SUMA

Clutch & Bearing

CHANGZHOU SUMA PRECISION MACHINERY CO.,LTD

One Way Clutch Bearing, Backstop Clutch, Overrunning Clutch, Needle Bearing, Cam Follower, etc. With sample or drawing, Non-Standard product can be customized based on customer's specific requirements.

CHANGZHOU SUMA PRECISION MACHINERY CO.,LTD

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Company Profile

Changzhou Suma Precision Machinery Co., Ltd was established in 2005, which was a professional and non-stop manufacturer for mechanical parts. Changzhou Suma Precision Machinery Co.,ltd integrates into R&D, Design, Manufacturing and Sales, the main products are one way clutch bearing, backstop clutch, overrunning clutch . Over 100 different patterns and more than thousands sizes available. With a wide range of variety , products are widely used in printing machine, packaging machine ,conveyor system, bucket elevator, gearbox , reducer and any power transmission industrial field.

With over 20 years experience, well equipped testing facilities and strict quality control, Changzhou Suma Precision Machinery Co., Ltd products sell well all over the world, the main markets are European, America, Canada, Brazil, India, Asia, etc . It was a certified enterprise with Quality Management System ISO9001:2015, SGS , Safety Certificate of Approval for Mining Products . In the meantime, with accurate control of key process and technical support from engineer team, customized products are also available. Stable product performance and reliable after sales service always are our only way to win customer.

The business principle of Changzhou Suma Precision Machinery Co., Ltd is human-oriented , customer first, excellent quality, prestige guarantee and perfect service . We anticipate for the cooperation with you and create a better future.

Production Overview

Testing Equipment

The main products are: One Way Clutch Bearing, Backstop Clutch, Overrunning Clutch, Needle Bearing, Cam Follower, etc. With sample or drawing, Non-Standard product can be customized based on customer's specific requirements. Now, product market spreads Europe, North America, South America, Oceania, Southeast Asia, and domestic market, and we have built long standing and good cooperation with many large and medium enterprises.

Products are widely used in printing machinery, packing machinery, textile machinery, paper making machinery, fishing net machinery, mining machinery, conveyor machinery, and heavy industrial machineries.

Production Equipment

Changzhou Suma Precision Machinery Co.,Ltd

单向离合器俗称单向轴承，也是仅能单一方向（顺时针方向或逆时针方向）传动的机械传动基础件。
当动力源驱动被动元件时只能单一方向 传动,若动力源转变方向时，（如顺时针变为逆时针方向），
被动元件则自动脱离不产生任何动力传送的功能。
单向离合器有两种运动方式
扭矩传递或称接合（楔合）
空转或称超越（解脱）
单向离合器具备以下功能
超越
当单向离合器的动力输出部分（内环或外环）转速比动力源（外环或内环）还快时，离合器处于
解脱状态,内外环没有任何连动关系,此谓单向离合器的单向超载功能。
定位（分度）
将直线往复运动转换成旋转轴的圆周步进运动,此谓单向离合器的分度功能。
逆止
将单向离合器用于物科输送设备（如皮带输送机、斗式提升机等），以防止设备在无动力源时倒
退或反转。互谓单向离合器的单向逆止功能。

Freewheels are directional couplings,which means that the driving memberrotates thd driven member in one direction,while automatically disengaging itself from the driven member.
When the direction of rotation is reversed.
The two operating states are
Transmission of torque(engagement)
Idling(overrunning)
Freewheels may be employed as.
Overrunning clutch
The freewheel dicengages automatically when the driven member rotates faster than the driving member.
Indexing clutch
The freewheel allows the conversion of reciprocating motion into intermittent rotational movement.
Backstop clutch
The freewheel allows rotation in one direction only.It overruns continuously during operation. The freewheel prevents reverse rotation of the drive is disconnected.
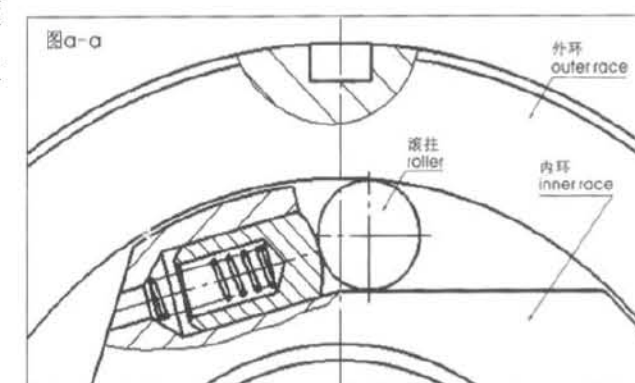
基本形式有
The basic version are

滚柱式单向离合器　ROLLER FREEWHEELS

滚柱式单向离合器为外环与内环之间以圆柱形滚子支撑，而内环安装有弹簧及顶销，由顶销产生一个持续的推力，将滚柱往外挤压便构成了外环、内环及滚柱的接合结构如下图，由于滚柱与内环、外环的接触为持续不间断的，故可立即的反应与传输扭矩力。此种滚柱型设计坚固耐用、可靠性高，可适用各种应用范围。例如超运转速度离合器、定位离合器或防止逆转离合器（如图 a—a）

图a-a

These freewheels feature a cylindrical outer race and an inner consisting of ramps on which rollers are located .Springs and plungers ensure a permanent conact between the different elements for an instant torque transmission.This rugged reliable versatile design can be used as an overrunning clutch,indexing clutch or backstop(See figure a—a).

模块式单向离合器　SPRAG FREEWHEELS

此型单向离合器的内环及外环均为圆柱形环面。楔块安置在保持器中来支撑内环与外环，依照楔块与内环、外环的相对运动来达到传递扭力或空转的功能。此种型式可设计出各种形式的楔块及保持器以满足各种不同的特性需求。其特点是传递扭矩大,作用寿命长。
（如图 b-b ）

图b-b
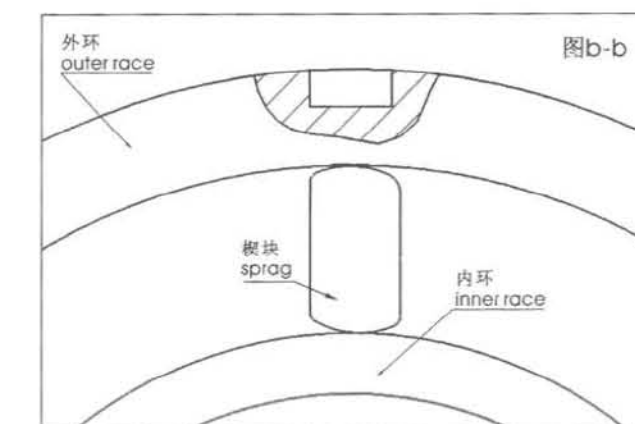
In this type of freewheel,the two races are cylindrical.The sprags fittes in a cage feature an active profile that ensures engagement or disengagementaccording to the relative motion of the races.It is possible to adapt the design of sprags and cage to get significantly different characteristics from one model to another(See figure b-b).

非接触式单向离合器　NON-CONTACT SPRAG

此型设计之特点为楔块固定于楔块保持架中，楔块保持架与超运转速度之环体（如内环或外环）结合。与内环或外环结合的楔块保持架及楔块转动时会产生离心力，此离心力会抵消或大于楔块弹簧的力量，从而使楔块以离心力的方向重新旋转一个角度，而使旋转之内环和外环与楔块保持一个无接触的状态，克服了离合器高速超越回转磨损较大的缺点，可使离合器的使用寿命得以延长。（如图 C-C）

Freewheel Sprags in this design are fitted into a cage connected to the overrunning member The sprag configuration is such that its center of gravity is offset to its rotation axis.Centrifugal force creates a lift engaging off moment against an spring,the sprag freewheels rotates freely with absolutely no mechanical contact and overcomes wearing. The result is a greatly increased its service life compared to conventional type at highspeed. (See figure c-c).

图C-C

超越
Inner Race Only Turning

结合
Inner And Outer Locked And Turning

选用时所需要的条件　THE INFORMATION FOR SELECTION
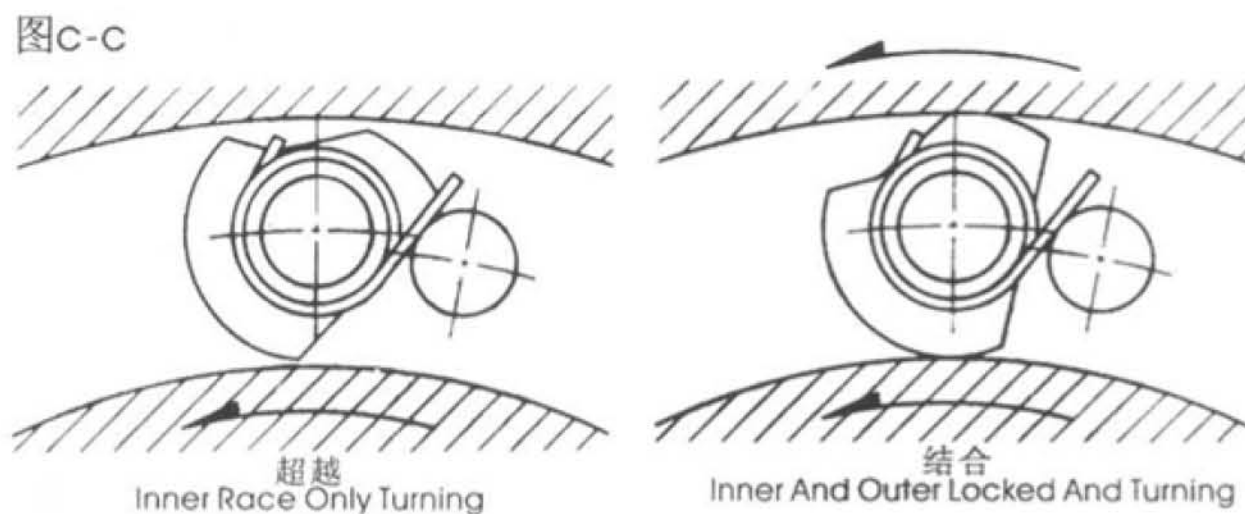
超越离合器	Overrunning clutch
马达规格（输入功率）	Type of motor
马达的起动转矩 / 额定转矩	Nmstart/Nmnominal of motors
额定驱动扭矩	Nominal driving torque
运转速度范围	Range of driving speed
被驱动件的惯量 "j"	Inertia" j" of the driven masses
超运转速度的范围	Range of overrunning speed
使用次数（寿命）	Number of start during service life
轴的直径	Shaft diameter
定位离合器	Indexing clutch
定位运动次数 / 每分钟	Number of cycles/min
定位运动角度	Index angle
额定扭矩	Nominal torque
被驱动件是惯量 "j"	Inertia " j" of the driven masses
传动件的加速度	Accelerations of the driving member
使用次数寿命	Number of indexes during service life
轴的直径	Shaft diameter

防止逆转离合器　BACKSTOP CLUTCH

后退冲击的扭矩
最大的动态后退撞击扭矩，此扭矩的产生由于物件端点被固定，两端点间的工作产生弹性的作用而发生。
超运转速度的范围
使用次数寿命
轴的直径

Stroke reverse torque
Maximum dynamic reverse torque,due to elasticity of the locked parts.
Range of overrunning speed
Number of torque applications during service life
Shaft diameter

选用步骤
SELECTION PROCEDURE

最标准的方法是按前页所提到的数据资料，使用已知的公式计算出所需的最大工作扭矩。

若无法得到某些数据资料则可使用负载安全系数的方法来计算，此方法较简单，而所求得的结果亦基本相等。

当最大的工作扭矩求得后，再依照所要求的寿命次数，对照选用图表，可得知单向离合器额定扭矩（负载安全系数"f"）O

依照应用例的不同，从防止逆转到定位离合器，其寿命年限内的运动次数均不同，故以负载安全系数"f"为纵坐标的曲线图，可以依照目录扭矩及不同的负载安全系数，求得不同比例的工作扭矩。

如（图1）X轴表示运动次数和扭矩，目录上的额定扭矩 Tn 相等于 1 X106 的运动次数寿命的扭矩。

最大的使用扭矩为额定扭矩的 1.7 倍，亦相等于 4x105 运动次数寿命，依照不同的扭矩或运动次数寿命可以从曲线中求得不同的负载安全系数"f"O

负载安全系数 f
Load factor

$$\text{额定扭矩} = \frac{\text{工作扭矩}}{\text{安全系数}}$$

$$Tn = \frac{\text{Working torque}}{f}$$
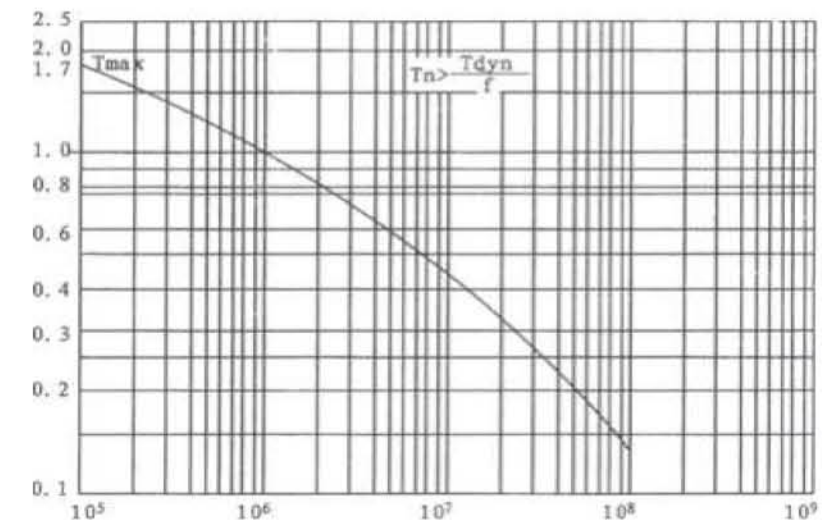
图 1 drawing1　使用次数寿命 Number of cycles

The previously mentioned data will be used to calculate the maximum working torque using kmown mechanical formulas.This way of calculation will be the most accurate.

If some of the data is not available.it will be necessary to work from service factors,an easier method,but more approximate.

When the maximum working torque has been calculated,and kmowing the desired number of torque applications within the lifetime,the unit catalogue torque can be determined from the following curve(load factor" f").

Depending on application type,from backstop to indexing clutch,the number of cycles within thedesired lifetime will be very different,thus adapting the selection.The ordinate of this curve is the "f" factor,ratio of the working torque over the catalogue torque.

The x-axis shows the number of cycles or torque applications.The cataloguetorque Tn is a value corresponding to a calculated life time of 1 x 106torque applications.

The maximum usable torque is 1.7 times the catalogue torque and corresponds to a life time of 100000 cycles.From the desired number of torque applications,theworking factor "f" will be read on the curve.

润滑与保养
Lubrication & maintenance

各类型号的离合器，在出厂时已加注品质优良的油脂。所以，根据环境和使用条件的不同可在三个月到半年之内不再重新添加油脂。在此期限之后，应定期检查、清洗、更换油脂。建议，每半年更换一次油脂，恶劣环境下应三个月一次。对于直径大于 <|> 200mm 的离合器，应每半年更换一次油脂。

有些型号的离合器需要用润滑油润滑，对这类型号的离合器，应定期加油，且油面保持一定的高度。选用润滑剂，请注意使用范围。润滑剂中含有石墨、钳之添加剂的，请勿使用。

Every type clutches have been lubricated with grease,which grease used in a long life type stability.Therefore no maintenance need from three month to six month according to different of environment and operation. Afterword grease should be checked、 cleaned、changed regularly、Recommend changed grease every six month or three month in a dirtyenvironment.to a bore size above 200mm after half year of operation.

Some type clutches lubricated with oil in operation regularly and the level should be checked. Grease and oil including graphite and molybdenum should be avoid and pay attention to limits of to use.

逆止器的扭矩计算　　SELECTION TORQUE FOR BACKSTOPS

例如要停止一个带载的倾斜的传送带，电梯或者泵是一个动态的过程。其间会有一个峰值扭矩的出现。而峰值扭矩恰恰决定了逆止器的大小。当前，最有效的方法是假想在自锁过程中会有震动产生，并对该系统进行计算。计算结果取决于转动惯量和弹性系数等的设定值。然而，在很多情况下，由于需考虑的元素太多，振动系统的计算复杂而繁琐，基于我们在经验，在选择扭矩时，我们只是采用如下的经验公式：

Ma=1,75 • ML[Nm]

通常只需给出电机的额定功率，进行如下计算：

Ma=1,75 • n2 - 9550 . Po/nSP[Nm]

在公式中：

Ma= 逆止器的计算扭矩 [Nm]

M|_=9550 • t] • PL/nSP[Nm]

= 满载下的有效扭矩 [Nm]

卩⊥ = 满载下的有效功率 [KW]

= 提升高度乘以每秒提升的重量 [kN/s]

卩。= 电机的额定功率 [KW]

贝 卩 = 逆止器所在轴的转 ii[min-1] n= 传动效率系数（详见附表）

在得出计算扭矩后，通过查表和对比逆止器的额定扭矩何计算扭矩，并保证：

Mn'Ma

1\/1 吖查表所得的逆止器额定扭矩 [Nm]

值得注意的是，当电机延逆止器同步动转方向起动时，会产生一个很高的扭矩峰值，该峰值有可能损坏回器。

I 的近似值：

安装形式	n	n2
传送带，倾角 6。	0,71	0,50
传送带，倾角 8。	0,78	0,61
传送带，倾角 10°	0,83	0,69
传送带，倾角 12°	0,86	0,74
传送带，倾角 15。	0,89	0,79
柱塞泵	0,93	0,87
球磨机干式滚筒	0,85	0,72
斗式输送机，升降机	0,92	0,85
锤磨机	0,93	0,87

Bringing a loaded inclined conveyor.an elevator or a pump to a standstill is a highly dynamic process that incurs high peak torques.Thhese peak torques are decisive for the selection of the backstop.The prior determination of the occurring torque in the case of locking is carried out most safely by using a rotational vibration analysis of the entire system. This,however,requires a knowledge of the rotating masses.the rotational rigidity and all of the excitation moments that occur on the system.In marry cases.a vibrational calculation is too time consuming or you may not have all the necessary data in the configuration phase available.In this case.the selection torque MA of the backstop should be determined as follows:

Ma=1,75 . ML[Nm]

Often you only have the figures for the motor nominal output P0[kW]available.Then:

Ma=1,75 • 9550 - P/risplNm]

In these equations:

MA=Selestion torque of the backstip[Nm]

ML=9550 • t] • PL/nSP[Nm]

=Static backdriving torque of the load referring to the backstop shaft[Nm]

PL=Lifting capacity of the conveyor system at full load[Nm]

=Lifting helght[m]multiplied by the load that is being conveyed per second[kN/s] P0=Nominal power of motor[Nm] nSP=Speed of backstop shaft[min-1]

t] =Efficiency of installation(refer to table)

After calculating MA the backstip size must be selected in accordance with the catalogue tables in such a way that in all cases this applies:

Mn N Ma

MN=Nominal torque of the backstip in accordance with the table values[Nm]

It must be noted that,with a direct motor start in the locking direction of a backstop,very high peak torques can occur which in turn can destroy the backstop. Approximate values torn:

Type of installation	n	n2
Conveyor belts,angle up to 6°	0,71	0,50
Conveyor belts,angle up to 8°	0,78	0,61
Conveyor belts,angle up to 10°	0,83	0,69
Conveyor belts.angle up to 12°	0,86	0,74
Conveyor belts,angle up to 15°	0,89	0,79
Screw pumps	0,93	0,87
Ball mills,drying drums	0,85	0,72
Bucket conveyors.elevators	0,92	0,85
Hammer mills	0,93	0,87

超越离合器扭矩的计算 SELECTION TORQUE FOR OVERRUNNING CLUTCHES

由于共振的影响，当超越离合器开始使用时，通常状况下会产生峰值扭矩，特别值得注意的是，在使用异步电动机时，装置的转动惯量非常大时，以及使用弹性联轴器时，峰值扭矩可以达到按电机额定功率计算出的扭矩的几倍. 内燃机也很类似，内燃机在政党运行时，由于其工作的不均衡，其峰值扭矩也会大大超过额定扭矩。

通过对整个系统进行转动振动分析可以预先推算出可能出现的最大扭矩峰值。这当然顺先了解旋转质量、扭转刚度和所有作用在系统上的激发扭矩，才能实现。很多情况下，振动计算太过复杂或者项目化阶段时没 有全部足够的数据。因此应根据下列方法计 算出计算扭矩 MA：

Ma=K • Ml

在公式中：

Ma= 超越离合器的计算扭矩

1<= 运行参数（详见附表）

ML=^ 载下的有效扭矩

=9550 . P（）/nFR

卩。= 电机的额定功率 [kW]

峰 = 同步时，超越离合器的转速 [min-1] 在得出计算扭矩后，通过查表和对比超越离合器的额定扭矩何计算扭矩计算扭矩，并保证：

Mn'Ma

Mn= 查表所得超越离合器的额定扭矩 [Nm]

运行参数 K 的近似值：

驱动类型	K
起动冲击较低的电机（例如，直流电电 机，带滑环转子或起动离合器的异步电动机），蒸汽涡轮机，燃气轮机	0.8-2.5
起动冲击较高的电机（例如同步或异步 电动机）	1.25-2.5
带超过两个缸的活塞式涡轮机，液压马达	1.25-3.15
带一个或多个缸的活塞式发动机	1.6-3.15

In many cases where overrunning clutches are being used,dynamic processes occur that cause high peak torques.In the case of overrunning clutches.the torques that occur during start up must be observed. The peak torques when starting up can,in the case of asynchronous motors-especially when accelerating large masses and when usingelastic coupling-significantly exceed the torque calculated from the motor pull-over torque.The conditions for internal com-bustion engines are similar.Even in normal operation,on account of their degree of irregu-larity.peak torques can occur that are way in excess of the nominal torque.

The prior determination of the maximum occurring torque is carried out most safely by using a rotational vibration analysis of the entire system.This.however.requires a knowledge of the rotating masses,the rotational rigidity and all of the excitation moments that occur on the system.In many cases,a vibrational calculation is too time consuming or you may not have all the necessary data in the configuration phase available.In this case,the selection torque MA of the overrunning clutch should be deter-mined as follows:

Ma=K - Ml

In this equation:

MA=Selection torque of the freewheel

K=Operating factor(refer to table)

ML=Load torque for constant rotating freewheel:

=9550 • Po/nFR

P0=Nominal power of motor[Nm]

nFR=Speed of the freewheel in driving operation[min-1] After calculating MA the freewheel size must be selected in accordance with the catalogue tables in such a way that in all cases this applies:

Mn^Ma

MN=Nominal torque of the freewheel in accordance with the table values[Nm]

Approximate values for operating factor K:

Type of driver	K
Electric motors with low start up impact(e · g . DC motors,asynchronous motors with slip rings or soft start couplings),steam turbines,gas turbines	0.8to2.5
Electric motors with considerable start up im- pact(e·g·synchronous or asynchronous motors with direct start)	1.25to2.5
Piston engines with more than two cylinders,water turbines,hydraulic motors	1.25to3.15
Piston engines with one or two cylinders	1.6to3.15

CSK/CSK-2RS

CSK

CSK..2RS

DESCRIPTION

Type CSK is a sprag type freewheel integrated into a 62 series ball bearing (except sizes 8 and 40). It is bearing supported, delivered grease lubricated and protected against dust of more than 0, 3 mm. The use of additional "nylos" type seals is recommended especially when the working temperature exceeds 50°C. Oil bath lubrication is also possible.

All the CSK versions are equipped with "form chromed" sprags. This process increases several times the overrunning life time. Torque transmission is ensured by a press fit assembly into a rigid outer housing with N6 tolerance, and onto a shaft with n6 tolerance.
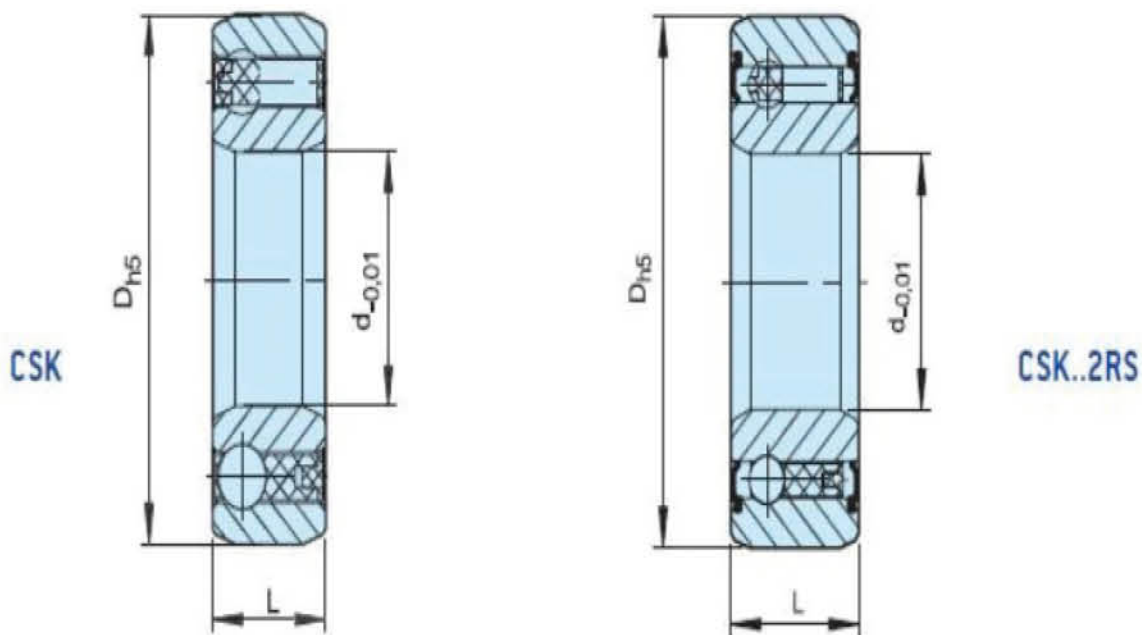
Type	Size d	Bearing series	Torque	Rotation Speed	Dimensions		Bearing loads		Weight	Drag torque
							dynamic	static		
			$T_{KN}^{1)}$	N_{max}	D	L	C	C0		
	[mm]		[Nm]	[min^{-1}]	[mm]	[mm]	[kN]	[kN]	[kg]	[Ncm]
CSK(KK)	8	–	2.5	15000	22	9	3.28	0.86	0.015	0.5
	12	6201	9.3	10000	32	10	6.1	2.77	0.04	0.7
	15	6202	17	8400	35	11	7.4	3.42	0.06	0.9
	17	6203	30	7350	40	12	7.9	3.8	0.07	1.1
	20	6204	50	6000	47	14	9.4	4.46	0.11	1.3
	25	6205	85	5200	52	15	10.7	5.46	0.14	2
	30	6206	138	4200	62	16	11.7	6.45	0.21	4.4
	35	6207	175	3600	72	17	12.6	7.28	0.3	5.8
	40	–	325	3000	80	22	15.54	12.25	0.5	7
CSK..2RS	8		2.5	15000	22	9	3.28	0.86	0.015	0.8
	12	–	9.3	10000	32	14	6.1	2.77	0.05	3
	15		17	8400	35	16	7.4	3.42	0.07	4
	17		30	7350	40	17	7.9	3.8	0.09	5.6
	20		50	6000	47	19	9.4	4.46	0.145	6
	25		85	5200	52	20	10.7	5.46	0.175	6
	30		138	4200	62	21	11.7	6.45	0.27	7.5
	35		175	3600	72	22	12.6	7.28	0.4	8.2
	40	–	325	3000	80	27	15.54	12.25	0.6	10

SUMA
Clutch & Bearing

Mounting example

Type	Size	Bearing series	Torque	Rotation Speed	Dimensions				Bearing loads		Weight	Drag torque
									dynamic	static		
	d		T_{KN}[1]	n_{max}	D	L	b	t	C	C0		TR
	[mm]		[Nm]	[min⁻¹]	[mm]	[mm]	[mm]	[mm]	[kN]	[kN]	[kg]	[Ncm]
CSK..P	12	6201	9.3	10000	32	10			6.1	2.77	0.04	0.7
	15	6202	17	8400	35	11			7.4	3.42	0.06	0.9
	17	6203	30	7350	40	12			7.9	3.8	0.07	1.1
	20	6204	50	6000	47	14			9.4	4.46	0.11	1.3
	25	6205	85	5200	52	15			10.7	5.46	0.14	2
	30	6206	138	4200	62	16			11.7	6.45	0.21	4.4
	35	6207	175	3600	72	17			12.6	7.28	0.3	5.8
	40	–	325	3000	80	22			15.54	12.25	0.5	7
CSK..PP	15	6202	17	8400	35	11	2	0.6	7.4	3.42	0.06	0.9
	17	6203	30	7350	40	12	2	1	7.9	3.8	0.07	1.1
	20	6204	50	6000	47	14	3	1.5	9.4	4.46	0.11	1.3
	25	6205	85	5200	52	15	6	2	10.7	5.46	0.14	2
	30	6206	138	4200	62	16	6	2	11.7	6.45	0.21	4.4
	35	6207	175	3600	72	17	8	2.5	12.6	7.28	0.3	5.8
	40	–	325	3000	80	22	10	3	15.54	12.25	0.5	7
CSK.. P-2RS	12	–	9.3	10000	32	14			6.1	2.77	0.05	3
	15	–	17	8400	35	16			7.4	3.42	0.07	4
	17	–	30	7350	40	17			7.9	3.8	0.09	5.6
	20	–	50	6000	47	19			9.4	4.46	0.145	6
	25	–	85	5200	52	20			10.7	5.46	0.175	6
	30	–	138	4200	62	21			11.7	6.45	0.27	7.5
	35	–	175	3600	72	22			12.6	7.28	0.4	8.2
	40	–	325	3000	80	27			15.54	12.25	0.6	10

BB

① Inner race
② Outer race
③ Cam cage
④ Ball bearing
⑤ Seal
⑥ Side plate
⑦ Retainer

This drawing shows BB-2GD series.

Retaining ring groove

Apply pressure

Press tool

DESCRIPTION

1. BB series Cam Clutch is designed for press fit installation.

2. BB-1K-K and BB-2GD 1K-K series have a keyway on the inner race. Keyways, except size 25 are manufactured to DIN 6885. 3, BB40-1K-K and BB40-2GD 1K-K are manufactured to DIN 6885. 1.

3. BB-2K-K series has a keyway on both the inner and outer race."-K" means keys shipped together with Cam Clutch.

4. Correct interference dimensions at the shaft and the housing must be maintained to obtain maximum bearing and clutch performance.

5. Refer to the table for tolerance of the shaft and housing for each series.

6. BB, BB-1K and BB-2K Clutches, bearing supported and delivered with grease have dust seal protection against particles of 0.25mm and over, whereas BB-2GD and BB-2GD-1K clutches, 5mm wider than standard BB series, have special lip seals for effective protection against any dust.

7. The arrow on the inner race shows the direction of inner race engaging.

8. To install the clutch, use a press tool of the appropriate diameter to apply even pressure over the entire face of the inner and outer race.

9. Do not hammer or apply other shock to the clutch.

10. Make sure the housing has enough strength to withstand the pressure required for the press fitting installation of the Clutch.

11. Operating temperature range: –30°C to +100°C (Consult us for the temperature that exceeds this range).

Model	Torque Capacity	Max. Overrunning		Drag Torque (N·m)		A		B	C	D		r	Weight (N)		Bearing Loads	
		Inner Race	Outer Race	BB BB-1K-K BB-2K-K	BB-2GD BB-2GD 1K-K	BB BB-1K-K BB-2K-K	BB-2GD BB-2GD 1K-K			BB BB-1K-K BB-2K-K	BB-2GD BB-2GD 1K-K		BB BB-1K-K BB-2K-K	BB-2GD BB-2GD 1K-K	Cr	Cor
	N·m	r/min	r/min												N	N
BB15	29	3600	2000	0.01	0.04	11	16	35	15	32.6	32.45	0.6	50	70	5950	3230
BB17	43	3500	1900	0.01	0.05	12	17	40	17	36.1	36.45	0.6	80	100	7000	3700
BB20	61	3000	1600	0.014	0.055	14	19	47	20	41.7	42.35	1	120	150	8500	4900
BB25	78	2500	1400	0.017	0.055	15	20	52	25	47.1	47.05	1	150	200	10700	6300
BB30	140	2000	1100	0.03	0.058	16	21	62	30	56.6	55.6	1	230	280	11900	7900
BB35	173	1800	1000	0.034	0.06	17	22	72	35	64	64.6	1.1	320	410	13500	9700
BB40	260	1800	900	0.04	0.08	22	27	80	40	71	71.6	1.1	400	600	14500	11700

AS / NSS

DESCRIPTION

Type AS is a roller type freewheel non bearing supported. Bearings are required to support axial and radial loads. Lubrication and sealing must also be provided by the installation. Nominal outside dimensions are the same as series 62...Ball bearings.

A typical arrangement is to install this type alongside a series 62 bearing within the same location tolerances, as shown on the following page. The inner race is keyed to the shaft (except 6 mm bore).

The outer race has a positive r6 tolerance to give a press fit in a H7 housing. The outer housing must be strong enough To not expand after assembly. This design can accept an axial misalignment of inner and outer race of ± S/2.

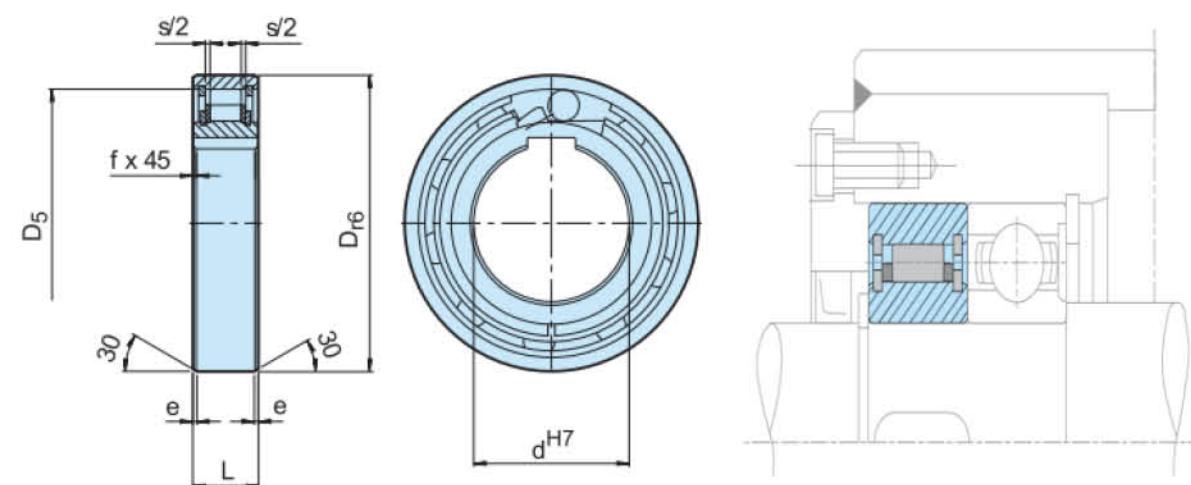| Type	Size	Torque	Overrunning speeds		Dimensions						Weight	Drag torque
	d^{H7}	T_{KN} [1]	n_{imax} [2]	n_{amax} [3]	D_{r6}	D_5	L	s	e	f		
	[mm]	[Nm]	[min-1]	[min-1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[Ncm]
AS (NSS)	6	2.1	5000	7500	19	15.8	6	0.3	0.6	0.3	0.01	0.18
	8	3.8	4300	6500	24	20	8	1.3	0.6	0.6	0.02	0.24
	10	6.8	3500	5200	30	25.9	9	1.3	0.6	0.6	0.03	0.36
	12	13	3200	4800	32	28	10	1.3	0.6	0.6	0.04	0.48
	15	14	2800	4300	35	31	11	1.4	0.6	0.6	0.05	0.7
	20	40	2200	3300	487	40	14	2.4	0.8	0.8	0.12	1.4
	25	56	1900	2900	52	45.9	15	2.4	0.8	0.8	0.14	2.4
	30	90	1600	2400	62	55	16	2.4	0.8	1	0.22	7.8
	35	143	1300	2000	72	64	17	2.5	0.8	1	0.31	9
	40	185	1200	1800	80	72	18	2.5	0.8	1	0.39	10
	45	218	1000	1600	85	77	19	2.5	1.2	1	0.44	11
	50	230	950	1500	90	82	20	2.5	1.2	1	0.49	13
	55	308	800	1300	100	90	21	2.5	1.2	1	0.66	14
	60	508	700	1100	110	100	22	2.5	1.2	1.5	0.81	26
	80	1063	600	900	140	128	26	2.5	1.2	1.5	1.41	58

ASNU(NFS)

DESCRIPTION

Type ASNU is a roller type freewheel nonbearing supported. Bearings are required to support axial and radial loads. Lubrication and sealing must also be provided by the installation. Nominal outer diameter is the same as a series 63...Ball bearing.
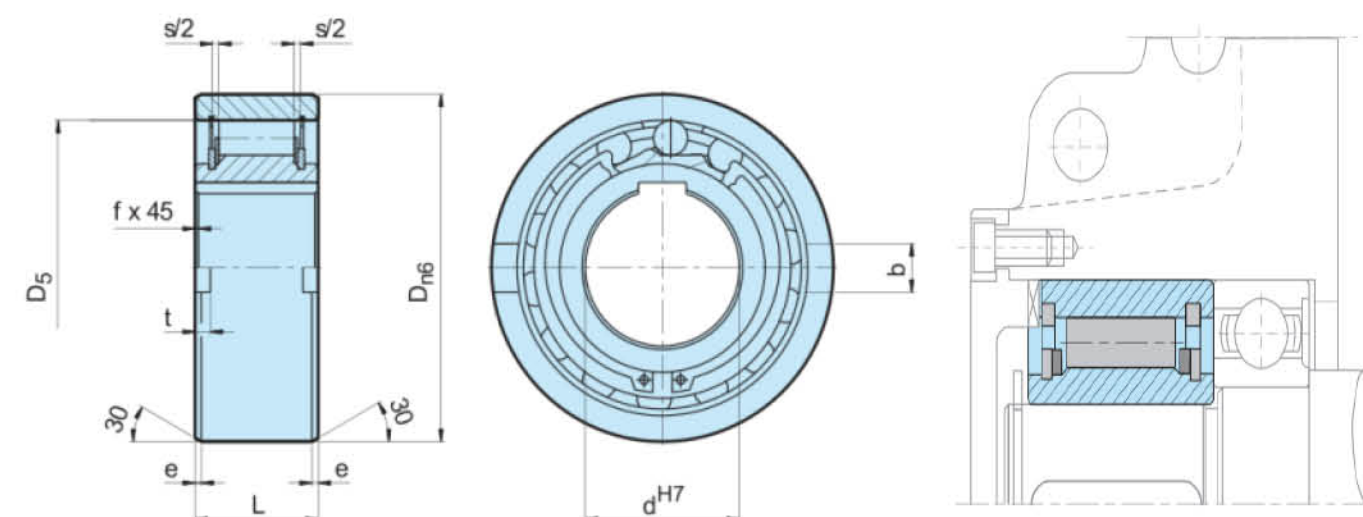
A typical arrangement is to install this type alongside a bearing within the same location tolerances, as shown on the following page. The inner race is keyed to the shaft.

