


# Drawn cup roller clutches



## **1** Drawn cup roller clutches **1008**

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# 1 Drawn cup roller clutches

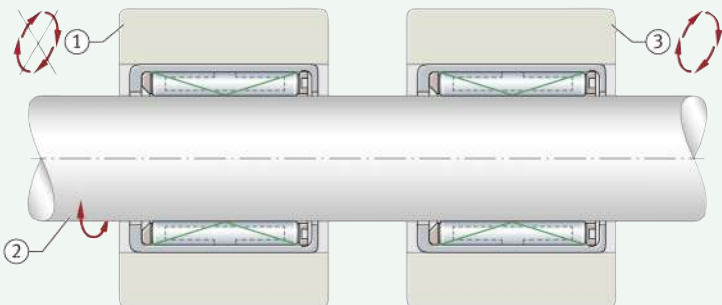


Drawn cup roller clutches:

- are one-way clutches, which transmit torques in one direction  
➤ 1008 | 1
- are available with or without an integrated bearing arrangement  
➤ 1009 | 2, ➤ 1010 | 3 and ➤ 1010 | 4
- give very precise indexing
- allow high indexing frequencies
- have a low overrunning frictional torque
- are available with or without greasing
- are particularly compact in a radial direction and therefore permit extremely compact designs
- are suitable for housing materials made from steel, light metal or plastic
- can be combined with drawn cup needle roller bearings with open ends HK and drawn cup needle roller bearings with closed end BK
- have an extensive range of applications, for example as indexing clutches, back-stopping clutches and overrunning clutches  
➤ 1008 | 1.

**1**  
Drawn cup roller clutches  
in tandem arrangement  
in an indexing system

- ① Stationary component
- ② Component performs a swivel motion
- ③ Component performs a gradual rotational motion



## 1.1 Product design

Design variants

Drawn cup roller clutches are available:

- without bearing arrangement  
➤ 1009 | 2
- with bearing arrangement (rolling or plain bearing)  
➤ 1010 | 3 and ➤ 1010 | 4.

### Drawn cup roller clutches

Drawn cup roller clutches  
are one-way clutches

These drawn cup roller clutches comprise thin-walled, drawn outer cups with a series of ramps on the inside diameter, plastic cages and needle rollers, which serve as clamping elements. Steel or plastic springs hold the needle rollers in their clamped position. Drawn cup roller clutches can transmit high torques in one direction and are particularly compact in a radial direction. The roller clutches are available with and without support bearing arrangements.

 **Suitable for applications with high indexing frequencies**

 **Preferred areas of application**




Drawn cup roller clutches give very precise indexing, since the individual spring loading of the needle rollers ensures continuous contact between the shaft, needle rollers and ramps. They allow high indexing frequencies due to their low mass and the resulting low moment of inertia of the clamping elements. They also have a low overrunning frictional torque.

Drawn cup roller clutches can be used in various applications such as indexing clutches, back-stopping clutches and overrunning clutches. In these cases, the drawn cup roller clutch performs an overrunning or locking function.

Drawn cup roller clutches should not be used if a malfunction could lead to personal injury. New applications, especially those involving extreme conditions, should first be verified by tests. Correct functioning can only be guaranteed if the concentricity error between the support bearing and the shaft can be kept to a low value.

### Drawn cup roller clutches without bearing arrangement



 **Suitable for supporting torques only**


Roller clutches HF do not have a bearing arrangement, i.e. they transmit torques only and, as a result, are unable to support any radial forces  2. In the case of these roller clutches, concentricity to the shaft axis must be secured by additional rolling bearings or drawn cup roller clutches with a bearing arrangement must be used. The drawn cup roller clutches are available with and without knurling.

 **Drawn cup roller clutches without knurling**

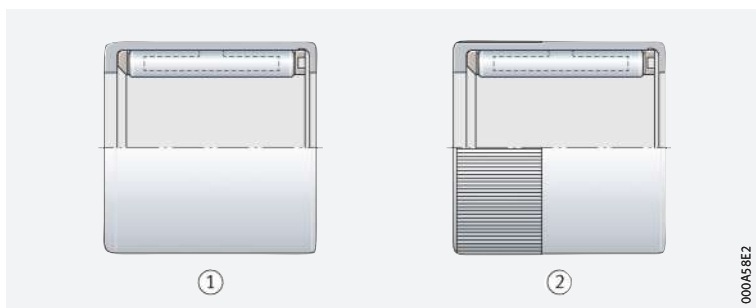
Drawn cup roller clutches without knurling are available with steel or plastic pressure springs  2. Bearings with plastic springs have the suffix KF  1.12.

 **Drawn cup roller clutches with knurling**

For improved torque transmission in plastic housings, drawn cup roller clutches are available with a knurled outside surface. These drawn cup roller clutches have the suffix R  1.12. The knurling can be applied to part of the drawn cup or over its entire length. The drawn cup roller clutches are also available with steel or plastic pressure springs. Roller clutches with plastic springs have the suffix KF  1.12.



 2  
Drawn cup roller clutches without bearing arrangement, with and without knurling

- ① Without knurling
- ② With knurling






### Drawn cup roller clutches with bearing arrangement



 **Also suitable for supporting radial forces**

Due to the integrated plain or rolling bearing, roller clutches HFL can also support radial forces in addition to torques  3 and  4. The drawn cup roller clutches are available with and without knurling.

