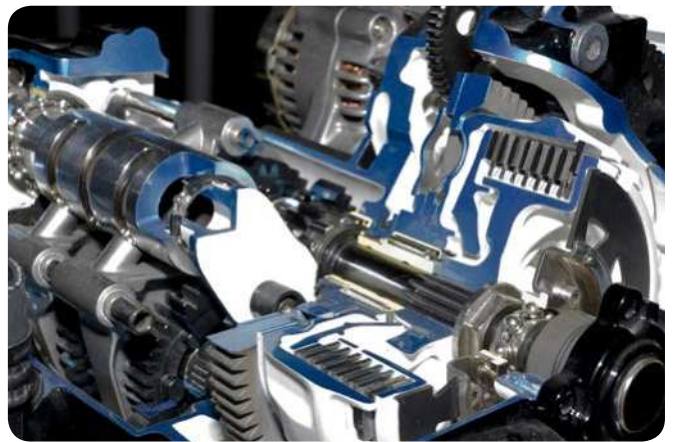


# SKF hub bearing units for automotive and industrial applications





# Hub bearing units for automotive and industrial applications

## Technical description and benefits (1st edition)

This publication highlights the benefits of hub bearing units (HBU) for automotive and industrial applications, and provides the basic data required for proper unit selection under given operating conditions. It also features a full technical description of the hub bearing unit from SKF, including external and internal design, cages, sealing and lubrication, plus additional capabilities such as speed sensing with impulse wheel and sensor integration. The Appendix provides detailed descriptions of several examples of automotive and industrial applications. Apart from the solutions presented in the catalogue, a wider range is also available.

For more information, please contact the SKF Application Engineering Department.



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# Product overview

## HBU description

Originally designed for car wheel applications, hub bearing units are greased-for-life, compact units providing defined and pre-adjusted clearance or preload, plus an integrated sealing solution. SKF has developed three families of SKF hub bearing units with dedicated designs to meet specific application requirements.

### First product family: HBU1 and HBU1T

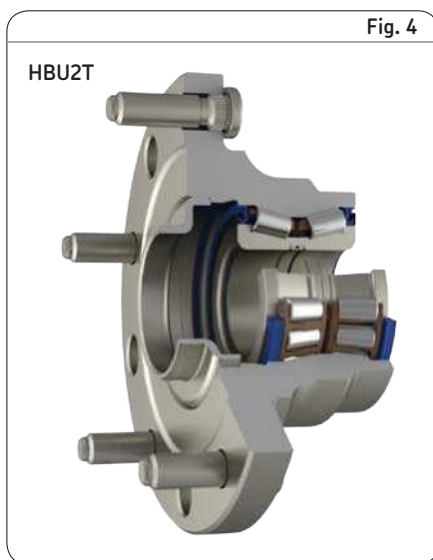
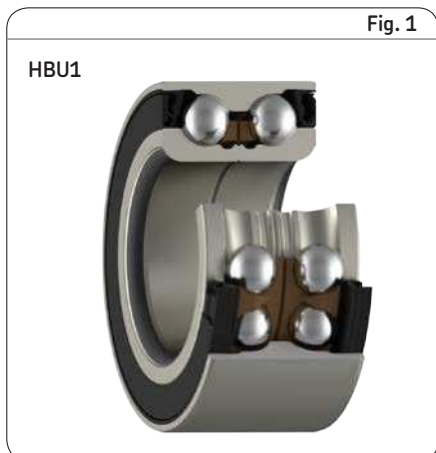
First product family designs – HBU1 (→ **fig. 1**) and HBU1T (→ **fig. 2**) – are based on ball and tapered roller bearings respectively, with cylindrical outside diameters.

HBU1 and HBU1T both have a two-piece inner ring. Boundary dimensions, including chamfers, are optimized to deliver superior application and cost-performance with each specific shaft and housing arrangement.

### Second product family: HBU2/2T/2R/2.1

The second product family of SKF hub bearing units – HBU2 (→ **fig. 3**) and HBU2T (→ **fig. 4**) are also based on ball and tapered roller bearings respectively. The outer ring of each unit integrates a flange with threaded holes or studs and a spigot to centre and mount surrounding parts; all dimensions are engineered to specific customer requirements.

While HBU2/2T units are generally used for outer ring rotating applications, a variant is also available for applications with inner ring rotation – HBU2R (→ **fig. 5**). SKF has also developed the HBU2.1 (→ **fig. 6**), an HBU1 unit that incorporates an integrated a journal (or shaft).



## Third product family: HBU3/3T

Also based on ball (→ **fig. 7**) or tapered roller (→ **fig. 8**) bearing designs, the third product family of SKF hub bearing units integrates the flange on the inner and outer rings. The dynamic load carrying capacity of HBU3/3T is maximized by a separate inner ring for the inboard rolling element row. This ring is mounted with an interference fit.

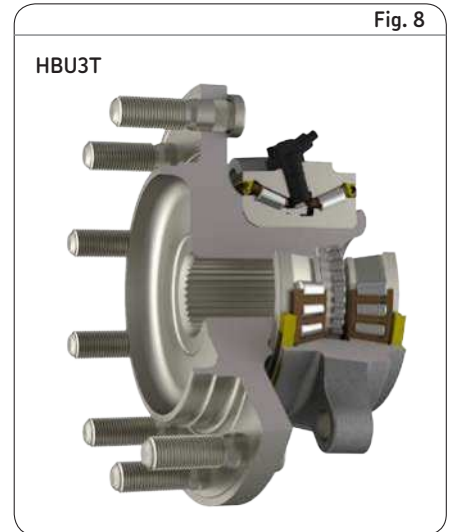
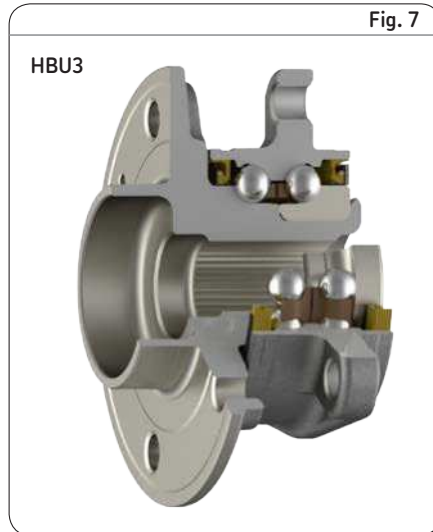
Usually, the outer ring flange makes it possible to bolt the unit to the static part of the equipment, while the rotating inner ring with its flange, spigot and threaded holes or studs, is designed for mounting of rotating parts.

## HBU features

Using first-generation SKF hub bearing units as an example, features can be described as follows:

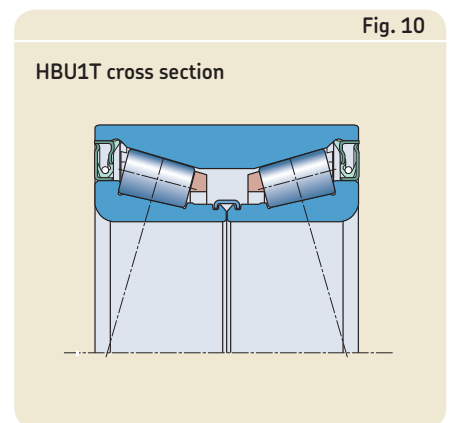
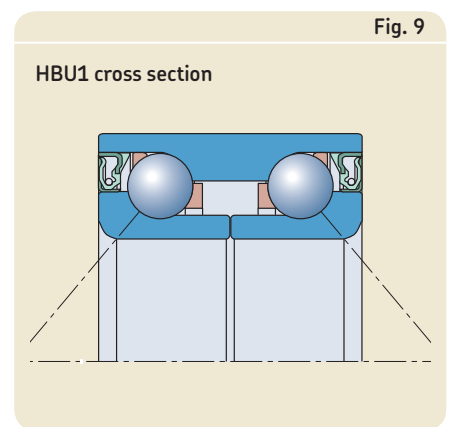
- HBU1 are double row angular contact ball bearings designed with a large contact angle (→ **fig. 9**). This provides the units with required stiffness to accommodate tilting forces under specified loading conditions.
- HBU1T are double row tapered roller bearings (→ **fig. 10**). The low cross-section and precise contact angle result in a very compact unit, which can accommodate both axial and radial loads.

Both HBU1 and HBU1T are generally assembled with polymer cages. Most of them feature integrated seals on both sides to keep grease in and lubricants out, even in applications frequently exposed to dust, mud and other elements.



Sealed and lubricated for life, the units deliver long life under severe load and temperature conditions. For more details on cage, sealing and greases, please see “Design” section (→ **page 7**).

**NOTE:** HBU2/2T and HBU3/3T are also double row angular contact bearings. Ring fixation by flange instead of a tight fit (outer ring for HBU2/HBU2T and both inner and outer rings for HBU3) makes the design less sensitive to internal geometry modification after unit assembly in surrounding parts.



# Application benefits

The same benefits that make SKF hub bearing units highly suitable for automotive applications also make them a superior choice for many consumer and industrial applications. These benefits include:

- Compactness
- Stiffness
- Efficient integrated sealing
- Pre-set clearance or preload
- Maintenance free (greased-for-life)
- Reduced number of parts
- Easy assembly
- Integrated encoder/sensor

Combined, these features and functional benefits enable products with:

- Increased performance
- Reduced total cost
- Reduced weight

Automotive and industrial applications for HBUs typically include:

- Agriculture
- Electric power-assisted steering (EPAS)
- Engine unit
- Fitness
- Heavy duty actuators
- Lift winch for elevator
- Transmission
- Washing machine

See Appendix for descriptions of many of these applications.



# Design

## Internal geometry and influence of fit on final clearance

Internal geometry is adjusted to get the desired value of axial clearance or preload once the unit is assembled in the equipment, taking into account the influence of mounting conditions.

Common car wheel application practices include axially clamping the two-piece inner rings with a nut and mounting bearings tightly within the housing and on the shaft.

Accordingly, when HBUs are used for automotive and industrial applications, particular attention should be paid to clearance reduction under actual mounting and thermal conditions.

## Lubrication

The greases generally used in SKF hub bearing units have been tested extensively at the high loads common in wheel end applications. **Table 1** compares the properties and performance of the two main grease types used in HBUs.

Other application specific greases are also available for more demanding requirements.

Table 1

| HBU grease comparison<br>SKF grease code | GHG ball bearings                 | GWZ tapered roller bearings     |
|--|-----------------------------------|---------------------------------|
| <b>Consistency (NLGI)</b>                | 1-2                               | 2-3                             |
| <b>Thickener type</b>                    | Lithium complex                   | Lithium complex                 |
| <b>Base oil type</b>                     | Mineral                           | Synthetic PAO                   |
| <b>Base oil viscosity</b>                | 40 °C: 100 cst / 100 °C: 11.2 cst | 40 °C: 191 cst / 100 °C: 42 cst |
| <b>Temperature range</b>                 | -30 to 140 °C                     | -30 to 160 °C                   |

## Cage

Hub bearing units are usually equipped with two cages made of polyamide 6.6 with 25% fibreglass reinforcement. Material properties make these cages suitable for continuous operating temperatures of up to 120 °C. Polyamide-based cages can operate in somewhat higher temperatures, but at the cost of cage life. In such cases SKF recommends contacting the SKF Application Engineering Department for support.

Specific and otherwise challenging application requirements can be met with cage material options that include high temperature-resistant polymers such as PEEK, as well as metal-pressed cages.



Polymer cage for balls



Polymer cage for tapered rollers

# Design

## Sealing

Hub Bearing Units may be equipped with various sealing solutions. These can be grouped into three main types:

### Automotive cassette seals

These consist of two components: an insert seal and a counter face (the “flinger”).

The insert seal consists of a metal insert with rubberized lips, of which there can be one or more situated in the radial and/or axial direction. Some designs also include a spring to maintain a high and constant contact force over the bearing lifetime. The flinger is fitted on the inner ring shoulder and uses the centrifugal effect as it rotates with the inner ring to prevent dust, mud and water from entering the unit. It is designed to prevent any corrosion that would result in seal failure caused by excessive seal lip wear.

### Mono component seals

These consist of a single component seal that is essentially an insert seal with lips riding directly on the ring, which work as a counter face. For some applications, contacting lips are not suitable; these are normally used to retain grease in the bearings.



### Special seals

These are specially designed seals, customized for specific applications. Seals of the designs mentioned above are made of material selected to tolerate application operating temperatures. The most common rubber mix used for HBU seals is NBR (Nitrile Butadiene Rubber).

Depending on customer specifications, HBUs could be equipped with:

- Sensors (for ABS)
- Sensors Carrier (for ABS sensor)
- Cap (to protect the bearing)
- No seal (hub bearing units can be supplied without shields or seals, e.g. for automotive and industrial applications lubricated with oil).

Differentiation of seal types between bearing sides is also possible (e.g. a seal design can incorporate a mono component seal on the inboard side and a cassette seal on the outboard side).