The outer race has positive n6 tolerance, to give a press fit in a H7 housing. Additional side notches in the outer race provide for positive torque transmission.

If the housing is to K6 tolerance, use of the notches is not necessary, but the housing must be strong enough to not expand after assembly. This design can accept an axial misalignment of inner and uter race of ± S/2.

Type	Size	Torque	Overrunning Speeds		Dimensions									Weight	Drag torque
	d^{H7}	T_{KN} [1]	n_{imax} [2]	n_{amax} [3]	D_{n6}	D_5	L	b	t	s	e	f		TR
	[mm]	[Nm]	[min^{-1}]	[min^{-1}]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[Ncm]
ASNU (NFS)	8	12	3300	5000	35	28	13	4	1.4	2.4	0.6	0.3	0.07	1.6
	12	12	3300	5000	35	28	13	4	1.4	2.4	0.6	0.3	0.06	1.6
	15	30	2400	3600	42	37	18	5	1.8	2.4	0.8	0.3	0.11	1.9
	17	49	2300	3400	47	40	19	5	2.3	2.4	1.2	0.8	0.15	1.9
	20	78	2100	3100	52	42	21	6	2.3	2.4	1.2	0.8	0.19	1.9
	25	125	1700	2600	62	51	24	8	2.8	2.4	1.2	0.8	0.38	5.6
	30	255	1400	2200	72	60	27	10	2.5	2.4	1.8	1	0.54	14
	35	383	1200	1900	80	70	31	12	3.5	2.4	1.8	1	0.74	16
	40	538	1100	1700	90	78	33	12	4.1	2.5	1.8	1	0.92	38
	45	780	1000	1600	100	85	36	14	4.6	2.5	1.8	1	1.31	43
	50	1013	850	1350	110	92	40	14	5.6	2.5	1.8	1	1.74	55
	60	1825	750	1050	130	110	46	18	5.5	3.6	2.6	1.5	2.77	110
	70	2300	600	950	150	125	51	20	6.9	3.6	2.6	1.5	4.16	140
	80	3275	550	850	170	140	58	20	7.5	3.6	2.6	1.5	6.09	180
	90	5325	500	750	190	160	64	20	8	3.6	2.6	2	8.2	230
	100	7250	450	680	215	175	73	24	8.5	3.6	2.6	2	12.6	380
	120	13500	370	550	260	215	86	28	10	3.6	2.6	2.5	22	650
	150	26625	300	460	320	260	108	32	12	3.6	3.6	2.5	42	1000
	200	44500	230	350	420	350	138	45	16	7.6	3.6	3	93	2000

DC

DESCRIPTION

Type DC is a sprag type freewheel cage without inner or outer races. It must be installed in a design providing races, bearing support for axial and radial loads, lubrication and sealing.

The DC type version-N accepts all types of lubricants currently used in the power transmission equipement.

-Tolearance

The sprag space tolerance must not be exceeded. Inner and outer races must both have a minimum plain width "e", without any recess, to ensure the freewheel functions correctly as shown on following data sheet.

-Hardness

Surface hardness of the finished part should be HRC 60 to 62, for a depth of 0, 6 mm minimum.
Core hardness to be HRC35 to 45. Surface roughness not to exceed 22CLA.
Maximum taper between races: 0, 007 mm for 25 mm width.
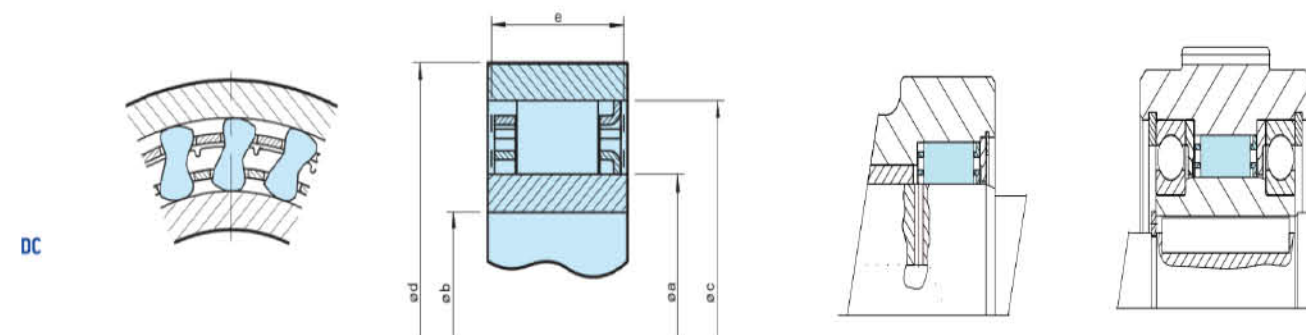
Type	Drag torque	Size(mm)						Number of clips
	Tkn(NM)	a	c	sprag space	e	d	b	
DC2222G	50	22.225	38.885	8.33	10	50	17	
DC2776	95	27.762	44.422	8.33	13.5	58	21	
DC3034	99	30.34	47	8.33	13.5	62	23	
DC3175(3C)	127	31.75	48.41	8.33	13.5	63	24	3
DC3809A	220	38.092	54.752	8.33	16	71	29	
DC4127(3C)	179	41.275	57.935	8.33	13.5	75	32	3
DC4445A	290	44.45	61.11	8.33	16	79	34	
DC4972(4C)	245	49.721	66.381	8.33	13.5	86	38	4
DC5476A	420	54.765	71.425	8.33	16	92	42	
DC5476A(4C)	420	54.765	71.425	8.33	16	92	42	4
DC5476B(4C)	615	54.765	71.425	8.33	21	92	42	4
DC5476C(4C)	792	54.765	71.425	8.33	25.4	92	42	4
DC5776A	483	57.76	74.42	8.33	16	98	44	
DC6334B	645	63.34	80	8.33	21	104	50	
DC7221(5C)	540	72.217	88.877	8.33	13.5	115	56	5
DC7221B	1023	72.217	88.877	8.33	21	115	56	
DC7221B(5C)	1023	72.217	88.877	8.33	21	115	56	5
DC7969C(5C)	1630	79.698	96.358	8.33	25.4	124	61	5
DC8334C	1645	83.34	100	8.33	25.4	132	65	
DC8729A	1000	87.29	103.96	8.33	16	134	67	
DC10323A(3C) *	1290	103.231 **	119.891	8.33	16	155	80	3
DC12334C *	3840	123.34 **	140	8.33	25.4	184	96	
DC12388C(11C)	3900	123.881	142.88	9.5	25.4	196	96	11

BWX

When viewing in directon X
the outer ring freewheels clockwise

109-1
109-2
109-3
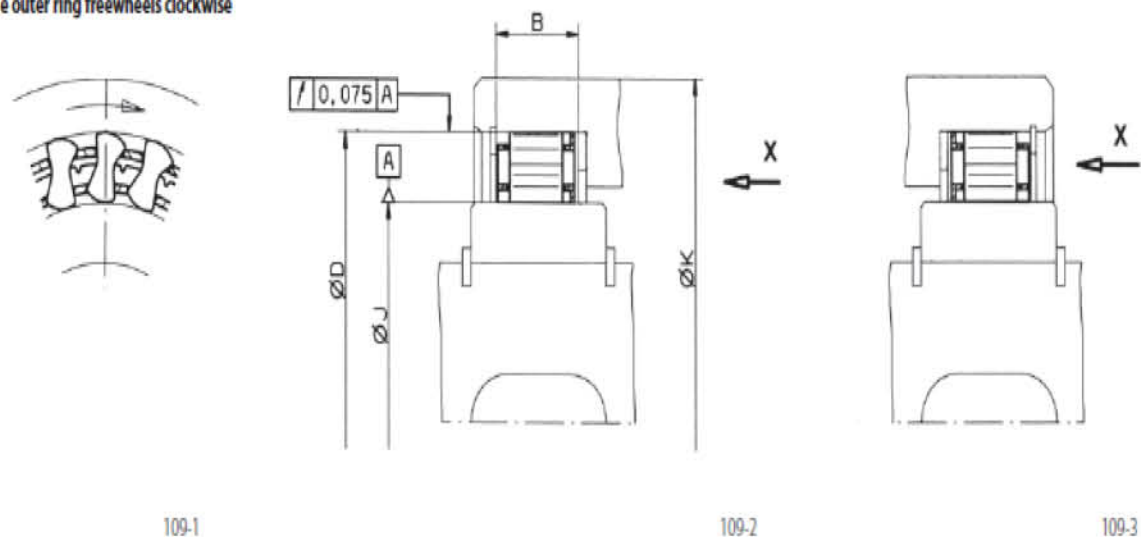
Freewheel Size	Type	Nominal torque MN Nm	J +0,008 -0,005 mm	D ±0,013 mm	B mm	K mm	Sprags Quantity	Drag strips Quantity	Brake clips Quantity	Design as ill.	Weight kg
BWX133590A	Disengaging	63	22,225	38,887	10,0	44,0	12			109-2	0,03
BWX13143A	Engaging	120	27,767	44,425	13,5	51,0	14			109-2	0,06
BWX133392	Disengaging	280	38,092	54,750	16,0	71,0	18			109-3	0,09
BWX1310145	Disengaging	180	41,275	57,937	13,5	74,2	14		3	109-2	0,07
BWX132909A	Disengaging	360	44,450	61,112	16,0	78,5	20	2	3	109-2	0,10
BWX133339	Disengaging	310	49,721	66,383	13,5	85,0	22	2	4	109-2	0,09
BWX 1310003	Disengaging	310	49,721	66,383	13,5	85,0	22		4	109-2	0,09
BWX137222	Engaging	570	49,721	66,383	19,0	85,0	22			109-2	0,12
BWX1310445	Disengaging	400	54,765	71,427	13,5	91,7	24			109-2	0,09
BWX1310172	Engaging	540	54,765	71,427	16,0	91,7	24			109-2	0,12
BWX1310226	Disengaging	520	54,765	71,427	16,0	91,7	24	2	4	109-2	0,12
BWX136709	Engaging	770	54,765	71,427	21,0	91,7	24	3	10	109-2	0,16
BWX1310147	Disengaging	1 000	54,765	71,427	25,4	91,7	24	3	8	109-2	0,20
BWX136324	Engaging	600	57,760	74,427	19,0	95,0	26			109-3	0,14
BWX1310080	Disengaging	670	72,217	88,882	13,5	115,0	30		4	109-2	0,12
BWX13168	Engaging	1 300	72,217	88,882	21,0	115,0	30			109-3	0,20
BWX134012	Engaging	1 300	72,217	88,882	21,0	115,0	30	4	10	109-3	0,20
BWX137322	Disengaging	2 000	796,982	96,363	25,4	124,0	34	5	12	109-2	0,28
BWX138316	Disengaging	2 960	835,972	102,596	25,4	131,6	34	5	12	109-2	0,30
BWX13261A1	Disengaging	1 600	1,032,312	119,893	16,0	154,0	40	6	10	109-3	0,19
BWX13236	Disengaging	1 700	1,173,912	136,391	16,0	175,3	30	5	6	109-3	0,25
BWX133403B	Engaging	4 900	1,238,812	142,880	25,4	188,0	44		11	109-2	0,46

FE

FE 400	FE 400 Z	FE 400 Z2
Mounting space	Mounting space	Mounting space
12±0.5	12±0.5	7±0.3
11	11	6.3
d_L shaft h5 hub H6 D_L	d_L shaft h5 hub H6 D_L	d_L shaft h5 hub H6 D_L

DESCRIPTION

FE are all sprag types freewheel cage without inner or outer races. They must be installed in a design providing races. bearing supported for axial and radial loads.

They accept all types of the lubrication currently used in the power transmission equipments.
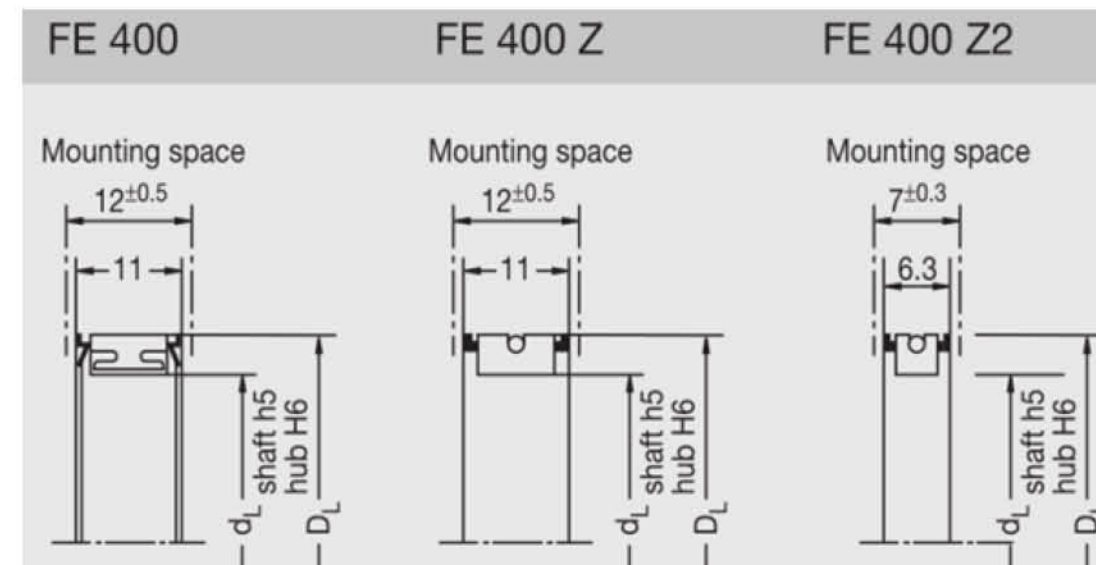
Designation	d [mm]	D [mm]	W [mm]	Tnom [Nm]	nmax [rpm]	Weight [kg]	Item no.
FE 412 Z	4	12	12	4	27,000	0.003	300393
FE 416 Z	8	16	12	16	19,200	0.006	300400
FE 420 Z	12	20	12	35	12,500	0.007	306041
FE 422 Z	14	22	12	53	10,100	0.008	300405
FE 423 Z	15	23	12	62	9,200	0.009	300411
FE 425 Z	17	25	12	72	8,100	0.011	300415
FE 427 Z	19	27	12	83	7,400	0.013	300422
FE 428 Z	20	28	12	93	7,500	0.013	300430
FE 430 Z	22	30	12	107	6,300	0.014	300435
FE 432 Z	24	32	12	117	5,900	0.016	300439
FE 433 Z	25	33	12	128	6,000	0.016	300445
FE 435 Z	27	35	12	143	5,100	0.017	300448
FE 437 Z	29	37	12	154	4,800	0.018	300455
FE 438 Z	30	38	12	166	4,900	0.019	300460
FE 442 Z	34	42	12	198	4,400	0.018	300463
FE 443 Z	35	43	12	207	4,300	0.022	300469
FE 448 Z	40	48	12	248	4,200	0.024	300478
FE 453 Z	45	53	12	293	3,400	0.022	300482
FE 455 Z	47	55	12	313	3,300	0.026	300487
FE 458 Z	50	58	12	344	3,100	0.029	300489
FE 459 Z	51	59	12	353	3,000	0.030	300494
FE 463 Z	55	63	12	393	2,900	0.032	300497
FE 468 Z	60	68	12	444	2,700	0.034	300501
FE 470 Z	62	70	12	465	2,600	0.035	300505
FE 473 Z	65	73	12	495	2,500	0.037	300508
FE 478 Z	70	78	12	548	2,600	0.039	300511
FE488Z	80	88	12	657	2,100	0.045	300514
FE 508 Z	100	108	12	889	1,700	0.055	300519
FE 528 Z	120	128	12	1,127	1,300	0.066	300522
FE 648 Z	240	248	12	2,673	800	0.131	300524

Freewheel Size	Type	Nominal torque	Type	Nominal torque	Type	Nominal torque	Sprag lift-off at outer ring speed	J	D	B	K	Sprags Quantity	Weight
		MN		MN		MN	min⁻¹	mm	mm	mm	mm		kg
SF18-13,5	J	66						18,80	35,47	13,5	50	10	0,04
SF23-13,5	J	120						23,63	40,29	13,5	55	12	0,04
SF27-13,5	J	160	JT	160	JZ	100	3 600	27,78	44,42	13,5	65	14	0,05
SF31-13,5	J	170	JT	170	JZ	110	3 400	31,75	48,41	13,5	70	12	0,04
SF32-21,5	J	400						32,77	49,44	21,5	65	14	0,07
SF37-14,5	K	270	KT	270	KZ	210	2 900	37	55	14,5	75	14	0,06
SF42-21	J	720						42,10	58,76	21	85	18	0,09
SF44-14,5	K	500	KT	500	KZ	400	2 250	44	62	14,5	90	20	0,08
SF46-21	J	840						46,77	63,43	21	90	20	0,10
SF50-18,5	K	680	KT	680	KZ	580	2 250	50	68	18,5	90	20	0,10
SF56-21	J	1 050						56,12	72,78	21	100	22	0,11
SF57-18,5	K	950	KT	950	KZ	800	2 000	57	75	18,5	105	24	0,13
SF61-21	J	1 300	JT	1 300	JZ	1 150	1 550	61,91	78,57	21	110	26	0,14
SF72-23,5	K	2 100	KT	2 100	KZ	1 850	1 550	72	90	23,5	135	32	0,23
SF82-25	K	2 300	KT	2 300	KZ	2 100	1 450	82	100	25	140	36	0,26
SF107-25	K	3 300	KT	3 300	KZ	3 100	1 300	107	125	25	170	48	0,35
SF127-25	K	4 900	KT	4 900	KZ	4 600	1 200	127	145	25	210	56	0,40
SF140-50	S	13 600	ST	13 600	SZ	10 500	950	140	180	50	260	24	1,70
SF140-63	S	18 000	ST	18 000	SZ	14 000	800	140	180	63	260	24	2,00
SF170-50	S	17 000	ST	17 000	SZ	13 500	880	170	210	50	290	28	1,95
SF170-63	S	23 000	ST	23 000	SZ	18 500	720	170	210	63	290	28	2,40
SF200-50	S	23 000	ST	23 000	SZ	18 500	820	200	240	50	325	36	2,50
SF200-63	S	29 000	ST	29 000	SZ	23 500	680	200	240	63	325	36	3,10
SF230-63	S	37 000	ST	37 000	SZ	29 500	650	230	270	63	360	45	3,90
SF270-50	S	35 000	ST	35 000	SZ	29 500	720	270	310	50	410	48	3,40
SF270-63	S	44 000	ST	44 000	SZ	37 000	600	270	310	63	410	48	4,20
SF340-50	S	45 000	ST	45 000	SZ	43 000	640	340	380	50	510	60	4,20
SF340-63	S	67 500	ST	67 500	SZ	57 500	540	340	380	63	510	60	5,20
SF380-50	S	57 000	ST	57 000	SZ	48 500	610	380	420	50	550	63	4,40
SF440-63	S	93 000	ST	93 000	SZ	80 000	470	440	480	63	640	72	6,20

B⁺⁰'⁵

A

ø K

ø D

ø J

| | 0,12 | A | As of D = 180 |
| | 0,06 | A | Up to D = 145 |

Size	Tolerance of track (mm)	
	ø J	ø D
Up to SF 127	-0,01 -0,03	+0,01 -0,01
As of SF 140	-0,02 -0,06	+0,02 -0,02

FWD

Type	Inner race	Outer race	min. Width	Nominal torque Tkn	Weight
	D+0.008 -0.005 (mm)	D 0±0.013 (mm)	W(mm)	Kgf-m	g
FWD331608BRB	39.627	56.294	13.0	27	73
FWD331808BRB	45.666	62.332	13.3	35	83
FWD332008BRB	51.71	68.377	13.3	45	92
FWD332211BRB	57.76	74.427	16.3	78	134

FWD BRS
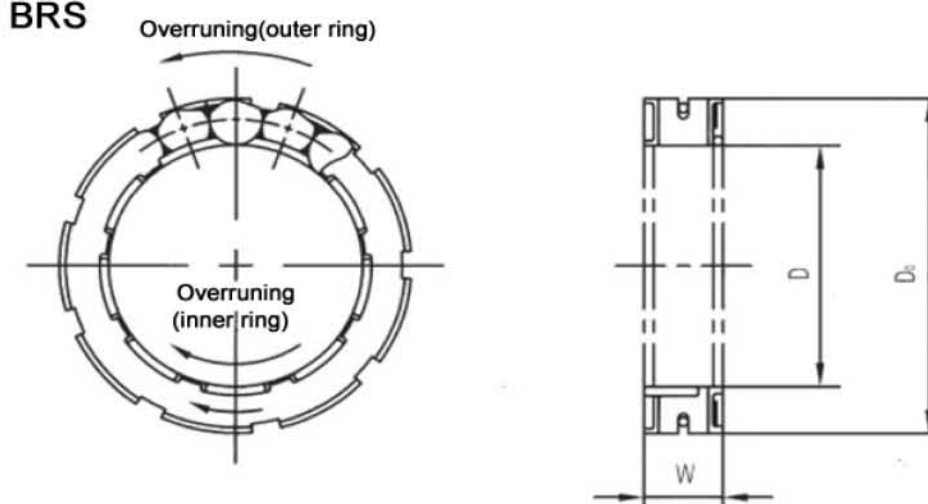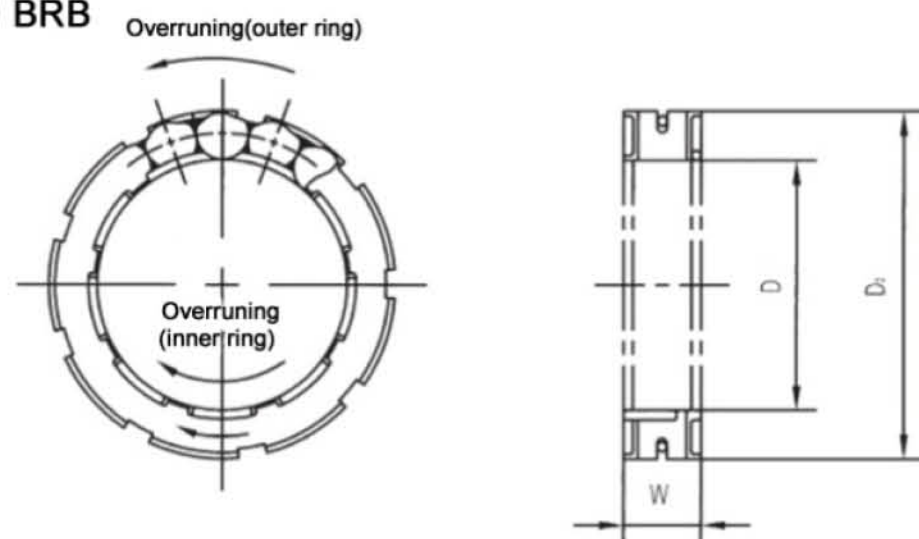
Overruning(outer ring)

Overruning (inner ring)

FWD BRB

Overruning(outer ring)

Overruning (inner ring)

Type	Inner race	Outer race	min. Width	Nominal torque Tkn	Weight
	D+0.008 -0.005 (mm)	D 0±0.013 (mm)	W(mm)	Kgf-m	g
FWD331608BRS	39.627	56.294	13.0	27	77
FWD331808BRS	45.666	62.332	13.3	35	87
FWD332008BRS	51.71	68.377	13.3	45	97
FWD332211BRS	57.76	74.427	16.3	78	134
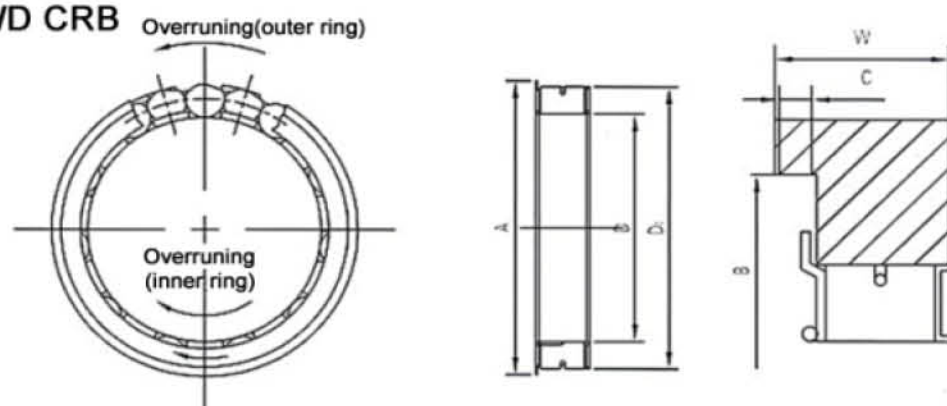
FWD

FWD CRB
Overruning(outer ring)

Overruning (inner ring)

Type	Inner race	Outer race	min. Width	A	B	C+0.2 0	Nominal torque Tkn	Weight
	D+0.008 -0.005 (mm)	D 0±0.013 (mm)	W(mm)	(mm)	(mm)	(mm)	Kgf-m	g
FWD331608CRB	39.627	56.294	13.0	60	62	1.0	27	73
FWD331808CRB	45.666	62.332	13.3	65	68	1.0	35	83
FWD332008CRB	51.71	68.377	13.3	71	74	1.0	45	92
FWD332211CRB	57.76	74.427	16.3	76	79	1.0	78	134

FWD CRS
Overruning(outer ring)
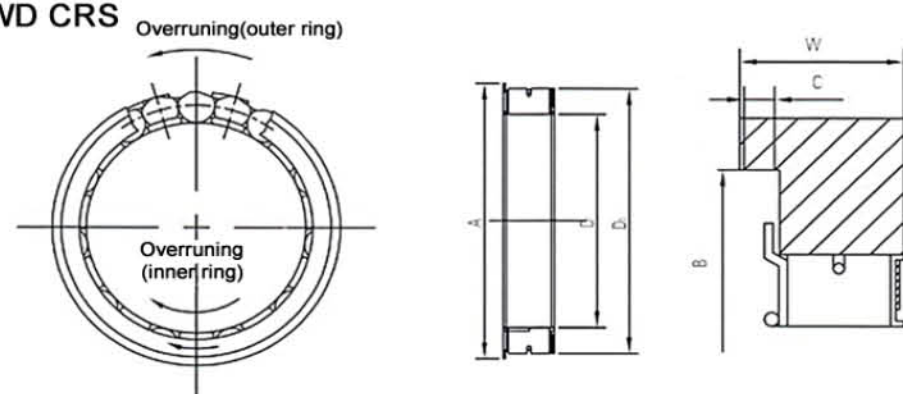
Overruning (inner ring)

Type	Inner race	Outer race	min. Width	A	B	C+0.2 0	Nominal torque Tkn	Weight
	D+0.008 -0.005 (mm)	D 0±0.013 (mm)	W(mm)	(mm)	(mm)	(mm)	Kgf-m	g
FWD331608CRS	39.627	56.294	13.0	60	62	1.0	27	73
FWD331808CRS	45.666	62.332	13.3	65	68	1.0	35	83
FWD332008CRS	51.71	68.377	13.3	71	74	1.0	45	92
FWD332211CRS	57.76	74.427	16.3	76	79	1.0	78	134

FWD PRB
Overruning(outer ring)
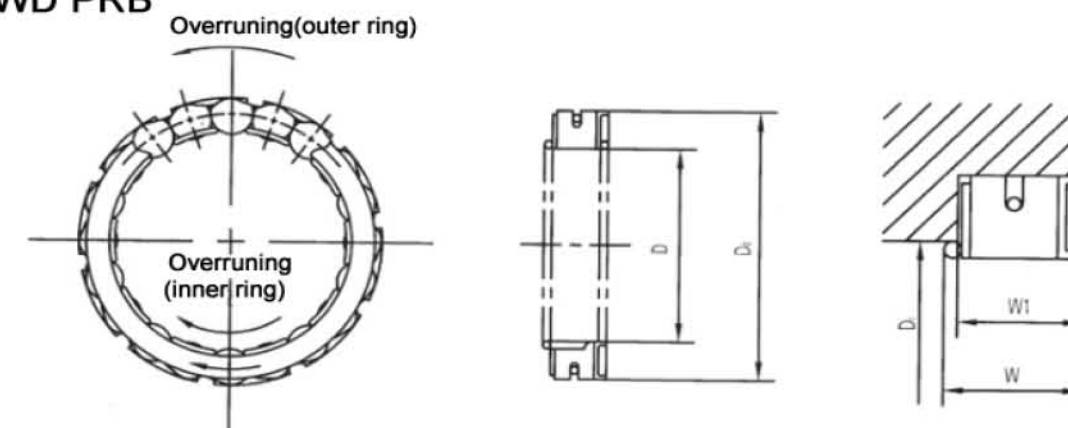
Overruning (inner ring)

Type	Inner race	Outer race	Wmin	Wmin	DC	Tkn	Weight
	D +0.008 -0.005 (mm)	DO ±0.013 (mm)	W (mm)	W1 (mm)	(mm)	(Kgf-m)	(g)
FWD331608PRB	39.627	56.294	13	11.4	45	27	70
FWD331808PRB	45.665	62.332	13.3	11.7	51	35	80
FWD332008PRB	51.71	68.377	13.3	11.7	57	45	89
FWD332211PRB	57.76	74.427	16.3	14.7	63	78	130

FWD PRS
Overruning(outer ring)
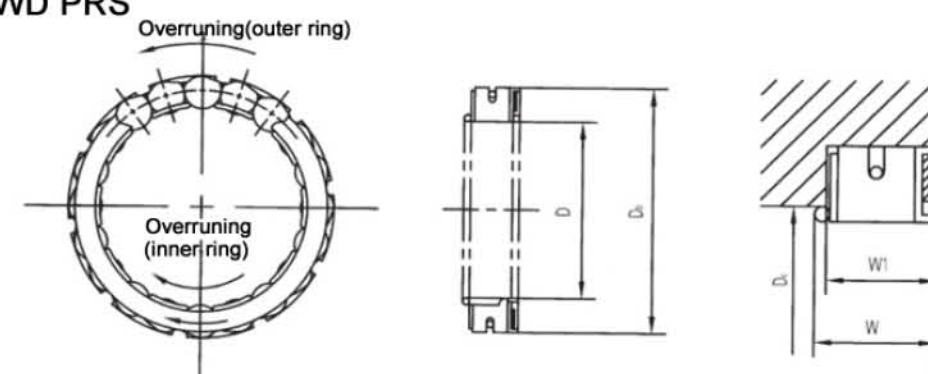
Overruning (inner ring)

Type	Inner race	Outer race	Wmin	Wmin	DC	Tkn	Weight
	D +0.008 -0.005 (mm)	DO ±0.013 (mm)	W (mm)	W1 (mm)	(mm)	(Kgf-m)	(g)
FWD331608PRS	39.627	56.294	13	11.4	45	27	75
FWD331808PRS	45.665	62.332	13.3	11.7	51	35	85
FWD332008PRS	51.71	68.377	13.3	11.7	57	45	94
FWD332211PRS	57.76	74.427	16.3	14.7	63	78	139

GFK

GFK

DESCRIPTION

Type GFK is a sprag type freewheel integrated into a 59..series ball bearing. This design provides high torque capacity for minimal outside diameter. It is a bearing supported type, delivered grease lubricated.

Oil bath lubrication is also possible. Whatever the lubrication type, seals should be provided, as illustrated on the next page.

Torque transmission must be ensured by a press fit assembly into a rigid outer housing with R6 tolerance, and onto a shaft with p5 tolerance.

Initial radial clearance has been provided to take into account this heavy press fit. Operating temperature range: –20°C to +100°C. Peaks up to +120°C are acceptable for short periods. Please contact us for higher temperatures.

Type GFK is a sprag type freewheel integrated into a 59..series ball bearing. This design provides high torque capacity for minimal outside diameter. It is a bearing supported type, delivered grease lubricated.
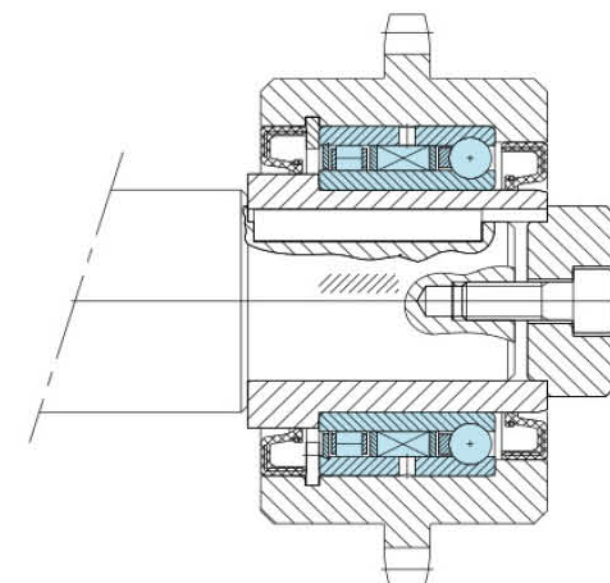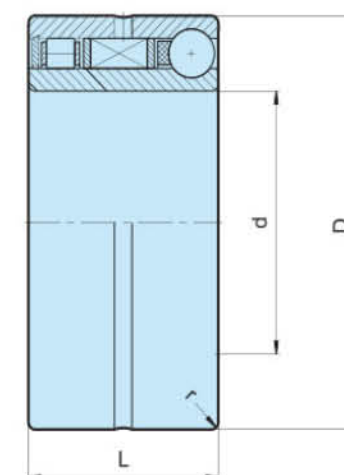
Type	Size	Torque	Overrunningspeeds		Bearing series	Loads				Dimensions			Weight
						Rollers dyn.	Balls dyn.	Rollers stat.	Balls stat.				
	d		n_{lmax}[2)	n_{amax}[3)		C	C	C0	C0	D	L	r	
	[mm]	[Nm]	[min⁻¹]	[min⁻¹]		[N]	[N]	[N]	[N]	[mm]	[mm]	[mm]	[kg]
GFK	20	51	5500	4000	5904	5600	4400	2900	2750	37	23	0.5	0.09
	25	65	5300	3800	5905	6300	5300	3450	3350	42	23	0.5	0.11
	30	95	5000	3500	5906	7700	5500	4600	3650	47	23	0.5	0.13
	35	204	4600	3200	5907	8200	8500	5200	5700	55	27	1	0.2
	40	315	4200	3000	5908	8650	9300	5750	6700	62	30	1	0.3
	45	370	3800	2500	5909	9200	9700	6350	7300	68	30	1	0.34
	50	460	3400	2200	5910	9650	10000	6950	7800	72	30	1	0.36

AA
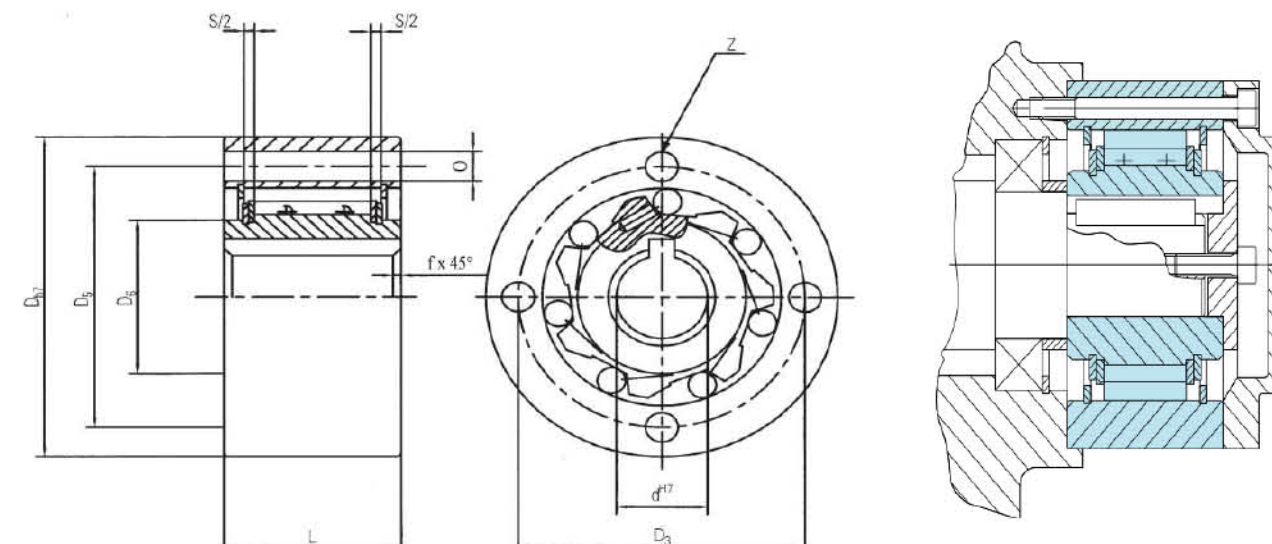
DESCRIPTION

AA is a roller type freewheel non-bearing supported.

Bearings are required to support axial and radial loads.

Lubrication and sealing must also be provided by the installation.

The inner race is keyed to the shaft.

The fit for centering of the outer race must be to H7 tolerance.

Connection of the outer race is via through bolts to grade 10.9 or better.

Type	Size	Torque	Overrunning speeds		Dimensions									Weight	Drag torque
	d^{H7}	TK1	N_{imax} [2]	N_{amax} [3]	D_{h7}	D_5	D_6	D_3	Z	O	L	f	s		TR
	(mm)	(Nm)	(min⁻¹)	(min⁻¹)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)	(Ncm)
AA	12	17	3100	6000	47	28	20	38	3	5.5	20	0.5	4.5	0.21	0.7
	15	55	2300	5400	55	37	26	45	3	5.5	30	0.8	4.5	0.44	3.5
	20	146	2000	3600	68	50	35	58	4	5.5	34	0.8	5.5	0.7	8.4
	25	285	1700	2600	90	68	45	7	6	5.5	37	1	6.5	1.3	14
	30	500	1500	2100	100	75	50	87	6	6.6	44	1	6.5	2	23
	35	720	1300	1950	110	80	55	96	6	6.6	48	1	6.5	2.6	60
	40	1030	1200	1700	125	90	60	108	6	9	56	1.5	7.6	3.9	72
	45	1125	1050	1500	130	95	65	112	8	9	56	1.5	7.6	4	140
	50	2150	950	1300	150	110	75	132	8	9	63	1.5	7.6	6	180
	55	2675	850	1200	160	115	82	138	8	11	67	2	7.6	7.2	190
	60	3500	800	1100	170	125	90	150	10	11	78	2	7.6	9.2	240
	70	5813	650	900	190	140	100	165	10	11	95	2.5	7.6	11.8	320

AE

Type	Size d^{H7} (mm)	T_{KN}^{1} (Nm)	Overrunning speeds $N_{imax}^{2)}$ (min^{1})	Overrunning speeds $N_{amax}^{3)}$ (min^{1})	D_{h6} (mm)	D_5 (mm)	D_6 (mm)	L (mm)	s (mm)	f (mm)	e (mm)	b (mm)	t (mm)	Weight (kg)	Drag torque T_R (Ncm)
AE	12	17	3100	6000	37	28	20	20	4.5	0.5	0.8	6	3	0.11	0.7
	15	55	2300	5400	47	37	26	30	4.5	0.8	1.2	7	3.5	0.30	3.5
	20	146	2000	3600	62	50	35	34	5.5	0.8	1.2	8	3.5	0.55	8.4
	25	285	1700	2600	80	68	45	37	6.5	1	1.8	9	4	0.98	14
	30	500	1500	2100	90	75	50	44	6.2	1	1.8	12	5	1.50	23
	35	720	1300	1950	100	80	55	48	3.8	1	1.8	13	6	2.00	60
	40	1030	1200	1700	110	90	60	56	3.8	1.5	1.8	15	7	2.80	72
	45	1125	1050	1600	120	95	65	56	3.8	1.5	2.6	16	7	3.30	140
	50	2150	950	1300	130	110	75	63	5.8	1.5	2.6	17	8	4.20	180
	55	2675	850	1200	140	115	82	67	3.8	2	2.6	18	9	5.20	190
	60	3500	800	1100	150	125	90	78	7.6	2	2.6	18	9	6.80	240
	70	5813	650	900	170	140	100	95	7.6	2.5	2.6	20	9	10.5	320

DESCRIPTION

Type AE is a roller type freewheel non-bearing supported. Bearings are required to support axial and radial loads. Lubrication and sealing must also be provided by the installation. Nominal outside diameter is a standard ball bearing dimension.

