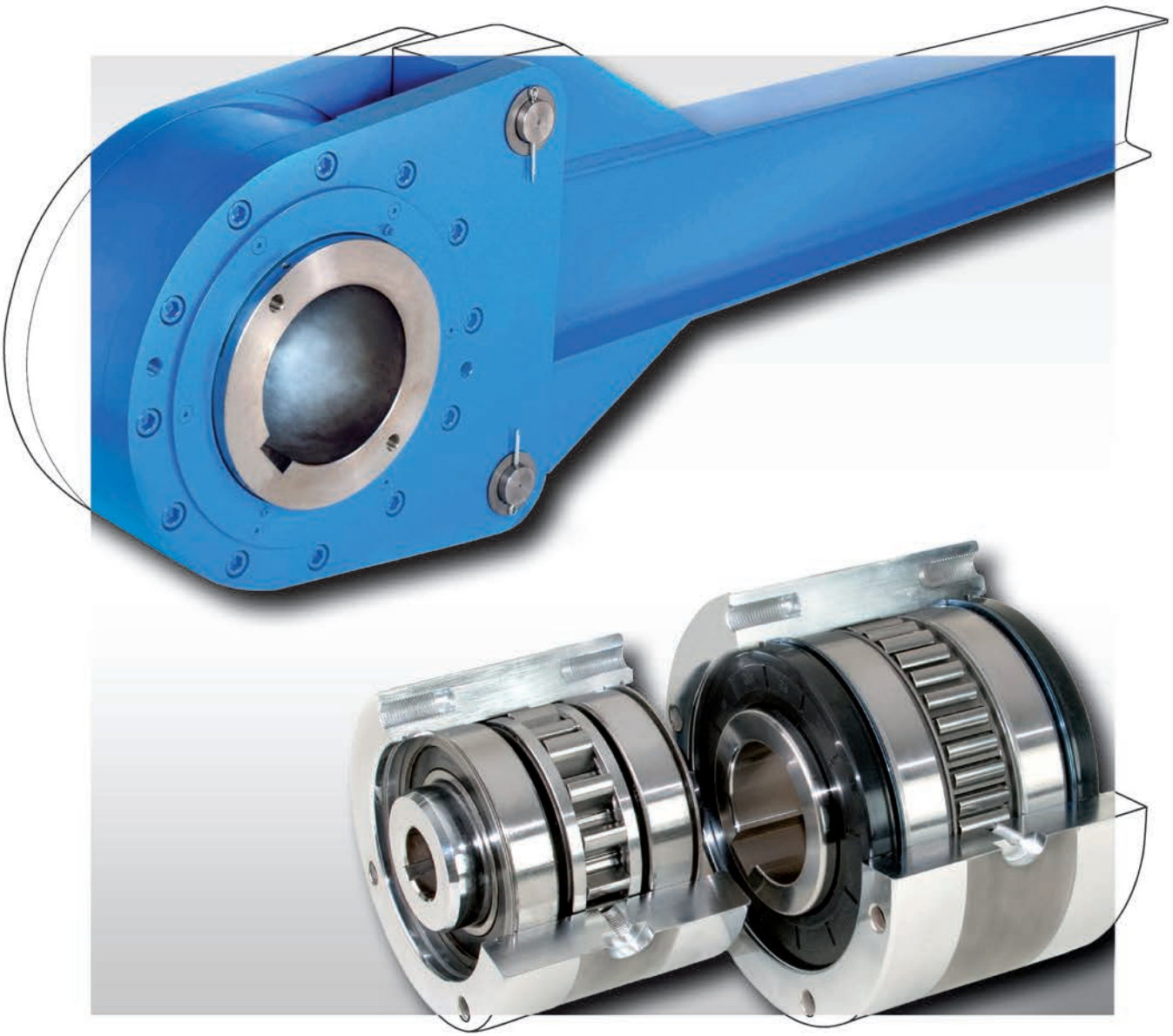
RINGSPANN®
CORPORATION
Power Transmission

Freewheel Clutches

Backstops • Overrunning Clutches • Indexing Freewheels



North American Edition 2015/2016

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RINGSPANN®

Issue 09/2015 • Technical details subject to change without notice.

RINGSPANN GmbH has been in business for over 70 years and is a world leader in Power Transmission and Workholding Technology. RINGSPANN CORPORATION, as a wholly owned subsidiary of RINGSPANN GmbH, designs, manufactures and assembles sprag and roller clutches mainly for the North American market. With innovative German engineering and American ingenuity, RINGSPANN CORPORATION offers the winning combination of quality products for your needs.

Products contained in this catalog represent RINGSPANN CORPORATION's standard freewheel clutches. Located in a 20,000 sq. ft. manufacturing facility, RINGSPANN CORPORATION can readily design new or modify existing products to suit your application.

The RINGSPANN CORPORATION service advantage:

- Detailed application support backed by over 70 years of experience.
- Direct sales and service from the manufacturer
- 24 hour emergency service
- North American industry leader for
  - Price
  - Delivery
  - Customer service
  - Quality

The RINGSPANN CORPORATION design advantage:

- American design and manufacture
- Patented sprag cage designs for increased torque and maximum life
- Maximum torque in a minimum space
- Sprag Lift off "X" and "Z" for infinite, maintenance free life
- Individual springs on every sprag to provide added security against failures

Freewheels are machine elements with particular characteristics:

- In one direction of rotation there is no contact between the inner and outer ring; the freewheel is in freewheeling operation.
- In the opposite direction of rotation there is contact between the inner and outer ring; in this direction it is possible to transmit torque.

For example the outer ring of the freewheel shown in figure 4-1 can freewheel clockwise while the inner ring is stationary. If, however, the outer ring is turned in the opposite direction, there is contact between the inner and outer ring and the inner ring is driven (driving operation).

Freewheels are used as:

- Backstops
- Overrunning Clutches
- Indexing Freewheels

Freewheels can fulfill these functions completely automatically in the most diverse machines. No mechanical or hydraulic operating equipment is required, such as externally actuated clutches or brakes.

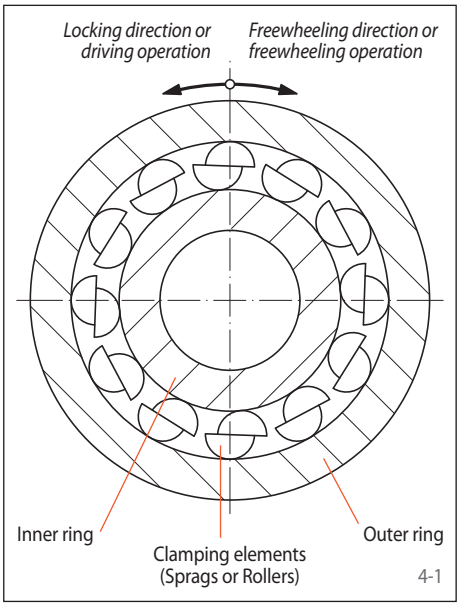
Freewheels consist of an inner and an outer ring between which clamping elements are arranged. Clamping elements can be sprags or rollers. We differentiate as follows:

- Freewheels with bearing support and
- Freewheels without bearing support.

For a freewheel to function, concentric alignment of the inner and outer ring is required. In the case of freewheels without bearing support, concentric alignment must be provided by the customer.

