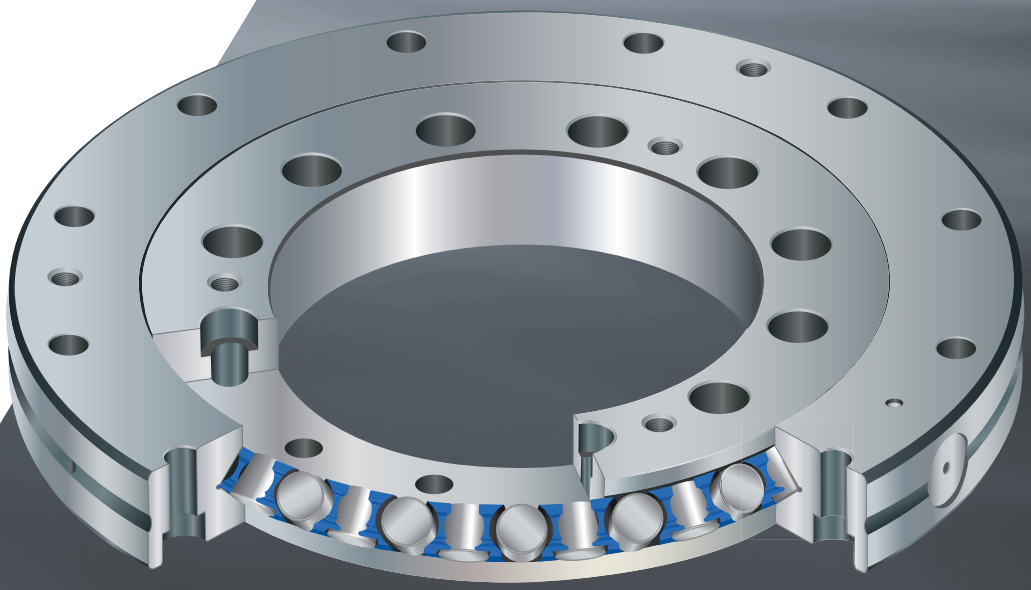
Product chapter

AXCR



General/available designs

General

AXCR bearings consist of an inner and outer ring, cylindrical rollers and spacers. Due to their compact size, these are frequently used as axis and swivel bearings. Typical applications are milling heads, swivel axes or robots, but also industrial applications with increased accuracy requirements.

In cross roller bearings, the cylindrical rollers are arranged cross-wise in a raceway offset by 90° so that loads and torques can be evenly absorbed in all directions.

Cross roller bearings offer relatively high axial and radial rigidities and tilting rigidity in highly compact constructions.

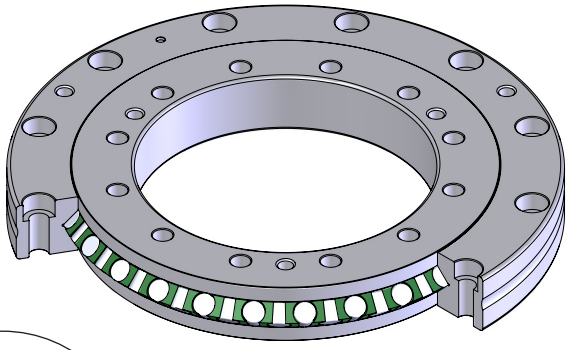
Bearing types

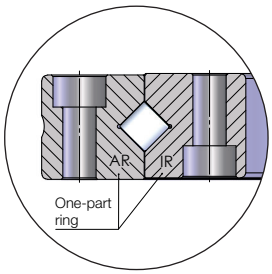
Cross roller bearings are available in a multitude of bearing types and designs. Besically, we differentiate between these as follows:

- Single-part rings with radial filling plugs for filling with rollers and distance pieces (spacers)
- Two-part, non-rotating ring, single-part rotating ring
- Screw-on rings/non screw-on rings
- Special bearings with special ring dimensions, fastening possibilities or toothings

AXCR-U

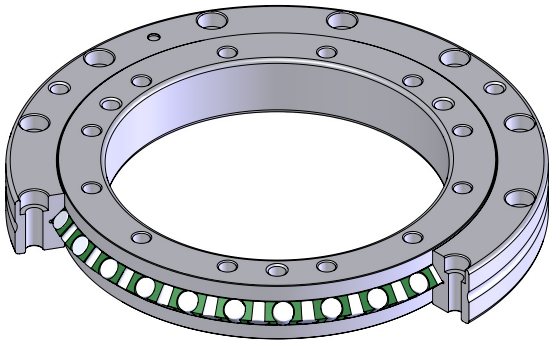
Design with single-part rings, both rings can be screwed on, standard program available (see product tables).

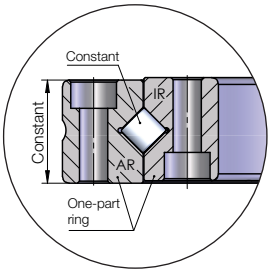




Available designs

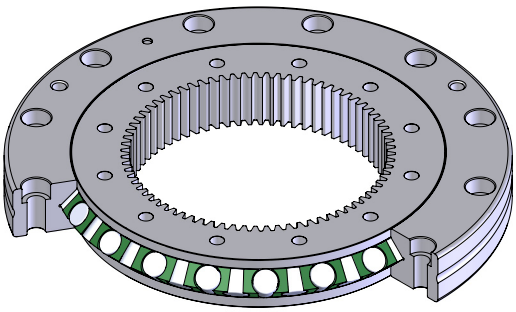
AXCR-S Design with single-part rings at constant construction height, both rings can be screwed on, standard program available (see product tables).

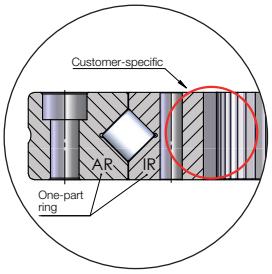




Available designs

AXCR-M Customer-specific design with single-part rings.
The roller elements and the spacers are filled via a radial filling plug. The ring designs are designed with countersunk holes, through or threaded bores or without holes.
All features of the bearing are adapted to the customer requirements.





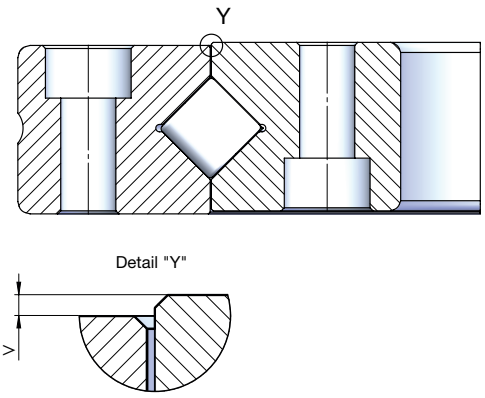
Specific bearing features

Fastening possibilities AXCR-U/AXCR-S

myonic offers the following fixing possibilities in the standard series.

Standard fastening designs:

- SA = Grooves opposite



Further details can be found in the chapter Recommended connection dimensions.

- SS = Groove identical

Further details can be found in the chapter Recommended connection dimensions.

Special features

These two standard designs contain the completely identical individual rings. Only one inner ring each is installed in mirror opposition, depending on which fastening possibility is desired.

The individual rings are always unsupported on the side of the cylinder counterbore, meaning that collisions in the fastening possibility "SA" are excluded.

If, on the other hand, the ring arrangement "SS" is selected, a lower total height results, as both the recessed cylinder counterbores are located on the same side.
For details see chapter Adjacent construction.

