



Double Row Angular Contact Needle Roller Bearings

Series XZU-RTH

Double row angular contact needle roller bearings



Figure 1: Cobot solutions

New bearing type for lightweight robotics

The new double row angular contact needle roller bearings of series XZU from Schaeffler are tailored precisely to the requirements of lightweight robots and cobots in terms of running behaviour, rigidity, load carrying capacity and compactness. The bearings require little maintenance, can be easily integrated into the robots and, as a result of their long service life, reduce the total cost of ownership. The needle rollers in angular contact needle roller bearing XZU are guided in an optimized cage design, so that no friction can occur between the individual rolling elements. Compared with crossed roller bearings of the same size, angular contact needle roller bearings XZU therefore have up to 20 % lower frictional resistance. The uniform running behaviour facilitates high-precision torque control and predestines the bearings for applications with high demands on precision and repeat accuracy.

Raceways in an X arrangement increase tilting rigidity

Angular contact needle roller bearings XZU have two discrete raceways, each at a contact angle of 45° , and are separated by an internal distance. In combination with the large number of rolling elements in line contact, they have a 30 % higher tilting rigidity than crossed roller bearings of the same size. As a result, angular contact needle roller bearings XZU give the articulated arm significantly greater system rigidity, which enables high repeat accuracy and contour accuracy. The very high tilting rigidity of the bearings and resulting low post-oscillation of the articulated arm enables the robots to move accurately to their end position, without the need for complex control processes.

Articulated arms fitted with angular contact needle roller bearings XZU thus enable high dynamic characteristics with compact dimensions and low weight. The result is short positioning times, which permit production processes with faster cycle times.

Technical data

Performance data				
Designation	Basic load ratings		Permissible moment	Tilting rigidity
	dyn. C	stat. C ₀	M _{perm}	C _{KL}
	N	N	Nm	Nm/mrad
XZU-RTH11	6200	24600	62	247
XZU-RTH14	6800	29500	74	420
XZU-RTH17	12400	55000	124	810
XZU-RTH20	14800	68000	187	1 220
XZU-RTH25	18800	88000	258	2 090
XZU-RTH32	33000	180000	580	4 320
XZU-RTH40	38500	221000	849	7 338

Large number of rolling elements for greater precision

As a result of the large number of rolling elements present with rigid line contact in angular contact needle roller bearings XZU, the loads are distributed to a multitude of needle rollers, which increases the axial load carrying capacity of the bearing.

With angular contact needle roller bearing XZU, there is less internal tilting in the articulated arm gear units and, as a result, the load on the gear unit elements is reduced.

This permits an expansion of the working range or a higher power consumption.

Maintenance-free and easy to integrate

The bearings are supplied pregreased and are designed to be maintenance-free. In order to rule out increased friction or severe wear, the needle cage with integral lubricant pockets maintains a uniform supply of lubricant in the rolling contact area.

A pumping effect and resulting inadequate or non-uniform lubrication is thus prevented. Any skewing of the rolling elements or direct contact between them is also avoided, as a result of which friction and wear are reduced. The bearing is sealed to the outside on one side so that no lubricant can escape into the joint.

As a result, angular contact needle roller bearings XZU are also suitable for applications that require freedom from contamination.

Angular contact needle roller bearings XZU have the same mounting dimensions as standard crossed roller bearings and can replace the latter in existing robots. The aligned hole pattern is also conducive to reduced assembly times.

Angular contact needle roller bearings XZU can be used in a wide variety of applications: as a bearing arrangement for articulated arms or as the main bearing arrangement of articulated arm gear units (e.g. in the RT series of the Schaeffler DuraWave strain wave gears).

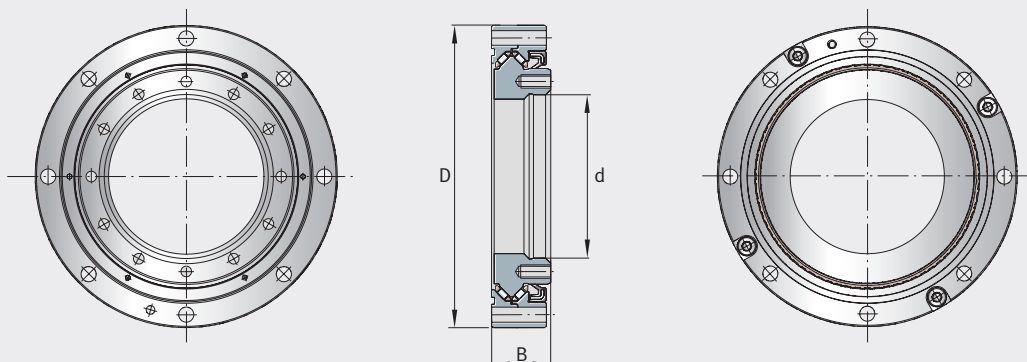
Dimensions

Version XZU-RTH

Design sizes 11, 14, 17, 20, 25, 32, 40

Dimension table · Dimensions in mm

Designation	Mass ≈ m g	Dimensions			
		B	D h6	d H7	
XZU-RTH11	193	13	62	31	CAD
XZU-RTH14	258	15,1	70	38	CAD
XZU-RTH17	341	17	80	47	CAD
XZU-RTH20	477	18,5	90	54	CAD
XZU-RTH25	760	20,7	110	67	CAD
XZU-RTH32	1580	24,4	142	88	CAD
XZU-RTH40	2720	30	170	108	CAD



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