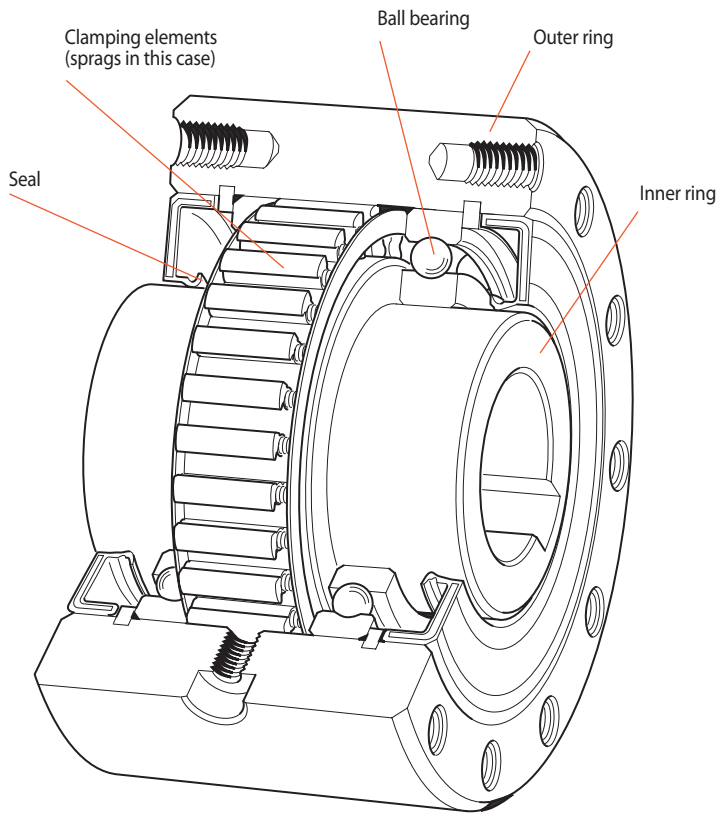
RINGSPANN freewheels are an indispensable design element in the machine building industry. Many designs are only economical if freewheels are used. The freewheel as an automatic driving element is preferred to conventional solutions because it offers the following significant advantages:

- safe
- efficient
- high degree of automation

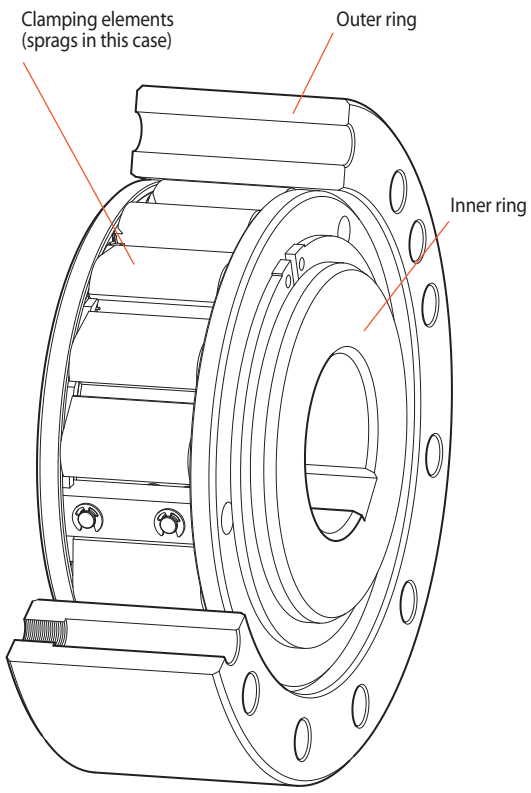


4-1

With more than 50 years experience in the development, production and sales of freewheels, RINGSPANN offers the most comprehensive range of freewheels. A global network of subsidiaries and sales agencies ensures the best possible personal on-site service. Assembly and production facilities in various countries provide fast, reliable delivery.



Freewheel with bearing support



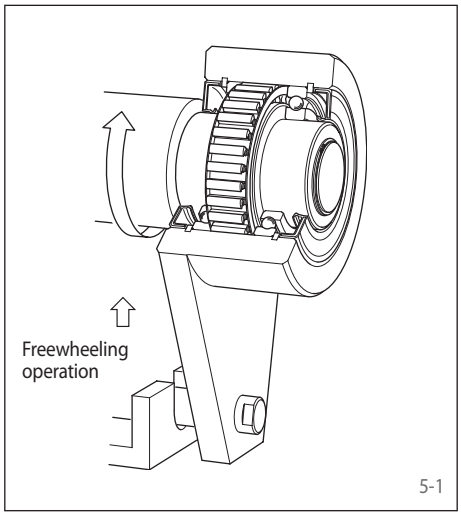
Freewheel without bearing support

4-2

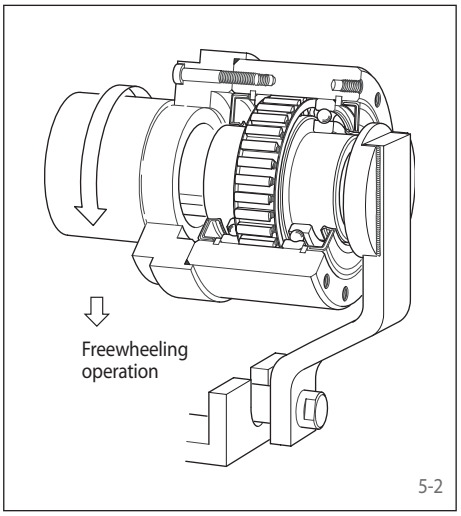
Backstop

Freewheels are used as backstops if reverse rotation of the operating equipment needs to be prevented. In many machines and installations, for technical safety or functional reasons, it is necessary to ensure that the operating equipment is in just one specific direction of rotation. Backstops are used where legal stipulations require a mechanical safety device be installed for the operation of conveyor systems.

The normal operating mode of a backstop is freewheeling operation; the locking (torque transmission) is performed at zero speed. The immediate engagement of the clamping elements ensures the required high operating safety.



In general, backstops are used where the inner ring freewheels and the stationary held outer ring prevents reverse rotation (figure 5-1).



The more complicated designed backstops where the outer ring freewheels and the stationary held inner ring prevents reverse rotation are rarely used today (figure 5-2).

Overrunning Clutch

The overrunning clutch engages machines or machine parts and automatically interrupts their contact as soon as the driven part of the overrunning clutch is turned faster than the driving part. In many cases, this can replace a more expensive externally actuated clutch.

With overrunning clutches the engagement takes place in the driving operation (torque transmission), while in freewheeling operation the torque transmission between the inner and outer ring is interrupted. In driving operation the speeds of the inner and outer ring are equal, while in freewheeling operation they are different.

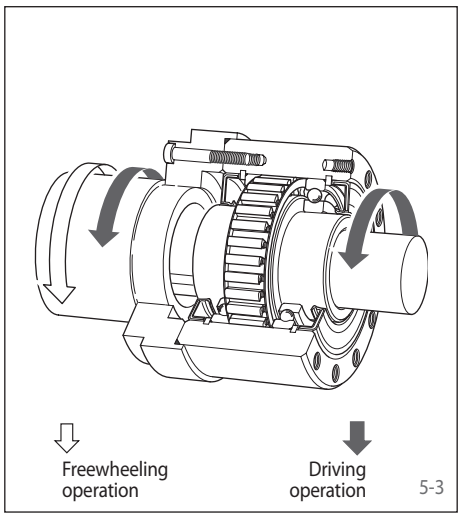


Figure 5-3 shows an overrunning clutch where in driving operation the power flow is transferred from the inner ring to the outer ring and in freewheeling operation the outer ring overruns the inner ring at a higher speed.

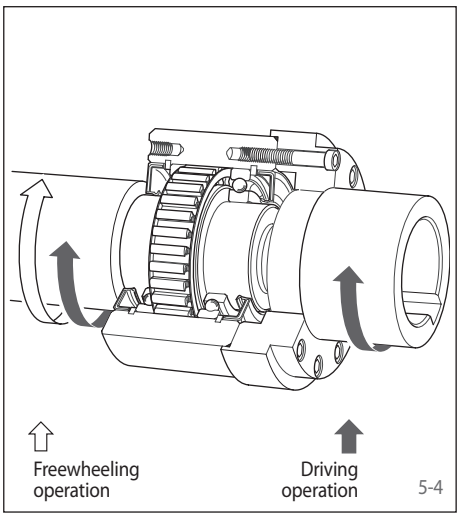


Figure 5-4 shows an overrunning clutch where in driving operation the power flow is transferred from the outer ring to the inner ring and in freewheeling operation the inner ring overruns the outer ring at a higher speed.