# Unit data – general

## Dimensions and tolerances

Because hub bearing units are customized products, dimensions and tolerances will vary with application requirements and will be specified on proposal drawings. Boundary dimensions of the most common hub bearing unit types are shown in tables in the “Range” section (→ page 10).

## Internal clearance

Proposal drawings will note internal axial clearance; values are valid for bearings before mounting and under specified measuring load.

## Misalignment

Misalignment of the outer ring with respect to the inner ring of hub bearing units can only be accommodated by generating forces between rolling elements and raceways. Any misalignment will generate noise in operation and reduce bearing service life.

## Speed

Typical maximum speed for hub bearing units in car wheel applications is about 2 000 r/min. Units can operate at higher speeds, particularly in open versions. However, since both reference and limiting speed ratings will vary, SKF recommends contacting the SKF Application Engineering Department when speed exceeds maximum limits.

## Load carrying capacities

Dynamic (C) and static (C<sub>0</sub>) load carrying capacities will be noted on proposal drawings. Values relating to most common SKF hub bearing units are shown in the tables throughout the “Range” section (→ page 10).

## Bearing loads

### Equivalent dynamic bearing load

#### HBU (Ball)

- $P = F_r + Y_1 F_a$  when  $F_a / F_r \leq e$
- $P = X F_r + Y_2 F_a$  when  $F_a / F_r > e$

#### HBU (Taper)

- $P = F_r + Y_1 F_a$  when  $F_a / F_r \leq e$
- $P = 0,67 F_r + Y_2 F_a$  when  $F_a / F_r > e$

Values for factors e, X, Y<sub>1</sub> and Y<sub>2</sub> depend on bearing internal geometry and are mentioned on proposal drawings.

### Equivalent static bearing load

- $P_o = F_r + Y_o F_a$

Values for factors e, X, Y<sub>1</sub> and Y<sub>2</sub> depend on bearing internal geometry and are mentioned on proposal drawings.

## Engineering checklist

Customers considering the use of SKF hub bearing units for automotive and industrial applications should provide SKF with the following background data. This information will allow SKF Application Engineers to make the most appropriate HBU recommendation.

### ✓ Application description

- Segment: Type of application
- Customer name
- Equipment
- Position
- Bearing type
- Current design in case of replacement
- Application assembly drawing

### ✓ Operating conditions and environment

- Load, speed and temperature (cycle)
- Contamination
- Surrounding parts (design and material)
- Fits and axial clamping force

### ✓ Application requirements

- Life (fatigue and service)
- Stiffness
- Running accuracy
- Silent running
- Friction torque

### ✓ Additional functions

- Speed-sensing

### ✓ Validation methodology

- Test specification

### ✓ Other specifications or comments

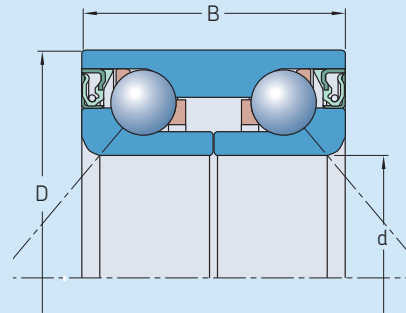
- Specific market applications (e.g. AgriHub)

# Range

The following tables list the most commonly employed hub bearing units.

For more information on available items, or further technical details, please contact the SKF Application Engineering.

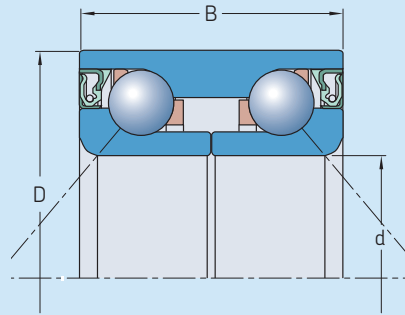
## HBU1



| Catalogue reference | Principal dimensions |        |    | Basic load ratings |                          | Mass   | Seals          |                |
|---------------------|----------------------|--------|----|--------------------|--------------------------|--------|----------------|----------------|
|                     | d                    | D      | B  | dynamic<br>C       | static<br>C <sub>0</sub> |        | left           | right          |
| –                   | mm                   |        |    | N                  |                          | kg     | –              |                |
| HBU1 - 1            | 25                   | 56     | 32 | 39 000             | 28 000                   | 0,33   | No seal        | No seal        |
| HBU1 - 2            | 28                   | 58     | 44 | 35 800             | 28 000                   | 0,495  | Cassette       | Cassette       |
| HBU1 - 3            | 30                   | 60,03  | 37 | 37 700             | 26 500                   | 0,43   | Mono Component | Mono Component |
| HBU1 - 4            | 30                   | 72     | 37 | 49 400             | 36 000                   | 0,7    | Mono Component | Mono Component |
| HBU1 - 5            | 30                   | 60     | 34 | 37 700             | 26 500                   | 0,384  | No seal        | No seal        |
| HBU1 - 6            | 30                   | 60,03  | 37 | 37 700             | 26 500                   | 0,43   | Mono Component | Mono Component |
| HBU1 - 7            | 30                   | 60,03  | 37 | 37 700             | 31 000                   | 0,42   | Mono Component | Mono Component |
| HBU1 - 8            | 30                   | 60     | 37 | 37 700             | 26 500                   | 0,409  | No seal        | No seal        |
| HBU1 - 9            | 30                   | 67     | 31 | 44 900             | 31 000                   | 0,463  | Mono Component | Mono Component |
| HBU1 - 10           | 30                   | 60,03  | 37 | 37 700             | 26 500                   | 0,43   | Mono Component | Mono Component |
| HBU1 - 11           | 34                   | 64     | 37 | 37 700             | 32 000                   | 0,47   | Cassette       | Cassette       |
| HBU1 - 12           | 34                   | 62     | 37 | 33 200             | 24 000                   | 0,42   | Mono Component | Mono Component |
| HBU1 - 13           | 34                   | 64     | 37 | 37 100             | 32 500                   | 0,487  | Cassette       | Cassette       |
| HBU1 - 14           | 34                   | 66     | 37 | 43 600             | 30 000                   | 0,49   | Mono Component | Mono Component |
| HBU1 - 15           | 34                   | 67     | 37 | 41 000             | 35 500                   | 0,57   | Cassette       | Cassette       |
| HBU1 - 16           | 35                   | 72     | 33 | 50 700             | 34 500                   | 0,54   | Cassette       | Cassette       |
| HBU1 - 17           | 35                   | 72,043 | 33 | 46 200             | 40 000                   | 0,6    | Cassette       | Cassette       |
| HBU1 - 18           | 35                   | 66     | 33 | 39 700             | 34 500                   | 0,47   | Cassette       | Cassette       |
| HBU1 - 19           | 35                   | 66     | 37 | 39 700             | 34 500                   | 0,51   | Cassette       | Cassette       |
| HBU1 - 20           | 35                   | 64     | 37 | 33 200             | 30 000                   | 0,45   | Mono Component | Mono Component |
| HBU1 - 21           | 35                   | 72,043 | 33 | 46 200             | 40 000                   | 0,62   | Cassette       | Cassette       |
| HBU1 - 22           | 35                   | 62     | 28 | 34 500             | 31 500                   | 0,32   | Mono Component | Mono Component |
| HBU1 - 23           | 35                   | 66     | 33 | 39 700             | 34 500                   | 0,48   | Cassette       | Cassette       |
| HBU1 - 24           | 35                   | 72     | 33 | 46 200             | 40 000                   | 0,61   | Cassette       | Cassette       |
| HBU1 - 25           | 35                   | 66     | 32 | 44 900             | 35 500                   | 0,44   | Cassette       | Cassette       |
| HBU1 - 26           | 35                   | 68     | 37 | 44 900             | 32 000                   | 0,54   | Cassette       | Cassette       |
| HBU1 - 27           | 35                   | 68,015 | 37 | 41 600             | 35 500                   | 0,56   | Cassette       | Cassette       |
| HBU1 - 28           | 35                   | 72     | 27 | 44 900             | 31 000                   | 0,47   | No seal        | No seal        |
| HBU1 - 29           | 35                   | 72     | 35 | 46 200             | 39 000                   | 0,545  | No seal        | No seal        |
| HBU1 - 30           | 35                   | 73     | 30 | 49 400             | 43 000                   | 0,58   | Mono Component | Mono Component |
| HBU1 - 31           | 35                   | 73     | 30 | 30 700 / 29 100    | 21 200 / 19 600          | 0,57   | No seal        | No seal        |
| HBU1 - 32           | 35                   | 68     | 37 | 44 900             | 32 000                   | 0,53   | Mono Component | Mono Component |
| HBU1 - 33           | 35                   | 68     | 37 | 41 600             | 35 500                   | 0,55   | Cassette       | Cassette       |
| HBU1 - 34           | 35                   | 61,8   | 40 | 29 100             | 27 500                   | 0,1478 | Cassette       | Cassette       |
| HBU1 - 35           | 35                   | 61,8   | 40 | 33 200             | 30 500                   | 0,43   | Cassette       | Cassette       |
| HBU1 - 36           | 36                   | 68     | 33 | 42 300             | 36 000                   | 0,484  | Cassette       | Cassette       |