 **Drawn cup roller clutches without knurling**

Drawn cup roller clutches without knurling are available with steel or plastic pressure springs  3 and  4. Drawn cup roller clutches with plastic springs have the suffix KF  1.12.

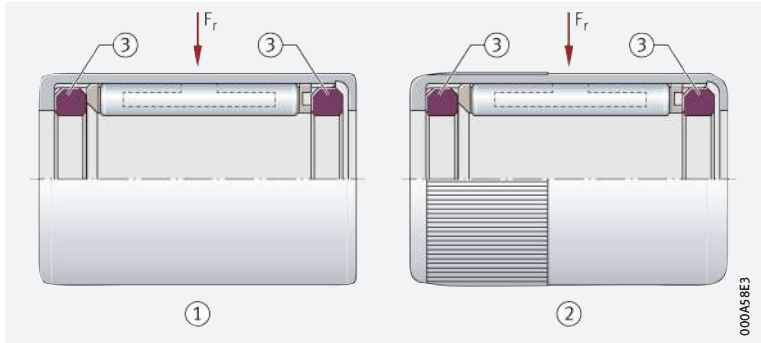
 **Drawn cup roller clutches with knurling**

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### 3 Drawn cup roller clutches with plain bearing arrangement, with and without knurling

$F_r$  = radial load

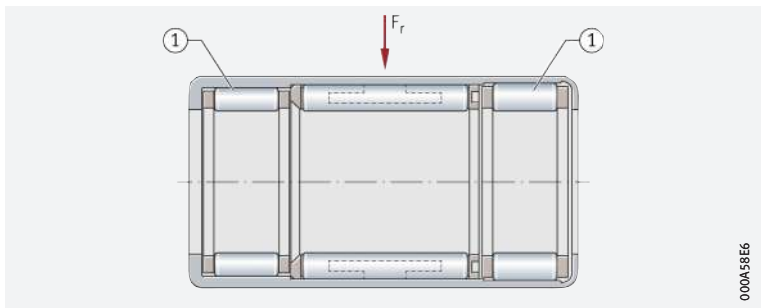
- ① Without knurling
- ② With knurling
- ③ Plain bearing



### 4 Drawn cup roller clutch with rolling bearing arrangement, without knurling

$F_r$  = radial load

- ① Rolling bearing



#### Clamping direction of the drawn cup roller clutch



An arrow on the end face of the drawn cup indicates the clamping direction of the drawn cup roller clutch. The roller clutch clamps when the drawn cup is rotated in the direction of the arrow.

## 1.2 Load carrying capacity

Roller clutches  
with a support bearing  
arrangement accommodate  
radial forces

The rigidity  
of the housing determines  
the transmissible torque

Do not exceed  
the limiting load

Depending on the design (with or without bearing arrangement), drawn cup roller clutches can either transmit torques only or additional radial loads ► 1008 | 1.1, ► 1010 | 3 and ► 1010 | 4.

For roller clutches without bearing arrangement, radial forces must be supported by additional bearings.

#### Transmissible torque

Transmission of torque requires a rigid housing. The transmissible torque is therefore dependent on the shaft and housing material, the shaft hardness, the wall thickness of the housing and the shaft and housing tolerances. When calculating the torque, the maximum drive torque and the moment of inertia of the masses during acceleration must be taken into consideration.

#### Limiting load

In the case of drawn cup roller clutches with plain bearings, the product calculated from the actual speed  $n$  and radial load  $F_r$  must not exceed the value stated for the limiting load  $(F_r \cdot n)_{\max}$ . The operating limits are determined by the limiting speeds stated in the product tables and the permissible radial load.

☞ *The roller clutch must not be overloaded*

### Indexing accuracy and indexing frequency

In order not to overload the clutch, the inertia of the entire system must be taken into consideration. The high indexing accuracy is due to the individual spring loading of the needle rollers, which ensures continuous contact between the shaft, needle rollers and clamping surface.

The indexing accuracy is influenced by the indexing frequency, lubrication, fitting tolerances, adjacent construction, elastic deformation of the adjacent parts and the drive method, either through the shaft or the housing. Optimum accuracy is achieved if the drive is via the shaft.

☞ *High indexing frequencies due to low mass*

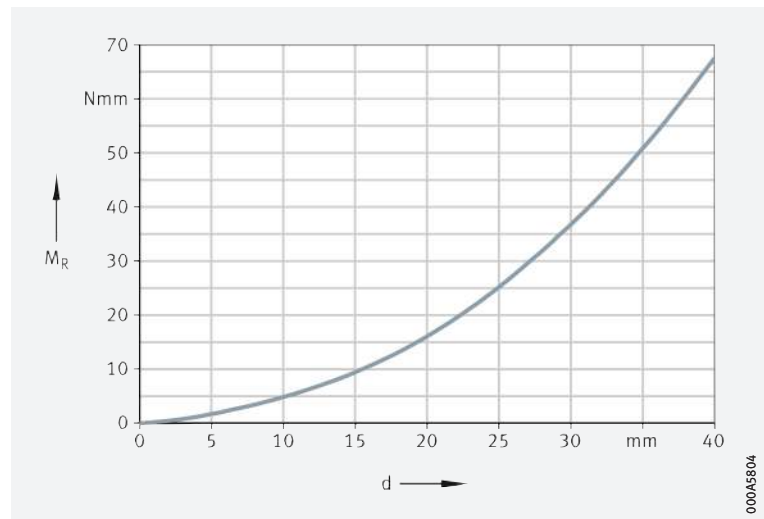
High indexing frequencies are due to the low mass and the resulting low moment of inertia of the clamping elements.