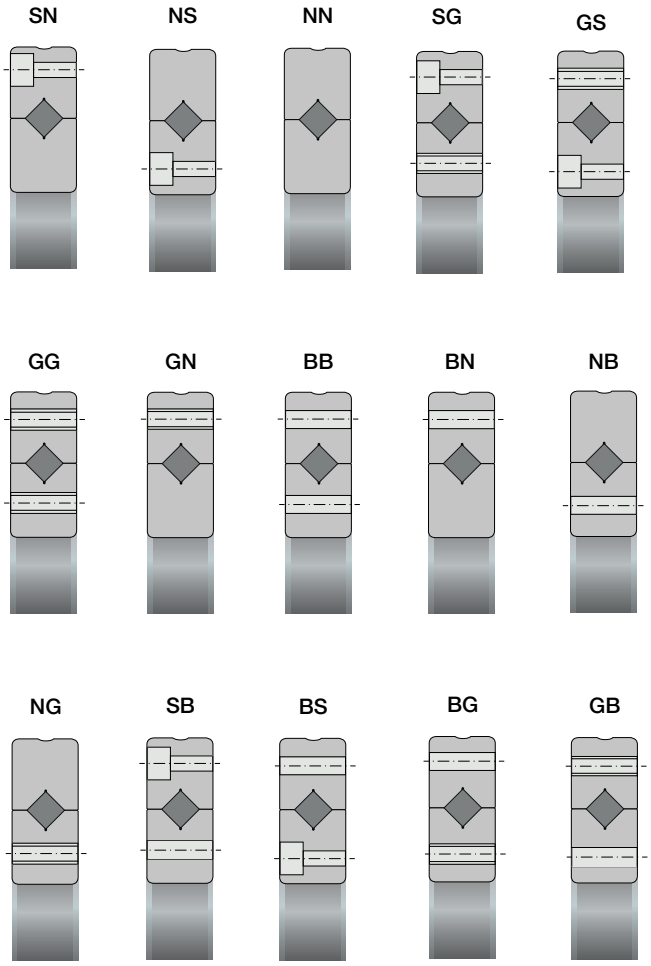
Specific bearing features

Further ring designs (on request)

Designation system for the ring designs:

- S = Countersunk hole
- N = No holes
- G = Threaded bore
- B = Through bore

Designation sequence: first position outer ring design, second position ring inner ring design



Example

Fastening possibility SG

- Position one: Other ring design with countersunk hole
- Position two: Inner ring design with threaded bore

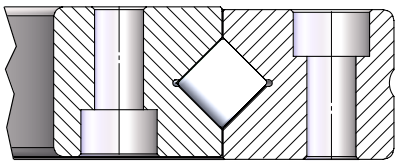
Specific bearing features

Seals

myonic cross roller bearings are supplied with a non-grinding gap or labyrinth seal.
Through the gap formation, the penetration of dirt particles is efficiently prevented without causing additional friction (temperature).

For special applications, grinding seals made from very different materials can also be used.

- Gap seal



Accuracy

The production at myonic takes place on the same production systems as for all other ultra precision bearings. In this way, myonic-AXCR cross roller bearings run with similar accuracies as AXRY or AXDR bearings.

The measuring accuracy P5 with the hole and the outer diameter permit the manufacture of high precision fits and thus the accurate guidance of rotary axes.

The axial and radial runout accuracies for AXCR-U and AXCR-M correspond to classes P4, P2 and UP. With AXCR-S it can be selected between standard and restricted running accuracies (-PRR50).
For further information see product tables.

Specific bearing features

Preload

myonic cross roller bearings are available with bearing clearance, more lightweight and with standard preload.
In case of higher preload, the rigidity increases; at the same time however the bearing friction torque increases.
Usually, most AXCR are assembled with standard preload.

Customer-specific designs Jxxxx (J-numbers)

myonic produces customer-specific designs which are designated with J and a number.

Such J-numbers can for example contain:

- Specific application-related preload values or friction torques
- Special directives for marking or packaging
- Special lubrication systems
- Changed tolerances

Lubrication

Cross roller bearings are pre-greased with a high-performance grease (Li-special soap with a mix of synthetic hydrocarbon oil and mineral oil), but can be supplied ungreased (suffix L120).

Preservatives

The used corrosion protection oil is compatible und mixable with most of greases and oils produced on a mineral basis.

Check for compatibility when using synthetic lubricants and other consistency enhancers than lithium (complex) soaps.

Surface treatment

In case of incompatibility, please consult myonic as to further procedures.

myonic cross roller bearings are offered in the standard series without surface treatment.

Product chapter AXCR

Specific bearing features

Limiting speeds/temperatures/friction

The limiting speed nG stated in the dimensions table can be achieved for the selected cross roller bearing in swivel operation or during short-term continuous operation.
In case of prolonged operation in the area of the limiting speed, the bearing increasingly heats up.

The friction torque of cross roller bearings is in particular influenced through the selected preload.
Higher preloads result in higher rigidities with simultaneously higher levels of friction.

Relubrication

The selected lubricant, in particular the viscosity and the filling quantity, have a direct influence on the friction. Standard pregreased bearings are suitable for swivel operation and short continuous operation up to the limiting speed.

Metering systems are most suitable for relubrication purposes. In case of manual relubrication, there is a risk of over-greasing and thus an increase in the bearing friction torque.
During run-in or during relubrication, the appropriate run-in cycles must be adhered to.

Calculation of rigidity

The rigidity calculation takes place under the following parameters:

- With the application of a radial and axial load and a tilting moment
- With slight preloads
- With normal adjacent construction and screw connections acc. the information in this myonic catalogue
- Across all product groups, identical FEM calculation procedures were defined with precisely-defined parameters. The stated rigidity values in the product tables are directly comparable (AXRY vs. AXDR vs. AXCR)

An under-dimensioned, inaccurate adjacent construction reduces the rigidity of the bearing position substantially; on the other hand rigidities can also be increased through constructional support of the additional parts.

myonic application engineering is happy to assist in case of further enquiries or optimisations of your axes.

For further details, see chapter "General".

Life time and load safety factor

General notes

The following calculation is generally used and represents a good approximately for simple application cases.

Calculations at myonic

An accurate calculation of the nominal life time is possible via special calculation programs at myonic.

The following is required for calculation:

- Details on application (drawings, sketches, technical specifications)
- Workpiece dimensions and weight
- Details on the load cycle (cutting forces, speeds, operating durations)

Dynamically equivalent load

In case of applications with radial and axial loads and speeds which have an effect on the bearing, all loads can be collected to form a single equivalent load. This "dynamically equivalent load" can be calculated acc. the following formula:

$$P = X \cdot \left(F_r + \frac{2M}{D_{pw}} \right) + Y \cdot F_a$$

$$X=1\ ; \qquad Y=0{,}45\ ; \qquad \frac{F_a}{F_r + \frac{2M}{D_{pw}}} \leq 1{,}5$$

$$X=0{,}67\ ; \qquad Y=0{,}67\ ; \qquad \frac{F_a}{F_r + \frac{2M}{D_{pw}}} > 1{,}5$$

P = Dynamically equivalent load [N]

F_r = Radial load [N]

F_a = Axial load [N]

M = Torque [Nmm]

D_{pw} = Roller centre diameter [mm]

X = Radial load coefficient

Y = Axial load coefficient

Life time and load safety factor

Nominal life time

The nominal life time can be estimated with the following equation. The nominal life time designated the rotations of a bearing with the same load and speed in millions, which 90 % of all bearings of the same type achieve before material fatigue occurs.

$$L = \left(\frac{C}{P}\right)^{\frac{10}{3}}$$

L = Nominal life time of the bearing [10^6 rotations]

C = Dynamic load rating [N]

For mainly radial loads on the bearing, please use C_r, and for mainly axial loads use C_a.

P = Dynamic equivalent load [N]

Equivalent static load

The static equivalent load collects all loads incurred during static application into one single load. This puts load on the bearing in the same way as the actual effective loads.

$$P_0 = \left(F_r + \frac{2M}{D_{pw}}\right) + 0{,}44 \cdot F_a$$

P_0 = Equivalent static load [N]

F_r = Radial load [N]

F_a = Axial load [N]

M = Torque [Nmm]

D_{pw} = Roller centre diameter [mm]

Static limiting load diagrams

Static load safety factor

The static load safety factor describes the relationship from the static load rating C_0 (depending on the application case, C_{0r} or C_{0a} must be drawn upon) and the equivalent static load P_0. Depending on the respective operating case, different static load safety factors are to be strived for.
For more accurate information, please contact our Technical Support.

$$S_0 = \frac{C_0}{P_0}$$

S_0 = Static load safety factor
C_0 = Static load rating [N]
P_0 = Equivalent static load [N]

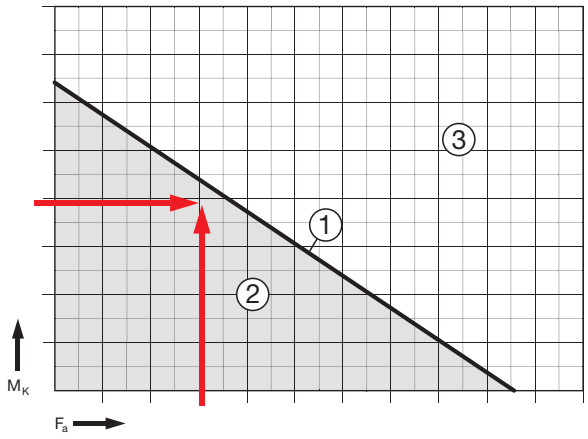
Limiting load diagram

The static limiting load diagrams serve to:

- Check the selected bearing size with mainly static load
- Determine the tilting moment Mk which the AXCR is able to absorb in addition to the axial load

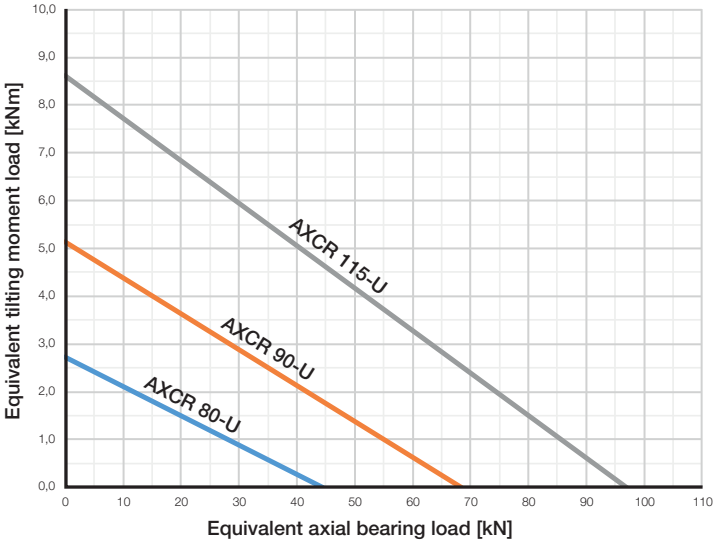
The static limiting load diagrams take into account for the roller element set the static load safety factor $S_o \geq 4$ and the screw and bearing ring strength.

Example:
Static limiting load diagram for AXCR
1 Bearing/size
2 Permitted range
3 Unpermitted range
M_K Maximum tilting moment in [kNm]
F_a Axial load [kN]

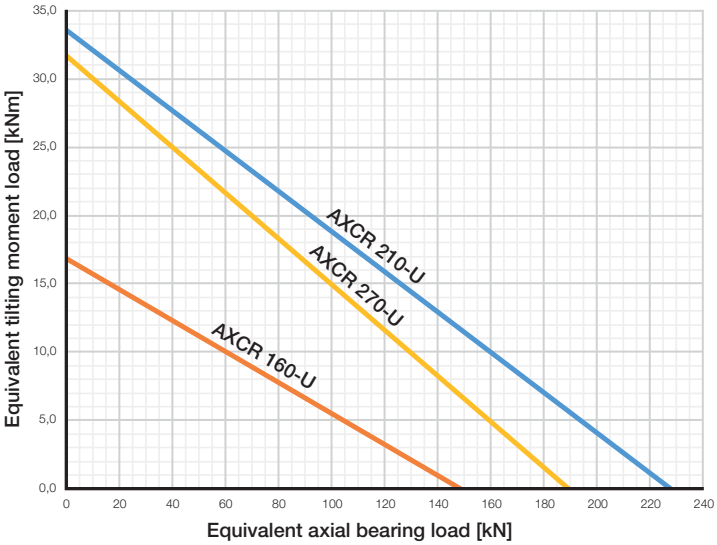


Static limiting load diagrams

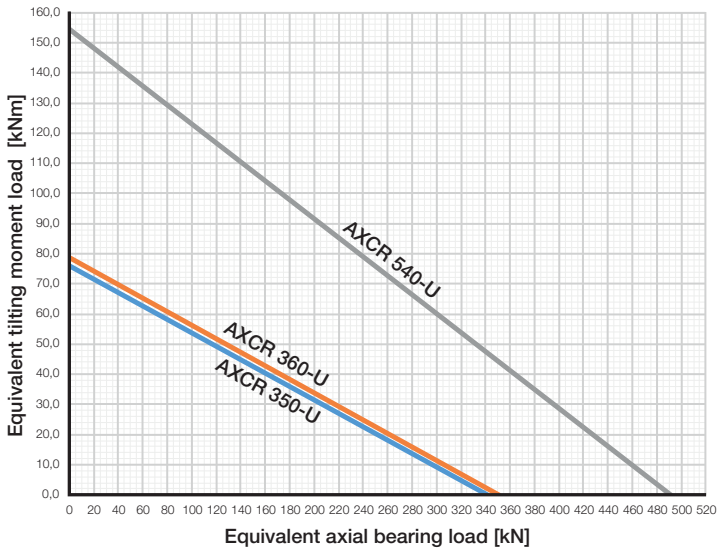
Limiting load diagram cross roller bearing AXCR 80-U to AXCR 115-U



Limiting load diagram cross roller bearing AXCR 160-U to AXCR 270-U

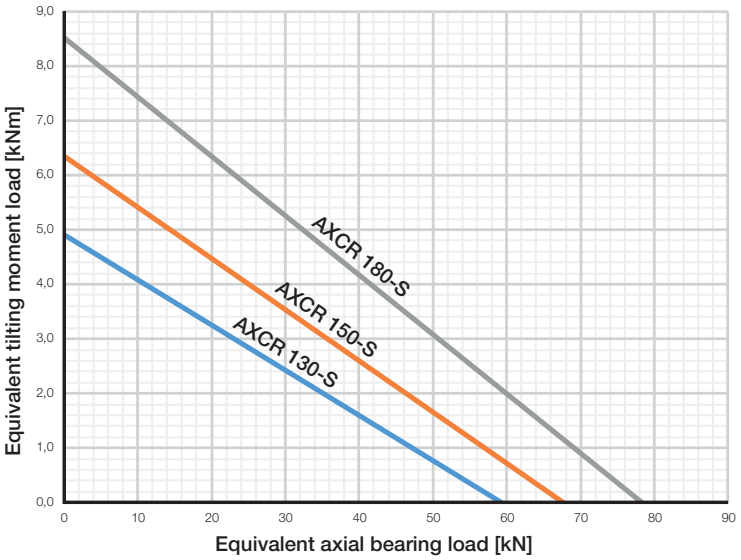


Limiting load diagram cross roller bearing AXCR 350-U to AXCR 540-U

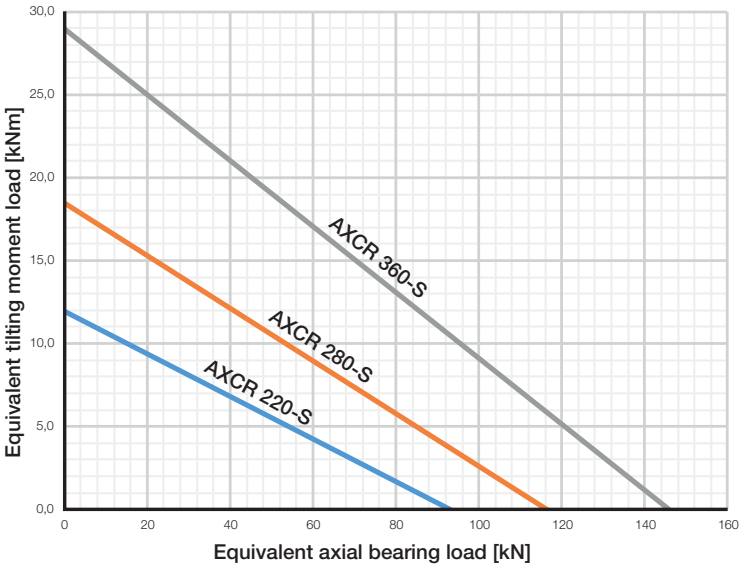


Static limiting load diagrams

Limiting load diagram cross roller bearing AXCR 130-S to AXCR 180-S



Limiting load diagram cross roller bearing AXCR 220-S to AXCR 360-S



Design of the adjacent construction

In the following sketches and tables, the design of the adjacent construction is described.
Pay particular attention to the connection areas, as any deviations will have an effect on the overall accuracy and the rigidities of the roller bearing.
In order to avoid a decline in bearing friction torque, accuracy requirements and running characteristics, the recommended tolerances may not be exceeded.