Indexing Freewheel

The indexing freewheel transmits a back and forth motion into a stepped rotation (indexed feed). The RINGSPANN indexing freewheel enables an infinitly adjustable setting of the feed, for precise and quiet operation.

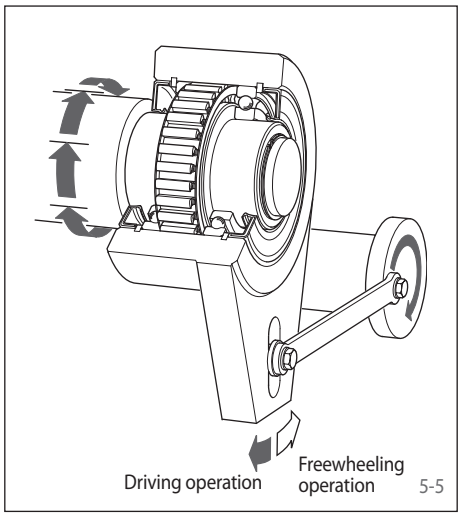


Figure 5-5 shows an indexing freewheel where the outer ring makes the back and forth motion and the inner ring carries out the indexed feed.

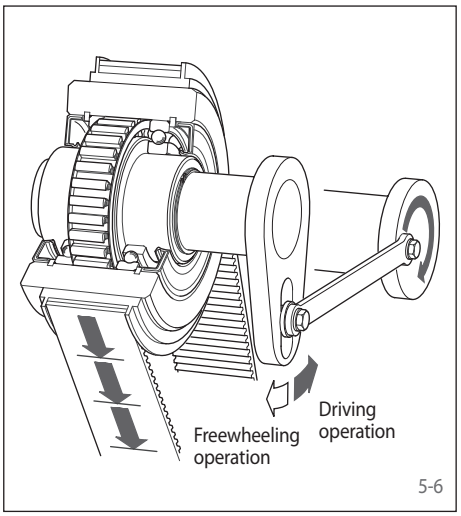
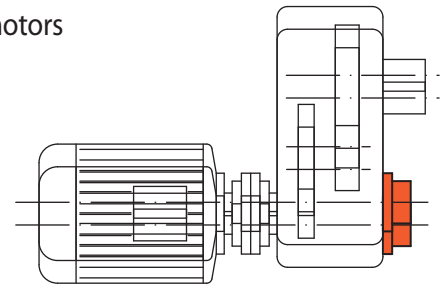


Figure 5-6 shows an indexing freewheel where the inner ring makes the back and forth motion and the outer ring carries out the indexed feed.

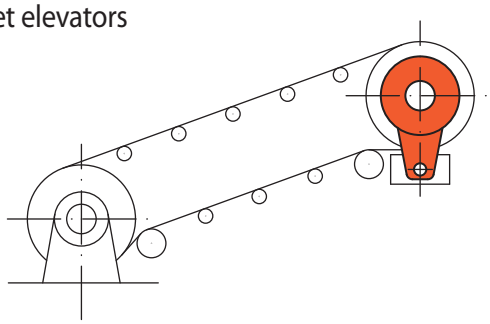
Applications for Freewheels

Gear units
Electric motors
Gear motors



The backstop prevents reverse rotation of the drive of a conveyor installation if the power fails or the motor is turned off.

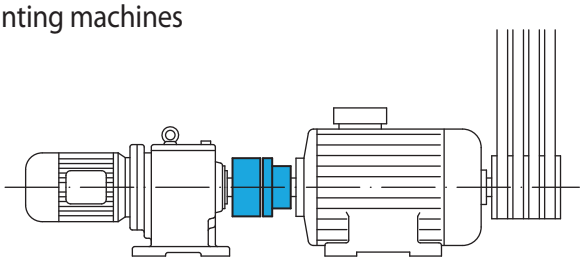
Inclined conveyors
Elevators
Bucket elevators



The backstop prevents reverse rotation of the conveyor load if the power fails or the motor is turned off.

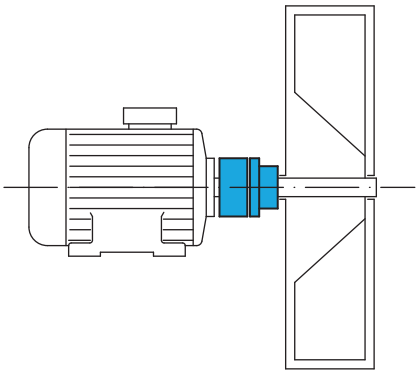
Areas of application for Overrunning Clutches

Textile machines
Printing machines



During normal operation of textile or printing machines, the overrunning clutch separates the auxiliary drive which is used as a starter from the main drive.

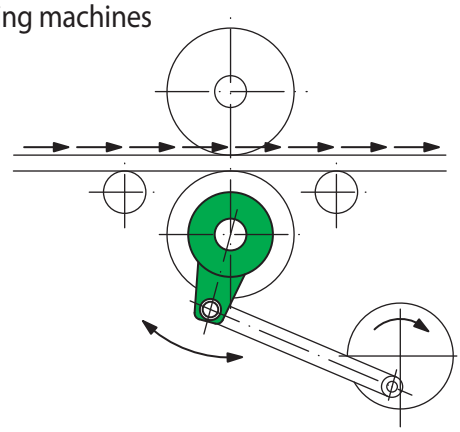
Fans



If fans are turned off, the overrunning clutch prevents the flywheel mass from rotating the drive.

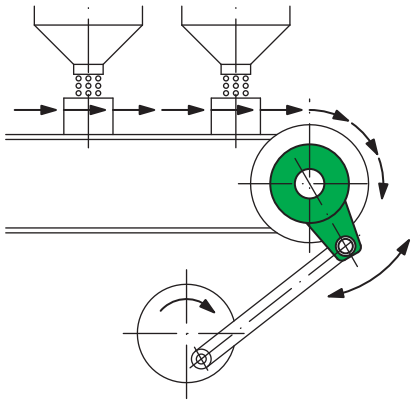
Areas of application for Indexing Freewheels

Textile machines
Printing machines



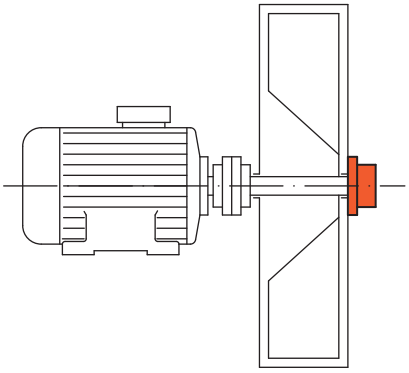
The indexing freewheel generates an indexed feed in textile and printing machines.

Packaging machines
Filling plants



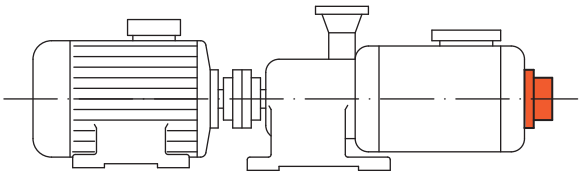
The indexing freewheel is used in packaging machines and filling plants for an indexed feed.

Fans



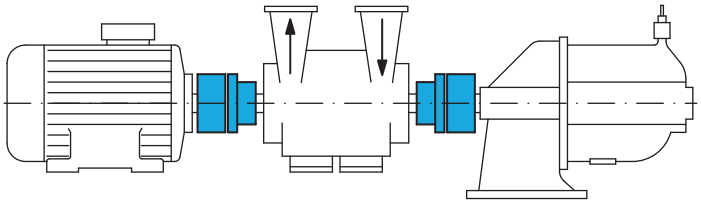
The backstop prevents the motor from reverse rotation under the back pressure when it is turned off.