### Frictional torque and frictional energy

For pattern of frictional torque ➤ 1011 | 5. The overrunning frictional energy at idle is dependent on whether the shaft or the outer ring is rotating ➤ 1011 | 6.

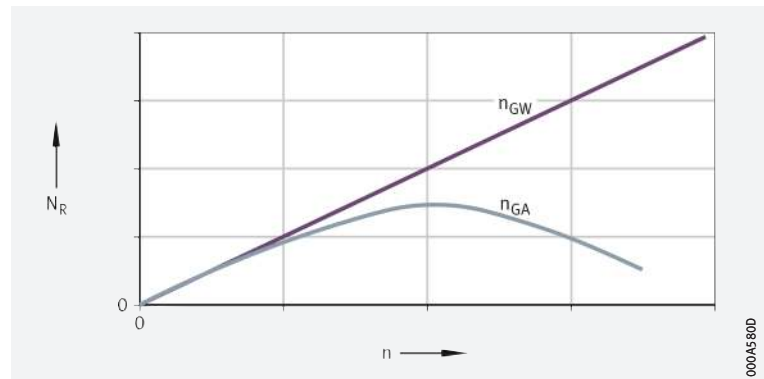
5  
Overrunning frictional torque,  
as a function of shaft diameter

$M_R$  = overrunning frictional torque  
 $d$  = shaft diameter



6  
Overrunning frictional energy,  
as a function of speed

$N_R$  = overrunning frictional energy  
 $n$  = speed  
 $n_{GA}$  = limiting speed  
with rotating outer ring  
 $n_{GW}$  = limiting speed  
with rotating shaft



☞ *Due to the centrifugal force, the needle rollers may lift off the shaft*

### Rotating outer ring

If the outer ring rotates, the frictional energy increases with speed at first but then, due to the centrifugal force of the needle rollers, it decreases gradually towards zero. At this speed, there is no longer any frictional contact between the needle rollers and the shaft. Due to the increasing centrifugal force, the needle rollers lift off the shaft.

## 1.3 Compensation of angular misalignments



Concentricity is an essential precondition for correct functioning of the roller clutch. Correct functioning can only be guaranteed if the concentricity error between the support bearing and the shaft can be kept to a low value.


## 1.4 Lubrication

 *A grease to GA26 is used for initial greasing*

The roller clutches are greased using a lithium soap grease to GA26. In many cases, the initial greasing is sufficient to last the operating life of the bearings. For applications with oil lubrication, roller clutches are available without greasing. These roller clutches are coated with a preservative. For general applications (mixed operation involving locking and overrunning), the Schaeffler initial greasing has proved effective. In order to ensure optimum function, it may be necessary to use different lubricants. The suitability of the lubricant must then be verified by means of tests.



For applications in which one operating condition (overrunning or locking) is heavily predominant, a special greasing should be used. In this case, please consult Schaeffler.

 *A grease operating life cannot be calculated*

It is not possible to calculate the grease operating life or lubrication interval for drawn cup roller clutches. If relubrication is carried out, oil should be used for lubrication or a changeover to oil lubrication should generally be made. At temperatures  $< -10\text{ }^{\circ}\text{C}$  and speeds  $> 0,7\text{ }n_G$ , recommendations on lubrication should be requested. At temperatures over  $+70\text{ }^{\circ}\text{C}$ , oil lubrication should be used. The oil level should be such that, when the drawn cup roller clutch is stationary and the axis is horizontal, it is immersed approx.  $\frac{1}{3}$  in the oil bath.

 *Suitable lubricating oils*

Suitable oils are CL and CLP to DIN 51517 or HL and HLP to DIN 51524. Viscosity classes  1.

 *Compatibility with plastic cages*

When using bearings with plastic cages, compatibility between the lubricant and the cage material must be ensured if synthetic oils, lubricating greases with a synthetic oil base or lubricants containing a high proportion of EP additives are used.


 **1**  
Viscosity classes


Operating temperature $^{\circ}\text{C}$		Viscosity class
from	to	
+15	+30	ISO VG 10
+15	+90	ISO VG 32
+60	+120	ISO VG 100

## 1.5 Sealing

Drawn cup roller clutches (with and without bearing arrangement) are supplied without seals. Contaminants (dust, dirt and moisture) can impair the function and operating life of roller clutches.

### Sealing of the bearing position with sealing rings G or SD

 *Effective sealing elements for use in sealing open drawn cup roller clutches with a risk of contamination*

If there is a risk of contamination, sealing rings of economical series G or SD should be fitted  1026. The sealing rings are designed as contact seals and are arranged in front of the roller clutch. They protect the bearing position reliably against contamination, spray water and excessive loss of grease. The sealing rings are matched to the small radial dimensions of the drawn cup roller clutches and can be combined with wider inner rings of series IR. They are very easy to fit, since they are simply pressed into the housing bore.

1.6 Speeds

⚙️ *Speeds for rotating shaft or rotating outer ring*

The limiting speeds  $n_{GW}$  and  $n_{GA}$  in the product tables are valid for oil and grease lubrication. The limiting speed  $n_{GW}$  is valid for a rotating shaft, while  $n_{GA}$  is valid for a rotating outer ring.