IAM = Independent Aftermarket

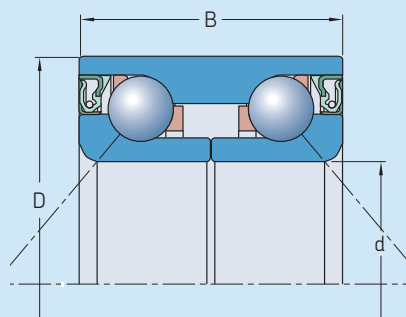
HBU1



| Catalogue reference | Principal dimensions |        |       | Basic load ratings |                       | Mass   | Seals          |                |
|---------------------|----------------------|--------|-------|--------------------|-----------------------|--------|----------------|----------------|
|                     | d                    | D      | B     | dynamic C          | static C <sub>0</sub> |        | left           | right          |
| –                   | mm                   |        |       | N                  |                       | kg     | –              |                |
| HBU1 - 37           | 37                   | 72,043 | 37    | 46 200             | 40 000                | 0,64   | Cassette       | Cassette       |
| HBU1 - 38           | 37                   | 72     | 33    | 46 200             | 40 000                | 0,57   | Cassette       | Cassette       |
| HBU1 - 39           | 37                   | 72,043 | 37    | 54 000             | 38 000                | 0,62   | Cassette       | Cassette       |
| HBU1 - 40           | 37                   | 74     | 45    | 57 200             | 42 500                | 0,751  | Mono Component | Mono Component |
| HBU1 - 41           | 37                   | 72     | 33    | 46 200             | 40 000                | 0,57   | Cassette       | Cassette       |
| HBU1 - 42           | 37                   | 74,043 | 37    | 46 200             | 40 000                | 0,72   | Cassette       | Cassette       |
| HBU1 - 43           | 37                   | 72,043 | 37    | 46 200             | 40 000                | 0,64   | Cassette       | Cassette       |
| HBU1 - 44           | 37                   | 72,043 | 37    | 46 200             | 40 000                | 0,65   | Cassette       | Cassette       |
| HBU1 - 45           | 37                   | 72,043 | 37    | 46 200             | 40 000                | 0,64   | Cassette       | Cassette       |
| HBU1 - 46           | 38,1                 | 70     | 37    | 46 200             | 40 500                | 0,57   | Cassette       | Cassette       |
| HBU1 - 47           | 38                   | 74     | 36    | 55 300             | 47 500                | 0,6    | No seal        | No seal        |
| HBU1 - 48           | 38                   | 71     | 39    | 44 200             | 39 000                | 0,62   | Cassette       | Cassette       |
| HBU1 - 49           | 38,993               | 72     | 37    | 46 200             | 40 000                | 0,6    | Cassette       | Cassette       |
| HBU1 - 50           | 38,993               | 72     | 37    | 46 200             | 40 000                | 0,59   | Cassette       | Cassette       |
| HBU1 - 51           | 38,993               | 72     | 37    | 44 200             | 40 000                | 0,59   | Cassette       | Cassette       |
| HBU1 - 52           | 39                   | 68,07  | 37    | 39 700             | 29 000                | 0,48   | Mono Component | Mono Component |
| HBU1 - 53           | 39                   | 74     | 39    | 57 200             | 41 500                | 0,66   | Mono Component | Mono Component |
| HBU1 - 54           | 39                   | 72     | 37    | 55 300             | 40 500                | 0,0052 | Mono Component | Mono Component |
| HBU1 - 55           | 39                   | 72     | 37    | 49 400             | 36 000                | 0,55   | Mono Component | Mono Component |
| HBU1 - 56           | 38,993               | 72     | 37    | 44 200             | 40 000                | 0,59   | Cassette       | Cassette       |
| HBU1 - 57           | 39                   | 74     | 39    | 52 700             | 45 000                | 0,66   | Cassette       | Cassette       |
| HBU1 - 58           | 39                   | 72     | 37    | 44 200             | 40 000                | 0,59   | Cassette       | Cassette       |
| HBU1 - 59           | 39,1                 | 74     | 36    | 46 200             | 42 500                | 0,62   | Cassette       | Cassette       |
| HBU1 - 60           | 39/41                | 75     | 37    | 47 500             | 43 000                | 0,7    | Mono Component | Mono Component |
| HBU1 - 61           | 40                   | 74     | 40    | 49 400             | 44 000                | 0,67   | Cassette       | Cassette       |
| HBU1 - 62           | 40                   | 74     | 36    | 49 400             | 44 000                | 0,61   | Cassette       | Cassette       |
| HBU1 - 63           | 40                   | 75     | 37    | 47 500             | 43 000                | 0,67   | Cassette       | Cassette       |
| HBU1 - 64           | 40                   | 72,05  | 37    | 46 800             | 34 500                | 0,56   | Mono Component | Mono Component |
| HBU1 - 65           | 40                   | 75     | 37    | 47 500             | 34 500                | 0,65   | Cassette       | Cassette       |
| HBU1 - 66           | 40                   | 80     | 34    | 55 300             | 40 000                | 0,77   | Cassette       | Cassette       |
| HBU1 - 67           | 40                   | 74     | 40    | 49 400             | 44 000                | 0,675  | Cassette       | Cassette       |
| HBU1 - 68           | 40                   | 75     | 37    | 47 500             | 43 000                | 0,66   | Cassette       | Cassette       |
| HBU1 - 69           | 40                   | 74     | 36    | 49 400             | 44 000                | 0,62   | Cassette       | Cassette       |
| HBU1 - 70           | 40                   | 72     | 36    | 46 200             | 41 500                | 0,58   | Cassette       | Cassette       |
| HBU1 - 71           | 40                   | 72     | 36    | 46 200             | 41 500                | 0,57   | Cassette       | Cassette       |
| HBU1 - 72           | 40                   | 72     | 37    | 46 800             | 34 500                | 0,56   | Mono Component | Mono Component |
| HBU1 - 73           | 40                   | 74     | 40    | 46 800             | 41 500                | 0,68   | Mono Component | Mono Component |
| HBU1 - 74           | 40                   | 74     | 42    | 49 400             | 44 000                | 0,7    | Cassette       | Cassette       |
| HBU1 - 75           | 40                   | 84     | 38    | 65 000             | 57 000                | 0,9    | Cassette       | Cassette       |
| HBU1 - 76           | 40                   | 74     | 40    | 46 800             | 41 500                | 0,68   | Mono Component | Mono Component |
| HBU1 - 77           | 40                   | 84,055 | 39,7  | 65 000             | 57 000                | 0,92   | Cassette       | Cassette       |
| HBU1 - 78           | 40                   | 74     | 36    | 49 400             | 44 000                | 0,62   | Cassette       | Cassette       |
| HBU1 - 79           | 40                   | 84,055 | 39,7  | 65 000             | 57 000                | 0,93   | Cassette       | Cassette       |
| HBU1 - 80           | 42                   | 75     | 37    | 48 800             | 36 500                | 0,6    | Cassette       | Cassette       |
| HBU1 - 81           | 42                   | 82     | 36    | 65 000             | 55 000                | 0,8    | Cassette       | Cassette       |
| HBU1 - 82           | 42                   | 80     | 37    | 62 400             | 53 000                | 0,75   | Cassette       | Cassette       |
| HBU1 - 83           | 42                   | 80     | 45    | 57 200             | 50 000                | 0,9    | Cassette       | Cassette       |
| HBU1 - 84           | 42                   | 80     | 46    | 49 400             | 46 500                | 0,98   | Cassette       | Cassette       |
| HBU1 - 85           | 42                   | 76     | 38/35 | 54 000             | 48 000                | 0,64   | No seal        | No seal        |
| HBU1 - 86           | 42                   | 75,043 | 37    | 44 900             | 41 500                | 0,62   | Cassette       | Cassette       |

# Range

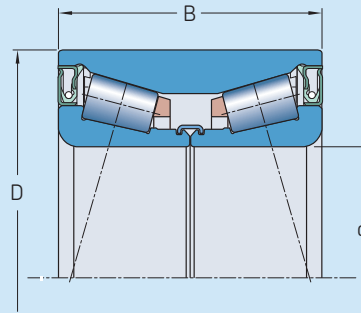
## HBU1



| Catalogue reference | Principal dimensions |       |    | Basic load ratings |                       | Mass  | Seals          |                |
|---------------------|----------------------|-------|----|--------------------|-----------------------|-------|----------------|----------------|
|                     | d                    | D     | B  | dynamic C          | static C <sub>0</sub> |       | left           | right          |
| -                   | mm                   |       |    | N                  |                       | kg    | -              |                |
| HBU1 - 87           | 42                   | 78    | 45 | 49 400             | 46 500                | 0,88  | Cassette       | Cassette       |
| HBU1 - 88           | 42                   | 80    | 34 | 55 300             | 49 000                | 0,73  | Cassette       | Cassette       |
| HBU1 - 89           | 42                   | 78    | 40 | 54 000             | 48 000                | 0,77  | Cassette       | Cassette       |
| HBU1 - 90           | 42                   | 80,03 | 42 | 66 300             | 48 000                | 0,776 | Mono Component | Mono Component |
| HBU1 - 91           | 42                   | 82    | 36 | 63 700             | 56 000                | 0,77  | Cassette       | Cassette       |
| HBU1 - 92           | 42                   | 82    | 36 | 63 700             | 56 000                | 0,78  | Cassette       | Cassette       |
| HBU1 - 93           | 42                   | 75,05 | 37 | 50 700             | 46 500                | 0,65  | Cassette       | Cassette       |
| HBU1 - 94           | 42                   | 80    | 39 | 59 200             | 54 000                | 0,81  | Cassette       | Cassette       |
| HBU1 - 95           | 42                   | 75    | 37 | 48 800             | 36 500                | 0,59  | Mono Component | Mono Component |
| HBU1 - 96           | 42                   | 84    | 39 | 62 400             | 53 000                | 0,89  | Cassette       | Cassette       |
| HBU1 - 97           | 42                   | 76    | 39 | 54 000             | 48 000                | 0,68  | Cassette       | Cassette       |
| HBU1 - 98           | 42                   | 80    | 37 | 60 500             | 55 000                | 0,79  | Cassette       | Cassette       |
| HBU1 - 99           | 45                   | 82    | 37 | 55 300             | 52 000                | 0,82  | Mono Component | Mono Component |
| HBU1 - 100          | 43                   | 82    | 45 | 59 200             | 54 000                | 0,96  | Cassette       | Cassette       |
| HBU1 - 101          | 43                   | 80    | 38 | 50 700             | 48 000                | 0,78  | Cassette       | Cassette       |
| HBU1 - 102          | 43                   | 76    | 43 | 50 700             | 47 500                | 0,73  | Cassette       | Cassette       |
| HBU1 - 103          | 44                   | 82,5  | 37 | 55 300             | 52 000                | 0,835 | Mono Component | Mono Component |
| HBU1 - 104          | 44                   | 95    | 42 | 52 000 / 59 200    | 37 500 / 42 500       | 1,323 | Mono Component | Mono Component |
| HBU1 - 105          | 45                   | 84    | 39 | 58 500             | 55 000                | 0,94  | Cassette       | Cassette       |
| HBU1 - 106          | 45                   | 84    | 39 | 60 500             | 45 000                | 0,84  | Cassette       | Cassette       |
| HBU1 - 107          | 45                   | 88    | 39 | 66 300             | 63 000                | 1,048 | Cassette       | Cassette       |
| HBU1 - 108          | 45                   | 84    | 41 | 60 500             | 55 000                | 0,92  | Cassette       | Cassette       |
| HBU1 - 109          | 45                   | 85,05 | 41 | 60 500             | 55 000                | 0,95  | Cassette       | Cassette       |
| HBU1 - 110          | 45                   | 84    | 39 | 62 400             | 47 500                | 0,82  | Cassette       | Cassette       |
| HBU1 - 111          | 45                   | 84    | 39 | 60 500             | 55 000                | 0,8   | Cassette       | Cassette       |
| HBU1 - 112          | 45                   | 80    | 45 | 52 700             | 50 000                | 0,86  | Cassette       | Cassette       |
| HBU1 - 113          | 45                   | 88    | 39 | 65 000             | 57 000                | 1,04  | Cassette       | Cassette       |
| HBU1 - 114          | 45                   | 83    | 39 | 60 500             | 55 000                | 0,8   | Cassette       | Cassette       |
| HBU1 - 115          | 47                   | 83    | 37 | 55 300             | 53 000                | 0,8   | Cassette       | Cassette       |
| HBU1 - 116          | 49                   | 91,5  | 54 | 55 300             | 56 000                | 1,62  | Cassette       | Cassette       |
| HBU1 - 117          | 49                   | 88    | 46 | 65 000             | 62 000                | 1,1   | Cassette       | Cassette       |
| HBU1 - 118          | 51                   | 72    | 24 | 24 700             | 30 000                | 0,28  | Mono Component | Mono Component |
| HBU1 - 119          |                      |       |    |                    |                       |       |                |                |
| HBU1 - 120          |                      |       |    |                    |                       |       |                |                |

IAM = Independent Aftermarket

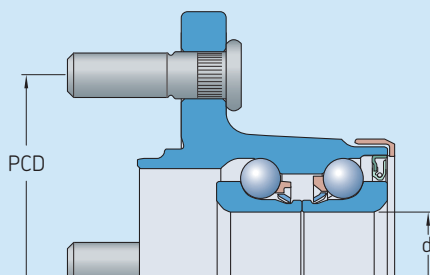
## HBU1T



| Catalogue reference | Principal dimensions |       |        | Basic load ratings |                          | Mass  | Sealing        |                |
|---------------------|----------------------|-------|--------|--------------------|--------------------------|-------|----------------|----------------|
|                     | d                    | D     | B      | dynamic<br>C       | static<br>C <sub>0</sub> |       | left           | right          |
| –                   | mm                   |       |        | N                  |                          | kg    | –              |                |
| HBU1T - 1           | 25                   | 50    | 37     | 61 600             | 73 500                   | 0,36  | Mono Component | Mono Component |
| HBU1T - 2           | 25                   | 52    | 37     | 61 600             | 73 500                   | 0,36  | Mono Component | Mono Component |
| HBU1T - 3           | 25                   | 60    | 45     | 78 100             | 104 000                  | 0,67  | Cassette       | Special        |
| HBU1T - 4           | 25                   | 52    | 42     | 64 400             | 83 000                   | 0,42  | Cassette       | No seal        |
| HBU1T - 5           | 25                   | 55    | 43     | 73 700             | 93 000                   | 0,512 | Cassette       | No seal        |
| HBU1T - 6           | 30                   | 62    | 48     | 78 100             | 104 000                  | 0,79  | Cassette       | No seal        |
| HBU1T - 7           | 25                   | 55    | 43     | 73 700             | 93 000                   | 0,52  | Cassette       | No seal        |
| HBU1T - 8           | 29                   | 53    | 37     | 52 300             | 69 500                   | 0,35  | Cassette       | Special        |
| HBU1T - 9           | 30                   | 62    | 48     | 78 000             | 104 000                  | 0,7   | Cassette       | Special        |
| HBU1T - 10          | 30                   | 62    | 48     | 78 100             | 104 000                  | 0,7   | Cassette       | No seal        |
| HBU1T - 11          | 30                   | 62    | 48     | 78 100             | 104 000                  | 0,71  | Cassette       | No seal        |
| HBU1T - 12          | 35                   | 65    | 35     | 68 200             | 95 700                   | 0,6   | Mono Component | Mono Component |
| HBU1T - 13          | 35                   | 68    | 50     | 101 000            | 146 000                  | 0,75  | Cassette       | Cassette       |
| HBU1T - 14          | 40                   | 73    | 55     | 102 000            | 153 000                  | 1,1   | Cassette       | Cassette       |
| HBU1T - 15          | 40                   | 73    | 55     | 102 000            | 153 000                  | 0,997 | Cassette       | Cassette       |
| HBU1T - 16          | 41                   | 68    | 40     | 80 900             | 118 000                  | 0,55  | No seal        | No seal        |
| HBU1T - 17          | 41,285               | 85    | 82     | 161 000            | 232 000                  | 2,32  | No seal        | No seal        |
| HBU1T - 18          | 45                   | 88    | 55     | 154 000            | 200 000                  | 1,45  | Cassette       | Cassette       |
| HBU1T - 19          | 49                   | 84    | 48     | 105 000            | 146 000                  | 1,07  | Cassette       | Cassette       |
| HBU1T - 20          | 49                   | 84    | 48     | 105 000            | 146 000                  | 1,042 | Cassette       | Cassette       |
| HBU1T - 21          | 49                   | 84    | 48     | 105 000            | 146 000                  | 1,04  | Cassette       | Cassette       |
| HBU1T - 22          | 49                   | 84    | 48     | 105 000            | 146 000                  | 1,05  | Cassette       | Cassette       |
| HBU1T - 23          | 50                   | 105   | 66     | 201 000            | 275 000                  | 2,668 | No seal        | No seal        |
| HBU1T - 24          | 55                   | 85,65 | 60     | 151 000            | 232 000                  | 1,45  | Cassette       | Cassette       |
| HBU1T - 25          | 55                   | 90    | 54     | 108 000            | 160 000                  | 1,3   | Cassette       | Cassette       |
| HBU1T - 26          | 55                   | 90    | 55     | 151 000            | 232 000                  | 1,312 | Cassette       | Cassette       |
| HBU1T - 27          | 60                   | 130   | 69,849 | 264 000            | 335 000                  | 4,271 | No seal        | No seal        |

