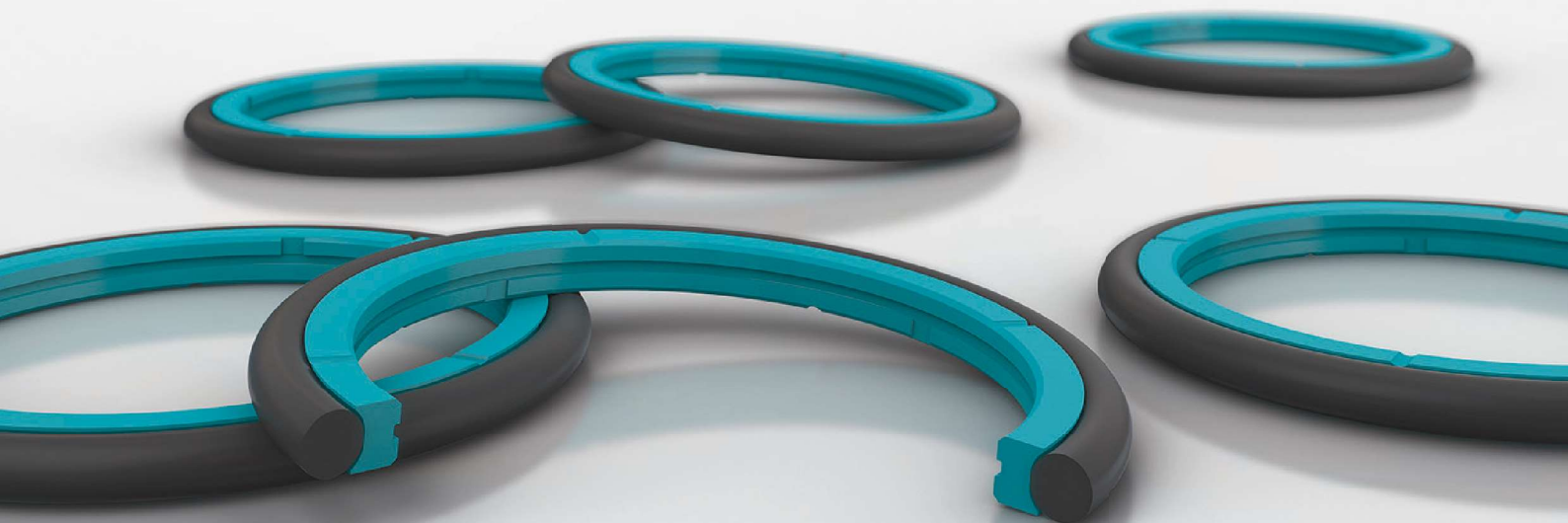


Turcon[®] Roto Glyd Ring[®] K





■ Turcon® Roto Glyd Ring® K

■ General Description

Turcon® Roto Glyd Ring® K is used to seal shafts, axles, bores, rotary manifolds and swivels with rotary, helical or oscillating movement. It consists of a seal ring in high-grade Turcon® material activated by an elastomer O-Ring.

The contact surface profile of the seal ring is specially designed for use at high pressure and low sliding speeds.

Preferably, the Roto Glyd Ring® K version is used as single-acting seal because of its asymmetric appearance although a semi double-acting sealing function is maintained.

Roto Glyd Ring® K is supplied with an axial pressure relief groove. As illustrated in Figure 129, the continuous radial groove is on one side linked to the pressure chamber.

The seal is thus relieved of pressure from one side and can be used for higher PV values than Turcon® Roto Glyd Ring®.