A typical arrangement is to install this type beside a bearing with the same housing diameter tolerance.

The inner race is keyed to the shaft. The outer race has a h6 tolerance and should be fitted in a housing with a K7 tolerance. Additional side notches provide for positive torque transmission.

If the housing tolerance is to R6, use of the notches is not necessary, but the housing must be strong enough to not expand after assembly. This design can accept an axial misalignment of inner and outer race of ± S/2.
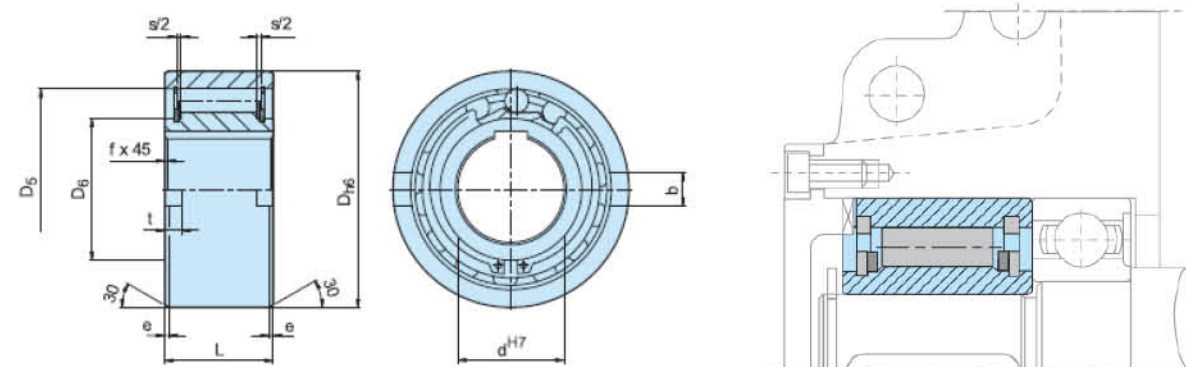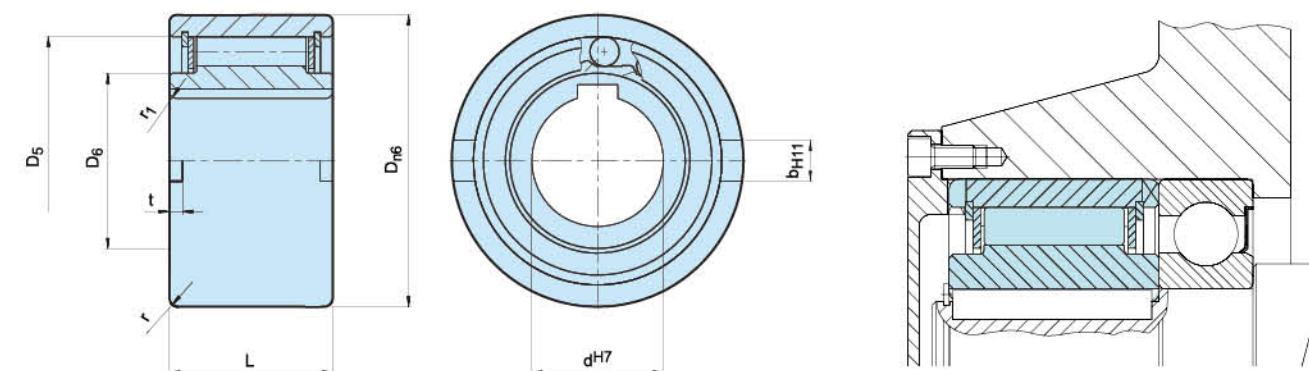
NF

DESCRIPTION

Type NF is a roller type freewheel non-bearing pported. Bearings are required to support axial and radial loads. Lubrication and sealing must also be provided by the installation.

Standard lubrication is oil. Nominal outside diametel is a standard ball bearing dimension. A typical arrangement is to install this type alongside a bearing with the same housing tolerances, as shown on the following page. The inner race is keyed to the shaft. The outer race has a positive n6 tolerance to give a press fit in a H7 housing. Additional side notches provide for positive torque transmission.

If the housing tolerance is to K6, use of the notches is not necessary, but the housing must be strong enough to not expand after assembly.

Type	Size		Overrunning speeds										Weight
	d^{H7} [mm]	$T_{KN}^{1)}$ [Nm]	$n_{imax}^{2)}$ [min^{-1}]	$n_{amax}^{3)}$ [min^{-1}]	D_{n6} [mm]	D_5 [mm]	D_6 [mm]	L [mm]	t [mm]	b^{H11} [mm]	r [mm]	r_1 [mm]	[kg]
NF	8	20	5000	6000	37	30	20	20	3	6	1.0	1.5	0.1
	12	20	5000	6000	37	30	20	20	3	6	1.0	1.5	0.1
	15	78	4500	5400	47	37	26	30	3.5	7	1.5	1.5	0.3
	20	188	3000	3600	62	52	37	36	3.5	8	2.0	2.0	0.6
	25	250	2200	2600	80	68	49	40	4	9	2.5	2.0	1.1
	30	500	1800	2100	90	75	52.5	48	5	12	2.5	2.0	1.6
	35	663	1600	1950	100	80	58	53	6	13	2.5	2.5	2.3
	40	1100	1250	1700	110	90	62	63	7	15	3.0	2.5	3.1
	45	1500	1100	1500	120	92	69	63	7	16	3.0	2.5	3.7
	50	2375	850	1300	130	110	82	80	8.5	17	3.5	3.0	5.4
	55	2500	800	1200	140	115	83	80	9	18	3.5	3.0	6.1
	60	4250	700	1100	150	125	93.5	95	9	18	3.5	3.5	8.5
	70	5875	620	900	170	140	106	110	9	20	3.5	3.5	13.0
	80	10000	550	800	190	160	122	125	9	20	4.0	3.5	18.0
	90	17250	480	700	215	180	133	140	11.5	24	4.0	4.0	25.3
	100	19625	400	600	260	210	157	150	14.5	28	4.0	4.0	42.1
	130	34750	300	480	300	240	188	180	17	32	5.0	5.0	65.0
	150	44375	250	400	320	260	205	180	17	32	5.0	5.0	95.0

NFR

NFR 8-20*   NFR 25-130**

Description:

Type NFR is a bearing supported roller type freewheel without any sealing. Lubrication and sealing must be provided by the installation. Standard lubrication is oil. Size 8 to 20 units use steel on steel bearing support ROM the inner race. Above size 20, two 160...Series ball bearings are used, giving a higher overrunning speed capacity. A typical arrangement is shown overleaf.

The inner race is keyed to the shaft. The outer race has a positive n6 tolerance to give a press fit in a housing to H7. Additional side notches provide for positive torque transmission. The housing must be strong enough to not expand after assembly.
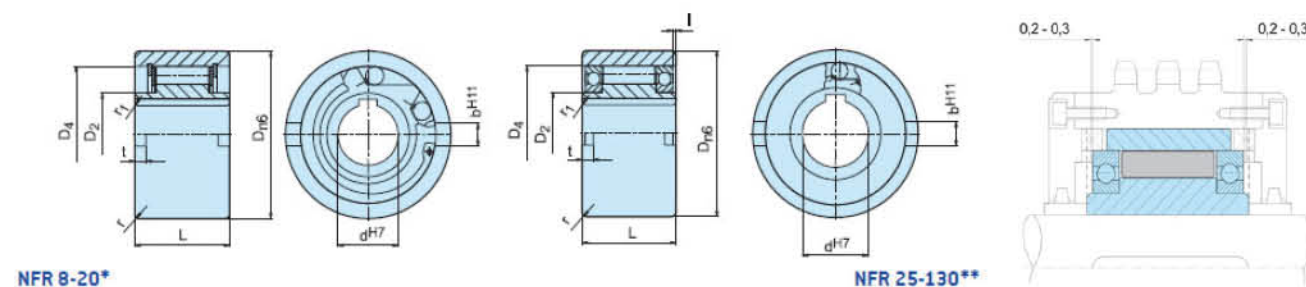
Type	Size	Torque	Overrunning speeds		Bearing	Dimensions									Weight
	d^{H7} (mm)	$T_{KN}{}^1$	$N_{Imax}{}^{2)}$ (min^{-1})	$N_{amax}{}^{3)}$ (min^{-1})		D_{n6} (mm)	D_2 (mm)	D_4 (mm)	L (mm)	I (mm)	t (mm)	b_{H11} (mm)	r (mm)	r_1 (mm)	(kg)
NFR (ANR-ANG)	8	20	1000	1000	*	37	20	30	20		3	6	1	1.5	0.1
	12	20	1000	1000	*	37	20	30	20		3	6	1	1.5	0.1
	15	78	850	850	*	47	26	37	30		3.5	7	1.5	1.5	0.3
	20	188	650	650	*	62	37	52	36		3.5	8	2	2	0.6
	25	250	2100	3600	16008**	80	40	68	40	0.2	4	9	2.5	2	1.2
	30	500	1700	3200	16009**	90	45	75	48	0.2	5	12	2..5	2	1.8
	35	663	1550	3000	16010**	100	50	80	53	1.2	6	13	2.5	2.5	2.4
	40	1100	1150	2600	16011**	110	55	90	63	2.2	7	15	3	2.5	3.3
	45	1500	1000	2400	16012**	120	60	95	63	2.2	7	16	3	2.5	4.0
	50	2375	800	2150	16014**	130	70	110	80	2.7	8.5	17	3.5	3	5.7
	55	2550	750	2000	16015**	140	75	115	80	4.2	9	18	3.5	3	6.5
	60	4250	650	1900	16016**	150	80	125	95	3.2	9	18	3.5	3.5	8.9
	70	5875	550	1750	16018**	170	90	140	110	1.1	9	20	3.5	3.5	13.5
	80	10000	500	1600	16021**	190	105	160	125	0	9	20	4	3.5	19.0
	90	17250	450	1450	16024**	215	120	180	140	0.6	11.5	24	4	4	27.2
	100	79625	350	1250	16028**	260	140	210	150	2.6	14.5	28	4	4	44.5
	130	34750	250	1000	16032**	300	160	240	180	2	17.5	32	5	5	68.0

SUMA
Clutch & Bearing

① Cam
② Outer race
③ Spring
④ Side plate

DESCRIPTION

Type S200(B200) is a non bearing supported sprag type freewheel.

The sprags run directly on the shaft provided by the user. Bearings are required to support axial and radial loads.
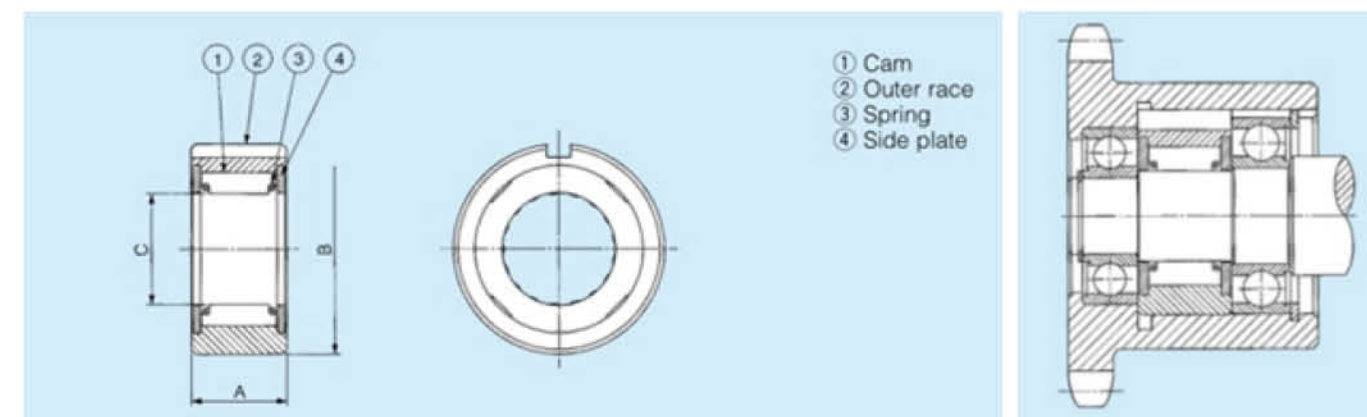
Model	Torque Capacity (N.m)	Drag Torque (N.m)	Max .Overrunning (r/min) Shaft	Max .Overrunning (r/min) Outer Race	Max. Idexing (cycle/ min)	A(+0 to -0.6)	B	Keyway	With JIS Bearing No.	Shaft Dia. C(+0 to -0.025)	Weight (kg)
B203	39.2	0.1	2400	500	150	25	40(-0.014-0.039)	4X2.5	6203	16.51	0.23
B204	58.8	0.1	2400	500	150	25	47(-0.014-0.039)	5X3	6204	18.796	0.34
B205	98	0.2	1800	400	150	25	52(0.017-0.042)	5X3	6205	23.622	0.45
B206	235	0.2	1800	350	150	28	62(-0.017-0.042)	7X4	6206	32.766	0.68
B207	372	0.2	1800	300	150	28	72(-0.017—0.042)	7X4	6207	42.088	0.8
B208	549	0.2	1800	200	150	32	80(-0.017-0.042)	10X4.5	6208	46.761	0.91
B209	549	0.2	1800	200	150	32	85(-0.020-0.045)	10X4.5	6209	46.761	0.95
B2010	784	0.29	1200	200	150	32	90(-0.020-0.045)	10X4.5	6210	56.109	1
B2011	784	0.29	1200	200	150	32	100(-0.020-0.050)	10X4.5	6211	56.109	1.4
B2012	1230	0.29	1200	180	150	42	110(-0.020-0.050)	10X4.5	6212	70.029	1.8
B2013	1230	0.29	1200	180	150	42	120(-0.020-0.050)	10X4.5	6213	70.029	2.3
B2014	1390	0.39	180	180	150	42	125(-0.024-0.060)	12X4.5	6214	79.356	2.4

GFR

GFR

GFRN

DESCRIPTION

Types GFR,GFRN are roller type freewheels. They are bearing supported, using two 160.. series bearings, and require oil lubrication. These units may be used in designs providing oil lubrication and sealing as on the example overleaf. The bearings must not be axially stressed.

Typically, types GFR,GFRN are used with the F series covers that are designed to transmit torque, and provide oil lubrication and sealing. Usually these covers are used in pairs according to combinations shown on the following pages. The outer race of the GFR model is plain to receive and center any component bored to H7 tolerance.

Torque is transmitted by bolts through the cover plate in this case. Types GFR, GFRN are identical except that type GFRN has a keyway on the outside diameter to transmit the torque. Two paper seals are delivered with each unit to be placed between the outer race and cover plates.

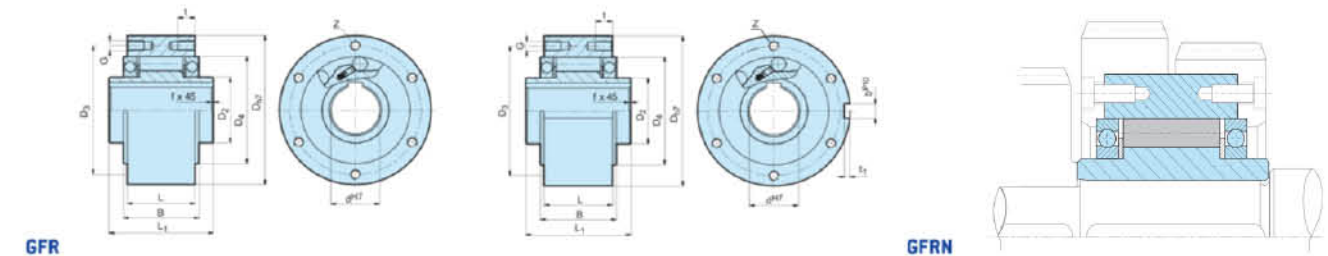| Type	Size	Torque	Overrunning speeds		Dimensions						NO	Dimensions						Weight
	d^{H7}	T_{KN} [1]	n_{Imax} [2]	n_{amax} [3]	D_{h7}	D_2	D_4	D_3	G	t	z	L 1	L	B	t1	bP10	f	
	[mm]	[Nm]	[min^{-1}]	[min^{-1}]	[mm]	[mm]	[mm]	[mm]		[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
	12*	55	4000	7200	62	20	42	51	ø5.5	–	3	42	20	27	2.5	4	0.5	0.5
	15	125	3600	6500	68	25	47	56	M5	8	3	52	28	32	3	5	0.8	0.8
	20	181	2700	5600	75	30	55	64	M5	8	4	57	34	39	3.5	6	0.8	1
	25	288	2100	4500	90	40	68	78	M6	10	4	60	35	40	4	8	1	1.5
	30	500	1700	4100	100	45	75	87	M6	10	6	68	43	48	4	8	1	2.2
	35	725	1550	3800	110	50	80	96	M6	12	6	74	45	51	5	10	1	3
	40	1025	1150	3400	125	55	90	108	M8	14	6	86	53	59	5	12	1.5	4.6
GFR GFRN	45	1125	1000	3200	130	60	95	112	M8	14	8	86	53	59	5.5	14	1.5	4.7
	50	2125	800	2800	150	70	110	132	M8	14	8	94	64	72	5.5	14	1.5	7.2
	55	2625	750	2650	160	75	115	138	M10	16	8	104	66	72	6	16	2	8.6
	60	3500	650	2450	170	80	125	150	M10	16	10	114	78	89	7	18	2	10.5
	70	5750	550	2150	190	90	140	165	M10	16	10	134	95	108	7.5	20	2.5	13.5
	80	8500	500	1900	210	105	160	185	M10	16	10	144	100	108	9	22	2.5	18.2
	90	14500	450	1700	230	120	180	206	M12	20	10	158	115	125	9	25	3	28.5
	100	20000	350	1450	270	140	210	240	M16	24	10	182	120	131	10	28	3	42.5
	130	31250	250	1250	310	160	240	278	M16	24	12	212	152	168	11	32	3	65
	150	70000	200	980	400	200	310	360	M20	32	12	246	180	194	12	36	4	138

GFR F1F2

GFR...F1F2

GFR...F2F7

GFRN...F5F6

DESCRIPTION

Types GFR..F1F2/F2F7 and GFRN..F5F6 are roller type freewheels, self-contained, sealed and bearing supported, using two 160.. series bearings.

They use the GFR, GFRN base modules described on previous pages. Units must be oil lubricated before use if they are delivered disassembled. Primarily used as overrunning or indexing clutches. the cover combination is chosen according to the type of drive, as shown overleaf.F2 and F6 covers are used to close the unit. They are equipped with 3 screws for oil filling, drain and level.

The shaft seal is a standard lip seal. Covers may be easily assembled by a qualified user, allowing direction of rotation to be selected on site. Alternatively, units can be delivered assembled and lubricated (except GFRN.. F5F6).).

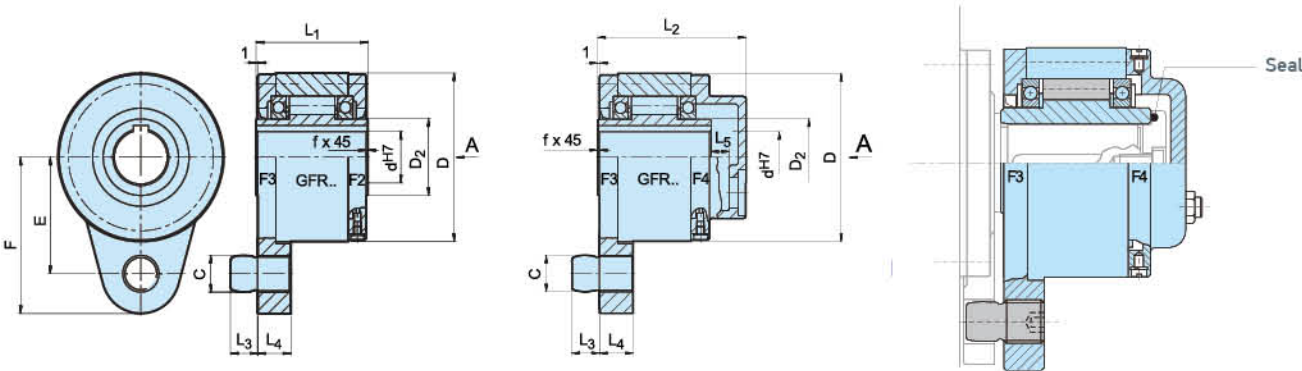| Type	Size	Overrunning speeds																			Weight
	d^{H7} [mm]	$T_{KN}^{1)}$ [Nm]	$n_{imax}^{2)}$ [min^{-1}]	$n_{amax}^{3)}$ [min^{-1}]	D_{H7} [mm]	D_5 [mm]	D_7 [mm]	D_3 [mm]	D_{4H7} [mm]	O [mm]	t_2 [mm]	Z	L_1 [mm]	L_5 [mm]	L [mm]	L_2 [mm]	L_3 [mm]	L_4 [mm]	t_1 [mm]	b^{p10} [mm]	f [mm]	[kg]
GFR	12	55	3100	4700	62	85	70	72	42	5.5	5.7	3	42	44	20	10	10	3	2.5	4	0.5	1.2
	15	125	2800	4400	68	92	76	78	47	5.5	5.7	3	52	54	28	11	11	3	3	5	0.8	1.6
	20	181	2400	4100	75	98	84	85	55	5.5	5.7	4	57	59	34	10.5	10.5	3	3.5	6	0.8	1.9
	25	288	1600	3800	90	118	99	104	68	6.6	6.8	4	60	62	35	11.5	11.5	3	4	8	1.0	2.9
	30	500	1300	2800	100	128	109	114	75	6.6	6.8	6	68	70	43	11.5	11.5	3	4	8	1.0	3.9
	35	725	1200	2600	110	140	119	124	80	6.6	6.8	6	74	76	45	13.5	13	3.5	5	10	1.0	4.9
	40	1025	850	2300	125	160	135	142	90	9	9	6	86	88	53	15.5	15	3.5	5	12	1.5	7.5
	45	1125	740	2200	130	165	140	146	95	9	9	8	86	88	53	15.5	15	3.5	5.5	14	1.5	7.8
	50	2125	580	1950	150	185	160	166	110	9	9	8	94	96	64	14	13	4	5.5	14	1.5	10.8
	55	2625	550	1800	160	204	170	182	115	11	11	8	104	106	66	18	17	4	6	16	2.0	14.0
	60	3500	530	1700	170	214	182	192	125	11	11	10	114	116	78	17	16	4	7	18	2.0	16.8
	70	5750	500	1600	190	234	202	212	140	11	11	10	134	136	95	18.5	17.5	4	7.5	20	2.5	20.8
	80	8500	480	1500	210	254	222	232	160	11	11	10	144	146	100	21	20	4	9	22	2.5	27.0

GFR F2F3

DESCRIPTION

Types GFR..F2F3/F3F4 are roller type freewheels, self-contained, sealed and bearing supported, using two 160... series bearings.

They use the GFR base module. Units must be oil lubricated before use if they are delivered disassembled and in any case for the F3F4 combination. These cover combinations are primarily used as backstops, as shown overleaf. The F3 cover acts as a torque arm and has an integrated stop bolt. The stop bolt should go into a slot in a fixed part of the machine. The stop bolt must have a radiat clearance of 1-3 % of the bolt's diameter. The torque arm and bearings must not be prestressed in any way. F2 and F4 covers are used to close the unit. They are equipped with 3 screws for oil filling, drain and level.

If using cover type F4, shaft end plate and its screw must be sealed to avoid oil leakage through the keyway.Covers are easily fitted, allowing on site selection of rotation direction. If requested units can be delivered assembled and lubricated for the F2F3 combination.

Type	Size	Overrunning speeds		D	D_2	C	L_1	L_2	L_3	L_4	F	E	L_5	f	Weight
	d^{H7} [mm]	T_{KN} [1)] [Nm]	n_{imax} [2)] [min^{-1}]	D [mm]	D_2 [mm]	C [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	L_4 [mm]	F [mm]	E [mm]	L_5 [mm]	f [mm]	[kg]
GFR	12	55	3100	62	20	10	42	64	10	13	59	44	6	0.5	1.4
	15	125	2800	68	25	10	52	78	10	13	62	47	10	0.8	1.8
	20	181	2400	75	30	12	57	82	11	15	72	54	10	0.8	2.3
	25	288	1600	90	40	16	60	85	14	18	84	62	10	1.0	3.4
	30	500	1300	100	45	16	68	95	14	18	92	68	10	1.0	4.5
	35	725	1200	110	50	20	74	102	18	25	102	76	12	1.0	5.6
	40	1025	850	125	55	20	86	115	18	25	112	85	12	1.5	8.5
	45	1125	740	130	60	25	86	115	22	25	120	90	12	1.5	8.9
	50	2125	580	150	70	25	94	123	22	25	135	102	12	1.5	12.8
	55	2625	550	160	75	32	104	138	25	30	142	108	15	2.0	16.2
	60	3500	530	170	80	32	114	147	25	30	145	112	15	2.0	19.3
	70	5750	500	190	90	38	134	168	30	35	175	135	16	2.5	23.5
	80	8500	480	210	105	38	144	178	30	35	185	145	16	2.5	32
	90	14500	450	230	120	50	158	192	40	45	205	155	16	3.0	47.2
	100	20000	350	270	140	50	182	217	40	45	230	180	16	3.0	76
	130	31250	250	310	160	68	212	250	55	60	268	205	18	3.0	110
	150	70000	200	400	200	68	246	286	55	60	325	255	20	4.0	214

KI

KI
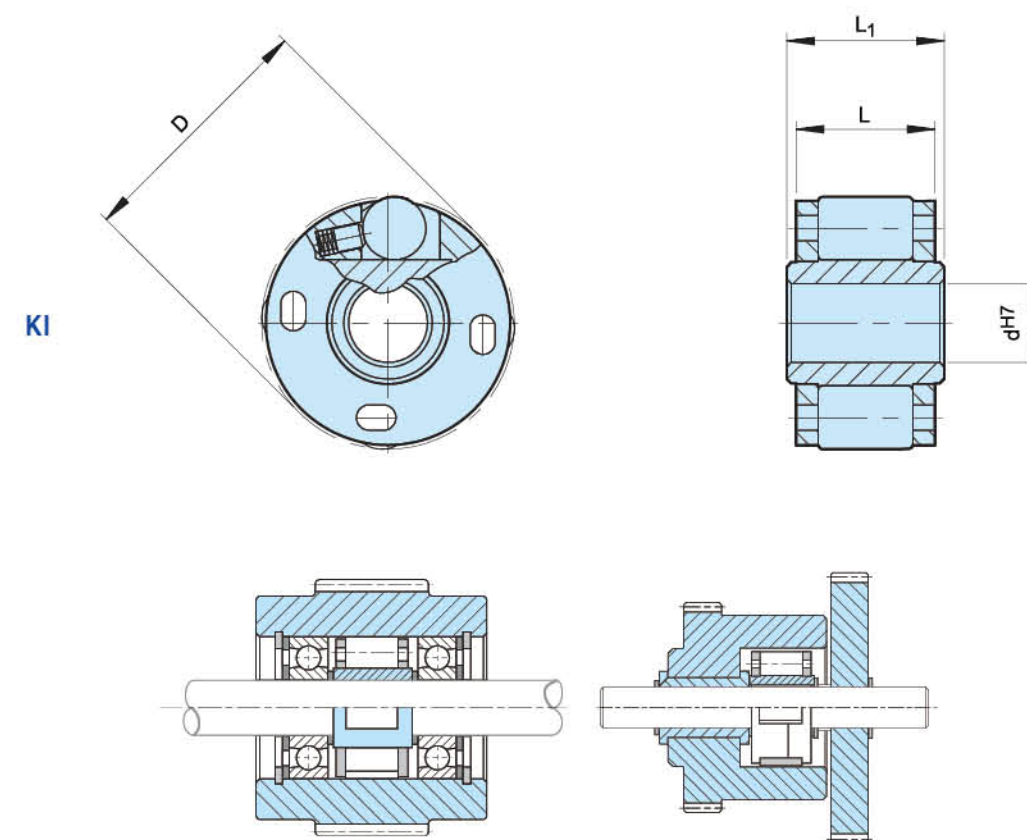
DESCRIPTION

Type KI is a roller type freewheel. It is an assembly comprising of an inner race and rollers fitted into a polyamide cage. This type of unit can not be dismantled. It is designed for small mechanisms in office equipment, or packaging machines, to be mounted inside gears or feed rollers.

The gear or feed roller inner diameter is used as the outer race. Additional bearing support is required, and the freewheel must not be subjected to axial loading; mounting examples are shown on the following page. The outer race does not need to be hardened; min. strength: 700 N/mm^2

The surface roughness will not exceed 22 CLA.Mounting onto the shaft can be a press fit to r6 tolerance or a glue fit with a clearance of 0.02 to 0.05mm.

Sizes 8 mm and above can be supplied with a keyway.Temperature range: -40°C to +100°C (continuous operation).Peak temperatures of +120°C are acceptable for short periods of time.

Type	Size			Overrunning speeds					Weight
		d^{H7} [mm]	$T_{KN}^{1)}$ [Nm]	$n_{imax}^{2)}$ [min^{-1}]	$n_{amax}^{3)}$ [min^{-1}]	D^{H7} [mm]	L_1 [mm]	L [mm]	[kg]
	164	4	0.8	8000	10000	16	10	9	0.008
	165	5	0.8	8000	10000	16	10	9	0.007
	194	4	0.9	7000	9000	19	10	9	0.012
Ki	195	5	0.9	7000	9000	19	10	9	0.011
	196	6	0.9	7000	9000	19	10	9	0.010
	268*	8	2.9	5000	6000	26	14	13	0.023
	269*	9	2.9	5000	6000	26	14	13	0.02
	2610*	10	2.9	5000	6000	26	14	13	0.019

FSO|HPI

SUMA ®
Clutch & Bearing

FSO

Notes:
(1) T max = 2 × T KN
(2) Inner race/outer race
(3) Inner race/outer race labyrinth seal
(4) Inch bore available on request
(5) Only for oversize bore
    Size 600 > 50 mm
    Size 700 > 75 mm
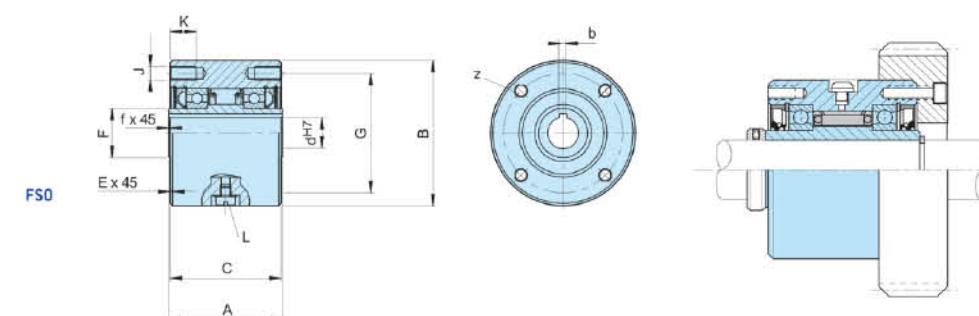*) 6 holes equally spaced at 60° plus
2 extra-holes at 180°

DESCRIPTION

Types FSO, FSO-GR, and HPI 300 to 700 are sprag type freewheels self-contained, sealed and bearing supported, using two ball bearings.

Units are delivered oil or grease lubricated according to the type. It is R&B design with a full sprag complement that gives a very high torque for a given diameter. Any overload is resisted by a sprag to sprag abutment, avoiding a sprag tilt over. Types FSO and HPI are oil lubricated and use standard shaft lip seals. Type FSO-GR is grease lubricated and can be equipped with contact free labyrinth seals.
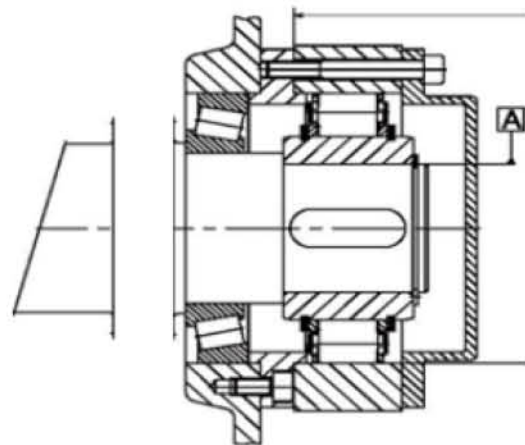
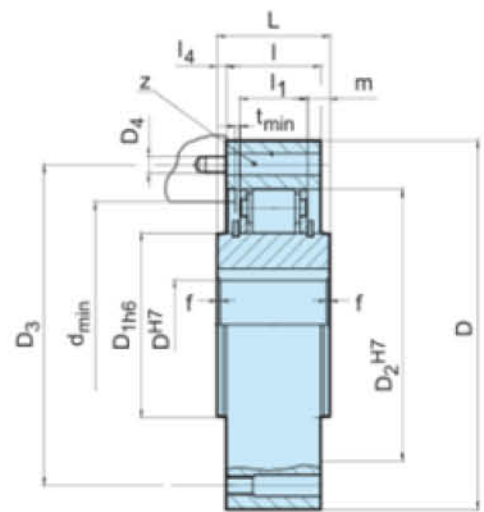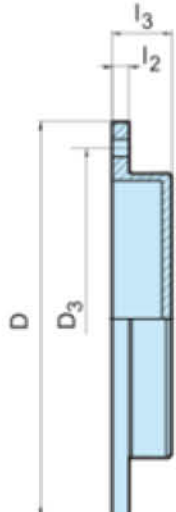	Type	Size	Torque	Overrunning speeds		Dimensions																Lubricant			Weight	Drag torque
			FSO	FSO-GR	d H7 -bxh	d 4) min-max	A	B 5) -0.05	C	D	E	F	G	z	J	K	L	P	f	FSO	HPI	FS		
		TKN1)	nmax2)	nmax3)																				
		[Nm]	[min -1]	[min -1]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[inch]	[mm]	[mm]	[mm]	[ml]	[ml]	[ml]	[kg]	[Ncm]
FSO FS HPI	300	379	3000/900	3600/900	15-5x5	12–19	63.5	76.2	60.45		1.6	28.58	66.67	4	M8	13	M6		0.8	7	14		1.6	18
	400	407	2800/850	3600/850	18-6x6	12–22	69.85	88.9	68.07		1.6	30	73	4	M8	13	M6		0.8	10	20		2.7	27
	500	1621	2500/800	3000/800	30-8x7 / 40-12x8	19–33	88.9	107.95	85.73		1.6	45	92	4	M8	16	M6		1.5	22	35		4.8	31
	600	3105	2200/750	2400/750	45-14x9 / 50-14x6 / 50-14x9	24–57	95.25	136.525	92.2		1.6	63.5	120.6	6	M8	16	M6		1.6	52	84		8.6	62
	700	6900	1600/450	2000/450	60-18x11 / 65-18x11 / 70-20x12	48–82	127	180.975	123.9		1.6	90 / 101.6	158.8	8	M10 *	20	M6		1.6	168	280		19	156
	750	9660	1800/650	1000/650	75-20x12 / 80-22x14 / 85-22x14 / 80-22x14	57–87	152.4	222.25	149.2	31.7	1.6	107.7	177.8	8 *	M12 *	25	1/2-20	49.2	1.6	222	384	207	38	5.08
	800	17940	1500/525	850/525	90-25x14 / 100-28x16 / 110-28x16 / 100-28x16	66–112	152.4	254	149.2	31.7	1.6	139.7	227	8	M12	25	1/2-20	49.2	1.6	222	444	251	46	7.12
	900	24408	1350/500	700/500	110-28x16 / 120-32x18 / 130-32x18 / 130-32x18	92–138	161.9	304.8	158.7	34.9	1.6	161.9	247.7	10	M16	32	1/2-20	54	1.6	532	473	340	71	8.47
	1027	36612	700/375	500/375	150-36x20 / 175-45x25	125–177	168.3	381	165.1	34.9	3.2	228.6	298.5	12	M16	32	1/2-20	54	3.2	651	946	473	113	13.56

RSCI

RSCI

F8

Description:

RSCI is a centrifugal lift off sprag type freewheel with the inner race rotating. It is a non self-supported type. So, bearings must be provided to ensure concerntricity of the inner and outer races and support axial and radial loads. This type can be also used as an ocerrunning clutch in crawl drives, where the overrunning speed is low and does not exceed the maximum driving speed.

| Type	Size	Torque	Rotation Speeds			Dimensions					Number	Dimensions						Weight	
		T_{KN} [1]	n_{max} [2]	n_{lmin} [3]	n_{lmax} [4]	D5)	D1h6	D2H7	D3	D4	z	L	l	l1	m	l2	l3	RSCI	F8
	d^{H7}																		
	[mm]	[Nm]	[min-1]	[min-1]	[min-1]	[mm]	[mm]	[mm]	[mm]			[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[kg]
RSCI	20	212	315	750	15000	90	36	66	78	M6	6	35	35	25	5	8	16	1.5	0.3
	25	319	300	725	14000	95	40	70	82	M6	6	35	35	25	5	8	16	1.6	0.4
	30	375	290	700	11000	100	45	75	87	M6	6	35	35	25	5	8	16	1.8	0.4
	35	550	280	670	11000	110	50	80	96	M6	8	35	35	25	5	8	16	2.1	0.5
	40	800	260	630	8000	125	60	90	108	M8	8	35	35	25	5	10	21	2.7	0.7
	45	912	255	610	7000	130	65	95	112	M8	8	35	35	25	5	10	21	2.9	0.9
	50	1400	235	560	6000	150	80	110	132	M8	8	40	40	25	7.5	10	21	4.3	1
	60	2350	210	510	6000	175	85	125	155	M10	8	60	50	36	12	12	35	6.5	1.8
	70	3050	195	470	4000	190	100	140	165	M10	12	60	50	36	12	12	35	8.6	1.9
	80	4500	180	440	4000	210	120	160	185	M10	12	70	60	36	17	12	35	12.5	2.6
	80M	5800	155	375	4000	210	120	160	185	M10	12	70	60	46	12	12	35	13.1	2.6
	90	5600	170	410	3000	230	140	180	206	M12	12	80	70	36	22	12	35	17.4	3
	90M	8700	145	350	3000	245	140	180	206	M12	12	80	70	46	17	12	35	18.3	3
	100	10500	145	355	3000	290	140	210	258	M16	12	90	80	52.6	18.6	15	37	28	5
	100M	16000	140	340	2400	290	170	210	258	M16	12	90	80	63	13.5	12	35	30	5
	130	15750	135	330	2400	322	170	240	278	M16	12	90	80	52.6	18.6	15	37	35	6

