

**Flanged housing units  
for large electrical machinery**

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# Rotor bearing arrangements in large electrical machinery with flanged housing units

There is nowadays an increasing requirement for high availability of industrial drive components. Schaeffler Group Industrial offers integrated rolling bearing solutions for manufacturers of large electrical machinery. Innovative products that were developed in-house in accordance with customer-specific perspectives and which offer cost-effective solutions.

For rotor bearing arrangements in large electrical machinery with end shields, FAG manufactures complete flanged housing units of series FERS, FERB, FKC and FKB.

- **Designs FERS, FERB**

Flanged housing units with integrated cylindrical roller bearings or a combination of one cylindrical roller bearing and one deep groove ball bearing. Special designs include flanged housing units fitted with angular contact or deep groove ball bearings.

- **Design FKC**

Flanged housing unit fitted with a radial spherical roller bearing

- **Design FKB**

Flanged housing unit fitted with one axial spherical roller bearing and one radial deep groove ball bearing

FAG flanged housing units offer a wide range of advantages in the design, production, assembly and maintenance of large electrical machinery. The design of the end shields is significantly simplified, resulting in considerable reductions in the construction work required on large motor housings. Thanks to their highly developed design, these bearing solutions are extremely easy to maintain.

The maximum possible flexibility in use is facilitated by, for example, a wide range of sealing variants corresponding to all IP codes. In addition, the lubrication concept can be individually matched to the specific application engineering requirements.

This provides our customers with the maximum freedom to shape their own developments. FAG guarantees the highest quality standards in order to fulfil the requirements of our customers. FAG flanged housing units are manufactured in Germany to the highest quality standards and to proven FAG precision.

A team of experienced engineers is available worldwide at any time to offer advice.

**Figure 1:** FAG flanged housing units



## Flanged housing units FERB, FERS

The rotor bearing arrangement must be matched to the particular operating and ambient conditions in electrical machinery with end shields.

Depending on whether the rotor axis is arranged horizontally (type B) or vertically (type V), different bearing loads must be taken into consideration. The lubrication and sealing must be configured such that the bearings are neither undersupplied nor oversupplied with lubricant in any operating status. Due to the large mass of the housing, the aim must be to achieve simple mounting of the bearing arrangements. These conditions and requirements are fulfilled by the FAG flanged housing units (Figure 2).

Flanged housing units and accessories are made from spheroidal graphite cast iron GGG-50 or, in exceptional cases, from flake graphite cast iron (GG) or cast steel (GS).

The product range includes a narrow housing type (FERS) for one bearing and a wide housing type (FERB) for two bearings.

Both types are lubricated with grease; relubrication is possible (for lubricators, see page 22).

The grease valve prevents overlubrication of the bearings. Excess grease can be removed via a collector in the lower section of the housing by means of a slide.

Special designs with a container for collecting used grease are also in existence or are adapted to the appropriate customer requirements.

FERS and FERB housings are designed according to the modular concept, i. e. the labyrinth ring, cover, spacer ring, grease valve and the shaft nut for locating the bearings are matched to each other.

The shaft nut also forms a labyrinth ring.

It has a slot on one part of the circumference and is clamped to the shaft thread by means of a cap screw – it is thus secured against rotation.

The flanged housing units are normally mounted externally on the end shield. They are designed in such a way, however, that they can be flange mounted from the inside if necessary.

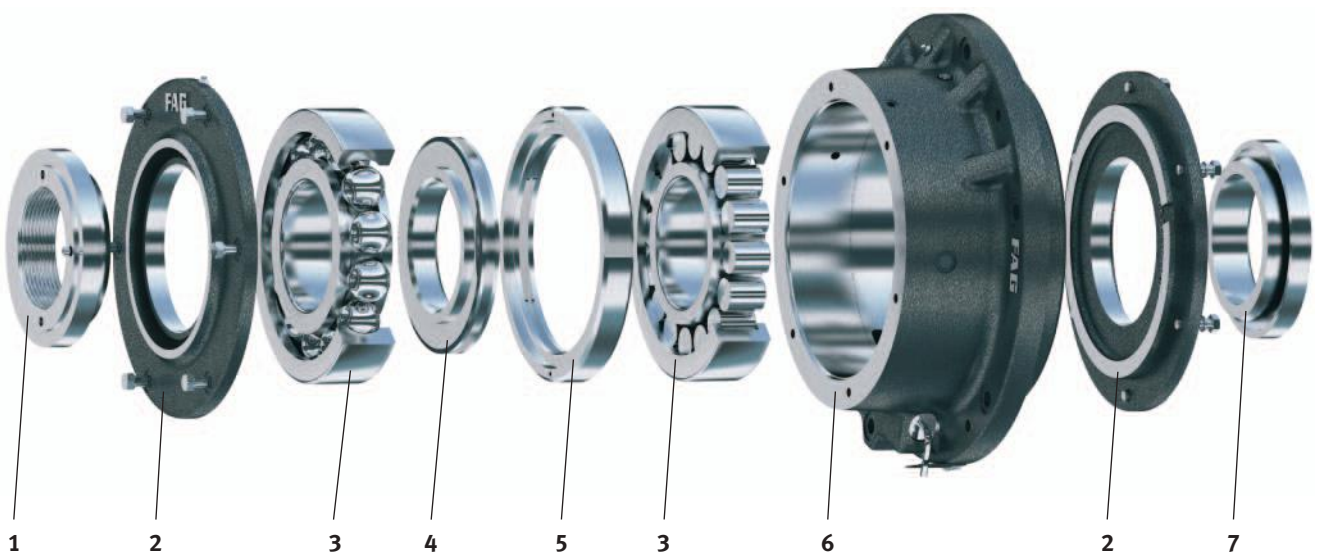
Apart from the correct arrangement of the bearings, it is only necessary to ensure that the labyrinth ring ring is located on the inside and the shaft nut is located on the outside.

The grease feed lines are laid to the outside.

A precondition for fitting from the inside is that there is sufficient space in the motor housing for the flanged housing units and the grease removal slide is accessible.

**Figure 2:** Individual parts of the FAG flanged housing unit FERB

1 Shaft nut, 2 Cover, 3 Bearing, 4 Grease valve, 5 Spacer ring, 6 Housing, 7 Labyrinth ring



# Locating/non-locating bearing design

## Locating bearing arrangement

The wide FERB housings are normally fitted with a deep groove ball bearing and a cylindrical roller bearing; this arrangement forms the locating bearing design of the flanged housing unit (Figure 3).

Other bearing designs can be fitted if necessary. However, this should only be undertaken in consultation with the relevant Application Engineering department.

## Non-locating bearing arrangement

The narrow housings FERS form, when fitted with the cylindrical roller bearing, the non-locating bearing design of the flanged housing unit (Figure 3).

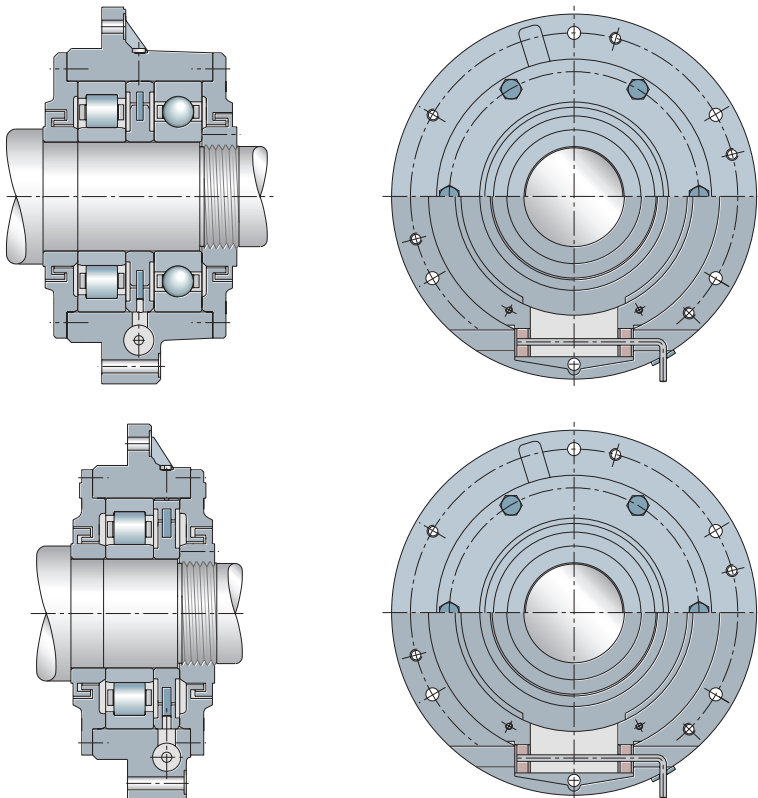
FAG flanged housing units for large electrical machinery are designed to be fitted with bearings of diameter series 0, 2 and 3.

Accordingly, there are three housing series each for the flanged housing units FERB and FERS:

| Diameter series | Flanged housing Type |       |
|-----------------|----------------------|-------|
|                 | FERB                 | FERS  |
| 0               | FERB0                | FERS0 |
| 2               | FERB2                | FERS2 |
| 3               | FERB3                | FERS3 |

FAG flanged housing units FERS and FERB are available for shaft diameters  $d = 100$  to  $400$  mm.

**Figure 3:** Flanged housing units



Flanged housing unit of type FERB as a locating bearing design, with one cylindrical roller bearing to support the radial force and one deep groove ball bearing to support the axial force.

Flanged housing unit of type FERS as a non-locating bearing design with one cylindrical roller bearing.

# Fits · Designations

## Fits

The bearings are located on the shaft with a tight fit. The tight fit for deep groove ball bearings and cylindrical roller bearings is achieved with a shaft tolerance of m5.