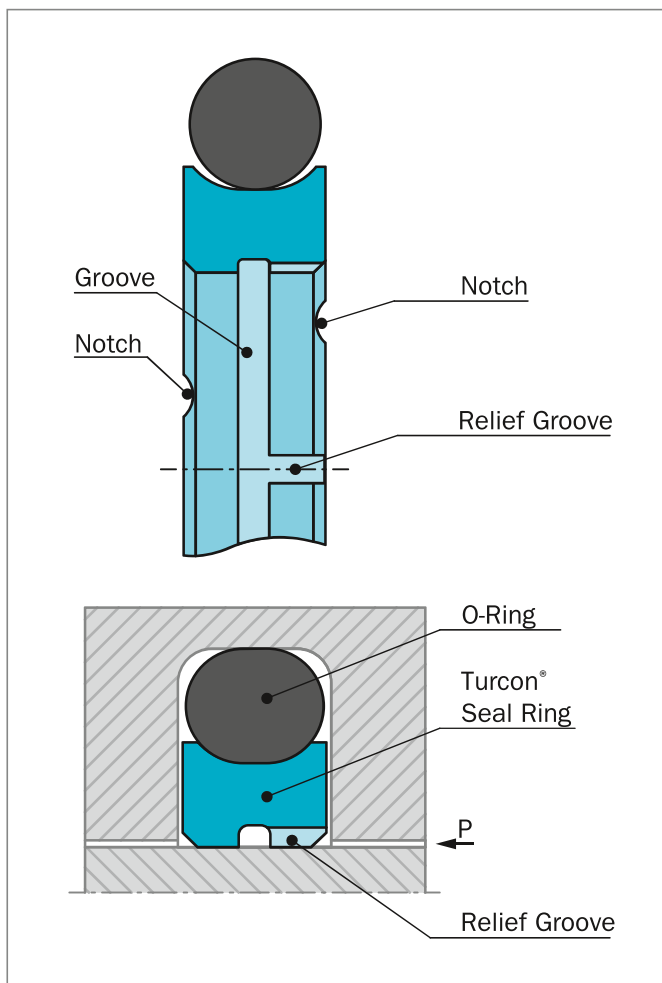


Figure 129: Turcon® Roto Glyd Ring® K with pressure relief.

This Roto Glyd Ring® version is identified in the TSS Article Number by a "K" at the 5th digit, see Ordering Examples. For this seal, the direction of installation must be observed.

METHOD OF OPERATION

Initial contact pressure of the Roto Glyd Ring® K is provided by radial compression of the O-Ring. When the system pressure is increased, the O-Ring transforms this into additional contact pressure. The contact pressure of the seal is thereby automatically adjusted so sealing is ensured under all service conditions.

The single-acting performance of the seal follows from the asymmetrical cross section which allows the seal to respond to high pressure in one direction.

The axial pressure relief groove connecting the pressurized fluid to the circumferential center groove ensures a pressure balance of more than half of the seal contact area. This significantly reduces the seal friction when compared to the double-acting Roto Glyd Ring®.

As the K version still has full sealing contact and hold pressure from both directions, it can act as a double-acting rotary seal. The relieved side must be installed on the side with the higher pressure.

The unrelieved side of the seal is only for low pressure, which should not exceed 3 MPa as it is not sufficiently supported to prevent extrusion from high pressure.

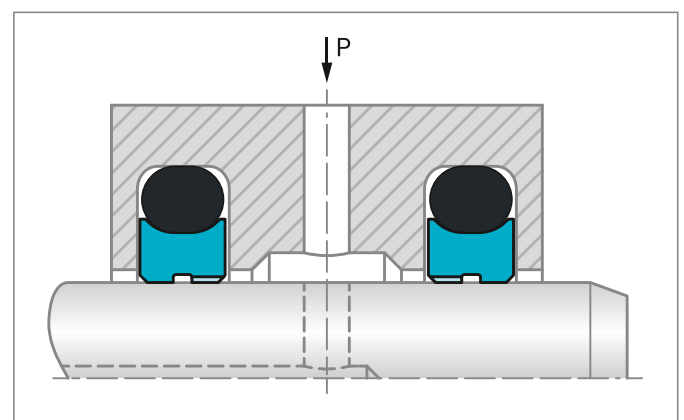


Figure 130: Right installation of Roto Glyd Ring® K

NOTCH

To assure rapid activation of the seal at sudden changes of pressure and direction of motion, radial notches are added on both sides of the seal ring.



ADVANTAGES

- Single-acting rotary seal
- Simple groove design
- Small groove dimensions
- Very low friction
- Stick-slip free operation
- No vulcanizing to mating surfaces

TYPICAL APPLICATIONS

Roto Glyd Ring® K is preferably used as a single-acting rotary seal for hydraulic and pneumatic equipment in applications such as:

- In end caps of rotary distributors and unions
- High pressure valve stems
- Manipulators
- Hydraulic motors
- Pivoting motors in mobile hydraulic and machine tools
- Blow molding machines

OPERATING CONDITIONS

Seal performance is influenced by such factors as lubrication capability of the sealed medium and heat dissipation in the hardware. It follows that testing should always be made.

