



## SEAL DATA SHEET

## K01-R



3D Seals &gt; Hydraulics &amp; Pneumatics &gt;

## PISTON SEALS

**Description**

As Profile K01-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.



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

- Asymmetric single acting piston lipseal, with the dynamic sealing lip being 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 (see notes on installation).
- Best sealing effect across a wide temperature range.
- Sealing effect enhanced by high recovery rate.
- For pressures up to 160 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 K01-R 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 small extrusion gap and without special impact load.

Can also be used as a pivot seal at low loads

**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).

**Function**

K01-R profiles are lip seals designed to seal pressurised space against the atmosphere or -in case of back to back arrangement with intermediate guiding – 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 <sup>1</sup> | Hydrolysis | Dry Running | Wear Resistance |
|----------|--------------------|--------------------|----------------------------|------------|-------------|-----------------|
| NBR      | -30 °C ... +100 °C | 0.5 m/s            | 160 bar (160 MPa)          | -          | -           | 0               |
| FKM      | -20 °C ... +200 °C | 0.5 m/s            | 160 bar (160 MPa)          | -          | -           | 0               |
| EPDM 2   | -50 °C ... +150 °C | 0.5 m/s            | 160 bar (160 MPa)          | ++         | -           | 0               |
| HNBR     | -25 °C ... +150 °C | 0.5 m/s            | 160 bar (160 MPa)          | +          | 0           | +               |
| MVQ      | -60 °C ... +200 °C | -                  | 160 bar (160 MPa)          | ++         | -           | -               |

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. 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 should be used (e.g. PTFE materials).

**Gap Dimension**

| Operating Pressure | cs = (∅D - ∅d)/2 mm     |      |      |      |      |      |
|--------------------|-------------------------|------|------|------|------|------|
|                    | 4                       | 5    | 7.5  | 10   | 12.5 | 15   |
|                    | Safe Extrusion Gap (mm) |      |      |      |      |      |
| 50 bar (5 MPa)     | 0.18                    | 0.22 | 0.26 | 0.30 | 0.33 | 0.36 |
| 100 bar (10 MPa)   | 0.16                    | 0.18 | 0.27 | 0.27 | 0.31 | 0.35 |
| 160 bar (16 MPa)   | 0.14                    | 0.17 | 0.25 | 0.25 | 0.27 | 0.33 |

**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 | $R_{tmax}$<br>( $\mu m$ ) | $R_a$<br>( $\mu m$ ) |
|-------------------|---------------------------|----------------------|
| Sliding surface   | $\leq 2.5$                | $\leq 0.1-0.5$       |
| Bottom of Groove  | $\leq 6.3$                | $\leq 1.6$           |
| Groove Face       | $\leq 15$                 | $\leq 3$             |

### Tolerance Recommendation

| Seal Housing Tolerances |     |
|-------------------------|-----|
| $\varnothing d$         | h10 |
| $\varnothing D$         | H9  |

### Insertion chamfer

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)                             |                                    |
|---------|------------------------------------|------------------------------------|
|         | $\alpha = 15^\circ \dots 20^\circ$ | $\alpha = 20^\circ \dots 30^\circ$ |
| 2       | 2                                  | 1                                  |
| 3       | 3                                  | 1.5                                |
| 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                                 |