

# RAILWAY SOLUTIONS

PERFORMANCE THAT GOES THE DISTANCE

## NTN-SNR. Expertise that leads the way

A single-minded organisation, inventive technology and global competence are the driving forces behind an innovative and efficient service which pushes back the barriers and crosses borders in a railway sector that is forever moving forwards.

The NTN Group and its European branch, NTN-SNR, form an organisation that positions itself as a global player in the bearings market. The success of this union is based on a number of noteworthy factors: shared values, a shared strategic vision, synergies of expertise and a strongly differentiated customer base.

The possibilities that result from these achievements lead us to accelerate our growth in the rail industry, based not only on a long history in this field, but also on our position as the undisputed leader in the high speed sector. The convergence of our experience and our strengths give us an edge in the rail industry and enable us to look to the future.

## Freely flowing solutions

From the London Underground to the Shinkansen in Tokyo, and encompassing the French regional rolling stock, the NTN Group and its European branch, NTN-SNR, supply throughout the world. Our solutions cover every journey and every form of progress, with solutions that fit every bogie, satisfy every specific rail transport requirement and meet the standards of every country.



High speed



Intercity



Light rail vehicle (metro, tram)



Locomotives



Freight

**REFERENCES :** ABRF - ADTRANZ - ALSTOM - ARBEL - ASTRA - ATELIER DE JOIGNY - BOMBARDIER - CFD DB - DYMOS - EUROTUNNEL - FAIVELEY - GHH - HITACHI - JAPAN RAILWAYS - KCRC - KORAIL - LUCCHINI MITSUBISHI ELECTRIC - NOVATRANS - ONCF - RAILCARE - RATP - RENFE - ROTEM - SIEMENS - SMRT - SNCB SNCF - TALGO - TEXELIS - TOSHIBA - TRANSMASHOLDING - VALDUNES- VOITH - VOSSLOH - WATTEEUW

## A reputation built on breaking records...

NTN has been supplying trains on the Shinkansen network for 40 years. SNR, technical partner to TGV since its launch, worked with SNCF and ALSTOM to win the world rail speed record of 574.8 km/h, established in 2007.



## Forward-moving solutions

Embodying expertise at the forefront of technology, our bearings satisfy the most demanding requirements. Designed to perform in every environment and over long and short-haul distances they cover the entire rail market.

Our culture of innovation and service drives up reliability and enhanced safety as well as significantly decreasing life cycle costs (LCC) and the total cost of ownership (TCO).

### Traction motor bearings

- Optimised cage design
- Insulated bearings (ceramic or polymer insulation)



### Transmission bearings

- Optimised cage design
- Increased load-bearing capacity
- Large bearings



### Journal bearings

- Increased service life
- Reduced maintenance
- Anti-fretting solutions
- Optimized cage design
- Labyrinth & friction seals
- Metric or AAR dimensioning



### Mechatronic solutions

- Speed and temperature sensors
- Diagnosis systems (Condition Monitoring Systems)
- Wireless communication





## Performance that moves into top gear

NTN-SNR is the preferred partner of the major players in the railway world for both original equipment and replacement parts as well as collaborating on major projects that keep the world moving. Our reason to be and our way forward is to satisfy your requirements and shift your development into top gear.



With over 40 years of high-speed experience, NTN-SNR has demonstrated its ability to provide expert answers to complex problems while guaranteeing its customers exceptional quality and complete safety. IRIS (International Railway Industry Standard)-certified since 2010, our standards have received the highest acclaim: your trust.

### Going the distance

Reliability is based on know-how that has been acquired, perpetuated and optimized, but also on a relationship of trust and closeness that enables everyone to get involved reactively and effectively in a project. Cultivating that reliability, regardless of where it is being applied, is one of the secrets of NTN-SNR's longevity. The world rail speed record is evidence of this, since the TGV was equipped with standard series bearings, approved for a commercial operation at a speed of 350 km/h, but having no special features. The NTN Group and its European branch, NTN-SNR has, to its credit, never been involved in a major rail incident; this ensures a scale and presence on the world stage that is unmatched to this day.

### Anticipating requirements

NTN-SNR has stepped up its research and development activities. With its advances in the field of high technology, and more specifically that of mechatronics, it has become a powerful force for innovation in the railway sector:

- **Self-regulating sensor cartridges**

- Speed and temperature sensors
- On-board diagnosis systems
- Wireless communication

- **Anti-fretting solutions**

- **Megaohm™ Series**

- **Polyamide, steel,  
or solid single-block cages**

## Services to support you over time

Committed to be at your side, our teams not only offer innovative and effective products to meet the needs of a changing world. From the start of each project they are there with you, accompanying you at every stage, offering you all the services needed to make sure the project is well organised and proceeds at the correct pace.



### 1 Design and calculation

A calculation department is available to clients to help ensure research and development projects get off the ground and are successfully implemented. Application engineers support clients in their design calculations and in selecting the appropriate bearings. Cutting-edge application tools are available to them. For example, the SharcLab package, developed by NTN-SNR, is used to calculate the lifetime of a bearing taking into account various factors: loads, lubrication, geometry and micro-geometry of the bearing, axle deformation, etc.

### 2 Test bench

A COFRAC-accredited testing laboratory enables each bearing to be certified to European Standard EN 12082. It offers all the skills to satisfy customers' testing needs, guaranteeing them flexibility, timeliness and high-quality measurements. It conducts speed and load tests.

### 3 Bearing expertise

Our expert technical support service enables our customers to analyse, at any time, the reliability of a bearing by visual analysis, electron microscope analysis, molecular analysis, etc.

### 4 Training

A training module enables consultants to improve the design of bearings. We also offer a practical training module for installation and maintenance teams.

### 5 Client support

Thanks to the experience and expertise of our technical and sales teams, we offer personalized support for each of your projects, from the development phase right through to series production. For instance, we provide technical on-site support for the fitting of bearings to ensure that best practices are applied.

# Railway Bearings Catalogue



## Codes

| CAGE TYPE | MEANING   |
|-----------|---|
| PA        | Polyamide cage  |
| Steel     | Steel cage  |
| MP        | 1 piece Massive Brass cage, Rollers Centered          |
| M         | 2 pieces Massive Brass riveted cage, Rollers Centered |
| MPA       | 1 piece Massive Brass cage, Outer Ring Centered       |

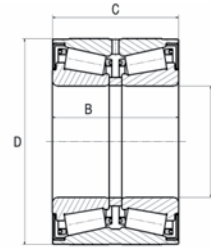
| SEAL TYPE | MEANING           |
|-----------|-------------------|
| RS        | Rubber Seal       |
| DF        | Labyrinth Sealing |

| SPEC    | MEANING  |
|---------|--|
| EN12080 | According to European standard EN12080 for axle bearings                     |
| LRV     | NTN-SNR standard for LRV axle bearings (reduced controls compare to EN12080) |
| NF18831 | According to SNCF standard NF18831 for gearbox and traction motor bearings   |
| JPN     | According to Japan standard  |
| AAR     | According to American AAR standard for axle bearings                         |

| APPLICATION | MEANING   |
|-------------|---|
| LRV         | Light Rail Vehicle (metro, tramway, tram-train)         |
| I           | Intercity, regional, commuter trains (speed < 200 km/h) |
| HST         | High Speed Trains (speed < 300 km/h)                    |
| VHST        | Very High Speed Trains (speed > 300 km/h)               |
| Loco        | Locomotive  |
| Fr          | Freight   |