In the case of the angular contact ball bearings fitted in special housings (page 7), a shaft tolerance of k5 has proved effective.

| Bearing fitted  | Housing type | Tolerances Shaft | Tolerances Housing |
|---|--------------|------------------|--------------------|
| Radial ball bearings for supporting axial load                  | FERB         | m5               | E8                 |
| Cylindrical roller bearings                                     | FERB, FERS   | m5               | K6                 |
| Deep groove ball bearings as locating and non-locating bearings | FERS         | m5               | H6                 |
| Angular contact ball bearings, in matched pairs                 | FERB         | k5               | H6                 |

In case of doubt, the Application Engineering resources of Schaeffler Group Industrial are available to offer advice.

## Designation

For the normal designs, the basic designation of the flanged housing units is sufficient as an ordering designation.

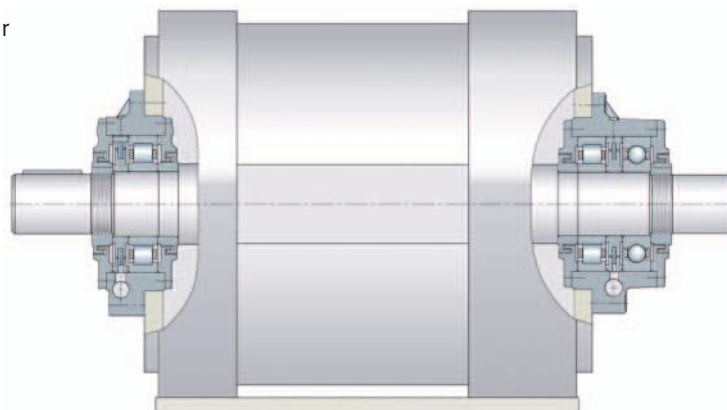
The locating bearing side contains a deep groove ball bearing and a cylindrical roller bearing, while the non-locating bearing has only one cylindrical roller bearing.

In these cases, the designation describes the:

- housing unit FERS or FERB
- diameter series of the bearings (series 0, 2, 3)
- bearing size (by means of the bore code) (see tables, page 9 to 12).

**The rolling bearings must be ordered separately.** Ordering examples are shown in Figure 4.

**Figure 4:** Horizontal motor



Ordering examples

1 flanged housing unit of non-locating bearing design

**FAG FERS056**

1 cylindrical roller bearing **FAG NU1056-M1-C3**

1 flanged housing unit of locating bearing design

**FAG FERB056**

1 cylindrical roller bearing **FAG NU1056-M1-C3**

1 deep groove ball bearing **FAG 6056-M-C3**

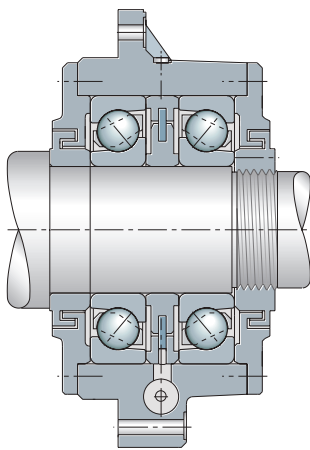
## Special designs

If it is necessary due to the operating conditions, the FAG flanged housing units can be fitted with other bearing types, principally angular contact ball bearings and deep groove ball bearings.

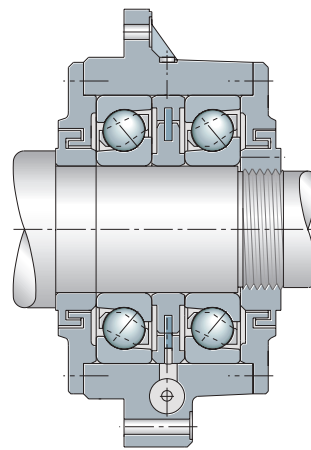
As examples, Figure 5 shows special designs of the flanged housing units FERB with angular contact ball

bearings in an X and tandem arrangement, as well as FAG flanged housing units FERS with deep groove ball bearings as a locating or non-locating bearing design. The main dimensions of the housings and the mounting dimensions of the bearings correspond to the normal flanged housing units.

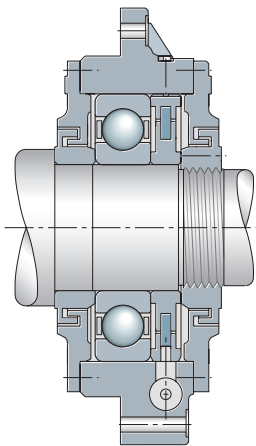
**Figure 5:** Special designs of FAG flanged housing units with angular contact or deep groove ball bearings



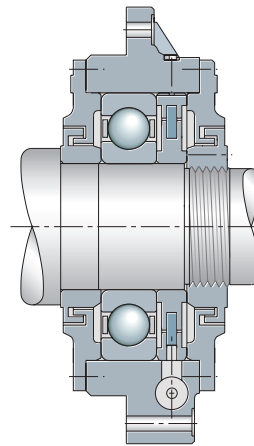
Flanged housing unit of type FERB (special design) as locating bearing design with two angular contact ball bearings in X arrangement to support the radial force and the alternating axial force.



Flanged housing unit of type FERB (special design) as locating bearing design with two angular contact ball bearings in tandem arrangement to support the radial force and the high, unilateral axial force.



Flanged housing unit of type FERS (special design) as non-locating bearing design with one deep groove ball bearing; optionally with spring adjustment.



Flanged housing unit of type FERS (special design) as locating bearing design with one deep groove ball bearing to support the radial force and the axial guidance forces.



## Special designs

The ordering designation for special designs of flanged housing units comprises a Z-100 000 range number and an additional basic housing designation. This ensures that the bearing seats in the housings are correctly machined.

**The bearings and housings must be ordered individually.** Ordering examples are shown in Figure 6.

If the shaft seats for the cylindrical roller bearings and deep groove ball bearings are machined to tolerance class m5 as recommended, the bearings must be ordered with an increased internal clearance to C3 or C4 depending on the operating conditions.

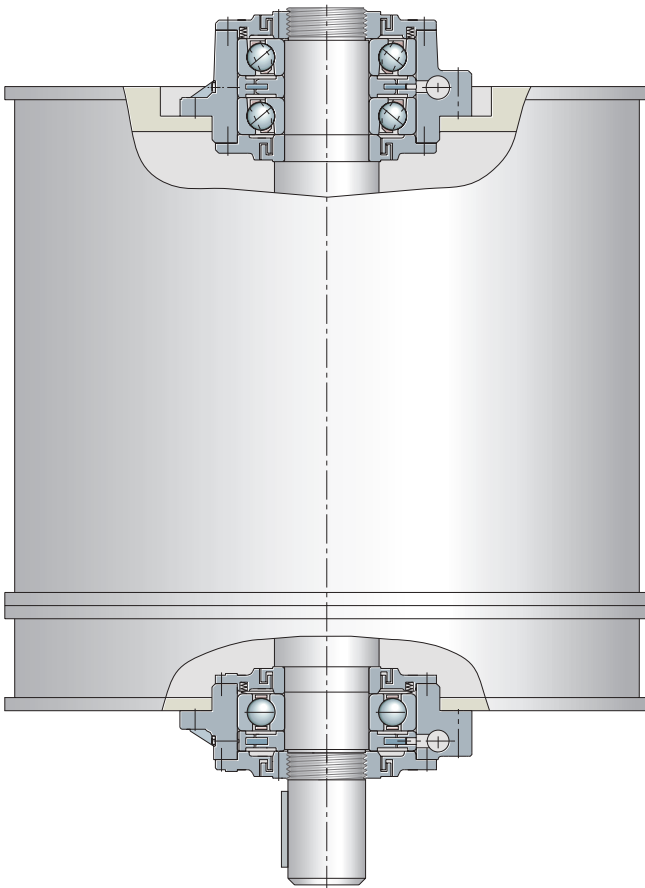
If the shaft is machined to tolerance k5, angular contact ball bearings of UA design have a small axial internal clearance when fitted in matched pairs in an X arrangement.

For electrical machinery with higher protection levels, Schaeffler Group Industrial supplies flanged housing units in special designs. These are sealed, instead of labyrinth rings, with V rings or rotary shaft seals.

For oil lubrication, the special housing FKC is available (see page 16 onwards), or special designs of FERB/FERS may be produced by agreement.

For increased operational security, the flanged housing units can be supplied as a current-insulated variant. An insulating layer is applied to the housing flange.

**Figure 6:** Vertical motor



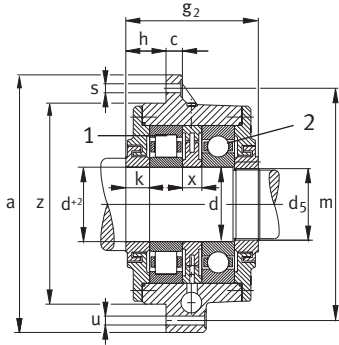
### Ordering examples (special design)

- 1 flanged housing unit of locating bearing design **FAG Z-1...FERB340**
- 2 angular contact ball bearings in tandem arrangement  
**FAG 7340-B-MP-UA**

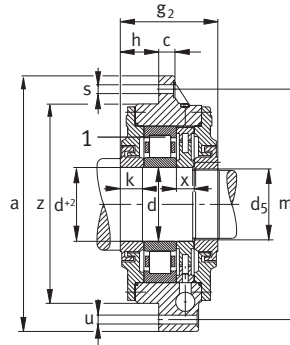
- 1 flanged housing unit of non-locating bearing design **FAG Z-1...FERS056**
- 1 deep groove ball bearing with spring adjustment **FAG 6056-M-C3**