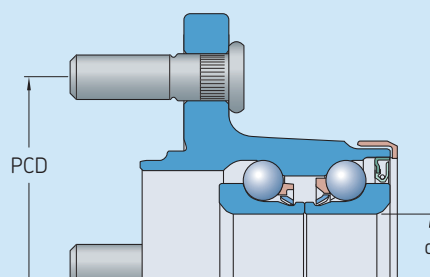
# Range

## HBU2 and HBU2R



| Catalogue reference | Bore d | Bolt circle # x PCD | Basic load rating |                       | Mass   | Seals          |          |
|---------------------|--------|---------------------|-------------------|-----------------------|--------|----------------|----------|
|                     |        |                     | dynamic C         | static C <sub>0</sub> |        | inboard        | outboard |
| -                   | mm     |                     | N                 |                       | kg     | -              |          |
| HBU2 - 1            | 20     | 6x75                | 20 800            | 13 200                | 0,466  | Mono Component | Special  |
| HBU2 - 2            | 20     | 6x75                | 20 800            | 13 200                | 0,464  | Mono Component | Special  |
| HBU2 - 3            | 24     | 4x85                | 37 700            | 31 000                | -      | No seal        | No seal  |
| HBU2 - 4            | 25     | 4x108               | 57 000            | 40 500                | 1,59   | Cassette       | No seal  |
| HBU2 - 5            | 25     | 4x108               | 52 000            | 39 000                | 1,58   | Cassette       | No seal  |
| HBU2 - 6            | 25     | 4x108               | 52 000            | 39 000                | 1,74   | Cassette       | No seal  |
| HBU2 - 7            | 25     | 4x108               | 70 200            | 48 000                | 1,851  | Mono Component | No seal  |
| HBU2 - 8            | 25     | 4x108               | 70 200            | 48 000                | 1,911  | Mono Component | No seal  |
| HBU2 - 9            | 27     | 4x114,3             | 43 600            | 33 500                | 2,03   | Cassette       | No seal  |
| HBU2 - 10           | 27     | 4x114,3             | 43 600            | 33 500                | 2,11   | Cassette       | No seal  |
| HBU2 - 11           | 27     | 4x100               | 42 300            | 29 000                | 1,966  | Cassette       | No seal  |
| HBU2 - 12           | 27,5   | 4x98                | 47 500            | 37 500                | 2,27   | Mono Component | Special  |
| HBU2 - 13           | 28     | 4x98                | 47 500            | 37 500                | 2,23   | No seal        | Special  |
| HBU2 - 14           | 28     | 4x98                | 47 500            | 37 500                | 2,21   | Mono Component | Special  |
| HBU2 - 15           | 28     | 4x98                | 47 500            | 37 500                | 2,22   | Mono Component | Special  |
| HBU2 - 16           | 28     | 4x100               | 25 100 / 23 800   | 16 000 / 15 000       | 1,58   | Cassette       | No seal  |
| HBU2 - 17           | 28     | 4x100               | 23 800 / 25 100   | 15 000 / 16 000       | 1,4428 | Cassette       | No seal  |
| HBU2 - 18           | 28     | 4x104               | 25 100            | 16 000                | 2,06   | Cassette       | No seal  |
| HBU2 - 19           | 28     | 5x100               | 44 200            | 30 000                | 1,729  | Cassette       | No seal  |
| HBU2 - 20           | 30     | 4x100               | 44 200            | 30 000                | 1,79   | Cassette       | No seal  |
| HBU2 - 21           | 30     | 4x98                | 28 100 / 29 600   | 15 000 / 16 600       | 1,44   | Mono Component | No seal  |
| HBU2 - 22           | 30     | 4x98                | 28 100 / 29 600   | 15 000 / 16 600       | 1,46   | Mono Component | No seal  |
| HBU2 - 23           | 30     | 5x100               | 31 200 / 29 600   | 19 300 / 17 600       | 1,50   | Cassette       | No seal  |
| HBU2 - 24           | 30     | 4x100               | 28 100 / 29 600   | 15 000 / 16 600       | 1,49   | Mono Component | No seal  |
| HBU2 - 25           | 30     | 5x110               | 28 100 / 29 600   | 15 000 / 16 600       | 1,60   | Mono Component | No seal  |
| HBU2 - 26           | 30     | 5x100               | 31 200 / 29 600   | 19 300 / 17 600       | 1,48   | Cassette       | No seal  |
| HBU2 - 27           | 30     | 4x100               | 44 200            | 30 000                | 1,71   | Cassette       | No seal  |
| HBU2 - 28           | 30     | 5x98                | 28100 / 29 600    | 15 000 / 16 600       | 1,50   | Mono Component | No seal  |
| HBU2 - 29           | 30     | 4x98                | 47 500            | 37 500                | 1,7    | Mono Component | Special  |
| HBU2 - 30           | 30     | 4x98                | 47 500            | 37 500                | 2,26   | Mono Component | Special  |
| HBU2 - 31           | 30     | 4x98                | 28100 / 29 600    | 15 000 / 16 600       | 1,4    | Mono Component | No seal  |
| HBU2 - 32           | 30     | 5x108               | 57 200            | 43 000                | 2,37   | Cassette       | Special  |
| HBU2 - 33           | 30     | 4x114,3             | 28 600 / 27 000   | 18 600 / 17 300       | 2,347  | Cassette       | No seal  |
| HBU2 - 34           | 30     | 4x114,3             | 28 600 / 27 000   | 18 600 / 17 300       | 2,407  | Cassette       | No seal  |
| HBU2 - 35           | 30     | 5x112               | 29 600 / 31 900   | 18 600 / 20 000       | 1,804  | Cassette       | No seal  |
| HBU2 - 36           | 30     | 5x112               | 29 600 / 31 900   | 18 600 / 20 000       | 1,833  | Cassette       | No seal  |
| HBU2 - 37           | 30     | 5x112               | 57 000            | 44 000                | 1,91   | Cassette       | No seal  |
| HBU2 - 38           | 30     | 4x100               | 44 200            | 30 000                | 2,212  | Cassette       | No seal  |
| HBU2 - 39           | 30     | 4x100               | 44 200            | 30 000                | 2,236  | Cassette       | No seal  |
| HBU2 - 40           | 30     | 5x114,3             | 44 200            | 30 000                | 2,405  | Cassette       | No seal  |
| HBU2 - 41           | 30     | 5x114,3             | 44 200            | 30 000                | 2,463  | Cassette       | No seal  |
| HBU2 - 42           | 30     | 4x114,3             | 47 500            | 35 500                | 2,259  | Cassette       | No seal  |
| HBU2 - 43           | 30     | 5x114,3             | 54 000            | 40 000                | 2,224  | Cassette       | No seal  |
| HBU2 - 44           | 30     | 5x114,3             | 54 000            | 40 000                | 2,363  | Cassette       | No seal  |
| HBU2 - 45           | 30     | 4x98                | 22 100 / 23 400   | 12 200 / 13 200       | 1,25   | Mono Component | No seal  |
| HBU2 - 46           | 30     | 4x106               | 28 100 / 29 600   | 15 000 / 16 600       | 1,65   | Mono Component | No seal  |
| HBU2 - 47           | 30     | 4x100               | 44 200            | 30 000                | 1,78   | Cassette       | No seal  |
| HBU2 - 48           | 30,9   | 5x114,3             | 55 300            | 56 000                | 7,3    | Cassette       | Cassette |
| HBU2 - 49           | 30,9   | 5x114               | 55 300            | 56 000                | 7,3    | Cassette       | Cassette |
| HBU2 - 50           | 30,9   | 5x114               | 55 300            | 56 000                | 7,3    | Cassette       | Cassette |

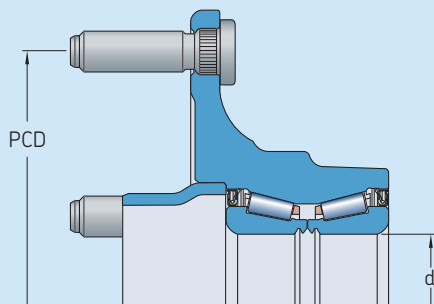
## HBU2 and HBU2R



| Catalogue reference | Bore d  | Bolt circle # x PCD | Basic load rating |                       | Mass  | Seals          |                |
|---------------------|---------|---------------------|-------------------|-----------------------|-------|----------------|----------------|
|                     |         |                     | dynamic C         | static C <sub>0</sub> |       | inboard        | outboard       |
| –                   | mm      |                     | N                 |                       | kg    | –              |                |
| HBU2 - 51           | 30,9    | 5x114               | 55 300            | 56 000                | 6,8   | Cassette       | Cassette       |
| HBU2 - 52           | 32      | 4x108               | 58 500            | 45 500                | 1,90  | Cassette       | No seal        |
| HBU2 - 53           | 32      | 4x108               | 70 200            | 48 000                | 1,77  | Mono Component | No seal        |
| HBU2 - 54           | 32      | 5x108               | 58 500            | 45 500                | 1,9   | Cassette       | No seal        |
| HBU2 - 55           | 32      | 4x108               | 58 500            | 45 500                | 1,86  | Cassette       | No seal        |
| HBU2 - 56           | 32      | 5x100               | 31 200 / 29 600   | 20 800 / 19 000       | 2,17  | Cassette       | No seal        |
| HBU2 - 57           | 32      | 5x112               | 36 400 / 39 000   | 24 000 / 26 000       | 2,01  | Cassette       | No seal        |
| HBU2 - 58           | 32      | 5x114,3             | 31 200 / 29 600   | 20 800 / 19 000       | 2,62  | Cassette       | No seal        |
| HBU2 - 59           | 32      | 4x108               | 58 500            | 45 500                | 1,87  | Cassette       | No seal        |
| HBU2 - 60           | 32      | 4x114,3             | 42 300            | 41 500                | 2,49  | Cassette       | Cassette       |
| HBU2 - 61           | 33      | 4x114,3             | 44 200            | 35 500                | 2,37  | Cassette       | Special        |
| HBU2 - 62           | 33      | 4x114,3             | 44 200            | 35 500                | 2,427 | Cassette       | No seal        |
| HBU2 - 63           | 35      | 5x98                | 26 500 / 27 600   | 15 000 / 16 000       | 1,50  | Cassette       | No seal        |
| HBU2 - 64           | 35      | 4x107,95            | 52 700            | 36 500                | 2,02  | Cassette       | Special        |
| HBU2 - 65           | 35      | 5x108               | 61 800            | 44 000                | 2,28  | Cassette       | Cassette       |
| HBU2 - 66           | 35      | 4x107,95            | 31 200 / 29 600   | 19 300 / 18 000       | 1,837 | Cassette       | No seal        |
| HBU2 - 67           | 35      | 4x107,95            | 31 200 / 29 601   | 19 300 / 18 001       | 1,884 | Cassette       | No seal        |
| HBU2 - 68           | 35      | 5x108               | 48 800            | 40 500                | 1,9   | Cassette       | No seal        |
| HBU2 - 69           | 35      | 5x108               | 48 800            | 40 500                | 1,73  | Cassette       | No seal        |
| HBU2 - 70           | 37      | 5x107,95            | 37 000 / 35 100   | 25 000 / 23 200       | 2,61  | Cassette       | No seal        |
| HBU2 - 71           | 37      | 5x115               | 60 500            | 50 000                | 2,88  | Cassette       | No seal        |
| HBU2 - 72           | 37      | 5x114,3             | 61 800            | 50 000                | 2,50  | Cassette       | Special        |
| HBU2 - 73           | 37      | 4x108               | 46 200            | 40 000                | 1,03  | Cassette       | Cassette       |
| HBU2 - 74           | 37      | 5x114,3             | 61 800            | 50 000                | 3,26  | Cassette       | Mono Component |
| HBU2 - 75           | 37      | 5x114,3             | 61 800            | 50 000                | 3,2   | Cassette       | Mono Component |
| HBU2 - 76           | 37,005  | 5x114,3             | 61 800            | 50 000                | 2,77  | Cassette       | Cassette       |
| HBU2 - 77           | 37,005  | 4x107,95            | 37 000 / 35 100   | 25 000 / 23 200       | 2,61  | Cassette       | No seal        |
| HBU2 - 78           | 37,005  | 5x114,3             | 61 800            | 50 000                | 2,774 | Cassette       | No seal        |
| HBU2 - 79           | 42      | 4x108               | 60 500            | 55 000                | 1,15  | Cassette       | Cassette       |
| HBU2 - 80           | 42      | 6x114,3             | –                 | –                     | 3,53  | –              | –              |
| HBU2 - 81           | 42      | 6x114,3             | –                 | –                     | 3,27  | –              | –              |
| HBU2 - 82           | 43 / 45 | 4x107               | 55 300            | 52 000                | 1,19  | Cassette       | Cassette       |
| HBU2 - 83           | 43 / 45 | 4x107               | 55 300            | 52 000                | 1,20  | Cassette       | Cassette       |
| HBU2 - 84           | 43 / 45 | 4x107               | 55 300            | 52 000                | 1,19  | Cassette       | Cassette       |
| HBU2 - 85           | 45 / 47 | 4x114               | 66 300            | 63 000                | 1,51  | Cassette       | Cassette       |
| HBU2 - 86           | 49      | 4x108               | 67 600            | 67 000                | 1,738 | Cassette       | Cassette       |