# Axle Bearings

## Tapered Bearing Units (TBU)

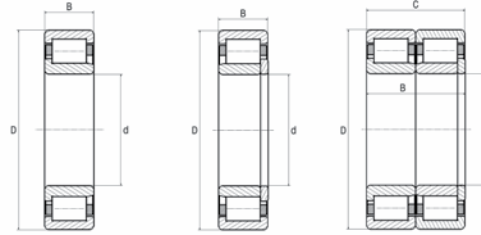


| Bearing type | Dimensions |         |        |        | Dynamic Load | Static Load    | Weight | Designation | Cage  | Seal | Spec    | Main application |
|--------------|------------|---------|--------|--------|--------------|----------------|--------|-------------|-------|------|---------|------------------|
|              | d          | D       | B (IR) | C (OR) | C            | C <sub>0</sub> | kg     |             |       |      |         |                  |
|              | mm         | mm      | mm     | mm     | kN           | kN             |        |             |       |      |         |                  |
| TBU 130x230  | 130        | 230     | 150    | 150    | 940          | 1760           | 27.6   | FC43497S01  | PA    | RS   | EN12080 | I                |
| TBU 130x230  | 130        | 230     | 150    | 160    | 940          | 1760           | 30.1   | FC42384S04  | PA    | DF   | EN12080 | I, LRV, HST      |
| TBU 130x230  | 130        | 230     | 184    | 150    | 870          | 1610           | 31.0   | FC43718S01  | PA    | RS   | EN12080 | VHST             |
| TBU 130x240  | 130        | 240     | 160    | 160    | 940          | 1770           | 30.2   | FC41411S06  | PA    | DF   | EN12080 | I                |
| TBU 130x240  | 130        | 240     | 160    | 160    | 940          | 1770           | 31.2   | FC42932S01  | PA    | DF   | EN12080 | VHST             |
| TBU 130x240  | 130        | 240     | 160    | 160    | 940          | 1770           | 29.3   | FC42766S01  | PA    | -    | EN12080 | HST              |
| TBU 130x240  | 130        | 240     | 160    | 160    | 940          | 1770           | 30.8   | FC41411S10  | Steel | DF   | EN12080 | I                |
| TBU 130x250  | 130        | 150     | 160    | 160    | 940          | 1760           | 37.9   | FC43527S01  | PA    | RS   | EN12080 | Fr               |
| TBU 150x250  | 150        | 250     | 160    | 160    | 940          | 1760           | 29.8   | FC42593S01  | PA    | DF   | EN12080 | Loco, I          |
| TBU 150x250  | 150        | 250     | 158.4  | 160    | 940          | 1760           | 29.6   | FC42956S06  | PA    | DF   | EN12080 | HST              |
| TBU 150x250  | 150        | 250     | 154    | 160    | 940          | 1760           | 31.3   | FC12782S01  | Steel | DF   | EN12080 | I, LRV           |
| TBU 150x250  | 150        | 250     | 179    | 185    | 940          | 1760           | 33.1   | FC42600S01  | PA    | DF   | EN12080 | HST, VHST        |
| TBU 150x250  | 150        | 250     | 179    | 185    | 940          | 1760           | 33.8   | FC12790S12  | Steel | DF   | EN12080 | VHST             |
| TBU 160x270  | 160        | 270     | 170    | 150    | 1 000        | 1 980          | 36.0   | FC42666S02  | PA    | RS   | EN12080 | LRV              |
| TBU 178x265  | 178.62     | 265.137 | 173    | 173    | 850          | 1820           | 26.7   | FC42398S03  | PA    | DF   | EN12080 | I                |
| TBU 185x280  | 185        | 280     | 160    | 160    | 990          | 2090           | 32.3   | FC43176S01  | PA    | DF   | EN12080 | HST              |
| TBU 110x175  | 110        | 175     | 125    | 130    | 465          | 925            | 22.4   | JT9         | Steel | RS   | JPN     | LRV,Fr           |
| TBU 110x180  | 110        | 180     | 142    | 142    | 550          | 1030           | 13.8   | CRI-2289    | PA    | RS   | JPN     | LRV              |
| TBU 110x188  | 110        | 188     | 145    | 150    | 620          | 1120           | 30.6   | JT20        | Steel | RS   | JPN     | I                |
| TBU 110x190  | 110        | 190     | 145    | 150    | 620          | 1120           | 26.4   | CRI-2290    | Steel | RS   | JPN     | LRV              |
| TBU 110x190  | 110        | 190     | 145    | 150    | 620          | 1120           | 26.2   | JT14        | Steel | RS   | JPN     | I                |
| TBU 110x205  | 110        | 205     | 130    | 140    | 745          | 1250           | 27.6   | JT13        | Steel | RS   | JPN     | I                |
| TBU 110x205  | 110        | 205     | 130    | 140    | 745          | 1250           | 28.3   | JT15        | Steel | RS   | JPN     | I                |
| TBU 118x195  | 118        | 195     | 136    | 142    | 640          | 1270           | 27.4   | JT10A       | Steel | RS   | JPN     |                  |
| TBU 120x195  | 120        | 195     | 136    | 142    | 640          | 1270           | 26.5   | JT10        | Steel | RS   | JPN     | Fr               |
| TBU 120x220  | 120        | 220     | 135    | 110    | 750          | 1230           | 20.9   | CRI-2499    | Steel | -    | JPN     | I                |
| TBU 120x220  | 120        | 220     | 150    | 155    | 775          | 1330           | 32     | CRI-24A11   | Steel | RS   | JPN     |                  |
| TBU 120x220  | 120        | 220     | 150    | 155    | 775          | 1330           | 32     | WJT1/WJT1K  | Steel | RS   | JPN     | HST, VHST        |
| TBU 120x220  | 120        | 220     | 150    | 130    | 850          | 1460           | 24.5   | WJT2A       | Steel | RS   | JPN     | HST              |
| TBU 120x220  | 120        | 220     | 150    | 130    | 860          | 1480           | 24.5   | WJT2B       | Steel | RS   | JPN     | HST              |
| TBU 120x220  | 120        | 220     | 155    | 130    | 850          | 1460           | 24.5   | JT21        | Steel | -    | JPN     | HST, VHST        |
| TBU 120x220  | 120        | 220     | 155    | 155    | 905          | 1640           | 41.4   | JT12        | Steel | RS   | JPN     | I,LRV            |
| TBU 120x220  | 120        | 220     | 155    | 155    | 905          | 1640           | 41.4   | JT400K      | Steel | RS   | JPN     | I                |
| TBU 120x220  | 120        | 220     | 155    | 155    | 750          | 1230           | 37.4   | JT25        | Steel | RS   | JPN     | I                |
| TBU 125x235  | 125        | 235     | 165    | 155    | 960          | 1620           | 39.2   | JT23        | Steel | RS   | JPN     | HST              |
| TBU 130x208  | 130        | 208     | 146    | 152    | 650          | 1330           | 31.9   | JT11        | Steel | RS   | JPN     | Fr               |
| TBU 130x210  | 130        | 210     | 125.7  | 132    | 640          | 1270           | 21.1   | CRI-2694    | PA    | RS   | JPN     |                  |
| TBU 130x220  | 130        | 220     | 155    | 155    | 825          | 1550           | 33.6   | CRI-2676    | PA    | RS   | JPN     | I,Loco           |
| TBU 130x220  | 130        | 220     | 155    | 155    | 880          | 1690           | 35     | CRI-2628    | Steel | RS   | JPN     | LRV              |
| TBU 130x220  | 130        | 220     | 155    | 155    | 880          | 1690           | 37.1   | FJT1        | Steel | RS   | JPN     | Loco             |
| TBU 130x220  | 130        | 220     | 150    | 155    | 765          | 1420           | 28.8   | FJT2        | Steel | RS   | JPN     | Loco             |
| TBU 130x230  | 130        | 230     | 150    | 160    | 920          | 1670           | 31.8   | CRI-2683    | PA    | RS   | JPN     |                  |
| TBU 130x230  | 130        | 230     | 150    | 160    | 920          | 1670           | 36.8   | CRI-2677    | PA    | RS   | JPN     | Loco,HST         |
| TBU 130x230  | 130        | 230     | 150    | 160    | 920          | 1670           | 32.7   | CRI-2695    | PA    | RS   | JPN     | HST              |
| TBU 130x230  | 130        | 230     | 150    | 160    | 870          | 1600           | 32.4   | WJT3/KWJT3  | PA    | RS   | JPN     | HST              |
| TBU 130x240  | 130        | 240     | 160    | 165    | 1040         | 1870           | 38.4   | CRI-2692    | PA    | RS   | JPN     | VHST             |
| TBU 130x245  | 130        | 245     | 110    | 111.6  | 590          | 905            | 28.5   | CRI-2689    | Steel | RS   | JPN     | LRV              |
| TBU 130x250  | 130        | 250     | 170    | 140    | 1150         | 2030           | 42.2   | CRI-2696    | Steel | RS   | JPN     | Fr               |
| TBU 132x208  | 131.8      | 207.96  | 125.7  | 132    | 640          | 1270           | 20     | CRI-2684    | PA    | RS   | JPN     | LRV              |
| TBU 132x208  | 131.8      | 207.96  | 146.1  | 152.4  | 640          | 1270           | 22.2   | CRI-2685    | PA    | RS   | JPN     | LRV              |
| TBU 132x208  | 131.8      | 207.96  | 146.1  | 152.4  | 640          | 1270           | 24.9   | CRI-2687    | PA    | RS   | JPN     |                  |
| TBU 135x240  | 135        | 240     | 140    | 130    | 770          | 1270           | 25.5   | CRI-2709    | Steel | RS   | JPN     | LRV              |
| TBU 144x220  | 144.5      | 220.66  | 149.6  | 157.5  | 665          | 1350           | 21.1   | CRI-2958    | PA    | RS   | JPN     | LRV              |
| TBU 144x220  | 144.5      | 220.66  | 155.6  | 163.5  | 665          | 1350           | 35.4   | CRI-2960    | PA    | RS   | JPN     |                  |
| TBU 157x250  | 157.2      | 250     | 153.7  | 160    | 900          | 1820           | 36.2   | CRI-3108    | Steel | RS   | JPN     |                  |
| TBU 157x250  | 157.2      | 250     | 183    | 160    | 900          | 1820           | 35.3   | CRI-3110    | Steel | RS   | JPN     |                  |
| Class B      | 101.6      | 165.1   | 106.4  | 114.3  | 375          | 700            | 19.7   | JT-B19      | Steel | RS   | AAR     | Fr               |
| Class C      | 119.1      | 195.26  | 136.5  | 142.9  | 575          | 1080           | 27.2   | JT-C19      | Steel | RS   | AAR     | Fr,Loco          |
| Class D      | 131.8      | 207.96  | 146.1  | 152.4  | 640          | 1270           | 29.9   | JT-D19      | Steel | RS   | AAR     | Fr               |
| Class E      | 144.5      | 220.66  | 155.6  | 163.5  | 665          | 1350           | 35.4   | JT-E19      | Steel | RS   | AAR     | Fr               |
| Class F      | 157.2      | 252.41  | 177.8  | 184.2  | 900          | 1820           | 54.6   | JT-F19      | Steel | RS   | AAR     | Fr, LRV,Loco     |
| Class G      | 177.8      | 276.23  | 181    | 185.7  | 1040         | 2170           | 63.6   | JT-G19      | Steel | RS   | AAR     | Fr,LRV           |



## Axle Bearings

Cylindrical Roller Bearings (CRB)