FXM

DESCRIPTION

Integrated Freewheels FXM are sprag free -wheels without bearing support and with spraglift-off X.The sprag lift-off X ensures a wear-free freewheeling operation when the inner ring rotates at high speed.The freewheels FXM are used as:1. Backstops2. Overrunning Clutchesfor applications with high speed freewheeling operation and when used as an overrunning clutch with low speed driving operation.Nominal torqueswhich are supported in a cage connected with the inner ring, rotate with the inner ring. The centrifugal force F C that is applied in the center of gravity S of the sprag turns the sprag counterclockwise and rests against the support ring of the cage.
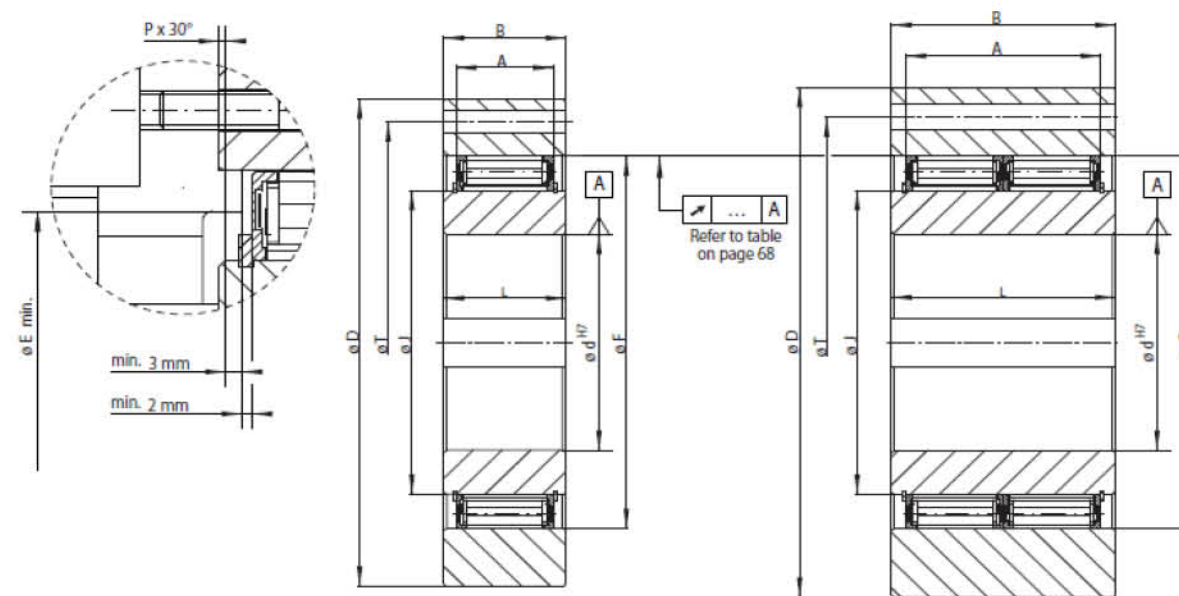
Type	Bore d							A	B	D	E	F	G	J	L	P	T
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm	mm
FXM 31-17	20*						20*	17	25	85	41	55	M6	31	24	1,0	70
FXM 38-17	25*						25*	17	25	90	48	62	M6	38	24	1,0	75
FXM 46-25	25						30	25	35	95	56	70	M6	46	35	1,0	82
FXM 51-25	25	30	35				36	25	35	105	62	75	M6	51	35	1,0	90
FXM 56-25	35						40	25	35	110	66	80	M6	56	35	1,0	96
FXM 61-19	30	35	40				45*	19	27	120	74	85	M8	61	25	1,0	105
FXM 66-25	35	40	45				48*	25	35	132	82	90	M8	66	35	1,0	115
FXM 76-25	45	55					60*	25	35	140	92	100	M8	76	35	1,0	125
FXM 86-25	40	45	50	60	65		70*	25	40	150	102	110	M8	86	40	1,0	132
FXM 101-25	55	70					80*	25	50	175	117	125	M10	101	50	1,0	155
FXM 85-40	45	50	60	65			65	40	50	175	102	125	M10	85	60	1,0	155
FXM 100-40	45	50	55	60	70	75	80*	40	50	190	130	140	M10	100	60	1,5	165
FXM 120-50	60	65	70	75	80	95	95	50	60	210	150	160	M10	120	70	1,5	185
FXM 140-50	65	90	100	110			110	50	70	245	170	180	M12	140	70	2,0	218
FXM 170-63	70	85	90	100	120		130	63	80	290	200	210	M16	170	80	2,0	258
FXM 200-63	130						155	63	80	310	230	240	M16	200	80	2,0	278
FXM 240-63							185	63	80	400	280	310	M20	240	90	2,0	360
FXM 240-96							185	96	125	420	280	310	M24	240	120	2,0	370
FXM 260-63							205	63	80	430	300	330	M20	260	105	2,0	380
FXM 290-70							230	70	80	460	330	360	M20	290	105	2,0	410
FXM 290-96							230	96	110	460	330	360	M20	290	120	2,0	410
FXM 310-70							240	70	125	497	360	380	M20	310	110	3,0	450
FXM 310-96							240	96	125	497	360	380	M20	310	120	3,0	450
FXM 320-70							250	70	80	490	360	390	M24	320	105	3,0	440
FXM 360-100							280	100	120	540	400	430	M24	360	125	3,0	500
FXM 410-100							320	100	120	630	460	480	M24	410	125	3,0	560
FXM 2410-100							320	200	220	630	460	480	M30	410	220	3,0	560

Freewheel Size	Type	Theoretical nominal torque (Nm) ↗0 A	Nominal torque at existing run out (T.I.R.) (Nm)						Sprag lift-off at inner ring speed min-1	Max. speed	
			↗0,1 A	↗0,2 A	↗0,3 A	↗0,4 A	↗0,5 A	↗0,8 A		Inner ring reewheels/ overruns min-1	Outer ring drives min-1
FXM31- 17	NX	110	110	105	100				890	5000	356
FXM38-17	NX	180	170	160	150				860	5000	344
FXM46-25	NX	460	450	440	430				820	5000	328
FXM51 - 25	NX	560	550	540	530				750	5000	300
FXM56 - 25	NX	660	650	640	630				730	5000	292
FXM61 - 19	NX	520	500	480	460				750	5000	300
FXM66 - 25	NX	950	930	910	890				700	5000	280
FXM76 - 25	NX	1200	1170	1140	1110				670	5000	268
FXM86 - 25	NX	1600	1550	1500	1450				630	5000	252
FXM101 -25	NX	2100	2050	2000	1950				610	5000	244
FXM85 -40	MX	2500	2500	2450	2450	2450	2450		430	6000	172
FXM100 -40	MX	3700	3600	3600	3500	3500	3500		400	4500	160
FXM120 -50	MX	7700	7600	7500	7300	7300	7300		320	4000	128
FXM140 -50	MX	10100	10000	9800	9600	9500	9500		320	3000	128
FXM170 -63	MX	20500	20500	20000	19500	19000	19000		250	2700	100
FXM200 -63	MX	31000	30500	30000	26500	23000	20500		240	2100	96
FXM240-63	LX	36500	36000	35500	35500	35000	34500	34000	220	3000	88
FXM240-96	LX	59000	58500	58500	57500	57000	56500	56000	220	2500	88
FXM2.240-70	LX	81000	80500	80000	79500	78500	77500	77000	220	2500	88
FXM2.240-96	LX	117500	116500	116000	114500	113500	112500	111500	220	2500	88
FXM260-63	LX	44500	44000	44000	43500	43000	42500	41500	210	2250	84
FXM290-70	LX	65000	64500	64000	63500	62500	62000	60000	200	2250	80
FXM290-96	LX	95500	95000	94500	93500	92500	91500	84500	200	2250	80
FXM2.290-70	LX	125500	125400	123500	122500	121000	119500	117000	200	2250	80
FXM2.290-96	LX	183000	181500	180000	178500	176500	174500	171000	200	2250	80
FXM310-70	LX	76000	75000	74500	74000	73000	72500	70000	195	2250	78
FXM310-96	LX	112000	111000	110500	109500	108000	107000	99000	195	2100	78
FXM320-70	LX	81000	80500	80000	79500	78500	78000	65500	195	2000	78
FXM320-96	LX	114000	113500	112500	111500	110000	109000	105500	195	2000	78
FXM2.320-70	LX	158000	156500	155500	154000	152500	151000	143000	195	2000	78
FXM2.320-96	LX	225000	223500	221500	220000	217500	215000	209000	195	2000	78
FXM360-100	LX	156000	155000	154000	152500	144000	134500	108000	180	1800	72
FXM2.360-73	LX	208000	206500	204500	203000	201000	199000	163000	180	1800	72
FXM2.360-100	LX	294500	292500	290000	287500	284500	281500	258500	180	1800	72
FXM410-100	LX	194500	193500	192000	190000	188500	179500	145000	170	1500	68
FXM2.410-73	LX	263000	261000	259000	257000	254500	252000	209500	170	1500	68
FXM2.410-100	LX	389500	387000	384000	380500	377000	359500	289500	170	1500	68
FXM500-100	LX	290000	287500	285500	283000	272000	255000	202000	150	1000	60
FXM2.500-100	LX	578000	574000	570000	566000	547000	508000	407000	150	1000	60
FXM620-105	LX	444500	441500	438500	427000	400000	374000	300000	135	1000	54
FXM2.620-105	LX	888000	882000	876000	860000	807000	754000	603000	135	1000	54

SUMA
Clutch & Bearing ®

FXN86-25/120

Refer to table on page 78
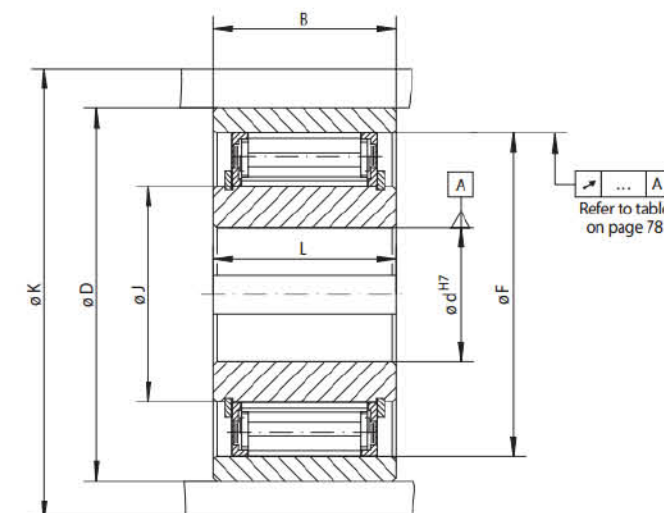
DESCRIPTION

Application example

Internal Freewheel FXN 38 - 17/70 NX as a backstop, arranged in a housing adapter to attach to an electric motor. The thin outer ring that is pressed into the housing enables a space-efficient fitting solution. Due to the high shaft speeds in normal operation (freewheeling operation), the sprag lift-off X ensures a contactless and hence wear-free continuous oper -ation.

Mounting

Internal Freewheels FXN are without bearing support. Concentric alignment of inner and outer ring must be provided by the customer. The permissible run out (T.I.R.) must be observed. The torque is transmitted on the outer ring by press fit. In order to transmit the torques specified in the table, the outer ring must be accommodated in a housing with an external diameter K. The housing is made of steel or grey cast iron in minimum quality GG-20. When using other housing materials or smaller external diameters, we urge you to contact us regarding the transmissible torque. The tolerance of the housing bore is specified in the table under dimension D. The tolerance of the shaft must be ISO h6 or j6.

Lubrication

At speeds in excess of the sprag lift-off speed, no special lubrication is required; the freewheel functions maintenance-free. When operating below the sprag lift-off speed, an oil lubrication of the specified quality must be provided.

Freewheel size	Type	Torque Nm	Inner ring Overrun	Bore d Standard						max.	B mm	D mm	F mm	J mm	K min. mm	L mm	Weight kg
FXN31 - 17/60	NX	110	5000	20*						20*	25	60 P6	55	31	85	24	0,3
FXN31 - 17/62	NX	110	5000	20*						20*	25	62 P6	55	31	85	24	0,4
FXN38 - 17/70	NX	180	5000	25*						25*	25	70 P6	62	38	90	24	0,4
FXN46 - 25/80	NX	460	5000	25						30	35	80 P6	70	46	95	35	0,8
FXN51 - 25/85	NX	560	5000	25	30	35				36	35	85 P6	75	51	105	35	0,8
FXN56 - 25/90	NX	660	5000	35						40	35	90 P6	80	56	110	35	0,9
FXN61 - 19/95	NX	520	5000	30	35	40				45*	26	95 P6	85	61	120	25	0,8
FXN61 - 19/106	NX	520	5000	30	35	40				45*	25	106 H7	85	61	120	25	1,2
FXN66 - 25/100	NX	950	5000	35	40	45				48*	30	100 P6	90	66	132	35	1,1
FXN66 - 25/110	NX	950	5000	35	40	45				48*	40	110 P6	90	66	132	35	1,8
FXN76 - 25/115	NX	1200	5000	45	55					60*	40	115 P6	100	76	140	35	1,7
FXN76 - 25/120	NX	1200	5000	45	55					60*	32	120 J6	100	76	140	35	1,8
FXN86 - 25/125	NX	1600	5000	40	45	50	60	65		70*	40	125 P6	110	86	150	40	2,3
FXN86 - 25/130	NX	1600	5000	40	45	50	60	65		70*	40	130 P6	110	86	150	40	2,6
FXN 101 - 25/140	NX	2100	5000	55	70					75	45	140 P6	125	101	175	50	3,1
FXN 101 - 25/149	NX	2100	5000	70						75	62	149 H6	125	101	175	62	4,2
FXN 101 - 25/150	NX	2100	5000	55	70					75	45	150 P6	125	101	175	50	3,6
FXN 85 - 40/140	MX	2500	6000	45	50	60	65			65	45	140 P6	125	85	175	60	3,2
FXN 85 - 40/150	MX	2500	6000	45	50	60	65			65	45	150 P6	125	85	175	60	4,2
FXN 100 - 40/160	MX	3700	4500	45	50	55	60	70	75	75	50	160 P6	140	100	190	60	5,1
FXN 105 - 50/165	MX	5200	4500	80						80	62	165 P6	145	105	195	62	5,8
FXN 120 - 50/198	MX	7700	4000	60	65	70	75	80	95	95	70	198 H6	160	120	210	70	8,6
FXN 140 - 50/215	MX	10100	3000	65	90	100	110			110	69	215 J6	180	140	245	70	14,0
FXN 170 - 63/258	MX	20500	2700	70	85	100	120			130	80	258 H6	210	170	290	80	21,0

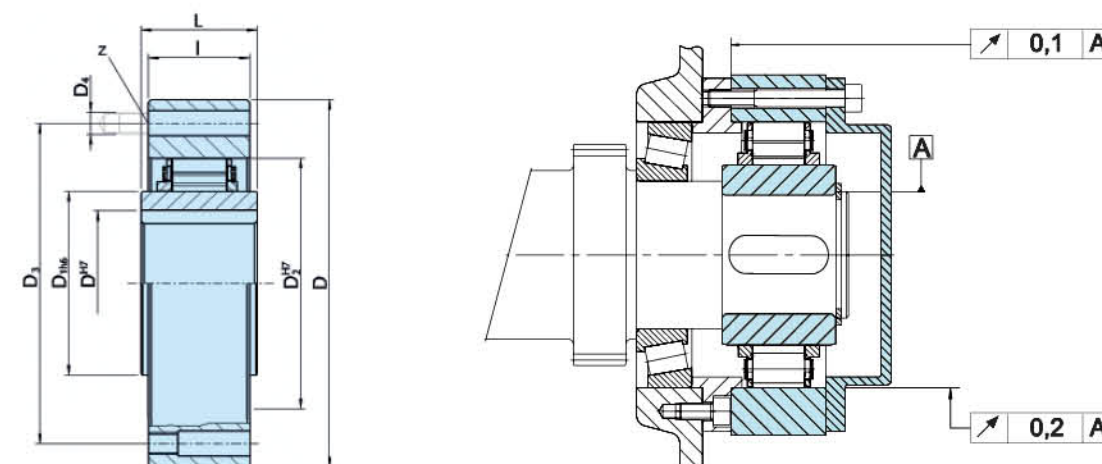## DESCRIPTION

The series RSXM completes teh small to medium backstop range, which commenced with the highly successful RSCI programme. Type RSXM is a centrifugal lift off sprag type freewheel with the inner race rotating. Only the inner race is designed for freewheeling. It is a non self-supported type. Bearings must be provided to ensure concentricity of the innerand outer races and support axial and radial loads, as shown overleaf. Concentricity and run-out limits must be observed.

The RSXM type accepts all types of lubricant currently used in power transmission equipment. It is possible to mount these freewheels directly in gear-boxes without seperate lubrication. An oil mist ist generally sufficient.Grease lubrication may be acceptable if the unit works mostly in overrunning condition, as on E-motors. When used as a backstop. it must be checked that the overrunning speed will not go below the minimum speed given in the characteristic table.

Type	Bore dia.	Torque	Overrunning speeds														Weight
RSXM	d^{H7} [mm]	$T_{KN}^{1)}$ [Nm]	$n_{max}^{2)}$ [min^{-1}]	$n_{min}^{3)}$ [min^{-1}]	$n_{imax}^{4)}$ [min^{-1}]	$D^{5)}$ [mm]	D_{1h6} [mm]	D_2^{H7} [mm]	D_3 [mm]	D_4 [mm]	z [nb]	L [mm]	l [mm]	l_1 [mm]	t_{min} [mm]	d_{min} [mm]	[kg]
31	20	100	340	820	20000	85	31	55	70	M6	6	24	25	17	1	41	0.75
38	20.25	135	320	770	18500	90	38	62	75	M6	6	24	25	17	1	50	0.95
46	25.30	425	300	720	13500	95	46	70	82	M6	6	35	35	25	4	53	1.4
51	30.25	525	220	525	12500	105	51	75	90	M6	6	35	35	25	1	60	1.8
56	35.40	625	210	500	11500	110	56	80	96	M6	8	35	35	25	1	62	1.8
61	35.40	420	265	640	14000	120	61	85	105	M8	6	25	27	17	2	73	1.8
66	35.40.45	850	200	480	10000	132	66	90	115	M8	8	35	35	25	1	78	2.7
76	40.45.50	1100	190	460	9000	140	76	100	125	M8	8	35	35	25	1	90	3.1
86	45.50	1450	180	440	8000	150	86	110	132	M8	8	40	40	25	1	100	4.2
101	45.55.60.70	1950	175	420	6500	175	101	125	155	M10	8	50	50	25	1	117	7.3

RSBI

RSBI 60-150

RSBI 180-240

F8

DESCRIPTION

1). This maximum allowable torque transmission speed n max must not be exceeded when transmitting torque .

2). This minimum allowable overrunning speed n imin should not be reduced under continuous operation. Possible reduction of this minimum speed on request
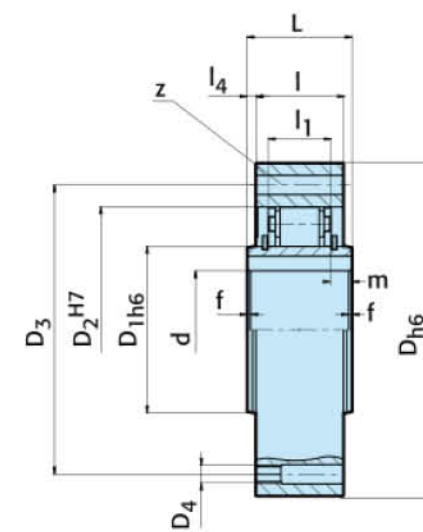
3). Inner race overruns

Type RSBI is a centrifugal lift off sprag type freewheel with the inner race rotating. Only the inner race is designed for freewheeling. It is a non self-supported type.

Bearings must be provided to ensure concentricity of the inner and outer races and support axial and radial loads.

Primarily designed as a backstop, this type can be also used as an overrunning clutch in crawl drives, where the overrunning speed is high but the driving speed is low and does not exceed the maximum driving speed shown in the table.
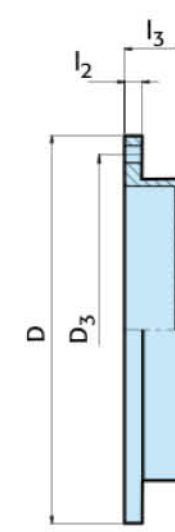
When used as a backstop, it must be checked that the overrunning speed will not go below the minimum speed given in the characteristics table.
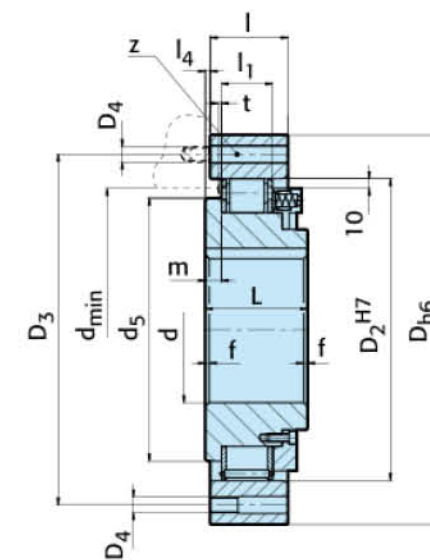
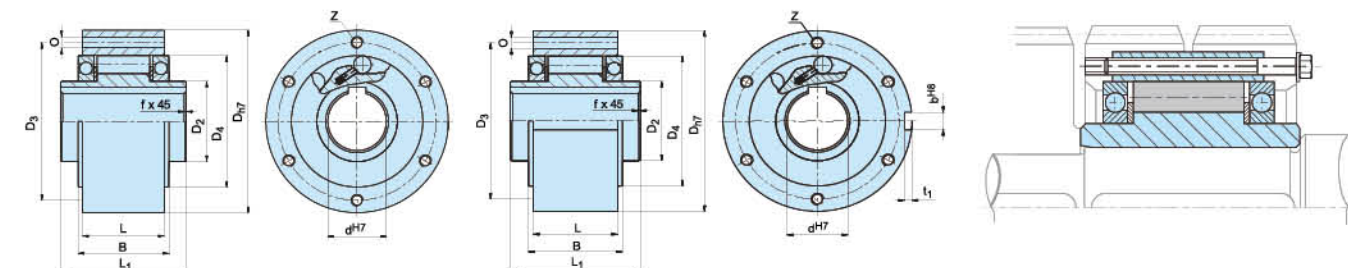| Model	Bore mm	Torque Nm	Speed $_{1)}$r/min	Speed $_{2)}$r/min	Speed $_{3)}$r/min	Dimensions (mm)															Weight (kg)	
	dH7					D_{h6}	$D1_{h6}$	$D2_{h7}$	D_3	D_4	d_5	z	L	l	l_1	I4	fx45	d_{min}	I2	I3	RSBI	F8
RSBI	60	1375	200	490	6100	175	85	125	155	M10	-	8	60	50	36	5	2	110	12	35	6.5	1.8
	70	2000	210	480	4500	190	95	140	165	M10	-	12	60	50	36	5	2	120	12	35	8.6	1.9
	80	3125	190	450	4000	210	115	160	185	M10	-	12	70	60	36	5	2	140	12	35	12.5	2.6
	90	4125	180	420	3000	230	135	180	206	M12	-	12	80	70	36	5	2.5	160	12	35	17.4	3
	100	7250	200	455	2700	270	140	210	240	M16	-	12	90	80	52.6	5	2.5	180	15	37	28	5
	130	10625	180	415	2400	310	170	240	278	M16	-	12	90	80	52.6	5	3	210	15	37	35	6
	150	20325	160	365	1300	400	240	310	360	M16	-	12	90	80	52.6	5	3.5	280	18	44	61	15
	180	20375	160	365	3450	400	-	310	360	M16	270	12	105	80	52.6	5	4	280	18	62	73	16
	190	25000	145	340	4200	420	-	330	380	M16	290	16	105	80	58.6	5	4	300	18	67	75	18
	220	33750	140	325	3600	460	-	360	410	M16	320	18	105	80	58.6	5	4	330	18	67	88	21
	240	38250	135	310	3100	490	-	390	440	M16	350	18	105	80	58.6	5	4	360	20	67	96	25

DESCRIPTION

Types AL, ALP are roller type freewheels. These units are part of the Stieber modular system. They are bearing supported, using two 160.. series bearings, and require oil lubrication. These units may be used in designs providing oil lubrication and sealing as on the example overleaf.

The bearings must not be axially stressed. Typically, types AL, ALP are used with standard covers that are designed to transmit torque, and provide oil lubrication and sealing. Usually these covers are used in pairs according to combinations shown on the following pages. The outer race of the AL model is plain to receive and center any component bored to H7 tolerance. Torque is transmitted by bolts through the cover plate in this case. Types AL, ALP are identical except that type ALP has a keyway on the outside diameter to transmit the torque. Two paper seals are delivered with each unit to be placed between the outer race and cover plates.

Type	Size	Overrunning speeds			D_{h7}	D_2	D_4	D_3	O	z	L_1	$L^{4)}$	B	t_1	b^{H8}	f	Weight	Drag torque
		d^{H7} [mm]	$T_{KN}^{1)}$ [Nm]	$n_{imax}^{2)}$ [min^{-1}]	$n_{amax}^{3)}$ [min^{-1}]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]					[kg]	T_R [Ncm]
AL	12	55	4000	7200	62	20	42	51	5.5	3	42	20.3	27	2.4	4	8.5	0.5	3.4
	15	125	3600	6500	68	25	47	56	5.5	3	52	30.3	34.1	2.9	5	0.8	0.8	4.1
	20	181	2700	5600	75	30	55	64	5.5	4	57	34.3	39.1	3.5	6	0.8	1.0	8
	25	288	2100	4500	90	40	68	78	5.5	6	60	37.3	42.1	4.1	8	1.0	1.5	14
	30	500	1700	4100	100	45	75	87	6.6	6	68	44.3	49.1	4.1	8	1.0	2.2	23
	35	725	1550	3800	110	50	80	96	6.6	6	74	48.3	54.1	4.7	10	1.0	3.0	60
	40	1025	1150	3400	125	55	90	108	9	6	86	56.3	62.1	4.9	12	1.5	4.6	72
	45	1125	1000	3200	130	60	95	112	9	8	86	56.3	62.1	5.5	14	1.5	4.7	140
	50	2125	800	2800	150	70	110	132	9	8	92	63.3	69.1	5.5	14	1.5	7.2	180
	55	2625	750	2650	160	75	115	138	11	8	104	67	73.1	6.2	16	2.0	8.6	190
	60	3500	650	2450	170	80	125	150	11	10	114	78	84	6.8	18	2.0	10.5	240
	70	5750	550	2150	190	90	140	165	11	10	134	95	103	7.4	20	2.5	13.5	320
	80	8500	500	1900	210	105	160	185	11	10	144	100	108	8.5	22	2.5	18.2	330
	90	14500	450	1700	230	120	180	206	14	10	158	115	125	8.7	25	3.0	28.5	650
	100	20000	350	1450	270	140	210	240	18	10	182	120	131	9.9	28	3.0	42.5	830
	120	31250	250	1250	310	160	240	278	18	12	202	140	152	11.1	32	3.0	65.0	1080
	150	70000	200	980	400	200	310	360	22	12	246	180	196	12.3	36	4.0	138.0	1240
	200	175000	150	750	520	262	400	460	26	18	326	240	265	15	45	5.0	315.0	3800
	250	287500	120	620	610	320	480	545	33	20	396	300	330	15	45	5.0	512.0	6100
	25	388	2100	2800	90	40	68	78	5.5	6	60	37.3	42.1	4.1	8	1.0	1.7	22
	30	588	1700	2500	100	45	75	87	6.6	6	68	44.3	49.1	4.1	8	1.0	2.5	37
	35	838	1550	2400	110	50	80	96	6.6	6	74	48.3	54.1	4.7	10	1.0	3.2	66

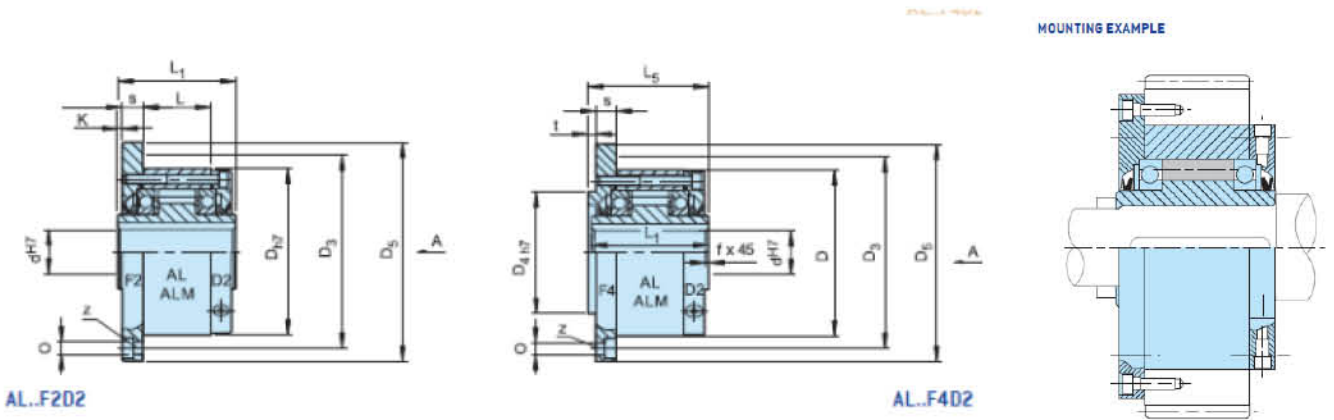# AL...F2D2 / AL...F4D2

AL..F2D2

AL..F4D2

MOUNTING EXAMPLE
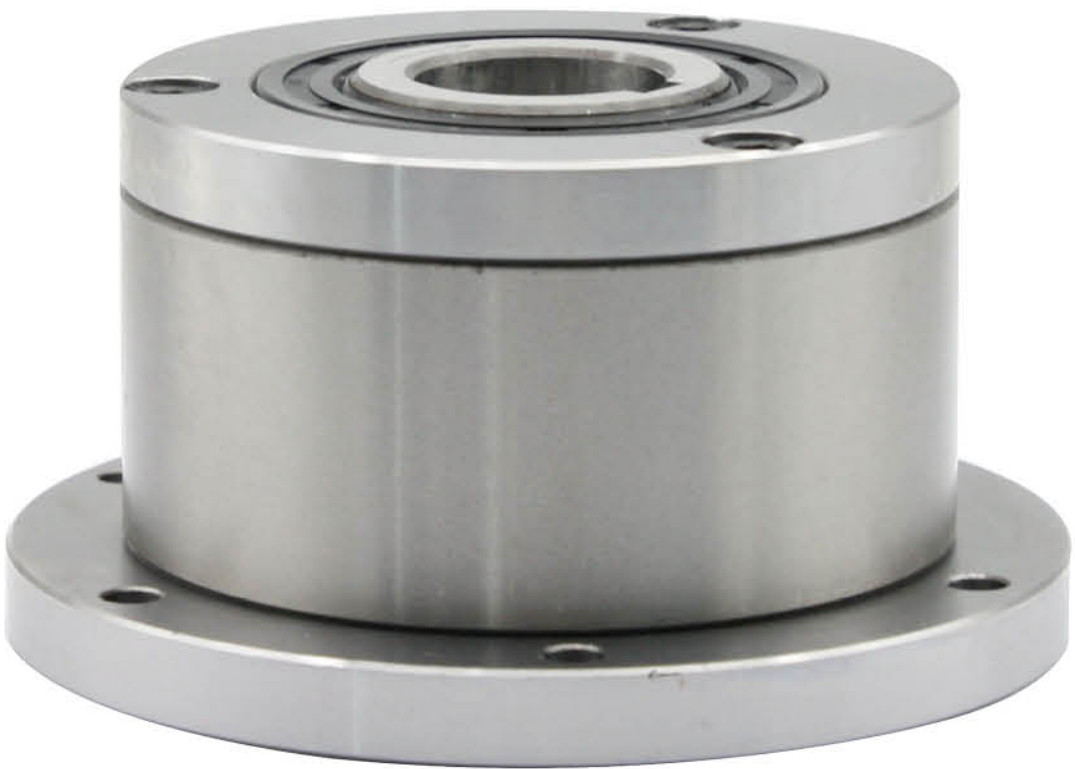
DESCRIPTION

Types AL..F2D2/F4D2 are roller type freewheels, self contained, sealed and bearing supported, using two 160.. series bearings. Units are delivered oil lubricated.

Primarily used as overrunning or indexing clutches, the cover combination is chosen according to the type of drive, as shown overleaf. D2 cover is used to close the unit. It is equipped with two screws for oil filling, drain and level. The shaft seal is a V-ring type. Cover and seal have been designed to be oil proof with minimum drag torque.

We recommend the unit is supplied assembled. Please specify inner race direction of rotation seen from the D2 flange.

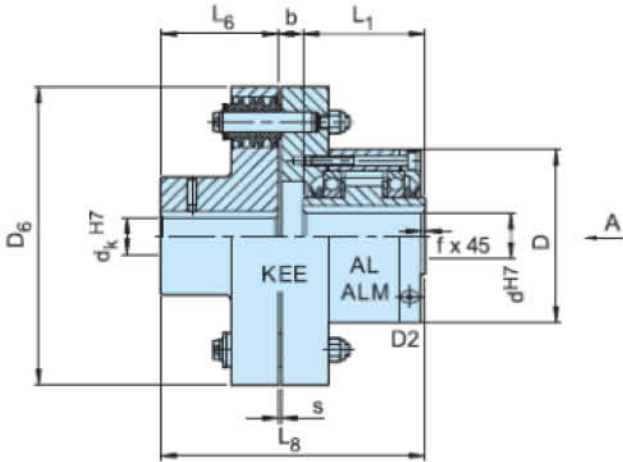| Type	Size	Overrunning speeds		D_{n7}	L_1	D_5	D_3	z	O	D_{4h7}	t	L_5	K	s	f	Weight	Drag Torque
	d^{H7} (mm)	T_{KN} [1] (Nm)	N_{imax} [2] (min-1)	N_{amax} [3] (min-1)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)	TR (Ncm)
AL.. F2D2 AL.. F4D2	12	55	2500	7200	62	42	85	72	3	5.5	42	3	44	0.5	10.3	0.5	0.9	11
	15	125	1900	6500	68	52	92	78	3	5.5	47	3	54	0.5	10.3	0.8	1.3	15
	20	181	1600	5600	75	57	98	85	4	5.5	55	3	59	0.5	10.8	0.8	1.7	18
	25	288	1400	4500	90	60	118	104	6	6.6	68	3	62	0.5	10.5	1	2.6	36
	30	500	1300	4100	100	68	128	114	6	6.6	75	3	70	0.5	11.3	1	3.5	48
	35	725	1100	3800	110	74	138	124	6	6.6	80	3.5	76	1	11.8	1	4.5	60
	40	1025	950	3400	125	86	160	142	6	9	90	3.5	88	1	13.8	1.5	6.9	84
	45	1125	900	3200	130	86	165	146	8	9	95	3.5	88	1	13.8	1.5	7.1	94
	50	2125	850	2800	150	92	185	166	8	9	110	4	94	1	12.8	1.5	10.1	158
	55	2625	720	2650	160	104	204	182	8	11	115	4	106	1.5	16.8	2	13.1	150
	60	3500	680	2450	170	114	214	192	10	11	125	4	116	1.5	16.3	2	15.6	160
	70	5750	580	2150	190	134	234	212	10	11	140	4	136	1.5	17.8	2.5	20.4	360
	80	8500	480	1900	210	144	254	232	10	11	160	4	146.3	1.5	20.3	2.5	26.7	360
	90	14500	380	1700	230	158	278	254	10	14	180	4.5	161	1.5	20	3	39	680
	100	20000	350	1450	270	182	335	305	10	18	210	5	184	2.5	28	3	66	880
	120	31250	250	1250	310	202	375	345	12	18	240	5	204	2.5	28.5	3	91	1200
	150	70000	180	980	400	246	485	445	12	22	310	5	249	2.5	31	4	186	1350
	200	175000	120	750	520	326	625	565	18	26	400	5	328	3	40	5	425	4200
	250	287500	100	620	610	396	740	680	20	33	480	5	398	3	45	5	680	6500
ALM.. F2D2 ALM.. F4D2	25	388	1100	2800	90	60	118	104	4	6.6	68	3	62	0.5	10.5	1	2.7	41
	30	588	1000	2500	100	68	128	114	6	6.6	75	3	70	0.5	11.3	1	36.65	64
	35	838	900	2400	110	74	138	124	6	6.6	80	3.5	76	1	11.8		4.7	76

AL...KEED2

AL..KEED2

DESCRIPTION

Type AL..KEED2 is a roller type freewheel, self-contained, sealed and bearing supported, using two 160.. series bearings. Unit is delivered oil lubricated.

This combination is used as overrunning clutch as shown overleaf. In this design, a standard AL freewheel is connected to a flexible coupling for in-line mounting.

The KEE type is a high performance coupling used to damp torsional vibrations and to accept misalignment without excess bearing loads. D2 cover is used to close the unit. It is equipped with two screws for oil filling, drain and level. We recommend the unit is supplied assembled.
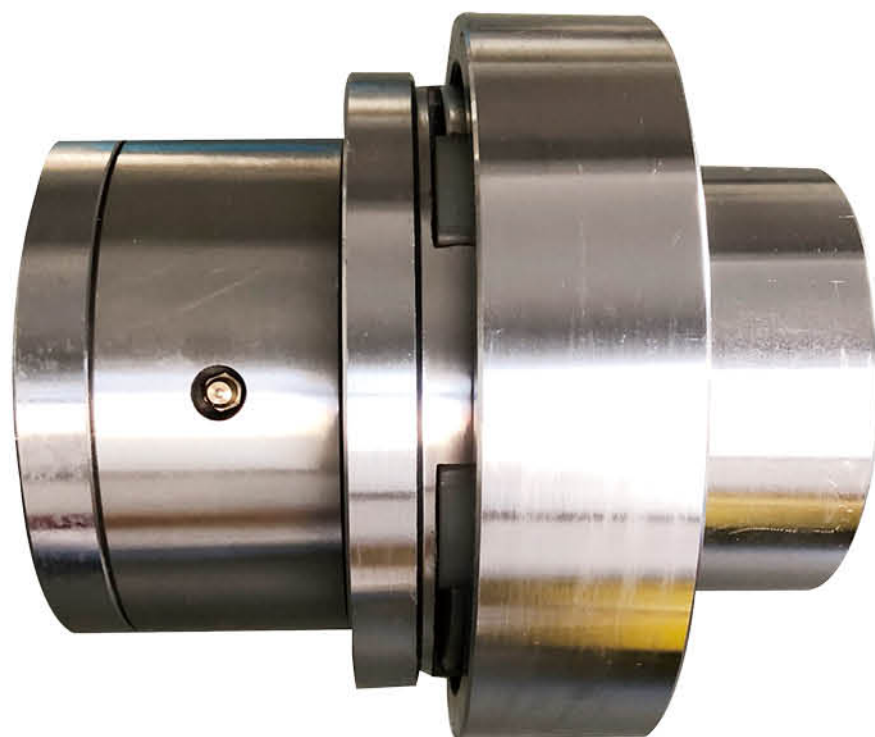
Please specify inner race direction of rotation seen from the D2 flange. Refer to manufacturer's catalogue to check coupling selection.

