

## 14. Cam Followers for Pallet Changer

Cam followers are often used on work piece transfer systems (such as pallet changers) of machine tools (such as machining centers) to handle the large loads generated by these systems.

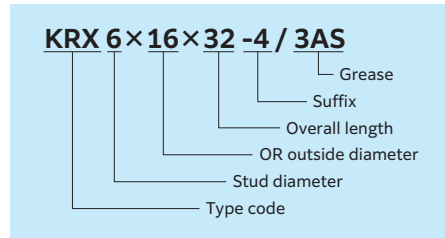
NTN offers various types of cam followers that include a ready-to-install cam follower optimized for pallet changers.

### 14.1 Structure and features

- The outer ring wall thickness is maximized for resistance to heavy load or impact load.
- Feature a compact design and can be easily mounted by tightening a setscrew.
- The outer ring outside diameter, outer ring width, and stud diameter are identical to the dimensions of NTN's standard cam followers (KR type).
- Because are actuated less frequently, they do not need to be relubricated. The oil hole has been deleted.
- Cost is reduced by removing the grease hole and the thread from the stud.

### 14.2 Cam follower numbering

The part number for cam followers for pallet changers is same as that of NTN special cam followers.



### 14.3 Accuracy

The accuracy of NTN cam followers for pallet changer is same as that of NTN standard cam followers (JIS Class 0).

### 14.4 Fits

The NTN pallet changer cam follower has a special stud that is readily secured with a setscrew. As shown example of mounting Fig. 14.2, a setscrew locks the pallet changer cam follower in the axial and circumferential directions.

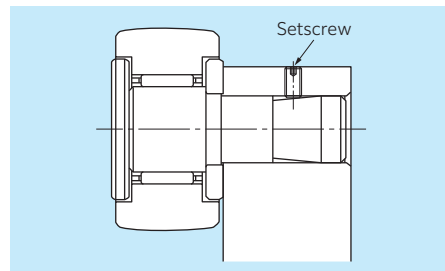


Fig. 14.2 Example of mounting

### 14.5 Radial internal clearance

The radial clearance of NTN cam followers for pallet changers is same as that of NTN standard cam followers (see Table 14.1).

Table 14.1. Radial internal clearance of cam followers

Unit:  $\mu\text{m}$

Nominal roller inscribed circle diameter $F_w$ (mm)		Internal clearance	
over	incl.	CN (normal clearance)	
		min	max
3	6	3	17
6	10	5	20
10	18	5	25
18	30	10	30
30	50	10	40

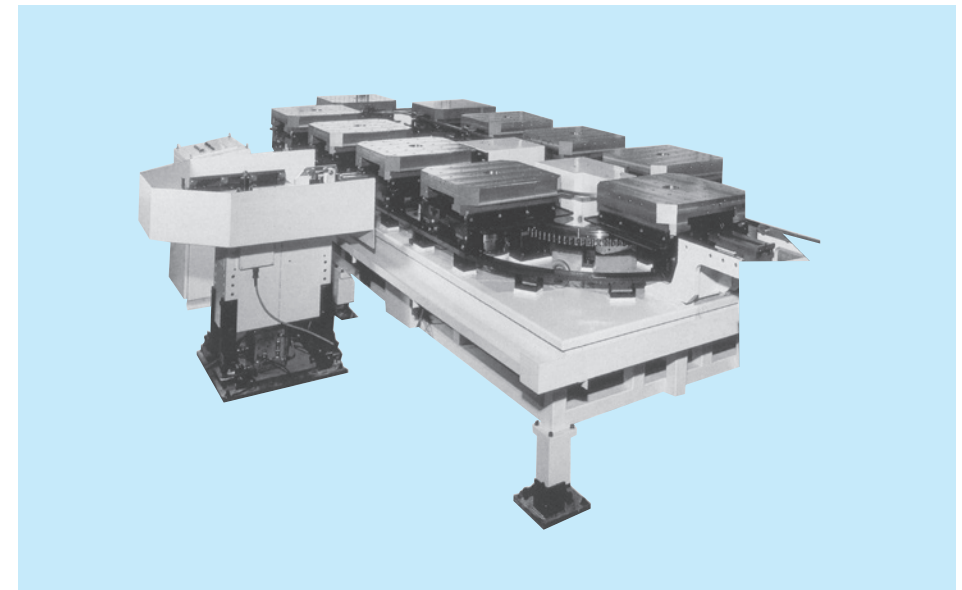
### 14.6 Lubrication

NTN cam followers for pallet changers are filled with lithium based grease and can be used in a temperature range of  $-20$  to  $120$  °C ( $100$  °C or less for continuous use).

Under the assumption that the user does not perform relubrication with grease, the standard NTN pallet changer cam follower does not have an oil hole for relubrication (If necessary, the cam follower can be provided with an oil hole or a hole for mounting a grease nipple).

