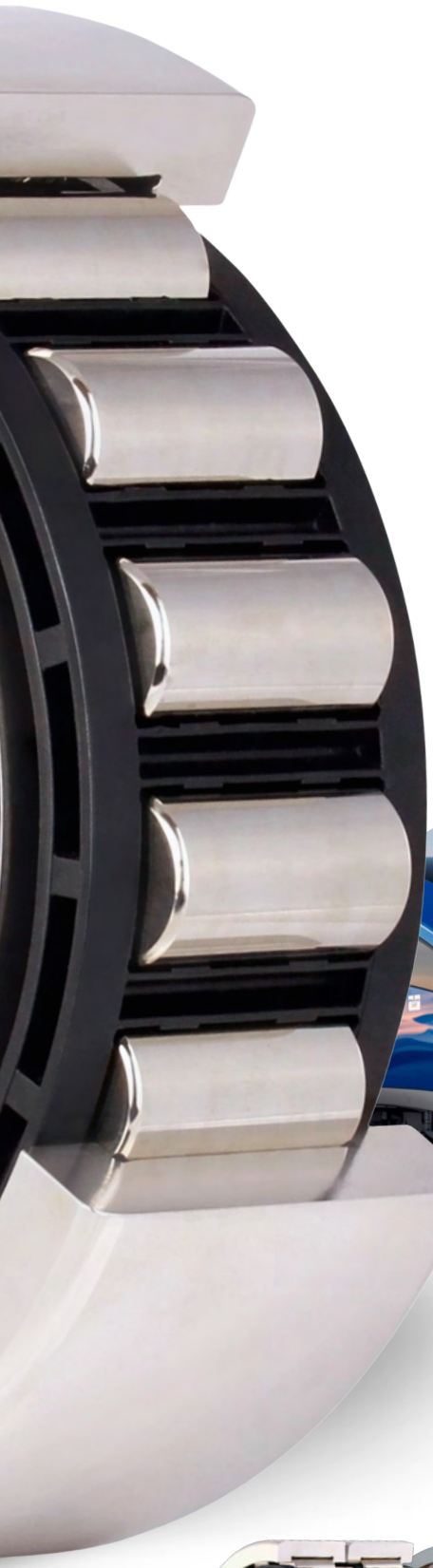
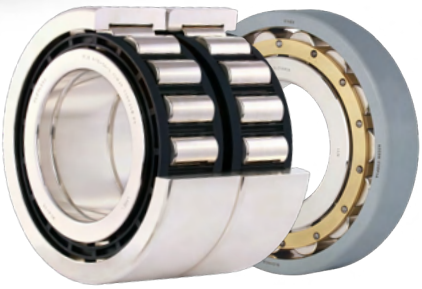
KINEX | 120 anniversary





# KINEX BEARINGS

## Rolling Bearings for Railway Vehicles

MORE THAN 120 YEARS
OF EXPERIENCE


Blue territories
KINEX trademark registration

**> Headquarters and Production Plants**

Slovakia, Bytča (HQ) and Kysucké Nové Mesto

**> Business Representations**

India, Jaipur

China, Shanghai

### Slovakia, Bytča (HQ)

Total land area: 86 336 m2
Production area: 41 659 m2
Estabilished: 1906

### Slovakia, Kysucké Nové Mesto

Total land area: 97 713 m2
Production area: 63 571 m2
Estabilished: 1948

## References

### Manufacturers

Alstom Transportation (DE), Bonatrans (CZ), Bochumer Verein Verkehrstechnik (DE), CRRC Shandong (CN), Greenbrier (PL, RO), Gredelj (HR), Inveho (DE), KLW Wheelco (UA), Kolowag (BG), Lucchini (IT), MAV Tiszavas (HU), Škoda Transportation (CZ), Taiyuan Heavy Industry Railway (CN), Talleres Alegría (ES), Tatravagónka (SK), ŽOS Trading (SK)

### Railway Companies / Operators

ČD Cargo (CZ), DB Cargo (UK), Deutsche Bahn (DB), GATX (DE), HŽ (HR), Lokaltog (DK), ÖBB (AT), PKP Cargo (PL), PKP Intercity (PL), S-Bahn (DE), SBB Cargo (CH), SJ AB (SE), SNCF (FR), SŽ (SI), Touax (FR), Transwaggon (CH), VTG (DE), ZSSK (SK), ZSSK Cargo (SK)



## Company Profile

Production program of KINEX BEARINGS includes wide assortment of standard and special rolling bearings for different industrial sectors. Production plants went through complicated historical development from their establishment and presently the KINEX BEARINGS with its large scale production program belongs to global producers of the rolling bearings.

Production of the rolling bearings has a long term tradition. KINEX BEARINGS offers complex services in the field of research, development and production of the rolling bearings and rolling elements. One of the most significant industrial segments in term of volume of sold bearings is the railway industry. Beginning of production in segment of single row roller bearings for the railway vehicles dates from year 1959. A commercial corporation KINEX BEARINGS, a.s. belongs at the moment to leaders in field of the roller bearings supplies for axles of the freight wagons in Europe and disposes of validations for different products supplies needed for application of the above mentioned bearings in various territories.

Production of the single row roller bearings that are used in railway industry is assured in accordance with requirements of the European standard EN 12080 and DBS 918 004-1. KINEX BEARINGS, a.s. (Joint Stock Company) offers also deliveries of the bearing units for axles of the goods wagons with load on the axle 22.5 tons and axle load of 25 tons.

### Product Portfolio for Railway Rolling Bearings

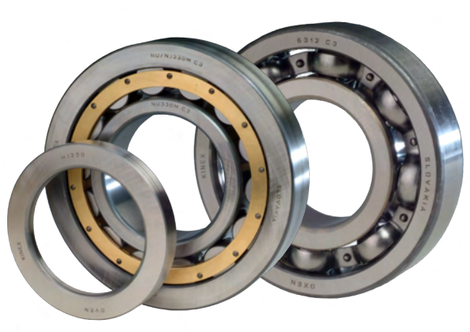
> Bearings
> Axleboxes
> Tailor made services

# APPLICATION OF BEARINGS

## Locomotives

• Axle Seatings of Electric and Diesel Locomotives

• Traction Motors and Generators Including Electrically Insulated Bearings



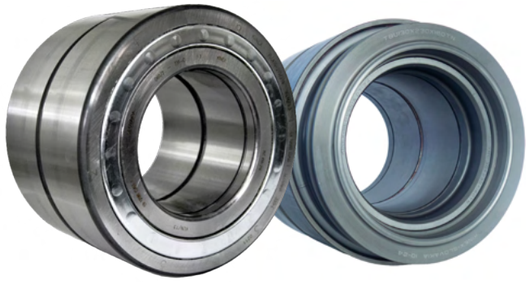

• Transmissions

• Compressor Motors, Fan Motors

• Drives of Blowers, Exciters and Charging Dynamos in Electric and Diesel Locomotives

## Train Sets and Wagons

• Bearing Unit for Passenger Transportation CRU and TBU



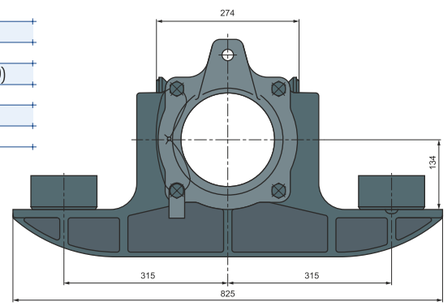
• Axleboxes and Roller Bearings for Passenger Cars and Freight Wagons

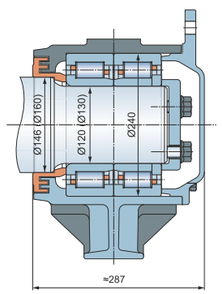

• Roller Bearings for Metro and Trams

# FREIGHT WAGON AXLEBOXES

**Axlebox BA 182**

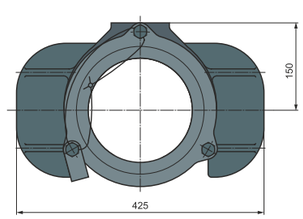
| | |
|---|---|
| Bogie | Y 25 |
| Axle load | 22.5 tons |
| Cyl. roller bearing | PLC 410-33-2/34-2 (WJ/WJP 130x240) |
| Maximum speed | 120 kmph |
| Suspension | helical coil springs |
| Box material | spheroidal grafite cast iron |