Press fit

In principle, when the fit is too constricted the radial bearing preload increases, and thus…

…the following increases:

- The surface pressure in the raceway
- The bearing friction
- The bearing heat
- The amount of wear

…the following is reduced:

- The maximum speed
- The life time

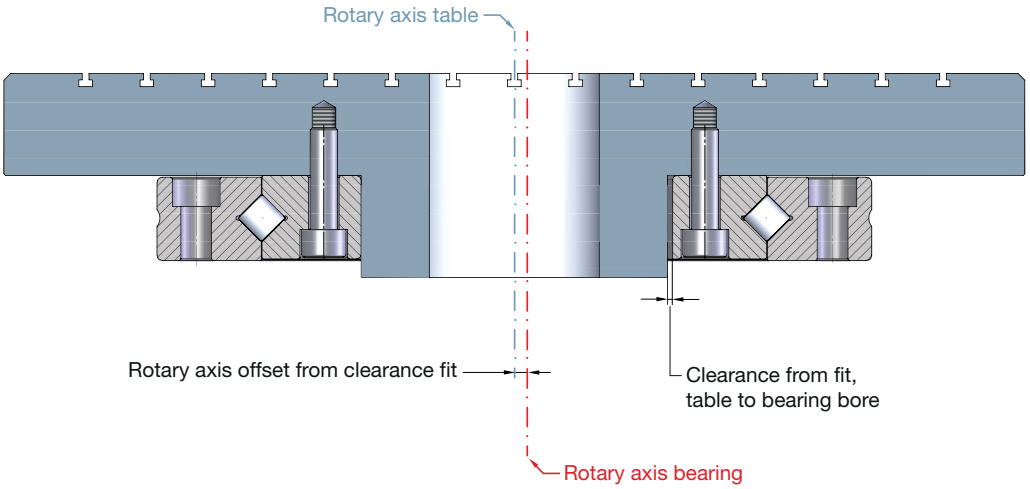
Clearance fit

If the rotating ring is not supported during clearance fits, displacement of the rotation axes raceway to table centre is probable. The clearance from the fit table to bearing bore (also applies for the clearance bearing outer diameter to table with rotating outer ring) can add to the radial runout.

myonic-AXCR bearings are produced both in the hole and on the outer diameter with severely limited tolerances (acc. P5/ DIN 620). This facilitates the generation of accurate fits; the accuracy of the bearing is transferred onto the table.

In case of applications with subordinate accuracy requirements, rings can also be screwed in clearance fits.
The wall thickness of the table adapter in the bearing bore (or on the outer diameter) must be appropriately large to exclude the risk of undefined operating conditions such as vibrations, errors in radial runout and repeatability etc.

Design of the adjacent construction



Centred shafts/tables

Execution via a shaft clearance fit with centring of the rotary axis is possible. Due to the solid rings, AXCR bearings are less sensitive to non-positive locking shafts than AXRY bearings. A reduction in the rigidity of the axis and possible radial runout problems or a displacement of the rotation axis on overload must be accepted.

A radial runout measurement with centred tabletop and mounted measuring ball does not accord with the following catalogue values. During this accurately centred measurement, exclusively the radial runout of the raceways and the form errors of the measuring construction are measured. If the measuring construction is executed precisely, the measured values are lower than the stated myonic radial runout values.

The myonic radial runout values include the radial runout errors of the raceway and the roundness of the hole.

Recommended fits, shaft

General

The accuracy of the fits and the geometrically-correct design of all adjacent parts have a direct effect on the accuracy requirements and the dynamic properties of the bearing and the axis.

Please observe the construction notes in the general catalogue section.

Rotating inner ring AXCR-U with the usual bore tolerance (0/minus)

On rotating shafts, the bearing inner ring is to be supported across its whole surface and the shaft is to be designed with a fit acc. h5. In this way, the bore tolerance of the bearing generates a transition fit with a slight tendency to a clearance fit.

Rotating inner ring AXCR-S with bore tolerance (0/plus)

On rotating shafts, the bearing inner ring is to be supported across its whole surface and the shaft is to be designed with a fit acc. h5. In this way, the bore tolerance of the bearing generates a transition fit with a slight tendency to a clearance fit.

In case of designs with clearance fits, see guidelines in the chapter Adjacent construction.

Higher requirement

Max. accuracy requirements:

For the maximum accuracy requirement with rotating inner ring, a clearance fit 0 must be targeted; existing clearance fits can add to the radial runout.

Higher dynamic characteristics:

In case of high speeds (ndm > 35,000 mm/min) and slower operating durations (>10 %), do not exceed an interference fit of 5 µm.

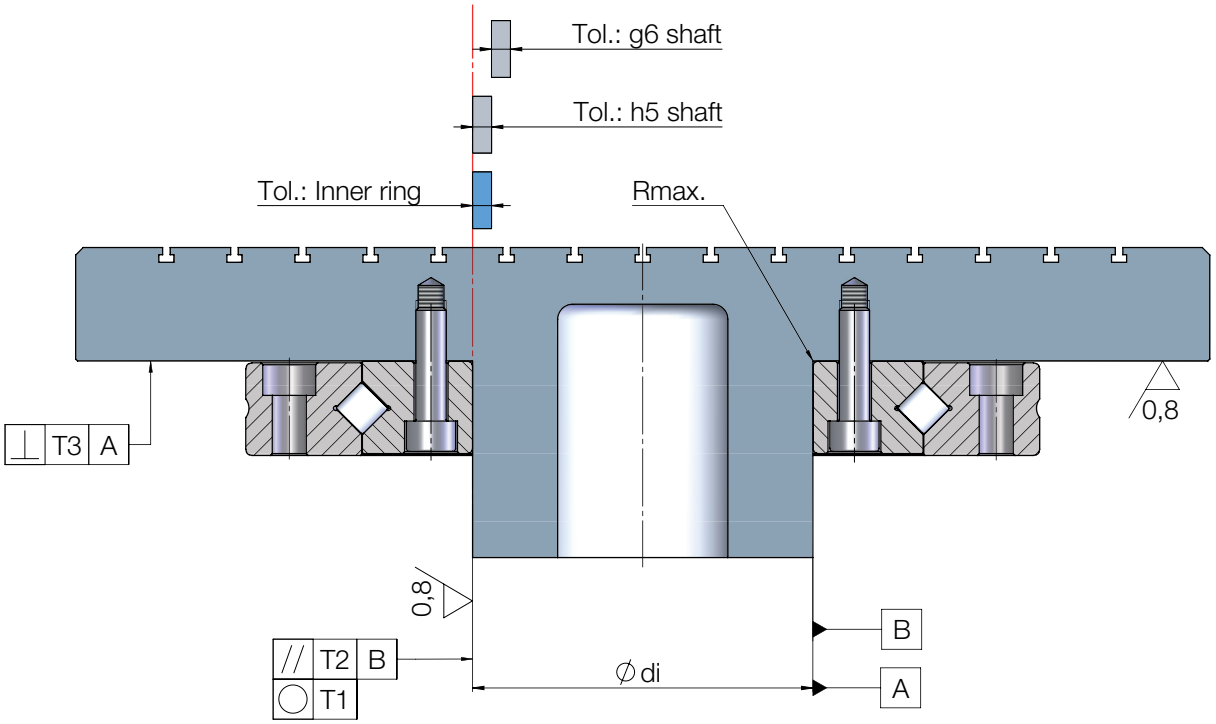
Stationary inner ring

Stationary, screw connection inner rings do not require a special fit, and can also be mounted with clearance to the shaft. If the inner ring is centred, then design

- For inner ring AXCR-U with the usual bore tolerance (0/minus) as g6 or similar or for
- Inner ring AXCR-S with bore tolerance (0/plus) as j6 or similar

