SEAL DATA SHEET

K02-RD

For symbols that are not bold, please consult our technical for application limitations.

3D Seals > Hydraulics & Pneumatics >
PISTON SEALS

Description

As profile K02-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material. K02-RD for short housing.

- Asymmetric single acting piston lipseal, with the dynamic sealing lip beeing shorter and thinner than the static one in order to avoid drag pressure built up.
- Interference fit on the inside diameter.
- Various materials are available for different purposes
- Snaps into simple grooves.
- Best sealing effect across a wide temperature range.
- The active back up ring on the trailing side of the seal reduces extrusion wear and allows larger gap dimensions respectively higher system pressure.
- Sealing effect enhanced by high recovery rate.
- For pressures up to 250 bar as a seal between pressurised spaces.
- Good sealing in the low pressure range.
- Excellent static and dynamic sealing.
- Suitable for long travel.
- Little inclination to "stick-slip".
- Low break-away load after prolonged periods of standstill.

Single Acting

The K02-RD seal is designed for use as a piston seal - either single or double acting where two seals are used 'back to back'

Area of Application: Hydraulics

Reciprocating pistons in hydraulic cylinders.
Piston seal for applications with large extrusion gap and without special impact load.

Note

- This seal has the correct functioning dimensions only when mounted. In unmounted condition, the seal may appear too small.
- The ratio between nominal width and sealing height CS/H should not drop below a value of 1/1.25 (essentially according to ISO 5597 housings for piston and rod seals).
- For short strokes or fast shifts in direction, the K04-P type is to be prefered.
- Recovery volume is limited.
- Design K02-RD with triangular back up ring can lead to installation difficulties.

Function

K02-R and K02-RD profiles are lip seals designed to seal pressurised space against the atmosphere or - in case of back to back arrangement with intermediate guidering – to seal between two pressurised spaces, mainly for reciprocating movements. The design is based on application in standard hydraulic systems with conventional hydraulic oils. The operating parameters are as defined in the sealing data sheet and material data. Requirements deviating from these parameters can be met to a certain degree by changing the geometry in the software program.

Operating Parameters & Material

Diameter range: up to 600 mm

Material		Temperature	Max. Surface Speed	Max. Pressure [1]	Hydrolysis	Dry Running	Wear Resistance
Seal Ring	B/U Ring						
NBR	POM / PA[2]	-30 °C ... +100 °C	0.5 m/s	250 bar (25 Mpa)	-	-	0
FKM	PTFE II	-20 °C ... +200 °C	0.5 m/s	250 bar (25 Mpa)	-	-	0
EPDM[3]	POM[2]	-50 °C ... +100 °C	0.5 m/s	250 bar (25 Mpa)	++	-	0
EPDM[3]	PA[2]	-50 °C ... +100 °C	0.5 m/s	250 bar (25 Mpa)	+	-	0
EPDM[3]	PTFE II	-50 °C ... +150 °C	0.5 m/s	250 bar (25 Mpa)	++	-	0
HNBR	POM / PA2	-20 °C ... +100 °C	0.5 m/s	250 bar (25 Mpa)	+	0	+
HNBR	PTFE II	-20 °C ... +150 °C	0.5 m/s	250 bar (25 Mpa)	+	0	+

The stated operation conditions represent general indications. It is recommended not to use all maximum values simultaneously. Surface speed limits apply only to the presence of adequate lubrication

1. Pressure ratings are dependent on the size of the extrusion gap.
2. POM up to ø260 mm, PA above ø260 mm
3. Attention: not suitable for mineral oils!

'++ ... particularly suitable O ... conditional suitable
+ ... suitable - ... not suitable

For detailed information regarding chemical resistance please refer to our „list of resistance“. For increased chemical and thermal resistance rubber materials are to be preferred, attention should be paid to restrictions for pressure range and wear resistance. For higher gliding speeds another system

Gap Dimension

Operating Pressure	cs = (ØD - Ød)/2 mm					
	4	5	7.5	10	12.5	15
	Safe Extrusion Gap (mm)					
50 bar (5 MPa)	0.80	1.00	1.50	2.00	2.50	3.00
100 bar (10 MPa)	0.80	1.00	1.40	1.65	1.85	2.20
200 bar (20 MPa)	0.60	0.75	0.85	1.12	1.25	1.35
250 bar (25 MPa)	0.50	0.65	0.75	0.85	1.00	1.25

Important Note

The above data are maximum value and can't be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

The table applies to an operating temperature of 70 °C

Use larger cross sections to increase maximum allowed gap dimension. If the permissible extrusion gap cannot be achieved, K02-P is to be used.

Surface Quality

Surface Roughness	R_{tmax} (µm)	R_a (µm)
Sliding	≤2.5	≤0.1-0.5
Bottom of Groove	≤6.3	≤1.6
Groove Face	≤15	≤3

Tolerance Recommendation

Seal Housing Tolerances	
Ød	h10
ØD	H9

Tolerance Recommendation

In order to avoid damage to the piston seal during installation, the piston and the housing is to be chamfered and rounded as shown in the "Recommended mounting space" drawing. The size of chamfer depends on the seal type and profile width.

cs (mm)	c (mm)	
	α = 15° ... 20°	α = 20° ... 30°
4	3.5	2
5	4	2.5
6	4.5	3
7.5	5	4
10	6	5
12.5	8.5	6.5
15	10	7.5
20	13	10