With good lubrication, the following values can be assumed:

Pressure:	Up to 30 MPa (from pressure relieved side) Up to 3 MPa (from pressure unrelieved side)
Speed:	Up to 2.0 m/s
PV:	Up to 2.5 MPa m/s The value must be reduced for diameters < 50 mm.
Temperatures:	-45 °C to +200 °C *) depending on O-Ring elastomer and medium
Media:	Mineral oil-based hydraulic fluids, flame-retardant hydraulic fluids, environmentally friendly hydraulic fluids (bio-oils), water and others, depending on seal and elastomer material.

IMPORTANT NOTE

The above data are maximum values and cannot be used at the same time, e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also depends on media.

*) IMPORTANT NOTE

In the case of unpressurized applications in temperatures below 0 °C please contact your local Trelleborg Sealing Solutions marketing company for more information.



INSTALLATION INSTRUCTIONS

Roto Glyd Ring® is installed according to information at page 313.

Closed groove installation according to dimensions at Table 85 on page 248.

RECOMMENDED MATERIALS

The following material combinations have proven effective for rotary applications:

Turcon® Roto Glyd Ring® K in Turcon® T40

All-round material in lubricating fluids and fluids with limited lubrication e.g. water:

O-Ring:	NBR 70 Shore A	N
	FKM 70 Shore A	V
	HNBR 70 Shore A	H
	(according to temperature)	

Set code: T40N, T40V or T40H

Turcon® Roto Glyd Ring® K in Turcon® M15

Material with high sealing effect for light to medium applications in fluids with good lubrication:

O-Ring:	NBR 70 Shore A	N
	FKM 70 Shore A	V
	HNBR 70 Shore A	H
	(according to temperature)	

Set code: M15N, M15V or M15H

Turcon® Roto Glyd Ring® K in Zurcon® Z80

For slow turning applications with fluid, air, gases and risk of high abrasive wear; temperature limit -45 °C to +80 °C:

O-Ring	NBR 70 Shore A
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Set code: Z80N

Z80 are for slow turning motion and not for constant rotation.

For specific applications other Turcon® and Zurcon® materials are available.



Table 84: Turcon® Roto Glyd Ring® K

Material, Applications, Properties	Code	O-Ring Material Shore D	Code	Service Temp. * °C	Mating Surface Material	MPa max. Dynamic	
Turcon® M04 For lubricating and non-lubricating fluids and gases Smooth and tight surface texture Good sealing performance Suitable for softer mating surfaces High extrusion resistance For swiveling and low velocity rotary service only Carbon filled Color: Black	M04	NBR 70	N	-30 to +100	Steel	30	
		NBR 70 Low temp.	T	-45 to +80	Hardend steel		
		FKM 70	V	-10 to +200			
		HNBR 70	H	-30 to +150			
Turcon® M15 Recommended material for rotary motion For lubricating fluids Tight surface texture Good sealing performance Very good wear properties Low friction Good extrusion resistance Suited to softer mating surfaces Polyaramide, mineral fiber, lubricant, graphite and Turcon® filled Color: Dark gray	M15	NBR 70	N	-30 to +100	Hardend steel	30	
		NBR 70 Low temp.	T	-45 to +80			
		FKM 70	V	-10 to +200			
		HNBR 70	H	-30 to +150			
Turcon® M30 For lubricating and non-lubricating fluids and gases Good wear and extrusion resistance Suited to high temperature service Tight surface structure Good sealing performance Suited to softer surfaces For swiveling and low velocity rotary service only Aromatic polymer, graphite, Turcon® filled; Color: Dark green-gray.	M30	NBR 70	N	-30 to +100	Steel	30	
		NBR 70 Low temp.	T	-45 to +80	Hardend steel Stainless steel		
		FKM 70	V	-10 to +200	Titanium		
		HNBR 70	H	-30 to +150	HVOF Tungsten carbide		