Type	Size			Overrunning speed											Weight
	d_{H7} [mm]	KEE	TKN [Nm]	n_{Imax}[1] [min^{-1}]	n_{amax}[2] [min^{-1}]	d_K^{H7} [mm]	D [mm]	L_1 [mm]	D_6 [mm]	L_6 [mm]	L_8 [mm]	b [mm]	s [mm]	f [mm]	[kg]
AL.. KEED2	12	2	55	2500	6000	12···25	62	42	97	35	90	13	3	0.5	3
	15	3	122	1900	6000	16···30	68	52	112	40	110	18	3	0.8	4.4
	20	3	122	1600	5600	16···30	75	57	112	40	114.5	17.5	3	0.8	4.6
	25	4	288	1400	4500	20···40	90	60	130	50	137.5	17.5	3	1	6.4
	30	5	500	1300	4100	20···50	100	68	160	60	148	20	2	1	11
	35	6	725	1100	3800	25···65	110	74	190	75	168	19	2	1	17
	40	6	1025	950	3400	25···65	125	86	190	75	178	17	2	1.5	19
	45	6	1050	900	3200	25···65	130	86	190	75	178	17	2	1.5	19
	50	7	1750	850	2800	30···75	150	92	225	90	207	25	2.5	1.5	31
	55	8	2625	720	2650	35···90	160	104	270	100	233.5	29.5	3	2	47
	60	8	2750	680	2450	35···90	170	114	270	100	244	30	3	2	49
	70	10	5750	580	2150	45···110	190	134	340	140	312.5	38.5	3	2.5	90
	80	11	8500	480	1900	55···125	210	144	380	160	340	36	3.	2.5	107
	90	12	13750	380	1700	65···140	230	158	440	180	388	50	3.5	3	170
	100	14	20000	350	1450	75···160	270	182	500	200	422.5	40.5	3.5	3	230
	120	16	30000	250	1250	85····180	310	202	560	220	471	49	4	3	330
	150	18	43750	180	980	95···200	400	246	640	250	543	47	4	4	500
	200	22	97500	120	750	125···250	520	326	880	320	700.5	54.5	4.5	5	965
	250	28	250000	100	620	160···320	610	396	1160	400	868	72	5	5	1725
ALM.. KEED2	25	4	288	1100	2800	20···40	90	60	130	50	127.5	17.5	3	1	6.4
	30	5	588	1000	2500	20···50	100	68	160	60	148	20	2	1	11
	35	6	838	900	2400	25···65	110	74	190	75	168	19	2	1	17

SUMA
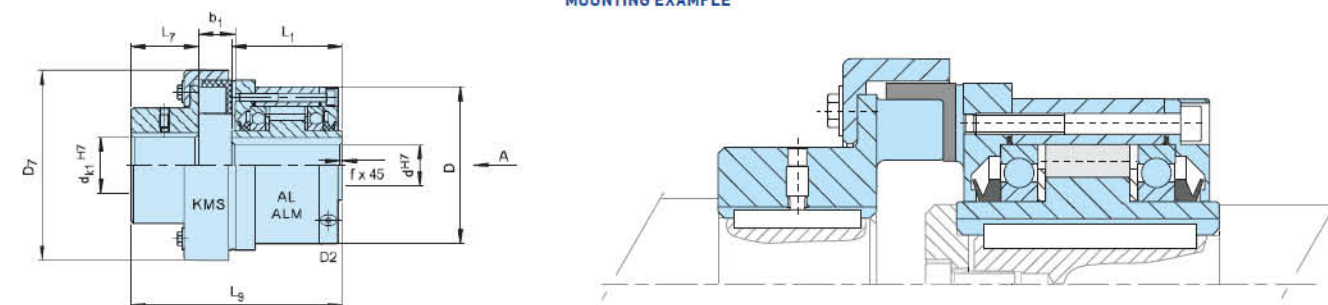Clutch & Bearing

MOUNTING EXAMPLE

DESCRIPTION

Type AL..KMSD2 is a roller type freewheel, self-contained, sealed and bearing supported, using two 160.. series bearings. Unit is delivered oil lubricated. This combination is used as overrunning clutch as shown overleaf.

In this design, a standard AL freewheel is connected to a KMS flexible coupling for in-line mounting. The KMS type is a rugged coupling, economical and suitable for many applications. D2 cover is used to close the unit. It is equipped with two screws for oil filling, drain and level.

We recommend the unit is supplied assembled. Please specify inner race direction of rotation seen

from the D2 flange. Refer to manufacturer's catalogue to check coupling selection.

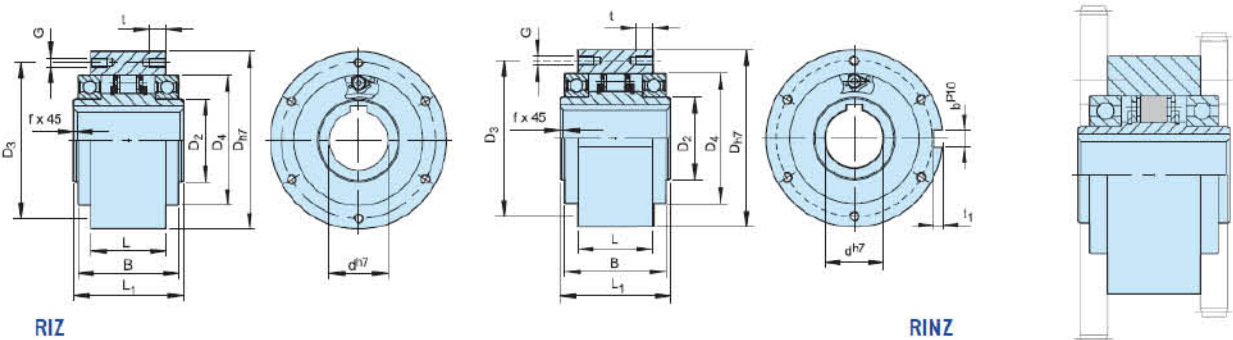| Type	Size			Overrunning speed									Weight
	d_{H7} [mm]	KEE	TKN [Nm]	n_{Imax} [min^{-1}]	n_{amax} [min^{-1}]	d_K^{H7} [mm]	D [mm]	L_1 [mm]	D_7 [mm]	L_7 [mm]	L_9 [mm]	b [mm]	[kg]
AL.. KMSD2	12	4	50	2500	6000	7···35	62	42	78	40	100	18	2.10
	15	6.3	79	1900	6000	12···40	68	52	90	45	116	20	2.70
	20	10	125	1600	5600	10···45	75	57	117	48	123.5	17	3.80
	25	10	125	1400	4500	10···45	90	60	117	48	126.5	17	4.4
	30	16	200	1300	4100	10···55	100	68	129	52	140	19	5.9
	35	25	313	1100	3800	15···55	110	74	134	57	155	22	8.1
	40	40	500	950	3400	20···60	125	86	155	61	173	26	11.4
	45	63	788	900	3200	20···70	130	86	175	67	186	30	13.3
	50	100	1250	850	2800	25···75	150	92	196	75	208.5	35	19.1
	55	100	1250	720	2650	25···75	160	104	196	75	216.5	35	20.4
	60	160	2000	680	2450	30···80	170	114	223	82	243	41	27.1
	70	250	3125	580	2150	35···90	190	134	252	89	277.5	47	40.4
	80	400	5000	480	1900	45···100	210	144	290	97	305	56	57
	90	630	7875	380	1700	60···120	230	158	330	116	346.5	64	87
	100	1000	12500	350	1450	75···140	270	182	378	140	386	75	131
	120	1600	20000	250	1250	90···160	310	202	432	160	430	85	196
	150												
	200					On Request							
	250												
ALM.. KMSD2	25	16	200	1100	2800	12···50	90	60	117	52	132.5	19	4.4
	30	25	313	1000	2500	15···55	100	68	129	57	150	22	5.9
	35	40	500	900	2400	18···60	110	74	134	61	163	26	8.1

RIZ

RIZ

RINZ

DESCRIPTION

Type RIZ, RINZ are centrifugal lift off sprag type freewheels with the inner race rotating. Suitable for backstop, or overrunning clutch applications. Only the inner race is designed for freewheeling.

These units are part of the modular system. They are bearing supported using series 60.. bearings, grease lubricated and fitted with ZZ seals. Units are delivered as standard lubricated with grease and ready to install in either a horizontal or vertical position.

Types RIZ, RINZ are designed to be used with G series covers. If the unit is to be installed inside a housing where oil lubrication is available, please specify type RIW, RIWN. The F series covers from type GFR, GFRN are then used without shaft seals.

| Type	Size		Speeds												Number							Weight
	d^{H7}	T_{KN} [1]	n_{max} [2]	n_{lmin} [3]	n_{imax} [4]	D_{h7}	D_3	D_4	D_5	D_7	O	z	S	L_1	L	L_5	t	t1	b^{P10}	f	G1
	[mm]	[Nm]	[min⁻¹]	[min⁻¹]	[min⁻¹]	[mm]	[mm]	[mm]	[mm]	[mm]			[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
RIZ RINZ	30	375	290	700	9000	100	114	75	128	109	6.6	6	11.5	68	43	70	3	4	8	1	3.9
	35	550	280	670	8500	110	124	80	140	119	6.6	6	13.5	74	45	76	4	5	10	1	4.9
	40	800	260	630	7500	125	142	90	160	135	9	6	15.5	86	53	88	4	5	12	1.5	7.5
	45	912	255	610	6700	130	146	95	165	140	9	8	15.5	86	53	88	4	5.5	14	1.5	7.8
	50	1400	235	560	6000	150	166	110	185	160	9	8	14	94	64	96	4	5.5	14	1.5	10.8
	60	2350	210	510	5300	170	192	125	214	182	11	10	17	114	78	116	4	7	18	2	16.8
	70	3050	195	470	4000	190	212	140	234	202	11	10	18.5	134	95	136	4	7.5	20	2.5	20.8
	80	5800	155	375	4000	210	232	160	254	222	11	10	21	144	110	146	4	9	22	2.5	27
	90	8700	145	350	3000	230	254	180	278	242	14	10	20.5	158	115	160	5	9	25	3	40
	100	16000	140	340	2400	270	305	210	335	282	18	10	30	182	120	184	5	10	28	3	67
	130	2300	130	320	2400	310	345	240	380	322	18	12	29	212	152	214	5	11	32	3	94

SMZ
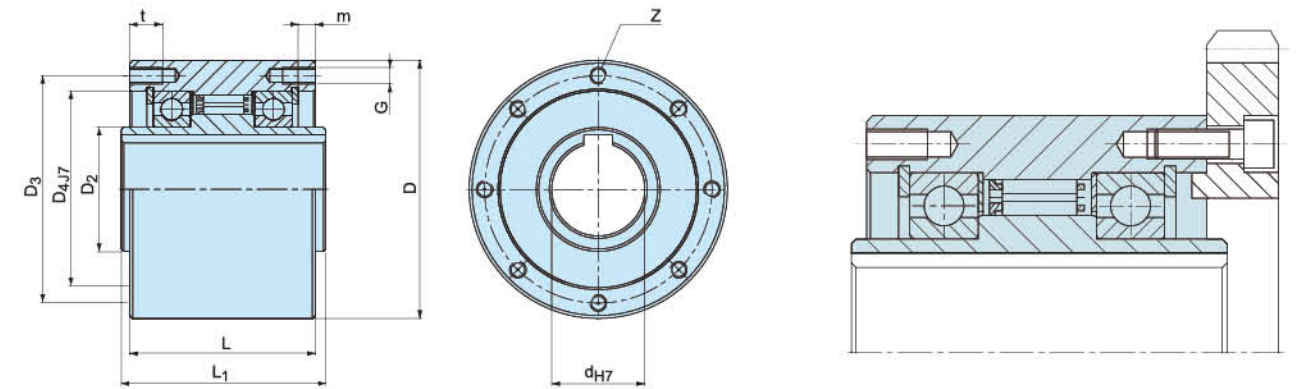
DESCRIPTION

Typle SMZ is a sealed, sprag type freewheel, bearing supported using two 60..ZZ series grease lubricated bearings.

Units are delivered grease lubricated ready for installation. SMZ units are intended as multipurpose,to be used in various applications. A typical mounting arrangement is shown on the following page. The inner race is keyed to the shaft. The inside diameter of the outer race (dimension D4) should be used as the mounting register for the connected parts (sprocket, pulley, gear,torque arm..). The mounting spigot should be to g6 tolerance.

Type	Size		Overrunning speeds													Weight
	d^{H7} [mm]	T_{KN} [Nm]	n_{imax} [min^{-1}]	n_{amax} [min^{-1}]	D [mm]	D_2 [mm]	D_3 [mm]	D_4^{H7} [mm]	L [mm]	L_1 [mm]	G [mm]	z	t	m	[kg]
SMZ	20	300	1600	700	80	30	68	55	65	67	M6	6	12	7.6	2
	30	1035	1500	500	100	45	88	75	80	82	M8	6	16	8.9	3.7
	35	1100	1400	300	110	50	95	80	85	87	M8	6	16	8.7	4.8
	45	1750	1300	300	125	60	110	95	90	92	M8	8	16	8.4	6.2
	60	3400	1100	250	155	80	140	125	100	102	M8	8	16	9.1	10.2
	70	4300	1000	250	175	95	162	145	103	105	M8	8	16	8.6	13.2

AV

AV
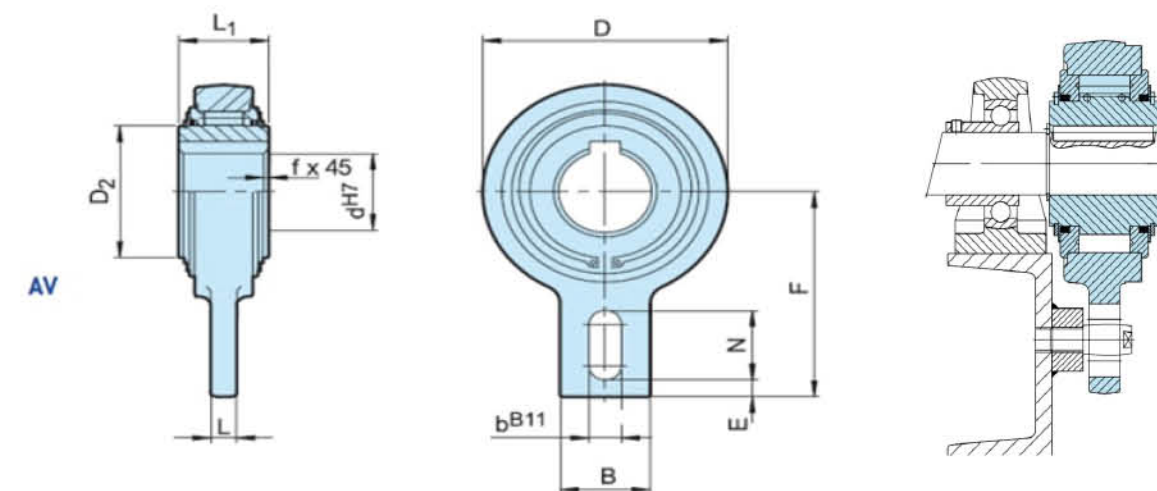
DESCRIPTION

Type AV is a roller type freewheel. It is self-contained, centered by plain bearings for low rotational speeds, and sealed using shield protected metallic labyrinth seals.

Unit is delivered grease lubricated, ready to install in a horizontal or vertical position.

Primarily used as a backstop, the torque capacity is high for a minimum space requirement.

This design is suitable for use in difficult environments. A bolt, secured to a fixed part of the machine and passing through the slot in the torque arm, provides the rotational stop.

Radial clearance on this bolt should be equal to 1–3 % of the slot width.

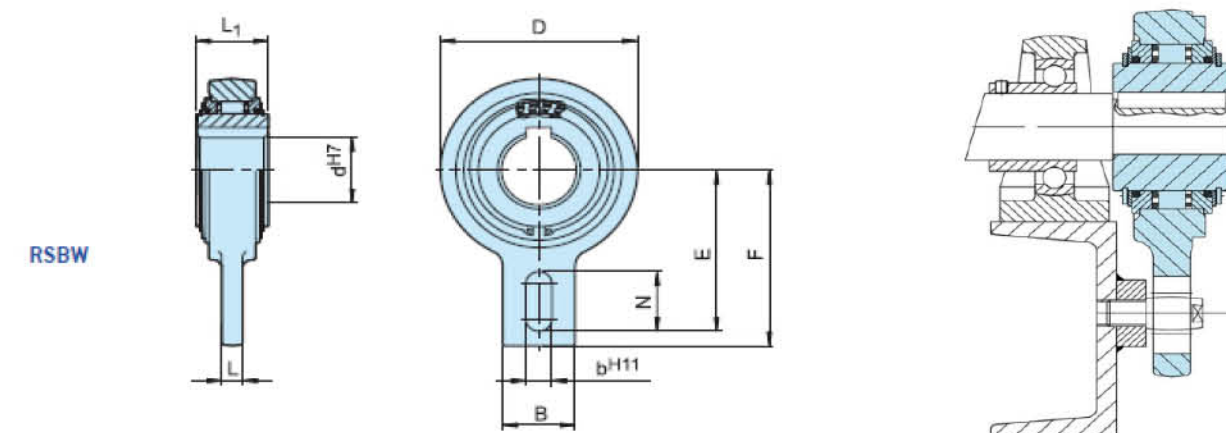| Type	Size	Torque	Overrunning speed	Dimensions											Weight	Drag torque
	d^{H7}	$T_{KN}^{1)}$	n_{imax}	D	D2	L 1	L	B	F	bB11	N	E	f		TR
	[mm]	[Nm]	[min^{-1}]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[Ncm]
AV	20	265	450	83	42	35	12	40	90	15	35	5	0.8	1.3	18
	25	265	450	83	42	35	12	40	90	15	35	5	0.8	1.3	18
	30	1200	320	118	60	54	15	40	110	15	35	8	1	3.5	130
	35	1200	320	118	60	54	15	40	110	15	35	8	1	3.4	130
	40	1200	320	118	60	54	15	40	110	15	35	8	1	3.3	130
	45	2150	280	155	90	54	20	80	140	18	47	10	1	5.5	240
	50	2150	280	155	90	54	20	80	140	18	47	10	1	5.4	240
	55	2150	280	155	90	54	20	80	140	18	47	10	1	5.3	240
	60	2150	280	155	90	54	20	80	140	18	47	10	1	5.2	240
	70	2150	280	155	90	54	20	80	140	18	47	10	1	5	240
	80	2900	200	190	110	64	20	80	155	20	40	10	1.5	8.7	360
	90*	7125	150	260	160	90	25	120	220	-	-	-	3	24.5	360
	100*	7125	150	260	160	90	25	120	220	-	-	-	3	23.5	360
	110*	7125	150	260	160	90	25	120	220	-	-	-	3	22.5	360
	120*	11000	130	300	180	110	30	140	260	-	-	-	3	42	600

RSBW

RSBW

Description:

RSBW one way clutch bearing is a sprag type freewheel. It is self-contained, centered by plain bearings for low rotational speeds, and sealed using shield protected metallic labyrinth seals.
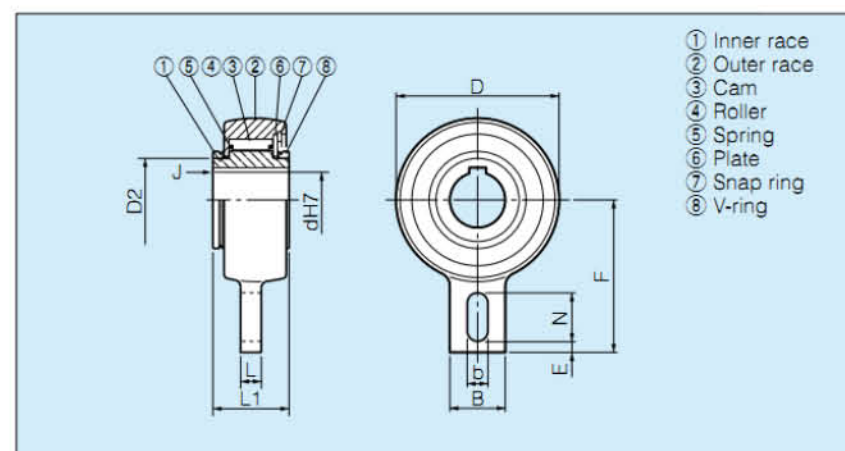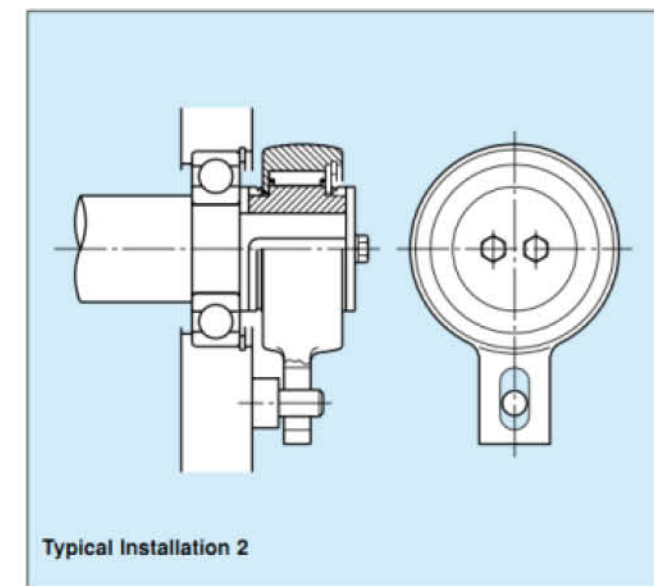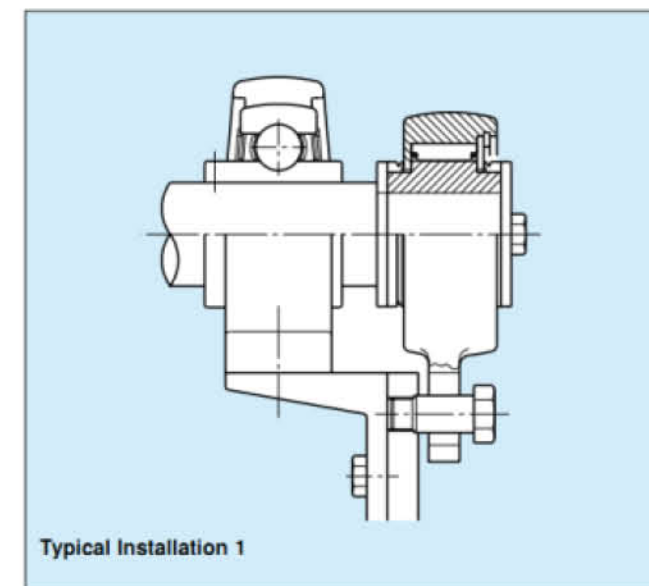
Application: Primarily used as backstop Package detail: radial spherical plain bearings are delivered grease lubricated, ready to install in a vertical or horizontal position.

Caution: the torque arm and bearings must not be pretressed.

Type	Size	Torque	Overrunning Speeds	DIMENSIONS								Weight
	d_{H7}	T_{KN} [1]	n_{Imax}	D	L1	F	E	B	N	L	bH11	
	[mm]	[Nm]	[min^{-1}]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
RSBW	20	375	400	106	35	113	102.5	40	35	15	18	2
	25	606	400	106	48	113	102.5	40	35	15	18	2.6
	30	606	400	106	48	113	102.5	40	35	15	18	2.5
	35M	375	400	106	35	113	102.5	40	35	15	18	2
	35	606	400	106	48	113	102.5	40	35	15	18	2.4
	40	1295	300	132	52	125	115	60	35	15	18	4.6
	45	1295	300	132	52	125	115	60	35	15	18	4.5
	50	1295	300	132	52	125	115	60	35	15	18	4.5
	55	1295	300	132	52	125	115	60	35	15	18	4.4
	60	2550	250	161	54	140	130	70	35	15	18	6.5
	70	2550	250	161	54	140	130	70	35	15	18	6.4
	80	4875	200	190	70	165	150	70	45	20	25	9.9
	90	4875	200	190	70	165	150	70	45	20	25	9.8

BSEU

Typical Installation 1

Typical Installation 2

① Inner race
② Outer race
③ Cam
④ Roller
⑤ Spring
⑥ Plate
⑦ Snap ring
⑧ V-ring

| Model | Bore Size | | Torque Capacity | Max. Overrunning (r/min) | D | D2 | L1 | L | B | F | b | N | E | J | W. Min | W. Max |
	Dia. (H7)	Keyway	(N·m)	Inner Race											kg	kg
BSEU25	20	6×2.8	216	500	83	42	35	12	40	90	15	35	5	1	1	0.95
BSEU25	25	8×3.3	216	500	83	42	35	12	40	90	15	35	5	1		
BSEU40	20	6×2.8	1,440	450	118	60	55	15	40	110	15	35	8	1.5	3.8	3.36
BSEU40	25	8×3.3	1,440	450	118	60	55	15	40	110	15	35	8	1.5		
BSEU40	30	8×3.3	1,440	450	118	60	55	15	40	110	15	35	8	1.5		
BSEU40	35	10×3.3	1,440	450	118	60	55	15	40	110	15	35	8	1.5		
BSEU40	40	12×3.3	1,440	450	118	60	55	15	40	110	15	35	8	1.5		
BSEU70	45	14×3.8	3,140	350	165	90	59	20	80	140	18	35	10	1.5	7.6	6.54
BSEU70	50	14×3.8	3,140	350	165	90	59	20	80	140	18	35	10	1.5		
BSEU70	55	16×4.3	3,140	350	165	90	59	20	80	140	18	35	10	2		
BSEU70	60	18×4.4	3,140	350	165	90	59	20	80	140	18	35	10	2		
BSEU70	65	18×4.4	3,140	350	165	90	59	20	80	140	18	35	10	2		
BSEU70	70	20×4.9	3,140	350	165	90	59	20	80	140	18	35	10	2		
BSEU90	75	20×4.9	4,700	250	190	120	63	20	80	165	20	40	15	2	10	9.27
BSEU90	80	22×5.4	4,700	250	190	120	63	20	80	165	20	40	15	2		
BSEU90	85	22×5.4	4,700	250	190	120	63	20	80	165	20	40	15	2		
BSEU90	90	25×5.4	4,700	250	190	120	63	20	80	165	20	40	15	2		

MZ

MZ30-25

Typical installation MZ-G Series

H-M equally spaced on both sides

① Inner race ⑤ Bearing (ZZ type)
② Outer race ⑥ Side plate
③ Cam ⑦ Spirolox
④ Spring

DESCRIPTION

Type MZ is sealed, sprag type freewheel, bearing supported using two 60...zz series grease lubrication bearings . Delivery detail: It is delivered grease lubricated ready for installation.

Advantage: Maintenance Free, Easy Installation.
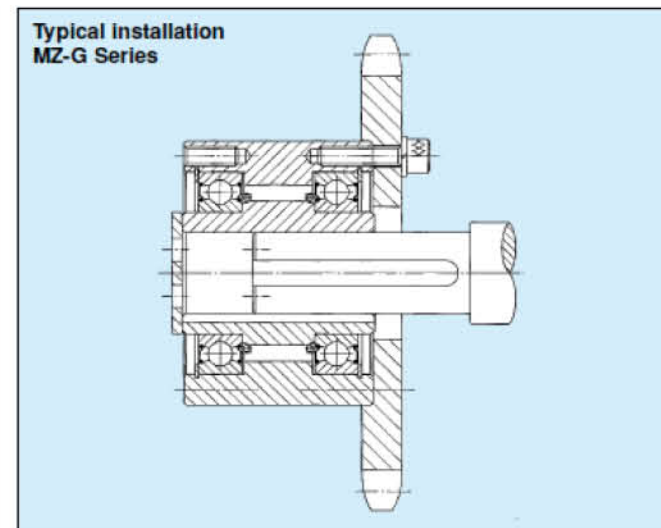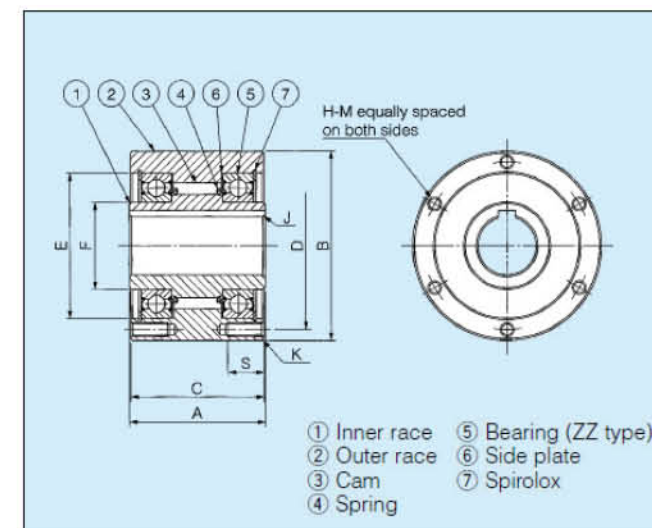
Model	Capacity Torque (Nm)	Torque Drag (Nm)	Overrunning (r/min)Max. Inner Race	Overrunning (r/min)Max. Outer Race	indexing Max. (cycle/min)	Bore Size Dia (H7)	Keyway	A	B	C	PCDD	(M6) E	F	G	H-M No. of Tapped x HolesSize×Pitch	S	Weight (kg)
MZ15	186	0.20	2,200	900	150	15	5*2.3	62	68	60	58	47	25	5.5	6*M5*P0.8	10	1.4
MZ17	215	0.20	2,000	800	150	17	5*2.3	66	75	64	64	52	28	6.3	6*M5*P0.8	10	1.8
MZ20	323	0.29	1,900	700	150	20	6*2.8	67	80	65	68	55	30	7.6	6*M6*P1.0	12	2.0
MZ30-22	735	0.39	1,800	500	150	22	6*2.8	82	100	80	88	75	45	8.9	6*M8*P1.25	16	3.7
MZ30-25	735	0.39	1,800	500	150	25	8*3.3	82	100	80	88	75	45	8.9	6*M8*P1.25	16	3.7
MZ30	735	0.39	1,800	500	150	30	10*3.3	82	100	80	88	75	45	8.9	6*M8*P1.25	16	3.7
MZ35	1,080	0.49	1,700	300	150	35	10*3.3	87	110	85	95	80	50	8.7	6*M8*P1.25	16	4.8
MZ45-40	1,620	0.69	1,700	300	150	40	12*3.3	92	125	90	110	95	60	8.4	8*M8*P1.25	16	6.2
MZ45	1,620	0.69	1,700	300	150	45	14*3.8	92	125	90	110	95	60	8.4	8*M8*P1.25	16	6.2
MZ60-50	2,110	0.98	1,600	250	150	50	14*3.8	102	155	100	140	125	80	9.1	8*M8*P1.25	16	10.2
MZ60-55	2,110	0.98	1,600	250	150	55	16*4.3	102	155	100	140	125	80	9.1	8*M8*P1.25	16	10.2
MZ60	2,110	0.98	1,600	250	150	60	18*4.4	102	155	100	140	125	80	9.1	8*M8*P1.25	16	10.2
MZ70-65	3,040	1.27	1,300	250	150	65	18*4.4	105	175	103	162	145	95	8.6	8*M8*P1.25	16	13.2
MZ70	3,040	1.27	1,300	250	150	70	20*4.9	105	175	103	162	145	95	8.6	8*M8*P1.25	16	13.2

Typical installation MZ-G Series

① Inner race ⑤ Bearing (ZZ type)
② Outer race ⑥ Side plate
③ Cam ⑦ Spirolox
④ Spring

H-M equally spaced on both sides

## MODELS MZ 15G TO MZ 70G
For General Applications

Features:

1.Outer race circumference ground finish Installation and Usage

1. When mounting sprockets or gears to the outer race, use the outer race outer dimension (dimension B) to make a centering flange in the gear or sprocket. Then attach firmly with bolts of tensile strength 10.9 or greater to the tapped holes in the outer race.
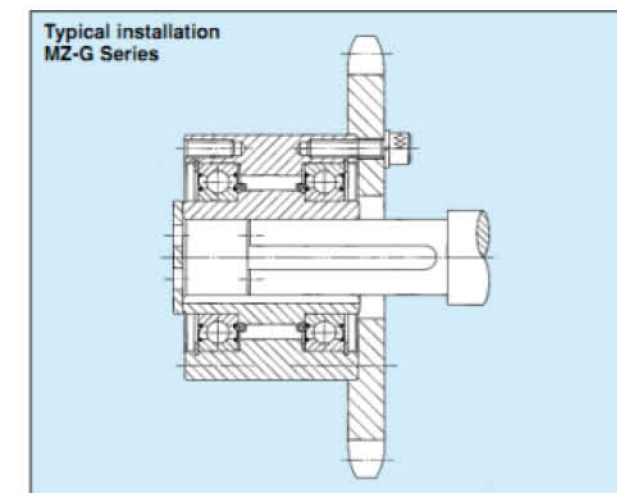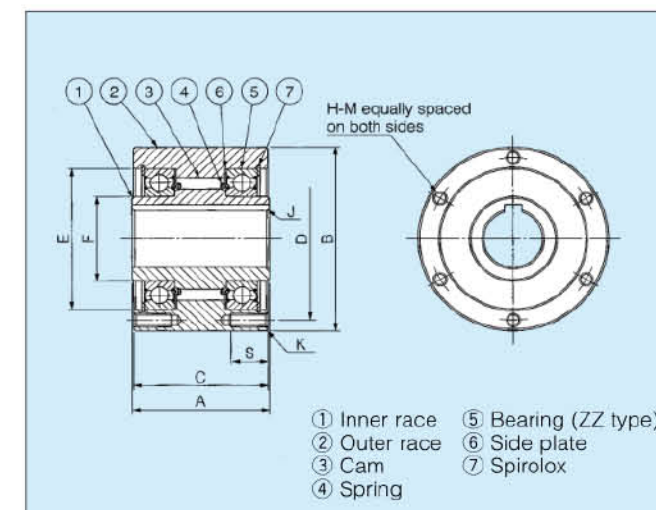
Model	Torque Capacity	Max. Overrunning (r/min)		Max. Indexing	Drag Torque	Bore size		A	C	B (h7)	F	E	K	PCD D	S	H-M No.of Tapped Holes	Weight (kg)
	(N·m)	Inner Race	Outer Race	(cycle/min)	(N·m)	Dia. (H7)	Keyway									×Size ×Pitch	
MZ15G	186	2,200	900	150	0.2	15	5×2.3	55	53	68	25	47	1.3	58	10	6-M5×0.8	1.3
MZ17G	215	2,000	800	150	0.2	17	5×2.3	63	61	75	28	52	1.3	64	10	6-M5×0.8	1.7
MZ20G	323	1,900	700	150	0.29	20	5×2.3	64	62	80	30	55	1.3	68	12	6-M6×1.0	1.9
MZ30G-22	735	1800	500	150	0.39	22	8×3.3	70	68	100	45	75	1.3	88	16	6-M8×1.25	3.2
MZ30G-25						25	8×3.3										
MZ30G						30	10×3.3										
MZ35G	1,080	1,700	300	150	0.49	35	10×3.3	78	76	110	50	80	1.3	95	16	6-M8×1.25	4.4
MZ45G-40	1620	1700	300	150	0.69	40	12×3.3	87	85	125	60	95	1.3	110	16	8-M8×1.25	6.2
MZ45G						45	12×3.3										
MZ60G-50	2110	1600	250	150	0.98	50	14×3.8	90	88	155	80	125	1.3	140	16	8-M8×1.25	9.5
MZ60G-55						55	16×4.3										
MZ60G						60	18×4.4										
MZ70G-65	3040	1300	250	150	1.27	65	18×4.4	105	103	175	95	145	1.3	162	16	8-M8×1.25	13.1

BS
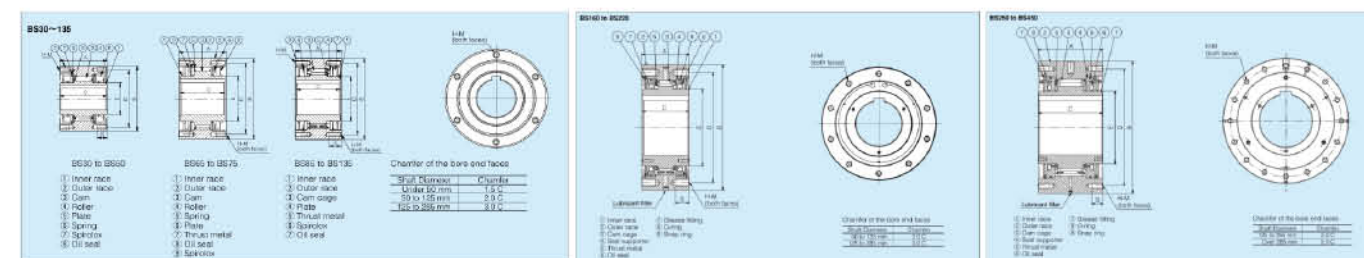
Type	Torque Capacity (Nm)	Max. Overrunning (r/min) Inner race	Drag Torque (Nm)	A	B	C	PCD D	E	S	H-M T.H.S.XP-Q'ty
BS30	294	350	0.588	64	90	64	80	45	13	M6xP1.0-4
BS50	784	300	0.38	67	125	67	110	70	16	M8xP1.25-4
BS65	1,570	340	3.92	90	160	85	140	90	20	M10xP1.5-6
BS75	2,450	300	5.88	90	170	85	150	100	20	M10xP1.5-6
BS85	5,880	300	7.84	115	210	110	185	115	30	M12xP1.75-6
BS95	7,840	250	9.8	115	230	110	200	130	30	M14xP2.0-6
BS 110	10,800	250	14.7	115	270	110	220	150	30	M16xP2.0-6
BS 135	15,700	200	19.6	135	320	130	280	180	30	M16xP2.0-8
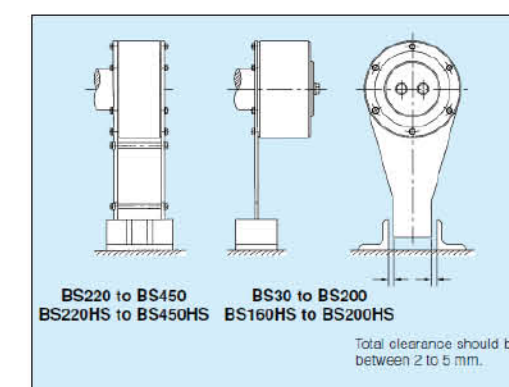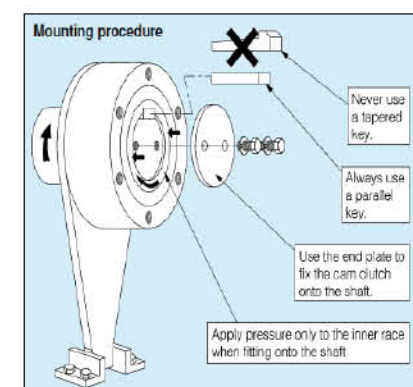
DESCRIPTION

The BS series Cam Clutches are intended for applications where reverse rotation of the slow speed conveyor head shaft is to prevented (backstopping).