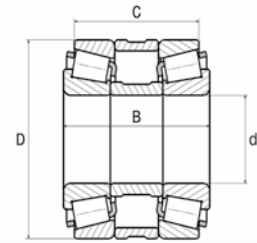


| Bearing type   | Dimensions |     |        |        | Dynamic Load | Static Load    | Weight | Designation    | Cage  | Seal | Spec    | Main application |
|----------------|------------|-----|--------|--------|--------------|----------------|--------|----------------|-------|------|---------|------------------|
|                | d          | D   | B (IR) | C (OR) | C            | C <sub>0</sub> |        |                |       |      |         |                  |
|                | mm         | mm  | mm     | mm     | kN           | kN             | kg     |                |       |      |         |                  |
| NJ 120x215     | 120        | 215 | 58     | 58     | 540          | 630            | 8.4    | NJ2224ES01     | PA    | -    | EN12080 | LRV              |
| NJP 120x215    | 120        | 215 | 58     | 58     | 540          | 630            | 8.4    | NJP2224ES01    | PA    | -    | EN12080 | LRV              |
| NJ 120x240     | 120        | 240 | 80     | 80     | 600          | 790            | 17.9   | 9980G13S02     | Steel | -    | EN12080 | Fr               |
| NJP 120x240    | 120        | 240 | 80     | 80     | 600          | 790            | 17.9   | 9981G13S02     | Steel | -    | EN12080 | Fr               |
| NJ 130x240     | 130        | 240 | 80     | 80     | 530          | 730            | 15.2   | 9993G13S02     | Steel | -    | EN12080 | Fr               |
| NJP 130x240    | 130        | 240 | 80     | 80     | 530          | 730            | 15.2   | 9994G13S04     | Steel | -    | EN12080 | Fr               |
| NJP 130x240    | 130        | 240 | 86     | 80     | 530          | 730            | 15.6   | 9994G13S03     | Steel | -    | EN12080 | Fr               |
| NJ 160x270     | 160        | 270 | 82     | 73     | 590          | 890            | 18.0   | CR 10193 G1 TT | M     | -    | EN12080 | Fr               |
| NJP 160x270    | 160        | 270 | 82     | 73     | 590          | 890            | 18.0   | CR 10194 G1 TT | M     | -    | EN12080 | Fr               |
| NU 110x215     | 110        | 215 | 73     | 73     | 445          | 600            | 12.1   | WU110x215      | -     | -    | JPN     |                  |
| NJ 110x215     | 110        | 215 | 73     | 73     | 445          | 600            | 12.5   | WJ110x215      | M     | -    | JPN     |                  |
| NHJ 110x215    | 110        | 215 | 73     | 73     | 445          | 600            | 13.1   | WUJ110x215     | -     | -    | JPN     |                  |
| NJ 120x220     | 120        | 220 | 73     | 73     | 470          | 665            | 12.6   | WJ120x220      |       | -    | JPN     |                  |
| NJP 120x220    | 120        | 220 | 73     | 73     | 470          | 665            | 12.6   | WJP120x220     |       | -    | JPN     |                  |
| NJ/NJP 120x220 | 120        | 220 | 182    | 175    | 850          | 1430           | -      | 2R2492         | M     | RS   | JPN     | I                |
| NJ 120x225     | 120        | 225 | 80     | 80     | 500          | 730            | 14.7   | WJ120x225      |       | -    | JPN     |                  |
| NJP 120x225    | 120        | 225 | 80     | 80     | 500          | 730            | 14.7   | WJP120x225     |       | -    | JPN     |                  |
| NU 120x240     | 120        | 240 | 80     | 80     | 560          | 750            | 17     | WU120x240      |       | -    | JPN     |                  |
| NJ 120x240     | 120        | 240 | 80     | 80     | 560          | 750            | 17.5   | WJ120x240      | PA    | -    | JPN     | Loco             |
| NJP 120x240    | 120        | 240 | 80     | 80     | 560          | 750            | 17.5   | WJP120x240     | PA    | -    | JPN     | Loco             |
| NJP 120x240    | 120        | 240 | 160    | 160    | 960          | 1500           | 35     | WJ/WJP120x240  | PA    | -    | JPN     | Loco             |
| NHJ 120x240    | 120        | 240 | 80     | 80     | 560          | 750            | 18.6   | WUJ120x240     |       | -    | JPN     |                  |
| NJ/NJP 130x220 | 130        | 220 | 124    | 124    | 805          | 1310           | 17.5   | RNJ2633        | PA    | -    | JPN     | LRV              |
| NJ/NJP 130x235 | 130        | 235 | 170    | 165    | 935          | 1570           | 28.8   | 2RNUP2653      | PA    | -    | JPN     |                  |
| NJ 130x240     | 130        | 240 | 80     | 80     | 495          | 695            | 16.5   | WJ130x240      |       | -    | JPN     | Fr               |
| NJP 130x240    | 130        | 240 | 80     | 80     | 495          | 695            | 16.5   | WJP130x240     |       | -    | JPN     |                  |
| NJ/NJP 130x240 | 130        | 240 | 160    | 160    | 935          | 1570           | 30     | WJ/WJP130x240  | PA    | -    | JPN     | Fr,LRV           |
| NJ/NJP 130x240 | 130        | 240 | 160    | 160    | 825          | 1310           |        | 2R2671         | M     | -    | JPN     | LOCO             |
| NU 130x260     | 130        | 260 | 86     | 86     | 710          | 965            | 21.4   | WU130x260      |       | -    | JPN     |                  |
| NJ 130x260     | 130        | 260 | 86     | 86     | 710          | 965            | 22     | WJ130x260      |       | -    | JPN     |                  |
| NJP 130x260    | 130        | 260 | 86     | 86     | 710          | 965            | 22     | WJP130x260     |       | -    | JPN     |                  |
| NHJ 130x260    | 130        | 260 | 86     | 86     | 710          | 965            | 23.4   | WUJ130x260     |       | -    | JPN     |                  |
| NJ 140x260     | 140        | 260 | 80     | 80     | 585          | 820            | 19.5   | WJ140x260      |       | -    | JPN     |                  |
| NJP 140x260    | 140        | 260 | 80     | 80     | 585          | 820            | 19.5   | WJP140x260     |       | -    | JPN     |                  |
| NJ 140x280     | 140        | 280 | 93     | 93     | 790          | 1080           | 27.8   | WJ140x280      |       | -    | JPN     |                  |
| NJP 140x280    | 140        | 280 | 93     | 93     | 790          | 1080           | 27.8   | WJP140x280     |       | -    | JPN     |                  |
| NJ 150x280     | 150        | 280 | 86     | 86     | 745          | 1050           | 24.5   | WJ150x280      |       | -    | JPN     |                  |
| NJP 150x280    | 150        | 280 | 86     | 86     | 745          | 1050           | 24.5   | WJP150x280     |       | -    | JPN     |                  |
| NJ 150x300     | 150        | 300 | 102    | 102    | 880          | 1230           | 35     | WJ150x300      |       | -    | JPN     |                  |
| NJP 150x300    | 150        | 300 | 102    | 102    | 880          | 1230           | 35     | WJP150x300     |       | -    | JPN     |                  |
| NJ 160x300     | 160        | 300 | 93     | 93     | 825          | 1180           | 30.5   | WJ160x300      |       | -    | JPN     |                  |
| NJP 160x300    | 160        | 300 | 93     | 93     | 825          | 1180           | 30.5   | WJP160x300     |       | -    | JPN     |                  |
| NJ 160x320     | 160        | 320 | 102    | 102    | 970          | 1360           | 40     | WJ160x320      |       | -    | JPN     |                  |
| NJP 160x320    | 160        | 320 | 102    | 102    | 970          | 1360           | 40     | WJP160x320     |       | -    | JPN     |                  |
| NJ 180x320     | 180        | 320 | 93     | 93     | 895          | 1340           | 33     | WJ180x320      |       | -    | JPN     |                  |
| NJP 180x320    | 180        | 320 | 93     | 93     | 895          | 1340           | 33     | WJP180x320     |       | -    | JPN     |                  |
| NU 180x340     | 180        | 340 | 100    | 100    | 1010         | 1480           | 41     | WU180x340      |       | -    | JPN     |                  |
| NJ 180x340     | 180        | 340 | 100    | 100    | 1010         | 1480           | 42.5   | WJ180x340      |       | -    | JPN     |                  |
| NHJ 180x340    | 180        | 340 | 100    | 100    | 1010         | 1480           | 44.5   | WUJ180x340     |       | -    | JPN     |                  |



## Axle Bearings

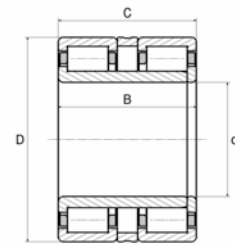
Tapered Roller Bearing Sets (TRB Set)



| Bearing type    | Dimensions |         |        |        | Dynamic Load | Static Load    | Weight | Designation      | Cage  | Seal | Spec    | Main application |
|-----------------|------------|---------|--------|--------|--------------|----------------|--------|------------------|-------|------|---------|------------------|
|                 | d          | D       | B (IR) | C (OR) | C            | C <sub>0</sub> |        |                  |       |      |         |                  |
|                 | mm         | mm      | mm     | mm     | kN           | kN             | kg     |                  |       |      |         |                  |
| TRB SET 105x220 | 105/130    | 160/220 | 181    | 159    | 475          | 740            | 17.2   | ENSFC40119       | Steel | -    | EN12080 | I                |
| TRB SET 130x219 | 130        | 219     | 181    | 155    | 475          | 740            | 22.5   | ENSEC40403S02    | Steel | -    | EN12080 | I                |
| TRB SET 130x220 | 130        | 220     | 181    | 155    | 475          | 740            | 22.7   | ENSEC10697S07    | Steel | -    | EN12080 | I                |
| TRB SET 140x250 | 140        | 250     | 197    | 169.8  | 960          | 1760           | 34.7   | ENSEC42442S01    | Steel | -    | EN12080 | Loco             |
| TRB SET 165x290 | 165        | 290     | 176    | 144    | 1115         | 1960           | 39.8   | ENSHM237537N513B | Steel | -    | EN12080 | I, loco          |
| TRB SET 200x318 | 200        | 317.5   | 158.2  | 126.4  | 650          | 1100           | 41.3   | ENS122978N125F   | Steel | -    | EN12080 | I, loco          |