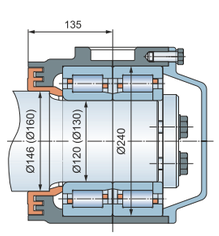



**Axlebox BA 381**

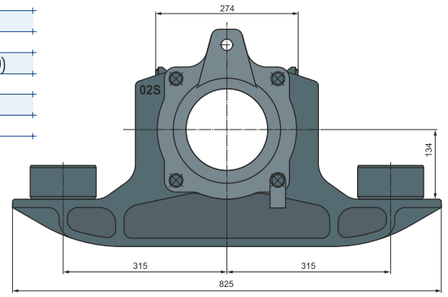
| | |
|---|---|
| Bogie | 2 and 4 axle goods wagon |
| Axle load 2 | 22.5 tons |
| Cyli. roller bearing | PLC 410-33-2/34-2 (WJ/WJP 130x240) |
| Maximum speed | 120 kmph |
| Suspension | leaf spring |
| Box material | spheroidal grafite cast iron |

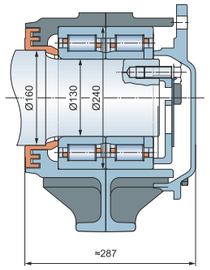



**Axlebox BA 386 (02S)**

| | |
|---|---|
| Bogie | Y 25 |
| Axle load | 25 tons |
| Cyl. roller bearing | PLC 410-33-2/34-2 (WJ/WJP 130x240) |
| Maximum speed | 120 kmph |
| Suspension | helical coil springs |
| Box material | spheroidal grafite cast iron |







# TRAININGS AND CONSULTATIONS

## Assembly Training, Disassembly and Maintenance of Cylindrical Bearings for Rail Vehicles

KINEX offers and provides professional training and practical demonstrations of assembly and disassembly of roller bearings for axleboxes of railway vehicles. The objective of these trainings is to train the staff of assembly plants in proper assembling of roller bearings which require the use of correct procedures, tools, measurement fixtures and lubrication.


For this area, KINEX has a group of experienced technicians who are ready to solve the assembling and disassembling procedure on site or demonstrate their own assembling. Based on customer requirements, we performed professional trainings for rail vehicles of cargo transport, subway, urban transport and locomotives. The subject of the training is basic information about bearings made by KINEX, assembling and disassembling of bearings and maintenance of bearings.

## Rules of Mounting and Dismounting of Bearings

### Warming Up of Bearings Inner Rings

Bearings of higher diameter series, used mostly in railway vehicles, require a bigger force to be pressed on at tight fitting. Therefore warming up of inner rings of bearings is used advantageously at the time of mounting them.

The bearings can be warmed up inductively or by air in electric furnace. Sufficient thermal expansion is achieved at the temperature 80–110 °C. The abutment dimensions of the axle journal and axlebox must be checked by measuring prior to bearings mounting procedure. The ring faces must be seated on their whole circumferences. Prior to mounting works it is necessary to check if the marking on the bearing is in conformity with the data on the drawing and at the list of parts.

**Protection of contact surfaces and lubrication**

Before fitting of the bearings it is advantageous to coat the contact surface of the axle journal and axlebox with a fine thin layer of LFAG 3 paste or with some other suitable agent in order to prevent rise of contact corrosion. At the time of mounting procedure, the bearings will be filled with a base grease, the brand and quantity of which is specified by the railway company with the consent of the bearings manufacturer.

**Conditions for assembling**

Mounting works must be carried out at a dry and dust-free workplace. The bearings, axleboxes and accessories must be protected from humidity and dirtiness during storage, checking and mounting procedures.

**Dismounting of the bearings**

If the bearings are to be reused after dismounting, this procedure must be carried out professionally with the help of suitable jigs and in accordance with the beforehand fixed procedure at a dry and dust-free workplace.

**Jigs used for dismounting**

It is important to be careful about that, only the ring which is to be pulled off was caught by the extracting jig. The force needed for dismounting must not be in any case carried through the rolling elements, since it would cause damage of raceways.

# REPLACEMENT OF SPHERICAL ROLLER BEARINGS

## by KINEX's Cylindrical Roller Bearings for Axles of Railway Vehicles

### Technical Benefits

They mainly lie in:

› At roller bearings the ring orbits and cylindrical surface of the cylinders are loaded by radial force Fr only and the axial forces Fa, which act shortly, i.e. there are transferred between the roller heads and supporting heads of the rings when driving through rail switches and curves, so they do not affect the bearing lifetime (see Fig. 1)

› At spherical bearings, both forces load the rolling surfaces of rings and spherical bodies (see Fig. 2)

› Roller bearings can also be used at high velocities, spherical bearings cannot be used in these cases

› The construction of roller bearings allows use of easier and less demanding assembling and disassembling of imposition.

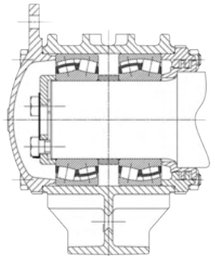


Fig. 1

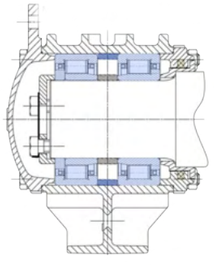


Fig. 2

Roller bearings have been and are introduced due to their technical and service benefits as a better solution of rail vehicle axle imposition. Therefore, they are continuously deployed into operation and as a replacement of spherical bearings.

Currently, from all spherical bearings, there are only bearings with dimensions 130x220x73 mm used in railway transports.

Based on the interest of European railways, KINEX BEARINGS, a.s. has developed and integrated into production roller bearings with identical dimensions and designation PLC 410-223-2/224-2, which may be used as a replacement for spherical bearings.

Principally, the replacement of spherical bearings with roller bearings should not be taken just as a mutual replacement of bearings without an impact on their internal loading in relation with various types of bearing boxes.

The way of ensuring of the functionality of the roller bearings (for instance respecting of the axial clearance) requires a qualification of bearing boxes (with tightening of lids onto the firmly anchored or continuous screws) and supplementing of the bearings with spacing rings as at the spherical bearings for two alternatives of length of the wheelset pins (191 mm and 217 mm).

### Economic Benefits

› Reduction of work intensity for service processes (assembling/ disassembling)

› Significant time savings when assembling and disassembling in comparison with spherical bearings, i.e. saves up to 60% of required time!

› Cost reduction of bearing replacement by 20 %

• For roller bearings, a replacement of individual components (bearing block – external ring, rollers, cage, inner rings, lean-ring)

• Interchangeability of inner rings of cylindrical roller bearings

• Replacement of whole bearing for spherical bearings

› When disassembling spherical roller bearings, the operator of repair shall comply with a specific regime, special fixture to squeeze the bearings, usage of special hydraulic device (oil pressure) => a big impact on the compliance with strict safety and health protection, environmental protection, what represents increased costs.

| 5 | 660000 km | 25 t |
|---|---|---|
| Years Warranty | of Guaranteed Warranties | Maximum Load |



# THE DIGITAL REVOLUTION

## in Railway Bearings

KINEX 120 anniversary

KINEX BEARINGS is no longer just a bearing manufacturer. KINEX BEARINGS is changing control, traceability, and the future. We deliver bearings together with their digital DNA – data, certainty, and the future with more efficient and optimized customer processes.

### End of Unnecessary Control

› Plug & Play: P6 accuracy (ISO 492), mounting straight out of box

› Automation: Measurements from production lines

› Savings: Control = statistical sample, time and money

### 30 Years in the Cloud

› EDI / ERP: DESADV / Excel → SAP

› Archiving: For 30 years digitally, without paper

› Digital Twin: Fewer errors, lower $CO_2$ footprint

### You Decide What Goes into DESADV

› Standard DESADV: SULKUS, without dimensions and batch

› Extension DESADV: Dimensions, Batch, Digital DNA

### DESADV (Despatch Advice)

› DESADV (Despatch Advice) is according to GS1 standrad


### Absolute Safety and Security

› GS1 DataMatrix: Each part has a unique S/N

› Zero Substitution: Digital Parts Matching

› 100% Traceability: Traceability up to the batch of the material

### Standard DESADV Message Contains

› Sender › Receiver › Delivery location › Purchase order number › Dispatch advice number › Product code › Quantity

› Packaging (pallets, cartons, SSCC) › Logistics data (weight, dispatch date, transport)

### Extension DESADV Message Contains

| Field name: | Description: | Example value: |
|---|---|---|
| › PRODUCER | Manufacturer of the product | KINEX BEARINGS, a.s. |
| › ORDER_NO | Customer purchase order number | YYYYYYY |
| › DELIVERY_NOTE_NO | Delivery note / dispatch advice number | DLXXXXXXXXX |
| › TRADE_ITEM_DESCRIPTION | Description of the product | WJ 130x240x80 TN |
| › BUYER_ASSIGNED | Product code assigned by the buyer | XXX |
| › GTIN | Global Trade Item Number identifying the product | 08586019690217 |
| › PALLET_NO | Identification number of the pallet / logistic unit | 990000003462 |
| › CERTIFICATE_NO | Quality or material certificate number | 95 / 2026 |
| › PCS | Number of pieces shipped | 48 |
| › OUTR_SERIAL_NO | Serial number of the outer component | 23410250435271020 |
| › OUTR_BATCH_NO | Production batch number of the outer component | C53693 |
| › OUTR_MANUFACTURE_DATE | Manufacturing date of the outer component | 251208 |
| › OUTR_D | Outer diameter of the component | 239,989 |
| › OUTR_DCS | Quality control parameter related to outer diameter | 79,969 |
| › CAGE_TYPE | Type of bearing cage | Monolit |
| › CAGE_MATERIAL | Material of the cage | PA6.6GF25 |
| › INTR_SERIAL_NO | Serial number of the inner component | 23410250434139040 |
| › INTR_BATCH_NO | Production batch number of the inner component | C53693 |
| › INTR_MANUFACTURE_DATE | Manufacturing date of the inner component | 251208 |
| › INTR_D_MALE | Inner diameter of the inner ring | 129,988 |
| › INTR_DBS | Quality or technical parameter related to inner diameter | 79,98 |

# RESEARCH AND DEVELOPMENT

An important factor of quality improvement of cylindrical roller bearings is continuing design improvement that optimises lubrication, increases loading capacity and minimizes edge stresses.