Table is continued on next page



Material, Applications, Properties	Code	O-Ring Material Shore D	Code	Service Temp.* °C	Mating Surface Material	MPa max. Dynamic
Turcon® T10 For lubricating and non-lubricating fluids and gases Suitable for slow rotary service in lubricating fluid High extrusion resistance Not for electrically conducting fluids Carbon, graphite filled Color: Black	T10	NBR 70	N	-30 to +100	Steel Hardend steel Chrome-plated steel (rod) Stainles steel	30
		NBR 70 Low temp.	T	-45 to +80		
		FKM 70	V	-10 to +200		
		EPDM 70	E	-45 to +145		
Turcon® T40 All-round material for rotary and turning movements Good wear resistance and service life with both lubricating and non-lubricating fluids Surface texture less suited to gas sealing Carbon fiber filled Color: Gray.	T40	NBR 70	N	-30 to +100	Hardend steel Hard Alloys	30
		NBR 70 Low temp.	T	-45 to +80		
		FKM 70	V	-10 to +200		
		HNBR 70	H	-30 to +150		
Zurcon® Z80 For lubricating and non-lubricating fluids and gases High abrasion and extrusion resistance Well suited to abrasive mating surfaces and fluids For swiveling and intermittent low velocity rotary service only Good chemical resistance Ultra-high molecular weight polyethylene Color: White to off-white	Z80	NBR 70	N	-30 to +80	Steel Hardend steel Ceramic coatings HVOF Tungsten carbide	30
		NBR 70 Low temp.	T	-45 to +80		

* Service temperatures are only valid when using hydraulic mineral oil. Note that frictional heat may cause increased temperatures at the seal.

Recommended material.

Note:

Rotary seals exert high loads on mating surfaces and mild steels are best suited for slow or swiveling service.

As a basic principle, the hardness of the mating surface should increase with the peripheral speed, and a hardness of 60 HRC is recommended for velocities above 1 m/s. Due to the mechanical stresses imposed, a hardness depth of 0.5 mm or more is recommended to limit dimensional changes to the mating surface.