## Axle Bearings

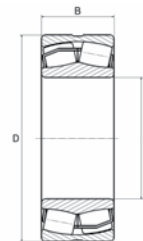
Cylindrical Roller Units (CRU)



| Bearing type | Dimensions |     |        |        | Dynamic Load | Static Load    | Weight | Designation | Cage  | Seal | Spec | Main application |
|--------------|------------|-----|--------|--------|--------------|----------------|--------|-------------|-------|------|------|------------------|
|              | d          | D   | B (IR) | C (OR) | C            | C <sub>0</sub> |        |             |       |      |      |                  |
|              | mm         | mm  | mm     | mm     | kN           | kN             | kg     |             |       |      |      |                  |
| CRU 110x220  | 110        | 220 | 180    | 180    | 790          | 1190           | 30.3   | JC6         | M     | -    | JPN  |                  |
| CRU 110x235  | 110        | 235 | 180    | 160    | 945          | 1450           | 37     | JC2         | M     | -    | JPN  | I                |
| CRU 120x220  | 120        | 220 | 128.5  | 145    | 700          | 1120           | 23.5   | JC36        | M     | RS   | JPN  | I                |
| CRU 120x230  | 120        | 230 | 126    | 150    | 830          | 1290           | 39     | JC32        | M     | RS   | JPN  | I                |
| CRU 120x230  | 120        | 230 | 170    | 165    | 945          | 1460           | 30.8   | JC34        | M     | -    | JPN  | HST              |
| CRU 120x240  | 120        | 240 | 145    | 160    | 935          | 1420           | 51.5   | JC26        | M     | RS   | JPN  | I                |
| CRU 120x240  | 120        | 240 | 158    | 170    | 1020         | 1580           | 54     | JC17        | M     | RS   | JPN  | I                |
| CRU 120x240  | 120        | 240 | 180    | 160    | 1020         | 1580           | 36.3   | JC11        | M     | -    | JPN  | I                |
| CRU 120x240  | 120        | 240 | 180    | 176    | 1020         | 1580           | 37.2   | JC12        | Steel | -    | JPN  | I                |
| CRU 125x235  | 125        | 235 | 170    | 165    | 945          | 1470           | 35.7   | JC38        | M     | -    | JPN  | HST              |
| CRU 130x235  | 130        | 235 | 170    | 165    | 935          | 1570           | 28.8   | 2RNUP2653   | PA    | -    | JPN  |                  |
| CRU 130x260  | 130        | 260 | 160    | 160    | 1080         | 1710           | 40.2   | JC14        | MP    | -    | JPN  | Loco             |
| CRU 130x260  | 130        | 260 | 180    | 160    | 1080         | 1710           | 42.3   | JC5         | M     | -    | JPN  | Loco             |
| CRU 130x265  | 130        | 265 | 166    | 166    | 1140         | 1700           | 43.4   | JC37        | MP    | -    | JPN  | HST              |
| CRU 130x270  | 130        | 270 | 215    | 210    | 1280         | 1990           | 55     | JC29        | MP    | -    | JPN  | HST              |
| CRU 133x280  | 133        | 280 | 215    | 210    | 1440         | 2250           | 61.4   | JC9/133     | MP    | -    | JPN  | HST              |

## Axle Bearings

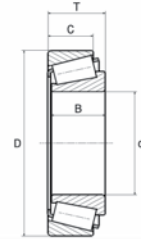
Spherical Roller Bearings (SRB)



| Bearing type | Dimensions |     |        |        | Dynamic Load | Static Load    | Weight | Designation | Cage  | Seal | Spec    | Main application |
|--------------|------------|-----|--------|--------|--------------|----------------|--------|-------------|-------|------|---------|------------------|
|              | d          | D   | B (IR) | C (OR) | C            | C <sub>0</sub> |        |             |       |      |         |                  |
|              | mm         | mm  | mm     | mm     | kN           | kN             | kg     |             |       |      |         |                  |
| SRB 80x140   | 80         | 140 | 33     |        | 224          | 287            | 2.1    | 22216EAS03  | Steel | -    | LRV     | LRV              |
| SRB 110x180  | 100        | 180 | 60.3   |        | 471          | 661            | 6.4    | 23220EAS01  | Steel | -    | LRV     | I, LRV           |
| SRB 130x220  | 130        | 220 | 73     |        | 655          | 881            | 11.4   | AT42467S02  | Steel | -    | EN12080 | Fr, I            |
| SRB 130x220  | 130        | 220 | 73     |        | 655          | 881            | 11.4   | AT42467S03  | Steel | -    | LRV     | Fr, I            |

## Gearbox Bearings

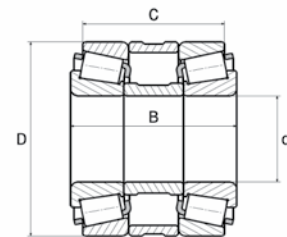
### Tapered Roller Bearings (TRB)



| Bearing type | Dimensions |        |       |        |        | Dynamic Load | Static Load    | Weight | Designation  | Cage  | Spec     | Main application |
|--------------|------------|--------|-------|--------|--------|--------------|----------------|--------|--------------|-------|----------|------------------|
|              | d          | D      | T     | B (IR) | C (OR) | C            | C <sub>0</sub> |        |              |       |          |                  |
|              | mm         | mm     | mm    | mm     | mm     | kN           | kN             | kg     |              |       |          |                  |
| TRB 85x150   | 85         | 150    | 45    | 47.22  | 35     | 248          | 220            |        | 7700017VB22  | Steel |          | LRV              |
| TRB 95x145   | 95         | 145    | 39    | 39     | 32.5   | 217          | 345            | 2.2    | EC12586H100  | Steel |          | LRV              |
| TRB 110x180  | 110        | 180    | 41    | 41     | 30.163 | 270          | 430            |        | EC10699      | Steel |          | LRV              |
| TRB 216x286  | 215.9      | 285.75 | 46.04 | 46.04  | 34.925 | 365          | 790            | 8.4    | EC42045      | Steel | NF 18831 | I                |
| TRB 216x286  | 216.4      | 285.75 | 46.14 | 49.21  | 34.925 | 370          | 790            | 8.4    | LM742747/710 | Steel | NF 18831 | I, VHST          |
| TRB 217x285  | 216.5      | 285    | 41    | 40     | 33     | 375          | 730            | 6.6    | EC42097      | Steel | NF 18831 | I                |
| TRB 220x295  | 220        | 295    | 46    | 49     | 34.925 | 365          | 780            | 8.6    | EC42549S01   | Steel | NF 18831 | VHST             |
| TRB 225x295  | 225        | 295    | 46    | 49     | 34.925 | 365          | 780            | 8      | EC40429      | Steel | NF 18831 | I, LRV           |
| TRB 267x325  | 266.6      | 324.44 | 29.5  | 33.47  | 25.4   | 209          | 448            | 5.2    | EC12514      | Steel | NF 18831 | VHST             |
| TRB 267x325  | 266.7      | 324.44 | 29.5  | 33.47  | 25.4   | 209          | 448            | 5.2    | 38886/38820  | Steel | NF 18831 | VHST             |
| TRB 70x150   | 70         | 150    | 38    | 35     | 25     | 161          | 179            | 2.9    | QT9/QT9A     | Steel | JPN      | I                |
| TRB 70x150   | 70         | 150    | 38    | 35     | 25     | 167          | 194            | 2.9    | QT9B/QT9C    | Steel | JPN      | I, LRV, HST      |
| TRB 70x150   | 70         | 150    | 38    | 35     | 25     | 163          | 182            | 2.8    | QT9F         | Steel | JPN      | I, HST           |
| TRB 70x150   | 70         | 150    | 40    | 37     | 27     | 181          | 209            | 3.1    | QT31         | Steel | JPN      | HST              |
| TRB 70x150   | 70         | 150    | 40    | 37     | 27     | 172          | 194            | 3.1    | QT31B        | Steel | JPN      | HST              |
| TRB 75x160   | 75         | 160    | 40    | 37     | 27     | 177          | 198            | 3.5    | QT7A         | Steel | JPN      | I                |
| TRB 80x170   | 80         | 170    | 42.5  | 39     | 28     | 210          | 240            | 4      | QT4A         | Steel | JPN      | LRV, I, HST      |
| TRB 85x150   | 85         | 150    | 64    | 94     | 74     | 340          | 510            | 6.3    | QT600K       | Steel | JPN      | I                |
| TRB 95x200   | 95         | 200    | 71.5  | 67     | 55     | 450          | 585            | 10.1   | 32319        | Steel | JPN      | I                |
| TRB 100x215  | 100        | 215    | 77.5  | 73     | 60     | 520          | 690            | 13     | 32320        | Steel | JPN      | I                |
| TRB 190x280  | 190        | 280    | 110   | 110    | 85     | 595          | 1210           | 23     | QT1          | Steel | JPN      | I                |
| TRB 192x290  | 192        | 290    | 64    | 64     | 52     | 540          | 940            | 13.7   | 32038        | Steel | JPN      | I                |
| TRB 195x282  | 193.7      | 282.58 | 50.8  | 47.63  | 36.512 | 355          | 595            | 9.4    | QT29         | Steel | JPN      | I                |
| TRB 195x280  | 195        | 280    | 58    | 60     | 41     | 410          | 740            | 10.8   | QT26         | Steel | JPN      | I                |
| TRB 200x280  | 200        | 280    | 51    | 48     | 41     | 370          | 705            | 9.1    | QT25         | Steel | JPN      | I                |
| TRB 200x290  | 200        | 290    | 55    | 60     | 41     | 400          | 750            | 11.9   | QT27         | Steel | JPN      | HST              |
| TRB 200x290  | 200        | 290    | 110   | 110    | 85     | 665          | 1440           | 23.4   | QT13         | Steel | JPN      | I                |
| TRB 202x290  | 202        | 290    | 58    | 60     | 41     | 445          | 805            | 11.9   | QT34         | Steel | JPN      | HST              |
| TRB 205x310  | 205        | 310    | 60    | 60     | 47     | 555          | 950            | 15.2   | QT38         | Steel | JPN      | VHST             |
| TRB 210x320  | 210        | 320    | 70    | 66     | 56     | 610          | 1060           | 19.1   | QT5          | Steel | JPN      | HST              |
| TRB 210x320  | 210        | 320    | 70    | 75     | 56     | 590          | 1010           | 19.2   | QT24         | Steel | JPN      | HST              |
| TRB 214x330  | 214        | 330    | 70    | 70     | 56     | 680          | 1200           | 21.1   | QT19         | Steel | JPN      | HST              |
| TRB 215x315  | 215        | 315    | 65    | 70     | 49     | 595          | 1140           | 17.4   | QT35         | Steel | JPN      | HST              |
| TRB 217x300  | 217        | 300    | 51    | 48     | 41     | 430          | 830            | 10.4   | CR-4304      | Steel | JPN      | LRV              |
| TRB 218x315  | 218        | 315    | 65    | 70     | 49     | 595          | 1140           | 16.8   | QT32         | Steel | JPN      | HST              |