## KINEX BEARINGS Has Been Giving Continuous Attention to:

- new product development
- present product improvement

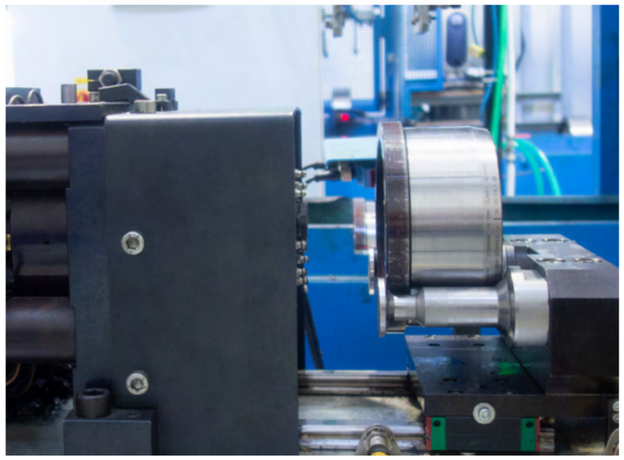
## Continuing Design Improvement Increases Bearing's Life and Reliability

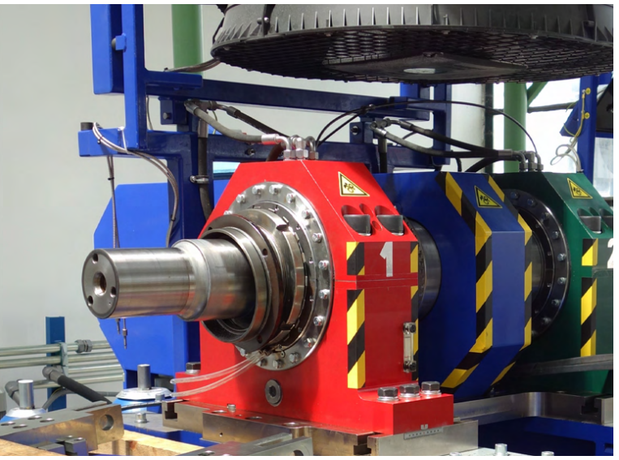
## Inspection and Testing

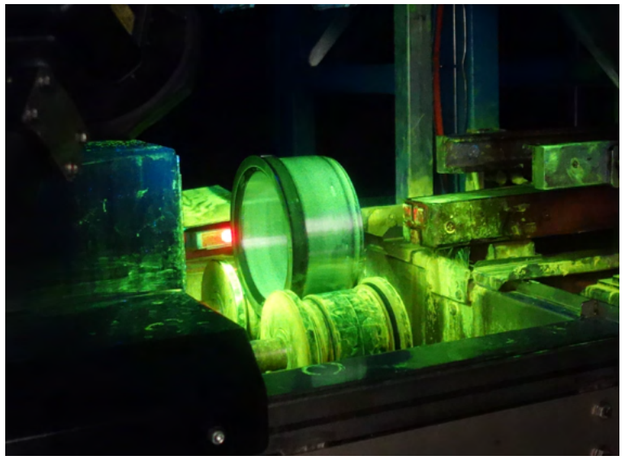
The production of axlebox cylindrical roller bearings used in railway industry is assured in accordance with requirements of european standard EN 12 080.

Rig performance tests of axlebox cylindrical roller bearings according to EN 12082, UIC515-5

Axle load 25 tons, speed 120 km per hour
Axle load 22,5 tons, speed 160 km per hour
Axle load 18 tons, speed 200 km per hour







## Standard Specifications

### Standards

| | |
|---|---|
| STN EN 12080 | Railway applications - Axleboxes - Rolling bearings |
| STN EN 12081 | Railway applications - Axleboxes - Lubricating greases |
| STN EN 12082-1 | Railway applications - Axleboxes - Part 1: Test procedures |
| STN EN 12082-2 | Railway applications - Axleboxes - Part 2: Deployment Procedure |
| STN EN ISO 683-17 | Heat-treated steels, alloy steels and free-cutting steels - Part 17: Ball and roller bearing steels |
| STN EN 1982 | Copper and copper alloys - Ingots and castings |
| STN EN 12420 | Copper and copper alloys - Forgings |
| STN ISO 281 | Rolling bearings. Dynamic load ratings and rating life |
| ISO 76 | Rolling bearings. Static load carrying capacity |
| DBS 918 004-1 | Rolling bearings and units for rail vehicles |

## Quality Management

Production plants of the KINEX BEARINGS are certified in accordance with standard ISO 9001, ISO TS 22 163, ISO/TS 16949, ISO 14001, TSI, ISO 45001 and ISO 50001 for the field of development and production of roller and ball bearings by a certification company 3EC International.

Development and manufacturing of bearings has established and maintains a quality management system according to international railway industry standard (IRIS). Because of the amount of all certificates we work simultaneously on a complex quality management system that will allow us to join the mutual requirements of those standards with effective implementation of other requirements.

### Quality Certificates

- ISO 9001
- ISO TS 22 163
- ISO/TS 16949
- ISO 14001
- TSI
- ISO 45001
- ISO 50001

# TECHNICAL DATA

## of Rolling Bearings for the Railway Vehicles

### Essential Condition of Reliable Operation of Cylindrical Roller Bearings is Observance of Mounting and Dismounting Principles:

- fitting tolerances
- shape deviations
- warming up of bearings (inner rings)
- qualified mounting workplace
- trained and qualified employees
- using of suitable jigs
- keeping of fixed procedures

Special single row cylindrical roller bearings used in axle railway vehicle seatings are produced with machined brass cage and glass-fibre reinforced polyamide cage. Reinforced polyamide cage improves reliability and safety. Single row cylindrical roller bearings in design NU, NJ, NUP used in railway drive systems and traction motors are produced with machined brass cage version E.

Rolling bearings used in production of railway vehicles are produced in standardized types ISO and also as special single row cylindrical roller bearings. The main advantages of cylindrical roller bearings usage are their simple design, easy assembly, easy maintenance and reliability in operation. Cylindrical roller bearings are characterized by low friction resistance, low temperature, low component wear and high load rating.

## Material

**Bearing rings according to EN 12080, EN ISO 683-17:**
Chromium steel through-hardening in the whole cross section:
100 Cr6, 100 CrMnSi6-4

**Bearing rollers according to EN 12080, EN ISO 683-17:**
Chromium steel through-hardening in the whole cross section:
100 Cr6, 100 CrMnSi6-4

**Cages according to BN 918 056:**
Polyamide cage: material PA 66 GF25 HZ
Machined brass cage: material CuZn40Pb2, CuZn37Al1, uZn31MnAl, MS58Al

**Structure of the steel after heat treatment:**
Martensite in which the residual austenite varies in the range from 3 to 10 %. This residual austenite in axle bearings is < 2 %.

**Hardness of the bearing rings after heat treatment is in the range:**
58–64 HRC (dispersion of measured values between all rings of one bearing must not be more than 3 HRC). To assure dimensional stability through the whole operational period, the bearing rings for axle bearings are stabilized by means of heat treatment on 200 °C (S1).

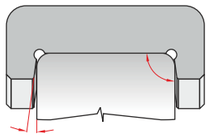
**Hardness of rollers after heat treatment is in the range:**
60–65 HRC (dispersion of measured values between all rollers of one bearing must not be more than 4 HRC).