The BS-HS series offer higher torque and speed not found in convention models.Notes:

1. The tolerance of Stock Finished Bore is H7.

2. Items hilighted in bold type are stock items, the others are built to order.

3. BS Cam Clutch can be bored according to your specification. Specify the bore diameter with tolerance and keyway dimensions. Please be sure to specify.

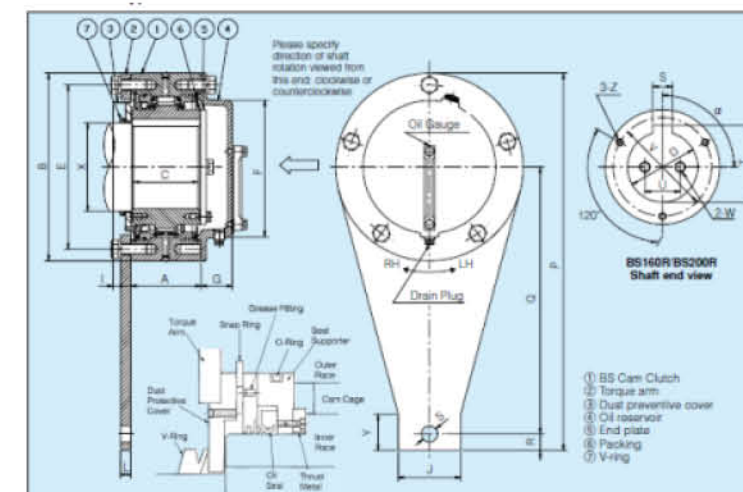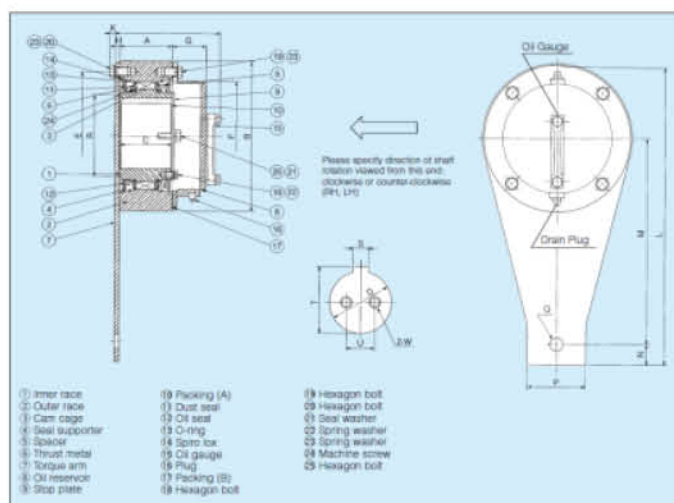| Type	Torque Capacity (Nm)	Max. Overrunning (r/min) Inner race	Drag Torque (Nm)	A	B	C	PCD D	E	S	H-M T.H.S.XP-Q'ty	G.F.H. (Size)	Q. of G. (kg)
BS 160	24,500	100	34.3	135	360	130	315	220	40	M20xP2.5-10	PT 1/4	0.12
BS 200	37,200	100	44.1	150	430	145	380	265	40	M22xP2.5-8	PT 1/4	0.14
BS 220	49,000	80	73.5	235	500	230	420	290	40	M20xP2.5-16	PT 1/4	0.8
BS 250	88,200	50	93.1	295	600	290	530	330	50	M24xP3.0-16	PT 1/4	1.1
BS 270	123,000	50	98	295	650	290	575	370	50	M24xP3.0-16	PT 1/4	1.2
BS300	176,000	50	108	295	780	290	690	470	60	M30xP3.5-16	PT 1/4	1.3
BS335	265,000	50	137	305	850	320	750	495	70	M36xP4.0-16	PT 1/4	1.4
BS350	314,000	50	157	320	930	360	815	535	70	M36xP4.0-16	PT 1/4	1.5
BS425	510,000	50	216	440	1,030	450	940	635	70	M36xP4.0-18	—	Oil 6,000ml
BS450	686,000	50	245	450	1,090	480	990	645	80	M42xP4.5-18	—	Oil 7,000ml

BS...R

Dimensions and Capacities(Dimensions in mm)

Model	Torque Capacity (N·m)	Bore Diameter Range	Max. Overrunning (r/m) Inner Race	A	B	C	PCD E	F	G	H	K	L	M	N	P	Q	R
BS65R	1,570	40to65	200	90	160	85	140	115	50	6	9.5	306	210	16	50	13.5	90
BS75R	2,450	50 to75	180	90	170	85	150	125	50	6	9.5	354	250	19	65	16.5	100
BS85R	5,880	60 to85	180	115	210	110	185	140	60	9	11	434	300	29	95	20.5	115
BS95R	7,840	70 to95	170	115	230	110	200	160	60	9	12.5	497	350	32	105	20.5	130
BS110R	10,800	80 to 110	170	115	270	110	220	180	60	12	14	560	385	40	110	26	140
BS135R	15,700	90 to 135	120	135	320	130	280	230	60	12	14	666	470	36	120	26	180

MODELS BS220R TO BS450R
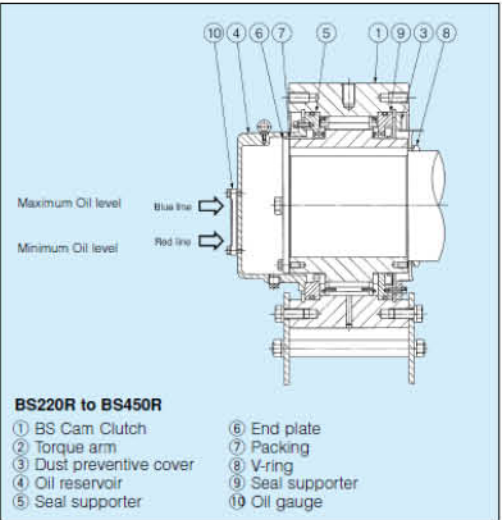
Oil Reservoir Type

MODELS BS65R TO BS135R
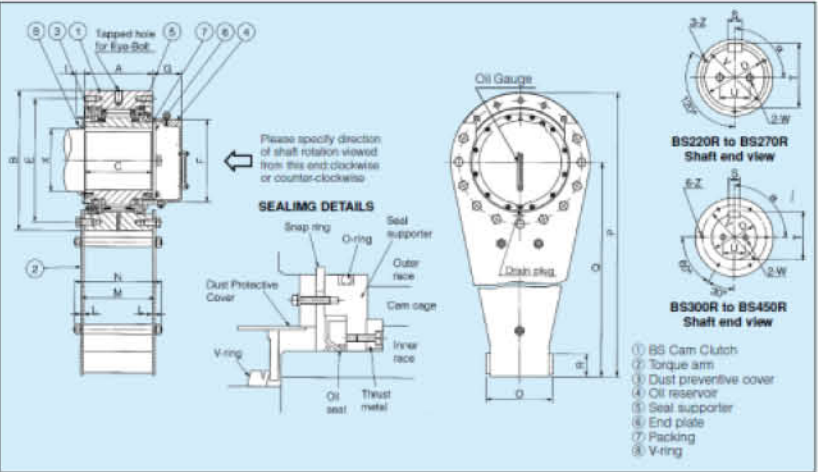
Oil Reservoir Type

Dimensions and Capacities(Dimensions in mm)

Model	Torque Capacity (N·m)	Bore Diameter Range	Max. Overrunning (r/m) Inner Race	A	B	C	PCD E	F	G	L	I	J	R	P	Q	S	V	Y	Z	Oil (mℓ)	W.Min	W.Max
BS160R	24500	100 to 160	100	135	360	130	315	255	60	19	16	120	32	792	580	31	190	65	M10	1300	108	95
BS200R	37200	100 to 200	100	150	430	145	380	310	60	19	21	130	43	838	623	41	235	70	M12	1900	182	155

## MODELS BS220R TO BS450R

Oil Reservoir Type

Dimensions and Capacities(Dimensions in mm)

Model	Torque Capacity (N·m)	Bore Diameter Range	Max. (r/m) Overrunning Inner Race	A	B	C	PCD E	F	G	I	L	M	N	O	P	Q	R	V	Z	W.Min	W.Max
BS 220R	49000	150 to 220	80	235	500	230	420	296	95	35	12	259	311	238	1070	820	80	255	M12	347	310
BS 250R	88200	175 to 250	50	295	600	290	530	355	125	35	12	319	375	288	1300	1000	100	290	M14	637	580
BS 270R	123000	200 to 270	50	295	650	290	575	395	130	40	12	319	375	298	1425	1100	110	320	M14	660	602
BS 300R	176000	230 to 300	50	295	780	290	690	495	130	45	19	333	396	356	1690	1300	135	385	M14	1050	983
BS 335R	265000	250 to 335	50	305	850	320	750	525	135	60	19	343	405	386	1925	1500	135	415	M16	1210	1120
BS 350R	314000	250 to 350	50	320	930	360	815	565	135	71	19	358	430	414	2065	1600	135	442	M16	1710	1580
BS 425R	510000	325 to 425	50	440	1030	450	940	680	170	70	22	484	570	474	2315	1800	165	5360	M20	1580	2370
BS 450R	686000	350 to 450	50	450	1090	480	990	690	180	80	22	494	580	526	2545	2000	165	550	M20	2930	2690

MODELS BS220R TO BS450R
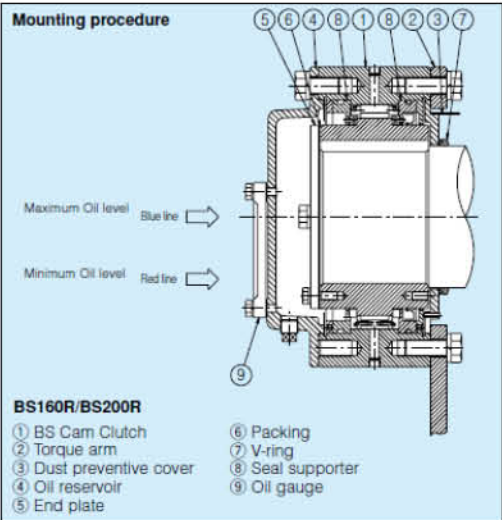
BS-R INSTALLATION PROCEDURES

Pre-Installation

1. The oil reservoir and the end plate are fixed to the BS Cam Clutch temporarily when packed to prevent dust from entering during transportation. Carefully remove them from the clutch and prevent the dust from penetrating into the clutch.

2. For models from BS160R to BS450R, Apply the grease between the space where the dust cover fits and the seal supporter. (The grease prevents the dust from entering.)

3. Attach the dust cover to the Cam Clutch.

4. Check whether the rotational direction of the conveyor shaft corresponds to that of the BS Cam Clutch viewed from the oil reservoir (the overrunning direction is shown
as an arrow on the end face of the inner race)

5. Securely install the torque arm to the BS Cam Clutch using bolts with a strength class of 10.9 grade or higher. Make sure the surface of the torque arm which contacts the end face of the outer race is flat and free of dust, to ensure enough frictional force is achieved.
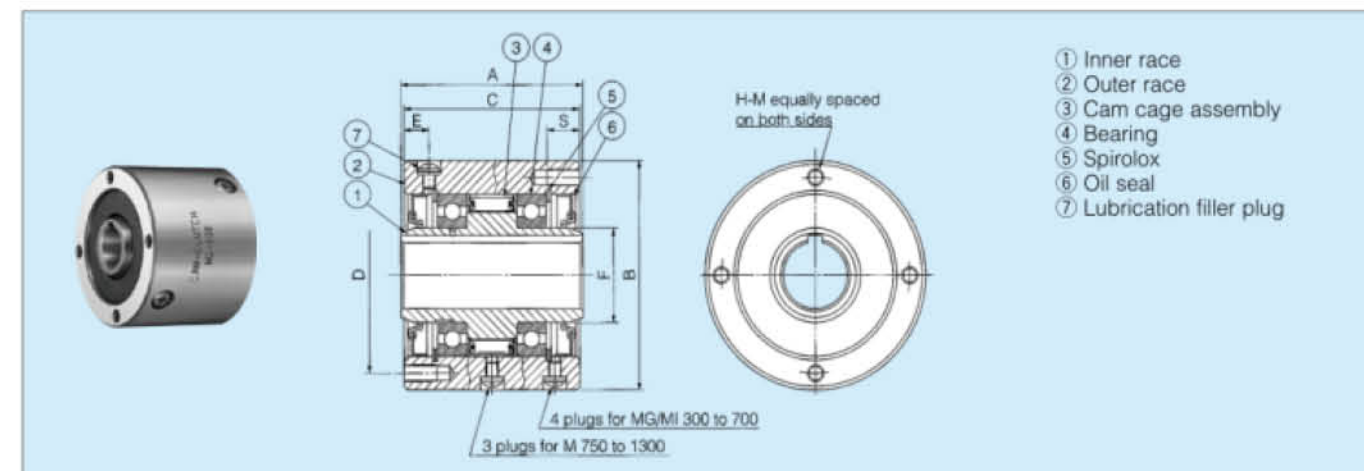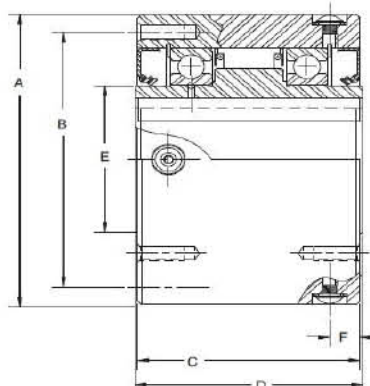
Installation

1. Pre-insert the V-ring into the conveyor shaft in the correct direction.

2. Securely install the BS Cam Clutch onto the shaft. Apply the pressure only on the end face of the inner race when inserting the BS Cam Clutch onto the shaft. Do not hit the inner race directly with a hammer or apply pressure on the outer race.

3. Apply the sealant supplied, to the end face of the inner race and packing, and fix the BS Cam Clutch unit to the conveyor shaft with the end plate. At the same time, use the seal washer on each bolt to prevent oil leakage.

4. After cleaning the inside of the oil reservoir, apply the sealant on the mating face of the oil reservoir. Place the oil level gauge vertically (red line is bottom, and blue is top), for models from BS65R to BS200R; install the oil reservoir to the end face of the outer race with the bolts, while for models BS220R and above, install the oil reservoir to the seal supporter using the bolts. Carefully prevent dust from penetrating the Cam Clutch or
oil reservoir.

5. Press the pre-inserted V-ring entirely so that the face of the dust cover contacts closely.

6. In case the ambient temperature rises 40°C and above, it is recommended to set shield or roof and avoid direct sunlight in order to extend the life span of Cam Clutch

MI / MG

① Inner race
② Outer race
③ Cam cage assembly
④ Bearing
⑤ Spirolox
⑥ Oil seal
⑦ Lubrication filler plug

H-M equally spaced on both sides

4 plugs for MG/MI 300 to 700
3 plugs for M 750 to 1300

DESCRIPTION

1. Self contained clutch designed for high speed applications.

2. Cam cage assembly engineered for optimum performance and increased capacity.

3. Two ball bearings included to support radial load and concentricity between races.

4. Positive contact lip or felt seals provided for grease or oil lubrication.

5. Tapped holes are machined on ends of outer race for mounting auxiliary components.

6. Metric bore and keyway available.

| Model	Torque Capacity (Nm)	Drag Torque (Nm)	Max. Overrunning (r/min) Inner Race	Max. Overrunning (r/min) Outer Race	Max. Indexing (cycle/min)	Bore Size Dia. (H7)	Bore Size Keyway	A	B (h7)	C	PCD D	E	F	S	H-M No.of Tapped Holes ×Size×Pitch	Weight (kg)
MG 300	314	0.23	2800	900	_	19	5x2	63	77	60	66	10.4	28.5	13	4xM6xP1.0	1.8
MI 300		0.31	50	_	300											
MG 400	539	0.29	2600	800	_	22	5x2	70	88	67	73	10.7	31.7	16	4XM8xP1.25	2.7
MI 400		0.38	50	_	300											
MG 500	1620	0.51	2400	800	_	31.5	7x3	89	108	86	92	12.3	44.4	16	4XM8xP1.25	5
MI 500		0.68	50	_	300											
MG 600	3140	0.85	2100	700	_	50	12x3.5	95	136	92	120	12.8	69.8	16	6xM8xP1.25	8.6
MI 600		1.54	30	_	300											
MG 700	5880	1.7	1500	500	_	70	18x6	127	180	124	160	19.8	101.5	20	6xM10xP1.5	19.5
MI 700		2.63	30	_	300											
MG 750	9500	3.43	1800	600	_	85	24x6	153	200	150	175	75	110	25	8xM14xP2.0	37
MI 750		4.12	30	_	300											
MG 800	17600	5.39	1300	475	_	110	28x7	158	250	155	220	77.5	140	25	8xM16xP2.0	46.5
MI 800		8.33	20	_	300											
MG 900	24500	6.77	1200	400	_	135	35x9	165	300	160	265	80	170	32	10xM16xP2.0	70.5
MI 900		9.41	20	_	300											
MG 1000	33800	8.14	1200	325	_	160	38x10	188	370	180	325	90	200	32	12xM16xP2.0	108.5
MI 1000		12.74	2	_	300											
MG 1100	78400	15	350	_	_	185	45x14	260	470	250	415	125	260	40	12xM20xP2.5	250
MI 1100		22.15	20	_	150											
MG 1200	95100	17.64	300	_	_	200	45x14	260	500	250	440	125	280	45	12xM24xP3.0	280
MI 1200		27.54	20	_	150											
MG 1300	176000	18.72	250	_	_	250	56x17.5	280	600	260	530	130	340	50	12xM30xP3.5	410
MI 1300		28.13	20	_	150											

FB

DESCRIPTION

Features

Complete Freewheels FB are sealed sprag freewheels with ball bearings. They are supplied oil-filled and ready for installation. The freewheels FB are used as:
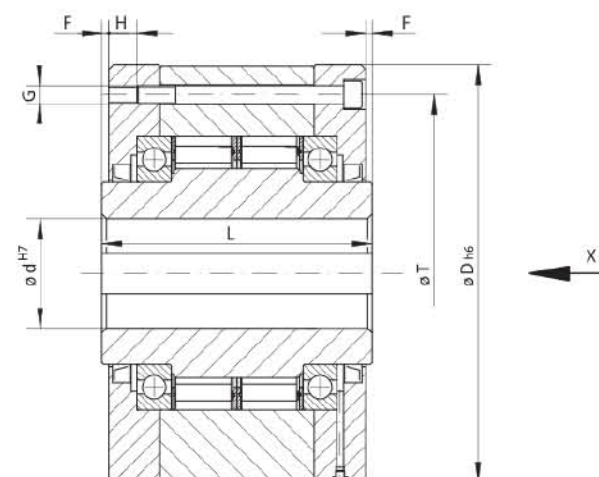
Backstops

Overrunning Clutches

Indexing Freewheels

In addition to the standard type, four other types are available for extended service life and indexing accuracy. Nominal torques up to 160 000 Nm. Bores up to 300 mm. Many standard bores are available.
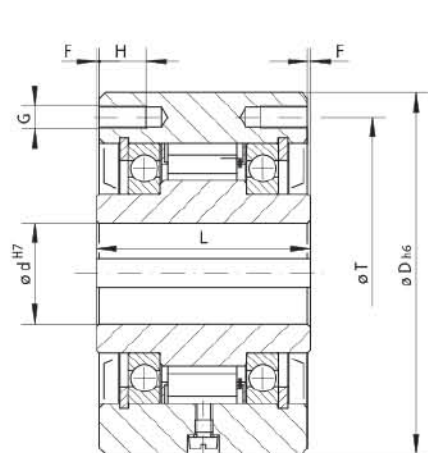
Size FB 24 to FB 270   17-1

Size FB 340 to FB 440

TORQUE CAPACITY AND ROTATION SPEED

Size	Type	Nominal torque M_N Nm	Freewheels Overruns Max speed min^{-1}		Type	Nominal torque M_N Nm	Freewheels Overruns Max Speed min^{-1}	
			Inner ring	Outer ring			Inner ring	Outer ring
FB24	CF	45	4800	5500	CFT	45	4800	5500
FB29	CF	80	3500	4000	CFT	80	3500	4000
FB37	SF	200	2500	2600	SFT	200	2500	2600
FB44	SF	320	1900	2200	SFT	320	1900	2200
FB57	SF	630	1400	1750	SFT	630	1400	1750
FB72	SF	1250	1120	1600	SFT	1250	1120	1600
FB82	SF	1800	1025	1450	SFT	1800	1025	1450
FB107	SF	2500	880	1250	SFT	2500	880	1250
FB127	SF	5000	800	1150	SFT	5000	800	1150
FB140	SF	10000	750	1100	SFT	10000	750	1100
FB200	SF	20000	630	900	SFT	20000	630	900
FB270	SF	40000	510	750	SFT	40000	510	750
FB340	SF	80000	460	630	SFT	80000	460	630
FB440	SF	160000	400	550	SFT	160000	400	550

MAIN DIMENSION

Freewheel Size	Bored Standard					Max.	D	F	G**	H	L	T	Z**	Weight
	mm	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm		kg
FB24	12	14*				14*	62	1.0	M5	8	50	51		0.9
FB29	15	17*				17*	68	1.0	M5	8	52	56	3	1.1
FB37	14	16	18	20	22*	22*	75	0.5	M6	10	48	65	34	1.3
FB44	20	22	25*			25*	90	0.5	M6	10	50	75	6	1.9
FB57	25	28	30	32*		32*	100	0.5	M8	12	65	88	6	2.8
FB72	35	38	40	42*		42*	125	1.0	M8	12	74	108	1	5.0
FB82	35	40	45	50*		50*	135	2.0	M10	16	75	115	12	5.8
FB107	50	55	60	65*		65*	170	2.5	M10	16	90	150	10	11.0
FB127	50	60	70	75*		75*	200	3.0	M12	18	112	180	12	19.0
FB140	65	75	80	90		95*	250	5.0	M16	25	150	225	12	42.0
FB200	110	120				120	300	5.0	M16	25	160	270	16	62.0
FB270	140					150	400	6.0	M20	30	212	360	18	150.0
FB340	180					240	500	7.5	M20	35	265	450	24	275.0
FB440	220					300	630	7.5	M30	40	315	560	24	510.0

FBF

Size FBF 24 to FBF 270   27·1   Size FBF 340 to FBF 440

DESCRIPTION

Complete Freewheels FBF with mounting flange are sealed sprag freewheels with ball bearings. They are supplied oil-filled and ready for installation.
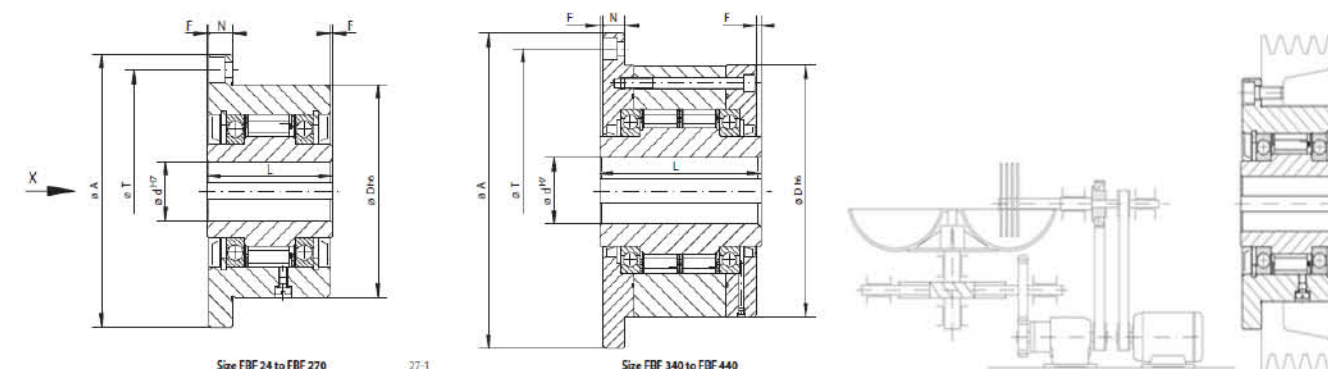
The freewheels FBF are used as:

Backstops

Overrunning Clutches

Indexing Freewheels

In addition to the standard type, four other types are available for extended service life and indexing accuracy. Nominal torques up to 160 000 Nm. Bores up to 300 mm. Many standard bores are available.

Freewheel Size	mm	mm	Bored				A	D mm	F	G**	L	N mm	T	Z**	Weight
			Standard mm	mm	mm	max mm	mm		mm		mm		mm		kg
FBF 24	12	14*				14*	85	62	1,0	M 5	50	10	72	3	1,1
FBF 29	15	17*				17*	92	68	1,0	M 5	52	11	78	3	1,3
FBF 37	14	16	18	20	22*	22*	98	75	0,5	M 5	48	11	85	8	1,5
FBF 44	20	22	25*			25*	118	90	0,5	M 6	50	12	104	8	2,3
FBF 57	25	28	30	32*		32*	128	100	0,5	M 6	65	12	114	12	3,2
FBF 72	35	38	40	42*		42*	160	125	1,0	M 8	74	14	142	12	5,8
FBF 82	35	40	45	50*		50*	180	135	2,0	M 10	75	16	155	8	7,0
FBF 107	50	55	60	65*		65*	214	170	2,5	M 10	90	18	192	10	12,6
FBF 127	50	60	70	75*		75*	250	200	3,0	M 12	112	20	225	12	21,4
FBF 140	65	75	80	90		95*	315	250	5,0	M 16	150	22	280	12	46,0
FBF 200	110	120				120	370	300	5,0	M 16	160	25	335	16	68,0
FBF 270	140					150	490	400	6,0	M 20	212	32	450	16	163,0
FBF 340	180					240	615	500	7,5	M 24	265	40	560	18	300,0
FBF 440	220					300	775	630	7,5	M 30	315	50	710	18	564,0

PB

PB12-RH

Specify right (RH) or left hand (LH) drive engagement viewed from this end, inner race driving

① Inner race
② Outer race
③ Cam
④ Spring
⑤ Plain bearing
⑥ Spirolox
⑦ Side plate
⑧ Lubrication filler plug
⑨ Set screw

Typical installation

Description:

1. Concentricities of the inner race and the outer race are maintained by the plain bearing located between the outer race and the shaft. Radial load which works on the outer race is also supported by this plain bearing. The shaft must therefore be extended through the clutch outer race end.

2. Specify right (RH) or left hand (LH) inner race drive viewed from the end marked by the arrow in the illustration Above.Check if the rotation of the clutch is correct before being run-in.

3. Key to be used should be in accordance with JIS B1301-1959

4.The bore of the driven member, such as the sprocket on the clutch outer race, should meet H6 or H7 tolerance of the JIS standard.
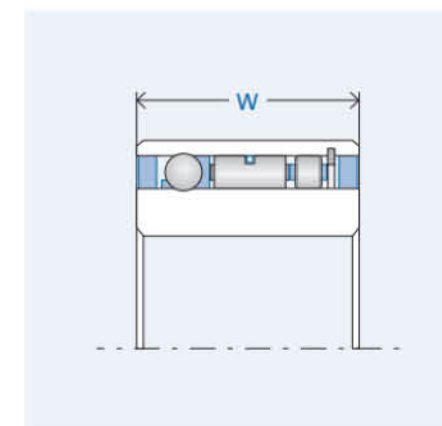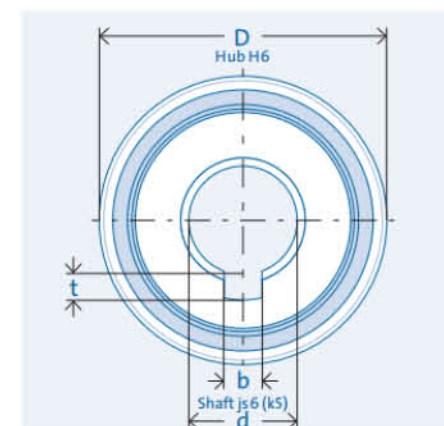
5. For indexing use, oil lubrication is recommended.
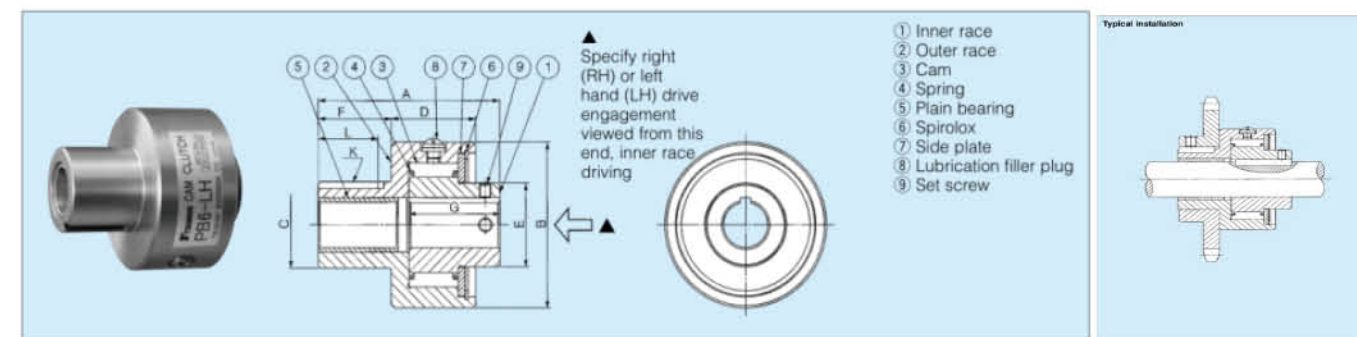
Model	Torque Capacity (Nm)	Drag Torque (Nm)	Max. Overrunning (r/min)		Max. indexing (cycle/min)	Bore Size		A	B	C (h7)	D	E	F	G	Outer Race Keyway		Weight (kg)	Lubrication Filler Plug SizexPitch
			Inner Race	Outer Race		Dia. (J7)	Keyway								K	L		
PB 3	29.4	0.2	1,800	900	150	10	4x1.5	50	50	23	22	25	21	25.7	4×2.5	16	0.23	M6× P1.0
PB 5	147	0.2	1,800	900	150	16	5x2	70	60	32	32	35	25	38.8	5×3.0	20	0.58	M6× P1.0
PB 6	382	0.2	1,500	800	150	20	5x2	82	73	38	38	37	33	41	5×3.0	27	1.1	M6× P1.0
PB 8	568	0.29	1,200	650	150	25	7x3	85	83	45	40	45	33	42	7×4.0	27	1.6	M6× P1.0
PB 10	843	0.39	1,000	400	150	31.5	10x3.5	92	95	60	41	56	37	44	10×4.5	28	2.5	M6× P1.0
PB 12	1530	0.39	800	300	150	40	10x3.5	100	113	65	50	66	37	52.6	10×4.5	29	3.6	M6× P1.0
PB 14	2110	0.59	700	300	150	45	12x3.5	112	133	75	54	76	41	57.3	12×4.5	30	6	M6× P1.0

Drawing legend

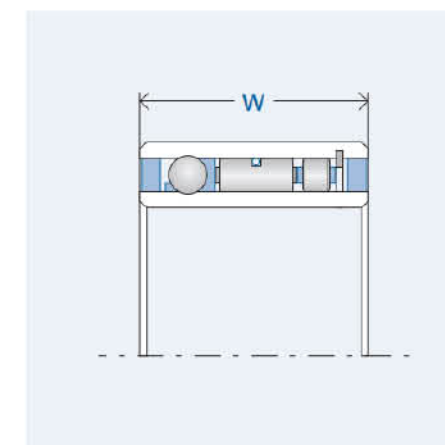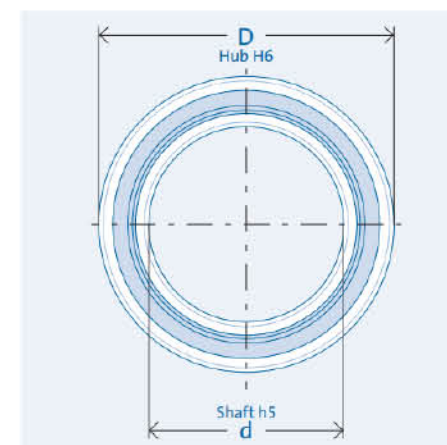d = inner diameter
D = outer diameter
W = width
T = torque
n = rotation speed
C = load capacity
b = keyway width
t = keyway depth

Components

Freewheel clutch insert element*	FE 400 Z (tension spring)
+ Raceways	Bearing steel, hardened and ground
inner ring	Keyway per DIN 6885
Tolerance	P9 with back clearance
outer ring	Press fit
+ Ball bearing	Integrated
+ Roller bearing	RL 400
+ Lubrication	Lifetime oil lubrication
+ Seal	rubber seal

Designation	d [mm]	D [mm]	W [mm]	T_{nom} [Nm]	n_{max} [rpm]	$c_{dyn.}$ [N]	$c_{stat.}$ [N]	Weight [kg]	b [mm]	t [mm]	Item no.
FND 437 M	15	41	34	176	1,700	8,962	8,661	0.24	5	2.3	300737
FND 437 Z	15	41	34	161	1,700	8,962	8,661	0.24	5	2.3	300738
FND 442 M	20	46	34	223	1,500	10,247	10,708	0.28	6	2.8	300743
FND 442 Z	20	46	34	208	1,500	10,247	10,708	0.28	6	2.8	300744
FND 453 M	25	58	34	343	1,200	11,417	13,577	0.46	8	3.3	300751
FND 453 Z	25	58	34	314	1,200	11,417	13,577	0.46	8	3.3	300752
FND 459 M	30	64	34	411	1,100	12,691	16,320	0.55	8	3.3	300758
FND 459 Z	30	64	34	381	1,100	12,691	16,320	0.55	8	3.3	300760
FND 463 M	35	68	34	462	1,100	13,070	17,063	0.60	10	3.3	306528
FND 463 Z	35	68	34	428	1,100	13,070	17,063	0.60	10	3.3	306529
FND 470 M	40	75	34	550	1,000	14,050	19,840	0.69	12	3.3	300765
FND 470 Z	40	75	34	509	1,000	14,050	19,840	0.69	12	3.3	300766
FND 473 M	45	78	34	588	1,000	14,128	19,896	0.73	14	3.8	306532
FND 473 Z	45	78	34	543	1,000	14,128	19,896	0.73	14	3.8	306533

SUMA

Clutch & Bearing

Drawing legend

d = inner diameter
D = outer diameter
W = width
T = torque
n = rotation speed
C = load capacity

Components

Freewheel clutch insert element*	FE 400 Z (tension spring)
+ Raceways inner ring outer ring	Bearing steel, hardened and ground Press fit Press fit
+ Ball bearing	Integrated
+ Roller bearing	RL 400
+ Lubrication	Lifetime oil lubrication
+ Seal	rubber seal

| Model	d [mm]	D [mm]	W [mm]	T_{nom} [Nm]	n_{max} [rpm]	$C_{dyn.}$ [N]	$C_{stat.}$ [N]	Weight [kg]	Item no.
FPD 427 M	15	31	34	94	2,000	7,679	6,397	0.09	306516
FPD 427 Z	15	31	34	84	2,000	7,679	6,397	0.09	306517
FPD 432 M	20	36	34	133	1,800	8,104	7,241	0.12	306518
FPD 432 Z	20	36	34	121	1,800	8,104	7,241	0.12	306519
FPD 437 M	25	41	34	176	1,700	9,201	8,142	0.15	306520
FPD 437 Z	25	41	34	160	1,700	9,201	8,142	0.15	306521
FPD 442 M	30	46	34	223	1,500	10,247	10,708	0.18	300696
FPD 442 Z	30	46	34	208	1,500	10,247	10,708	0.18	300697
FPD 448 M	35	53	34	286	1,300	11,642	13,440	0.23	306524
FPD 448 Z	35	53	34	262	1,300	11,642	13,440	0.23	306525
FPD 453 M	40	58	34	343	1,200	11,417	13,577	0.26	300702
FPD 453 Z	40	58	34	314	1,200	11,417	13,577	0.26	300700
FPD 463 M	50	68	34	461	1,100	13,070	17,063	0.34	306534
FPD 463 Z	50	68	34	428	1,100	13,070	17,063	0.34	306535
FPD 473 M	60	78	34	588	1000	14128	19896	0.41	306536
FPD 473 Z	60	78	34	543	1000	14128	19896	0.41	306537
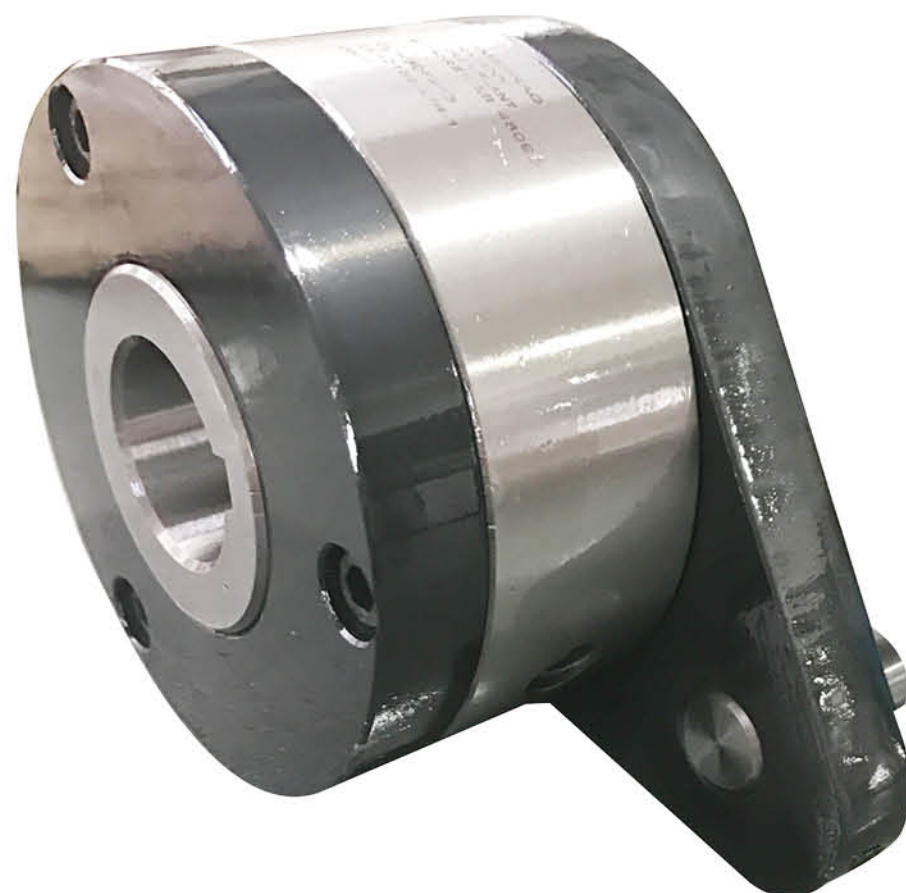
Description:

NF type non-contact backstop is a kind of high-speed anti-reversing device, which has the advantages of reliable backstopping, non-stuck operation, high holdback torque, easy installation, etc.

