

# TECHNICAL INFORMATION

## General Technical Data

ISO Tolerances, Selection - in  $\mu\text{m}$  -

Nominal dimension range [mm]		Piston guides	Bottom of groove for two-piece piston seals	Bottom of groove for piston seals	Simmering shaft	Piston rods	Simmering (housing), rod guides, wiper housing	Bottom of groove for rod seals	Simmering housing, special cases	Cylinder bores				
										h8	h9	h10	h11	f7
over 1,6	to 3	0	0	0	0	-6	-6	-14	14	25	40	60	20	
		-14	-25	-40	-60	-16	-20	-28	0	0	0	0	6	
3	6	0	0	0	0	-10	-10	-20	18	30	48	75	28	
6	10	0	0	0	0	-13	-13	-25	22	36	58	90	35	
		-22	-36	-58	-90	-28	-35	-47	0	0	0	0	13	
10	14	0	0	0	0	-16	-16	-32	27	43	70	110	43	
14	18	-27	-43	-70	-110	-34	-43	-59	0	0	0	0	16	
18	24	0	0	0	0	-20	-20	-40	33	52	84	130	53	
24	30	-33	-52	-84	-130	-41	-53	-73	0	0	0	0	20	
30	40	0	0	0	0	-25	-25	-50	39	62	100	160	64	
40	50	-39	-62	-100	-160	-50	-64	-89	0	0	0	0	25	
50	65	0	0	0	0	-30	-30	-60	46	74	120	190	76	
65	80	-46	-74	-120	-190	-60	-76	-106	0	0	0	0	30	
80	100	0	0	0	0	-36	-36	-72	54	87	140	220	90	
100	120	-54	-87	-140	-220	-71	-90	-126	0	0	0	0	36	
120	140	0	0	0	0	-43	-43	-85	63	100	160	250	106	
140	160	-63	-100	-160	-250	-83	-106	-148	0	0	0	0	43	
160	180													
180	200	0	0	0	0	-50	-50	-100	72	115	185	290	122	
200	225	-72	-115	-185	-290	-96	-122	-172	0	0	0	0	50	
225	250													

### Conversion Tables

Force: 1 Newton (N) = 1 kg m/s <sup>2</sup>				Energy, work, amount of heat: 1 Nm = 1 Joule (J) = 1 Ws					Power: Watt (W) = 1 Nm/s = 1 J/s			
N	kp	dyn		Nm	kWh	kpm	cal	W	kW	PS		
1 N	1	0,102	10 <sup>5</sup>	1 Nm	1	0,278 · 10 <sup>-6</sup>	0,102	0,238	1 W	1	10 <sup>-3</sup>	1,36 · 10 <sup>-3</sup>
1 kp	9,81	1	9,81 · 10 <sup>5</sup>	1 kWh	3,6 · 10 <sup>6</sup>	1	0,367 · 10 <sup>6</sup>	0,86 · 10 <sup>6</sup>	1 kW	10 <sup>3</sup>	1	1,36
1 dyn	10 <sup>-5</sup>	1,02 · 10 <sup>-6</sup>	1	1 kpm	9,81	2,72 · 10 <sup>-6</sup>	1	2,335	1 PS	736	0,736	1
				1 cal	4,19	1,17 · 10 <sup>-6</sup>	0,428	1				

Tbl. 20.9 Conversion factors for units of force, energy, work, amount of heat and power



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Pressure, mechanical stress

1 Pascal (Pa) = 1 N/m <sup>2</sup> ; 1 MPa (10 <sup>6</sup> Pa) = 1 N/mm <sup>2</sup> = 0,102 kp/mm <sup>2</sup>							
	Pa	MPa	bar	kp/cm <sup>2</sup>	mm Hg	atm	mWs
1 Pa = 1 N/m <sup>2</sup>	1	10 <sup>-6</sup>	10 <sup>-5</sup>	1,02 · 10 <sup>-5</sup>	7,50 · 10 <sup>-3</sup>	9,87 · 10 <sup>-6</sup>	1,02 · 10 <sup>-4</sup>
1 MPa = 1 N/mm <sup>2</sup>	10 <sup>6</sup>	1	10	10,2	7,50 · 10 <sup>3</sup>	9,87	102
1 bar	10 <sup>5</sup>	0,1	1	1,02	750	0,987	10,2
1 kp/cm <sup>2</sup> (at)	9,81 · 10 <sup>4</sup>	9,81 · 10 <sup>-2</sup>	0,981	1	736	0,968	10
1 mm Hg (Torr)	133	1,33 · 10 <sup>-4</sup>	1,33 · 10 <sup>-3</sup>	1,36 · 10 <sup>-3</sup>	1	1,32 · 10 <sup>-3</sup>	1,36 · 10 <sup>-2</sup>
1 atm	1,013 · 10 <sup>5</sup>	0,1013	1,013	1,033	760	1	10,33
1 mWs	9,81 · 10 <sup>3</sup>	9,81 · 10 <sup>-3</sup>	9,81 · 10 <sup>-2</sup>	0,1	73,6	9,68 · 10 <sup>-2</sup>	1

Tbl. 20.10 Conversion factors for units of pressure and mechanical stress

units no longer permitted after 31.12.1977



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