## Internal Design

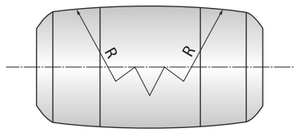
### Design of Roller Face and Guide Flange

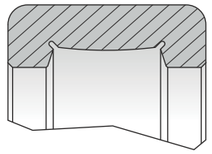
it optimizes lubrication of a contact zone in the contact area and thus it increases axial load carrying capacity of the bearing.



### ZB Profile of the Rollers and Raceway

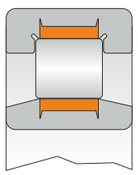
it takes part on minimizing of the edge stress and thus also on increasing of durability and reliability of the bearing.



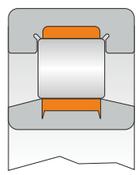



### Contact Effective Stress

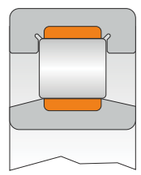
ZB optimizes the contact effective stress created on external and internal bearing ring.



Cylindrical roller without ZB profile and non-convexed raceways of the rings



Roller ZB profile and raceway ZB profile of the outer ring. Non-convexed raceway of the inner ring



Roller ZB profile and convexed raceways of the rings (KINEX design)

## Life Calculation

Single-row cylindrical roller bearings life calculation for railway vehicle axleboxes is based on the radial static load acting on the bearings of one wheel set i.e. axle load which is calculated from the equation:

$$G_1 = \frac{G}{n} - G_2$$

where:
G – weight of the vehicle (kN)
$G_1$ – radial static load acting on one wheel set (kN) (axle load)
$G_2$ – weight of a wheel set and others unsprung parts (kN)
n – number of wheel sets

Then radial static load acting on one bearing will be:

$$P_{or} = \frac{G_1}{4}$$

where:
$G_1$ – radial static load acting on one wheel set (kN) (axle load)
$P_{or}$ – radial static load acting on one bearing (kN)

Radial equivalent dynamic load acting on one bearing is calculated from the equation:

$$P_r = P_{or}.f_d$$

where:
$P_r$ – radial equivalent dynamic load acting on one bearing (kN)
$P_{or}$ – radial static load acting on one bearing (kN)
$f_d$ – factor of additional forces (see table 1)

**Factors of additional forces**

| Type of vehicle | $f_d$ |
|---|---|
| Passenger carriages | 1.2 to 1.3 |
| Goods, self-discharging and ingot wagons | 1.2 to 1.4 |
| Locomotives | 1.3 to 1.8 |

Basic bearing life can be calculated from the equation:

$$L_{10km} = \left(\frac{C_r}{P_r}\right)^{\frac{10}{3}}.\pi.D_k.10^{-3}$$

where:
$L_{10km}$ – basic bearing life ($10^6$ km)
$C_r$ – basic radial dynamic load rating (see dimension tables) (kN)
$P_r$ – radial equivalent dynamic load acting on one bearing (kN)
$D_k$ – diameter of the vehicle wheel (mm)

# BEARING ARRANGEMENT

## Influence of Arrangement on Bearing Life

Bearing life is considerably influenced by arrangement of bearing rings on the shaft and at the housing. These parts should be manufactured with required quality and tolerances. According to specific operational conditions the rings are either push fitted (clearance fit) or force fitted (interference fit).

Essential condition for bearing arrangement is that the ring loaded on its circumference must be force fitted. Recommended values of shaft diameters and housing bore tolerances take into consideration all operational influences (type, direction and intensity of load, temperature …) with loading during the entire operating time.

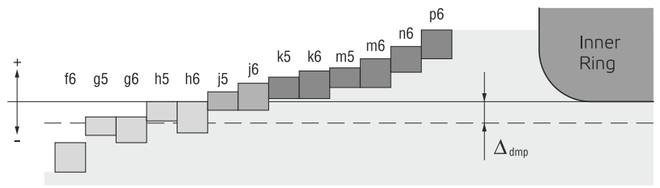
**Recommended tolerances of journals diameters and housing bores**

| Arrangement | Journal diameter | | Tolerance | Housing bore diameter | Tolerance |
|---|---|---|---|---|---|
| | Ball | Roller | | | |
| Fans | 18 to 100 | to 40 | j6 | Fans | J7 |
| Generators | 100 to 200 | 40 to 140 | k6 | Electic motors | K7 |
| | 18 to 100 | to 40 | k5 | | |
| Electric motors | 100 to 200 | 40 to 140 | m5 | Traction motors | M7 |
| | 140 to 200 | 100 to 140 | m6 | | |
| Axlebox bearings | | 50 to 140 | *n6, p6 | Axlebox bearings | H7 |
| Traction motorbearings | | 140 to 500 | *n6, p6 | Axlebox bearings | H7 |

* It is necessary to use bearings with higher radial clearance at these arrangement.

**Journal diameter tolerance limiting deviations**

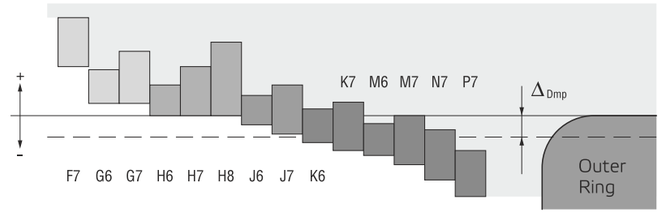
| Journal nominal diameter mm | | k5 | | m5 | | j6 | | k6 | | m6 | | n6 | | p6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | µm | | | | | | | |
| over | to | upper | lower | upper | lower | upper | lower | upper | lower | upper | lower | upper | lower | upper | lower |
| 30 | 50 | +13 | +2 | +20 | +9 | +11 | -5 | +18 | +2 | +25 | +9 | +33 | +17 | +42 | +26 |
| 50 | 80 | +15 | +2 | +24 | +11 | +12 | -7 | +21 | +2 | +30 | +11 | +39 | +20 | +51 | +32 |
| 80 | 120 | +18 | +3 | +28 | +13 | +13 | -9 | +25 | +3 | +35 | +13 | +45 | +23 | +59 | +37 |
| 120 | 180 | +21 | +3 | +33 | +15 | +14 | -11 | +28 | +3 | +40 | +15 | +52 | +27 | +68 | +43 |
| 180 | 250 | +24 | +4 | +37 | +17 | +16 | -13 | +33 | +4 | +46 | +17 | +60 | +31 | +79 | +50 |





**Bore diameter tolerance limiting deviations**

| Nominal bore diameter mm | | H7 | | J7 | | K7 | | M7 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | µm | | | | | |
| over | to | upper | lower | upper | lower | upper | lower | upper | lower |
| 50 | 80 | +30 | 0 | +18 | -12 | +9 | -21 | 0 | -30 |
| 80 | 120 | +35 | 0 | +22 | -13 | +10 | -25 | 0 | -35 |
| 120 | 180 | +40 | 0 | +26 | -14 | +12 | -28 | 0 | -40 |
| 180 | 250 | +46 | 0 | +30 | -16 | +13 | -33 | 0 | -46 |
| 250 | 315 | +52 | 0 | +36 | -16 | +16 | -36 | 0 | -52 |
| 315 | 400 | +57 | 0 | +39 | -18 | +17 | -40 | 0 | -57 |




## Shape Deviations

The further conditions to achieve high bearing life in arrangements is to keep prescribed shape deviations of supporting areas and their surface quality. The shape deviations of supporting surfaces i.e. permissible deviation from roundness and cylindrical shape and permissible run-out of bearing surfaces with regard to the axle must be smaller than range of diameter tolerances.

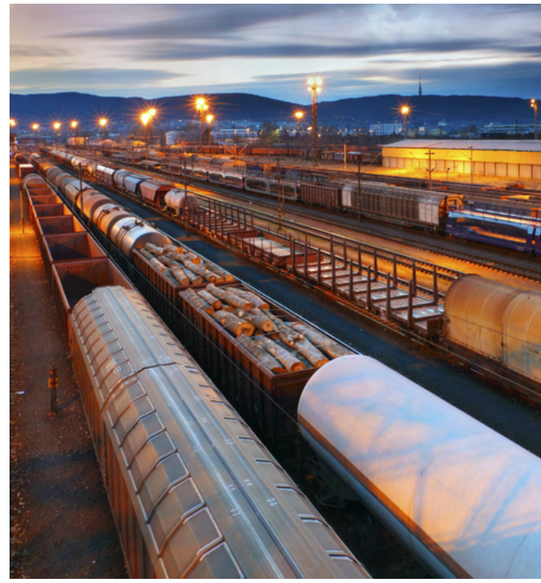
| Tolerance class | Place of arrangement from cylindrical shape | Permissible deviation | Permissible run-out of bearing surfaces with regard to the axle |
|---|---|---|---|
| P0, P6 | shaft | IT 5/2 | IT 3 |
| P0, P6 | shape | IT 6/2 | IT 4 |