# Flanged housing units

With grease valve



**Type FERB**  
1 Cylindrical roller bearing  
2 Deep groove ball bearing



**Type FERS**  
1 Cylindrical roller bearing

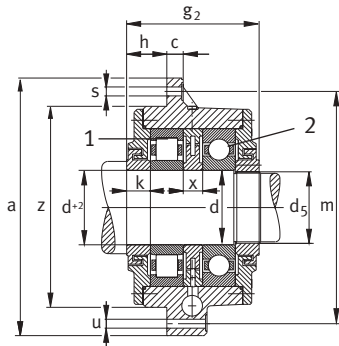
## Flanged housing units with grease valve

| Designation*) |                 | Mass<br>m<br>≈kg | Dimensions |        |                |     |     |                |    |     |     |     |     |     |     |
|---------------|-----------------|------------------|------------|--------|----------------|-----|-----|----------------|----|-----|-----|-----|-----|-----|-----|
| Housing       | Bearing 1       |                  | Bearing 2  | d      | d <sub>5</sub> | a   | c   | g <sub>2</sub> | h  | k   | m   | u   | s   | x   | z   |
|               |                 |                  | mm         |        |                |     |     |                |    |     |     |     |     |     |     |
| FERB020       | NU1020-M1-C3    | 8                | 100        | M95x2  | 220            | 10  | 76  | 30             | 17 | 200 | 9   | M8  | 18  | 180 |     |
| FERS220       | NU220-E-TVP2-C3 | 20               | 100        | M95x2  | 280            | 18  | 104 | 40             | 25 | 255 | 11  | M10 | 20  | 220 |     |
| FERS320       | NU320-E-TVP2-C3 | 47               | 100        | M95x2  | 355            | 25  | 147 | 60             | 35 | 320 | 14  | M12 | 30  | 275 |     |
| FERB020       | NU1020-M1-C3    | 6020-C3          | 10         | 100    | M95x2          | 220 | 10  | 100            | 30 | 17  | 200 | 9   | M8  | 18  | 180 |
| FERB220       | NU220-E-TVP2-C3 | 6220-C3          | 23         | 100    | M95x2          | 280 | 18  | 138            | 40 | 25  | 255 | 11  | M10 | 20  | 220 |
| FERB320       | NU320-E-TVP2-C3 | 6320-C3          | 55         | 100    | M95x2          | 355 | 25  | 194            | 60 | 35  | 320 | 14  | M12 | 30  | 275 |
| FERS022       | NU1022-M1-C3    | 12               | 110        | M105x2 | 250            | 12  | 88  | 35             | 20 | 225 | 9   | M8  | 20  | 200 |     |
| FERS222       | NU222-E-TVP2-C3 | 30               | 110        | M105x2 | 320            | 20  | 123 | 50             | 30 | 290 | 11  | M10 | 25  | 250 |     |
| FERS322       | NU322-E-TVP2-C3 | 57               | 110        | M105x2 | 390            | 25  | 150 | 60             | 35 | 350 | 14  | M12 | 30  | 300 |     |
| FERB022       | NU1022-M1-C3    | 6022-C3          | 14         | 110    | M105x2         | 250 | 12  | 116            | 35 | 20  | 225 | 9   | M8  | 20  | 200 |
| FERB222       | NU222-E-TVP2-C3 | 6222-C3          | 35         | 110    | M105x2         | 320 | 20  | 161            | 50 | 30  | 290 | 11  | M10 | 25  | 250 |
| FERB322       | NU322-E-TVP2-C3 | 6322-C3          | 67         | 110    | M105x2         | 390 | 25  | 200            | 60 | 35  | 350 | 14  | M12 | 30  | 300 |
| FERS024       | NU1024-M1-C3    | 15               | 120        | M115x2 | 265            | 12  | 97  | 40             | 25 | 245 | 11  | M10 | 20  | 215 |     |
| FERS224       | NU224-E-TVP2-C3 | 34               | 120        | M115x2 | 335            | 20  | 125 | 50             | 30 | 305 | 14  | M12 | 25  | 265 |     |
| FERS324       | NU324-E-TVP2-C3 | 76               | 120        | M115x2 | 420            | 25  | 165 | 70             | 40 | 380 | 18  | M16 | 30  | 330 |     |
| FERB024       | NU1024-M1-C3    | 6024-C3          | 17         | 120    | M115x2         | 265 | 12  | 125            | 40 | 25  | 245 | 11  | M10 | 20  | 215 |
| FERB224       | NU224-E-TVP2-C3 | 6224-C3          | 40         | 120    | M115x2         | 335 | 20  | 165            | 50 | 30  | 305 | 14  | M12 | 25  | 265 |
| FERB324       | NU324-E-TVP2-C3 | 6324-C3          | 90         | 120    | M115x2         | 420 | 25  | 220            | 70 | 40  | 380 | 18  | M16 | 30  | 330 |
| FERS026       | NU1026-M1-C3    | 22               | 130        | M125x2 | 300            | 15  | 108 | 40             | 25 | 275 | 11  | M10 | 25  | 240 |     |
| FERS226       | NU226-E-TVP2-C3 | 38               | 130        | M125x2 | 350            | 20  | 125 | 50             | 30 | 320 | 14  | M12 | 25  | 280 |     |
| FERS326       | NU326-E-TVP2-C3 | 90               | 130        | M125x2 | 450            | 25  | 173 | 70             | 40 | 405 | 18  | M16 | 35  | 350 |     |
| FERB026       | NU1026-M1-C3    | 6026-C3          | 25         | 130    | M125x2         | 300 | 15  | 141            | 40 | 25  | 275 | 11  | M10 | 25  | 240 |
| FERB226       | NU226-E-TVP2-C3 | 6226-C3          | 44         | 130    | M125x2         | 350 | 20  | 165            | 50 | 30  | 320 | 14  | M12 | 25  | 280 |
| FERB326       | NU326-E-TVP2-C3 | 6326-M-C3        | 105        | 130    | M125x2         | 450 | 25  | 231            | 70 | 40  | 405 | 18  | M16 | 35  | 350 |
| FERS028       | NU1028-M1-C3    | 24               | 140        | M135x2 | 310            | 15  | 112 | 45             | 27 | 285 | 11  | M10 | 25  | 250 |     |
| FERS028       | NU228-E-TVP2-C3 | 53               | 140        | M135x2 | 390            | 25  | 142 | 55             | 35 | 355 | 14  | M12 | 30  | 310 |     |
| FERS028       | NU328-E-TVP2-C3 | 114              | 140        | M135x2 | 490            | 30  | 187 | 75             | 45 | 440 | 18  | M16 | 35  | 380 |     |
| FERB028       | NU1028-M1-C3    | 6028-C3          | 27         | 140    | M135x2         | 310 | 15  | 145            | 45 | 27  | 285 | 11  | M10 | 25  | 250 |
| FERB228       | NU228-E-TVP2-C3 | 6228-C3          | 60         | 140    | M135x2         | 390 | 25  | 184            | 55 | 35  | 355 | 14  | M12 | 30  | 310 |
| FERB328       | NU328-E-TVP2-C3 | 6328-M-C3        | 133        | 140    | M135x2         | 490 | 30  | 249            | 75 | 45  | 440 | 18  | M16 | 35  | 380 |

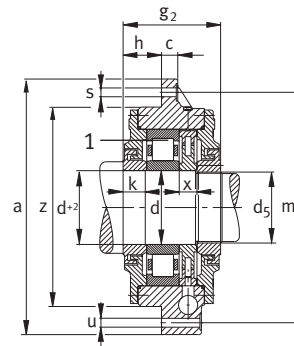
\*) Ordering examples for flanged housing unit on page 6 and 8.

# Flanged housing units

With grease valve



**Type FERB**  
1 Cylindrical roller bearing  
2 Deep groove ball bearing



**Type FERS**  
1 Cylindrical roller bearing

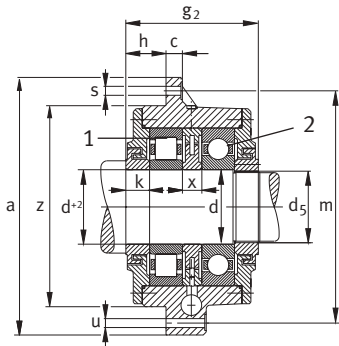
## Flanged housing units with grease valve