Installation Recommendation for Shaft

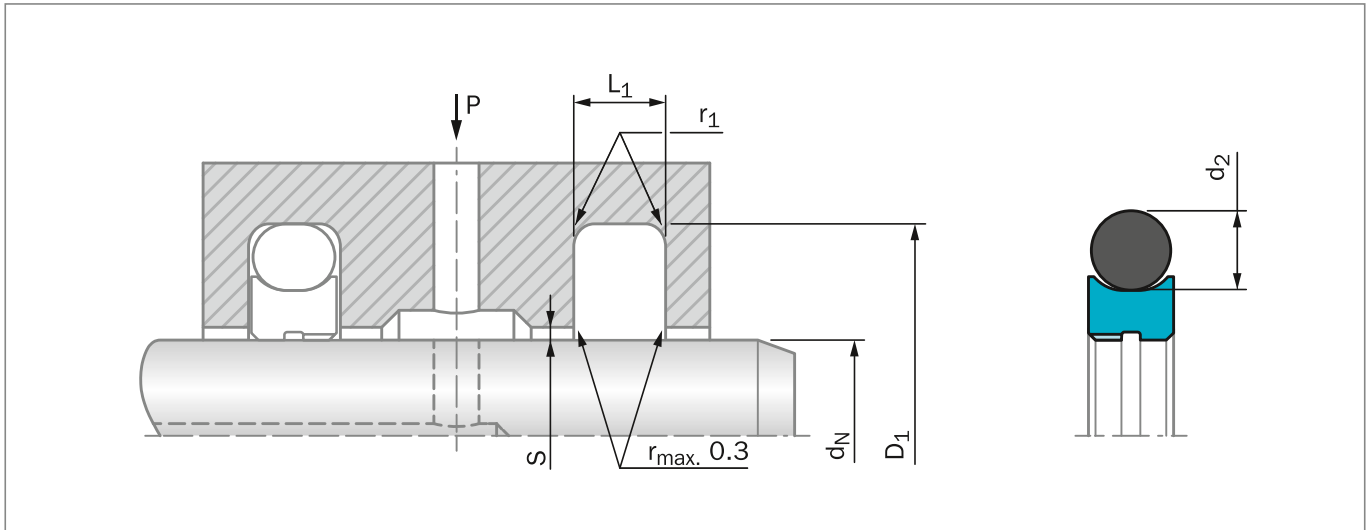


Figure 131: Installation Drawing

Table 85: Installation Dimensions – Standard Recommendations

Series Number	Shaft Diameter d_N f8/h9		Groove Diameter D_1 H9	Groove Width L_1 +0.2	Radius r_1	Radial Clearance S_{max} *			O-Ring Cross-Section- \emptyset d_2	No. of Grooves in the Sealing Surface
	Recommended Range	Available Range				10 MPa	20 MPa	30 MPa		
TG31K	19 - 37.9	10 - 245.0	$d_N + 7.5$	3.20	0.60	0.20	0.15	0.10	2.62	1
TG32K	38 - 199.9	19 - 455.0	$d_N + 11.0$	4.20	1.00	0.25	0.20	0.15	3.53	1
TG33K	200 - 255.9	38 - 655.0	$d_N + 15.5$	6.30	1.30	0.30	0.25	0.20	5.33	2
TG34K	256 - 649.9	120 - 655.0	$d_N + 21.0$	8.10	1.80	0.35	0.30	0.25	7.00	2
TG35K	650 - 999.9	650 - 999.9	$d_N + 28.0$	9.50	2.50	0.40	0.35	0.30	8.40	2

* At pressures > 30 MPa: Use diameter tolerance H8/f8 (bore / shaft) in area of seal.

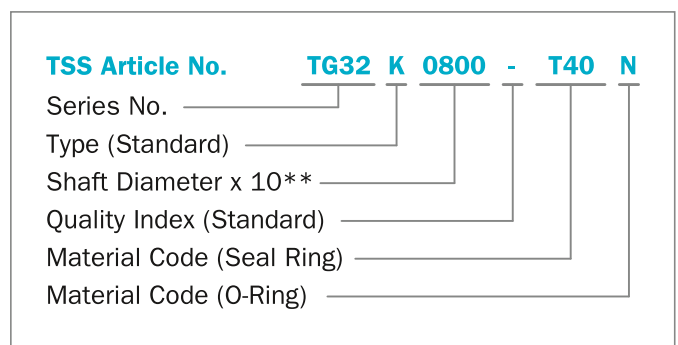
At pressures > 10 MPa it is recommendable to choose the next larger cross section according to the column "Available range" i.e. for shaft $\emptyset d_N = 80$ mm: TG33K 800-.

ORDERING EXAMPLE

Turcon® Roto Glyd Ring® K, complete with O-Ring, standard application:

Series:	TG32K (from Table 85)
Shaft diameter:	$d_N = 80$ mm
TSS Part No.:	TG32K0800 (from Table 86)

Select the material from Table 84. The corresponding code numbers are appended to the TSS Part No. Together they form the TSS Article No. The TSS Article No. for all intermediate sizes not shown in Table 86 can be determined following the example opposite.