**Values of standard tolerances IT**

| Nominal diameter mm | | Tolerance class | | | | |
|---|---|---|---|---|---|---|
| | | µm | | | | |
| over | to | IT 2 | IT 3 | IT 4 | IT 5 | IT 6 |
| 18 | 30 | 2.5 | 4 | 6 | 9 | 13 |
| 30 | 50 | 2.5 | 4 | 7 | 11 | 16 |
| 50 | 80 | 3 | 5 | 8 | 13 | 19 |
| 80 | 120 | 4 | 6 | 10 | 15 | 22 |
| 120 | 180 | 5 | 8 | 12 | 18 | 25 |

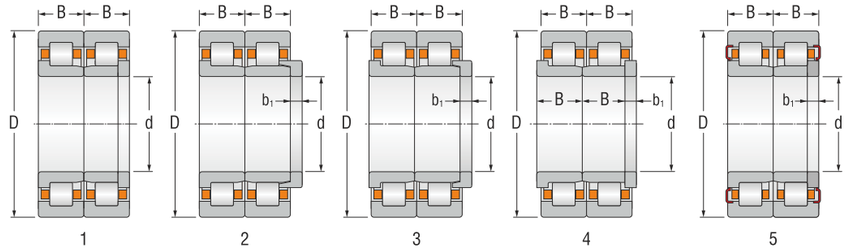
Arrangement quality is influenced also by roughness of bearing supporting surfaces. These surfaces are smoothened at mounting procedures. Interference in the arrangement is more reduced if the surfaces are enough roughness.

| Supporting surface | Nominal diameter of the bearing | |
|---|---|---|
| | from 10 to 80 | over 80 |
| | $Ra_{max}$ µm | |
| Shaft | 0.63 | 1.25 |
| Housing´s bore | 0.63 | 1.25 |
| Face of jounal shaft or housing | 1.25 | 1.25 |



# SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

## For Axleboxes




| Dimensions | | | | Basic load rating | | Max. speed of railway vehicle | Weight of a pair of bearings | Bearings designation | | Fig. | Cage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d | D | B | $b_1$ | dyn. cr | static cor | | | | | | |
| mm | | | | kN | | km/hour | kg | | | | |
| **100** | 180 | 60.3 | - | 333.5 | 444.4 | 160 | 12 | **PLC 49-200-2-1 (WJ100x180)** | **PLC 49-201-2 (WJP 100x180)** [1)3)4)] | 1 | TNG |
| | 180 | 120.6 | - | 333.5 | 444.4 | 160 | 12 | **WJ/WJP 100x180x120,6 P TN C4** | | 1 | TNG |
| **118** | 215 | 80 | - | 519.8 | 740.9 | 160 | 25.7 | **PLC 410-213-3** | **PLC 410-214-3** [1)4)5)] [1)4)5)] | 1 | M |
| | 240 | 80 | - | 553.8 | 742.5 | 160 | 32.3 | **WJ 118x240x80 TN (PLC 410-13-2-3)** | **WJP 118x240x80 P TN(PLC 410-14-2-3)** [1)3)4)] | 1 | TNG |
| | 240 | 80 | - | 553.8 | 742.5 | 160 | 34.2 | **PLC 410-23** | **PLC 410-24** [1)2)4)] | 1 | TNG |
| **119** | 240 | 80 | - | 553.8 | 742.5 | 160 | 32.1 | **WJ 119x240x80 TN (PLC 410-13-2-4)** | **WJP 119x240x80 P TN (PLC 410-14-2-4)** [1)3)4)] | 1 | TNG |
| **119.3** | 240 | 80 | - | 553.8 | 742.5 | 160 | 31.7 | **WJ 119,3x240x80 TN (PLC 410-13-2-5)** | **WJP 119,3x240x80 P TN (PLC 410-14-2-5)** [1)3)4)] | 1 | TNG |
| **120** | 200 | 62 | - | 372.8 | 549.1 | 120 | 16 | **PLC 49-202** | **PLC 49-203** [1)4)5)] | 1 | M |
| | 215 | 73 | - | 518.5 | 717.5 | 160 | 21 | **PLC 410-231-2 (WJ 120x215x73)** | **PLC 410-232-2 (WJP 120x215x73)** [1)3)4)] | 1 | TNG |
| | 215 | 80 | - | 519.8 | 740.9 | 160 | 25.2 | **PLC 410-213** | **PLC 410-214** [1)2)4)] | 1 | M |
| | 240 | 80 | - | 553.8 | 742.5 | 160 | 33.7 | **PLC 410-13** | **PLC 410-14** [1)2)4)] | 1 | M |
| | 240 | 80 | - | 553.8 | 742.5 | 160 | 33.7 | **PLC 410-13-1** | **PLC 410-14-1** [1)4)5)] | 1 | M |
| | 240 | 80 | - | 553.8 | 742.5 | 160 | 31.7 | **WJ 120x240x80 TN (PLC 410-13-2)** | **WJP 120x240x80 P TN (PLC 410-14-2)** [1)3)4)] | 1 | TNG |
| **129** | 240 | 80 | - | 539.6 | 775.4 | 160 | 30.2 | **WJ 129x240x80 TN (PLC 410-33-2-4)** | **WJP 129x240x80 P TN (PLC 410-34-2-4)** [1)3)4)] | 1 | TNG |
| **129.3** | 240 | 80 | - | 539.6 | 775.4 | 160 | 30.18 | **WJ 129,3x240x80 TN (PLC 410-33-2-9)** | **WJP 129,3x240x80 P TN (PLC 410-34-2-9)** [1)3)4)] | 1 | TNG |
| **130** | 220 | 73 | - | 505.0 | 761.7 | 160 | 21.08 | **PLC 410-223-2** | **PLC 410-224-2** [1)3)4)] | 1 | TNG |
| | 240 | 80 | - | 516.3 | 752.1 | 160 | 32.6 | **PLC 410-15** | **PLC 410-16** [1)2)4)] | 1 | M |
| | 240 | 80 | - | 516.3 | 752.1 | 160 | 30.5 | **PLC 410-15-2 (WJ 130x240)** | **PLC 410-16-2 (WJP 130x240)** [1)3)4)] | 1 | TNG |
| | 240 | 80 | - | 539.6 | 775.4 | 160 | 32.7 | **PLC 410-33-1** | **PLC 410-34-1** [1)2)4)] | 1 | M |
| | 240 | 80 | - | 539.6 | 775.4 | 160 | 30.2 | **WJ 130x240x80 TN (PLC 410-33-2)** | **WJP 130x240x80 P TN (PLC 410-34-2)** [1)3)4)] | 1 | TNG |
| | 240 | 86 | 21.55 | 539.6 | 775.4 | 160 | 30.7 | **WJ 130x240x80 TN (PLC 410-33-2)** | **WJP 130x240x86 P TN (PLC 410-34-2-6)** [1)3)4)] | | TNG |
| | 240 | 160 | - | 539.6 | 775.4 | 200 | 30.6 | **PLC 410-215/216** | | 5 | TNG |
| | 250 | 80 | - | 580.0 | 800.3 | 160 | 36.6 | **PLC 410-17** | **PLC 410-18** [1)2)4)] | 1 | M |
| | 250 | 80 | - | 580.0 | 800.3 | 160 | 34.2 | **PLC 410-17-2** | **PLC 410-18-2** [1)3)4)] | 1 | TNG |
| **158** | 300 | 84 | 15 | 869.5 | 1214.3 | 160 | 58.3 | **PLC 411-200** | **PLC 411-201** [1)2)4)] | 2 | M |
| **159** | 300 | 84 | 15 | 869.5 | 1214.3 | 160 | 57.9 | **PLC 411-20** | **PLC 411-21** [1)2)4)] | 2 | M |
| **160** | 300 | 84 | 15 | 869.5 | 1214.3 | 160 | 57.5 | **PLC 411-10** | **PLC 411-12** [1)2)4)] | 2 | M |
| **180** | 320 | 86 | 12 | 713.5 | 1082.8 | 160 | 64.6 | **NJ2236 M C 4A450-900** | **NUC2236 M C4 + HJ2236 X 16.33** [2)4)] | 2 | M |
| | 320 | 86 | 15 | 713.5 | 1082.8 | 160 | 64.9 | **NJ2236 XM C4** | **NUC2236 M C4 + PLC 810-1** | 3 | M |
| | 320 | 86 | 15 | 713.5 | 1082.8 | 160 | 64.9 | **NJ2236 XMAS C4** | **NUC2236 MAS C4 + PLC 810-1** | 3 | MAS |
| | 320 | 86 | 17 | 713.5 | 1082.8 | 160 | 64.8 | **NJ2236 XM C4** | **NUC2236 M C4+príložný krúžok NUP2236** | 4 | M |