| Designation*) |               |           | Mass<br>m<br>≈kg | Dimensions |                | a   | c  | g <sub>2</sub> | h  | k  | m   | u  | s   | x  | z   |
|---------------|---------------|-----------|------------------|------------|----------------|-----|----|----------------|----|----|-----|----|-----|----|-----|
| Housing       | Bearing 1     | Bearing 2 |                  | d          | d <sub>5</sub> |     |    |                |    |    |     |    |     |    |     |
| Housing<br>mm |               |           |                  |            |                |     |    |                |    |    |     |    |     |    |     |
| FERS030       | NU1030-M1-C3  |           | 28               | 150        | M145x2         | 325 | 15 | 120            | 50 | 30 | 300 | 11 | M10 | 25 | 265 |
| FERS230       | NU230-E-M1-C3 |           | 61               | 150        | M145x2         | 420 | 25 | 145            | 55 | 35 | 380 | 18 | M16 | 30 | 330 |
| FERS330       | NU330-E-M1-C3 |           | 134              | 150        | M145x2         | 510 | 30 | 200            | 85 | 50 | 460 | 18 | M16 | 35 | 400 |
| FERB030       | NU1030-M1-C3  | 6030-C3   | 32               | 150        | M145x2         | 325 | 15 | 155            | 50 | 30 | 300 | 11 | M10 | 25 | 265 |
| FERB230       | NU230-E-M1-C3 | 6230-C3   | 70               | 150        | M145x2         | 420 | 25 | 190            | 55 | 35 | 380 | 18 | M16 | 30 | 330 |
| FERB330       | NU330-E-M1-C3 | 6330-M-C3 | 156              | 150        | M145x2         | 510 | 30 | 265            | 85 | 50 | 460 | 18 | M16 | 35 | 400 |
| FERS032       | NU1032-M1-C3  |           | 32               | 160        | M155x3         | 350 | 20 | 123            | 50 | 30 | 320 | 14 | M12 | 25 | 280 |
| FERS232       | NU232-E-M1-C3 |           | 77               | 160        | M155x3         | 440 | 25 | 163            | 65 | 40 | 400 | 18 | M16 | 35 | 350 |
| FERS332       | NU332-E-M1-C3 |           | 150              | 160        | M155x3         | 540 | 30 | 203            | 85 | 50 | 490 | 22 | M20 | 35 | 420 |
| FERB032       | NU1032-M1-C3  | 6032-M-C3 | 36               | 160        | M155x3         | 350 | 20 | 161            | 50 | 30 | 320 | 14 | M12 | 25 | 280 |
| FERB232       | NU232-E-M1-C3 | 6232-M-C3 | 88               | 160        | M155x3         | 440 | 25 | 211            | 65 | 40 | 400 | 18 | M16 | 35 | 350 |
| FERB332       | NU332-E-M1-C3 | 6332-M-C3 | 175              | 160        | M155x3         | 540 | 30 | 271            | 85 | 50 | 490 | 22 | M20 | 35 | 420 |
| FERS034       | NU1034-M1-C3  |           | 42               | 170        | M165x3         | 380 | 20 | 127            | 50 | 30 | 345 | 14 | M12 | 25 | 310 |
| FERS234       | NU234-E-M1-C3 |           | 100              | 170        | M165x3         | 480 | 25 | 177            | 70 | 45 | 440 | 18 | M16 | 35 | 380 |
| FERS334       | NU334-E-M1-C3 |           | 182              | 170        | M165x3         | 560 | 30 | 226            | 94 | 57 | 510 | 22 | M20 | 40 | 440 |
| FERB034       | NU1034-M1-C3  | 6034-C3   | 50               | 170        | M165x3         | 380 | 20 | 169            | 50 | 30 | 345 | 14 | M12 | 25 | 310 |
| FERB234       | NU234-E-M1-C3 | 6234-M-C3 | 113              | 170        | M165x3         | 480 | 25 | 229            | 70 | 45 | 440 | 18 | M16 | 35 | 380 |
| FERB334       | NU334-E-M1-C3 | 6334-M-C3 | 210              | 170        | M165x3         | 560 | 30 | 298            | 94 | 57 | 510 | 22 | M20 | 40 | 440 |
| FERS036       | NU1036-M1-C3  |           | 55               | 180        | M175x3         | 400 | 20 | 146            | 60 | 35 | 365 | 14 | M12 | 30 | 330 |
| FERS236       | NU236-E-M1-C3 |           | 104              | 180        | M175x3         | 490 | 25 | 177            | 70 | 45 | 450 | 18 | M16 | 35 | 390 |
| FERS336       | NU336-E-M1-C3 |           | 218              | 180        | M175x3         | 610 | 35 | 225            | 95 | 55 | 555 | 22 | M20 | 40 | 480 |
| FERB036       | NU1036-M1-C3  | 6036-M-C3 | 63               | 180        | M175x3         | 400 | 20 | 192            | 60 | 35 | 365 | 14 | M12 | 30 | 330 |
| FERB236       | NU236-E-M1-C3 | 6236-M-C3 | 117              | 180        | M175x3         | 490 | 25 | 229            | 70 | 45 | 450 | 18 | M16 | 35 | 390 |
| FERB336       | NU336-E-M1-C3 | 6336-M-C3 | 255              | 180        | M175x3         | 610 | 35 | 300            | 95 | 55 | 555 | 22 | M20 | 40 | 480 |
| FERS038       | NU1038-M1-C3  |           | 62               | 190        | M185x3         | 440 | 25 | 146            | 60 | 35 | 400 | 18 | M16 | 30 | 350 |
| FERS238       | NU238-E-M1-C3 |           | 127              | 190        | M185x3         | 540 | 30 | 185            | 70 | 45 | 490 | 18 | M16 | 40 | 420 |
| FERS338       | NU338-E-M1-C3 |           | 240              | 190        | M185x3         | 630 | 35 | 228            | 95 | 55 | 575 | 22 | M20 | 40 | 500 |
| FERB038       | NU1038-M1-C3  | 6038-M-C3 | 71               | 190        | M185x3         | 440 | 25 | 192            | 60 | 35 | 400 | 18 | M16 | 30 | 350 |
| FERB238       | NU238-E-M1-C3 | 6238-M-C3 | 144              | 190        | M185x3         | 540 | 30 | 240            | 70 | 45 | 490 | 18 | M16 | 40 | 420 |
| FERB338       | NU338-E-M1-C3 | 6338-M-C3 | 280              | 190        | M185x3         | 630 | 35 | 306            | 95 | 55 | 575 | 22 | M20 | 40 | 500 |

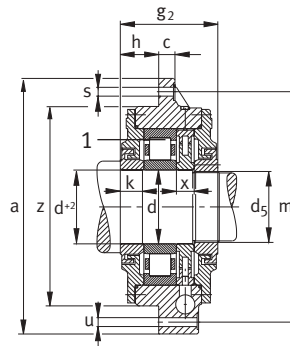
\*) Ordering examples for flanged housing unit on page 6 and 8.

# Flanged housing units

With grease valve



**Type FERB**  
1 Cylindrical roller bearing  
2 Deep groove ball bearing



**Type FERS**  
1 Cylindrical roller bearing

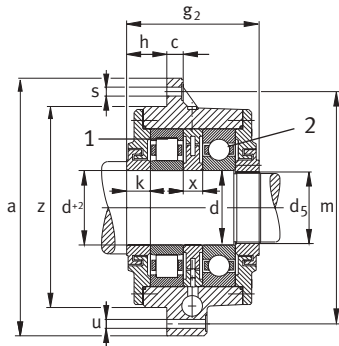
## Flanged housing units with grease valve

| Designation*) |               | Mass<br>m<br>≈kg | Dimensions |         | a       | c   | g <sub>2</sub> | h   | k    | m    | u   | s   | x   | z   |                |
|---------------|---------------|------------------|------------|---------|---------|-----|----------------|-----|------|------|-----|-----|-----|-----|----------------|
| Housing       | Bearing 1     |                  | Bearing 2  | d       |         |     |                |     |      |      |     |     |     |     | d <sub>5</sub> |
| FERS040       | NU1040-M1-C3  | 74               | 200        | M195x3  | 460     | 25  | 156            | 60  | 35   | 420  | 18  | M16 | 35  | 370 |                |
| FERS240       | NU240-E-M1-C3 | 158              | 200        | M195x3  | 580     | 30  | 198            | 80  | 50   | 525  | 22  | M20 | 40  | 450 |                |
| FERS340       | NU340-E-M1-C3 | 260              | 200        | M195x3  | 660     | 35  | 230            | 100 | 55   | 600  | 26  | M24 | 40  | 520 |                |
| FERB040       | NU1040-M1-C3  | 6040-M-C3        | 91         | 200     | M195x3  | 460 | 25             | 207 | 60   | 35   | 420 | 18  | M16 | 35  | 370            |
| FERB240       | NU240-E-M1-C3 | 6240-M-C3        | 178        | 200     | M195x3  | 580 | 30             | 256 | 80   | 50   | 525 | 22  | M20 | 40  | 450            |
| FERB340       | NU340-E-M1-C3 | 6340-M-C3        | 306        | 200     | M195x3  | 660 | 35             | 310 | 100  | 55   | 600 | 26  | M24 | 40  | 520            |
| FERS044       | NU1044-M1-C3  | 106              | 220        | Tr215x4 | 510     | 25  | 181            | 75  | 45   | 465  | 18  | M16 | 35  | 410 |                |
| FERS244       | NU244-E-M1-C3 | 193              | 220        | Tr215x4 | 620     | 30  | 205            | 80  | 50   | 560  | 22  | M20 | 40  | 490 |                |
| FERS344       | NU344-E-M1-C3 | 378              | 220        | Tr215x4 | 740     | 40  | 268            | 110 | 65   | 665  | 26  | M24 | 50  | 580 |                |
| FERB044       | NU1044-M1-C3  | 6044-M-C3        | 122        | 220     | Tr215x4 | 510 | 25             | 237 | 75   | 45   | 465 | 18  | M16 | 35  | 410            |
| FERB244       | NU244-E-M1-C3 | 6244-M-C3        | 222        | 220     | Tr215x4 | 620 | 30             | 270 | 80   | 50   | 560 | 22  | M20 | 40  | 490            |
| FERB344       | NU344-E-M1-C3 | 6344-M-C3        | 440        | 220     | Tr215x4 | 740 | 40             | 356 | 110  | 65   | 665 | 26  | M24 | 50  | 580            |
| FERS048       | NU1048-M1-C3  | 116              | 240        | Tr235x4 | 530     | 25  | 186            | 75  | 45   | 485  | 18  | M16 | 40  | 430 |                |
| FERS248       | NU248-E-M1-C3 | 272              | 240        | Tr235x4 | 680     | 35  | 237            | 95  | 60   | 620  | 22  | M20 | 45  | 540 |                |
| FERS348       | NU348-E-M1-C3 | 457              | 240        | Tr235x4 | 800     | 40  | 275            | 115 | 65   | 720  | 26  | M24 | 50  | 630 |                |
| FERB048       | NU1048-M1-C3  | 6048-M-C3        | 132        | 240     | Tr235x4 | 530 | 25             | 242 | 75   | 45   | 485 | 18  | M16 | 40  | 430            |
| FERB248       | NU248-E-M1-C3 | 6248-M-C3        | 310        | 240     | Tr235x4 | 680 | 35             | 309 | 95   | 60   | 620 | 22  | M20 | 45  | 540            |
| FERB348       | NU348-E-M1-C3 | 6348-M-C3        | 538        | 240     | Tr235x4 | 800 | 40             | 370 | 115  | 65   | 720 | 26  | M24 | 50  | 630            |
| FERS052       | NU1052-M1-C3  | 170              | 260        | Tr255x4 | 590     | 30  | 214            | 85  | 54,5 | 540  | 18  | M16 | 40  | 480 |                |
| FERS252       | NU252-E-M1-C3 | 337              | 260        | Tr255x4 | 730     | 35  | 245            | 100 | 60   | 670  | 22  | M20 | 45  | 590 |                |
| FERS352       | NU352-E-M1-C3 | 594              | 260        | Tr255x4 | 860     | 40  | 307            | 125 | 75   | 780  | 26  | M24 | 55  | 680 |                |
| FERB052       | NU1052-M1-C3  | 6052-M-C3        | 195        | 260     | Tr255x4 | 590 | 30             | 279 | 85   | 54,5 | 540 | 18  | M16 | 40  | 480            |
| FERB252       | NU252-E-M1-C3 | 6252-M-C3        | 390        | 260     | Tr255x4 | 730 | 35             | 325 | 100  | 60   | 670 | 22  | M20 | 45  | 590            |
| FERB352       | NU352-E-M1-C3 | 6352-M-C3        | 692        | 260     | Tr255x4 | 860 | 40             | 409 | 125  | 75   | 780 | 26  | M24 | 55  | 680            |
| FERS056       | NU1056-M1-C3  | 180              | 280        | Tr275x4 | 630     | 30  | 214            | 85  | 54,5 | 570  | 18  | M16 | 40  | 500 |                |
| FERS256       | NU256-E-M1-C3 | 374              | 280        | Tr275x4 | 750     | 35  | 260            | 105 | 65   | 690  | 22  | M20 | 50  | 610 |                |
| FERS356       | NU356-E-M1-C3 | 697              | 280        | Tr275x4 | 910     | 45  | 313            | 130 | 75   | 830  | 26  | M24 | 55  | 730 |                |
| FERB056       | NU1056-M1-C3  | 6056-M-C3        | 205        | 280     | Tr275x4 | 630 | 30             | 279 | 85   | 54,5 | 570 | 18  | M16 | 40  | 500            |
| FERB256       | NU256-E-M1-C3 | 6256-M-C3        | 428        | 280     | Tr275x4 | 750 | 35             | 340 | 105  | 65   | 690 | 22  | M20 | 50  | 610            |
| FERB356       | NU356-E-M1-C3 | 6356-M-C3        | 820        | 280     | Tr275x4 | 910 | 45             | 421 | 130  | 75   | 830 | 26  | M24 | 55  | 730            |
| FERS060       | NU1060-M1-C3  | 238              | 300        | Tr295x4 | 680     | 35  | 229            | 90  | 55   | 620  | 22  | M20 | 45  | 550 |                |
| FERS260       | NU260-E-M1-C3 | 415              | 300        | Tr295x4 | 820     | 40  | 281            | 115 | 73   | 750  | 26  | M24 | 50  | 670 |                |
| FERS360       | NU360-E-M1-C3 | 828              | 300        | Tr295x4 | 960     | 45  | 336            | 140 | 83,5 | 870  | 33  | M30 | 60  | 770 |                |