** For diameters $d_N \geq 1,000.0$ mm only on TSS Special Article Number.



Table 86: Standard Installation Dimensions / TSS Part Number

Shaft Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions	Shaft Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
d_N f8/h9	D_1 H9	L_1 +0.20			d_N f8/h9	D_1 H9	L_1 +0.20		
20.0	27.5	3.2	TG31K0200	21.89 x 2.62	210.0	225.5	6.3	TG33K2100	215.27 x 5.33
22.0	29.5	3.2	TG31K0220	25.07 x 2.62	220.0	235.5	6.3	TG33K2200	227.97 x 5.33
25.0	32.5	3.2	TG31K0250	28.24 x 2.62	230.0	245.5	6.3	TG33K2300	234.32 x 5.33
28.0	35.5	3.2	TG31K0280	31.42 x 2.62	240.0	255.5	6.3	TG33K2400	247.02 x 5.33
30.0	37.5	3.2	TG31K0300	32.99 x 2.62	250.0	265.5	6.3	TG33K2500	253.37 x 5.33
32.0	39.5	3.2	TG31K0320	34.59 x 2.62	280.0	301.0	8.1	TG34K2800	291.47 x 7.00
35.0	42.5	3.2	TG31K0350	37.77 x 2.62	300.0	321.0	8.1	TG34K3000	304.17 x 7.00
36.0	43.5	3.2	TG31K0360	39.34 x 2.62	320.0	341.0	8.1	TG34K3200	329.57 x 7.00
40.0	51.0	4.2	TG32K0400	44.04 x 3.53	350.0	371.0	8.1	TG34K3500	354.97 x 7.00
42.0	53.0	4.2	TG32K0420	47.22 x 3.53	360.0	381.0	8.1	TG34K3600	367.67 x 7.00
45.0	56.0	4.2	TG32K0450	50.39 x 3.53	400.0	421.0	8.1	TG34K4000	405.26 x 7.00
48.0	59.0	4.2	TG32K0480	53.57 x 3.53	500.0	521.0	8.1	TG34K5000	506.86 x 7.00
50.0	61.0	4.2	TG32K0500	53.57 x 3.53	550.0	571.0	8.1	TG34K5500	557.66 x 7.00
52.0	63.0	4.2	TG32K0520	56.74 x 3.53	600.0	621.0	8.1	TG34K6000	608.08 x 7.00
55.0	66.0	4.2	TG32K0550	59.92 x 3.53	700.0	728.0	9.5	TG35K7000	712.90 x 8.40*
56.0	67.0	4.2	TG32K0560	59.92 x 3.53	800.0	828.0	9.5	TG35K8000	812.90 x 8.40*
60.0	71.0	4.2	TG32K0600	63.09 x 3.53	900.0	928.0	9.5	TG35K9000	912.90 x 8.40*
63.0	74.0	4.2	TG32K0630	66.27 x 3.53					
65.0	76.0	4.2	TG32K0650	69.44 x 3.53					
70.0	81.0	4.2	TG32K0700	75.79 x 3.53					
75.0	86.0	4.2	TG32K0750	78.97 x 3.53					
80.0	91.0	4.2	TG32K0800	85.32 x 3.53					
85.0	96.0	4.2	TG32K0850	88.49 x 3.53					
90.0	101.0	4.2	TG32K0900	94.84 x 3.53					
95.0	106.0	4.2	TG32K0950	101.19 x 3.53					
100.0	111.0	4.2	TG32K1000	104.37 x 3.53					
105.0	116.0	4.2	TG32K1050	110.72 x 3.53					
110.0	121.0	4.2	TG32K1100	113.89 x 3.53					
115.0	126.0	4.2	TG32K1150	120.24 x 3.53					
120.0	131.0	4.2	TG32K1200	123.42 x 3.53					
125.0	136.0	4.2	TG32K1250	129.77 x 3.53					
130.0	141.0	4.2	TG32K1300	136.12 x 3.53					
135.0	146.0	4.2	TG32K1350	139.29 x 3.53					
140.0	151.0	4.2	TG32K1400	145.64 x 3.53					
150.0	161.0	4.2	TG32K1500	158.34 x 3.53					
160.0	171.0	4.2	TG32K1600	164.69 x 3.53					
170.0	181.0	4.2	TG32K1700	177.39 x 3.53					
180.0	191.0	4.2	TG32K1800	183.74 x 3.53					
190.0	201.0	4.2	TG32K1900	196.44 x 3.53					
200.0	215.5	6.3	TG33K2000	208.92 x 5.33					

The Shaft diameters in **bold** type correspond to the recommendations of ISO 3320.

Other dimensions and all intermediate sizes up to 999.9 mm diameter including inch sizes can be supplied. For diameters $\geq 1,000.0$ mm only with a TSS Special Article Number.

