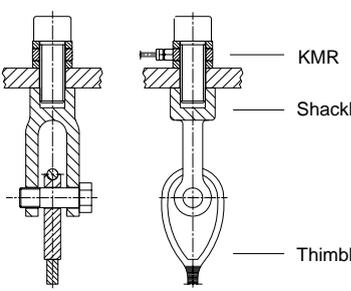


Figure 3: Monitoring rope forces.

Scope of supply: KMR Force washer, two hardened washers, mounting instructions

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