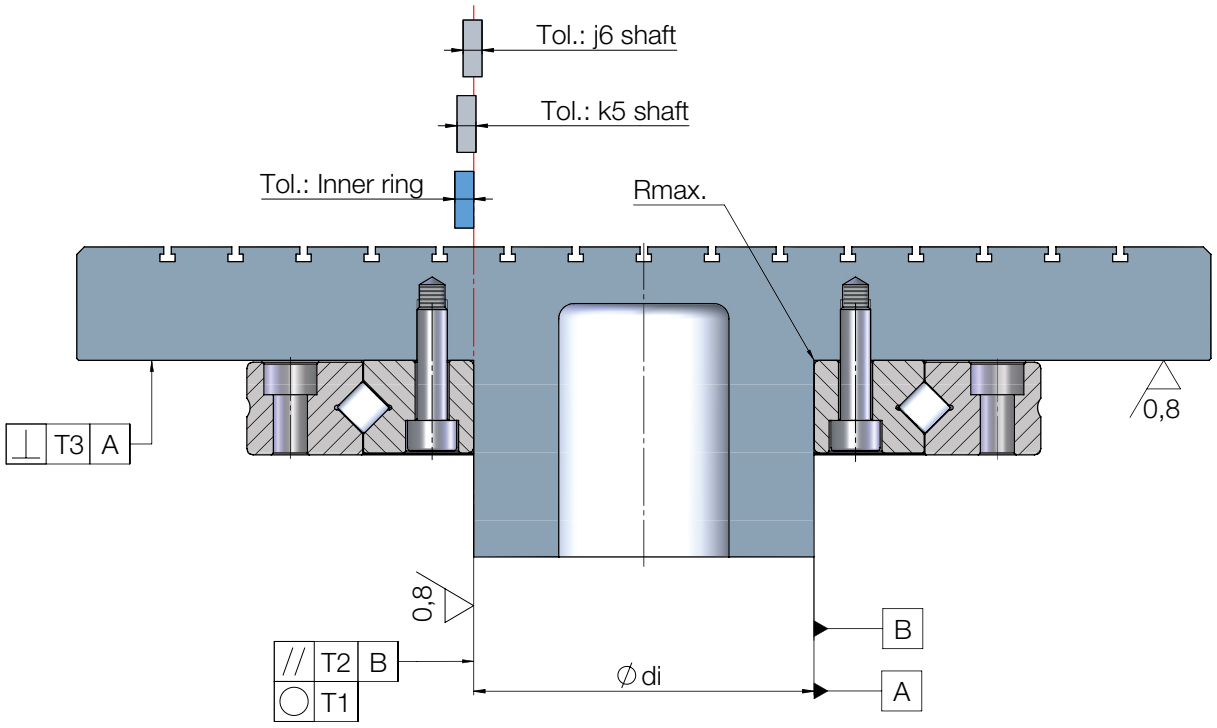
Press fits are to be avoided due to the risk of an increase in bearing preload.

Recommended fits, shaft



Application case			With stationary inner ring		With rotating inner ring				
Cross roller bearing	Shaft Ø di [mm]	Tolerance zone bearing inner Ø [mm]	Tolerance zone g6 of the shaft Ø di [mm]	Roundness, parallelism, perpendicularity T1, T2, T3 [µm]	Tolerance zone h5 of the shaft Ø di [mm]	Roundness T1 [µm]	Parallelism T2 [µm]	Perpendicularity T3 [µm]	Maximum corner radius Rmax. [mm]
AXCR 80-U	80	0 -0.009	-0.010 -0.029	5	0 -0.013	3	1.5	3	0.1
AXCR 90-U	90	0 -0.010	-0.012 -0.034	6	0 -0.015	4	2	4	0.1
AXCR 115-U	115	0 -0.010	-0.012 -0.034	6	0 -0.015	4	2	4	0.1
AXCR 160-U	160	0 -0.013	-0.014 -0.039	8	0 -0.018	5	2.5	5	0.1
AXCR 210-U	210	0 -0.015	-0.015 -0.044	10	0 -0.020	7	3.5	7	0.3
AXCR 270-U	270	0 -0.018	-0.017 -0.049	12	0 -0.023	8	4	8	0.3
AXCR 350-U	350	0 -0.023	-0.018 -0.054	13	0 -0.025	9	4.5	9	0.3
AXCR 360-U	360	0 -0.023	-0.018 -0.054	13	0 -0.025	9	4.5	9	0.3
AXCR 540-U	540	0 -0.030	-0.022 -0.066	16	0 -0.032	11	5.5	11	0.3

Recommended fits, shaft



Application case			With stationary inner ring		With rotating inner ring				
Cross roller bearing	Shaft Ø di [mm]	Tolerance zone bearing inner Ø [mm]	Tolerance zone j6 of the shaft Ø di [mm]	Roundness, parallelism, perpendicularity T1, T2, T3 [µm]	Tolerance zone k5 of the shaft Ø di [mm]	Roundness T1 [µm]	Parallelism T2 [µm]	Perpendicularity T3 [µm]	Maximum corner radius Rmax. [mm]
AXCR 130-S	130	0 0.025	0.014 -0.011	8	0.021 0.003	5	2.5	5	0.1
AXCR 150-S	150	0 0.025	0.014 -0.011	8	0.021 0.003	5	2.5	5	0.1
AXCR 180-S	180	0 0.025	0.014 -0.011	8	0.021 0.003	5	2.5	5	0.1
AXCR 220-S	220	0 0.029	0.016 -0.013	10	0.024 0.004	7	3.5	7	0.3
AXCR 280-S	280	0 0.032	0.016 -0.016	12	0.027 0.004	8	4	8	0.3
AXCR 360-S	360	0 0.036	0.018 -0.018	13	0.029 0.004	9	4.5	9	0.3

Recommended fits, housing

General

The accuracy of the fits and the geometrically-correct design of all adjacent parts have a direct effect on the accuracy requirements and the dynamic properties of the bearing and the table.
In case of maximum demands, limit the tolerances and fits accordingly.

Please observe the construction notes in the general catalogue chapter.

Outer ring stationary

It is possible to do without a fit in the housing or alternatively to have a G7 fit design.
Outer ring diameter clearance to the housing makes assembly easier.

In case of higher dynamic requirements (ndm > 35,000 mm/min, prolonged operating duration) on the rotating shaft, maintain a minimum clearance of 20 µm for the fit seat of the outer ring to the housing.

Outer ring rotates

Normal requirement:
Design the rotating housing with a J6 clearance; here a transition fit results with a tendency for clearance fit. Design the fit seat across the entire height of the outer ring.

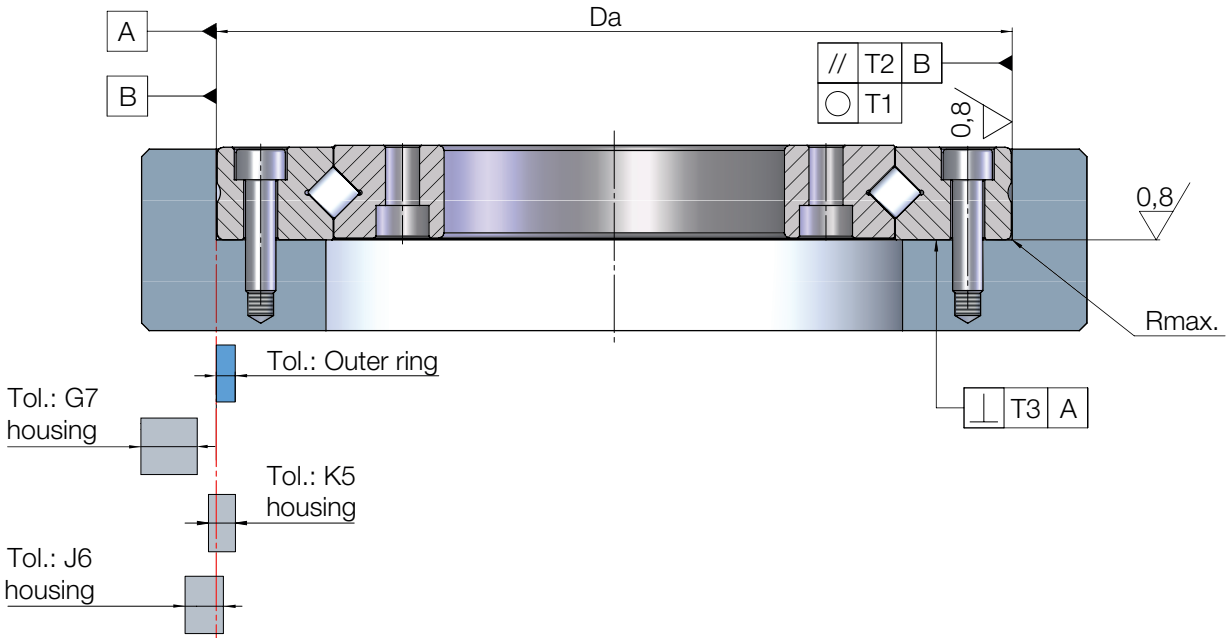
Alternatively, the housing can also be designed with a K5 fit for a narrower fit.
This can more easily be mated with the tolerance zone of the bearing outer diameter in case of high requirements; the assembly may prove more complex.