Pumps
Compressors



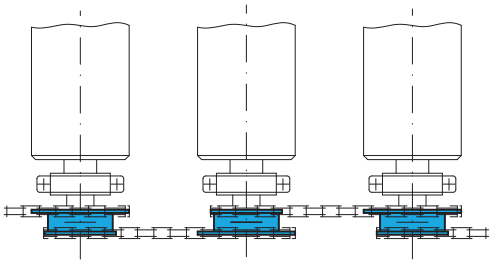
The backstop prevents the motor from reverse rotation under the back pressure when it is turned off.

Pumps
Generators



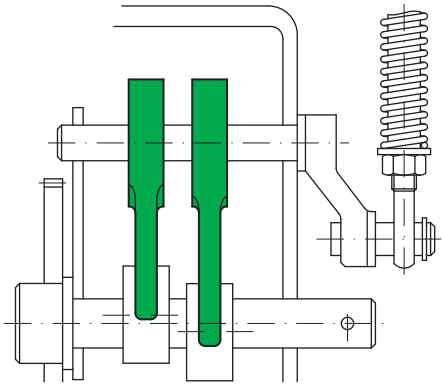
In multimotor drives the overrunning clutch disengages the inactive or lower speed drive.

Roller conveyor



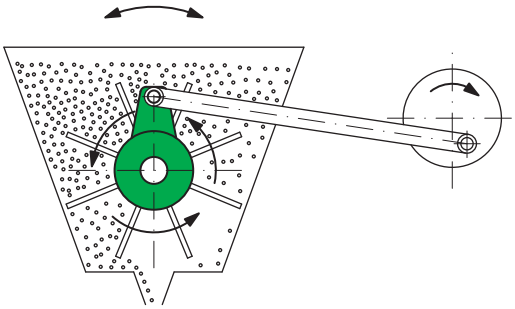
The overrunning clutch ensures that the conveyed material can be pushed or pulled faster over the rollers than the speed of the drive.

High voltage switches



In high voltage switches for tensioning a spring, the indexing freewheel is used in the place of a reduction gear.

Seed spreader



The indexing freewheel replaces a reduction gear in seed spreader.

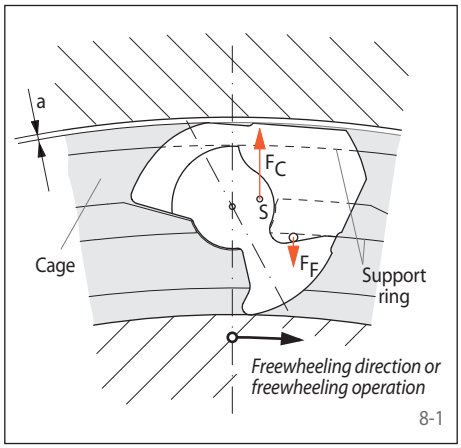
Use as	Standard type	Type with sprag lift-off X	Type with sprag lift-off Z
	For universal use	To extend service life using sprag lift-off for high speed rotating inner ring	To extend service life using sprag lift-off for high speed rotating outer ring
Backstop	Up to medium speeds during freewheeling operation (inner or outer ring freewheels)	Up to very high speeds during freewheeling operation (inner ring freewheels)	Up to very high speeds during freewheeling operation (outer ring freewheels)
Overrunning Clutch	Up to medium speeds during freewheeling operation (inner or outer ring overruns)	Up to very high speeds during freewheeling operation (inner ring overruns)	Up to very high speeds during freewheeling operation (outer ring overruns)
	Up to very high speeds in driving operation (outer or inner ring drives)	Low speeds in driving operation (outer ring drives)	Low speeds in driving operation (inner ring drives)
Indexing Freewheel	Up to a medium total number of actuations		

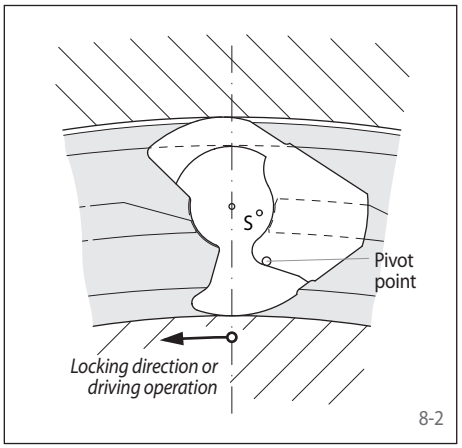
In addition to the standard type, RINGSPANN has developed other types to extend service life for freewheels with sprags. The table above lists the recommended application conditions for these types.

Type with sprag lift-off X

The sprag lift-off X is used for backstops and overrunning clutches, provided that in freewheeling operation the inner ring is rotating at high speed and with overrunning clutches that the driving operation is at a low speed. In freewheeling operation, the centrifugal force F_C causes the sprag to lift off from the sprag track of the outer ring. In this operating state, the freewheel operates wear-free with unlimited service life.

Figure 8-1 shows a freewheel with sprag lift-off X in freewheeling operation. The sprags, which are supported in a cage connected to 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. This results in the gap "a" between the sprag and the sprag track of the outer ring; the freewheel works without contact. If the inner ring speed decreases to such an extent that the effect of the centrifugal force on the sprag is less than that of the spring force F_F, the sprag again rests on the outer track and the freewheel is ready to lock (figure 8-2). If used as an overrunning clutch, the driving speed must not exceed 40% of the lift-off speed.

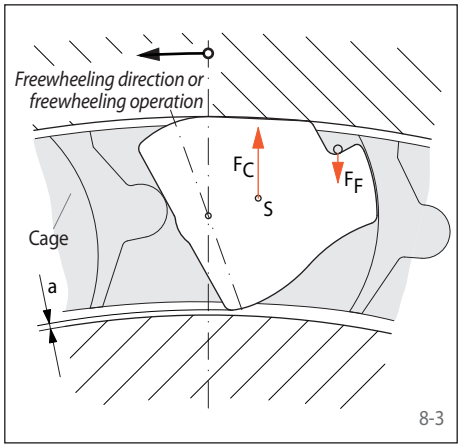


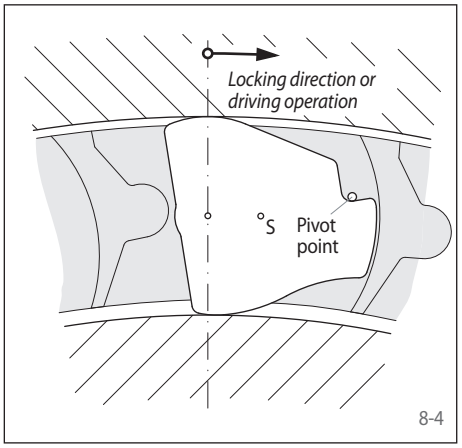


Type with sprag lift-off Z

The sprag lift-off Z is used for backstops and overrunning clutches, provided that in freewheeling operation the outer ring is rotating at high speed, and with overrunning clutches that the driving operation is at a low speed. In freewheeling operation, the centrifugal force F_C causes the sprag to lift off from the sprag track of the inner ring. In this operating state, the freewheel operates wear-free with unlimited service life.

Figure 8-3 shows a freewheel with sprag lift-off Z in freewheeling operation. The sprags rotate with the outer ring. The centrifugal force F_C that is applied in the centre of gravity S of the sprag turns the sprag counterclockwise and rests against the outer ring. This results in the gap "a" between the sprag and the sprag track of the inner ring; the freewheel works without contact. If the outer ring speed decreases to such an extent that the effect of the centrifugal force on the sprag is less than that of the spring force F_F, the sprag again rests on the inner track and the freewheel is ready to lock (figure 8-4). If used as an overrunning clutch, the driving speed must not exceed 40% of the lift-off speed.