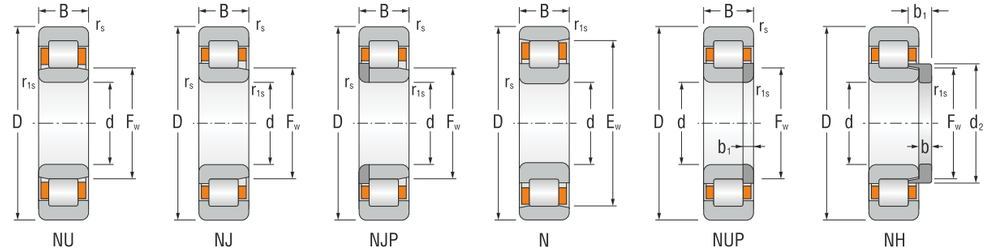
1) Pair of bearings is marked shortly e. g. PLC 410-13/14
2) Machined brass cage (steel riveted) or -1 (cross piece riveted)
3) Glass-fiber reinforced polyamide cage, roller centred
4) Inner ring interchangeable
5) Two-piece machined brass pronged cage

M – two-piece machined brass cage, roller centred
MAS – two-piece machined brass cage with lubrication grooves, outer ring centred
TNG – polyamide cage



# SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

## For Locomotives

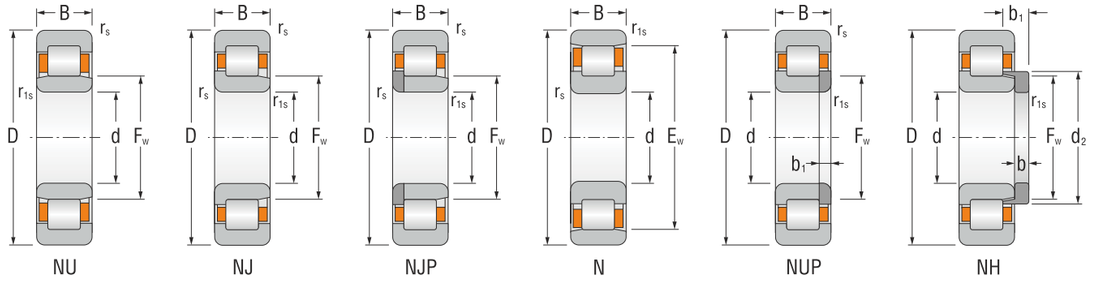



| Dimensions | | | Bearings designation | Angle ring | Basic load rating | | Limiting speed for lubrication | | Mass of | | Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | dynamic | static | | | Bearing | Angle ring | | | | | | | | |
| d | D | B | | HJ | $C_r$ | $C_{or}$ | grease | oil | | | $rs_{min}$ | $r1s_{min}$ | Fw | Ew | d2 | b | b1 | s [1)] |
| mm | | | | | kN | | $min^{-1}$ | | kg | | mm | | | | | | | |
| **70** | 150 | 51 | **NU2314EMAP** | | 273.8 | 322.9 | 2 730 | 3 250 | 4.507 | | | | | | | | | 4.1 |
| | 150 | 51 | **NUP2314EMAP R110-130NAS0** | | 273.8 | 322.9 | 2 730 | 3 250 | 4.680 | | 2.1 | 2.1 | 89 | | | | 8.5 | |
| **75** | 160 | 55 | **NU2314EMAP R170-190NAS0** | | 329.4 | 394.5 | 2 470 | 2 925 | 5.468 | | 2.1 | 2.1 | 95 | | | | | 4.5 |
| | 160 | 55 | **NU2315EMAP R170-190NAS0** | | 329.4 | 394.5 | 2 470 | 2 925 | 6.661 | | 2.1 | 2.1 | 95 | | | | 8.5 | |
| **85** | 210 | 52 | **NUP417AM P6R155-172NAA260-491** | | 355 | 381.8 | 3 000 | 3 500 | 10.000 | | 4 | 4 | 113 | | | | 10 | |
| **90** | 190 | 43 | **NJ318EM** | **HJ318E** | 310.8 | 346.9 | 3 000 | 3 500 | 6.230 | 0.641 | 4 | 4 | 113.5 | | 124 | 12 | 18.5 | 2 |
| | 190 | 43 | **NU318EM** | **HJ318E** | 310.8 | 346.9 | 3 000 | 3 500 | 6.229 | 0.641 | 4 | 4 | 113.5 | | 124 | 12 | 18.5 | 2 |
| | 190 | 43 | **NJ318M** | **HJ318** | 234.9 | 258.4 | 3 200 | 3 800 | 6.070 | 0.667 | 4 | 4 | 115 | | 125 | 12 | 21 | 2 |
| | 190 | 43 | **N318** | | 234.9 | 258.4 | 3 200 | 3 800 | 5.250 | | 4 | 4 | | 165 | | | | 2 |
| | 190 | 43 | **NU318M** | **HJ318** | 234.9 | 258.4 | 3 200 | 3 800 | 5.910 | 0.667 | 4 | 4 | 115 | | 125 | 12 | 21 | 2 |
| | 190 | 43 | **NU318MA** | **HJ318** | 234.9 | 258.4 | 3 200 | 3 800 | 5.910 | 0.667 | 4 | 4 | 115 | | 125 | 12 | 21 | 2 |
| | 190 | 43 | **NJ318** | **HJ318** | 234.9 | 258.4 | 3 200 | 3 800 | 5.520 | 0.667 | 4 | 4 | 115 | | 125 | 12 | 21 | 2 |
| | 190 | 43 | **NU318** | **HJ318** | 234.9 | 258.4 | 3 200 | 3 800 | 5.360 | 0.667 | 4 | 4 | 115 | | 125 | 12 | 21 | 2 |
| | 190 | 43 | **NU318EMAP R120-150S0** | | 310.8 | 346.9 | 1 950 | 2 275 | 5.955 | | 3 | 3 | 113.5 | | | | | 2 |
| **95** | 200 | 45 | **NJ319EM** | | 328.9 | 378.5 | 2 800 | 3 300 | 7.170 | | 4 | 4 | 121.5 | | | | | 1.9 |
| | 240 | 55 | **NJ419M** | | 415.2 | 465.0 | 2 500 | 3 000 | 13.860 | | 4 | 4 | 133.5 | | | | | 2.5 |
| | 240 | 55 | **NU419M** | | 415.2 | 465.0 | 2 500 | 3 000 | 13.570 | | 4 | 4 | 133.5 | | | | | 2.5 |
| **100** | 180 | 34 | **NJ220EX6M P64S0** | | 191.3 | 230.8 | 3 500 | 4 200 | 3.935 | | 2.1 | 2.1 | 119 | | | | | 2 |
| | 180 | 34 | **NJP220EX6M P64S0** | | 191.3 | 230.8 | 3 500 | 4 200 | 3.931 | | 2.1 | 2.1 | 119 | | | | | |
| | 215 | 47 | **NU320EMA** | | 379.1 | 424.3 | 2 700 | 3 200 | 8.840 | | 4 | 4 | 127.5 | | | | | 2 |
| | 215 | 47 | **NJ320EAM C4 SP1B F1** | **HJ320EA F1** | 379.2 | 424.3 | 2 800 | 3 300 | 8.700 | 0.900 | 4 | 4 | 127.5 | | 215 | 13 | 20.5 | 2 |
| **105** | 260 | 60 | **NJ421M** | **HJ421** | 515.1 | 585.1 | 2 200 | 2 700 | 17.620 | 1.740 | 4 | 4 | 144.5 | | 159.7 | 16 | 27 | 2.5 |
| | 260 | 60 | **NU421M** | **HJ421** | 515.1 | 585.1 | 2 200 | 2 700 | 17.250 | 1.740 | 4 | 4 | 144.5 | | 159.7 | 16 | 27 | 2.5 |
| **110** | 200 | 38 | **NJ222EX6M P64S0** | | 240.1 | 289.7 | 3 200 | 3 800 | 5.508 | | 2.1 | 2.1 | 132.5 | | | | | 2.5 |
| | 200 | 38 | **NJP222EX6M P64S0** | | 240.1 | 289.7 | 3 200 | 3 800 | 5.511 | | 2.1 | 2.1 | 132.5 | | | | | |
| | 240 | 50 | **NJ322EM** | | 439.6 | 507.6 | 2 400 | 2 800 | 12.006 | | 4 | 4 | 143 | | | | | 2.9 |
| | 240 | 50 | **NU322EM** | | 439.6 | 507.6 | 2 400 | 2 800 | 11.806 | | 4 | 4 | 143 | | | | | 2.9 |
| | 240 | 50 | **NJ322M** | **HJ322** | 401.0 | 467.1 | 2 500 | 3 000 | 11.830 | 1.020 | 4 | 4 | 143 | | 147.5 | 13 | 22.5 | 2.7 |
| | 240 | 50 | **NJ322MA** | **HJ322** | 401.0 | 467.1 | 2 500 | 3 000 | 11.830 | 1.020 | 4 | 4 | 143 | | 147.5 | 13 | 22.5 | 2.7 |
| | 240 | 50 | **N322M** | | 401.0 | 467.1 | 2 500 | 3 000 | 11.420 | | 4 | 4 | | 207 | | | | 2.7 |
| | 240 | 50 | **NU322M** | **HJ322** | 401.0 | 467.1 | 2 500 | 3 000 | 11.580 | 1.020 | 4 | 4 | 143 | | 147.5 | 13 | 22.5 | 2.7 |
| | 280 | 65 | **NJ422M** | | 569.5 | 654.7 | 2 100 | 2 500 | 22.350 | | 4 | 4 | 155 | | | | | 2.7 |
| | 280 | 65 | **NU422M** | | 569.5 | 654.7 | 2 100 | 2 500 | 21.880 | | 4 | 4 | 155 | | | | | 2.7 |