* Theoretical ideal O-Ring size



Installation Recommendation for Bore

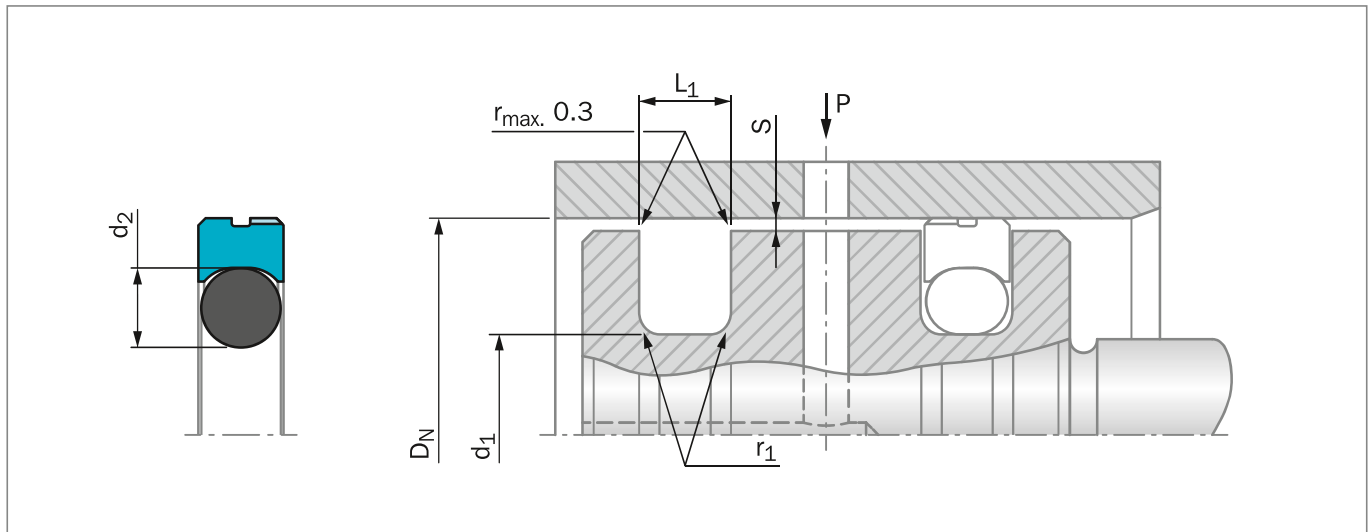


Figure 132: Installation Drawing

Table 87: Installation Dimensions – Standard Recommendations

Series Number	Bore Diameter D_N H9		Groove Diameter d_1 h9	Groove Width $L_1 +0.2$	Radius r_1	Radial Clearance S_{max}^*			O-Ring Cross-Section- \emptyset d_2	No. of Grooves in the Sealing Surface
	Recommended Range	Available Range				10 MPa	20 MPa	30 MPa		
TG41K	40 - 79.9	14 - 250.0	$D_N - 7.5$	3.20	0.60	0.20	0.15	0.10	2.62	1
TG42K	80 - 132.9	22 - 460.0	$D_N - 11.0$	4.20	1.00	0.25	0.20	0.15	3.53	1
TG43K	133 - 329.9	40 - 675.0	$D_N - 15.5$	6.30	1.30	0.30	0.25	0.20	5.33	2
TG44K	330 - 669.9	133 - 690.0	$D_N - 21.0$	8.10	1.80	0.35	0.30	0.25	7.00	2
TG45K	670 - 999.9	-	$D_N - 28.0$	9.50	2.50	0.40	0.35	0.30	8.40	2

* At pressures > 30 MPa: Use diameter tolerance H8/f8 (bore / shaft) in area of seal.

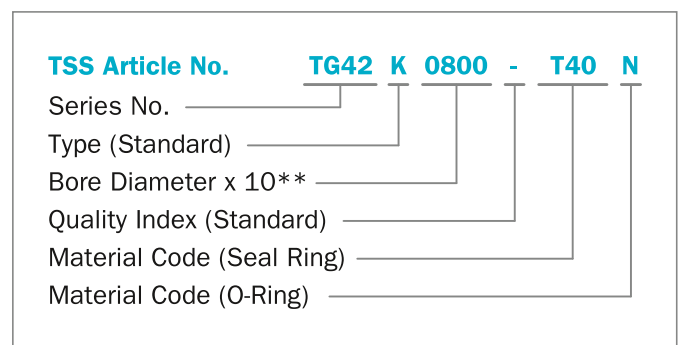
At pressures > 10 MPa it is recommendable to choose the next larger cross section according to the column "Available range" i.e. for shaft \emptyset 80 mm: TG43K 800-.

ORDERING EXAMPLE

Turcon® Roto Glyd Ring® K complete with O-Ring, standard application:

Series:	TG42K (from Table 87)
Bore diameter:	$D_N = 80.0$ mm
TSS Part No.:	TG42K0800 (from Table 88)

Select the material from Table 84. The corresponding code numbers are appended to the TSS Part No. Together they form the TSS Article No. The TSS Article No. for all intermediate sizes not shown in Table 88 can be determined following the example opposite.