Selection torque for Backstops

Bringing a loaded inclined conveyor, an elevator or a pump to a standstill is a highly dynamic process that incurs high peak torques. These peak torques are critical in the selection of the backstop. The determination of peak torques in the case of locking is more accurate by using a rotational vibration analysis of the entire system. This requires a knowledge of rotational masses, the rotational rigidity and the excitation moments that occur in 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 M_A of the backstop should be determined as follows:

$M_A = 1.75 \cdot M_L$ [lb-ft]

Often you only have the figures for the motor nominal output P_0 [hp] available. Then:

$M_A = F \cdot 5250 \cdot P_0/n_{SP}$ [lb-ft]

In these equations:

M_A = Selection torque of the backstop [lb-ft]

M_L = Static backdriving torque of the load referring to the backstop shaft [lb-ft]

P_0 = Nominal power of motor [hp]

n_{SP} = Speed of backstop shaft [rpm]

F = Selection factor (refer to table)

After calculating M_A the backstop size must be selected in accordance with the catalog tables in such a way that in all cases this applies:

$M_N \geq M_A$

M_N = Nominal torque of the backstop in accordance with the table values [lb-ft]

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 for F:

Type of installation	F
Conveyor belts, angle up to 6°	0.88
Conveyor belts, angle up to 8°	1.07
Conveyor belts, angle up to 10°	1.21
Conveyor belts, angle up to 12°	1.29
Conveyor belts, angle up to 15°	1.39
Screw pumps	1.51
Ball mills, drying drums	1.26
Bucket conveyors, elevators	1.48
Hammer mills	1.51
Fans, Ventilators	0.49

Selection torque for Overrunning Clutches

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 using elastic couplings – significantly exceed the torque calculated from the motor pull-over torque. The conditions for internal combustion engines are similar. Even in normal operation, their degree of irregularity, peak torques can occur that are considerably greater than the nominal torque.

The prior determination of the maximum occurring torque is carried out more accurately 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 M_A of the overrunning clutch should be determined as follows:

$M_A = K \cdot M_L$

In this equation:

M_A = Selection torque of the freewheel

K = Operating factor (refer to table)

M_L = Load torque for constant rotating freewheel:

$= 5\,250 \cdot P_0/n_{FR}$

P_0 = Nominal power of motor [hp]

n_{FR} = Speed of the freewheel in driving operation [rpm]

After calculating M_A the freewheel size must be selected in accordance with the catalog tables in such a way that in all cases this applies:

$M_N \geq M_A$

M_N = Nominal torque of the freewheel in accordance with the table values [lb-ft],

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	0.8 to 2.5
Electric motors with considerable start up impact (e.g. synchronous or asynchronous motors with direct start)	1.25 to 2.5
Piston engines with more than two cylinders, water turbines, hydraulic motors	1.25 to 3.15
Piston engines with one or two cylinders	1.6 to 3.15

The operating factor K depends on the properties of the driver and the machine. The general rules of mechanical engineering apply here. We know from practice that applications are known where the operating factor K can also assume values of up to 20, e.g. with a direct start-up of asynchronous electric motors in connection with elastic couplings.

Selection torque for Indexing Freewheels

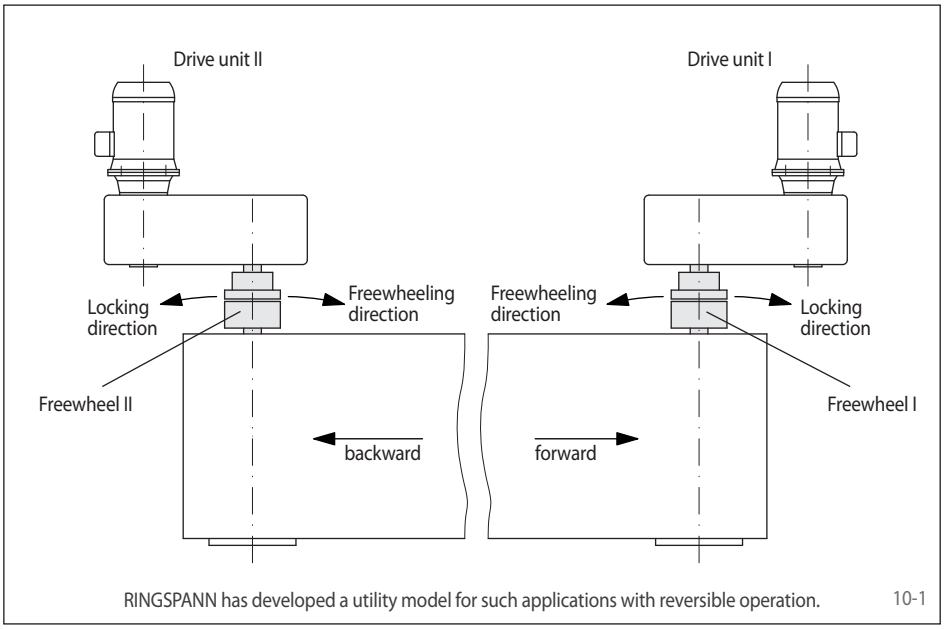
The selection torque for indexing freewheels is, among other things, dependent upon how the back and forth motion is generated (crank operation, hydraulic cylinders, pneumatic cylinders etc.). It cannot be specified in a simple equation. When stating the maximum torque to be transmitted, we are happy to advise you regarding the selection torque.

Complete Freewheels FRS and FRSG

for bolting to the face with sprags

RINGSPANN®

10-1



RINGSPANN has developed a utility model for such applications with reversible operation. 10-1

Application as

- Backstop
- Overrunning Clutch
- Indexing Freewheel

Features

Complete Freewheels FRS and FRSG are sealed sprag freewheels with ball bearings and ready for installation.

The freewheels FRS are supplied oil-filled.

The freewheels FRSG are supplied grease filled.

Maximum torques up to 55 000 lb-ft.

Bores up to 7 inch. Standard bores in inch dimension are available from stock. Metric bores on request.

Application example

Complete Freewheels FRS 600 in both drive units of a transport system with a conveyor belt that moves both forward and backward (reversible operation). In order to ensure that the conveyor belt is moved under tension, forward movement is driven by drive unit I, reverse movement by drive unit II. The freewheels automatically disengage the respective non working drive, eliminating the need for expensive external clutches or brakes.

For forward movement, drive unit II is started in freewheeling direction of freewheel II; freewheel II is in freewheeling operation and disengages drive unit II from the conveyor belt. Afterwords drive unit I is started in the locking direction of the freewheel I; freewheel I is in driving operation and the conveyor belt is moved forward by drive unit I. The speed of drive unit I is lower than that of drive unit II. Thus freewheel II remains in freewheeling operation and drive unit II is not improperly engaged.

For reverse movement, the drive units are started in reverse order and direction of rotation at the corresponding speeds.

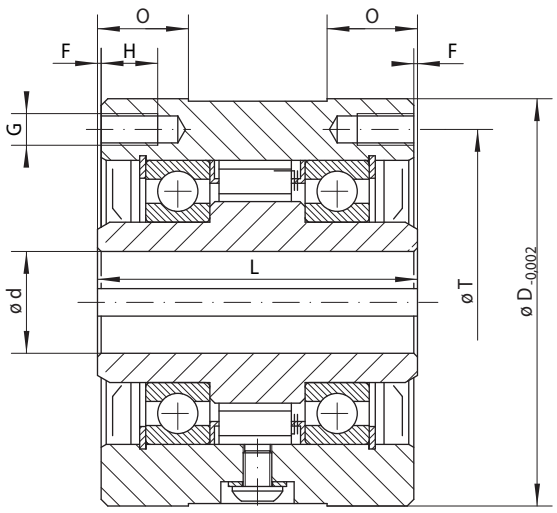
The mentioned application for a reversing conveyor requires speed control for both of the drives.

Conveyors operating in the same direction can use clutches in conjunction with the two drives.