1.7 Noise

Schaeffler Noise Index

The Schaeffler Noise Index (SGI) is not yet available for this bearing type ➤69. The data for these bearing series will be introduced and updated in stages.


Further information:

■ **medias** ➤ <https://medias.schaeffler.com>.

1.8 Temperature range

Possible operating temperatures of drawn cup roller clutches ➤1013|2.

⌘2  
*Permissible temperature ranges*

Operating temperature	Drawn cup roller clutches
	−10 °C to +70 °C, limited by the lubricant



In the event of anticipated temperatures which lie outside the stated values, please contact Schaeffler.

1.9 Cages

Plastic cages are used in the guidance of rolling elements for roller clutches and for integrated support bearing arrangements supported by rolling elements.

1.10 Internal clearance

⚙️ *The enveloping circle diameter  $F_w$  applies instead of the radial internal clearance*

In the case of bearings without inner ring, the dimension for the enveloping circle diameter  $F_w$  is used instead of the radial internal clearance. The enveloping circle is the inner inscribed circle of the needle rollers in clearance-free contact with the outer raceway. In drawn cup roller clutches with a rolling bearing arrangement, the enveloping circle diameter  $F_w$  of the bearings once fitted (in the solid section ring gauge) is approximately in tolerance class F8. Upper and lower deviations of enveloping circle diameter for tolerance class F8 ➤1013|3.

⌘3  
*Deviations of enveloping circle diameter for drawn cup roller clutches supported by rolling bearings*

Enveloping circle diameter $F_w$ mm		Tolerance class F8	
		Tolerance for enveloping circle diameter $F_w$	
over	incl.	upper deviation μm	lower deviation μm
3	6	+28	+10
6	10	+35	+13
10	18	+43	+16
18	30	+53	+20
30	50	+64	+25



1.11

Dimensions, tolerances

Dimensions and tolerances of drawn cup roller clutches are not standardised. The thin-walled outer cups adopt the dimensional and geometrical accuracy of the housing bore.

1.12

Suffixes

For a description of the suffixes used in this chapter ▶ 1014 | 4 and **medias** interchange ▶ <https://www.schaeffler.de/std/1D52>.

 **4**  
Suffixes and  
corresponding descriptions


Suffix	Description of suffix	
–	Steel springs	Standard
KF	Plastic pressure springs	
R	Knurled outside surface	
RR	Drawn cup roller clutch with Corrotect coating	Special design, available by agreement

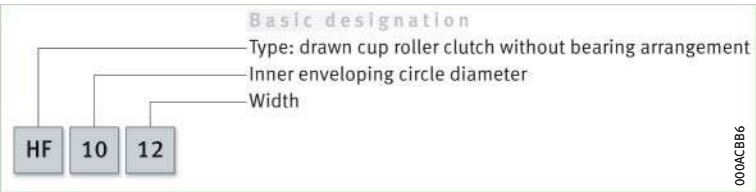
1.13


Structure of the product designation

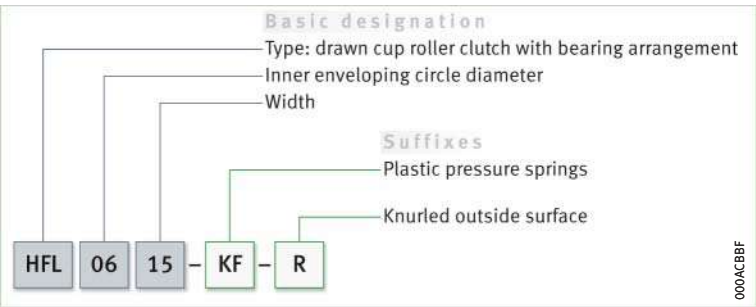
 *Examples of composition  
of product designation*

The designation of drawn cup roller clutches follows a set model.  
Examples ▶ 1014 | 7 and ▶ 1014 | 8.

 **7**  
Drawn cup roller clutch  
without bearing arrangement,  
without knurling:  
designation structure



 **8**  
Drawn cup roller clutch  
with bearing arrangement,  
plastic pressure springs,  
with knurling:  
designation structure



1.14

Dimensioning

The size is determined on the basis of the load carrying capacity of the drawn cup roller clutch relative to the loads and the requirements for rating life and operational reliability ▶ 1015 | 1.15.

1.15

Design of the adjacent construction

Design of housing bore

☞ *Support outer cup over entire circumference and width*

Suitable housing materials are steel, light metal or plastic. In order to allow full utilisation of the performance capability of drawn cup roller clutches and achieve the requisite rating life, sufficient rigid support must be provided for the outer cups in the housing. The support for the outer cup in the housing bore can be produced as a cylindrical seating surface. The seating surfaces for the outer cup and the raceway for the rolling elements or inner ring (if the bearing arrangement is not produced as a direct bearing arrangement) should not be interrupted by grooves, holes or other recesses. The accuracy of the mating parts must meet specific requirements, the bore tolerances for the housing bore (recommended tolerance classes) are dependent on the housing material ► 1015 | 5 and ► 1016 | 6. The surface quality of the housing bore should be  $R_{\text{max}} 0,8$ . The cylindricity tolerance of the housing bore in metal housings should be within the tolerance grade IT5/2.