# Range

## HBU2T and HBU2TR

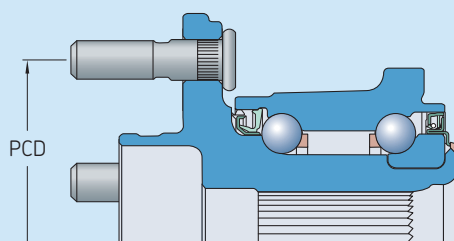


| Catalogue reference | Bore d | Bolt circle # x PCD | Basic load rating |                       | Mass | Seals          |          |
|---------------------|--------|---------------------|-------------------|-----------------------|------|----------------|----------|
|                     |        |                     | dynamic C         | static C <sub>0</sub> |      | inboard        | outboard |
| -                   | mm     |                     | N                 |                       | kg   | -              |          |
| HBU2T - 1           | 37     | 5 x 160             | 102 000           | 153 000               | 4,3  | Mono component | Cassette |
| HBU2T - 2           | 37     | 5x160               | 102 000           | 153 000               | 6,81 | Cassette       | Cassette |
| HBU2T - 3           | 37     | 5x160               | 102 000           | 153 000               | 4,5  | Mono component | Cassette |
| HBU2T - 4           | 45     | 5x97,5              | 101 000           | 150 000               | 1,3  | Cassette       | Cassette |
| HBU2T - 5           | 45     | 5x97,5              | 101 000           | 150 000               | 1,5  | Cassette       | Cassette |
| HBU2T - 6           | 45     | 5x160               | 154 000           | 200 000               | 6,69 | Cassette       | Cassette |
| HBU2T - 7           | 49     | 5x108               | 105 000           | 156 000               | 1,5  | Cassette       | Cassette |
| HBU2T - 8           | 55     | 3x126               | 145 000           | 193 000               | 2,07 | Cassette       | Cassette |
| HBU2T - 9           | 55     | 3x126               | -                 | -                     | 2,03 | Cassette       | Cassette |
| HBU2T - 10          | 55     | 3x126               | -                 | -                     | -    | Cassette       | Cassette |
| HBU2T - 11          | 55     | 3x126               | -                 | -                     | 2,07 | Cassette       | Cassette |
| HBU2T - 12          | 55     | 3x126               | -                 | -                     | -    | Cassette       | Cassette |
| HBU2T - 13          | 58     | 4x140               | 151 000           | 245 000               | 3,05 | Cassette       | Cassette |
| HBU2T - 14          | 58     | 4x140               | 151 000           | 245 000               | 3,05 | Cassette       | Cassette |
| HBU2T - 15          | 58     | 4x(74)              | 183 000           | 250 000               | 3,89 | Cassette       | Cassette |
| HBU2T - 16          |        | 3x126               | 145 000           | 193 000               | -    | Cassette       | No seal  |
| HBU2T - 17          |        | 3x127               | 145 000           | 193 000               | -    | Cassette       | No seal  |

IAM = Independent Aftermarket



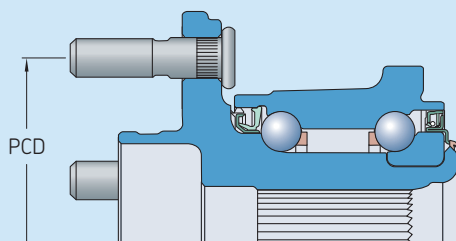
## HBU3



| Catalogue reference | Bolt circle<br># x PCD | Basic load rating |                          | Mass  | Seals          |          |
|---------------------|------------------------|-------------------|--------------------------|-------|----------------|----------|
|                     |                        | dynamic<br>C      | static<br>C <sub>0</sub> |       | inboard        | outboard |
| –                   | mm                     | N                 |                          | kg    | –              |          |
| HBU3 - 1            | 4x98                   | 34 500            | 20 800                   | 1,84  | Mono Component | Special  |
| HBU3 - 2            | 4x114,3                | 36 400            | 30 000                   | 2,73  | Sensor carrier | Cassette |
| HBU3 - 3            | 4x114,3                | 36 400            | 30 000                   | 2,73  | Cassette       | No seal  |
| HBU3 - 4            | 5x110                  | 36 400            | 30 000                   | 3,325 | Cassette       | Cassette |
| HBU3 - 5            | 5x110                  | 36 400            | 30 000                   | 3,215 | Cassette       | Cassette |
| HBU3 - 6            | 3x112                  | 39 000            | 35 500                   | 1,94  | Cassette       | Cassette |
| HBU3 - 7            | 4x112                  | 39 000            | 35 500                   | 2,05  | Cassette       | Cassette |
| HBU3 - 8            | 4x100                  | 43 600            | 29 000                   | 3     | Cup            | Cassette |
| HBU3 - 9            | 4x100                  | 43 600            | 29 000                   | 3     | Cassette       | No seal  |
| HBU3 - 10           | 4x100                  | 43 600            | 29 000                   | 2,9   | Cassette       | No seal  |
| HBU3 - 11           | 4x100                  | 43 600            | 29 000                   | 3,124 | Cassette       | No seal  |
| HBU3 - 12           | 5x110                  | 46 200            | 37 500                   | 3     | Cup            | Cassette |
| HBU3 - 13           | 5x110                  | 46 200            | 37 500                   | 3,47  | Sensor         | Cassette |
| HBU3 - 14           | 5x110                  | 46 200            | 37 500                   | 3,52  | Sensor         | Cassette |
| HBU3 - 15           | 5x110                  | 46 200            | 37 500                   | 3,5   | Sensor         | Cassette |
| HBU3 - 16           | 5x100                  | 46 200            | 37 500                   | 3,523 | Cassette       | No seal  |
| HBU3 - 17           | 5x110                  | 46 200            | 37 500                   | 3,25  | Cassette       | No seal  |
| HBU3 - 18           | 5x110                  | 46 200            | 37 500                   | 3,465 | Cassette       | No seal  |
| HBU3 - 19           | 5x110                  | 46 200            | 37 500                   | 3,504 | Cassette       | No seal  |
| HBU3 - 20           | 5x110                  | 46 200            | 37 500                   | 3,488 | No seal        | Cassette |
| HBU3 - 21           | 5x107,95               | 48 800            | 40 500                   | 3,63  | Sensor         | Special  |
| HBU3 - 22           | 5x112                  | 48 800            | 40 500                   | 3,63  | Cassette       | Cassette |
| HBU3 - 23           | 5x114,3                | 49 400            | 46 500                   | 3,51  | Cassette       | Special  |
| HBU3 - 24           | 5x114,3                | 49 400            | 46 500                   | 3,32  | Cassette       | Special  |
| HBU3 - 25           | 5x114,3                | 49 400            | 46 500                   | 3,51  | Special        | Cassette |
| HBU3 - 26           | 5x114,3                | 49 400            | 46 500                   | 3,32  | Special        | Cassette |
| HBU3 - 27           | 5x110                  | 50 700            | 42 500                   | 3,4   | Cassette       | No seal  |
| HBU3 - 28           | 5x107,95               | 50 700            | 42 500                   | 3,37  | Cassette       | No seal  |
| HBU3 - 29           | 5x107,95               | 50 700            | 42 500                   | 3,397 | Cassette       | No seal  |
| HBU3 - 30           | 5x107,95               | 50 700            | 42 500                   | 3,336 | Cassette       | No seal  |
| HBU3 - 31           | 5x107,95               | 50 700            | 42 500                   | 3,356 | Cassette       | No seal  |
| HBU3 - 32           | 5x107,95               | 50 700            | 42 500                   | 3,384 | Cassette       | No seal  |
| HBU3 - 33           | 4x100                  | 52 000            | 49 000                   | 2,57  | Cassette       | Special  |
| HBU3 - 34           | 4x100                  | 52 000            | 49 000                   | 2,74  | Cassette       | Special  |
| HBU3 - 35           | 5x110                  | 52 000            | 49 000                   | 3,06  | Cassette       | Special  |
| HBU3 - 36           | 5x110                  | 52 000            | 49 000                   | 2,85  | Cassette       | Special  |
| HBU3 - 37           | 5x110                  | 52 000            | 49 000                   | 3,08  | Cassette       | Special  |
| HBU3 - 38           | 5x114,3                | 52 000            | 49 000                   | 3,33  | Sensor carrier | Special  |
| HBU3 - 39           | 4x100                  | 52 000            | 49 000                   | 2,57  | Cassette       | Cassette |
| HBU3 - 40           | 5x110                  | 52 000            | 49 000                   | 3,059 | Cassette       | Cassette |
| HBU3 - 41           | 5x110                  | 52 000            | 49 000                   | 2,969 | Cassette       | Cassette |
| HBU3 - 42           | 5x110                  | 52 000            | 49 000                   | 3,067 | Special        | Cassette |
| HBU3 - 43           | 4x100                  | 52 000            | 49 000                   | 2,754 | Cassette       | Special  |
| HBU3 - 44           | 5x114,3                | 52 000            | 43 000                   | 3,07  | Special        | Cassette |
| HBU3 - 45           | 5x107,95               | 52 000            | 49 000                   | 3,33  | Special        | No seal  |
| HBU3 - 46           | 5x120                  | 52 700            | 45 000                   | 4,09  | Cassette       | No seal  |
| HBU3 - 47           | 4x108                  | 54 000            | 41 500                   | 2,65  | Cassette       | Special  |
| HBU3 - 48           | 5x108                  | 54 000            | 51 000                   | 2,807 | Cassette       | Cassette |
| HBU3 - 49           | 5x107,95               | 54 000            | 41 500                   | 3,33  | Cassette       | Cassette |
| HBU3 - 50           | 5x108                  | 54 000            | 51 000                   | 2,803 | Special        | Cassette |
| HBU3 - 51           | 5x114,3                | 55 300            | 52 000                   | 3,35  | Cassette       | Special  |
| HBU3 - 52           | 5x114,3                | 55 300            | 52 000                   | 2,7   | Cassette       | Special  |
| HBU3 - 53           | 5x112                  | 55 300            | 52 000                   | 3,059 | Cassette       | Cassette |
| HBU3 - 54           | 5x114,3                | 55 300            | 52 000                   | 3,35  | Special        | Cassette |