Complete Freewheels FRS and FRSG

RINGSPANN®

for bolting to the face with sprags



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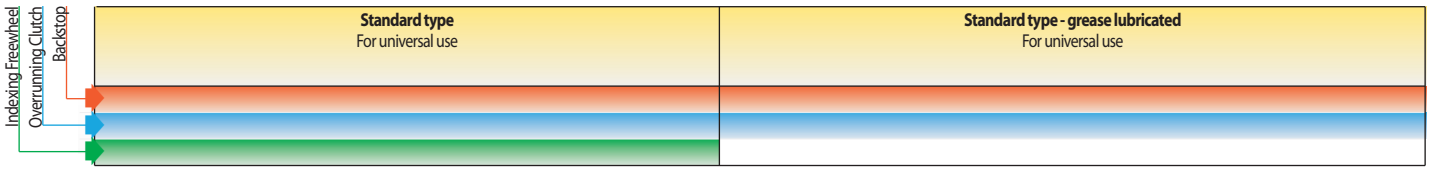


Freewheel Size	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Max. speed inner ring freewheels/ overruns rpm	Max. speed outer ring freewheels/ overruns rpm	Freewheel Size	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Max. speed inner ring freewheels/ overruns rpm	Max. speed outer ring freewheels/ overruns rpm
FRS 300	420	210	2500	2600	FRSG 300	420	210	3600	3600
FRS 400	670	335	1900	2100	FRSG 400	670	335	3600	3600
FRS 500	1600	800	1400	1900	FRSG 500	1600	800	3600	3600
FRS 550	3050	1525	1175	1600	FRSG 550	3050	1525	3600	3600
FRS 600	3900	1950	1100	1500	FRSG 600	3900	1950	3600	3600
FRS 650	5400	2700	900	1250	FRSG 650	5400	2700	3600	3600
FRS 700	11050	5525	790	1150	FRSG 700	11050	5525	1800	1800
FRS 750	18700	9350	790	1150	FRSG 750	18700	9350	1800	1800
FRS 775	17000	8500	750	1050	FRSG 775	17000	8500	1800	1800
FRS 800	22200	11100	700	950	FRSG 800	22200	11100	1800	1800
FRS 900	33600	16800	700	950	FRSG 900	33600	16800	1200	1200
FRS 1000	55000	27500	630	800	FRSG 1000	55000	27500	1200	1200

See page 9 for determination of selection torque.

Freewheel Size	Bore d Standard bores inch									max. inch	D inch	F inch	G Thread	L inch	H inch	O inch	T inch	Z*	Weight lbs
FR … 300	0.500	0.650	0.750							0.750	3.000	0.063	0.250-28	2.500	0.375	0.750	2.625	4	3.5
FR … 400	0.500	0.625	0.750	0.875	1.000	1.125				1.125	3.500	0.032	0.312-24	2.750	0.500	0.750	2.875	4	6.0
FR … 500	0.875	1.000	1.125	1.250	1.312					1.312	4.250	0.063	0.312-24	3.500	0.625	1.000	3.625	4	10.0
FR … 550	1.250	1.312	1.500	1.625						1.625	4.750	0.063	0.312-24	3.250	0.540	0.750	4.250	6	12.0
FR … 600	1.250	1.375	1.438	1.500	1.625	1.688	1.750	1.938	2.000	2.000	5.375	0.063	0.312-24	3.750	0.625	1.000	4.750	6	19.0
FR … 650	1.938	2.000	2.250	2.438	2.500					2.500	6.500	0.063	0.375-24	3.500	0.750	1.000	5.750	8	24.0
FR … 700	1.938	2.000	2.250	2.438	2.500	2.750	2.938			2.938	7.125	0.063	0.375-24	5.000	0.750	1.000	6.250	8**	42.0
FR … 750	2.438	2.500	2.938	3.000	3.250	3.438				3.438	8.750	0.063	0.500-20	6.000	0.875	1.250	7.000	8**	83.0
FR … 775	2.750	2.938	3.000	3.250	3.438	3.500	3.750			3.750	9.750	0.063	0.500-20	6.000	0.875	1.250	8.500	8	96.0
FR … 800	3.000	3.250	3.438	3.500	3.750	3.937	4.000	4.250	4.500	4.500	10.000	0.063	0.500-20	6.000	0.875	1.250	8.937	8	102.0
FR … 900	4.000	4.438	4.500	4.938	5.000	5.438				5.438	12.000	0.063	0.625-18	6.375	1.000	1.375	9.750	10	156.0
FR … 1000	5.750	5.938	6.000	6.750	6.875	7.000				7.000	15.000	0.063	0.625-18	6.625	1.000	1.375	11.750	12	250.0

* Z = Number of tapped holes G on pitch circle T.
** Six holes are equally spaced 60° apart with two additional holes located 30° from the six equally spaced holes and 180° apart.
Keyway dimensions upon request by customers.

Mounting

The customer attachment part is centered on the external diameter D and then bolted on to the face.

The recommended tolerance of the shaft is + 0 / - 0.001 inch and the tolerance of the pilot diameter D of the attachment part is - 0 / + 0.002 inch.

Labyrinth Seals

Labyrinth seals are available to provide additional protection for harsh environments.

Complete Freewheels FRX and FRZ

for bolting to the face
with sprag lift-off X or lift-off Z

Application as

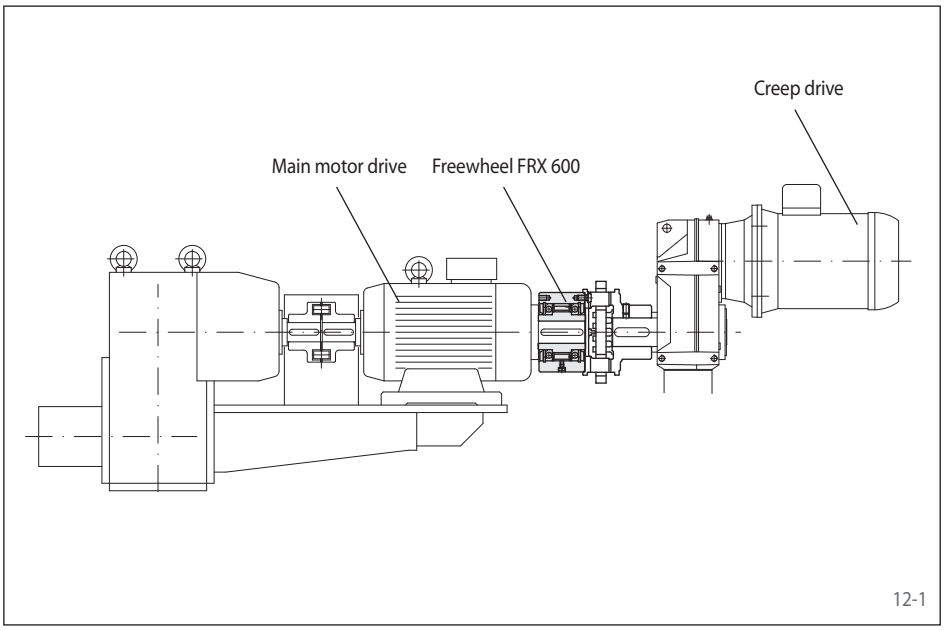
- Backstop
- Overrunning Clutch

Features

Complete Freewheels FRX and FRZ are sealed sprag freewheels with ball bearings and sprag lift-off X or sprag lift-off Z.

Maximum torques up to 30 000 lb-ft.

Bores up to 5.438 inch. Standard bores in inch dimension are available from stock. Metric bores on request.