** For diameters $D_N \geq 1,000.0$ mm only with a TSS Special Article Number.



Table 88: Standard Installation Dimensions / TSS Part Number

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions	Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
D_N H9	d_1 h9	L_1 +0.20			D_N H9	d_1 h9	L_1 +0.20		
40.0	32.5	3.2	TG41K0400	31.42 x 2.62	400.0	379.0	8.1	TG44K4000	367.67 x 7.00
42.0	34.5	3.2	TG41K0420	32.99 x 2.62	420.0	399.0	8.1	TG44K4200	393.07 x 7.00
45.0	37.5	3.2	TG41K0450	36.17 x 2.62	450.0	429.0	8.1	TG44K4500	417.96 x 7.00
48.0	40.5	3.2	TG41K0480	39.34 x 2.62	480.0	459.0	8.1	TG44K4800	456.06 x 7.00
50.0	42.5	3.2	TG41K0500	40.94 x 2.62	500.0	479.0	8.1	TG44K5000	468.76 x 7.00
52.0	44.5	3.2	TG41K0521	44.12 x 2.62	550.0	529.0	8.1	TG44K55000	532.26 x 7.00
55.0	47.5	3.2	TG41K0550	45.69 x 2.62	600.0	579.0	8.1	TG44K6000	582.68 x 7.00
56.0	48.5	3.2	TG41K0560	47.29 x 2.62	650.0	629.0	8.1	TG44K6500	633.48 x 7.00
60.0	52.5	3.2	TG41K0600	52.07 x 2.62	700.0	672.0	9.5	TG45K7000	670.30 x 8.40*
63.0	55.5	3.2	TG41K0630	53.64 x 2.62	800.0	772.0	9.5	TG45K8000	770.30 x 8.40*
65.0	57.5	3.2	TG41K0650	56.82 x 2.62	900.0	872.0	9.5	TG45K9000	870.30 x 8.40*
70.0	62.5	3.2	TG41K0700	61.60 x 2.62					
75.0	67.5	3.2	TG41K0750	66.34 x 2.62					
80.0	69.0	4.2	TG42K0800	66.27 x 3.53					
85.0	74.0	4.2	TG42K0850	72.62 x 3.53					
90.0	79.0	4.2	TG42K0900	78.97 x 3.53					
95.0	84.0	4.2	TG42K0950	82.14 x 3.53					
100.0	89.0	4.2	TG42K1000	88.49 x 3.53					
110.0	99.0	4.2	TG42K1100	98.02 x 3.53					
115.0	104.0	4.2	TG42K1150	101.19 x 3.53					
120.0	109.0	4.2	TG42K1200	107.54 x 3.53					
125.0	114.0	4.2	TG42K1250	113.89 x 3.53					
130.0	119.0	4.2	TG43K1300	117.07 x 5.33					
135.0	119.5	6.3	TG43K1350	116.84 x 5.33					
140.0	124.5	6.3	TG43K1400	123.19 x 5.33					
150.0	134.5	6.3	TG43K1500	132.72 x 5.33					
160.0	144.5	6.3	TG43K1600	142.24 x 5.33					
170.0	154.5	6.3	TG43K1700	151.77 x 5.33					
180.0	164.5	6.3	TG43K1800	164.47 x 5.33					
190.0	174.5	6.3	TG43K1900	170.82 x 5.33					
200.0	184.5	6.3	TG43K2000	183.52 x 5.33					
210.0	194.5	6.3	TG43K2100	189.87 x 5.33					
220.0	204.5	6.3	TG43K2200	202.57 x 5.33					
230.0	214.5	6.3	TG43K2300	208.92 x 5.33					
240.0	224.5	6.3	TG43K2400	221.62 x 5.33					
250.0	234.5	6.3	TG43K2500	234.32 x 5.33					
280.0	264.5	6.3	TG43K2800	266.07 x 5.33					
300.0	284.5	6.3	TG43K3000	278.77 x 5.33					
320.0	304.5	6.3	TG43K3200	304.17 x 5.33					
350.0	334.5	8.1	TG43K3500	329.57 x 7.00					

The Bore diameters in **bold** type correspond to the recommendations of ISO 3320.

Other dimensions and all intermediate sizes up to 999.9 mm diameter including inch sizes can be supplied. For diameters $\geq 1,000.0$ mm only with a TSS Special Article Number.

* Theoretical ideal O-Ring size