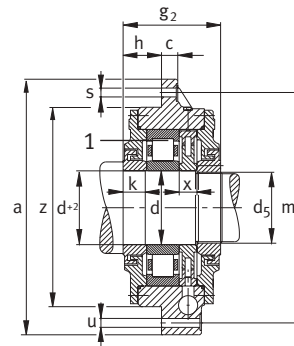
\*) Ordering examples for flanged housing unit on page 6 and 8.

# Flanged housing units

With grease valve



**Type FERB**  
1 Cylindrical roller bearing  
2 Deep groove ball bearing



**Type FERS**  
1 Cylindrical roller bearing

## Flanged housing units with grease valve

| Designation*) |                | Mass<br>m<br>≈kg | Dimensions<br>Housing<br>mm |         | Dimensions     |       |     |                |     |       |       |     |     |       |       |
|---------------|----------------|------------------|-----------------------------|---------|----------------|-------|-----|----------------|-----|-------|-------|-----|-----|-------|-------|
| Housing       | Bearing 1      |                  | Bearing 2                   | d       | d <sub>5</sub> | a     | c   | g <sub>2</sub> | h   | k     | m     | u   | s   | x     | z     |
| FERS064       | NU1064-M1-C3   | 250              | 320                         | Tr315x5 | 700            | 35    | 229 | 90             | 55  | 640   | 22    | M20 | 45  | 570   |       |
| FERS264       | NU264-EX-M1-C3 | 567              | 320                         | Tr315x5 | 860            | 40    | 288 | 120            | 73  | 790   | 26    | M24 | 50  | 710   |       |
| FERS364       | NU364-E-M1-C3  | 1 040            | 320                         | Tr315x5 | 1 060          | 50    | 352 | 145            | 90  | 960   | 33    | M30 | 60  | 840   |       |
| FERB064       | NU1064-M1-C3   | 6064-M-C3        | 289                         | 320     | Tr315x5        | 700   | 35  | 303            | 90  | 55    | 640   | 22  | M20 | 45    | 570   |
| FERB264       | NU264-E-M1-C3  | 6264-M-C3        | 654                         | 320     | Tr315x5        | 860   | 40  | 380            | 120 | 73    | 790   | 26  | M24 | 50    | 710   |
| FERB364       | NU364-E-M1-C3  | 6364-M-C3        | 1 120                       | 320     | Tr315x5        | 1 060 | 50  | 464            | 145 | 90    | 960   | 33  | M30 | 60    | 840   |
| FERS068       | NU1068-M1-C3   | 300              | 340                         | Tr335x5 | 780            | 40    | 252 | 100            | 60  | 710   | 22    | M20 | 50  | 620   |       |
| FERS268       | NU268-E-M1-C3  | 663              | 340                         | Tr335x5 | 920            | 40    | 293 | 120            | 73  | 845   | 26    | M24 | 55  | 760   |       |
| FERS368       | NU368-E-M1-C3  | 1 236            | 340                         | Tr335x5 | 1 120          | 55    | 373 | 155            | 95  | 1 020 | 33    | M30 | 65  | 890   |       |
| FERB068       | NU1068-M1-C3   | 6068-M-C3        | 350                         | 340     | Tr335x5        | 780   | 40  | 334            | 100 | 60    | 710   | 22  | M20 | 50    | 620   |
| FERB268       | NU268-E-M1-C3  | 6268-M-C3        | 762                         | 340     | Tr335x5        | 920   | 40  | 385            | 120 | 73    | 845   | 26  | M24 | 55    | 760   |
| FERB368       | NU368-E-M1-C3  | 6368-M-C3        | 1 424                       | 340     | Tr335x5        | 1 120 | 55  | 491            | 155 | 95    | 1 020 | 33  | M30 | 65    | 890   |
| FERS072       | NU1072-M1-C3   | 345              | 360                         | Tr355x5 | 800            | 40    | 252 | 100            | 60  | 730   | 22    | M20 | 50  | 640   |       |
| FERS272       | NU272-E-M1-C3  | 775              | 360                         | Tr355x5 | 970            | 45    | 310 | 130            | 80  | 890   | 26    | M24 | 55  | 800   |       |
| FERS372       | NU372-E-M1-C3  | 1 440            | 360                         | Tr355x5 | 1 180          | 60    | 390 | 165            | 100 | 1 070 | 39    | M36 | 65  | 940   |       |
| FERB072       | NU1072-M1-C3   | 6072-M-C3        | 400                         | 360     | Tr355x5        | 800   | 40  | 334            | 100 | 60    | 730   | 22  | M20 | 50    | 640   |
| FERB272       | NU272-E-M1-C3  | 6272-M-C3        | 886                         | 360     | Tr355x5        | 970   | 45  | 405            | 130 | 80    | 890   | 26  | M24 | 55    | 800   |
| FERB372       | NU372-E-M1-C3  | 6372-M-C3        | 1 664                       | 360     | Tr355x5        | 1 180 | 60  | 515            | 165 | 100   | 1 070 | 39  | M36 | 65    | 940   |
| FERS076       | NU1076-M1-C3   | 360              | 380                         | Tr375x5 | 820            | 40    | 252 | 100            | 60  | 750   | 22    | M20 | 50  | 660   |       |
| FERS276       | NU276-E-M1-C3  | 827              | 380                         | Tr375x5 | 1000           | 45    | 310 | 130            | 80  | 920   | 29    | M24 | 55  | 830   |       |
| FERS376       | NU376-E-M1-C3  | 1 553            | 380                         | Tr375x5 | 1 230          | 65    | 398 | 165            | 100 | 1 120 | 39    | M36 | 70  | 970   |       |
| FERB076       | NU1076-M1-C3   | 6076-M-C3        | 417                         | 380     | Tr375x5        | 820   | 40  | 334            | 100 | 60    | 750   | 22  | M20 | 50    | 660   |
| FERB276       | NU276-E-M1-C3  | 6276-M-C3        | 945                         | 380     | Tr375x5        | 1 000 | 45  | 405            | 130 | 80    | 920   | 26  | M24 | 55    | 830   |
| FERB376       | NU376-E-M1-C3  | 6376-M-C3        | 1 795                       | 380     | Tr375x5        | 1 230 | 65  | 526            | 165 | 100   | 1 120 | 39  | M36 | 70    | 970   |
| FERS080       | NU1080-M1-C3   | 455              | 400                         | Tr395x5 | 880            | 40    | 270 | 105            | 65  | 810   | 22    | M20 | 50  | 710   |       |
| FERS280       | NU280-M1-C3    | 972              | 400                         | Tr395x5 | 1 060          | 50    | 323 | 135            | 80  | 980   | 26    | M24 | 60  | 880   |       |
| FERS380       | NU380-M1-C3    | 1 815            | 400                         | Tr395x5 | 1 300          | 70    | 421 | 175            | 105 | 1 190 | 39    | M36 | 75  | 1 020 |       |
| FERB080       | NU1080-M1-C3   | 6080-M-C3        | 530                         | 400     | Tr395x5        | 880   | 40  | 360            | 105 | 65    | 810   | 22  | M20 | 50    | 710   |
| FERB280       | NU280-M1-C3    | 6280-M-C3        | 1 122                       | 400     | Tr395x5        | 1 060 | 50  | 426            | 135 | 80    | 980   | 26  | M24 | 60    | 880   |
| FERB380       | NU380-M1-C3    | 6380-M-C3        | 2 102                       | 400     | Tr395x5        | 1 300 | 70  | 557            | 175 | 105   | 1 190 | 39  | M36 | 75    | 1 020 |

\*) Ordering examples for flanged housing unit on page 6 and 8.