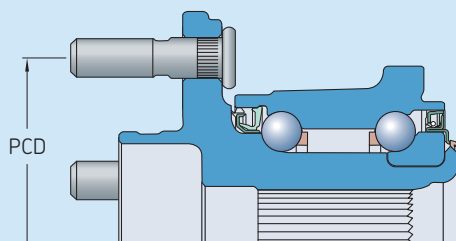
# Range

## HBU3



| Catalogue reference | Bolt circle<br># x PCD | Basic load rating |                          | Mass  | Seals    |          |
|---------------------|------------------------|-------------------|--------------------------|-------|----------|----------|
|                     |                        | dynamic<br>C      | static<br>C <sub>0</sub> |       | inboard  | outboard |
| -                   | mm                     | N                 |                          | kg    | -        |          |
| HBU3 - 55           | 5x114,3                | 55 300            | 52 000                   | 2,7   | Special  | Cassette |
| HBU3 - 56           | 5x112                  | 55 300            | 45 500                   | 2,937 | Cassette | No seal  |
| HBU3 - 57           | 5x110                  | 55 300            | 52 000                   | 3,2   | Cassette | Cassette |
| HBU3 - 58           | 5x110                  | 55 300            | 52 000                   | 3,3   | Cassette | Cassette |
| HBU3 - 59           | 5x110                  | 55 300            | 52 000                   | 3,1   | Cassette | Cassette |
| HBU3 - 60           | 5x110                  | 55 300            | 52 000                   | 3,2   | Cassette | Cassette |
| HBU3 - 61           | 5x112                  | 60 500            | 55 000                   | 3,268 | Cassette | Special  |
| HBU3 - 62           | 5x107,95               | 61 800            | 57 000                   | 4,2   | Sensor   | Cassette |
| HBU3 - 63           | 5x107,95               | 61 800            | 57 000                   | 3,5   | Sensor   | Cassette |
| HBU3 - 64           | 5x114,3                | 61 800            | 45 000                   | 3,7   | Cassette | Special  |
| HBU3 - 65           | 4x112                  | 61 800            | 45 000                   | 3,8   | Cassette | Cassette |
| HBU3 - 66           | 5x107,95               | 61 800            | 57 000                   | 3,4   | Cassette | Cassette |
| HBU3 - 67           | 5x107,95               | 61 800            | 57 000                   | 3,5   | Cassette | No seal  |
| HBU3 - 68           | 5x107,95               | 61 800            | 57 000                   | 4,1   | Cassette | No seal  |
| HBU3 - 69           | 5x107,95               | 61 800            | 57 000                   | 4,17  | Cassette | No seal  |
| HBU3 - 70           | 5x107,95               | 61 800            | 57 000                   | 4,2   | Cassette | No seal  |
| HBU3 - 71           | 5x107,95               | 61 800            | 57 000                   | 3,7   | Cassette | No seal  |
| HBU3 - 72           | 5x107,95               | 61 800            | 57 000                   | 3,7   | Cassette | No seal  |
| HBU3 - 73           | 5x107,95               | 61 800            | 57 000                   | 3,8   | Cassette | Cassette |
| HBU3 - 74           | 5x107,95               | 61 800            | 57 000                   | 3,8   | Cassette | No seal  |
| HBU3 - 75           | 5x107,95               | 61 800            | 57 000                   | 3,6   | Cassette | Cassette |
| HBU3 - 76           | 5x107,95               | 61 800            | 57 000                   | 3,6   | Cassette | Cassette |
| HBU3 - 77           | 5x139,7                | 61 800            | 45 000                   | 6,58  | Cassette | Cassette |
| HBU3 - 78           | 5x139,7                | 61 800            | 45 000                   | 6,62  | Cassette | Cassette |
| HBU3 - 79           | 5x139,7                | 61 800            | 45 000                   | 6,48  | Cassette | Cassette |
| HBU3 - 80           | 6x110                  | 61 800            | 58 500                   | 2,78  | Cassette | Cassette |
| HBU3 - 81           | 5x108                  | 61 800            | 57 000                   | 3,25  | Cassette | Cassette |
| HBU3 - 82           | 5x108                  | 61 800            | 57 000                   | 3,239 | Cassette | Cassette |
| HBU3 - 83           | 5x108                  | 61 800            | 57 000                   | 3,245 | Cassette | Cassette |
| HBU3 - 84           | 5x108                  | 61 800            | 57 000                   | 3,161 | Cassette | Cassette |
| HBU3 - 85           | 4x112                  | 62 400            | 61 000                   | 3,495 | Cassette | Cassette |
| HBU3 - 86           | 5x112                  | 62 400            | 61 000                   | 3,488 | Cassette | Cassette |
| HBU3 - 87           | 5x108                  | 63 700            | 58 500                   | 3,4   | Cassette | Cassette |
| HBU3 - 88           | 5x108                  | 63 700            | 58 500                   | 3,5   | Cassette | Cassette |
| HBU3 - 89           | 5x108                  | 63 700            | 58 500                   | 3,5   | Cassette | Cassette |
| HBU3 - 90           | 5x108                  | 63 700            | 58 500                   | 3,4   | Cassette | Cassette |
| HBU3 - 91           | 5x108                  | 63 700            | 58 500                   | 3,5   | Cassette | Cassette |
| HBU3 - 92           | 5x108                  | 63 700            | 58 500                   | 3,5   | Cassette | Cassette |
| HBU3 - 93           | 5x108                  | 63 700            | 58 500                   | 3,5   | Cassette | Cassette |
| HBU3 - 94           | 5x114,3                | 63 700            | 58 500                   | 3,39  | Special  | Cassette |
| HBU3 - 95           | 5x107,95               | 63 700            | 58 500                   | 3,4   | Cassette | No seal  |
| HBU3 - 96           | 5x107,95               | 63 700            | 58 500                   | 4     | Cassette | No seal  |
| HBU3 - 97           | 5x107,95               | 63 700            | 58 500                   | 4     | Cassette | No seal  |
| HBU3 - 98           | 5x107,95               | 63 700            | 58 500                   | 3,3   | Cassette | Cassette |
| HBU3 - 99           | 5x107,95               | 63 700            | 58 500                   | 3,6   | Cassette | Cassette |
| HBU3 - 100          | 5x107,95               | 63 700            | 58 500                   | 3,6   | Cassette | Cassette |
| HBU3 - 101          | 5x107,95               | 63 700            | 58 500                   | 3,7   | Cassette | No seal  |
| HBU3 - 102          | 5x107,95               | 63 700            | 58 500                   | 3,8   | Cassette | Cassette |
| HBU3 - 103          | 5x107,95               | 63 700            | 58 500                   | 4     | No seal  | Cassette |
| HBU3 - 104          | 5x107,95               | 63 700            | 58 500                   | 4     | No seal  | Cassette |
| HBU3 - 105          | 5x107,95               | 63 700            | 58 500                   | 3,6   | Cassette | Cassette |
| HBU3 - 106          | 5x107,95               | 63 700            | 58 500                   | 3,4   | No seal  | Cassette |
| HBU3 - 107          | 5x107,95               | 63 700            | 58 500                   | 4     | No seal  | Cassette |
| HBU3 - 108          | 5x107,95               | 63 700            | 58 500                   | 3,8   | Cassette | Cassette |

## HBU3

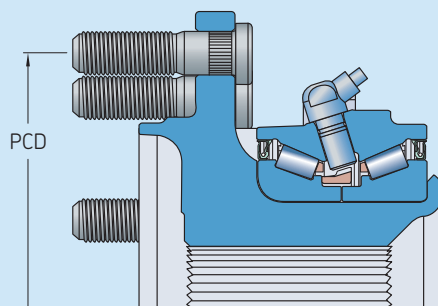


| Catalogue reference | Bolt circle<br># x PCD | Basic load rating |                          | Mass  | Seals          |          |
|---------------------|------------------------|-------------------|--------------------------|-------|----------------|----------|
|                     |                        | dynamic<br>C      | static<br>C <sub>0</sub> |       | inboard        | outboard |
| –                   | mm                     | N                 |                          | kg    | –              |          |
| HBU3 - 109          | 5x107,95               | 63 700            | 58 500                   | 3,9   | Cassette       | Cassette |
| HBU3 - 110          | 5x114                  | 65 000            | 62 000                   | 3,2   | Cassette       | Special  |
| HBU3 - 111          | 5x114                  | 65 000            | 62 000                   | 3,06  | Cassette       | Special  |
| HBU3 - 112          | 5x114,3                | 66 300            | 58 500                   | 3,27  | Cassette       | Special  |
| HBU3 - 113          | 4x100                  | 66 300            | 58 500                   | 2,744 | Cassette       | Cassette |
| HBU3 - 114          | 5x114                  | 66 300            | 58 500                   | 3,27  | Cassette       | Special  |
| HBU3 - 115          | 5x120                  | 67 600            | 67 000                   | 3,52  | Special        | No seal  |
| HBU3 - 116          | 5x116                  | 67 600            | 67 000                   | 3,54  | Special        | No seal  |
| HBU3 - 117          | 5x112                  | 67 600            | 67 000                   | 3,83  | No seal        | Special  |
| HBU3 - 118          | 5x112                  | 67 600            | 67 000                   | 3,78  | Cassette       | Special  |
| HBU3 - 119          | 5x112                  | 67 600            | 67 000                   | 3,77  | Cup            | Special  |
| HBU3 - 120          | 5x112                  | 67 600            | 67 000                   | 3,61  | Cassette       | Cassette |
| HBU3 - 121          | 5x114,3                | 68 500            | 46 000                   | 4,67  | Sensor         | Cassette |
| HBU3 - 122          | 5x121,5                | 72 800            | 69 500                   | 4,284 | Cup            | Special  |
| HBU3 - 123          | 6x132                  | 74 100            | 71 000                   | 4,87  | Cassette       | Cassette |
| HBU3 - 124          | 5x120,56               | –                 | –                        | 4,68  | Cassette       | Cassette |
| HBU3 - 125          | 5x120,56               | –                 | –                        | 4,67  | Cassette       | Cassette |
| HBU3 - 126          | 5x120,56               | –                 | –                        | 4,5   | Cassette       | Cassette |
| HBU3 - 127          | 5x114,3                | –                 | –                        | 5,23  | Cassette       | Cassette |
| HBU3 - 128          | 5x114,3                | –                 | –                        | –     | Cassette       | Cassette |
| HBU3 - 129          | 5x114,3                | –                 | –                        | –     | Cassette       | Cassette |
| HBU3 - 130          | 5x114,3                | –                 | –                        | –     | Cassette       | Cassette |
| HBU3 - 131          | 5x114,3                | –                 | –                        | –     | Cassette       | Cassette |
| HBU3 - 132          | 5x114,3                | –                 | –                        | –     | Cassette       | Cassette |
| HBU3 - 133          | 6x127                  | 36 400 / 34 500   | 28 116 / 26 054          | 4,44  | Cassette       | Cassette |
| HBU3 - 134          | 6x120,65               | 36 400 / 34 500   | 28 116 / 26 054          | 4,26  | Cassette       | Cassette |
| HBU3 - 135          | 3x120,65               | 36 400 / 34 500   | 28 116 / 26 054          | 4,44  | Cassette       | Cassette |
| HBU3 - 136          | 3x120,65               | 36 400 / 34 500   | 28 116 / 26 054          | 4,26  | Cassette       | Cassette |
| HBU3 - 137          | 5x115                  | 37 700 / 36 400   | 33 500 / 30 000          | 3,74  | Sensor         | Special  |
| HBU3 - 138          | 6x115                  | 37 700 / 36 400   | 33 500 / 30 000          | 3,98  | No seal        | Cassette |
| HBU3 - 139          | 6x120,65               | 37 700 / 36 400   | 33 500 / 30 000          | 3,9   | No seal        | Cassette |
| HBU3 - 140          | 6x120                  | 37 700 / 36 400   | 33 500 / 30 000          | 4,3   | Cassette       | Cassette |
| HBU3 - 141          | 6x130                  | 37 700 / 36 400   | 33 500 / 30 000          | 4,32  | Cassette       | Cassette |
| HBU3 - 142          | 6x120,65               | 37 700 / 36 400   | 33 500 / 30 000          | 3,923 | Cassette       | Special  |
| HBU3 - 143          | 6x120,65               | 37 700 / 36 400   | 33 500 / 30 000          | 3,97  | Cup            | Special  |
| HBU3 - 144          | 5x115                  | 37 700 / 36 400   | 33 500 / 30 000          | 3,81  | Cassette       | Cassette |
| HBU3 - 145          | 5x115                  | 37 700 / 36 400   | 33 500 / 30 000          | 3,95  | No seal        | Cassette |
| HBU3 - 146          | 6x115                  | 37 700 / 36 400   | 33 500 / 30 000          | 3,8   | No seal        | Cassette |
| HBU3 - 147          | 3x116                  | 37 700 / 36 400   | 33 500 / 30 000          | 3,81  | Cassette       | Cassette |
| HBU3 - 148          | 3x117                  | 37 700 / 36 400   | 33 500 / 30 000          | 3,95  | Cassette       | Cassette |
| HBU3 - 149          | 3x116                  | 37 700 / 36 400   | 33 500 / 30 000          | 3,8   | Cassette       | Cassette |
| HBU3 - 150          | 6x115                  | 37 700 / 36 400   | 33 500 / 30 000          | 3,9   | No seal        | Cassette |
| HBU3 - 151          | 6x114,3                | 39 700 / 44 900   | 39 700 / 44 900          | 4,67  | No seal        | Cassette |
| HBU3 - 152          | 6x114,3                | 41 600 / 40 300   | 33 500 / 31 000          | 3,9   | Cassette       | Special  |
| HBU3 - 153          | 5x120                  | 41 600 / 40 300   | 33 500 / 31 000          | 4,024 | Cassette       | Cassette |
| HBU3 - 154          | 5x120                  | 41 600 / 40 300   | 33 500 / 31 000          | 4,069 | Cassette       | Cassette |
| HBU3 - 155          | 6x114,3                | 41 600 / 40 300   | 33 500 / 31 000          | 3,9   | Cassette       | Cassette |
| HBU3 - 156          | 5x114,3                | 44 900 / 39 700   | 31 000 / 26 000          | 4,6   | Sensor         | Special  |
| HBU3 - 157          | 5x114,3                | 44 900 / 44 900   | 31 000 / 31 000          | 4,75  | No seal        | Cassette |
| HBU3 - 158          | 6x114,3                | 44 900 / 44 900   | 31 000 / 31 000          | 4,69  | No seal        | Cassette |
| HBU3 - 159          | 4x98                   | 34 500            | 20 800                   | 1,84  | Mono Component | Cassette |
| HBU3 - 160          | 4x98                   | 34 500            | 20 800                   | 1,84  | Mono Component |          |