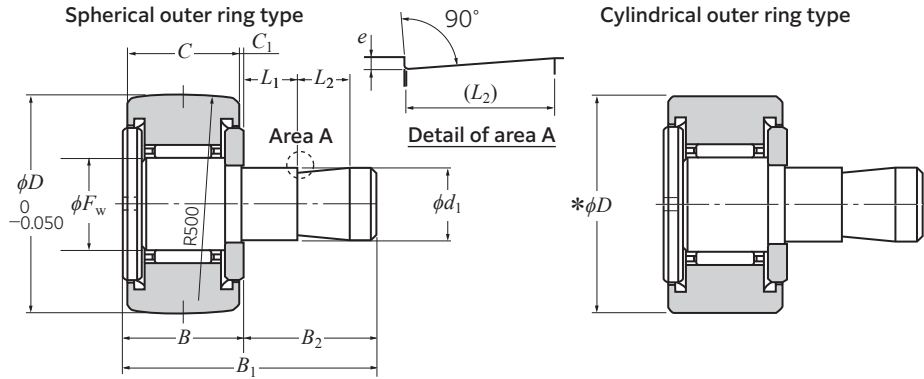
Upon request, NTN can also provide cam followers with a synthetic rubber seal.

Lubrication between the outside surface of bearing and track is also necessary. Failure to properly lubricate the outside surface of the cam follower could lead to premature wear of the bearing.



Example application of NTN cam followers for pallet changer (Photo: courtesy of Tsudakoma Corporation)

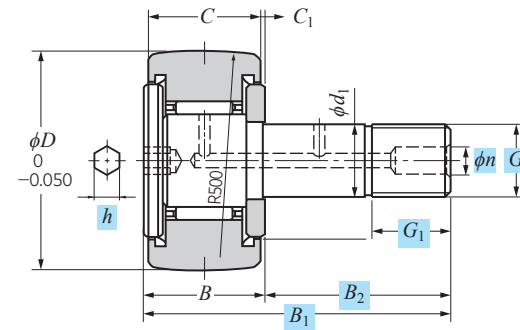
Cam followers for pallet changers  
Sealed KRX type



d1 6-20 mm

Cam follower number		Dimensions mm		Dimensions mm					Basic load ratings		Track load capacity		Reference dimensions											
Spherical outer ring	Cylindrical outer ring	d1	Tolerance	D	Tolerance* (cylindrical outer ring)				C	C1	L1	L2	e	Cr	C0r	spherical outer ring	cylindrical outer ring	B1	B2	G	G1	n	h	
					Fw	B1	B	B2																dynamic N
KRX 6×16×32-4/3AS	KRX 6×16×32-2/3AS	6	0 -0.012	16	0 -0.008	8	32	12	20	11	0.6	5	10	0.3	4 050 415	4 200 430	1 080 110	3 400 350	28	16	M6 ×1	8	—	3
KRX 8×19×32-9/3AS	KRX 8×19×32-7/3AS	8	0 -0.015	19	0 -0.009	10	32	12	20	11	0.6	5	10	0.5	4 750 480	5 400 555	1 380 141	4 050 415	32	20	M8 ×1.25	10	—	4
KRX10×22×33-3/3AS	KRX10×22×33-1/3AS	10	0 -0.015	22	0 -0.009	12	33	13	20	12	0.6	5	10	0.5	5 300 540	6 650 680	1 690 172	5 150 525	36	23	M10×1.25	12	4	4
KRX10×26×33-4/3AS	KRX10×26×33-2/3AS	10	0 -0.015	26	0 -0.009	12	33	13	20	12	0.6	5	10	0.5	5 300 540	6 650 680	2 120 216	6 100 620	36	23	M10×1.25	12	4	4
KRX12×30×35-3/3AS	KRX12×30×35/3AS	12	0 -0.018	30	0 -0.009	15	35	15	20	14	0.6	5	10	1.0	7 850 800	9 650 985	2 620 267	7 700 785	40	25	M12×1.5	13	6	6
KRX12×32×35-3/3AS	KRX12×32×35-1/3AS	12	0 -0.018	32	0 -0.011	15	35	15	20	14	0.6	5	10	1.0	7 850 800	9 650 985	2 860 291	8 200 835	40	25	M12×1.5	13	6	6
KRX16×35×44.5-1/3AS	KRX16×35×44.5-3/3AS	16	0 -0.018	35	0 -0.011	18	44.5	19.5	25	18	0.8	10	10	1.0	12 200 1 240	17 900 1 830	3 200 325	11 900 1 220	52	32.5	M16×1.5	17	6	6
KRX18×40×46.5-6/3AS	KRX18×40×46.5-4/3AS	18	0 -0.018	40	0 -0.011	22	46.5	21.5	25	20	0.8	10	10	1.0	14 000 1 430	22 800 2 330	3 850 390	14 500 1 480	58	36.5	M18×1.5	19	6	6
KRX20×47×50.5-1/3AS	KRX20×47×50.5-3/3AS	20	0 -0.021	47	0 -0.011	25	50.5	25.5	25	24	0.8	10	10	1.0	20 700 2 110	33 500 3 450	4 700 480	21 000 2 150	66	40.5	M20×1.5	21	8	8
KRX20×52×50.5-3/3AS	KRX20×52×50.5-1/3AS	20	0 -0.021	52	0 -0.013	25	50.5	25.5	25	24	0.8	10	10	1.0	20 700 2 110	33 500 3 450	5 550 565	23 300 2 370	66	40.5	M20×1.5	21	8	8

(Reference) Standard cam follower KR·H type (w/ hex socket)



The dimensions of standard cam followers (marked with      in the diagram above) are different from those of NTN pallet changer cam followers. Please see the reference dimensions in the table below.

\* The cam followers in the table above have seals. However, upon request, NTN will offer a cam followers without seals.