Higher requirement

Max. accuracy requirement:
For the maximum accuracy requirement with rotating outer ring, a clearance fit 0 must be targeted; existing clearance fits can add to the radial runout. The actual dimension of the bearing outer diameter can be found in the inspection report enclosed with all bearings.

Higher dynamic characteristics:
In case of higher speeds (ndm > 35,000 mm/min) and prolonged operating durations) do not exceed an interference fit of 5 µm.

Recommended fits, housing



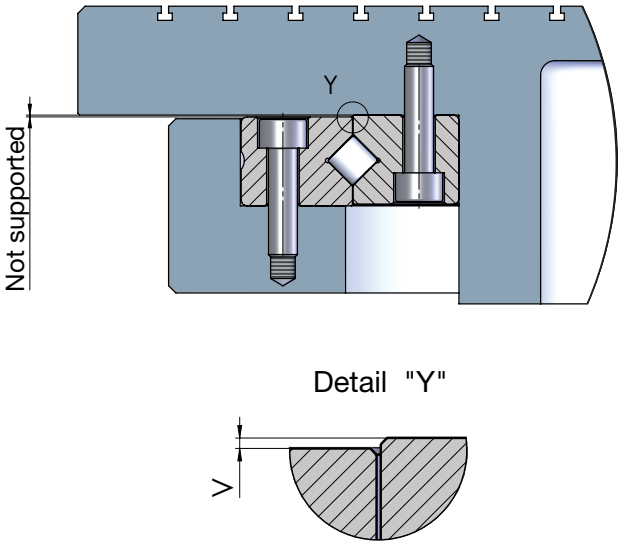
			Stationary outer ring		Rotating outer ring					
Cross roller bearing	Housing Ø Da [mm]	Tolerance zone Bearing outer Ø [mm]	Tolerance zone G7 of the housing Ø Da [mm]	Roundness, perpen-dicularity T1, T3 [µm]	Tolerance zone J6 of the housing Ø Da [mm]	Tolerance zone K5 of the housing Ø Da [mm]	Round-ness T1 [µm]	Paralle-lism T2 [µm]	Perpen-dicularity T3 [µm]	Maximum corner radius Rmax. [mm]
AXCR 80-U	165	0 -0.013	0.054 0.014	8	0.018 -0.007	0.003 -0.015	5	2.5	5	0.1
AXCR 90-U	210	0 -0.015	0.061 0.015	10	0.022 -0.007	0.002 -0.018	7	3.5	7	0.3
AXCR 115-U	240	0 -0.015	0.061 0.015	10	0.022 -0.007	0.002 -0.018	7	3.5	7	0.3
AXCR 160-U	295	0 -0.018	0.069 0.017	12	0.025 -0.007	0.003 -0.020	8	4	8	0.3
AXCR 210-U	380	0 -0.020	0.075 0.018	13	0.029 -0.007	0.003 -0.022	9	4.5	9	0.3
AXCR 270-U	400	0 -0.020	0.075 0.018	13	0.029 -0.007	0.003 -0.022	9	4.5	9	0.3
AXCR 350-U	540	0 -0.028	0.092 0.022	16	0.034 -0.010	0.000 -0.032	11	5.5	11	0.3
AXCR 360-U	540	0 -0.028	0.092 0.022	16	0.034 -0.010	0.000 -0.032	11	5.5	11	0.3
AXCR 540-U	718	0 -0.035	0.104 0.024	18	0.038 -0.012	0.000 -0.036	13	6.5	13	1
AXCR 130-S	205	0 -0.029	0.061 0.015	10	0.022 -0.007	0.002 -0.018	7	3.5	7	0.3
AXCR 150-S	225	0 -0.029	0.061 0.015	10	0.022 -0.007	0.002 -0.018	7	3.5	7	0.3
AXCR 180-S	255	0 -0.032	0.069 0.017	12	0.025 -0.007	0.003 -0.020	8	4	8	0.3
AXCR 220-S	295	0 -0.032	0.069 0.017	12	0.025 -0.007	0.003 -0.020	8	4	8	0.3
AXCR 280-S	355	0 -0.036	0.075 0.018	13	0.029 -0.007	0.003 -0.022	9	4.5	9	0.3
AXCR 360-S	435	0 -0.040	0.083 0.020	15	0.033 -0.007	0.002 -0.025	10	5	10	0.3

Recommended connection dimensions

Fastening possibility SA

For the connection dimensions, two cases must be considered:

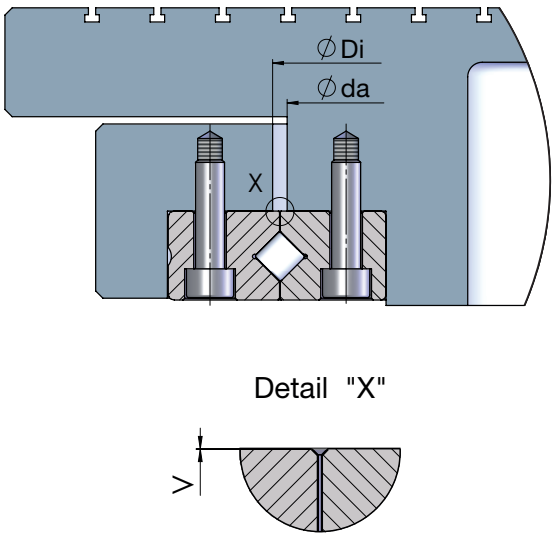
For the fastening possibilities SA; there are no specific connection dimensions (as may happen due to the offset of the two rings to each other, no collision with the adjacent construction can occur).



Fastening possibility SS

For the fastening possibility SS, there is no offset between the inner and outer ring and therefore the specified table values apply here.

The diameter value da is a maximum value, and the diameter value Di is a minimum value.



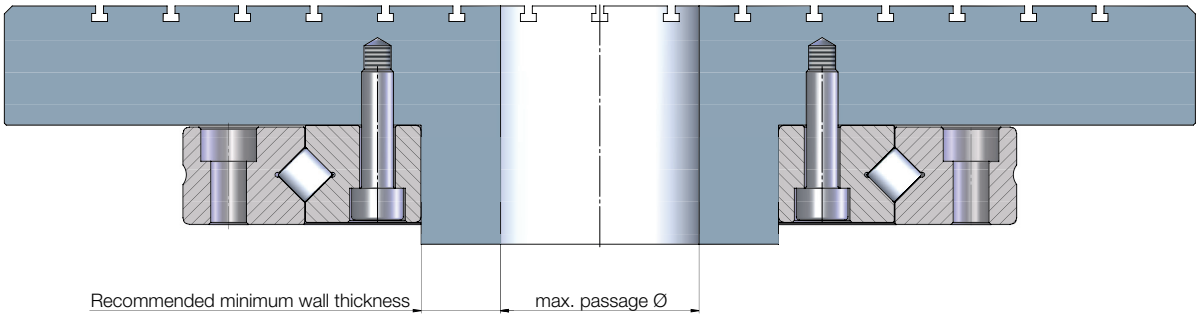
Recommended connection dimensions

The offset "V", as shown in detail "X", can be produced with high precision on customer request; a tolerance of a few µm is possible.

This means that complex shim rings and high assembly costs are no longer required.