# Fitting example for FERB/FERS

## Drive unit for a wind tunnel blower

### Technical data

- AC motor
- Nom. power rating 2 300 kW at 270 min<sup>-1</sup>
- Impeller diameter 8 m
- Max. axial thrust 97 kN at 300 min<sup>-1</sup>
- Weight of shaft and impeller 176 kN

The impeller is located on the extended motor shaft.

### Bearing arrangement

The locating bearing side is fitted with a flanged housing unit FERB356 in a special design.

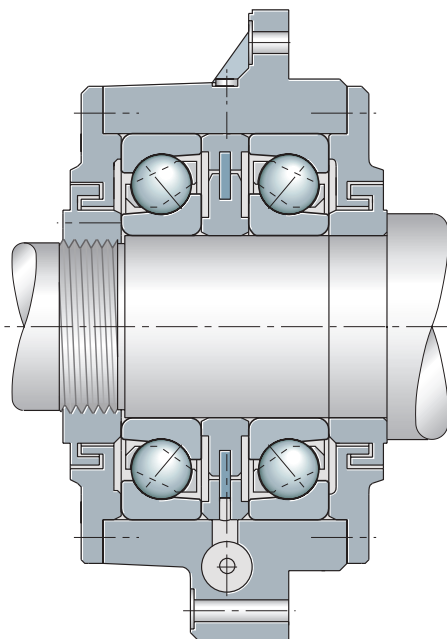
This contains two angular contact ball bearings 7356-B-MP-UA in an X arrangement. This bearing arrangement can support not only the high axial thrust but also radial load components.

The non-locating bearing arrangement of the motor contains the flanged housing unit FERS280 with a cylindrical roller bearing NU280-M-C3. This bearing only transmits radial forces. They comprise the weight of the rotor, the magnetic attraction, the unbalance occurring and the additional radial forces arising from the drive system.

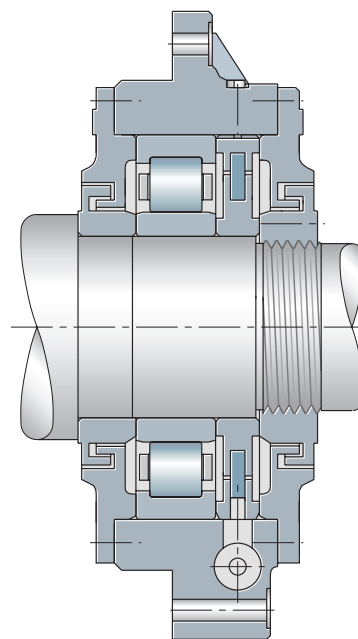
Both bearing positions are lubricated using a lithium soap grease.

The housings are fitted with grease valves in order to prevent overlubrication when they are relubricated.

Figure 7: Rotor shaft bearing arrangement



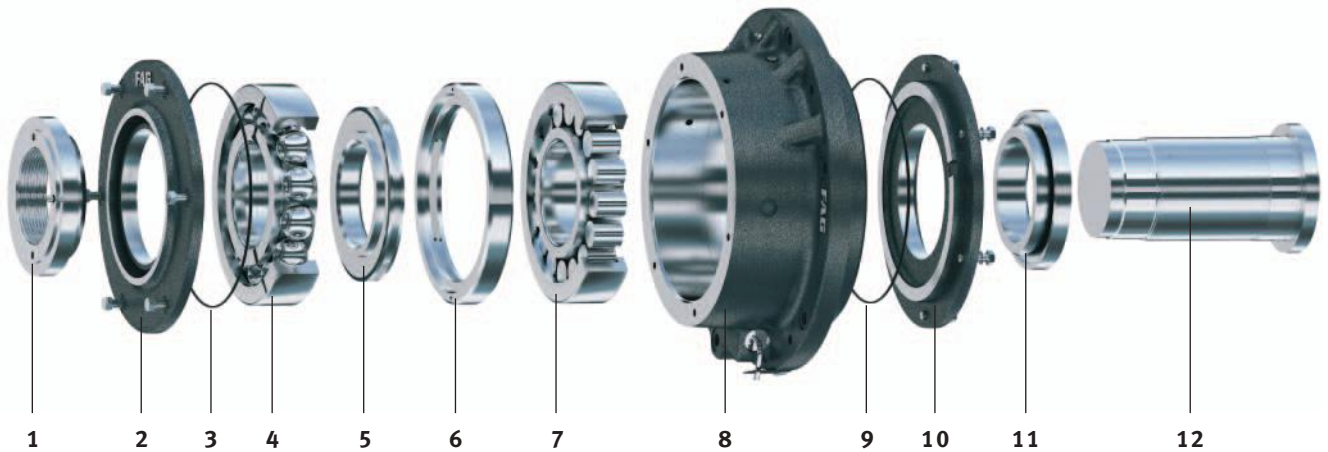
Flanged housing unit  
**FAG FERB 356.1...**  
(special design)



Flanged housing unit  
**FAG FERS280**

## Fitting manual for FERB/FERS

**Figure 8:** FERB flanged housing unit with one cylindrical roller bearing and one deep groove ball bearing



- 1 Shaft nut
- 2 Labyrinth cover
- 3 Toroidal ring
- 4 Deep groove ball bearing
- 5 Grease valve
- 6 Spacer ring
- 7 Cylindrical roller bearing
- 8 Housing body
- 9 Toroidal ring
- 10 Labyrinth cover
- 11 Labyrinth ring
- 12 Rotor shaft

### Measures to be taken prior to assembly

- The assembly area should be clean and dry.
- All parts – housing body, cover, spacer ring and labyrinth rings – must be carefully cleaned, paying particular attention to machining or moulding sand residues.
- The seating points on the shaft for rolling bearings, labyrinth rings and grease valves must be checked for dimensional accuracy and compliance with the specified tolerances. The edges must be deburred.
- The rolling bearings should only be removed from their packaging immediately before assembly. It must be checked whether the rolling bearing designation matches the designation on the packaging. The rolling bearings in their original packaging are treated with an anti-corrosion oil that does not normally need to be washed out.



# Fitting manual for FERB/FERS

## Mounting of rolling bearings in FERB housings

1. Pull the rotor (12) out of the stator as far as possible and ensure that the rotor is securely supported.
2. In order to prevent fretting corrosion, rub the shaft seats with mounting paste ARCANOL-MOUNTINGPASTE or an equivalent agent and ensure that the previously shiny metal surface is now matt.
3. Locate the inner labyrinth ring (11) and grease the labyrinth passage.
4. Work the toroidal ring (9) onto the cover flange of the housing body (8).
5. Grease the labyrinth passage with the inner labyrinth cover (10). Push the prepared labyrinth cover (10) into place such that it is initially supported by the labyrinth ring (11).
6. Heat the inner ring of the cylindrical roller bearing (7) using an appropriate heating device and press it on until it is force-locked on the locating surface. Grease the outer ring and the rolling element set of the cylindrical roller bearing (7) and press it onto the inner ring using a circular motion.
7. Push on the grease valve (5) and place the spacer ring (6) over this. The slot in the spacer ring (6) must face upwards.
8. Heat the deep groove ball bearing (4) using an appropriate induction heating device, push it onto the shaft and press into place with force locking until the bearing has cooled and is firmly seated on the shaft.
9. Tighten the fixing screw in the housing body (8) until the cylindrical stud of the screw is flush with the housing bore.
10. Heat the housing body (8) to approx. 70°C and fit it over the mounted bearings. It must be ensured that the retaining screw in the housing and the slot in the spacer ring are in the same plane.
11. After sliding into place, the retaining screw must be completely tightened.
12. Insert the toroidal ring (3) into the slot of the labyrinth cover (2). Grease the labyrinth passage of the labyrinth cover (2) and screw mount the labyrinth cover (2) to the housing body (8).
13. Screw down the shaft nut (1) and secure using a cap screw.
14. Ensure that both labyrinth covers (2) and (10) are screwed firmly into place.
15. Screw mount the housing flange to the end shield.

## Mounting of rolling bearings in FERS housings

Mounting is carried out in line with the mounting of FERB flanged housing units.

For further information, please contact the Application Engineering resources of Schaeffler Group Industrial.



## Flanged housing units FKC

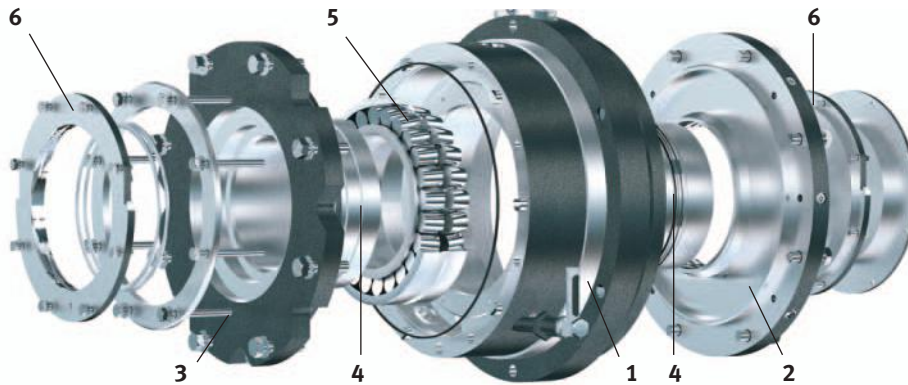
Large electrical machinery of type B supported by rolling bearings is often fitted with spherical roller bearings. These give reliable resistance to the high loads occurring. Flanged housing units FKC designed for oil lubrication have been specially developed for such applications. These housing designs comprise a housing body that is also available in current-insulated

form where necessary, two labyrinth covers, two labyrinth rings and two sealing washers that are used to support an additional sealing cover.