## Gearbox Bearings

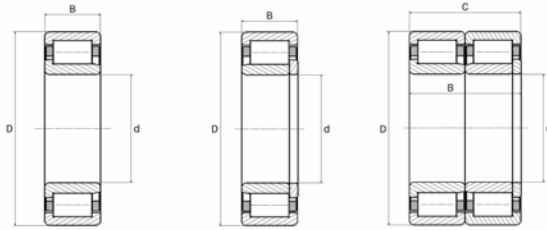
### Tapered Roller Bearing Sets (TRB Set)



| Bearing type    | Dimensions |        |        |        | Dynamic Load | Static Load    | Weight | Designation       | Cage  | Spec     | Main application |
|-----------------|------------|--------|--------|--------|--------------|----------------|--------|-------------------|-------|----------|------------------|
|                 | d          | D      | B (IR) | C (OR) | C            | C <sub>0</sub> |        |                   |       |          |                  |
|                 | mm         | mm     | mm     | mm     | kN           | kN             | kg     |                   |       |          |                  |
| TRB SET 70x127  | 69.85      | 127    | 73.03  | 73.026 | 295          | 480            | 3.9    | ENSHM813846N810S2 | Steel | NF 18831 | LRV              |
| TRB SET 216x286 | 216.4      | 285.75 | 98.42  | 93     | 635          | 1560           | 17.4   | FC12241           | Steel | NF 18831 | VHST             |
| TRB SET 267x325 | 266.7      | 325.44 | 76.35  | 70     | 360          | 960            | 11.8   | FC12211           | Steel | NF 18831 | VHST             |

## Gearbox Bearings

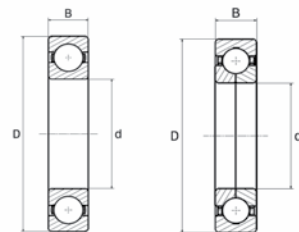
### Cylindrical Roller Bearings (CRB)



| Bearing type | Dimensions |     |        |        | Dynamic Load | Static Load    | Weight | Designation       | Cage  | Spec    | Main application |
|--------------|------------|-----|--------|--------|--------------|----------------|--------|-------------------|-------|---------|------------------|
|              | d          | D   | B (IR) | C (OR) | C            | C <sub>0</sub> |        |                   |       |         |                  |
|              | mm         | mm  | mm     | mm     | kN           | kN             | kg     |                   |       |         |                  |
| CRB 60x130   | 60         | 130 | 46     | 46     | 226          | 265            | 3.1    | NJ2312ES01        | MPA   | NF18831 | VHST             |
| CRB 65x140   | 65         | 140 | 48     | 48     | 255          | 285            | 4.2    | NU2313ES04        | MPA   | NF18831 | VHST             |
| CRB 65x140   | 65         | 140 | 48     | 48     | 255          | 285            | 4.2    | NUP2313ES04       | MPA   | NF18831 | VHST             |
| CRB 70x125   | 70         | 125 | 24     | 24     | 143          | 141            | 1.3    | NU214ES02         | MPA   | NF18831 | VHST             |
| CRB 70x125   | 70         | 125 | 31     | 31     | 187          | 198            | 1.7    | NU2214ES01        | MPA   | NF18831 | VHST             |
| CRB 70x150   | 70         | 150 | 51     | 51     | 275          | 320            | 4.4    | NU2314ES05        | MPA   | NF18831 | VHST             |
| CRB 70x150   | 70         | 150 | 51     | 51     | 275          | 320            | 4.3    | NUP2314ES05 / S07 | MPA   | NF18831 | VHST             |
| CRB 70x150   | 70         | 150 | 51     | 51     | 295          | 350            | 4.3    | NUP2314ES03       | Steel | NF18831 | VHST             |
| CRB 75x160   | 75         | 160 | 37     | 37     | 285          | 265            | 3.7    | NU315ES01         | MPA   | NF18831 | LRV              |
| CRB 75x160   | 75         | 160 | 55     | 55     | 315          | 370            | 5.4    | NU2315ES05 / S06  | MPA   | NF18831 | VHST, I          |
| CRB 75x160   | 75         | 160 | 55     | 55     | 340          | 395            | 5.5    | NU2315ES01 / S03  | Steel | NF18831 | VHST             |
| CRB 75x160   | 75         | 160 | 55     | 55     | 315          | 370            | 5.4    | NUP2315ES03 / S04 | MPA   | NF18831 | VHST, I          |
| CRB 75x160   | 75         | 160 | 55     | 55     | 340          | 395            | 5.5    | NUP2315ES01       | Steel | NF18831 | VHST             |
| CRB 80x140   | 80         | 140 | 26     | 26     | 145          | 168            | 1.7    | NU216ES02         | M     | NF18831 | LRV              |
| CRB 80x140   | 80         | 140 | 33     | 33     | 189          | 247            | 2.2    | NU2216ES01        | MPA   | NF18831 | VHST             |
| CRB 80x170   | 80         | 170 | 58     | 58     | 360          | 440            | 6.5    | NU2316ES02        | MPA   | NF18831 | VHST             |
| CRB 85x150   | 85         | 150 | 28     | 28     | 200          | 201            | 2.1    | NU217ES02 / S03   | MPA   | NF18831 | I                |
| CRB 90x190   | 90         | 190 | 43     | 43     | 320          | 360            | 6      | NU318ES01         | MPA   | NF18831 | VHST             |
| CRB 100x180  | 100        | 180 | 46     | 46     | 360          | 470            | 4.8    | NU2220ES02        | Steel | NF18831 | VHST             |
| CRB 120x215  | 120        | 215 | 58     | 58     | 460          | 630            | 9.4    | NU2224ES02        | MPA   | NF18831 |                  |
| CRB 120x215  | 120        | 215 | 58     | 58     | 460          | 630            | 9.4    | NUP2224ES01       | MPA   | NF18831 |                  |
| CRB 120x260  | 120        | 260 | 55     | 55     | 530          | 590            | 14     | NU324ES01 / S02   | M     | NF18831 |                  |
| CRB 120x260  | 120        | 260 | 55     | 55     | 530          | 590            | 14.2   | NJ324ES02         | M     | NF18831 |                  |
| CRB 120x260  | 120        | 260 | 83     | 55     | 530          | 590            | 14     | NU2J324ES01 / S02 | M     | NF18831 |                  |
| CRB 220x300  | 220        | 300 | 38     | 38     | 360          | 560            | 7.1    | NU1944S03 / S04   | MPA   | NF18831 | VHST             |
| CRB 220x340  | 220        | 340 | 56     | 56     | 615          | 790            | 18.4   | NU1044S01         | MPA   | NF18831 | LRV              |
| CRB 230x350  | 230        | 350 | 45     | 45     | 620          | 950            |        | N9907S06          | M     | NF18831 |                  |
| CRB 260x320  | 260        | 320 | 36     | 36     | 320          | 620            | 5.8    | NU2852S03 / S06   | MPA   | NF18831 | VHST             |
| CRB 70x125   | 70         | 125 | 24     | 24     | 119          | 137            |        | NU214E            | MPA   | JPN     |                  |
| CRB 90x160   | 90         | 160 | 30     | 30     | 174          | 204            |        | NJ218E            | MPA   | JPN     |                  |
| CRB 100x180  | 100        | 180 | 46     | 46     | 320          | 420            | 5.3    | NJ2220E           | MPA   | JPN     | Loco             |
| CRB 100x180  | 100        | 180 | 46     | 46     | 335          | 445            | 5.3    | NU2220E           | MPA   | JPN     |                  |
| CRB 160x240  | 160        | 240 | 38     | 38     | 238          | 340            | 6.5    | NJ1032            | M     | JPN     | LRV              |
| CRB 190x260  | 190        | 260 | 33     | 33     | 225          | 360            |        | NJ1938            | MPA   | JPN     |                  |
| CRB 200x280  | 200        | 280 | 38     | 38     | 259          | 405            | 7.5    | NJ1940            | MPA   | JPN     | VHST             |
| CRB 220x300  | 220        | 300 | 38     | 38     | 275          | 455            | 8.1    | NJ1944            | MPA   | JPN     | VHST             |
| CRB 240x320  | 240        | 320 | 38     | 38     | 285          | 485            |        | NJ1948            | MPA   | JPN     |                  |
| CRB 340x460  | 340        | 460 | 56     | 56     | 590          | 1040           |        | NU1968            | MPA   | JPN     | Loc              |
| CRB 380x480  | 380        | 480 | 46     | 46     | 490          | 960            | 17.8   | NJ1876            | MPA   | JPN     | Loc              |

## Gearbox Bearings

### Ball Bearings (BB - QJ)

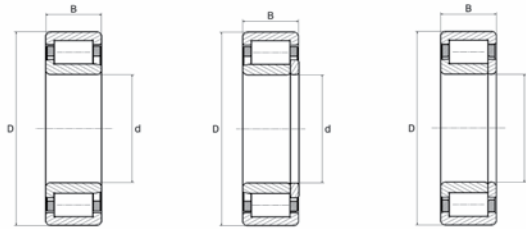


| Bearing type | Dimensions |     |        |     | Dynamic Load   | Static Load | Weight | Designation      | Cage | Spec    | Main application |
|--------------|------------|-----|--------|-----|----------------|-------------|--------|------------------|------|---------|------------------|
|              | d          | D   | B (IR) | C   | C <sub>0</sub> |             |        |                  |      |         |                  |
|              | mm         | mm  | mm     | mm  | kN             | kN          | kg     |                  |      |         |                  |
| BB 65x160    | 65         | 160 | 37     | 114 | 79             | 3.6         |        | AB4349S01 / 6413 | M    | NF18831 | LRV              |
| QJ 70x125    | 70         | 125 | 24     | 124 | 114            | 1.3         |        | QJ214S01         | MPA  | NF18831 | VHST             |
| QJ 75x130    | 75         | 130 | 25     | 129 | 123            | 1.5         |        | QJ215S01         | MPA  | NF18831 | VHST             |
| QJ 90x160    | 90         | 160 | 30     | 191 | 206            | 2.9         |        | QJ218S01         | MPA  | NF18831 | VHST             |
| QJ 70x125    | 70         | 125 | 24     | 101 | 184            |             |        | QJ214            | MPA  | JPN     |                  |
| BB 220x340   | 220        | 340 | 56     | 241 | 289            | 18.9        |        | 6044             | M    | JPN     | Loco             |