IAM = Independent Aftermarket

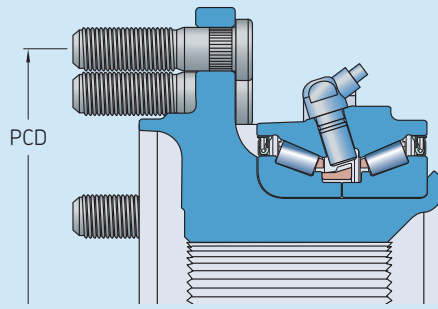
# Range

## HBU3.2T



| Catalogue reference | Bolt circle<br># x PCD | Basic load rating |                          | Seals    |          |
|---------------------|------------------------|-------------------|--------------------------|----------|----------|
|                     |                        | dynamic<br>C      | static<br>C <sub>0</sub> | inboard  | outboard |
| -                   | mm                     | N                 |                          | -        |          |
| HBU3.2T - 1         | 6x135                  | 119 000           | 170 000                  | Cassette | Cassette |
| HBU3.2T - 2         | 6x135                  | 119 000           | 170 000                  | Cassette | Cassette |
| HBU3.2T - 3         | 7x150                  | 119 000           | 170 000                  | Cassette | Cassette |
| HBU3.2T - 4         | 6x135                  | 119 000           | 170 000                  | Cassette | Cassette |
| HBU3.2T - 5         | 6x135                  | 119 000           | 170 000                  | No Seal  | Cassette |
| HBU3.2T - 6         | 6x135                  | 119 000           | 170 000                  | No Seal  | Cassette |
| HBU3.2T - 7         | 6x135                  | 119 000           | 170 000                  | Cassette | Cassette |
| HBU3.2T - 8         | 6x135                  | 119 000           | 170 000                  | No Seal  | Cassette |
| HBU3.2T - 9         | 6x139.7                | 145 000           | 193 000                  | No Seal  | Cassette |
| HBU3.2T - 10        | 5x139.7                | 145 000           | 193 000                  | Cassette | Cassette |
| HBU3.2T - 11        | 8x165.1                | 151 000           | 245 000                  | No Seal  | Cassette |
| HBU3.2T - 12        | 8x165.1                | 151 000           | 245 000                  | No Seal  | Cassette |
| HBU3.2T - 13        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 14        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 15        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 16        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 17        | 8x165.1                | 151 000           | 245 000                  | No Seal  | Cassette |
| HBU3.2T - 18        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 19        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 20        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 21        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 22        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 23        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 24        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 25        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 26        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 27        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 28        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 29        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 30        | 8x165.1                | 151 000           | 245 000                  | No Seal  | Cassette |
| HBU3.2T - 31        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 32        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 33        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 34        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 35        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 36        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 37        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 38        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 39        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 40        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 41        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 42        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 43        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 44        | 8x170                  | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 45        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 46        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 47        | 8x165.1                | 151 000           | 245 000                  | Cassette | Cassette |
| HBU3.2T - 48        | 8x165.1                | 204 000           | 280 000                  | Cassette | Cassette |
| HBU3.2T - 49        | 8x170                  | -                 | -                        | Cassette | Cassette |
| HBU3.2T - 50        | 4x165.1                | -                 | -                        | No Seal  | Cassette |
| HBU3.2T - 51        | 5x139.7                | -                 | -                        | Cassette | Cassette |

HBU3.2T



| Catalogue reference | Bolt circle # x PCD | Basic load rating |                       | Seals    |          |
|---------------------|---------------------|-------------------|-----------------------|----------|----------|
|                     |                     | dynamic C         | static C <sub>0</sub> | inboard  | outboard |
| –                   | mm                  | N                 |                       | –        |          |
| HBU3.2T - 52        | 5x139.7             | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 53        | 7x150               | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 54        | 5x135               | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 55        | 5x135               | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 56        | 5x135               | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 57        | 5x135               | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 58        | 7x150               | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 59        | 5x135               | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 60        | 5x135               | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 61        | 5x139.7             | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 62        | 5x139.7             | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 63        | 5x139.7             | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 64        | 5x139.7             | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 65        | 6x139.7             | –                 | –                     | Cassette | Cassette |
| HBU3.2T - 66        | 6x139.7             | –                 | –                     | Cassette | Cassette |

IAM = Independent Aftermarket

# Appendix: Agriculture unit



## Existing HBU solutions

| Catalogue reference | Principal dimensions |            |    | Width incl. shaft | Outer ring bolt circle diameter | Contact angle | Basic load ratings |                        |
|---------------------|----------------------|------------|----|-------------------|---------------------------------|---------------|--------------------|------------------------|
|                     | d                    | D (flange) | B  |                   |                                 |               | static C           | dynamic C <sub>0</sub> |
| –                   | mm                   |            |    |                   |                                 | °             | N                  |                        |
| <b>HBU2 - 13</b>    | 30                   | 117        | 60 | -108              | 98                              | 32            | 28 100 / 29 600    | 15 000 / 16 600        |

## Application description

Developed for independent tillage disc applications, SKF Agri Hub units offer proven performance for disc harrow machines or general soil preparation machines. Based on the HBU2 design, the Agri Hub unit is fixed on the machine arm with a shaft and nut, while the disc is fixed on the outer ring with four screws. Two Agri Hub versions are available:

- Version 1, including fixation shaft (plug-and-play concept)
- Version 2, without shaft

The external portion of the outer ring is coated for corrosion resistance. Agri Hub types integrate the SKF Mudblock seal, a heavy-duty R-Safe seal specially developed for agricultural environments.

### Typical application conditions

- Shaft diameter: 30 mm
- Rotating speed: from 100 to 350 r/min
- Loading: maximum 3 000 N (applied on disc)
- Disc diameter: from 300 to 800 mm
- Temperature: from -40 to +50 °C

### Mounting conditions

- Axial clearance after mounting: preload

## Application benefits

- High stiffness
- Axial compactness
- High sealing efficiency
- Fewer suppliers to monitor
- Fewer items to handle

## Quantified benefits

### OEMs

- Reduced cost of management by 30%

### End-users

- Increased farm productivity by 150% (→ **diagram 1**)
- Reduced cost of ownership by 30% (→ **diagram 2**)

### Society

- Saving of 200 kg of grease per machine



| Axial clearance<br>(under ±100 N) | Seal type<br>arm side | disc side              | Grease<br>type | quantity               | shaft thread |
|-----------------------------------|-----------------------|------------------------|----------------|------------------------|--------------|
| μm                                |                       |                        |                |                        |              |
| 0                                 | SKF Mudblock seal     | Plastic cover + O-ring | GHG            | Special grease filling | M22          |

Diagram 1

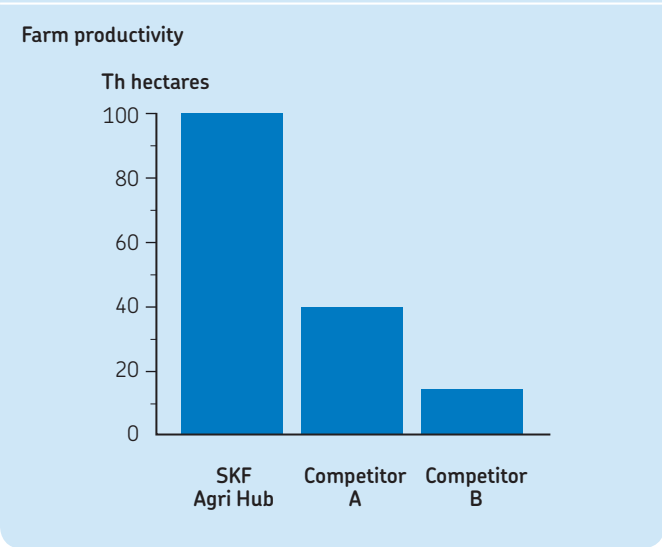
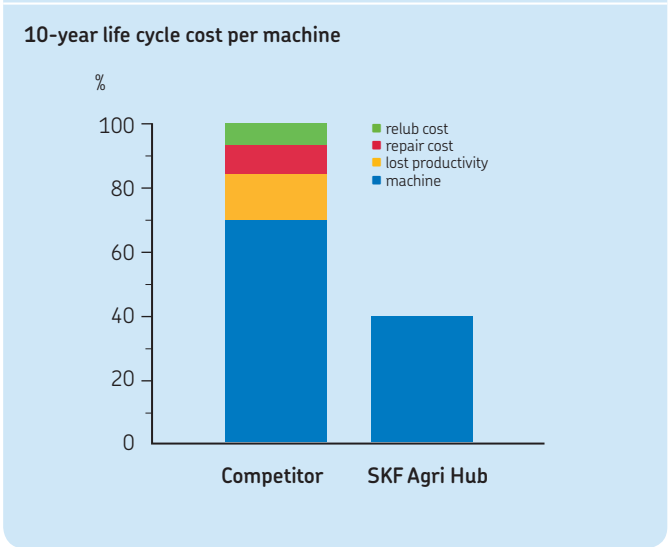


Diagram 2



# Appendix: Engine unit



## Selected unit

| Catalogue reference | Principal dimensions |    |    | Basic load ratings |                          | Axial clearance | Sealing          | Lubrication |
|---------------------|----------------------|----|----|--------------------|--------------------------|-----------------|------------------|-------------|
|                     | d                    | D  | B  | dynamic<br>C       | static<br>C <sub>0</sub> |                 |                  |             |
| –                   | mm                   |    |    | N                  |                          | µm              | –                | g           |
| <b>HBU1T - 12</b>   | 35                   | 65 | 35 | 68 200             | 95 700                   | 135–165         | LS (2 lips) HNBR | GWZ         |
| <b>HBU1 - 20</b>    | 35                   | 64 | 37 | 33 200             | 30 000                   | 50–70           | LS (2 lips) NBR  | GXK         |

## Application description

Used within an electronically/mechanically controlled viscous clutch, an engine fan hub unit enables the belt-driven fan pulley. Current fan hubs are either mounted directly onto engine block or via spacer or bracket.

Input/drive speed is normally higher than engine speed. The ratio depends on vehicle application – the same fan hub can be fitted with different types of fans, but also with a spacer in between pulley and fan clutch flange.

Specific HBU1 units – both ball and tapered – have been developed for this application, but even better performance and easier assembly is possible with an HBU2/3 that integrates engine or pulley interfaces (HBU2) or both (HBU3).

## Operating conditions

- Ambient air temperature during normal operation: from +80 to +130 °C (max 180 °C)
- Ambient air temperature at start-up: from –30 to +45 °C
- Heat transfer from engine
- Input speeds:
  - Normal operation from 1 500 to 3 000 r/min
  - Engine and retarder brake operation at 3 600 r/min
  - Overspeed condition (e.g. wrong gear shifting) at 3 650 r/min for limited duration
- Fan speed depends on cooling demand and driving condition
- Vibrations on engine front:
  - Longitudinal ±6 g
  - Lateral ±3 g
  - Vertical ±5,5 g

## Application benefits

- Specific seal design for grease leakage prevention and friction reduction
- Better cleanliness
- Increased service life
- No adjustment required
- Flanged units for easier assembly operation
- Higher stiffness compared to DGBB+ACBB
- Special high temperature capability with FKM seal material and/or PEEK cage material
- Compatible with special grease



# Appendix: Fitness unit



## Application description

The Wave fitness machine was originally equipped with a two-paired TRB (32008 X) bearing arrangement supporting both main arms. However, it was apparent that this arrangement was prone to contamination and corrosion in this application.

To solve the problem, SKF suggested replacing the two-bearing arrangement with a single HBU1T with integrated automotive cassette seal. By eliminating the contamination issues, the solution would extend bearing and machine service life. After successfully performing a 3-million cycle test, the OEM achieved technical homologation.

## Operating conditions

- Shaft diameter: 40 mm
- Rotating speed: oscillation at variable speed 40 to 100 r/min
- Loading:  $M \times y = 624 \text{ Nm}$  equivalent to 1 200 N at 520 mm from bearing centre line
- Temperature: 40 to 50 °C

## Selected unit

- $d = 40 \text{ mm}$
- $D = 73 \text{ mm}$
- $B = 55 \text{ mm}$
- $C = 103\,000 \text{ N}$
- $C_0 = 153\,000 \text{ N}$

## Application benefits

- Superior sealing thanks to automotive cassette seal
- Just one unit with integrated seals and grease to order and store
- Better cleanliness
- Increased service life
- No adjustment required

# Appendix: Lift winch unit



## Application description

Working closely with the OEM, SKF replaced a two-paired (7207 BECBP) bearing arrangement with a single HBU1 unit. Mounted on the input shaft of the worm gear on the motor side, the HBU1 has been tailored for this application to meet requirements.

This particular HBU1 arrangement is equipped with two integrated automotive seals, which makes it possible to remove the “Nilos” ring on the left side and the garter seal on the right. Customer homologation has been achieved following successful test results; during production the HBU1 will be mounted on the medium-size lift winches.