FKC flanged housing units with spherical roller bearings are particularly suitable for applications with high loads, moderate speeds and where, due to the bearing size, only oil lubrication can be considered.

**Figure 9:** Individual parts of an FAG flanged housing unit FKC

1 Housing, 2 Labyrinth cover, 3 Labyrinth cover, 4 Labyrinth ring, 5 Spherical roller bearing, 6 Sealing sleeve



In order to give better sealing of the housing, an air barrier seal is used in addition to the sealing washers. The fitting of additional sealing washers to the sealing sleeve further improves the IP protection against external influences.

The flanged housing units FKC are available in a locating or non-locating design. The spherical roller bearing must be ordered separately.

An oil level indicator can be screw mounted to both sides to monitor the oil level. The oil level at any point in operation can thus be monitored. The flanged housings also have additional connectors for thermocouples, air feed and shock impulse measurement. At customer request, the design can be modified to include further connectors.

### FKC flanged housings with spherical roller bearings of the latest generation in diameter series 3

| Shaft<br>mm | Housing<br>FAG | Bearing<br>FAG |
|-------------|----------------|----------------|
| 180         | FKC3036        | 23036-E1A-M-C3 |
| 200         | FKC3040        | 23040-E1A-M-C3 |
| 220         | FKC3044        | 23044-MB-C3    |
| 260         | FKC3052        | 23052-MB-C3    |
| 280         | FKC3056        | 23056-B-MB-C3  |
| 300         | FKC3060        | 23060-MB-C3    |
| 340         | FKC3068        | 23068-MB-C3    |
| 380         | FKC3076        | 23076-B-MB-C3  |
| 420         | FKC3084        | 23084-B-MB-C3  |

**When ordering, it must always be stated whether a locating or non-locating variant is required.**

If bearing designs other than those stated in the table are required, this must be agreed with the Application Engineering services of Schaeffler KG. These are available to offer advice on all matters.

A fitting and user manual can also be requested via the appropriate Application Engineering department.

# Fitting example for FKC

## Drive unit for a coiler motor

### Technical data

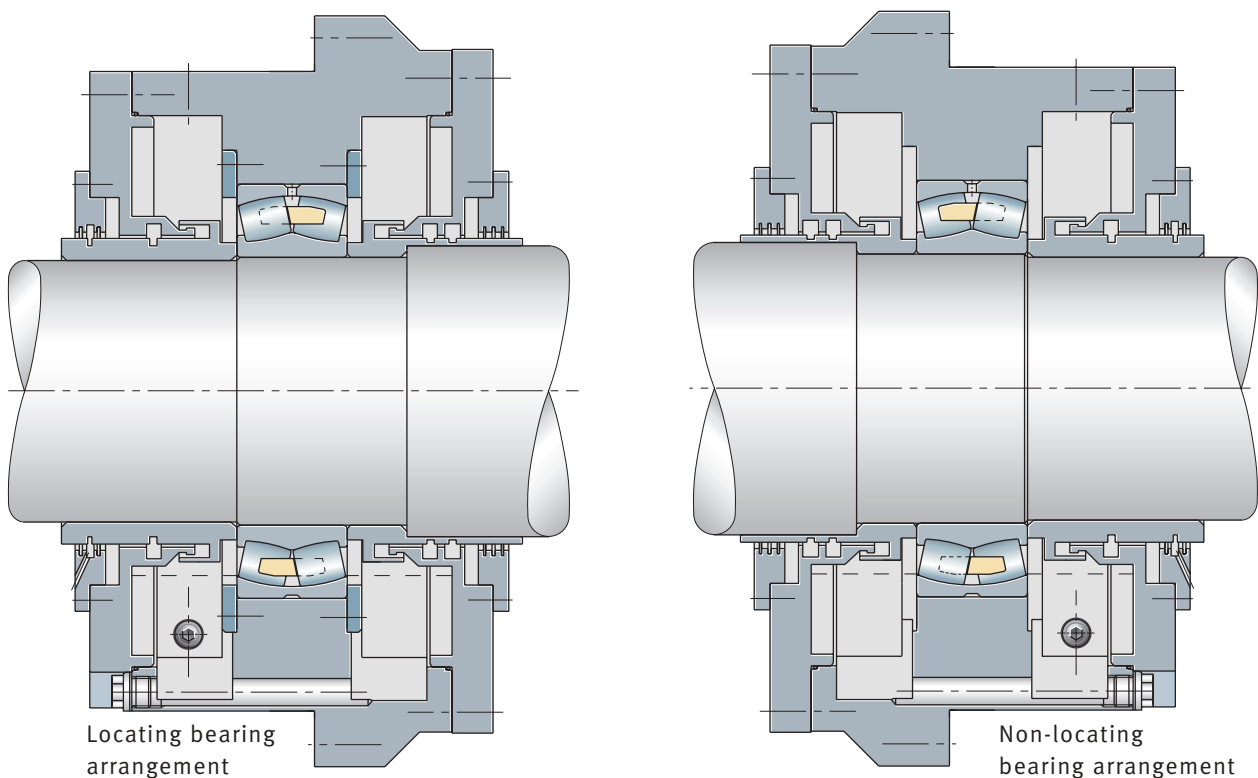
- Three-phase AC synchronous motor, speed control by frequency using inverter
- Motor rating: 2 300 kW for continuous operation
- Speed: 600 to 1 500 min<sup>-1</sup>
- Rotor mass: 5,2 tonnes
- Loads: Drive via gearbox, axial forces of 10 kN

### Bearing arrangement

Both the locating and non-locating bearing side are fitted with an FKC flanged housing unit with a new generation spherical roller bearing 23040-E1A-M-C3. This ensures the locating and non-locating function in the housing accordingly. The bearings are mainly subjected to load by the heavy weight of the rotor and the axial force. Both bearings are lubricated using oil. The oil level is monitored during operation by means of oil level indicators.

For protection against any current passage, both FKC flanged housing units are (optionally) provided with a current-insulating layer. The sealing function on the inside is increased further by an air barrier.

Figure 10: Rotor bearing arrangement of a coiler motor with flanged housing unit FKC



## Flanged housing units FKB

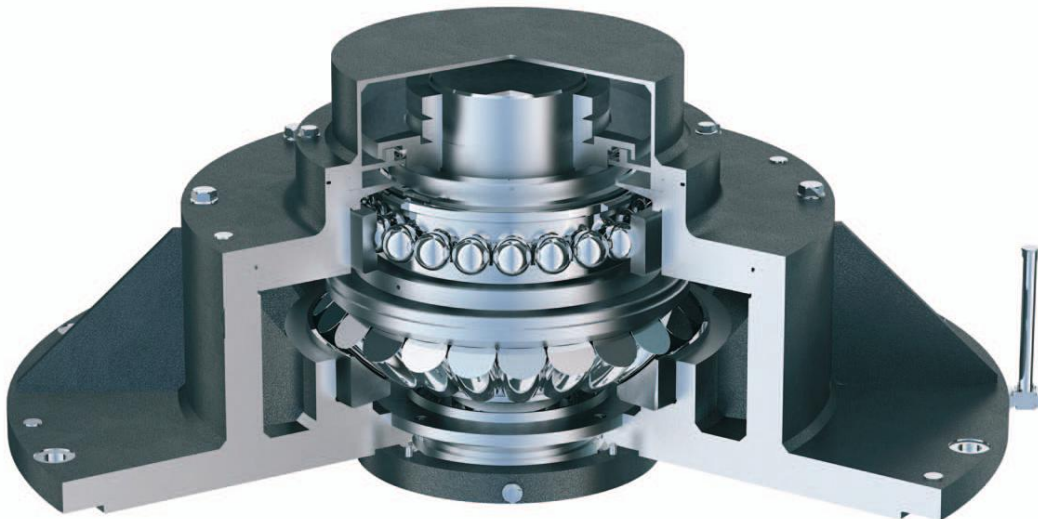
The flanged housing units FKB were specially developed for use in vertical motors and for the support of high axial forces.

Figure 11 shows a schematic of the FKB housing design. The housing generally comprises a housing body, covers, intermediate rings, collector plate, flinger plate and an oil injection ring.

The flanged housing is designed for sump type lubrication.

The associated bearings must be ordered separately. Recirculating oil lubrication with lubricant cooling is also conceivable. The peripheral equipment required here must be designed by the customer himself.

**Figure 11:** Flanged housing unit FKB with oil sump lubrication



### Bearing arrangement

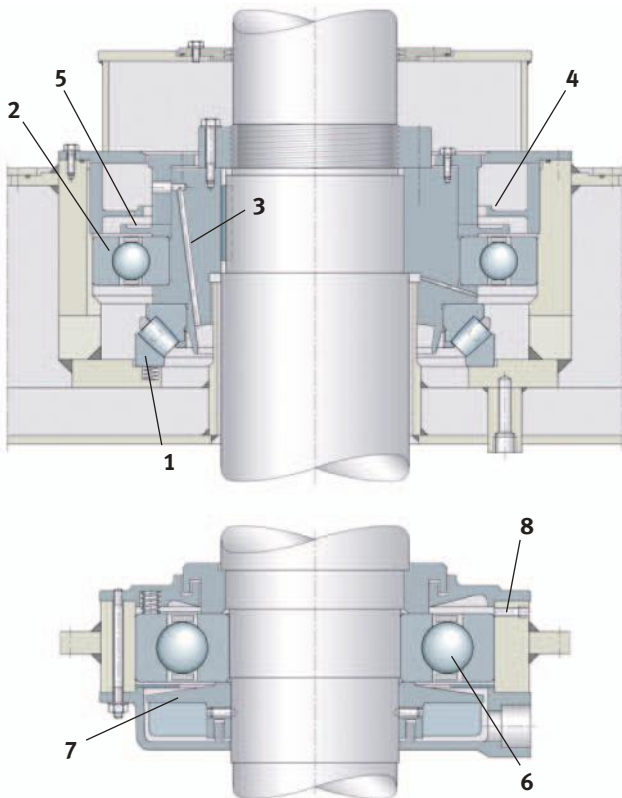
Figure 12 shows the upper and lower bearing position in a vertical electric motor. The upper bearing position is fitted with an FKB housing unit as a complete solution.