## Traction Motor Bearings

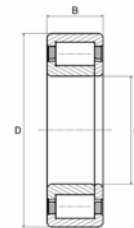
Cylindrical Roller Bearings (CRB)  
Non Insulated



| Bearing type | Dimensions |         |              | Dynamic Load | Static Load          | Weight | Designation | Cage  | Spec    | Main application |
|--------------|------------|---------|--------------|--------------|----------------------|--------|-------------|-------|---------|------------------|
|              | d<br>mm    | D<br>mm | B (IR)<br>mm | C<br>kN      | C <sub>0</sub><br>kN | kg     |             |       |         |                  |
| CRB 80x140   | 80         | 140     | 26           | 145          | 168                  | 1.7    | NU216ES02   | M     | NF18831 | LRV              |
| CRB 100x180  | 100        | 180     | 46           | 360          | 470                  | 4.8    | NU2220ES02  | Steel | NF18831 | VHST             |
| CRB 100x215  | 100        | 215     | 47           | 299          | 355                  |        | NH320       |       | JPN     | Loco             |
| CRB 120x260  | 120        | 260     | 55           | 530          | 590                  | 14     | NU324ES01   | M     | NF18831 | I                |
| CRB 150x320  | 150        | 320     | 65           | 665          | 805                  |        | NU330       |       | JPN     | Loco             |
| CRB 230x350  | 230        | 350     | 45           | 620          | 950                  |        | N9907S06    | M     | NF18831 |                  |
| CRB 60x130   | 60         | 130     | 31           | 124          | 126                  | 2.1    | NU312       | M     | JPN     | LRV              |
| CRB 60x130   | 60         | 130     | 31           | 150          | 157                  | 2.1    | NU312E      | MPA   | JPN     |                  |
| CRB 70x125   | 70         | 125     | 24           | 83.5         | 95                   | 1.2    | NU214       | M     | JPN     | LRV              |
| CRB 70x125   | 70         | 125     | 24           | 108          | 121                  |        | NU214E      | M     | JPN     |                  |
| CRB 70x150   | 70         | 150     | 35           | 158          | 168                  |        | NU314       | M     | JPN     | I, LRV           |
| CRB 75x160   | 75         | 160     | 37           | 190          | 205                  | 3.6    | NU315       | M     | JPN     | LRV              |
| CRB 80x140   | 80         | 140     | 26           | 133          | 158                  |        | NU216E      | MPA   | JPN     |                  |
| CRB 80x140   | 80         | 140     | 26           | 128          | 149                  |        | NU216E      | M     | JPN     | Loco             |
| CRB 85x150   | 85         | 150     | 28           | 167          | 199                  | 2.1    | NU217E      | MPA   | JPN     | I                |
| CRB 85x150   | 85         | 150     | 28           | 152          | 175                  |        | NU217E      | M     | JPN     |                  |
| CRB 85x150   | 85         | 150     | 28           | 167          | 199                  | 2.2    | NUP217E     | MPA   | JPN     | I                |
| CRB 90x190   | 90         | 190     | 43           | 315          | 355                  | 6.7    | NH318E      | MPA   | JPN     | Loco             |
| CRB 90x190   | 90         | 190     | 43           | 298          | 325                  |        | NH318E      | M     | JPN     | Loco             |
| CRB 95x170   | 95         | 170     | 32           | 166          | 195                  | 3.2    | NU219       | M     | JPN     | LRV              |
| CRB 95x170   | 95         | 170     | 32           | 190          | 218                  | 3.2    | NU219E      | M     | JPN     |                  |
| CRB 100x180  | 100        | 180     | 46           | 335          | 445                  | 5.3    | NU2220E     | MPA   | JPN     |                  |
| CRB 100x215  | 100        | 215     | 47           | 335          | 360                  |        | NU320E      | M     | JPN     | HST              |
| CRB 100x215  | 100        | 215     | 47           | 299          | 335                  | 9.5    | NH320       | M     | JPN     | Loco             |
| CRB 100x215  | 100        | 215     | 47           | 380          | 425                  | 9.5    | NH320E      | MPA   | JPN     | Loco             |
| CRB 110x240  | 110        | 240     | 50           | 400          | 450                  |        | NH322E      | M     | JPN     | Loco             |
| CRB 130x280  | 130        | 280     | 58           | 630          | 795                  |        | NU326       | M     | JPN     | loco             |
| CRB 130x280  | 130        | 280     | 58           | 585          | 685                  | 18     | NU326E      | MPA   | JPN     | loco             |
| CRB 130x280  | 130        | 280     | 58           | 550          | 630                  | 18     | NU326E      | M     | JPN     | loco             |
| CRB 150x320  | 150        | 320     | 65           | 800          | 985                  |        | NU330       | M     | JPN     | Loco             |
| CRB 150x320  | 150        | 320     | 65           | 715          | 855                  | 26     | NU330E      | MPA   | JPN     | Loco             |
| CRB 150x320  | 150        | 320     | 65           | 715          | 855                  |        | NU330E      | M     | JPN     | Loco             |
| CRB 160x340  | 160        | 340     | 68           | 810          | 980                  | 29.5   | NU332E      | MPA   | JPN     | Loco             |
| CRB 160x340  | 160        | 340     | 68           | 810          | 980                  | 31     | NU332E      | M     | JPN     | Loco             |

## Traction Motor Bearings

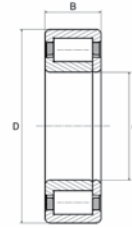
Cylindrical Roller Bearings (CRB)  
PPS Insulated



| Bearing type | Dimensions |         |              | Dynamic Load | Static Load          | Weight | Designation    | Cage | Spec | Main application |
|--------------|------------|---------|--------------|--------------|----------------------|--------|----------------|------|------|------------------|
|              | d<br>mm    | D<br>mm | B (IR)<br>mm | C<br>kN      | C <sub>0</sub><br>kN | kg     |                |      |      |                  |
| CRB 20x90    | 50         | 90      | 20           | 50.5         | 54.5                 | 0.5    | 2TS2-7MP-NU210 | M    | JPN  | I                |
| CRB 55x120   | 55         | 120     | 29           | 111          | 111                  |        | 2TS2-7MP-NU311 | M    | JPN  |                  |
| CRB 70x125   | 70         | 125     | 24           | 83.5         | 95                   |        | 2TS2-7MP-NU214 | M    | JPN  | I, LRV           |
| CRB 70x150   | 70         | 150     | 35           | 158          | 168                  | 2.7    | 2TS2-7MP-NU314 | M    | JPN  | I, LRV           |
| CRB 75x130   | 75         | 130     | 25           | 101          | 118                  | 1.2    | 2TS2-7MP-NU215 | M    | JPN  | LRV              |
| CRB 75x130   | 75         | 130     | 25           | 101          | 118                  | 1.2    | 2TS2-7MP-NU215 | MPA  | JPN  | I                |
| CRB 75x160   | 75         | 160     | 37           | 190          | 205                  |        | 2TS2-7MP-NU315 | M    | JPN  | I, LRV           |
| CRB 80x170   | 80         | 170     | 39           | 201          | 223                  |        | 2TS2-7MP-NU316 | M    | JPN  | I                |
| CRB 85x150   | 85         | 150     | 28           | 126          | 149                  |        | 2TS2-7MP-NU217 | M    | JPN  | I                |
| CRB 95x170   | 95         | 170     | 32           | 166          | 195                  | 2.9    | 2TS2-7MP-NU219 | M    | JPN  | I                |
| CRB 100x180  | 100        | 180     | 34           | 183          | 217                  |        | 2TS2-7MP-NJ220 | M    | JPN  |                  |

## Traction Motor Bearings

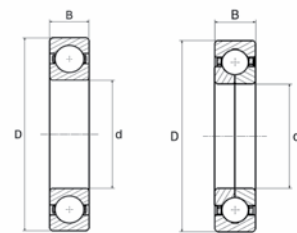
Cylindrical Roller Bearings (CRB)  
Ceramic Insulated