Due to the thin-walled outside surface, the roller clutches only adopt their precise geometry once they have a tight fit. As a result, the accuracy of the locating bore essentially determines the geometrical accuracy of the drawn cup and thus the functioning of the clutch.

☞ *Provide lead chamfer on the housing bore*

For the drawn cup roller clutches to be mounted without damage, the housing bore must have a lead chamfer of 15°.



5

Design of housing bore

Series	Springs	Bore		
		Housing material		
		Steel Cast iron	Light metal	Max. bore in plastic <sup>2)</sup>
HF, HFL	Steel	N6 Ⓜ (N7 Ⓜ) <sup>1)</sup>	R6 Ⓜ (R7 Ⓜ) <sup>1)</sup>	–
HF...KF, HFL...KF	Plastic	N7 Ⓜ	R7 Ⓜ	–
HF...R, HFL...R	Steel	–	–	0 D –0,05
HF...KF-R, HFL...KF-R	Plastic	–	–	0 D –0,05
HFL0606-KF-R, HFL0806-KF-R	Plastic	–	–	0 D –0,05

1) The values in brackets can be used if the actual torque is no more than 50% of the permissible torque  $M_{d \text{ per}}$  in accordance with the product table.

2) Guide values as a function of the plastic used. Outside diameter D ► 1021 | 6.

Maximum transmissible torque

Minimum wall thickness for metal housings

For metal housings, the maximum transmissible torque  $M_{d \text{ per max}}$  is determined as a function of the diameter ratio  $Q_A$  to **1016** **9** (steel housing) or to **1017** **10** (aluminium housing), see calculation examples. Guide values for  $Q_{A \text{ max}}$  with steel and aluminium as housing materials **1016** **6**.

Guide values

Housing material	Diameter ratio $Q_{A \text{ max}}$
Steel	0,8
Aluminium	0,6



The comparative stress  $\sigma_v$  must not exceed the yield stress of the housing material.

Steel housing

Calculation example

For drawn cup roller clutches HF0612, the maximum transmissible torque  $M_{d \text{ per max}}$  should be determined **1016** **9**:

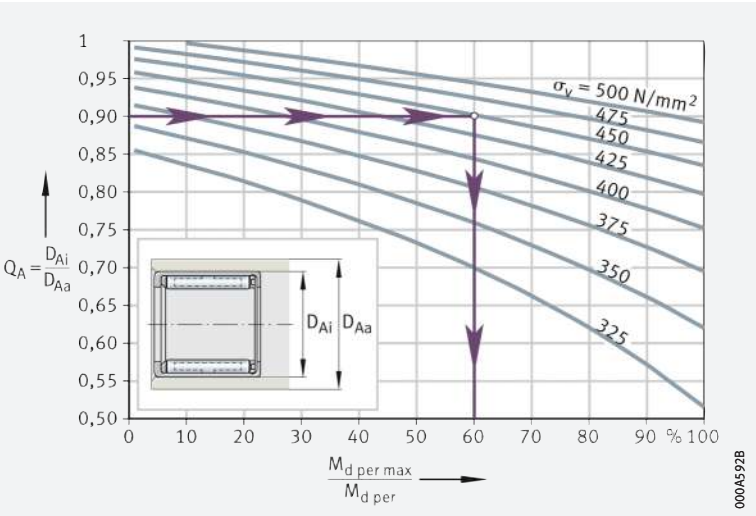
Drawn cup roller clutch HF0612  
Housing Steel  
Housing bore tolerance N6 **1015** **5**  
Permissible housing stress ( $R_{p0,2}$ )  $\sigma_v$  450 N/mm<sup>2</sup>  
Diameter ratio  $Q_A$  of housing 0,9  
Permissible torque  $M_{d \text{ per}}$  in accordance with product table

Calculation

$$\begin{aligned} M_{d \text{ per max}} &= 60\% M_{d \text{ per}} \\ &= 0,6 \cdot 1,76 \text{ Nm} \\ &= 1,056 \text{ Nm} \end{aligned}$$

Steel housing

Modulus of elasticity  
 $E = 210\,000 \text{ N/mm}^2$   
 $Q_A$  = diameter ratio of housing  
 $D_{Ai}$  = housing bore  
 $D_{Aa}$  = housing outside diameter  
 $M_{d \text{ per}}$  = permissible torque  
 $M_{d \text{ per max}}$  = maximum transmissible torque  
 $\sigma_v$  = comparative stress



### Calculation example

#### Aluminium housing

For drawn cup roller clutch HF1616, the diameter ratio  $Q_A$  of the housing should be determined ➤ 1017 | 10:

Drawn cup roller clutch

HF1616

Housing

Aluminium

Housing bore tolerance

R6 @ ➤ 1015 | 5

Permissible housing stress ( $R_{p0,2}$ )  $\sigma_v$

250 N/mm<sup>2</sup>

Maximum transmissible

10 Nm

torque  $M_{d \text{ per max}}$

Permissible torque  $M_{d \text{ per}}$

in accordance with product table

giving  $M_{d \text{ per max}}/M_{d \text{ per}}$

50%

### Calculation

$$Q_A = D_{Ai}/D_{Aa} \leq 0,7$$

$$D_{Aa} \geq D_{Ai}/0,7 = 22 \text{ mm}/0,7$$

$$= 31,5 \text{ mm}$$

### 10

#### Aluminium housing

Modulus of elasticity  
 $E = 70\,000 \text{ N/mm}^2$

$Q_A$  = diameter ratio of housing

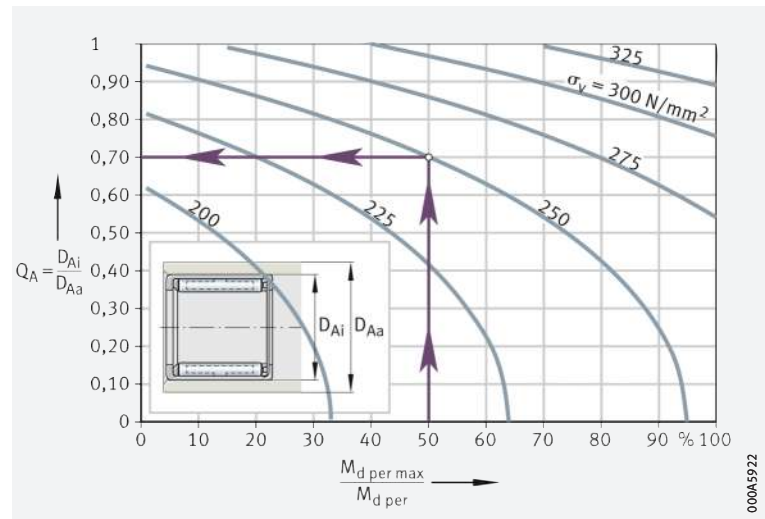
$D_{Ai}$  = housing bore

$D_{Aa}$  = housing outside diameter

$M_{d \text{ per}}$  = permissible torque

$M_{d \text{ per max}}$  = maximum transmissible torque

$\sigma_v$  = comparative stress



000A5922

Minimum wall thickness for plastic housings



For plastic housings, drawn cup roller clutches with a partially or fully knurled outside surface should be used (suffix R).

The guide value for the minimum wall thickness of plastic housings is:

$f_1$

$$s_{\min} \geq D - F_w$$

Legend

$s_{\min}$	mm	Minimum wall thickness
D	mm	Outside diameter of roller clutch
$F_w$	mm	Enveloping circle.

Axial location

A tight fit is usually sufficient for axial location

Drawn cup roller clutches give very easy mounting and permit simple adjacent constructions. The drawn cup roller clutches are pressed into the housing bore and require no further axial location. The precondition for this is, however, that the specifications in accordance with 5 are observed.

Design of the shaft/raceway

Produce the raceway as a rolling bearing raceway

Drawn cup roller clutches HF/HFL are usually used without an inner ring. In order to guarantee correct functioning of the drawn cup roller clutches, the raceway for the rolling elements on the shaft must be produced as a rolling bearing raceway (hardened and ground). The surface hardness of the raceways must be 670 HV to 840 HV, the case hardening depth CHD must be sufficiently large ( $CHD \geq 0,3 \text{ mm}$ ). Design of raceways 7. If the shaft cannot be produced as a raceway, the bearings can be combined with inner rings IR or LR.

Provide lead chamfer on the shaft

For the bearings to be mounted without damage, the shaft must have a lead chamfer of 10° to 15° with a width of approx. 1 mm.

Design of shaft

Series	Springs	Shaft			
		Tolerance class <sup>1)</sup>	Roundness tolerance	Parallelism tolerance	Recommended mean roughness value R <sub>amax</sub> (R <sub>zmax</sub> ) μm
HF, HFL	Steel	h5 (h6) <sup>2)</sup>	max. IT3	max. IT3	0,4 (2)
HF..-KF, HFL..-KF	Plastic	h8			
HF..-R, HFL..-R	Steel	h5 (h6) <sup>2)</sup>			
HF..-KF-R, HFL..-KF-R	Plastic	h8			
HFL0606-KF-R, HFL0806-KF-R	Plastic	h9			

<sup>1)</sup> The envelope requirement applies.

<sup>2)</sup> The values in brackets can be used if the actual torque is no more than 50% of the permissible torque  $M_{d \text{ per}}$

## 1.16

## Mounting and dismounting



Protect drawn cup roller clutches against dust, dirt and moisture; contaminants can impair the function and operating life of roller clutches. Pressing-in forces must never be directed through the rolling elements. Drawn cup roller clutches must not be tilted during pressing-in, as this may damage the needle rollers and raceways.

#### Retention for transport

Drawn cup roller clutches are normally packed individually in the case of small quantities. Where larger quantities are involved, drawn cup roller clutches are placed in a specific orientation in blister packaging and delivered in this form. The blister packaging then serves to retain the parts in position during transport.

#### Removing the drawn cup roller clutches from the packaging

Drawn cup roller clutches should only be removed from their original packaging immediately before assembly. If roller clutches are removed from a batch packaged with dry preservative, the package must be closed again immediately. The protective vapour phase can be maintained only in the closed package. Ungreased drawn cup roller clutches are coated with a preservative. Lubrication with oil must take place after pressing-in, in accordance with the specifications.

#### Storage

Drawn cup roller clutches should be stored:

- in dry, clean rooms with the room temperature as constant as possible
- at a relative humidity of max. 65%.

#### Storage period

The storage period for greased drawn cup roller clutches is limited by the shelf life of the lubricating grease.




#### Mounting using a fitting mandrel

Drawn cup roller clutches should only be pressed into the locating bore using a special fitting mandrel. Attention must be paid to the clamping direction of the roller clutch. The clamping direction is indicated by an arrow on the end face of the drawn cup.