Cross roller bearing	Connection dimension Ø da MAX. [mm]	Connection dimension Ø Di MIN. [mm]
AXCR 80-U	122.0	130.0
AXCR 90-U	144.5	152.5
AXCR 115-U	173.0	181.0
AXCR 160-U	223.0	231.0
AXCR 210-U	295.0	303.0
AXCR 270-U	331.0	339.0
AXCR 350-U	439.0	447.0
AXCR 360-U	450.0	458.0
AXCR 540-U	626.0	634.0
AXCR 130-S	162.0	170.0
AXCR 150-S	184.5	192.5
AXCR 180-S	213.0	221.0
AXCR 220-S	253.0	261.0
AXCR 280-S	315.0	323.0
AXCR 360-S	394.5	402.5

Design of the adjacent construction



Recommended minimum wall thicknesses

Cross roller bearing	Min. wall thickness [mm]	Max. passage [mm]
AXCR 80-U	15	50
AXCR 90-U	21	48
AXCR 115-U	22	71
AXCR 160-U	24	113
AXCR 210-U	30	150
AXCR 270-U	23	224
AXCR 350-U	34	283
AXCR 360-U	32	297
AXCR 540-U	31	478
AXCR 130-S	13	104
AXCR 150-S	13	124
AXCR 180-S	13	154
AXCR 220-S	13	194
AXCR 280-S	13	254
AXCR 360-S	13	334

Order designation

Designation system

AXCR 210 - USA - P2 - CL - JXXXX - L120

Construction series

Bore
in mm

Bearing type:

U = Standard design with single-part rings

S = Standard design with single-part rings and constant construction height

M = Customer-specific design with single-part rings

Fastening possibility:

SA = Counterbores opposite
SS = Counterbores identical

Others available on request

Lubrication:
Without = Standard grease
L120 = Bearing ungreased, only preserved (e.g. for oil lubrication)
GXXX= Special grease (number is issued by myonic)

Design:
Without = Catalogue design
JXXXX = Customer-specific design (number is issued by myonic)

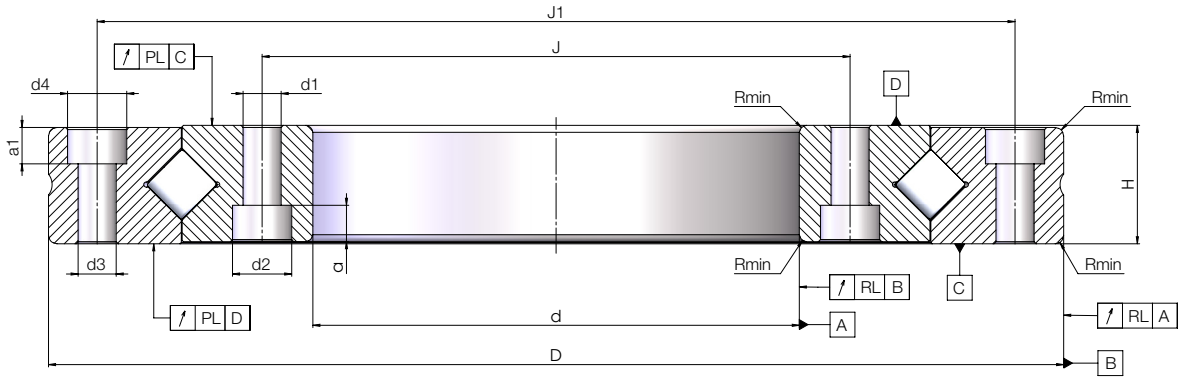
Preload:
Without = Standard preload
CL = Slight preload
CP = Clearance

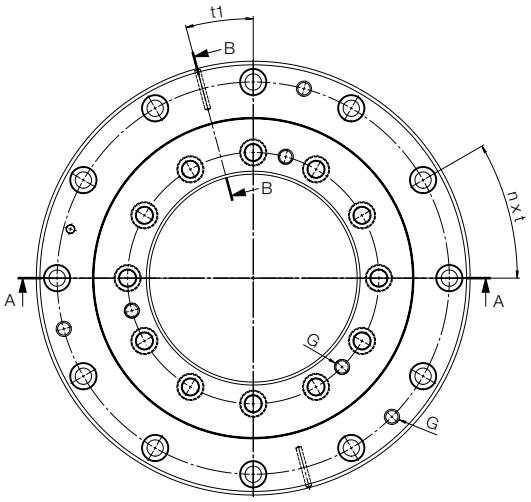
Accuracy requirements:
Without = Standard running accuracy (with AXCR-U or AXCR-M = P4 with AXCR-S = Standard)
P2 = Restricted running accuracy (only applies to AXCR-U or AXCR-M)
UP = Ultra high precision running accuracy (only applies to AXCR-U or AXCR-M)
PRR50 = Restricted running accuracy (only applies to AXCR-S)

For further technical details or special designs, please contact myonic application engineering.

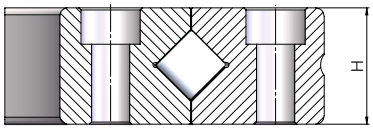
Dimensions table AXCR-U

A-A (Design: USA)

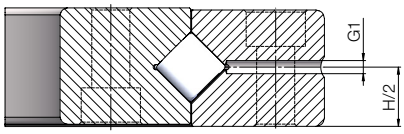




(Design: USS)



B-B



Designation	Weight	Dimensions [mm]										
	m	d	Δd	D	ΔD	H		ΔH	J	J1	t1	G1	Number
	[kg]					USA	USS						
AXCR 80-U	2.6	80	-0.009	165	-0.013	22	21.5	+/- 0.150	97	148	18°	3.1	2
AXCR 90-U	4.9	90	-0.010	210	-0.015	25	24.5	+/- 0.150	112	187	15°	3.1	2
AXCR 115-U	6.9	115	-0.010	240	-0.015	28	27.5	+/- 0.150	139	217	15°	3.1	2
AXCR 160-U	11.8	160	-0.013	295	-0.018	35	34.5	+/- 0.200	184	270	15°	6	2
AXCR 210-U	22.0	210	-0.015	380	-0.020	40	39.5	+/- 0.200	240	350	11.25°	6	2
AXCR 270-U	14.9	270	-0.018	400	-0.020	30	29.5	+/- 0.250	298	376	11.25°	6	2
AXCR 350-U	42.6	350	-0.023	540	-0.028	45	44.5	+/- 0.300	385	505	7.5°	6	2
AXCR 360-U	35.8	360	-0.023	540	-0.028	40	39.5	+/- 0.300	395	510	7.5°	6	2
AXCR 540-U	62.1	540	-0.030	718	-0.035	50	49.5	+/- 0.300	574	684	5°	6	2

1) Tightening torque for screws acc. DIN 912, strength class 10.9.

2) Please enquire in case of high speed applications.