| Bearing type | Dimensions |         |              | Dynamic Load | Static Load          | Weight | Designation         | Cage | Spec | Main application |
|--------------|------------|---------|--------------|--------------|----------------------|--------|---------------------|------|------|------------------|
|              | d<br>mm    | D<br>mm | B (IR)<br>mm | C<br>kN      | C <sub>0</sub><br>kN | kg     |                     |      |      |                  |
| CRB 70x125   | 70         | 125     | 24           | 83.5         | 95                   |        | 2TS2-7MC-NU214      | MPA  | JPN  |                  |
| CRB 70x125   | 70         | 125     | 24           | 83.5         | 95                   | 1.2    | 2TS2-7MC-NU214      | M    | JPN  | HST,VHST         |
| CRB 70x125   | 70         | 125     | 24           | 83.5         | 95                   |        | 2TS2-7MC2-NU214     | M    | JPN  | LRV              |
| CRB 70x125   | 70         | 125     | 24           | 119          | 137                  |        | 2TS2-7MC2-NU214E    | MPA  | JPN  |                  |
| CRB 70x125   | 70         | 125     | 24           | 83.5         | 95                   | 1.3    | 2TS2-7MC3-NU214     | M    | JPN  | VHST             |
| CRB 70x125   | 70         | 125     | 24           | 119          | 137                  |        | 2TS2-7MC3-NU214E    | MPA  | JPN  | VHST             |
| CRB 70x150   | 70         | 150     | 35           | 158          | 168                  |        | 2TS2-7MC-NU314      | M    | JPN  | I, LRV           |
| CRB 70x150   | 70         | 150     | 35           | 181          | 188                  |        | 2TS2-7MC2-NU314E    | M    | JPN  | Loco             |
| CRB 70x150   | 70         | 150     | 35           | 158          | 168                  |        | 2TS2-7MC3-NU314     | MPA  | JPN  |                  |
| CRB 75x130   | 75         | 130     | 25           | 130          | 156                  | 1.4    | 2TS2-7MC3-NU215E    | MPA  | JPN  | VHST             |
| CRB 90x160   | 90         | 160     | 30           | 168          | 196                  |        | 2TS2-7MC-NU218E     | M    | JPN  |                  |
| CRB 80x170   | 80         | 170     | 39           | 201          | 223                  | 4.1    | 2TS2-7MC-NU316      | M    | JPN  | HST              |
| CRB 90x190   | 90         | 190     | 55           | 240          | 265                  | 6.8    | 2TS2-7MC-NH318      | M    | JPN  | loco             |
| CRB 90x190   | 90         | 190     | 55           | 298          | 325                  |        | 2TS2-7MC2-NH318E    | M    | JPN  |                  |
| CRB 90x190   | 90         | 190     | 55           | 315          | 355                  | 6.7    | 2TS2-7MC3-NH318E    | MPA  | JPN  | loco             |
| CRB 95x170   | 95         | 170     | 32           | 190          | 218                  |        | 2TS2-7MC3-NU219E    | M    | JPN  |                  |
| CRB 95x170   | 95         | 170     | 32           | 211          | 249                  |        | 2TS2-7MC3-NU219E    | MPA  | JPN  |                  |
| CRB 100x180  | 100        | 180     | 46           | 335          | 445                  | 5.3    | 2TS2-7MC3-6E-NU2220 | MPA  | JPN  |                  |
| CRB 100x215  | 100        | 215     | 47           | 380          | 425                  | 8.6    | 2TS2-7MC3-NU320E    | MPA  | JPN  | Loco             |
| CRB 100x215  | 100        | 215     | 60           | 380          | 425                  | 9.5    | 2TS2-7MC3-NH320E    | MPA  | JPN  | Loco             |
| CRB 110x200  | 110        | 200     | 38           | 293          | 365                  | 5.4    | 2TS2-7MC3-NU222E    | MPA  | JPN  | Loco             |
| CRB 110x240  | 110        | 240     | 50           | 380          | 435                  |        | 2TS2-7MC-NH322      | M    | JPN  | Fr               |
| CRB 130x280  | 130        | 280     | 58           | 560          | 665                  | 17.9   | 2TS2-7MC-NU326      | M    | JPN  | Loco             |
| CRB 150x320  | 150        | 320     | 65           | 715          | 855                  | 26     | 2TS2-7MC3-NU330E    | MPA  | JPN  | Loco             |
| CRB 180x320  | 180        | 320     | 52           | 600          | 805                  | 18.2   | 2TS2-7MC3-NU236E    | MPA  | JPN  | Loco             |
| CRB 260x320  | 260        | 320     | 28           | 197          | 375                  |        | 2TS2-7MC3-NU1852    | MPA  | JPN  |                  |

## Traction Motor Bearings

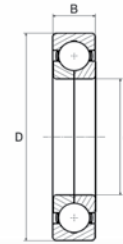
Ball Bearings (BB - QJ)  
Non Insulated



| Bearing type | Dimensions |         |              | Dynamic Load | Static Load          | Weight | Designation       | Cage  | Spec    | Main application |
|--------------|------------|---------|--------------|--------------|----------------------|--------|-------------------|-------|---------|------------------|
|              | d<br>mm    | D<br>mm | B (IR)<br>mm | C<br>kN      | C <sub>0</sub><br>kN | kg     |                   |       |         |                  |
| BB 70x125    | 70         | 125     | 24           | 62           | 44                   |        | AB42916S01 (6214) | M     | NF18831 | I                |
| QJ 75x130    | 75         | 130     | 25           | 129          | 123                  | 1.5    | QJ215S01          | MPA   | NF18831 | VHST             |
| BB 55x120    | 55         | 120     | 29           | 71.5         | 45                   |        | 6311              | Steel | JPN     | I, LRV           |
| BB 60x130    | 60         | 130     | 31           | 82           | 52                   |        | 6312              | Steel | JPN     | LRV              |
| BB 65x140    | 65         | 140     | 33           | 92.5         | 60                   |        | 6313              | Steel | JPN     | LRV              |
| BB 65x160    | 65         | 160     | 37           | 111          | 72.5                 |        | 6413              | Steel | JPN     | LRV              |
| BB 70x150    | 70         | 150     | 35           | 104          | 68                   |        | 6314              | Steel | JPN     | I                |
| QJ 75x130    | 75         | 130     | 25           | 110          | 212                  |        | QJ215             | MPA   | JPN     | LRV              |
| BB 85x150    | 85         | 150     | 28           | 83.5         | 64                   |        | 6217              | Steel | JPN     | I                |
| BB 90x160    | 90         | 160     | 30           | 96           | 71.5                 |        | 6218              | M     | JPN     |                  |
| BB 95x170    | 95         | 170     | 32           | 109          | 82                   |        | 6219              | Steel | JPN     | I                |

## Traction Motor Bearings

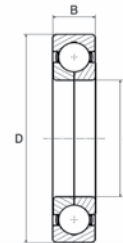
Ball Bearings (BB)  
PPS Insulated



| Bearing type | Dimensions |         |              | Dynamic Load | Static Load          | Weight | Designation   | Cage  | Spec | Main application |
|--------------|------------|---------|--------------|--------------|----------------------|--------|---------------|-------|------|------------------|
|              | d<br>mm    | D<br>mm | B (IR)<br>mm | C<br>kN      | C <sub>0</sub><br>kN | kg     |               |       |      |                  |
| BB 40x90     | 40         | 90      | 23           | 40.5         | 24                   |        | 2TS2-7MP-6308 | Steel | JPN  | LRV              |
| BB 50x110    | 50         | 110     | 27           | 62           | 38.5                 |        | 2TS2-7MP-6310 | Steel | JPN  | I, LRV           |
| BB 55x120    | 55         | 120     | 29           | 71.5         | 45                   |        | 2TS2-7MP-6311 | Steel | JPN  | I, LRV           |
| BB 60x130    | 60         | 130     | 31           | 82           | 52                   |        | 2TS2-7MP-6312 | Steel | JPN  | LRV              |
| BB 70x150    | 70         | 150     | 35           | 104          | 68                   |        | 2TS2-7MP-6314 | Steel | JPN  | I, LRV           |
| BB 75x130    | 75         | 130     | 25           | 66           | 49.5                 |        | 2TS2-7MP-6215 | Steel | JPN  |                  |
| BB 75x130    | 75         | 130     | 25           | 66           | 49.5                 |        | 2TS2-7MP-6215 | M     | JPN  |                  |
| BB 80x125    | 80         | 125     | 22           | 47.5         | 40                   |        | 2TS2-7MP-6016 | Steel | JPN  |                  |
| BB 85x150    | 85         | 150     | 28           | 83.5         | 64                   |        | 2TS2-7MP-6217 | Steel | JPN  |                  |
| BB 95x170    | 95         | 170     | 32           | 109          | 82                   |        | 2TS2-7MP-6219 | Steel | JPN  | I,LRV            |

## Traction Motor Bearings

Ball Bearings (BB - QJ)  
Ceramic Insulated



| Bearing type | Dimensions |         |              | Dynamic Load | Static Load          | Weight | Designation     | Cage  | Spec | Main application |
|--------------|------------|---------|--------------|--------------|----------------------|--------|-----------------|-------|------|------------------|
|              | d<br>mm    | D<br>mm | B (IR)<br>mm | C<br>kN      | C <sub>0</sub><br>kN | kg     |                 |       |      |                  |
| BB 55x120    | 55         | 120     | 29           | 71.5         | 45                   |        | 2TS2-7MC-6311   | Steel | JPN  | I,HST,VHST       |
| BB 55x120    | 55         | 120     | 29           | 71.5         | 45                   |        | 2TS2-7MC2-6311  | Steel | JPN  |                  |
| BB 55x120    | 55         | 120     | 29           | 71.5         | 45                   |        | 2TS2-7MC3-6311  | Steel | JPN  | I,HST,VHST       |
| BB 60x130    | 60         | 130     | 31           | 82           | 52                   |        | 2TS2-7MC2-6312  | Steel | JPN  |                  |
| BB 60x130    | 60         | 130     | 31           | 82           | 52                   |        | 2TS2-7MC3-6312  | M     | JPN  |                  |
| BB 60x130    | 60         | 130     | 31           | 82           | 52                   |        | 2TS2-7MC3-6312  | Steel | JPN  |                  |
| BB 75x130    | 75         | 130     | 25           | 66           | 49.5                 |        | 2TS2-7MC2-6215  | M     | JPN  |                  |
| BB 75x130    | 75         | 130     | 25           | 66           | 49.5                 |        | 2TS2-7MC2-6215  | Steel | JPN  |                  |
| BB 80x125    | 80         | 125     | 22           | 47.5         | 40                   |        | 2TS2-7MC2-6016  | M     | JPN  |                  |
| BB 80x125    | 80         | 125     | 22           | 47.5         | 40                   |        | 2TS2-7MC3-6016  | Steel | JPN  |                  |
| BB 80x125    | 80         | 125     | 22           | 47.5         | 40                   |        | 2TS2-7MC3-6016  | M     | JPN  |                  |
| QJ 90x190    | 90         | 190     | 43           | 171          | 297                  |        | 2TS2-7MC3-QJ318 | M     | JPN  | Loco             |
| BB 95x170    | 95         | 170     | 32           | 109          | 82                   |        | 2TS2-7MC3-6219  | M     | JPN  |                  |
| BB 105x225   | 105        | 225     | 49           | 184          | 153                  |        | 2TS2-7MC3-6321  | Steel | JPN  |                  |
| BB 130x280   | 130        | 280     | 58           | 229          | 214                  |        | 2TS2-7MC3-6326  | Steel | JPN  | Loco             |



### Engineering



Railway bearings that have a long life is the daily target of the NTN-SNR application engineers. From calculation, lubrication & design to simulation, prototyping & testing, they are basing their work on the decades of experience in NTN-SNR railway engineering.