The drawn cup roller clutch clamps if it is rotated in the direction of the arrow.

### Functional inspection

#### Clutches without knurling

The function of these roller clutches is checked in a housing with the minimum wall thickness determined according to ►1016| 9 or thicker. The housing bore and shaft tolerances must be observed ►1015| 5 and ►1018| 7.

#### Clutches with knurling

The function of these clutches is checked before they are pressed in. In this case, the inspection criteria are the clamping effect and idling.



For any questions relating to the mounting of drawn cup roller clutches, please consult Schaeffler.

### Schaeffler Mounting Handbook

#### Drawn cup roller clutches must be handled with great care

In order that drawn cup roller clutches can function correctly and achieve the envisaged operating life without detrimental effect, they must be handled with care.



The Schaeffler Mounting Handbook MH 1 gives comprehensive information about the correct storage, mounting, dismounting and maintenance of rotary rolling bearings ►<https://www.schaeffler.de/std/1D53>. It also provides information which should be observed by the designer, in relation to the mounting, dismounting and maintenance of bearings, in the original design of the bearing position. This book is available from Schaeffler on request.

## 1.17

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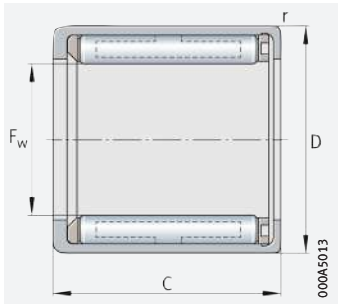


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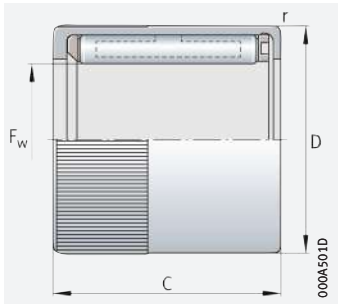


Drawn cup roller clutches

Without bearing arrangement  
With or without knurling



HF, HF..-KF  
Without knurling



HF..-R, HF..-KF-R  
With knurling

F<sub>w</sub> = 3 – 35 mm

Main dimensions				Permissible torque  M <sub>d</sub> per Nm	Limiting speeds		Mass  m ≈ g	Designation ➤ 1014   1.12 ➤ 1014   1.13		Suitable drawn cup needle roller bearings for radial support ➤ 886
F <sub>w</sub>	D	C -0,3	r min.		n <sub>GW</sub> <sup>1)</sup> min <sup>-1</sup>	n <sub>GA</sub> <sup>2)</sup> min <sup>-1</sup>		Drawn cup roller clutch with plastic springs	steel springs	
3	6,5	6	0,3	0,18	45 000	8 000	1	HF0306-KF	–	HK0306-TV
	6,5	6	0,3	0,06	45 000	8 000	1	HF0306-KF-R	–	HK0306-TV
4	8	6	0,3	0,34	34 000	8 000	1	HF0406-KF	–	HK0408
	8	6	0,3	0,1	34 000	8 000	1	HF0406-KF-R	–	HK0408
6	10	12	0,3	1,76	23 000	13 000	3	HF0612-KF	HF0612	HK0608
	10	12	0,3	0,6	23 000	13 000	3	HF0612-KF-R	HF0612-R	HK0608
8	12	12	0,3	3,15	17 000	12 000	3,5	HF0812-KF	HF0812	HK0808
	12	12	0,3	1	17 000	12 000	3,5	HF0812-KF-R	HF0812-R	HK0808
10	14	12	0,3	5,3	14 000	11 000	4	HF1012-KF	HF1012	HK1010
12	18	16	0,3	12,2	11 000	8 000	11	–	HF1216	HK1212
14	20	16	0,3	17,3	9 500	8 000	13	–	HF1416	HK1412
16	22	16	0,3	20,5	8 500	7 500	14	–	HF1616	HK1612
18	24	16	0,3	24,1	7 500	7 500	16	–	HF1816	HK1812
20	26	16	0,3	28,5	7 000	6 500	17	–	HF2016	HK2010
25	32	20	0,3	66	5 500	5 500	30	–	HF2520	HK2512
30	37	20	0,3	90	4 500	4 500	36	–	HF3020	HK3012
35	42	20	0,3	121	3 900	3 900	40	–	HF3520	HK3512

medias ➤ <https://www.schaeffler.de/std/1E86>

<sup>1)</sup> Limiting speed for rotating shaft.  
<sup>2)</sup> Limiting speed for rotating outer ring.