1) Permissible axial displacement out of central position
E – bearings with higher load rating
M – two piece machined brass cage, roller centred
MA – two piece machined brass cage, outer ring centred
MAP – machined brass cage

# SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

## For Locomotives



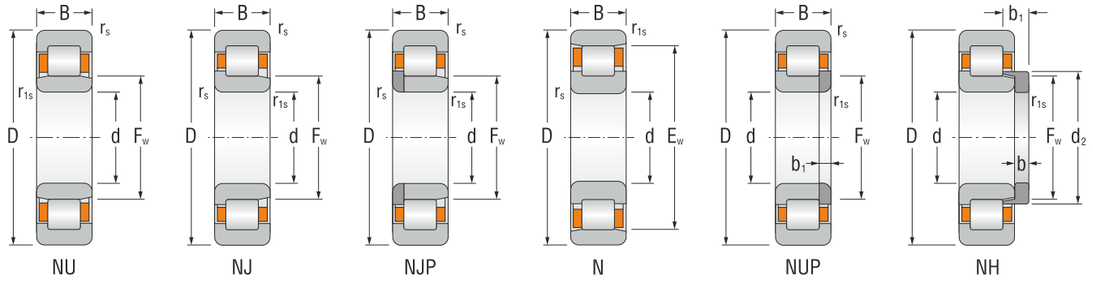

| Dimensions | | | Bearings designation | Angle ring | Basic load rating | | Limiting speed for lubrication | | Mass of | | Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | dynamic | static | | | Bearing | Angle ring | | | | | | | | |
| d | D | B | | HJ | $C_r$ | $C_{or}$ | grease | oil | | | $rs_{min}$ | $r1s_{min}$ | Fw | Ew | d2 | b | b1 | $s^{1)}$ |
| mm | | | | | kN | | $min^{-1}$ | | kg | | mm | | | | | | | |
| 120 | 215 | 58 | NU2224EMAP R150-180S0 | | 446.4 | 609.2 | 1 950 | 2 275 | 9.279 | | 2.1 | 2.1 | 143.5 | | | | | 4.6 |
| | 215 | 58 | NUP2224EMAP R150-180 A 180-300S0 | | 446.4 | 609.2 | 1 950 | 2 275 | 9.604 | | 2.1 | 2.1 | 144.5 | | | | 9 | |
| | 260 | 55 | NU324M | | 465.1 | 534.1 | 2 400 | 2 800 | 14.700 | | 4 | 4 | 154 | | | | | |
| | 260 | 55 | NJ324M | | 465.1 | 534.1 | 2 400 | 2 800 | 14.700 | | 4 | 4 | 154 | | | | | |
| | 260 | 55 | NUP324M | | 465.1 | 534.1 | 2 400 | 2 800 | 14.700 | | 4 | 4 | 154 | | | | | |
| | 260 | 55 | NH324M | HJ324 | 465.1 | 534.1 | 2 400 | 2 800 | 14.700 | 1.400 | 4 | 4 | 154 | | 164 | 14 | 22.5 | |
| | 260 | 55 | NU324EM | | 516.2 | 592.8 | 2 200 | 2 700 | 15.200 | | 4 | 4 | 154 | | | | | |
| | 310 | 72 | NU424M | | 714.4 | 834.5 | 1 900 | 2 200 | 30.590 | | 5 | 5 | 170 | | | | | |
| | 310 | 72 | NJ424M | | 714.4 | 834.5 | 1 900 | 2 200 | 30.590 | | 5 | 5 | 170 | | | | | |
| 130 | 280 | 58 | NU326EM | HJ326E | 603.2 | 715.6 | 2 000 | 2 400 | 18.600 | 1.700 | 4 | 4 | 167 | | 182 | 14 | 23 | 2.9 |
| | 280 | 58 | NJ326EM | HJ326E | 603.2 | 715.6 | 2 000 | 2 400 | 19.000 | 1.700 | 4 | 4 | 167 | | 182 | 14 | 23 | 2.9 |
| | 280 | 58 | NJ326EMP C4S0 | HJ326E S0 | 603.2 | 715.6 | 2 000 | 2 400 | 18.361 | 1.666 | 4 | 4 | 167 | | 182 | 14 | 23 | 2.9 |
| 140 | 250 | 42 | NJP228EMA | | 385.1 | 502.0 | 2 300 | 2 800 | 9.650 | | 4 | 4 | 169 | | | | | 1.6 |
| | 250 | 42 | NU228EMA | | 385.1 | 502.0 | 2 300 | 2 800 | 9.440 | | 4 | 4 | 169 | | | | | 1.6 |
| | 250 | 42 | N228M | | 318.3 | 410.5 | 2 500 | 3 000 | 8.897 | | 4 | 4 | | 221 | | | | 2.5 |
| | 250 | 42 | NUP228M | | 318.3 | 410.5 | 2 500 | 3 000 | 9.870 | | 4 | 4 | 169 | | | | | |
| | 250 | 42 | NJ228M | | 318.3 | 410.5 | 2 500 | 3 000 | 9.330 | | 4 | 4 | 169 | | | | | 2.5 |
| | 250 | 42 | NU228M | | 318.3 | 410.5 | 2 500 | 3 000 | 9.110 | | 4 | 4 | 169 | | | | | 2.5 |
| | 250 | 68 | NU2228EMAP R170-200S0 | | 615.3 | 903.6 | 2 000 | 2 500 | 14.991 | | 3 | 3 | 169 | | | | | 6.6 |
| | 250 | 68 | NUP222 8EMAP | | 615.3 | 903.6 | 2 000 | 2 500 | 15.513 | | 3 | 3 | 169 | | | | | 12 |
| | 300 | 62 | NU328M | | 603.4 | 725.8 | 2 000 | 2 400 | 22.100 | | 4 | 4 | 180 | | | | | 2.7 |
| | 300 | 62 | NJ328M | | 603.4 | 725.8 | 2 000 | 2 400 | 22.840 | | 4 | 4 | 180 | | | | | 2.7 |
| | 300 | 102 | NJ2328EM | | 1 018.8 | 1 384.5 | 1 900 | 2 200 | 37.600 | | 4 | 4 | 180 | | | | | 7.9 |
| | 300 | 102 | NJP2328M | | 909.3 | 1 229.8 | 2 000 | 2 400 | 36.760 | | 4 | 4 | 180 | | | | | 9.2 |
| | 300 | 102 | NU2328EM | | 1 018.8 | 1 384.5 | 1 900 | 2 200 | 37.600 | | 4 | 4 | 180 | | | | | 7.9 |
| | 300 | 102 | NJ2328M | HJ2328 | 909.3 | 1 229.8 | 2 000 | 2 400 | 36.100 | 2.380 | 4 | 4 | 180 | | 197.6 | 15 | 33.5 | 9.2 |
| | 300 | 102 | NU2328M | HJ2328 | 909.3 | 1 229.8 | 2 000 | 2 400 | 35.300 | 2.380 | 4 | 4 | 180 | | 197.6 | 15 | 33.5 | 9.2 |
| | 360 | 82 | NJ428X5M | | 952.8 | 1 117.7 | 1 600 | 1 900 | 47.160 | | 5 | 5 | 196 | | | | | |

[1] Permissible axial displacement out of central position
E – bearings with higher load rating
M – two piece machined brass cage, roller centred
MA – two piece machined brass cage, outer ring centred
MAP – machined brass cage