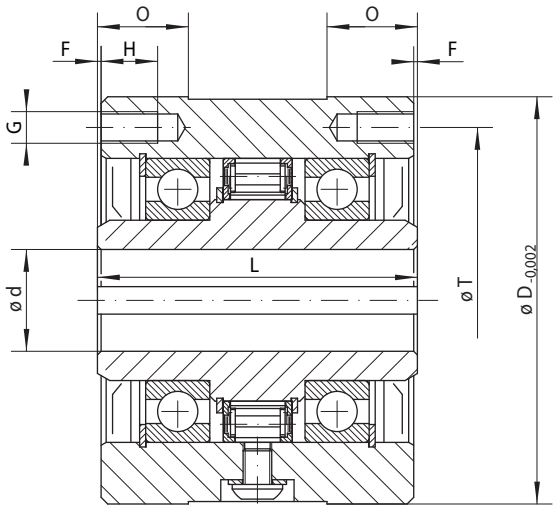


Application example

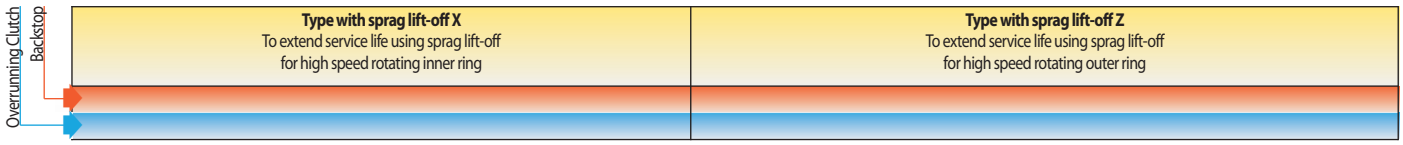
Complete Freewheel FRX 600 as an overrunning clutch in the drive unit of a conveyor belt system with additional creep drive. The freewheel with shaft coupling is installed between the main motor and the creep drive. When the creep drive operates, the freewheel is in driving operation and drives the belt at low speed. During normal operation (freewheeling operation), the main motor drives and the inner ring overruns and the creep drive is automatically disengaged. With this high speed, sprag lift-off X is used; the sprags work in freewheeling operation without contact and are wear-free.

Complete Freewheels FRX and FRZ

for bolting to the face with sprag lift-off X or lift-off Z



13-1



Freewheel Size	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Sprag lift-off at inner ring speed rpm	Max. speed inner ring freewheels/ overruns rpm	Max. speed outer ring drives rpm	Freewheel Size	Max. torque M_M lb-ft	Nominal torque M_N lb-ft	Sprag lift-off at outer ring speed rpm	Max. speed outer ring freewheels/ overruns rpm	Max. speed inner ring drives rpm
FRX 400	250	125	860	4000	340	FRZ 400	560	280	800	2600	320
FRX 500	850	425	750	4000	300	FRZ 500	1070	535	1400	2050	560
FRX 550	1500	750	700	4000	280	FRZ 550	2760	1380	1550	1800	620
FRX 600	2000	1000	670	4000	265	FRZ 600	3530	1765	1450	1650	580
FRX 650	3500	1750	610	3100	240	FRZ 650	5000	2500	1300	1400	520
FRX 700	8100	4050	350	2600	140	FRZ 700	10500	5250	1160	1200	465
FRX 750	14600	7300	320	2400	125	FRZ 750	17500	8750	1160	1200	465
FRX 775	14800	7400	320	2100	125	FRZ 775	15000	6500	950	1050	380
FRX 800	29000	14500	250	1800	100	FRZ 800	17400	8700	880	975	350
FRX 900	30000	15000	250	650	100	FRZ 900	26000	13000	720	925	288

See page 9 for determination of selection torque.

Freewheel Size	Bore d Standard bores inch									max. inch	D inch	F inch	G Thread	L inch	H inch	O inch	T inch	Z**	Weight lbs
FR … 400	0.500	0.625	0.750	0.875	1.000*	1.125*				1.125	3.500	0.032	0.312-24	2.750	0.500	0.750	2.875	4	6.0
FR … 500	0.875	1.000	1.125	1.250	1.312					1.312	4.250	0.063	0.312-24	3.500	0.625	1.000	3.625	4	10.0
FR … 550	1.250	1.312	1.500	1.625						1.625	4.750	0.063	0.312-24	3.250	0.540	0.750	4.250	6	12.0
FR … 600	1.250	1.375	1.438	1.500	1.625	1.688	1.750	1.938	2.000	2.000	5.375	0.063	0.312-24	3.750	0.625	1.000	4.750	6	19.0
FR … 650	1.938	2.000	2.250	2.438	2.500					2.500	6.500	0.063	0.375-24	3.500	0.750	1.000	5.750	8	24.0
FR … 700	1.938	2.000	2.250	2.438	2.500	2.750	2.938			2.938	7.125	0.063	0.375-24	5.000	0.750	1.000	6.250	8***	42.0
FR … 750	2.438	2.500	2.938	3.000	3.250	3.438				3.438	8.750	0.063	0.500-20	6.000	0.875	1.250	7.000	8***	83.0
FR … 775	2.750	2.938	3.000	3.250	3.438	3.500	3.750			3.750	9.750	0.063	0.500-20	6.000	0.875	1.250	8.500	8	96.0
FR … 800	3.000	3.250	3.438	3.500	3.750	3.937	4.000	4.250	4.500	4.500	10.000	0.063	0.500-20	6.000	0.875	1.250	8.937	8	102.0
FR … 900	4.000	4.438	4.500	4.938	5.000	5.438				5.438	12.000	0.063	0.625-18	6.375	1.000	1.375	9.750	10	156.0

* Not available for FRX. Max bore 0.875 inch.
** Z = Number of tapped holes G on pitch circle T.
*** Six holes are equally spaced 60° apart with two additional holes located 30° from the six equally spaced holes and 180° apart.
Keyway dimensions upon request by customers.

Mounting

The customer attachment part is centered on the external diameter D and then bolted on to the face.

The recommended tolerance of the shaft is + 0 / - 0.001 inch and the tolerance of the pilot diameter D of the attachment part is - 0 / + 0.002 inch.

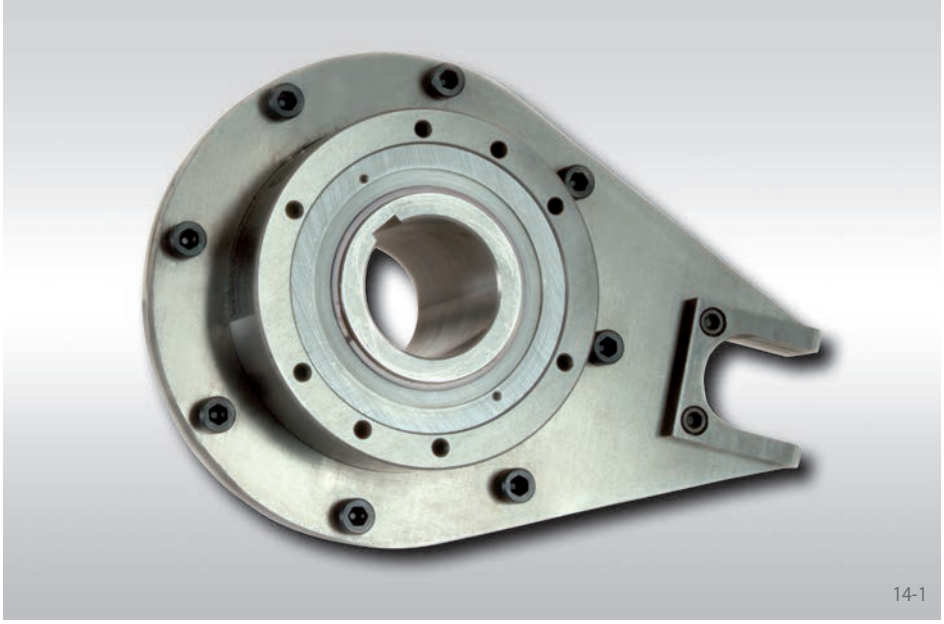
Labyrinth Seals

Labyrinth seals are available to provide additional protection for harsh environments.