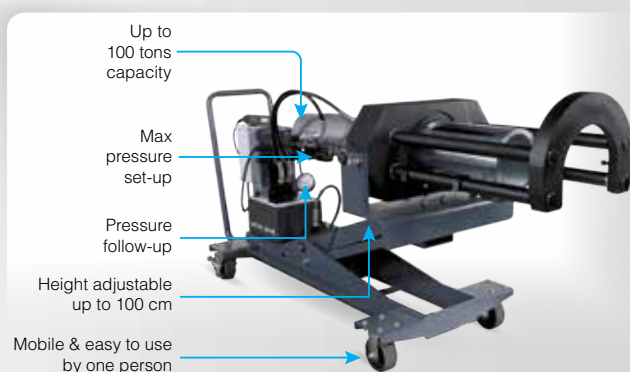
### Training



By providing 100% customized trainings, NTN-SNR ensure added value sessions and full trainee satisfaction & motivation. Trainings are mostly organized at customer facilities for practical maintenance topics or at NTN-SNR premises for engineering topics.

### Tooling

#### PUSH-PULLER 100 tons to INSTALL & REMOVE Taper roller journal bearings



### Technical Supports



Either to solve technical issues or to optimize maintenance efficiency, NTN-SNR railway experts ensure proper bearing installation & removal and provide maintenance teams with all recommendations to implement the right processes. NTN-SNR can also provide maintenance tools to guarantee a professional job.

### Expertise

With decades of experience in the diagnosis of railways bearings, NTN-SNR provides failure modes analysis and recommendations to solve them. In depth testing is carried out at NTN-SNR facilities.

### Reconditioning

To optimize the Total Cost of Ownership, railway bearings are designed more & more to operate for millions of kilometers before being changed. In their maintenance procedure, operators must disassemble the bearing and ensure that it can remain in operation until targeted overhaul mileage is reached. NTN-SNR can provide, to the operator, bearings reconditioning based on the experience of a railway bearing manufacturer.

|  |   |
|--|---|
| Capacity                                 | 100 tons (push)/68 tons (pull)                                |
| Max. stroke length                       | 398 mm  |
| Max. diameter                            | 178 mm*   |
| Min. diameter                            | 120 mm*   |
| Max. shaft length                        | 285 mm*   |
| Operating main cylinder                  | Electro-hydraulic pump. 400V - 16A 50 Hz, with remote control |
| Operating height adjustment              | With foot pump  |
| Min. centerline height relative to floor | 375 mm  |
| Max. centerline height relative to floor | 1050 mm   |
| Manometer                                | 700 bar/100 tons  |
| Weight                                   | 540 kg  |

\* Depends on accessories

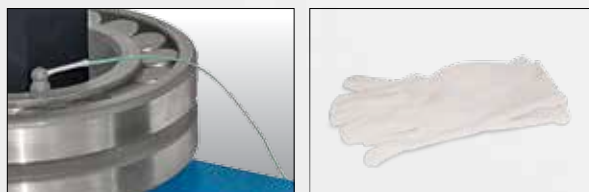
## Tooling

### FAST THERM to install inner ring of cylindrical roller bearings



| TECHNICAL DATA                              | FAST THERM 20      | FAST THERM 35     |
|---|--------------------|-------------------|
| <b>ELECTRICITY</b>                          |                    |                   |
| Max. power consumption                      | 3,6 kVA            | 3,6 kVA           |
| Max. voltage/current                        | 230 V / 16 A       | 230 V / 16 A      |
| Frequency                                   | 50 Hz              | 50 Hz             |
| Other voltages on request                   | 110 V to 240 V     | 110 V to 240 V    |
| Other frequencies on request                | 60 Hz              | 60 Hz             |
| <b>CONTROL</b>                              |                    |                   |
| Temperature adjustment                      | + 50°C to + 240°C  | + 50°C to + 240°C |
| Heating time adjustment / Max. temperature. | no                 | 0-99 min + 240°C  |
| Temperature control precision               | +/- 2°C            | +/- 2°C           |
| Automatic demagnetising                     | Automatic          | Automatic         |
| <b>APPLIANCE DESIGN</b>                     |                    |                   |
| Dimensions (L x W x H) mm                   | 345 x 200 x 240    | 420 x 260 x 380   |
| Space between pivots A and B                | 120 x 100 mm       | 180 x 180 mm      |
| Weight (without yokes)                      | 17 kg (with yokes) | 31 kg             |
| <b>PARTS TO BE HEATED</b>                   |                    |                   |
| Maximum weight (°)                          | 40 kg              | 70 kg             |
| Min. bore dia. (°)                          | 20 mm              | 20 mm             |
| Max. bore dia.                              | 280 mm             | 410 mm            |
| Max. width                                  | 120 mm             | 180 mm            |

(°): For bearings. For other parts; please contact us.  
(°): With min. yoke size



### MAINTENANCE TOOL FOR BEARING INSPECTION

When the bearing inspection is part of the maintenance process, it is necessary to take particular care of the journal bearing during its disassembly and reassembly, especially when it is sealed.

Based on customer bearing design, NTN-SNR proposes the right tools to ensure the bearing will remain safe after the inspection procedure.

### Mid-frequency heater to remove inner ring of cylindrical roller bearing



Mid Frequency technology

|              |  |
|--------------|--|
| FAST         | Less than 5 mins. to remove the inner ring |
| SAFE         | Shaft & inner ring do not heat             |
| POWERFULL    | 12.5kVA                                    |
| BEARING SIZE | Coil size is adapted to the bearing        |

### TRACK-LUBE: designed for wear reduction



The TRACK-LUBE system has been created to lubricate the rail curve and reduce wear on the wheel as well as on the rail itself.

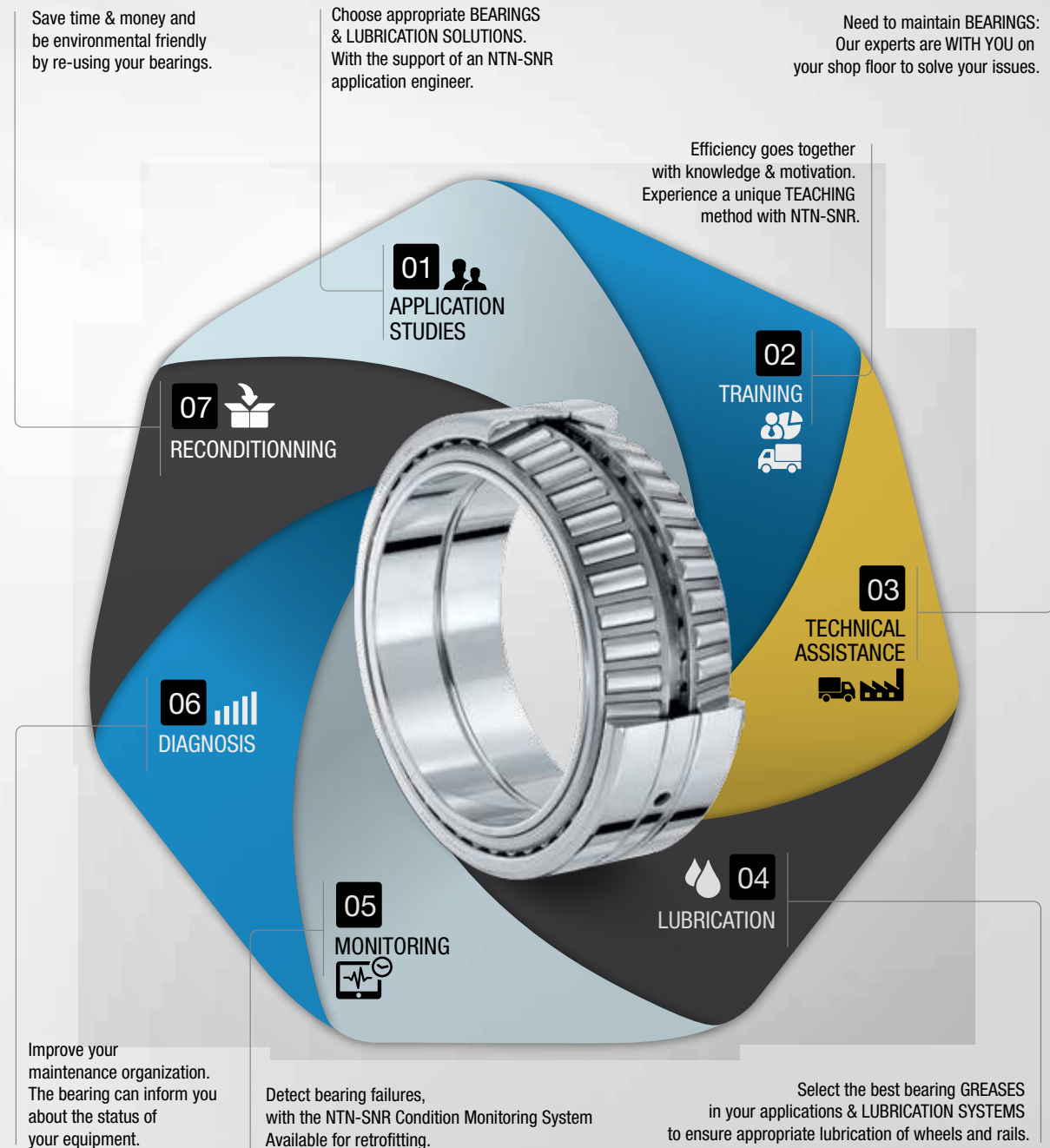
The TRACK-LUBE modular system consists on a single pump station (50kg reservoir) capable of lubricating up to 12 different curves of the rail independently. Each system can have its own vibration sensor to detect the train's position.

The TRACK-LUBE system has an advanced control system that uses a network connection that communicates with a remote laptop.

To reduce the wear created from the inside of the train wheel flange on the rail, a small system completed with a brush to apply lubricant to the profile of the wheel flange has been developed.

## With you, all along the Life Cycle of your train

Our bearings feature the latest technology that improve their performance and life duration. The solutions implemented by NTN-SNR aim to reduce the Total Cost of Ownership (TCO) and the Life Cycle Cost (LCC) of your application.



**IRIS**  
Certification

[www.alacam.com.tr](http://www.alacam.com.tr)