The internal structure of the device adopts the optimized design of new shaped wedge, which makes it obviously superior to other backstopping devices.

Besides, it also cleverly utilizes the centrifugal force of its own rotation: when the input shaft rotates positively at a speed higher than the minimum speed, the internal work of the backstop can be realized.

It is widely used in belt conveyor, bucket elevator, scraper conveyor and other equipment with backstop requirement.
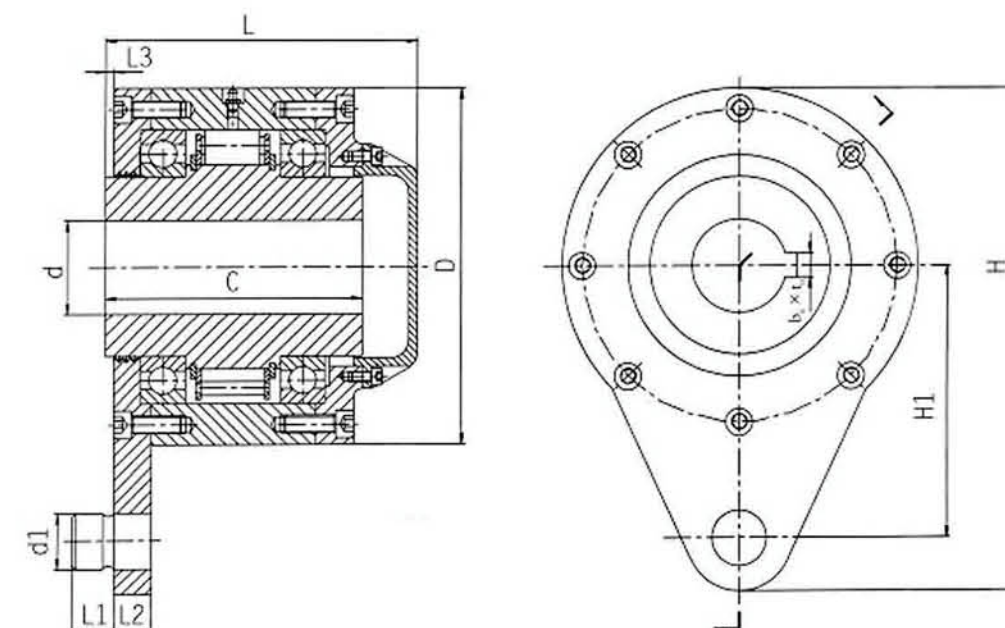
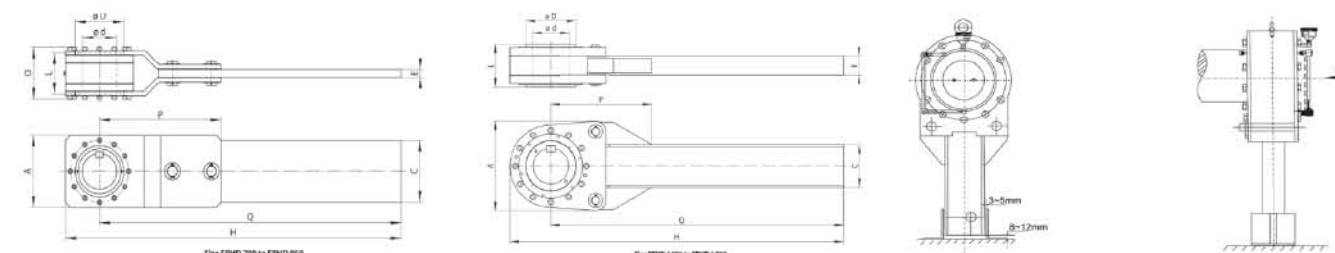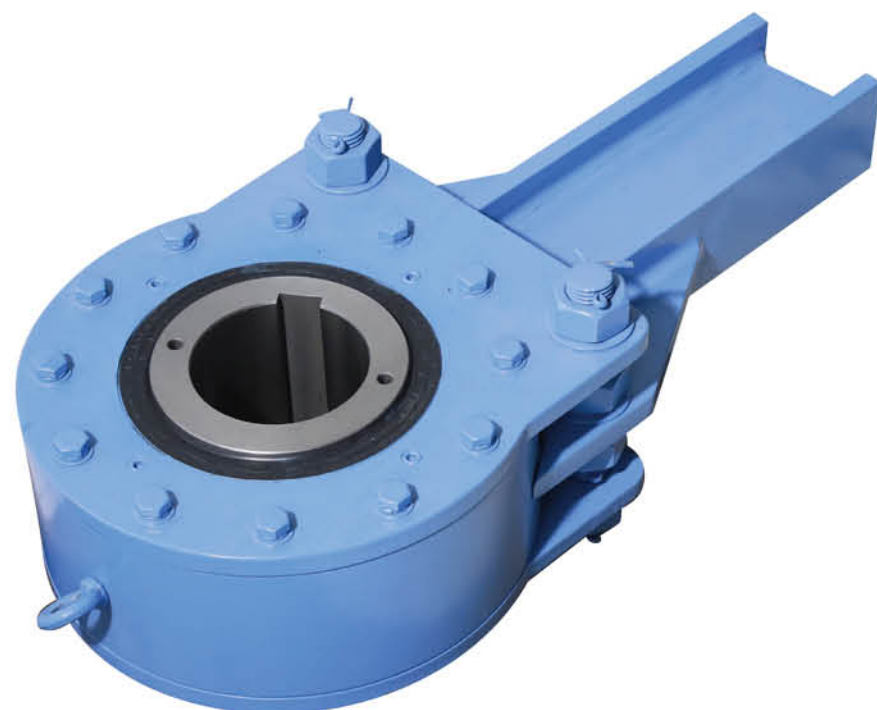| Model | Torque | Min Rotation speed | Max Rotation speed | Dimension | | | | | | | | | | Weight |
|-------|--------|--------------------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
| | Nm | r/min | r/min | d | D | d1 | H | H1 | L | L1 | L2 | L3 | kg |
| NF10 | 1000 | 450 | 1500 | | | | | | | | | | |
| | 40-50 | 190 | 28 | 273 | 150 | 172 | 25 | 20 | 5 | 28 | | | |
| NF16 | 1600 | | | 45-60 | 208 | 32 | 295 | 160 | 182 | | 22 | | 31 |
| NF25 | 2500 | 425 | | 50-70 | 230 | 38 | 323 | 170 | 190 | | 25 | | 38 |
| NF40 | 4000 | | | 60-80 | 245 | 42 | 350 | 185 | 207 | 28 | 30 | | 49 |
| NF63 | 6300 | 400 | | 70-90 | 260 | 45 | 370 | 195 | 221 | 30 | 35 | | 62 |
| NF80 | 8000 | | | 80-100 | 275 | 48 | 396 | 210 | 226 | 35 | 35 | | 73 |
| NF100 | 10000 | | | 90-110 | 295 | 52 | 425 | 225 | 261 | | 45 | | 98 |
| NF125 | 12500 | 375 | | 100-130 | 330 | 58 | 473 | 250 | 296 | 40 | 50 | 8 | 154 |
| NF160 | 16000 | | 1000 | 110-140 | 360 | 62 | 512 | 270 | 306 | | 55 | | 175 |
| NF200 | 20000 | 350 | | 120-150 | 400 | 65 | 565 | 300 | 306 | 50 | 58 | | 241 |
| NF250 | 25000 | | | 130-160 | 430 | 70 | 620 | 335 | 316 | | 63 | | 256 |
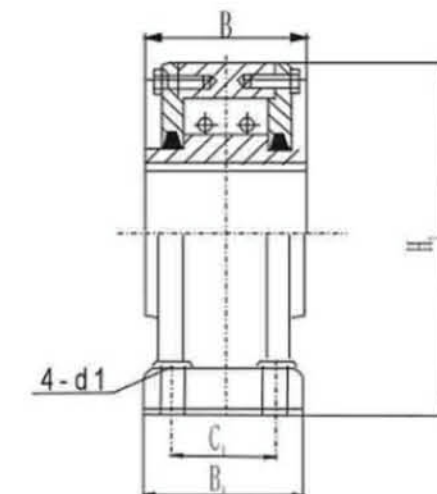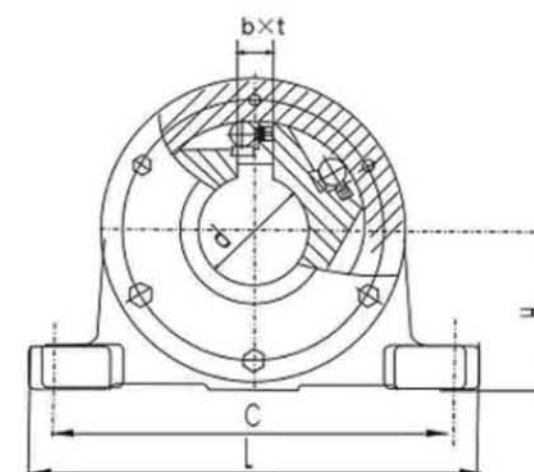
Description:

GN series backstop clutch is a kind of low speed of roller type plugging device,often with reducer , used in belt conveyor,hoist,electric drum, and other need a non-return device.Non-return quickly ,small reverse distance,long life ,can withstand the torque.

Type	Torque TKN	Bore Dia. Max. ødH7	DIMENSION									Weight	Recommended Suitable Reducer
			bxt	C	L	B	C1	B1	H	H1	D1	kg	
	N.m	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
GN110	6770	110	32X6.7	400	450	140	90	140	160	310	ø21	89.4	ZQ650 ZQ750
GN130	13700	130	36X7.4	430	480	170	120	180	175	340		120	ZQ850
GN140	13700	140	36X7.4	430	480	170	120	190	175	340		105	ZQ85
GN150	22800	150	40X8.7	510	580	190	170	230	215	420	ø26	186	ZQ1000
GN170	22800	170	40X8.7	510	580	190	170	250	215	420		182	ZL100
GN200	47600	200	45X9.9	590	660	220	210	290	275	540	ø32	352	ZL115
GN220	47600	220	50X11.2	590	660	220	210	290	275	540		339	ZL130

Size FRHD 700 to FRHD 950

Size FRHD 1000 to FRHD 1800

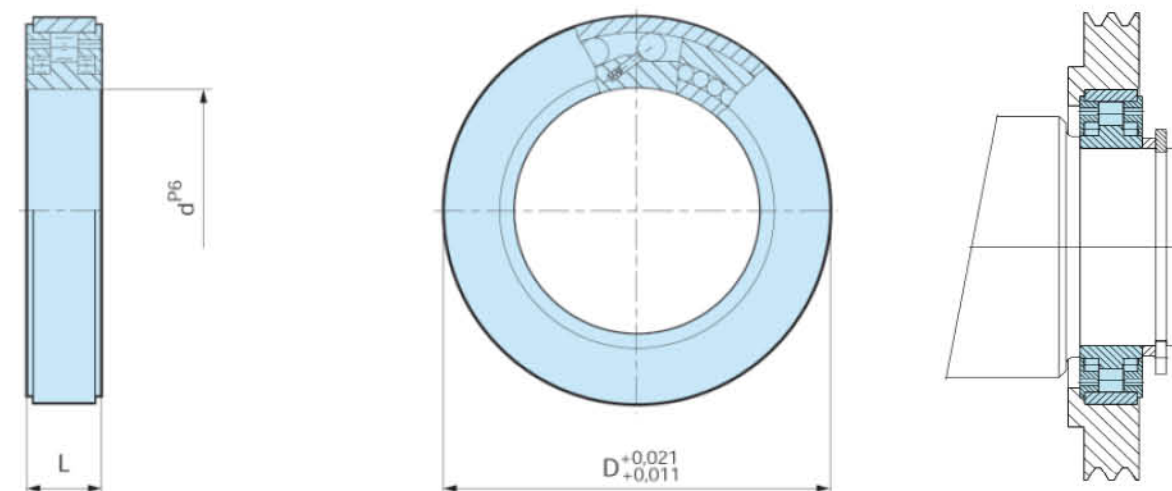| Freewheel size	Max torque lb-ft	Nominal torque lb-ft	Max inner ring speed rpm	Bore d max.	A inch	C inch	D inch	E inch	H inch	L inch	O inch	P inch	Q inch	Weight lbs
FRHD 700	7500	3750	620	3.44	8	6	5.25	0.5	36	6	6.75	16.38	32	135
FRHD 775	15000	7500	540	3.75	9.75	8	6	1	42.88	7.5	9	20.38	38	310
FRHD 800	24000	12000	460	4.5	10.5	10	7	1	43.25	8	9.5	22.13	38	360
FRHD 900	37000	18500	400	5.44	12	10	8	1.5	54	7.63	9.38	22.75	48	480
FRHD 950	46000	23000	360	7	14	12	10	1.5	69	8	10	25	62	530
FRHD 1000	56000	28000	360	7	17	8	9	4.13	80.38	8.75	-	23.13	72	550
FRHD 1100	90000	45000	360	7	17	8	9	4.13	80.38	10	-	23.13	72	795
FRHD 1200	185000	92500	250	9	23	10	12	4.94	89	11	-	28	78	1300
FRHD 1300	220000	110000	220	10	25	12	14	5.25	95	12	-	30	82.88	1674
FRHD 1400	280000	140000	200	12	30	18	16	6.25	107	13	-	36	94	2200
FRHD 1450	380000	190000	200	112	30	18	16	6.25	107	15	-	36	94	2500
FRHD 1500	580000	290000	200	12	31	18	15.13	6.25	107	17.62	-	36	94	2440
FRHD 1600	746000	373000	140	14	32.5	20	17.63	6.25	124	19.25	-	30.44	108	3400
FRHD 1700	1250000	625000	120	18	42.5	24.5	23	7.88	140	20	-	48	120	7000
FRHD 1800	1800000	900000	100	21	52	30	26.5	10.5	170	23	-	54	144	12000

DESCRIPTION

Complete freewheels FRHD with lever arm are sealed sprag freewheels with ball bearings.

They are supplied oil- filled and ready for installation.The freewheels are arranaged on through shafts or shafts ends.

ASK

DESCRIPTION

1. Type ASK is a roller type freewheel bearing supported by two rows of roller bearings.

2. The standard radial clearance is C4.

3. Shaft tolerance should be h6 or j6.

4. Type ASK freewheels can not accept axial loading. In cases of such loads, thrust bearings must be provided.

Type	Size	Bearing Series	Torque Cpacity	Rotation Speed	Outside Diameter	Height	Bearing loads		Weight	Drag torque
							Dynamic	static		
	D_{p6} (mm)		TKN1) (Nm)	nmax (min^{-1})	D (mm)	L (mm)	C	C0 (kN)	(kg)	(Ncm)
ASK	40	6008	72	3500	68	15	16	20.6	0.25	15
	50	6010	125	2200	80	16	19.6	23.5	0.34	20
	60	6012	250	1800	95	18	25.3	35.1	0.5	25

SUMA
Clutch & Bearing
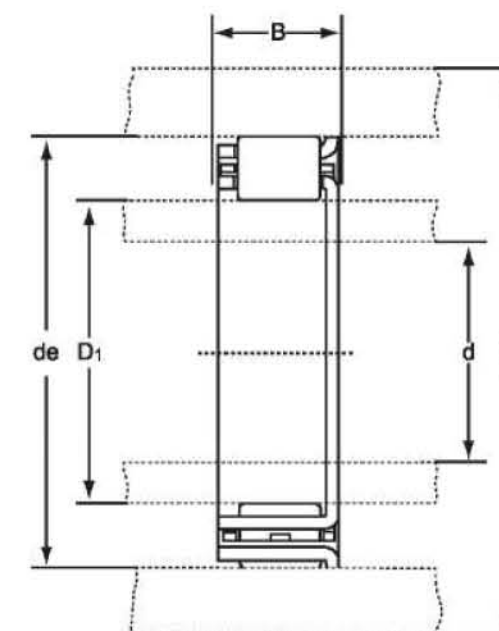
DESCRIPTION

Type BWC is a sprag type freewheel cage without inner or outer races. It must be installed in a design providing races, bearing support for axial and radial loads, lubrication and sealing. The BWC type version-N accepts all types of lubricants currently used in the power transmis-sion equipement. The sprag space tolerance must not be exceeded. Inner and outer races must both have a minimum plain width "e", without any recess, to ensure the freewheel functions correctly.Alternatively, races can be made in case hardened steel shafts, or housings, to the specification below. Surface hardness of the finished part should be HRC 60 to 62, for a depth of 0, 6 mm minimum. Core hardness to be HRC35 to 45. Surface roughness not to exceed 22CLA. Maximum taper between races: 0, 007 mm for 25 mm width.

| Type	Inside shaft Diameter	Outside Shaft Diameter	Maximum Width	Rated Drag Torque
	Di	de	B	N.m (kgf-m)
BW-13252	27.762	44.425	19.1	233 (23.8)
BWC-13219A	27.762	44.425	13.5	139 (14.2)
BWC-13230	38.092	54.75	15.9	323 (33.0)
BW-13161	38.092	54.75	13.5	251 (25.6)
BW-13244	41.275	57.937	13.5	212 (21.6)
BW-13231	54.765	71.427	13.5	400(41.0)
BW-13214	54.765	71.427	15.9	569(58.0)
BW-13167	54.765	71.427	15.9	569(58.0)
BW-13209	54.765	71.427	13.5	554(56.5)
BWC-13239B	57.76	74.427	15.9	711(72.5)
BW-13238	57.76	74.427	21	1050 (107)
BW-13243	72.217	88.882	13.5	637 (65.0)
BWC-13168	72.217	88.882	21	1510 (154)
BWC-13229	72.217	88.882	21.6	1325 (135)
BW-13255	72.217	88.882	26.7	1920 (196)
BWC-13251	103.231	119.944	15.4	789(80.5)
BWC-13261	103.231	119.944	15.4	1580 (161)

CK-A

CK-A45100

DESCRIPTION

CKA is a sprag type freewheel non-bearing supported . Bearings are required to support axial and radial loads, Units are delivered grease lubricated.
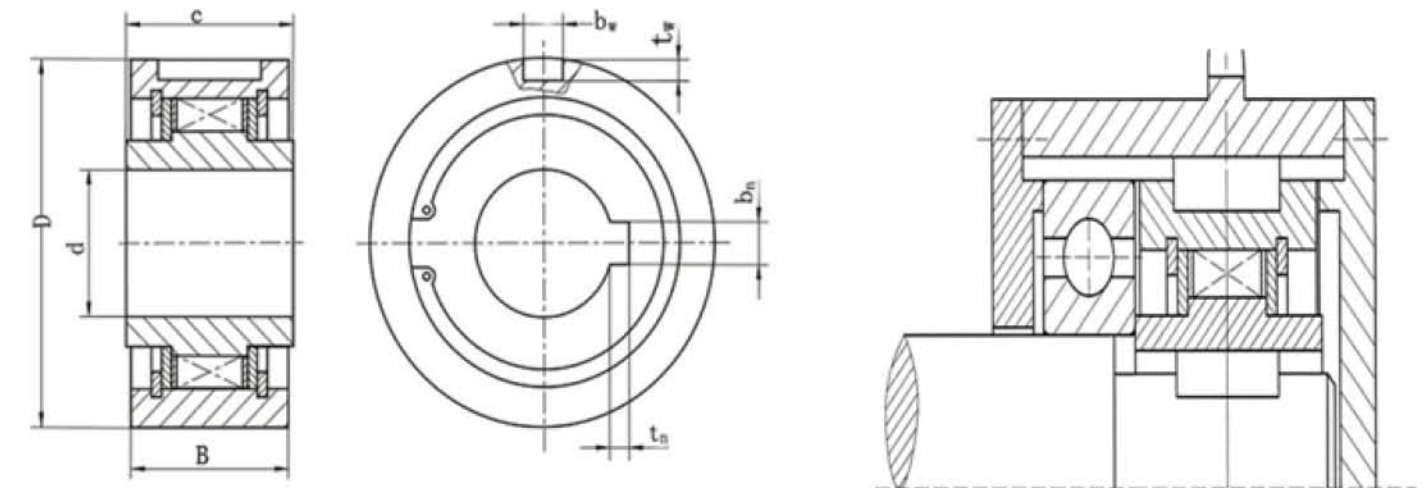
| Model	Nominal Torque	Overrunning Limiting Speed (r/min)		Dimension [mm]						Bearing	Weight
		Inner race	Outer race	Outer race			Inner race				[kg]
	[N.m]			D[h7]	B	bwxtw	d[h7]	C	bnxtn		
CK-A1542	54	1750	500	42	23	3x1.8	15	24	3x1.4	6302	0.17
CK-A1747	75	1575	400	47	23	3x1.8	17	24	3x1.4	6304	0.21
CK-A2052	95	1400	400	52	23	3x1.8	20	24	3x1.4	6305	0.25
CK-A2562	145	1260	350	62	23	4x2.5	25	24	4x1.8	6306	0.35
CK-A3072	208	1050	300	72	23	5x3.0	30	24	5x2.3	6307	0.47
CK-A3580	340	815	200	80	28	8x4.0	35	30	6x2.8	6308	0.69
CK-A4090	462	700	200	90	28	8x4.0	40	30	6x2.8	6309	0.87
CK-A45100	783	560	200	100	28	8x4.0	45	30	6x2.8	6310	1.07
CK-A50110	850	525	180	110	28	10x5.0	50	30	8x3.3	6311	1.59
CK-A60130	1050	490	180	130	34	10x5.0	60	36	8x3.3	6312	2.16
CK-A65140	1224	490	180	140	34	10x5.0	65	36	10x3.3	6313	2.49
CK-A70150	1850	455	150	150	40	10x5.0	70	42	10x3.3	6314	3.36
CK-A75160	2140	455	150	160	40	12x5.0	75	42	12x3.3	6315	3.81
CK-A80170	2450	420	150	170	40	12x5.0	80	42	12x3.3	6316	4.29
CK-A1250	31.5	1750	400	50	22	3x1.8	12	24	3x1.4		0.24
CK-A1855	50	1575	350	55	22	4x2.5	18	24	4x1.8		0.28
CK-A2060	63	1600	350	60	22	6x3.5	20	24	6x2.8		0.33
CK-A2563	100	1260	350	63	24	6x3.5	25	26	6x2.8		0.37
CK-A2563T	140	1260	350	63	30	6x3.5	25	32	8x3.3		0.68
CK-A2870	180	1050	300	70	30	8x4.0	28	32	8x3.3		0.6
CK-A3080T	340	875	200	80	30	8x4.0	30	32	8x3.3		0.75
CK-A3585	400	815	200	85	30	8x4.0	35	32	8x3.3		1
CK-A35100	780	875	200	100	32	10x5.0	35	34	10x3.3		1.34
CK-A35140	1000	490	180	140	35	8x4.0	35	35	10x3.5		3.28
CK-A40100	780	560	200	100	34	10x5.0	40	34	10x3.3		1.2
CK-A40110	850	700	180	110	32	10x5.0	40	34	10x3.3		1.19
CK-A50125	1000	490	180	125	36	14x5.5	50	35	14x3.8		2.21
CK-A50130	1050	560	180	130	36	14x5.5	50	38	14x3.8		3.02
CK-A55160	2000	455	150	160	52	16x6.0	55	55	16x4.3		6.96
CK-A58130	1050	490	180	130	36	14x5.5	58	38	14x3.8		2.6
CK-A60180	2000	420	140	180	52	18x6.0	60	52	18x4.4		7.4

FRHM
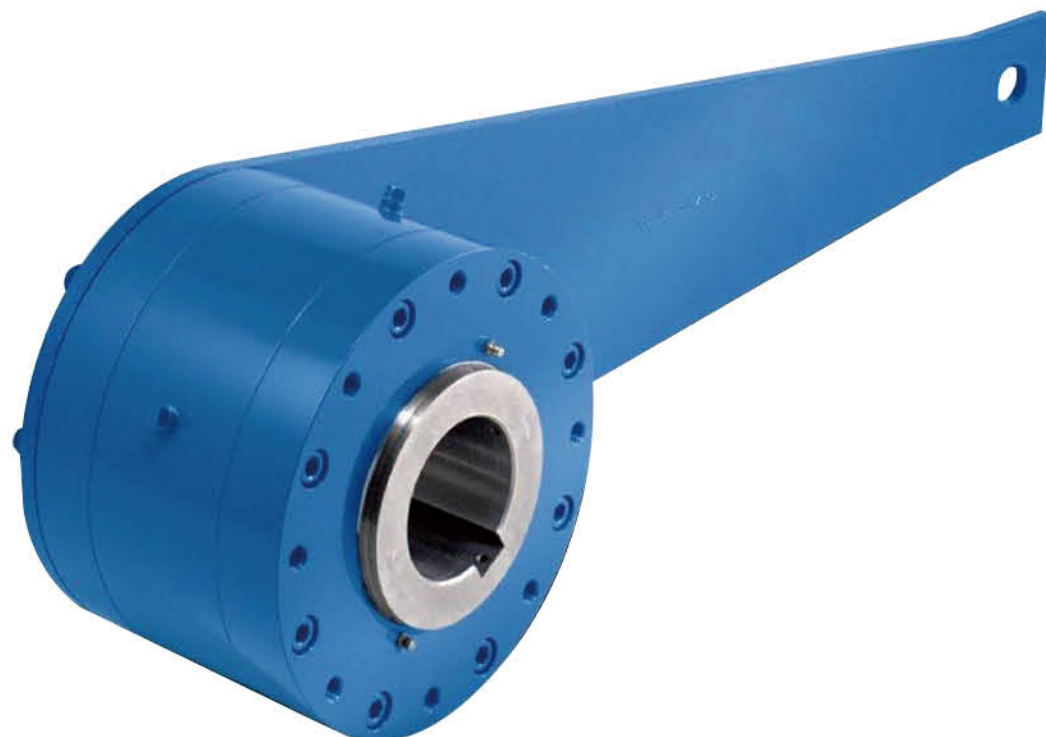
DESCRIPTION

Complete Freewheels FRHM with torque arm are sealed sprag freewheels with ball bearings. They are designed for interchanging the MorseCB units, supplied oil-filled and ready for installation. The freewheels FRHM are arranged on through shafts or shaft ends.
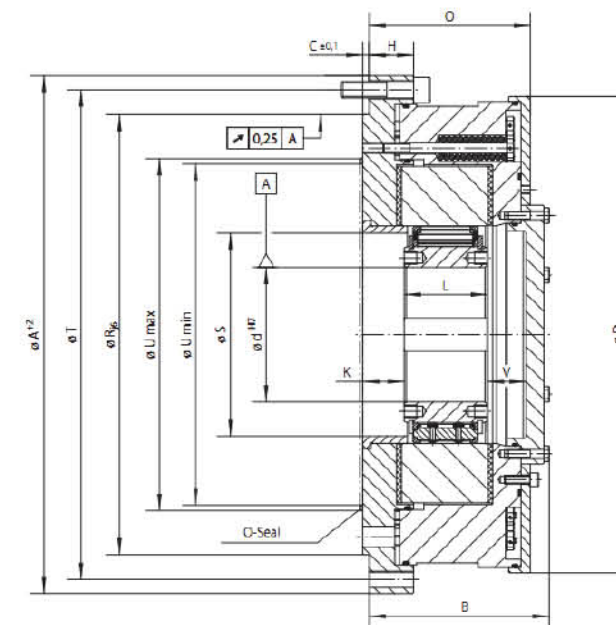
The freewheels FRHM are used as:

Backstops: for low-speed applications. They are designed for use in inclined conveyor-belt systems, elevators and pumps. Taconite seals protect the backstops when conditions are dirty and dusty.

Maximum torques up to 56 000 lb-ft.

Bores up to 7 inch.
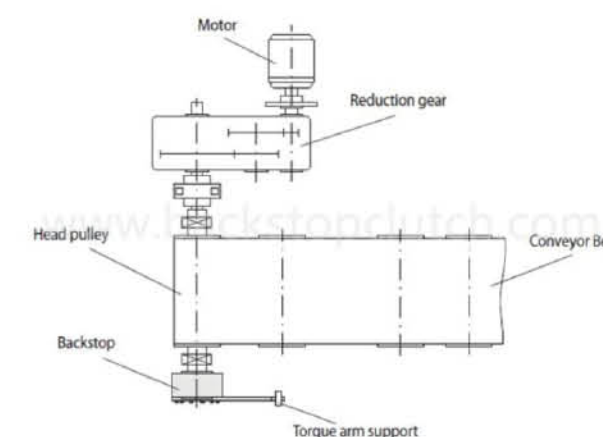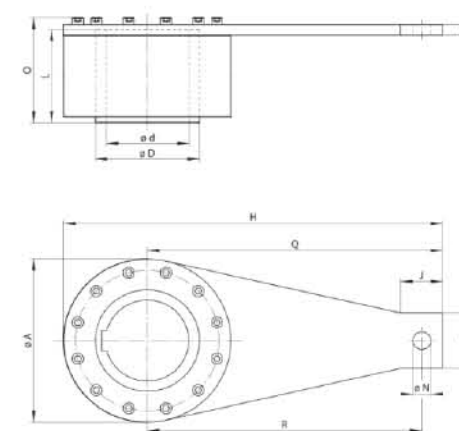
Freewheel Size	Maximum torque MM lb-ft	Nominal torque MN lb-ft	Maximum speed inner ring freewheels rpm	Bore d max. inch	A inch	C inch	D inch	E inch	H inch	J* inch	L* inch	N inch	O inch	Q inch	R* inch	Weight lbs
FRHM 775-7	15 000	7 500	540	3.75	9.75	4.38	6	0.50	21.88	3.56	7.50	1.25	8.13	17.00	15.25	160
FRHM 800-7	24 000	12 000	460	4.50	10.50	4.38	7	0.50	22.25	3.56	8.00	1.25	8.63	17.00	15.25	190
FRHM 800-12	24 000	12 000	460	4.50	10.50	4.75	7	0.50	25.50	3.56	8.00	1.25	8.63	20.25	18.63	200
FRHM 900-12	37 000	18 500	400	5.44	12.00	4.75	8	0.50	26.25	3.56	7.63	1.25	8.38	20.25	18.63	210
FRHM 900-19	37 000	18 500	400	5.44	12.00	4.75	8	0.88	30.63	3.56	7.63	1.50	8.75	24.63	22.88	220
FRHM 1000-19	56 000	28 000	360	7.00	16.50	4.75	9	0.88	32.89	3.56	8.75	1.50	9.13	24.63	22.88	270
FRHM 1000-30	56 000	28 000	360	7.00	16.50	5.25	9	0.88	33.25	3.56	8.75	1.75	9.13	25.00	23.00	275

FXRV/FXRT

DESCRIPTION

Integrated Freewheels FXRV and FXRT are sprag freewheels without bearing support and with sprag lift-off X. They consist of the Integrated Freewheels FXM with additional torque limiter. The sprag lift-off X ensures a wear-free freewheeling operation when the inner ring rotates at high speed. The freewheels FXRV and FXRT are used as:Backstops

Freewheel Size	Type	Slipping torque M_R	Sprag lift-off at inner ring speed	Max. speed Inner ring freewheels	Bore d	A	B	C	D	G**	H	K	L	O	R	S	T	U*** min.	U*** max.	V	Z**	Weight
		Nm	min⁻¹	min⁻¹	mm	mm	mm	mm	mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		kg
FXRV 85 - 40	MX	1 400	430	6 000	45-65	330	143	6	295	M 12	37	29	60	127	280	110	308	165	215	43	6	57
FXRV 100 - 50	MX	2 300	400	4 500	45-80	350	150	6	311	M 12	39	31	70	134	300	125	328	180	240	38	6	65
FXRV 120 - 50	MX	3 400	320	4 000	60-95	400	150	6	360	M 16	36	31	70	134	340	145	373	200	260	38	6	86
FXRV 140 - 50	MX	4 500	320	3 000	65-110	430	160	6	386	M 16	36	31	70	134	375	165	403	220	280	50	6	102
FXRV 170 - 63	MX	9 000	250	2 700	70-130	500	175	6	460	M 16	43	40	80	156	425	196	473	250	340	38	6	163
FXRV 200 - 63	MX	12 500	240	2 100	130-155	555	175	6	516	M 16	49	40	80	156	495	226	528	275	390	38	6	205
FXRV 240 - 63	LX	21 200	220	3 000	185	710	195	8	630	M 20	50	50	90	170	630	290	670	355	455	45	12	347
FXRV 260 - 63	LX	30 000	210	2 500	205	750	205	8	670	M 20	50	50	105	183	670	310	710	375	500	40	12	411
FXRV 290 - 70	LX	42 500	200	2 500	230	850	218	8	755	M 24	52	50	105	190	730	335	800	405	560	48	12	562
FXRV 310 - 96	LX	53 000	195	2 100	240	900	260	10	800	M 24	63	63	120	240	775	355	850	435	600	69	12	792
FXRV 360 - 100	LX	75 000	180	1 800	280	975	267	10	870	M 30	63	63	125	243	850	400	925	485	670	71	12	942
FXRV 410 - 100	LX	100 000	170	1 500	300	1 060	267	10	950	M 30	63	63	125	243	950	450	1 000	535	750	71	12	1053

FXRV/FXRT
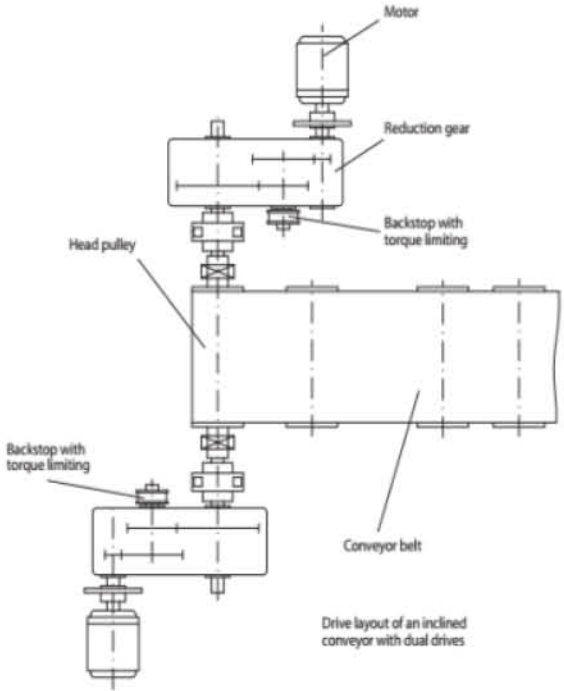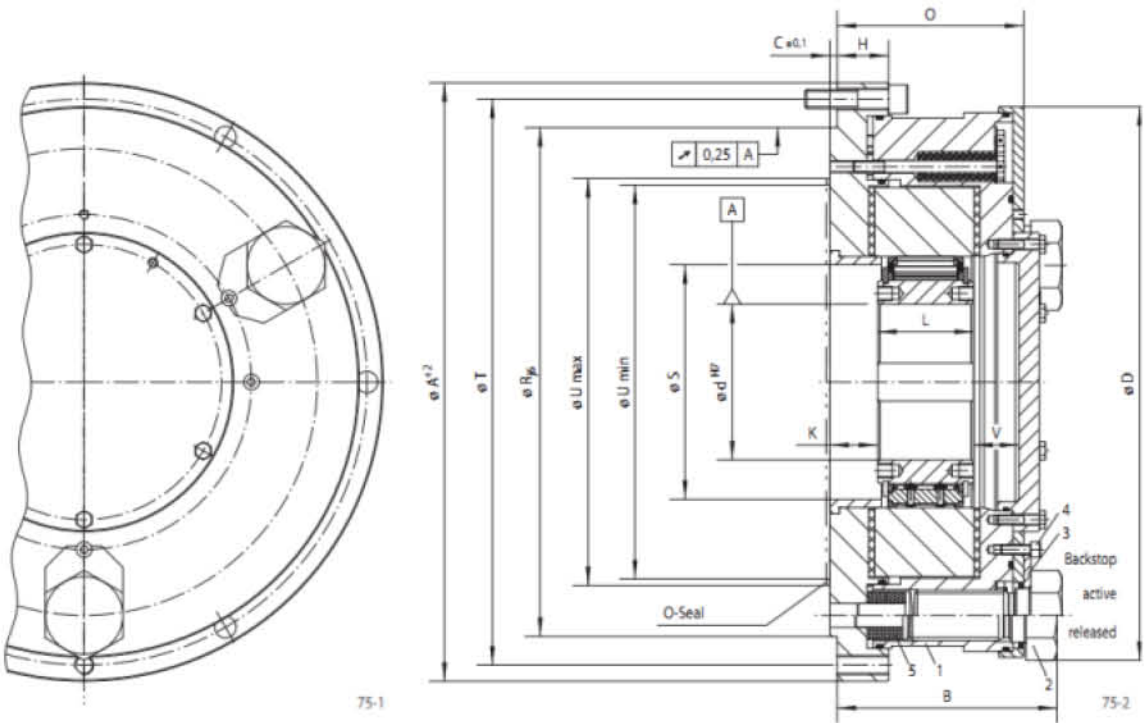
Freewheel Size	Type	Slipping torque	Sprag lift-off at inner	Max. speed	Bore d	A	B	C	D	G**	H	K	L	O	R	S	T	U***		V	Z**	Weight
		M_R	ring speed	Inner ring freewheels														min. mm	max.			
		Nm	min⁻¹	min⁻¹	mm	mm	mm	mm	mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		kg
FXRT 85 - 40	MX	1 400	430	6 000	45-65	330	148	6	295	M 12	37	29	60	127	280	110	308	165	215	43	6	60
FXRT 100 - 50	MX	2 300	400	4 500	45-80	350	159	6	311	M 12	39	31	70	134	300	125	328	180	240	38	6	66
FXRT 120 - 50	MX	3 400	320	4 000	60-95	400	159	6	360	M 16	36	31	70	134	340	145	373	200	260	38	6	87
FXRT 140 - 50	MX	4 500	320	3 000	65-110	430	163	6	386	M 16	36	31	70	134	375	165	403	220	280	50	6	104
FXRT 170 - 63	MX	9 000	250	2 700	70-130	500	188	6	460	M 16	43	40	80	156	425	196	473	250	340	38	6	166
FXRT 200 - 63	MX	12 500	240	2 100	130-155	555	188	6	516	M 16	49	40	80	156	495	226	528	275	390	38	6	209
FXRT 240 - 63	LX	21 200	220	3 000	185	710	210	8	630	M 20	50	50	90	170	630	290	670	355	455	45	12	355
FXRT 260 - 63	LX	30 000	210	2 500	205	750	223	8	670	M 20	50	50	105	183	670	310	710	375	500	40	12	418
FXRT 290 - 70	LX	42 500	200	2 500	230	850	243	8	755	M 24	52	50	105	190	730	335	800	405	560	48	12	574
FXRT 310 - 96	LX	53 000	195	2 100	240	900	293	10	800	M 24	63	63	120	240	775	355	850	435	600	69	12	805
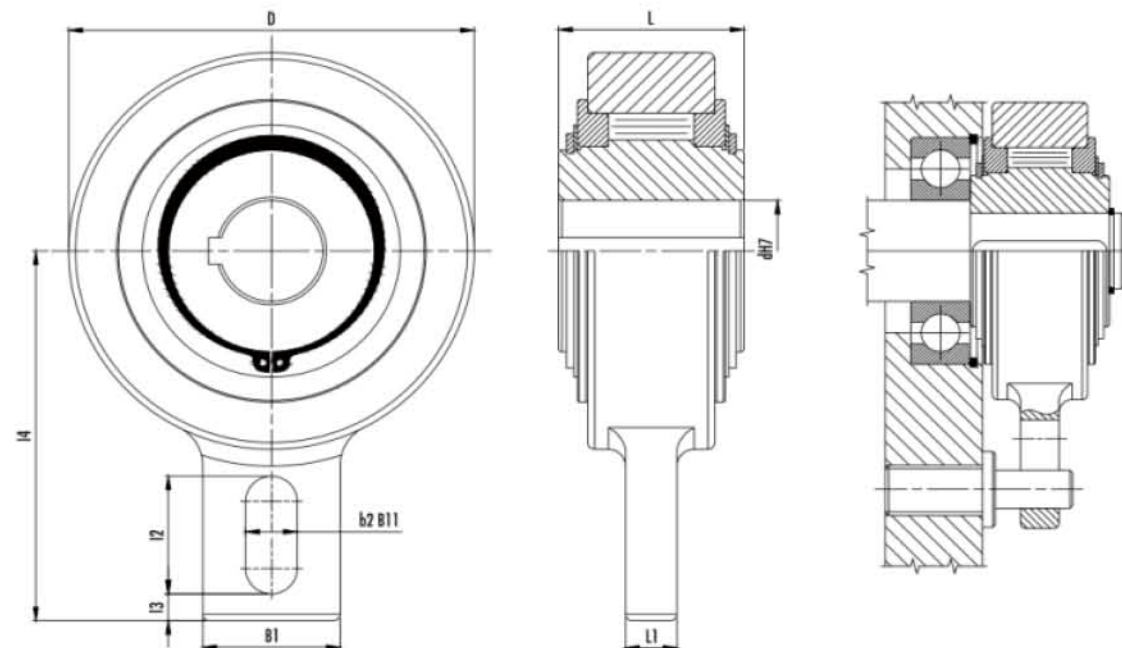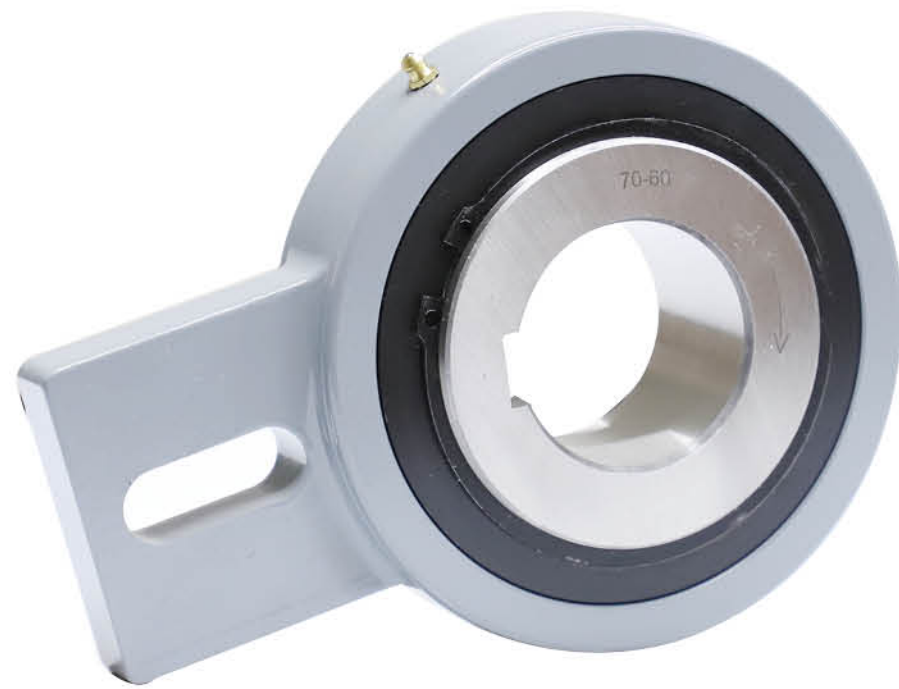
Model	dH7	D	L	B1	L1	b2	l2	l3	l4	Weight (kg)	Max. speed (rpm)	Torque (Nm)	Drag Torque (Ncm)
GV20	20	83	35	40	12	15	35	5	90	1.3	450	275	0.2
GV25	25	83	35	40	12	15	35	5	90	1.3	450	275	0.2
GV30	30	118	54	40	15	15	35	8	110	3.5	320	1250	1.2
GV35	35	118	54	40	15	15	35	8	110	3.4	320	1250	1.2
GV40	40	118	54	40	15	15	35	8	140	3.3	320	2180	1.2
GV45	45	155	54	80	15	18	35	10	140	5.8	300	2180	2.2
GV50	50	155	54	80	15	18	35	10	140	5.7	300	2180	2.2
GV55	55	155	54	80	15	18	35	10	140	5.6	300	2180	2.2
GV60	60	155	54	80	15	18	35	10	140	5.5	300	2180	2.2
GV70	70	155	54	80	15	18	35	10	140	5.3	300	2180	2.2
GV80	80	190	64	80	20	20	40	10	155	8.7	200	2930	3.5
GV90*	90	260	90	120	25	30	50	20	220	24.5	150	7250	3.5
GV100*	100	260	90	120	25	30	50	20	220	23.5	150	7250	3.5
GV110*	110	260	90	120	25	30	50	20	220	22.5	150	7250	3.5
GV120*	120	300	110	120	30	30	50	20	240	42	130	11100	6