## Operating conditions

- Shaft diameter: 35 mm
- Rotating speed: 1 500 r/min
- Loading:  $F_a = \pm 1\ 600\ \text{N}$ ,  $F_r = 500\ \text{N}$
- Temperature: 80 °C

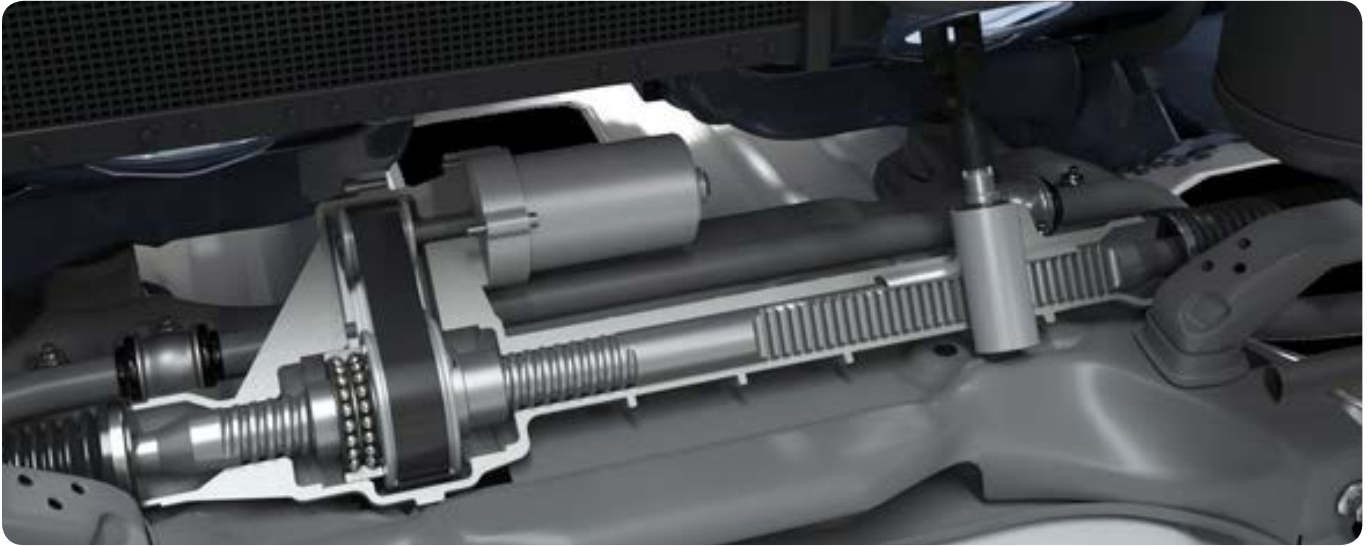
## Selected unit:

- $d = 35\ \text{mm}$
- $D = 72\ \text{mm}$
- $B = 33\ \text{mm}$
- $C = 46\ 200\ \text{N}$
- $Co = 40\ 000\ \text{N}$

## Application benefits

- Better cleanliness
- Increased service life
- Higher stiffness
- Reduced costs for customer

# Appendix: Electric power-assisted steering (EPAS) unit



## Application description

- Electric power-assisted steering (EPAS) uses an electric motor to reduce steering effort, assisting the driver by making it easy to steer the wheels.
- This electro-mechanical technology has been developed to reduce fuel consumption and CO<sub>2</sub> emissions, compared to hydraulic power-assisted technology in the past.
- There are three main types of electro-mechanical steering systems, depending on equipment installation and power to transmit:
  - 1 Column EPAS (light to medium vehicle)
  - 2 Dual-Pinion EPAS (medium segment vehicle)
  - 3 Rack EPAS (medium to high segment vehicle)

The Rack EPAS unit is composed of a split rack including a circumferential ball screw. The ball nut driven by an electric motor via a belt is supported by the main bearing.

For this solution previously, four point contact ball bearings (4PCBB) were used, while today a trend to more robustness can be seen on the market.

Steering bearing unit, based on HBU1, can be used alternatively, showing several benefits compared to previously used bearing technology.

### Operating conditions

- Rotating speed: up to 2 000 r/min (varying with different steering maneuvers)
- Loading: combined, but mainly axial, up to 20 kN rack force
- Temperature range: -40 up to 120 °C

### Selected unit HBU1-119 or HBU1-120

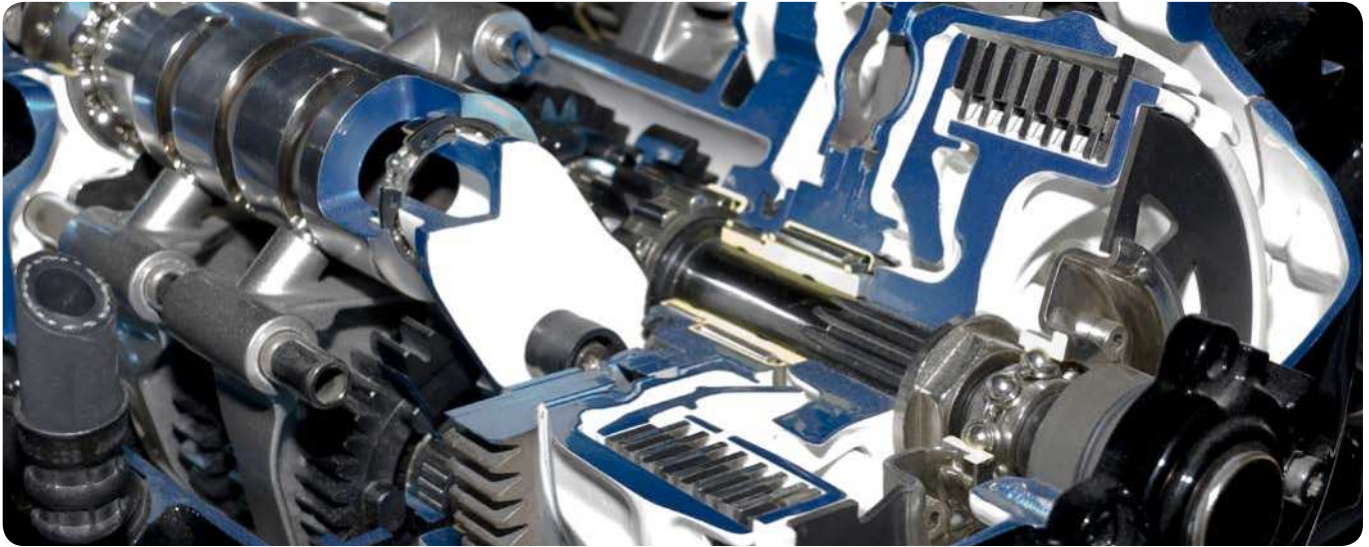
- d= 50 mm or 52 mm
- D= 90 mm
- B= 24 mm
- C= 37 000 N
- CO= 42 500 N
- Sealing: unsealed
- Lubrication: synthetic grease, special lithium soap

### Application benefits

Compared to 4PCBB following benefits:

- No axial and radial clearance / robust versus noise and drivability
- Improved friction torque behavior under high axial loads and misalignment
- Increased carrying capacity and misuse resistance

# Appendix: Transmission unit



## Application description

Pinion shafts in car axle gearboxes have traditionally been supported by two single tapered roller bearings adjusted with axial preload in an O-arrangement. To meet new requirements for increased bearing stiffness and reduced friction, SKF developed the innovative SKF Hybrid Pinion Unit. Consisting of a tapered roller bearing and an angular contact ball bearing, the SKF Hybrid Pinion Unit (HyPU) replaces the former TRB unit.

## Operating conditions

- Shaft diameter: from 41,3 to 41,313 mm
- Rotating speed: up to 6 500 r/min
- Loading: combined loading
- Temperature: from -40 to +150 °C

## Selected unit

- $d = 41,285$  mm
- $D = 85,5 / 91,8$  mm
- $B = 82$  mm
- $C = 85\,800$  N (tapered roller bearing) and  $36\,500$  N (angular contact ball bearing)
- $C_o = 118\,000$  N (tapered roller bearing) and  $26\,000$  N (angular contact ball bearing)

## Application benefits

- Improved system stiffness reduces wear and noise in the gear mesh point
- Reduced power loss results in lower operating temperature
- Optimized raceway profiles and more reliable lubrication enhance bearing service life

# Appendix: Heavy duty actuators unit



## Application description

Responsible for keeping solar panels moving and aligned with the sun, the SKF Solar Linear Actuator is a linear electromechanical actuator that must manage dynamic loads up to 12 000 N and static loads up to 60 000 N.

Rather than using a bearing developed for industrial applications, the SKF Solar Linear Actuator relies on a preloaded HBU1 bearing unit. The shaft can be supported with various bearing types; in many cases more than one bearing is necessary to hold the external axial load and to provide radial support for the rotating part.

- D = 60 mm
- B = 45 mm
- C = 78 100 N
- Co = 104 000 N

## Application benefits

- Lubricated for life
- Easy to assembly in series production
- Able to carry both axial and radial load
- Cost-effective thanks to automotive mass production volumes

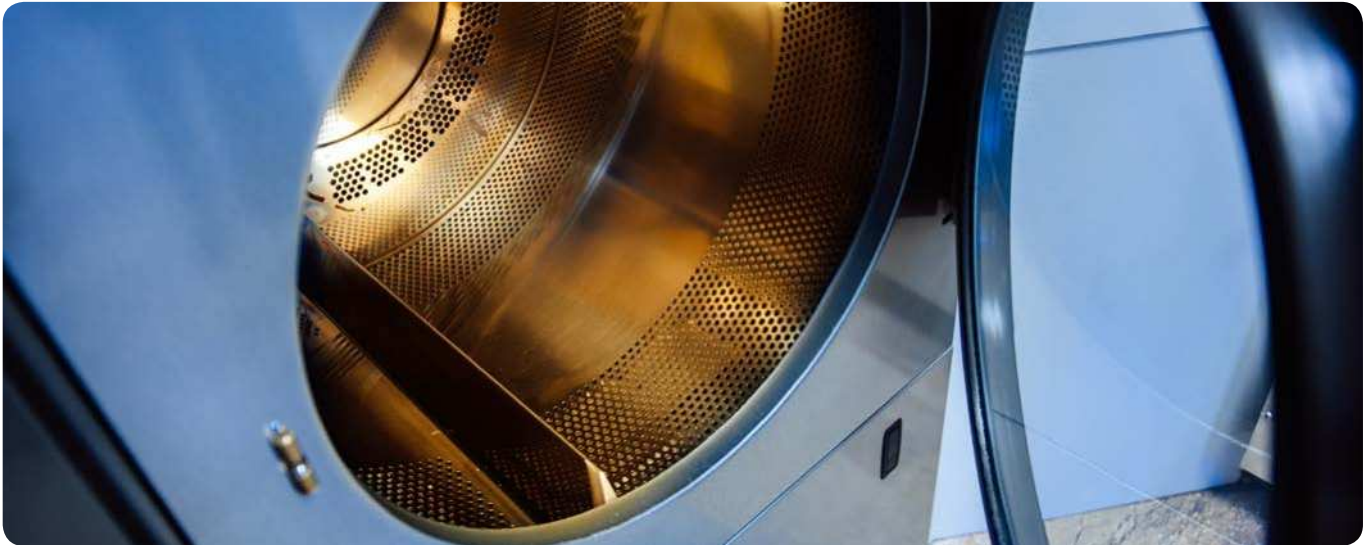
## Selected unit: HBU1T - 3

- d = 25 mm
- D = 60 mm
- B = 45 mm

## Operating conditions

- Shaft diameter: 25 mm
- Rotating speed: 30 r/min
- Loading: mainly axial load (12 000 N dynamic and 60 000 N static)
- Operating temperature range: -30 to +60 °C

# Appendix: Washing machine unit



## Existing HBU solutions

| Catalogue reference | Principal dimensions |    |    | Contact angle | Basic load ratings |                       | Axial clearance | Seal type (both sides) | Grease type | Grease quantity (% free volume) |
|---------------------|----------------------|----|----|---------------|--------------------|-----------------------|-----------------|------------------------|-------------|---------------------------------|
|                     | d                    | D  | B  |               | dynamic C          | static C <sub>0</sub> |                 |                        |             |                                 |
| –                   | mm                   |    |    | °             | N                  |                       | µm              | –                      |             |                                 |
| <b>HBU1 - 3</b>     | 30                   | 60 | 37 | 32            | 37 700             | 26 500                | 20–40           | Land riding            | GJN         | 30–40                           |
| <b>HBU1 - 32</b>    | 35                   | 68 | 37 | 32            | 44 900             | 32 000                | 20–40           | Land riding            | GJN         | 30–40                           |

## Application description

Drums of domestic front-loading washing machines are generally supported by two deep groove ball bearings mounted on the shaft attached to the drum and in the tank housing. A garter-type shaft seal mounted in the housing slides on the shaft to prevent water from entering the bearings.

The HBU1 can replace the two-bearing arrangement on some medium- and top-of-the-range washing machine ratings.

## Application benefits

- Higher stiffness
- More axial compactness
- Greater carrying capacity
- Fewer suppliers to monitor
- Fewer items to handle/assemble

## Typical application conditions

- Shaft diameter: 30–40 mm
- Rotating speed: up to 1 400 r/min
- Loading: moderate to high
- Temperature: up to 90 °C



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