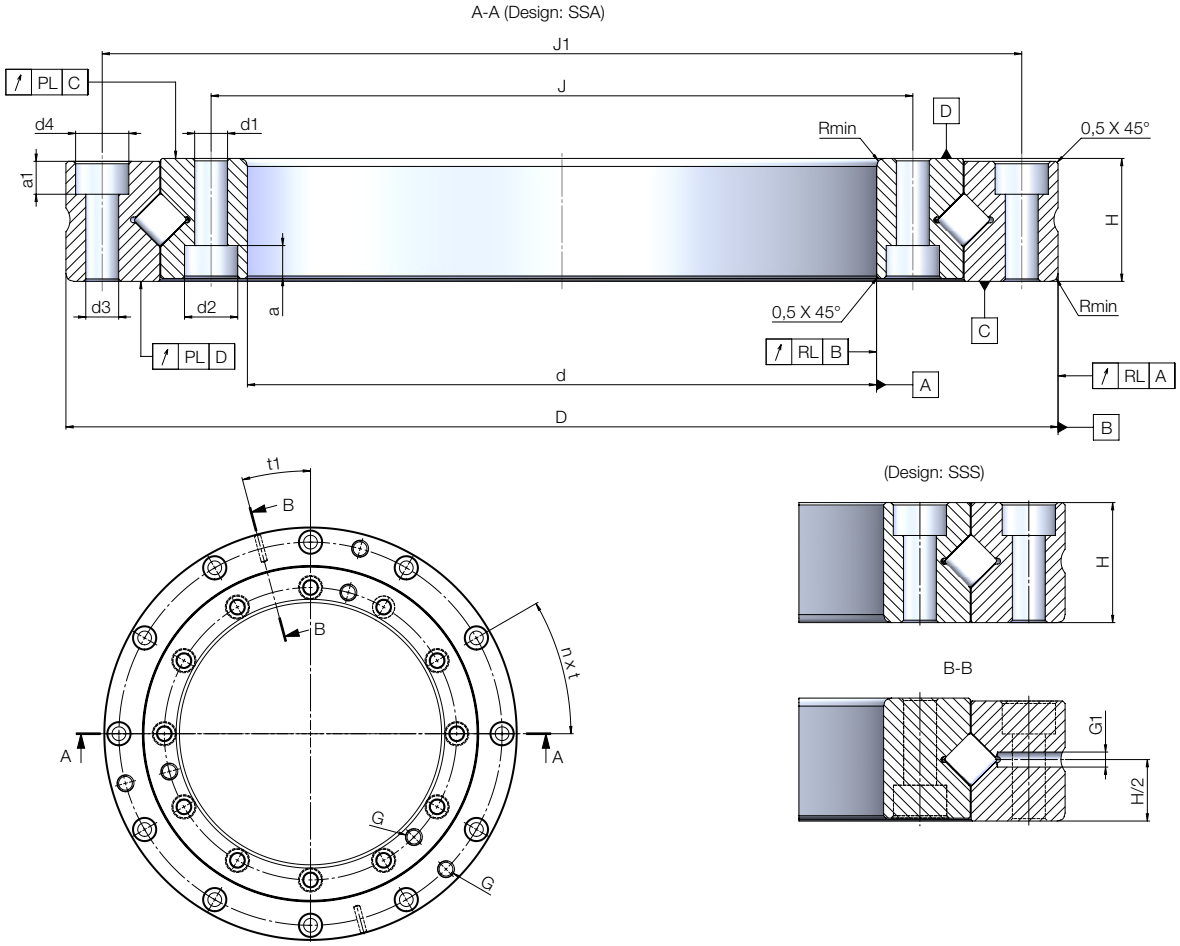
3) Measuring speed n_{const} = 5 rpm

4) Measured on the installed bearing with ideal adjacent construction.

Designation	Fixing holes										Extraction thread	
	Inner ring				Outer ring				Number x Pitch	Screw tightening torque	Inner ring/ outer ring	
	d1	d2	a	Number	d3	d4	a1	Number	nxt	M_A [1] [Nm]	G	Number
AXCR 80-U	5.5	9.5	5.4	10	5.5	9.5	5.4	10	10 x 36°	8.5	M8	2
AXCR 90-U	9	14	8.6	12	9	14	8.6	12	12 x 30°	34	M8	3
AXCR 115-U	9	14	8.6	12	9	14	8.6	12	12 x 30°	34	M8	3
AXCR 160-U	11	17.5	10.6	12	11	17.5	10.6	12	12 x 30°	68	M10	3
AXCR 210-U	13.5	20	12.6	16	13.5	20	12.6	16	16 x 22.5°	116	M10	2
AXCR 270-U	9	14	8.6	16	9	14	8.6	16	16 x 22.5°	34	M10	2
AXCR 350-U	13.5	20	12.6	24	13.5	20	12.6	24	24 x 15°	116	M10	3
AXCR 360-U	13.5	20	12.6	24	13.5	20	12.6	24	24 x 15°	116	M10	3
AXCR 540-U	13.5	20	12.6	36	13.5	20	12.6	36	36 x 10°	116	M10	3

Designation	Load rating				Limiting speed [2]	Bearing friction torque [3]	Axial runout & radial runout [4]						Rigidity of the bearing position			Min. corner radius
	Axial		Radial		Grease	Grease	Inner ring			Outer ring			Axial	Radial	Tilting rigidity	
							Class P4	Class P2	Class UP	Class P4	Class P2	Class UP				
	dyn. C_a [kN]	stat. C_{0a} [kN]	dyn. C_r [kN]	stat. C_{0r} [kN]	n_G [rpm]	$M_{RL\,max}$ [Nm]	PL & RL [µm]	PL & RL [µm]	PL & RL [µm]	PL & RL [µm]	PL & RL [µm]	PL & RL [µm]	C_{al} [kN/µm]	C_{rl} [kN/µm]	C_{kl} [kNm/mrad]	R_{min} [mm]
AXCR 80-U	49.4	177.8	44.0	71.1	320	5	4	2.5	2	8	5	3	1.4	0.8	2.7	1
AXCR 90-U	74.9	273.7	66.7	109.5	270	6	5	2.5	2	10	7	4	1.7	0.9	4.5	1.5
AXCR 115-U	103.8	388.2	92.5	155.3	225	10	5	2.5	2	10	7	4	1.8	0.9	6.9	1.5
AXCR 160-U	147.5	594.0	131.3	237.6	180	12	6	5	3	11	7	4	2.3	1.2	14.2	2
AXCR 210-U	206.2	911.6	183.5	364.6	140	18	8	5	3	13	8	5	3.0	1.5	32.1	2.5
AXCR 270-U	147.0	757.0	130.6	302.8	120	25	10	6	4	13	8	5	3.2	1.6	44.0	3
AXCR 350-U	254.2	1368.0	225.9	547.2	90	40	12	7	4	17	10	7	4.4	2.3	106.4	2.5
AXCR 360-U	258.0	1402.9	229.2	561.2	90	50	12	7	4	17	10	7	4.3	2.2	106.8	3.5
AXCR 540-U	307.3	1964.4	272.9	785.8	65	100	16	10	6	20	15	9	6.7	3.3	320.9	4

Dimensions table AXCR-S



Designation	Weight	Dimensions [mm]										
	m	d	Δd	D	ΔD	H		ΔH	J	J1	t1	G1	Number
	[kg]					SSA	SSS						
AXCR 130-S	3.3	130	0.025	205	-0.029	25.4	24.8	± 0.200	145	190	15°	3.1	2
AXCR 150-S	3.7	150	0.025	225	-0.029	25.4	24.8	± 0.200	165	210	11.25°	3.1	2
AXCR 180-S	4.3	180	0.025	255	-0.032	25.4	24.8	± 0.200	195	240	9°	3.1	2
AXCR 220-S	5.1	220	0.029	295	-0.032	25.4	24.8	± 0.200	235	280	7.5°	3.1	2
AXCR 280-S	6.3	280	0.032	355	-0.036	25.4	24.8	± 0.250	295	340	6.43°	3.1	2
AXCR 360-S	7.8	360	0.036	435	-0.040	25.4	24.8	± 0.300	375	420	5°	3.1	2

1) Tightening torque for screws acc. DIN 912, strength class 10.9.

2) Please enquire in case of high speed applications.

3) Measuring speed n_{const} = 5 rpm

4) Measured on the installed bearing with ideal adjacent construction.

Designation	Fixing bores										Extraction thread	
	Inner ring				Outer ring				Number x Pitch	Screw tightening torque	Inner ring/ outer ring	
	d1	d2	a	Number	d3	d4	a1	Number	nxt	M_A [1] [Nm]	G	Number
AXCR 130-S	6.6	11	6.4	12	6.6	11	6.4	12	12 x 30°	14	M8	3
AXCR 150-S	6.6	11	6.4	16	6.6	11	6.4	16	16 x 22.5°	14	M8	2
AXCR 180-S	6.6	11	6.4	20	6.6	11	6.4	20	20 x 18°	14	M8	2
AXCR 220-S	6.6	11	6.4	24	6.6	11	6.4	24	24 x 15°	14	M8	3
AXCR 280-S	6.6	11	6.4	28	6.6	11	6.4	28	28 x 12.857°	14	M8	2
AXCR 360-S	6.6	11	6.4	36	6.6	11	6.4	36	36 x 10°	14	M8	3

Designation	Load ratings				Limiting speed[2]	Bearing friction torque[3]	Axial runout & radial runout[4]		Rigidity of the bearing position			Min. corner radius
	Axial		Radial		Grease	Grease	Standard	Restricted	Axial	Radial	Tilting rigidity	
	dyn. C_a [kN]	stat. C_{0a} [kN]	dyn. C_r [kN]	stat. C_{0r} [kN]	n_G [rpm]	$M_{RL\,max}$ [Nm]	PL & RL [µm]	PL & RL [µm]	C_{al} [kN/µm]	C_{rl} [kN/µm]	C_{kl} [kNm/mrad]	R_{min} [mm]
AXCR 130-S	57.3	237.1	50.9	94.8	240	10	10	5	1.9	1.0	6.2	2
AXCR 150-S	61.5	270.8	54.7	108.3	215	12	10	5	2.1	1.1	9.1	2
AXCR 180-S	66.2	313.2	58.8	125.3	185	16	10	5	2.5	1.3	14.2	2
AXCR 220-S	72.4	372.5	64.3	149.0	155	18	10	5	2.9	1.5	23.5	2
AXCR 280-S	81.5	465.5	72.4	186.2	130	25	10	5	3.6	1.7	43.3	2
AXCR 360-S	91.7	584.0	81.4	233.6	100	50	10	5	4.4	2.0	83.9	2