GVG
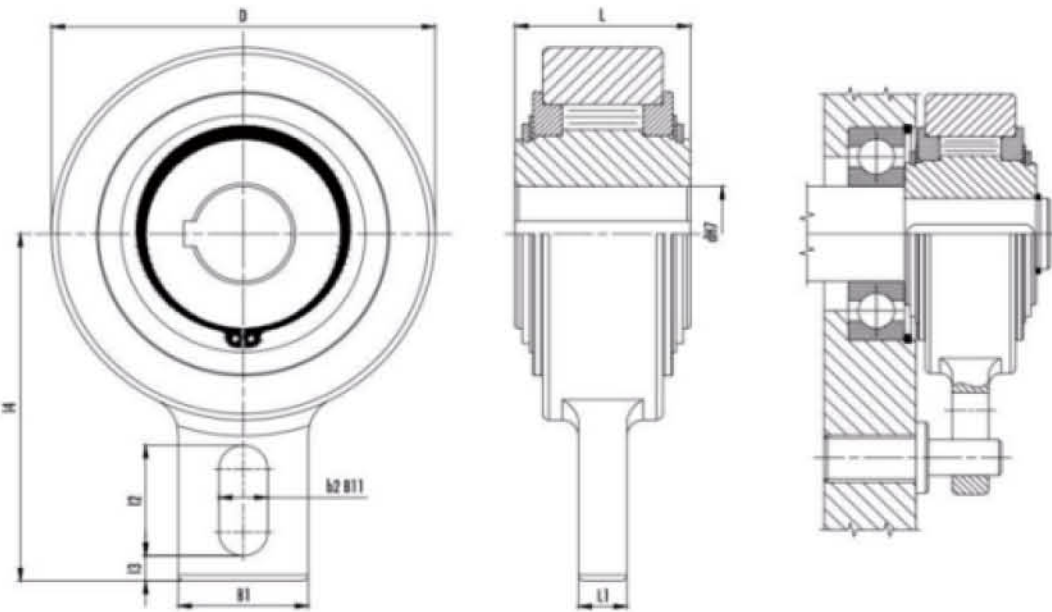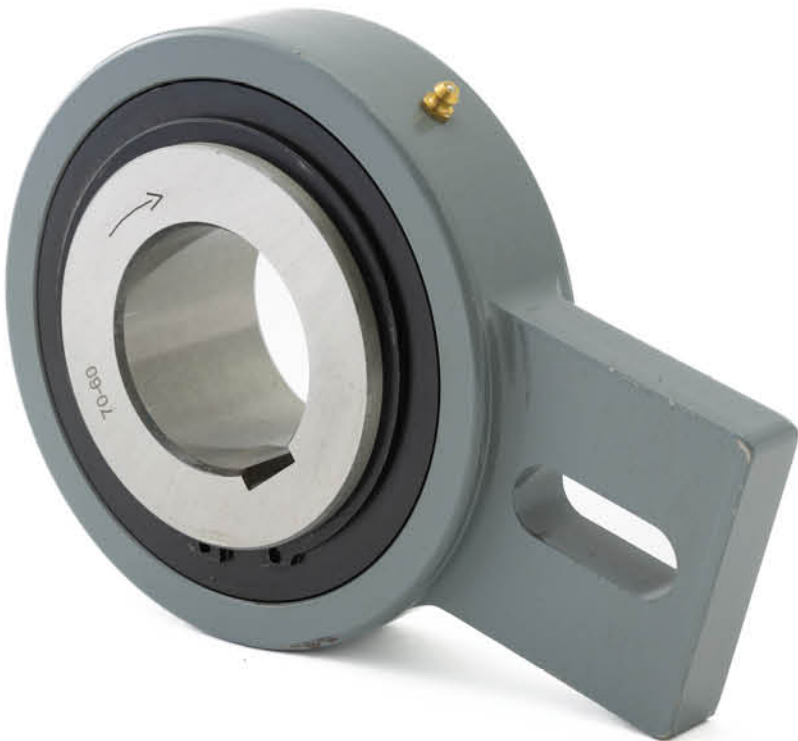
| Model	dH7	D	L	B1	L1	b2	l2	l3	l4	Weight (kg)	Max. speed (rpm)	Torque (Nm)
GVG20	20	106	48	40	15	18	35	10.5	113	2.5	400	606
GVG25	25	106	48	40	15	18	35	10.5	113	2.4	400	606
GVG30	30	106	48	40	15	18	35	10.5	113	2.3	400	606
GVG35	35	106	48	40	15	18	35	10.5	125	2.2	400	606
GVG40	40	132	52	60	15	18	35	10	125	4	300	1295
GVG45	45	132	52	60	15	18	35	10	125	3.8	300	1295
GVG50	50	132	52	60	15	18	35	10	125	3.7	300	1295
GVG55	55	132	52	60	15	18	35	10	125	3.5	300	1295
GVG60	60	161	54	70	15	18	35	10	140	6.1	250	2550
GVG70	70	161	54	70	15	18	35	10	140	5.7	250	2550
GVG80	80	190	70	70	20	25	45	15	165	10.2	200	4875
GVG90	90	290	70	70	20	25	45	15	165	9.6	200	4875

SUMA
Clutch & Bearing

MODELS MR 750 TO MR 1000
Outer Race Rotation and Lift-Off Cam Type

Lift-off (Outer race rotation type)
MR Series Cam Clutch is structured so that the cam rotates together with the outer race when the outer race overruns. As shown in the figure, the spring force (Fs) works to make the cam come in contact with the inner and outer races with fixed pressure. Conversely, the eccentric force (Fc), which works on the cam when overrunning, applies a moment in the direction where the cam does not contact the inner and outer races. Accordingly, when the overrunning speed is increased, the eccentric force (Fc) increases and the movement is augmented over the movement caused by the spring force. Next, the cam lifts off from the inner race and loses contact with it. This phenomenon is called "lift-off." In this state, there is no friction on the cam and it continues overrunning as long as the bearing lasts.
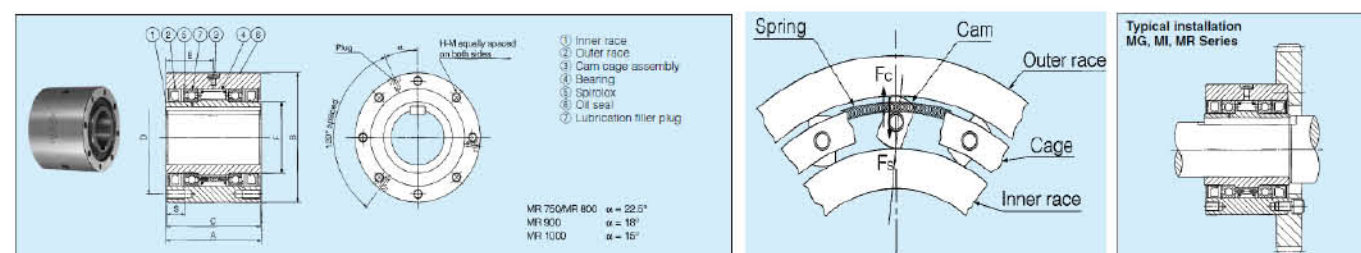
Model	Torque Capacity (N·m)	Max. Overrunning (r/min) Inner Race	Max. Overrunning (r/min) Outer Race	Bore Size Dia. (H7)	Bore Size Keyway	A	B (h7)	C	PCD D	E	F	S	H-M No.of Tapped Holes ×Size×Pitch	Lubrication Filler Plug Size×Pitch	Oil (ml)	Weight (kg)
MR 750	9500	525	2600	85	24x6	153	200	150	175	75	110	25	8xM14xP2.0	M8xP1.25	400	37.0
MR 800	17600	475	2100	110	28x7	158	250	155	220	77.5	140	25	8xM16xP2.0	M8xP1.25	500	46.5
MR 900	24500	400	1850	135	35x9	165	300	160	265	80	170	32	10xM16xP2.0	M8xP1.25	620	70.5
MR 1000	33800	325	1600	160	38x10	188	370	180	325	90	200	32	12xM16xP2.0	M8xP1.25	850	108.5
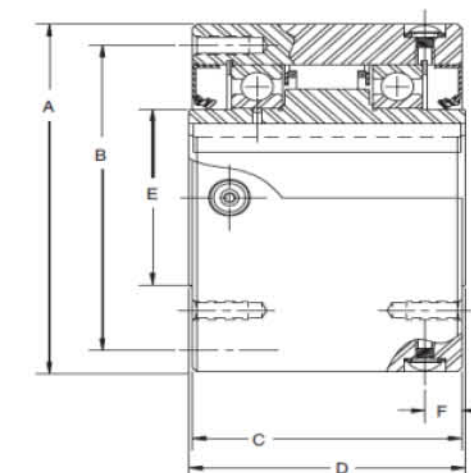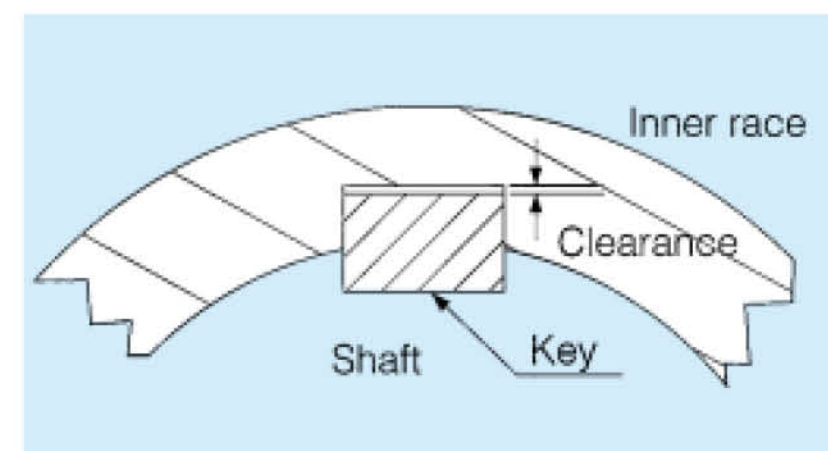
Model No.	Torque capacity	Drag Torque	Max Overrunning speed Inner race	Max Overrunning speed Outer race	Dimensions A	B	C	D	E	F	Weight
	N-m	N-m	r/min	r/min	mm	mm	mm	mm	mm	mm	kg
MG300A	373	0.2	2900	800	76.15/76.20	66.68	60.33	63.5	28.58	8.9	2
MI300A			-	-							
MO300A			3600	800							
MR300A			800	2900							
MG400A	542	0.3	2700	800	88.85/88.90	73.03	66.68	69.9	31.75	11.4	3
MI400A			-	-							
MO400A			3600	800							
MR400A			800	2700							
MG500A	1593	0.5	2400	750	107.90/107.95	92.08	85.73	88.9	44.45	12.4	5
MI500A			-	-							
MO500A			3000	750							
MR500A			750	2400							
MG600A	3051	0.9	1800	700	136.47/136.53	120.65	92.08	95.3	69.85	12.7	9
MI600A			-	-							
MO600A			2400	700							
MR600A			700	2100							
MG700A	6779	1.8	1200	400	180.92/180.98	158.75	123.83	127.0	101.60	17.3	20
MI700A			-	-							
MO700A			2000	400							
MR700A			400	1750							

MZEU

① Inner race
② Outer race
③ Cam
④ Spring
⑤ Bearing
⑥ Side plate

This drawing shows MZEU

Description：

Type MZEU is sealed, sprag type freewheel, bearing supported using two 60...zz series grease lubrication bearings .

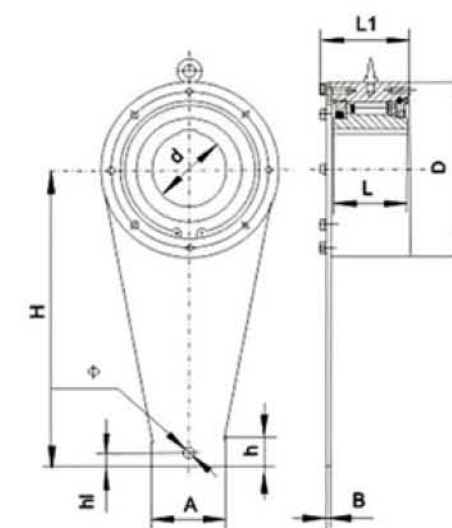Advantage: No need to do any maintenance, easy installation and usage.
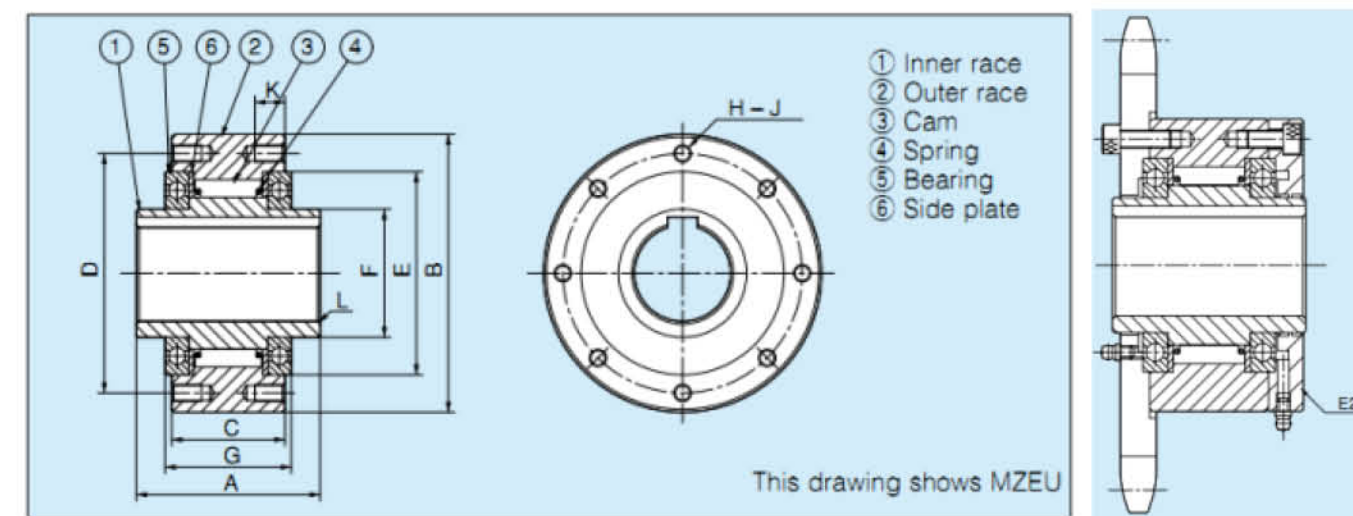
Model	Torque Capacity	Max. Overrunning	Drag Torque	Bore Size	Keyway	A	B	h7	C	D	E	F	G	H-J	K	L	Weight
	N·m	r/min	r/min	N·m	H7	Inner Race				PCD						C	(kg)
MZEU 12 (K)	60	2,000	1,000	0.2	12	4X1.8	42	62	20	51	42	20	27	3 - 05.5	-	0.8	0.5
MZEU 15 (K)	100	1,800	900	0.2	15	5X2.3	52	68	28	56	47	25	32	3 - M5	8	0.8	0.8
MZEU 20 (K)	245	1,600	700	0.29	20	6X2.8	57	75	34	64	55	30	39	4 - M5	8	0.8	1.2
MZEU 25 (K)	425	1,600	600	0.33	25	8X3.3	60	90	35	78	68	40	40	4 - M6	10	0.8	1.8
MZEU 30 (K)	735	1,500	500	0.39	30	8X3.3	68	100	43	87	75	45	48	6 - M6	10	1	2.6
MZEU 35 (K)	1,015	1,400	300	0.49	35	10X3.3	74	110	45	96	80	50	51	6 - M6	12	1	3.2
MZEU 40 (K)	1,350	1,400	300	0.59	40	12X3.3	86	125	53	108	90	55	59	6 - M8	14	1.3	4.8
MZEU 45 (K)	1,620	1,400	300	0.69	45	14X3.8	86	130	53	112	95	60	59	8 - M8	14	1.3	6.2
MZEU 50 (K)	2,070	1,300	250	0.79	50	14X3.8	94	150	64	132	110	70	72	8 - M8	14	1.3	8.2
MZEU 55 (K)	2,400	1,300	250	0.88	55	16X4.3	104	160	66	138	115	75	72	8 - M10	16	1.5	9.5
MZEU 60 (K)	2,950	1,200	250	0.98	60	18X4.4	114	170	78	150	125	80	89	10 - M10	16	1.5	12.3
MZEU 70 (K)	4,210	1,100	250	1.27	70	20X4.9	134	190	95	165	140	90	108	10 - M10	16	1.8	18.1
MZEU 80 (K)	5,170	800	200	1.38	80	22X5.4	144	210	100	185	160	105	108	10 - M10	16	1.8	23.1
MZEU 90 (K)	12,000	450	150	4.7	90	25X5.4	158	230	115	206	180	120	125	10 - M12	20	2	28.1
MZEU100 (K)	17,600	400	130	5.39	100	28X6.4	182	270	120	240	210	140	131	10 - M16	24	2	46.3
MZEU130 (K)	24,500	320	110	6.76	130	32X7.4	212	310	152	278	240	160	168	12 - M16	24	2.5	70.2
MZEU150 (K)	33,800	240	80	8.13	150	36X8.4	246	400	180	360	310	200	194	12 - M20	32	2.5	146.3

SUMA
Clutch & Bearing

ND16~ND380 (single plate)

ND500~ND7000 (double plate)

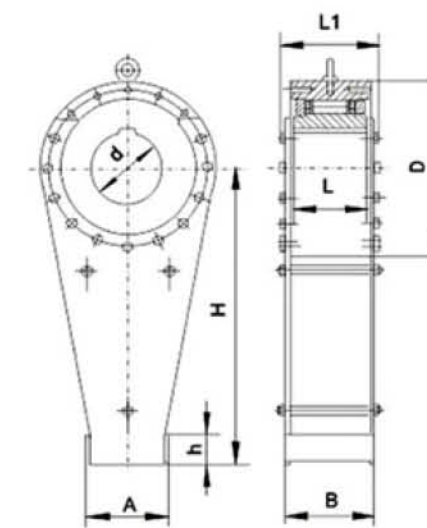| Model	Load Capacity	Inner Race Max. Speed	Drag Torque	Bore	Dimensions (mm)									Weight
	N.m	r/min	N.m	mm	A	B	D	H	h1	Φ	h	L	L1	kg
ND16 (NJ65)	1600	150	4	50-65	50	6	160	226	16	13.5	30	85	106	13.5
ND25 (NJ75)	2500		5	60-75	65		170	269	19	16.5	35			16.1
ND60 (NJ85)	6000		8	70-85	95	9	210	329	29	20.5	45	110	135	29.2
ND80 (NJ95)	8000		10	80-95	105		230	382	32		55		138	37.2
ND110 (NJ110)	11000		15	90-110	110	12	270	425	40	26	60		141	46.2
ND160 (NJ130)	16000	100	20	100-130	120		320	506	36		65	130	161	82.8
ND250 (NJ160)	25000		35	120-160	120	20	360	612	32	31		140	183	125
ND380 (NJ200)	38000		45	160-200	130		430	623	43	41	70	160	207	180
ND500 (NJ220)	50000	80	75	160-220	238	259	500	820	80	-		230	303	351
ND650 (NJ230)	65000	80	85	180-240	260	279	540	900	90	-		250	323	525
ND900 (NJ250)	90000	50	95	180-250	288	323	600	1000	100	-		290	367	675
ND1250 (NJ270)	125000		100	200-270	298	泵	650	1100	110	-				737
ND1800 (NJ300)	180000		110	230-300	356	335	780	1300	135	-		290	392	1123
ND2700 (NJ320)	270000		140	250-320	386	345	850	1500	135			320	412	1425
ND3200 (NJ350)	320000		160	250-350	414	360	930	1600	135			360	426	1955
ND5200 (NJ420)	520000		220	320-420	474	484	1030	1800	165			450	550	2930
ND7000 (NJ450)	700000		250	350-450	526	494	1090	2000	165			480	574	3380

Description:

ND / NJ / NYD series Backstop Clutch is a kind of low-speed plugging decive , its structure is compact , light weight , reliable wedge, relief operation without blinding, installer, installation accuracy is not high. The non-return device id conveying equipment in a safe protection device . Apply to dry belt conveyor , bucket lift helicopters. The scraper conveyor and other requirements have a non-return device.
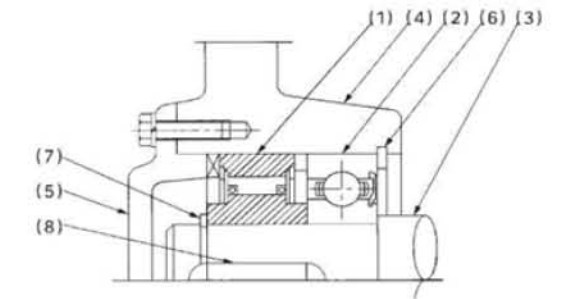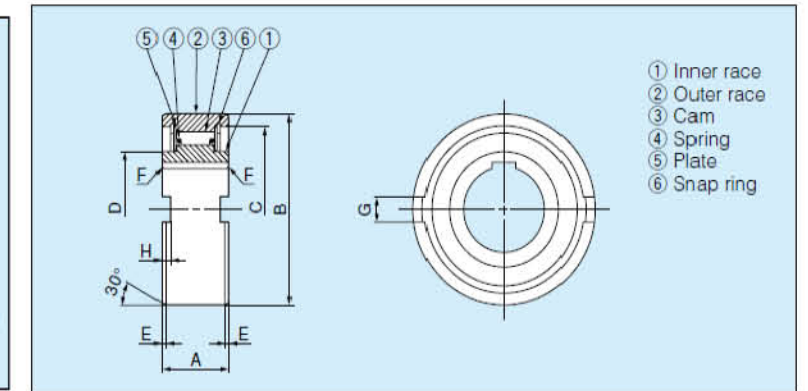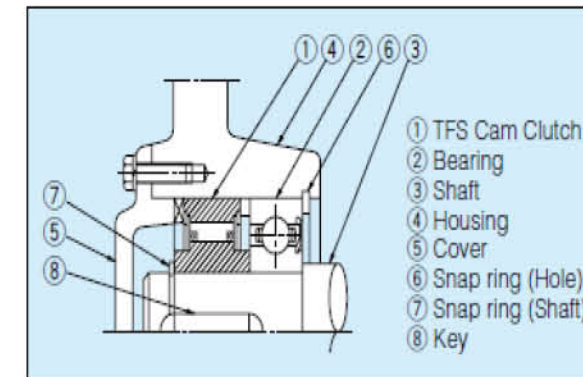
Description:

Type TFS is a roller type freewheel non bearing supported. Bearings are required to support axial and radial loads. Lubrication and sealing must also be provided by the installation.

Nominal outer diameter is the same as a series 63. Ball bearing.

A typical arrangement is to install this type alongside a bearing within the same location tolerances, as shown on the following page.

The inner race is keyed to the shaft. The outer race has positive n6 tolerance, to give a press fit in a H7 housing. Additional side notches in the outer race provide for positive torque transmission. If the housing is to K6 tolerance, use of the notches is not necessary, but The housing must be strong enough to not expand after assembly.

This design can accept an axial misalignment of inner and outer race of +/- S/2.Including: ASNU8(NFS8 TFS8) ASNU12(NFS12 TFS12) ASNU15(NFS15 TFS15) ASNU17(NFS17 TFS17) ASNU20(NFS20 TFS20)T ASNU25(NFS25 TFS25) ASNU30(NFS30 TFS30) ASNU35(NFS35 TFS35).
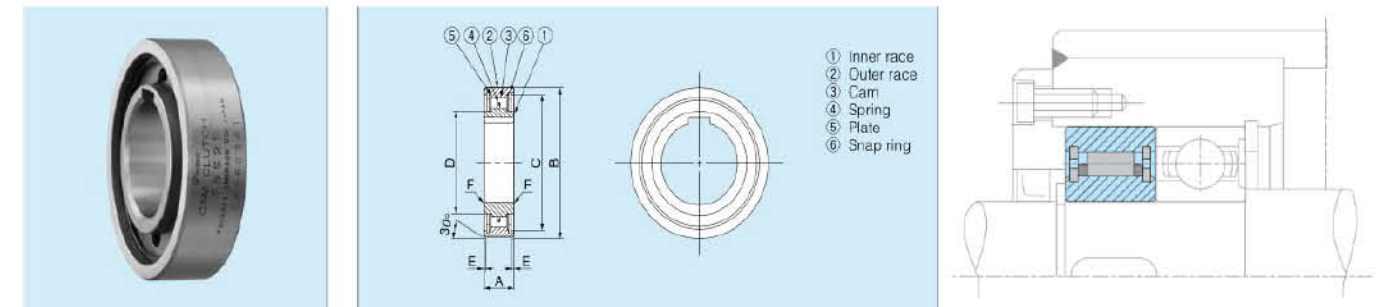
Model	Torque Capacity	Max.Overrunning		Drag Torque	Bore Size	Keyway	A	B	C	D	E	F	G	H	Weight
		Inner Race	Outer Race												
	(N·m)	(r/min)	(r/min)	(N·m)	(H7)										(g)
TFS12	18	4500	2300	0.04	12	4x1.8	13	35	30	18	0.6	0.3	4	1.4	68
TFS15	28	3500	1800	0.06	15	5x1.2	18	42	36	22	0.8	0.3	5	1.8	120
TFS17	50	3200	1600	0.11	17	5x1.2	19	47	38	22	1.2	0.8	5	2.3	150
TFS20	84	2500	1300	0.18	20	6x1.6	21	52	45	27	1.2	0.8	6	2.3	220
TFS25	128	2000	1000	0.19	25	8x2.0	24	62	52	35	1.2	0.8	8	2.8	360
TFS30	200	1600	800	0.21	30	8x2.0	27	72	62	40	1.8	1.0	10	2.5	530
TFS35	475	1400	700	0.42	35	10x2.4	31	80	70	48	1.8	1.0	12	3.5	790
TFS40	607	1300	650	0.46	40	12x2.2	33	90	78	54.5	1.8	1.0	12	4.1	1050
TFS45	756	1100	550	0.56	45	14x2.1	36	100	85.3	59	1.8	1.0	14	4.6	1370
TFS50	1124	1000	500	0.60	50	14x2.1	40	110	92	65	1.8	1.0	14	5.6	1900
TFS60	1975	840	420	0.87	60	18x2.3	46	130	110	84	2.6	1.5	18	5.5	3110
TFS70	2514	750	380	0.91	70	20x2.7	51	150	125	91	2.6	1.5	20	6.9	4390
TFS80	3924	670	340	1.22	80	22x3.1	58	170	140	100	2.6	1.5	20	7.5	6440

TSS

① Inner race
② Outer race
③ Cam
④ Spring
⑤ Plate
⑥ Snap ring

Type	Size	Torque	Overrunning speeds		DIMENSIONS						Weight	Drag torque
	ID	T_{KN} [1]	n_{lmax} [2]	n_{amax} [3]	OD	D5	Length	s	e	f		TR
	[mm]	[Nm]	[min⁻¹]	[min⁻¹]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[Ncm]
TSS	6	2.1	5000	7500	19	15.8	6	0.3	0.6	0.3	0.01	0.18
	8	3.8	4300	6500	24	20	8	1.3	0.6	0.6	0.02	0.24
	10	6.8	3500	5200	30	25.9	9	1.3	0.6	0.6	0.03	0.36
	12	13	3200	4800	32	28	10	1.3	0.6	0.6	0.04	0.48
	15	14	2800	4300	35	31	11	1.4	0.6	0.6	0.05	0.7
	20	40	2200	3300	487	40	14	2.4	0.8	0.8	0.12	1.4
	25	56	1900	2900	52	45.9	15	2.4	0.8	0.8	0.14	2.4
	30	90	1600	2400	62	55	16	2.4	0.8	1	0.22	7.8
	35	143	1300	2000	72	64	17	2.5	0.8	1	0.31	9
	40	185	1200	1800	80	72	18	2.5	0.8	1	0.39	10
	45	218	1000	1600	85	77	19	2.5	1.2	1	0.44	11
	50	230	950	1500	90	82	20	2.5	1.2	1	0.49	13
	55	308	800	1300	100	90	21	2.5	1.2	1	0.66	14
	60	508	700	1100	110	100	22	2.5	1.2	1.5	0.81	26
	80	1063	600	900	140	128	26	2.5	1.2	1.5	1.41	58

Description:

Type TSS is a roller type freewheel non-bearing supported. Bearings are required to support axial and radial loads. Lubrication and sealing must also be provided by the installation. Nominal outside diamensions are the same as series 62.. ball bearings. A typical arrangements is to install this type alongside a series 62 bearing within the same location tolerances, as shown on the following page.

The inner race is keyed to the shaft (except 6mm bore). The outer race has a positive r6 to lerance to give a press fit in a H7 housing. The outer housing must be strong enough to not expand after assembly.
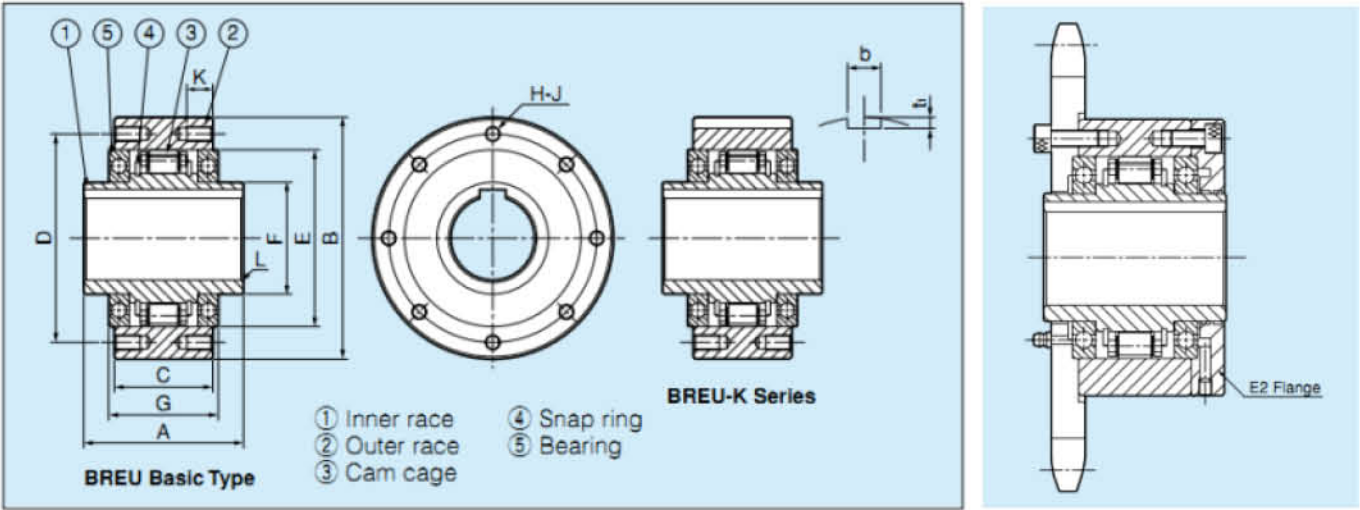
BREU

① Inner race   ④ Snap ring
② Outer race   ⑤ Bearing
③ Cam cage

BREU Basic Type

BREU-K Series

E2 Flange

DESCRIPTION

BREU series is a modular type Cam Clutch which is delivered as a BREU series Basic type or BREU-K series with option parts (E1, E2, E5, E7 flanges, E3 Torque arm and E4 cover) which are required as separate parts.

Model	Torque Capacity	Max. Engagement	Inner Race Overrunning Speed		Bore Size	Keyway	A	B	C	D	E	F	G	H-J	K	L	b	t1	Weight
	N·m	Speed (r/min)	Min. (r/min)	Max. (r/min)	H7	Inner Race		h7		PCD						C	P10		kg
BREU 30 (K)	607	350	880	3600	30	8x3.3	76	100	51	87	75	45	56	6-M6	10	1	8	4	2.7
BREU 35 (K)	686	300	780	3600	35	10x3.3	79	110	50	96	80	50	56	6-M6	12	1	10	5	3.2
BREU 40 (K)	980	300	720	3600	40	12x3.3	86	125	53	108	90	55	59	6-M8	14	1.3	12	5	4.4
BREU 45 (K)	1078	280	670	3600	45	14x3.8	86	130	53	112	95	60	59	8-M8	14	1.3	14	5.5	4.7
BREU 50 (K)	1715	240	610	3600	50	14x3.8	94	150	64	132	110	70	72	8-M8	14	1.3	14	5.5	7.6
BREU 55 (K)	1960	220	580	3600	55	16x4.3	104	160	66	138	115	75	72	8-M10	16	1.5	16	6	8.9
BREU 60 (K)	3479	200	490	3600	60	18x4.4	120	170	84	150	125	80	95	10-M10	16	1.5	18	7	12.5
BREU 70 (K)	4735	200	480	3600	70	20x4.9	134	190	95	165	140	90	108	10-M10	16	1.8	20	7.5	17.2
BREU 80 (K)	6517	190	450	3600	80	22x5.4	144	210	100	185	160	105	108	10-M10	16	1.8	22	9	22.4
BREU 90 (K)	8526	180	420	3000	90	25x5.4	158	230	115	206	180	120	125	10-M12	20	2	25	9	30.3
BREU100 (K)	14210	180	460	2500	100	28x6.4	186	270	124	240	210	140	135	10-M16	24	2	28	10	45.5
BREU130 (K)	20384	180	420	2200	130	32x7.4	212	310	152	278	240	160	168	12-M16	24	2.5	32	11	67
BREU150 (K)	33908	180	370	1300	150	36x8.4	246	400	180	360	310	200	194	12-M20	32	2.5	36	12	145