The bearings are mainly subjected to load by the heavy weight of the rotor and the axial forces. These forces are supported by the axial spherical roller bearing fitted as a supporting bearing in the upper bearing position.

The only radial forces occurring in vertical motors at the two bearing positions are guidance forces. They comprise the unilateral magnetic attraction that arises from magnetic asymmetry of the stator as well as the unbalance of the rotor and other rotating parts. If the precise values are not known, these forces can be taken into consideration adequately on the basis of experience by assuming that half the impeller weight is acting as a radial load at the centre of gravity of the impeller.

## Fitting example for FKB

**Figure 12:** Rotor bearing arrangement in a vertical motor



The main function of the two deep groove ball bearings is to hold the rotor at its concentric position. The lower deep groove ball bearing is designed as a non-locating bearing in order to compensate thermal expansion of the rotor. The bearing is preloaded using springs so that all the balls are subject to force locking.

The upper deep groove ball bearing performs radial as well as axial counter guidance of the rotor. The axial guidance is necessary during transport as well as during running-down of the motor. In this operating state, the direction of the axial force may be reversed. The axial guide travel upwards is restricted such that the axial spherical roller bearing does not lift too much under any circumstances.

Force locking in the axial spherical roller bearing is provided by springs arranged below the housing locating washer; their spring force must be determined accordingly.

The inner rings of the deep groove ball bearings and the shaft locating washer of the axial spherical roller bearing have a tight fit. The outer rings of the deep groove ball bearings must, however, be movable. Axial spherical roller bearings that, as shown in the example in Figure 12, only transmit axial forces have a loose housing fit.

Selection of the type of lubrication and the lubricant for the upper bearing position is based on the requirements of the axial spherical roller bearing. Oil lubrication is always the better alternative here. The axial spherical roller bearing (1) runs in the oil bath and, due to its asymmetrical construction, generates independent oil recirculation from the inside to the outside. Due to this displacement effect, there is a flow in the bath from the bearing to the cooling surface.

The large volume of oil and the large cooling surface allow dissipation of the frictional heat of the bearing. If this cooling is not sufficient, an oil cooling device can be provided outside the gearbox.

The oil is fed to the deep groove ball bearing in the upper bearing position (2) by a conveying cone and riser holes (3) running upwards at an angle. Above the deep groove ball bearing, the oil exits via the radial holes and first reaches a stationary collector plate (4). From there, it drips through holes onto the flinger plate (5) which sprays the oil into the bearing (2). The purpose of the collector plate and flinger plate is to ensure the supply of oil to the bearing during startup after an extended period of stoppage until the supply of oil from the oil bath comes into operation.

The lower guide bearing (6) is lubricated with grease and is fitted with a relubrication device (8) and a grease valve (7). The supporting bearing position and the lower guide bearing are sealed by labyrinths.

Other variants to meet specific requirements can be designed and supplied by agreement with the relevant Application Engineering department.

# Lubrication

Special rolling bearing greases such as Arcanol offer the best conditions for achieving reliable, durable and cost-effective bearing arrangements. For Arcanol gives you certainty, since Schaeffler KG carries out selection tests, provides quality assurance and gives practice-based lubrication recommendations. Bearings that fail prematurely because they were lubricated with the wrong grease, with all the unpleasant and expensive consequences, are increasingly a thing of the past.

In co-operation with renowned lubricant manufacturers, we have for many years developed lubricants that are particularly suitable for rolling bearings. However, before a new grease can be included in the Arcanol range, it is subjected to a series of tests in the Schaeffler lubricant laboratory.

The greases are tested thoroughly. On our lubricant test rigs FE8 (DIN 51819) and FE9 (DIN 51821), the greases are tested in rolling bearings to determine their service life, friction and wear characteristics. Only the best greases are then selected to undergo the subsequent tests under simulated field conditions in far more complex rolling bearing test rigs. If the results fulfil the requirements of the stringent Schaeffler specifications, the grease is “decorated”. It receives the Arcanol seal of quality.

In addition, we test every single batch to ensure the uniform quality of the product. It is only after this final test that approval can be given to designate the grease as Arcanol. The range is graduated such that almost all areas of application can be optimally covered using these greases.

The overview on page 21 shows chemical-physical data, fields of application and the conditions for which these greases are suitable. The selection of a suitable grease is considerably facilitated by the electronic INA/FAG rolling bearing catalogue.

- **More than 80% of all rolling bearings are lubricated with grease**
- **More than 40% of all cases of rolling bearing damage are caused by defective lubrication**
- **Users therefore require lubricants and lubrication recommendations they can rely on**
- **Arcanol rolling bearing greases ensure that a bearing arrangement can be used to its full performance capacity**
  - long service life
  - good running behaviour
  - high operational security.



# Lubrication

Arcanol rolling bearing greases

## The advantages of Arcanol greases

- With 100% testing, the lubricants guarantee consistent quality for long rolling bearing life
- Developed and tested in the field by application and tribology experts
- Close co-operation at all times with well known lubricant manufacturers
- Arcanol lubricants are optimally designed for rolling bearing applications

### Reduced costs through:

- Longer maintenance intervals
- Lower friction
- Less wear and bearing damage
- Considerably longer bearing operating life
- Increased operational security



## Grease selection table for flanged housing units in large electrical machinery

| MULTITOP   | MULTI3  | LOAD150   | LOAD220                                     | LOAD400  | TEMP90  | TEMP110   | TEMP120                                     | TEMP200   | SPEED2,6                             | VIB3  |
|--|---|---|---|--|---|---|---|---|--------------------------------------|---|
| Universal grease for ball and roller bearings  | Universal grease for ball bearings ØD > 62 mm   | Special grease for ball, roller and needle roller bearings, linear guidance systems | Special grease for ball and roller bearings | Special grease for ball and roller bearings              | Special grease for ball and roller bearings           | Special grease for ball and roller bearings     | Special grease for ball and roller bearings | Special grease for ball and roller bearings   | Special grease for ball bearings     | Special grease for ball and roller bearings                         |
| in rolling mills, construction machinery, automotive engineering, spinning and grinding spindles | in large electric motors, agricultural and construction machinery, household appliances | in machine tools  | in rolling mill plant, rail vehicles        | in mining machinery, construction machinery              | in couplings, electric motors, automotive engineering | in electrical equipment, automotive engineering | in continuous casting plant                 | in track rollers in automatic baking equipment, piston pins in compressors, kiln trucks, chemical plant | in machine tools, instruments        | in blade adjustment in rotors in wind turbines, packaging machinery |
| for increased speeds, high load, low and high temperatures                                       |   | for high load, large speed range, swivel motion                                     | for high load, large speed range            | for very high load, moderate temperature, moderate speed | for high temperature, high load                       | for high temperature, high speed                | for high temperature, high load             | for very high temperature, chemically aggressive environment  | for very high speed, low temperature | for high temperature, high load, oscillating motion                 |



# Lubrication

Lubricators

## Automatic FAG lubricators Motion Guard

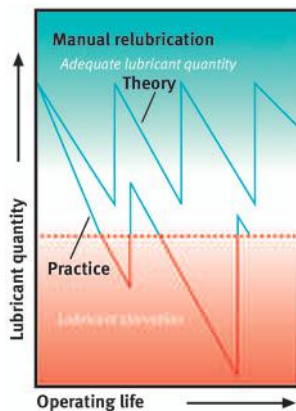
Almost half of all bearing failures can be traced back to inadequate or incorrect lubrication. Bearing failures can be very costly. Bearing failures in motors, pumps, generators or rotor systems, for example in the steel industry, in wind turbines, in the paper industry, in mining or the automotive industry, frequently lead to unplanned and expensive downtime.

In many cases, this incurs costs for repairs and lost production that not infrequently run to tens of thousands of Euros.

### Reliable and cost-effective prevention using FAG Motion Guard

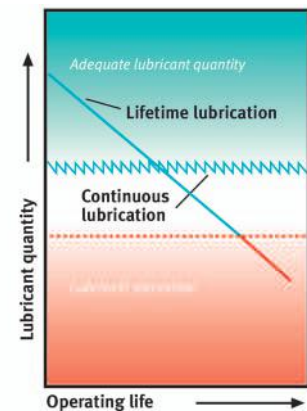
Such damage can be prevented by using automatic lubricators from the FAG Motion Guard range.

Based on the application and cost situation, you can decide which lubricator from the FAG Motion Guard range is the most suitable and the most cost-effective. With FAG Motion Guard lubricators, available as single point or multi-point versions, you are always on the safe side!



Their advantages:

- Individual, precise supply to each bearing position using the most suitable lubricant
- Fully automatic, maintenance-free operation due to continuous relubrication
- Extended service life and maintenance intervals
- Increased availability of plant
- Considerable cost savings



## Automatic FAG lubricators Motion Guard



The single and multi-point lubrication systems provide a lubricant supply for up to six different lubrication points with lubricant constantly, precisely and irrespective of temperature.

The advantages include:

- Maintenance-free and cost-effective
- Versatile in application
- Individually matched to the bearing position
- Precise quantity dispensing even over long periods
- Simple, user-friendly handling
- High flexibility
- Maintenance-free and cost-effective
- No manual relubrication necessary

## Notes



## Notes

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