# SINGLE-ROW CYLINDRICAL ROLLER BEARINGS

## For Locomotives

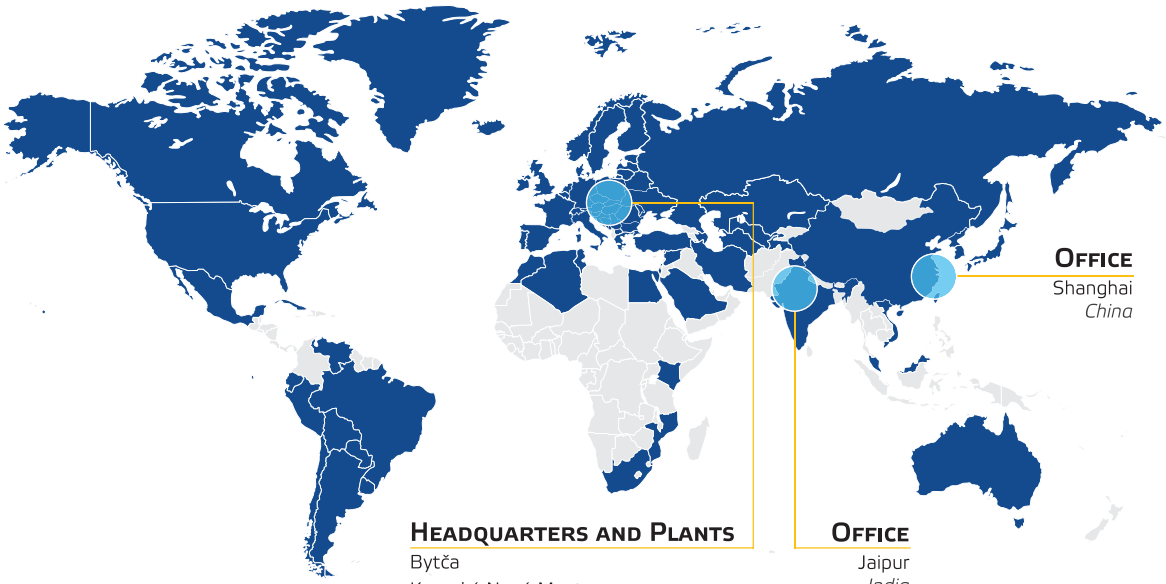

| Dimensions | | | Bearings designation | Angle ring | Basic load rating | | Limiting speed for lubrication | | Mass of | | Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | dynamic | static | | | Bearing | Angle ring | | | | | | | | |
| d | D | B | | HJ | $C_r$ | $C_{or}$ | grease | oil | | | $rs_{min}$ | $r1s_{min}$ | Fw | Ew | d2 | b | b1 | $s^{1)}$ |
| mm | | | | | kN | | $min^{-1}$ | | kg | | mm | | | | | | | |
| 150 | 270 | 45 | NJP230EMA | | 440.2 | 581.3 | 2 200 | 2 700 | 12.520 | | 4 | 4 | 182 | | | | | 2.4 |
| | 270 | 45 | NJ230EMA | | 440.2 | 581.3 | 2 200 | 2 700 | 12.520 | | 4 | 4 | 182 | | | | | 2.4 |
| | 270 | 45 | NU230EMA | | 440.2 | 581.3 | 2 200 | 2 700 | 12.160 | | 4 | 4 | 182 | | | | | 2.4 |
| | 270 | 45 | NJ230EM | | 440.2 | 581.3 | 2 200 | 2 700 | 12.520 | | 4 | 4 | 182 | | | | | 2.4 |
| | 270 | 45 | NU230EM | | 440.2 | 581.3 | 2 200 | 2 700 | 12.000 | | 4 | 4 | 182 | | | | | 2.4 |
| | 270 | 45 | NUP230M | | 367.7 | 480.5 | 2 200 | 2 700 | 12.050 | | 4 | 4 | 182 | | | | | |
| | 270 | 45 | NJ230M | | 367.7 | 480.5 | 2 200 | 2 700 | 11.800 | | 4 | 4 | 182 | | | | | 2.4 |
| | 270 | 45 | NU230M | | 367.7 | 480.5 | 2 200 | 2 700 | 11.800 | | 4 | 4 | 182 | | | | | 2.4 |
| | 320 | 65 | NJ330EM | | 757.6 | 921.6 | 1 800 | 2 100 | 27.100 | | 4 | 4 | 193 | | | | | 1.8 |
| | 320 | 65 | NJ330M | HJ330 | 663.1 | 807.4 | 1 900 | 2 200 | 26.840 | 2.420 | 4 | 4 | 193 | | 210 | 15 | 26.5 | 2.7 |
| | 320 | 65 | NU330M | HJ330 | 663.1 | 807.4 | 1 900 | 2 200 | 26.280 | 2.420 | 4 | 4 | 193 | | 210 | 15 | 26.5 | 2.7 |
| | 320 | 65 | NU330AH1M P6R185-210NA | | 663.1 | 807.4 | 1 900 | 2 200 | 26.200 | | 4 | 4 | 193 | | | | | 2.7 |
| 160 | 290 | 48 | NJ232EM | HJ232E | 498.6 | 666.4 | 2 000 | 2 400 | 14.700 | 1.520 | 4 | 4 | 195 | | 206.2 | 12 | 20 | 2.5 |
| | 340 | 67 | NJ332EM | | 857.8 | 1 053.2 | 1 700 | 2 000 | 32.200 | | 4 | 4 | 195 | | | | | 2.5 |
| | 340 | 68 | NJ332EAM P6R190-215NA | | 857.8 | 1 053.2 | 1 700 | 2 000 | 31.700 | | 4 | 4 | 204 | | | | | 2.4 |
| 170 | 310 | 52 | NJ234EM | HJ234E | 589.0 | 777.2 | 1 900 | 2 200 | 18.400 | 1.740 | 4 | 4 | 207 | | 221.4 | 12 | 20 | 2.9 |
| | 310 | 52 | NU234EM | HJ234E | 589.0 | 777.2 | 1 900 | 2 200 | 16.600 | 1.740 | 4 | 4 | 207 | | 221.4 | 12 | 20 | 2.9 |
| 180 | 280 | 46 | NU1036M | | 334.6 | 474.5 | 2 100 | 2 500 | 9.858 | | 2.1 | 2.1 | 205 | | | | | 3.6 |
| | 320 | 52 | NJ236EM | HJ236E | 611.3 | 826.0 | 1 800 | 2 100 | 19.500 | 1.820 | 4 | 4 | 217 | | 230.5 | 12 | 20 | 2.9 |
| | 320 | 52 | NU236EM | HJ236E | 611.3 | 826.0 | 1 800 | 2 100 | 19.200 | 1.820 | 4 | 4 | 217 | | 230.5 | 12 | 20 | 2.9 |
| | 320 | 86 | NU2236EAM C4 F1 | | 992.4 | 1 483.4 | 1 870 | 2 720 | 30.900 | | 4 | 4 | 215 | | | | | 6.9 |
| 190 | 290 | 46 | NJP1038EMA | | 411.2 | 612.0 | 1 970 | 2 360 | 12.100 | | 2.1 | 2.1 | 214 | | | | | 2.5 |
| | 290 | 46 | NU1038M | | 354.8 | 520.3 | 1 900 | 2 200 | 9.510 | | 2.1 | 2.1 | 215 | | | | | 3.5 |
| | 340 | 55 | NU238EMAP C4S0 | | 678.3 | 927 | 1 300 | 1 950 | 22.228 | | 4 | 4 | 230 | | | | | 2.1 |
| 200 | 310 | 51 | NUP1040M | | 381.9 | 567.1 | 1 900 | 2 200 | 14.750 | | 2.1 | 2.1 | 229 | | | | | |
| | 310 | 51 | NJ1040M | | 381.9 | 567.1 | 1 900 | 2 200 | 14.000 | | 2.1 | 2.1 | 229 | | | | | 4.2 |
| | 310 | 51 | NU1040M | | 381.9 | 567.1 | 1 900 | 2 200 | 13.804 | | 2.1 | 2.1 | 229 | | | | | 4.2 |
| | 360 | 58 | NJ240EM | HJ240E | 749.9 | 1 033.7 | 1 500 | 1 800 | 27.900 | 2.710 | 4 | 4 | 243 | | 257.8 | 14 | 23 | 2.9 |
| | 360 | 58 | NU240EM | HJ240E | 749.9 | 1 033.7 | 1 500 | 1 800 | 27.300 | 2.710 | 4 | 4 | 243 | | 257.8 | 14 | 23 | 2.9 |


[1] Permissible axial displacement out of central position
E – bearings with higher load rating
M – two piece machined brass cage, roller centred
MA – two piece machined brass cage, outer ring centred
MAP – machined brass cage

CKA Birla Group

KINEX | 120 anniversary

# YOUR PARTNER FOR INDUSTRY





> Contact

KINEX BEARINGS, a.s.

1.mája 71/36

014 83 Bytča

Slovakia

+421 41 5556 620

marketing@kinexbearings.sk

www.kinex.sk


ED.:RI_APR_2026