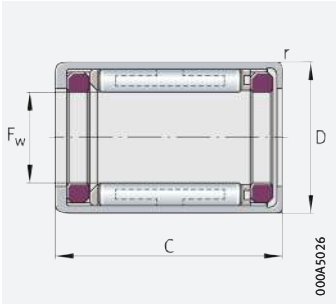




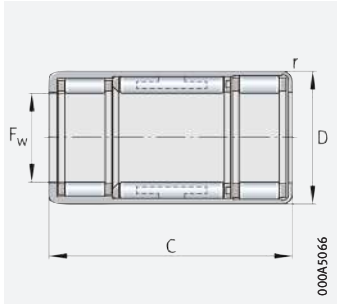


Drawn cup roller clutches

With bearing arrangement  
With or without knurling



HFL, HFL...-KF, plain bearing arrangement (HFL0308-KF, HFL0408-KF, HFL0615-KF, HFL0615)



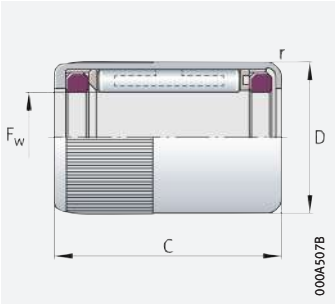
HFL, HFL...-KF, rolling bearing arrangement ( $F_w \geq 8 \text{ mm}$  and  $C \geq 22 \text{ mm}$ ), HFL0822-KF-R, HFL0822-R

$F_w = 3 - 35 \text{ mm}$

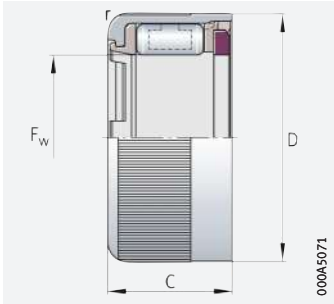
Main dimensions				Basic load ratings <sup>1)</sup>		Fatigue limit load	Permissible torque	Limiting speeds		Mass
F <sub>w</sub>	D	C	r	dyn. C <sub>r</sub> N	stat. C <sub>0r</sub> N	C <sub>ur</sub>  N	M <sub>d per</sub>  Nm	n <sub>GW</sub> <sup>3)</sup>  min <sup>-1</sup>	n <sub>GA</sub> <sup>4)</sup>  min <sup>-1</sup>	m  ≈ g
3	6,5	8	0,3	–	–	–	0,18	45 000	8 000	1,4
	6,5	8	0,3	–	–	–	0,06	45 000	8 000	1,4
4	8	8	0,3	–	–	–	0,34	34 000	8 000	1,6
	8	8	0,3	–	–	–	0,1	34 000	8 000	1,6
6	10	6	0,3	–	–	–	0,5	23 000	13 000	1
	10	15	0,3	–	–	–	1,76	23 000	13 000	4
	10	15	0,3	–	–	–	0,6	23 000	13 000	4
8	12	6	0,3	–	–	–	0,7	17 000	12 000	2
	12	22	0,3	3 650	3 950	550	3,15	17 000	12 000	7
	12	22	0,3	3 650	3 950	550	1	17 000	12 000	7
10	14	22	0,3	3 950	4 500	630	5,3	14 000	11 000	8
12	18	26	0,3	6 300	6 700	920	12,2	11 000	8 000	18
14	20	26	0,3	6 800	7 800	1 080	17,3	9 500	8 000	20
16	22	26	0,3	7 400	9 000	1 250	20,5	8 500	7 500	22
18	24	26	0,3	8 000	10 200	1 420	24,1	7 500	7 500	25
20	26	26	0,3	8 500	11 400	1 590	28,5	7 000	6 500	27
25	32	30	0,3	10 600	14 000	1 900	66	5 500	5 500	44
30	37	30	0,3	11 600	16 900	2 290	90	4 500	4 500	51
35	42	30	0,3	12 200	18 800	2 550	121	3 900	3 900	58

medias ► <https://www.schaeffler.de/std/1E87>

- <sup>1)</sup> Drawn cup roller clutches with rolling bearing arrangement.
- <sup>2)</sup> Drawn cup roller clutches with plain bearing arrangement: during operation, the product calculated from the actual speed  $n$  and radial load  $F_r$  must not exceed the value stated for the limiting load  $(F_r \cdot n)_{\max}$ . The operating limits are determined by the limiting speeds stated and the permissible radial load.
- <sup>3)</sup> Limiting speed for rotating shaft.
- <sup>4)</sup> Limiting speed for rotating outer ring.
- <sup>5)</sup> No arrow on end face.



HFL0308-KF-R, HFL0408-KF-R,  
HFL0615-R, HFL0615-KF-R, plain  
bearing arrangement, with knurling



HFL0606-KF-R<sup>5)</sup>, HFL0806-KF-R<sup>5)</sup>,  
plain bearing arrangement,  
with knurling

F <sub>w</sub>	Designation		Permissible radial load <sup>2)</sup>	
	▶ 1014   1.12 ▶ 1014   1.13		Limiting load (F <sub>r</sub> · n) <sub>max</sub> <sup>2)</sup>	
	Drawn cup roller clutch with		F <sub>r max</sub>	
	plastic springs	steel springs	N	N/min
3	HFL0308-KF	–	60	16 000
	HFL0308-KF-R	–	60	16 000
4	HFL0408-KF	–	80	16 000
	HFL0408-KF-R	–	80	16 000
6	HFL0606-KF-R	–	40	4 200
	HFL0615-KF	HFL0615	110	18 000
	HFL0615-KF-R	HFL0615-R	110	18 000
8	HFL0806-KF-R	–	54	4 200
	HFL0822-KF	HFL0822	–	–
	HFL0822-KF-R	HFL0822-R	–	–
10	–	HFL1022	–	–
12	–	HFL1226	–	–
14	–	HFL1426	–	–
16	–	HFL1626	–	–
18	–	HFL1826	–	–
20	–	HFL2026	–	–
25	–	HFL2530	–	–
30	–	HFL3030	–	–
35	–	HFL3530	–	–