Complete Freewheels FRXF

RINGSPANN®

with torque arm
with sprag lift-off X and sealed grease lubricated ball bearings



14-1

Application as

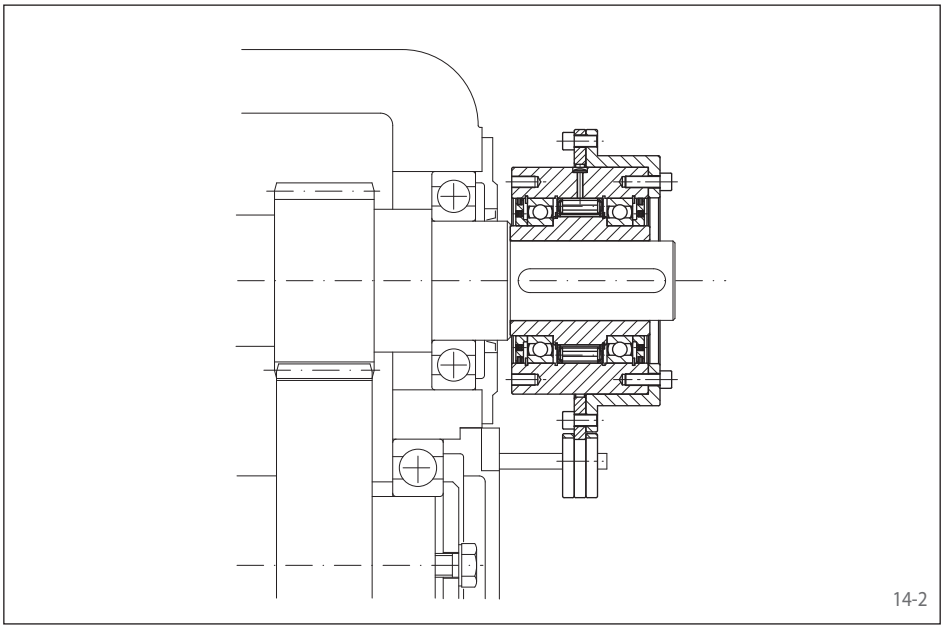
- Backstop

Features

Complete Freewheels FRXF are freewheels with sprag lift-off X, labyrinth seals, and sealed grease lubricated ball bearings. All units are supplied complete with torque arms. FRXF backstops are maintenance free and lubricated for life prior to shipping.

Maximum torques up to 29000 lb-ft.

Bores up to 4.5 inch. Standard bores are available from stock.



14-2

Application example

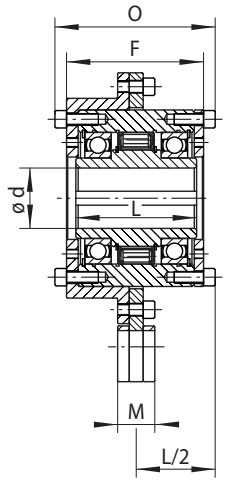
Complete Freewheel FRXF as backstop, arranged at the end of a high speed shaft of the gearbox. The back driving torque is restrained by the clutch torque arm and the gearbox torque arm pin.

With this high shaft speed under normal operation (freewheeling operation), sprag lift-off X is used; the sprags work in freewheeling operation without contact and are wear-free.

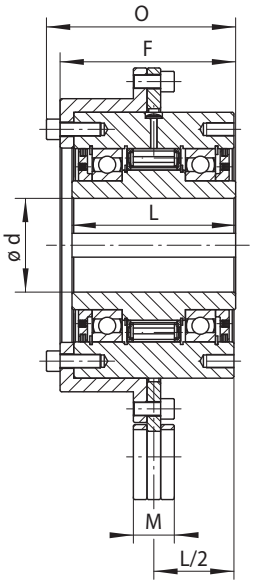
Complete Freewheels FRXF

RINGSPANN®

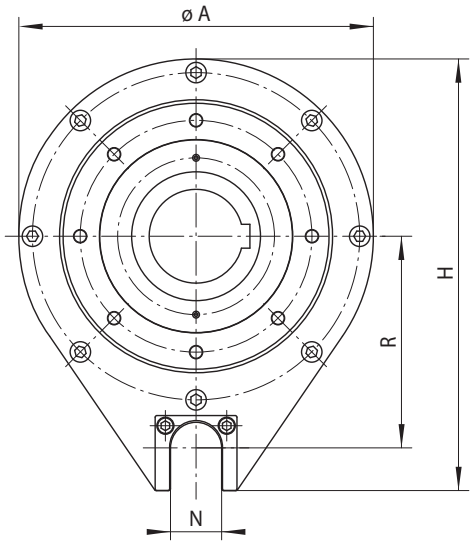
with torque arm
with sprag lift-off X and sealed grease lubricated ball bearings



Size FRXF 550



Size FRXF 700 to FRXF 800



15-1

Backstop

Type with sprag lift-off X To extend service life using sprag lift-off for high speed rotating inner ring	Dimensions

Freewheel Size	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Sprag lift-off at inner ring speed rpm*	Maximum speed inner ring overruns rpm	Bore d Standard bores inch							max. inch	A inch	F inch	H inch	L inch	M inch	N inch	O inch	R inch	Torque arm Size	Weight lbs
FRXF 550	1 500	750	700	4000	1.250	1.312	1.500	1.625				1.625	6.750	3.750	8.313	3.25	1.00	0.813	4.380	4.00	#10	20
FRXF 700	8 100	4050	350	3600	1.938	2.000	2.250	2.438	2.500	2.750	2.938	2.938	9.375	5.250	11.813	5.00	1.25	1.250	5.625	6.00	#20	60
FRXF 775	14 800	7300	320	2100	2.750	2.938	3.000	3.250	3.438	3.500	3.750	3.750	13.000	6.375	15.825	6.00	1.50	1.875	6.875	7.76	#60	150
FRXF 800	29 000	14500	250	1800	4.500							4.500	13.000	6.375	15.825	6.00	1.50	1.875	6.875	7.76	#60	160

See page 9 for determination of selection torque.
* Maximum recommended operating speed.
Keyway dimensions upon request by customers.

Mounting

The back driving torque is restrained by the clutch torque arm and the gearbox torque arm pin. It must have clearance of 1/4 inch to 1/2 inch in both radial and axial directions.

Complete Freewheels FRXF are furnished to size for a slip fit on the shaft.

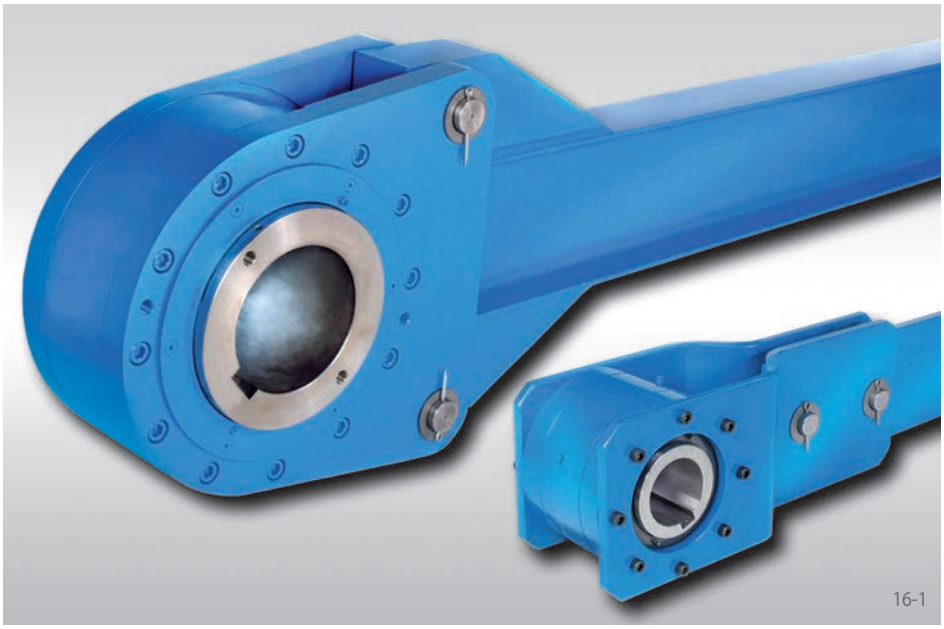
Non lift off clutch varieties are available when operating below sprag lift off speeds.

Lubrication

The freewheels FRXF 700 and larger are supplied with labyrinth seals, sealed grease lubrication ball bearings and required no additional lubrication.

Complete Freewheel FRHD

with torque arm
with sprags


16-1

Application as

- Backstop

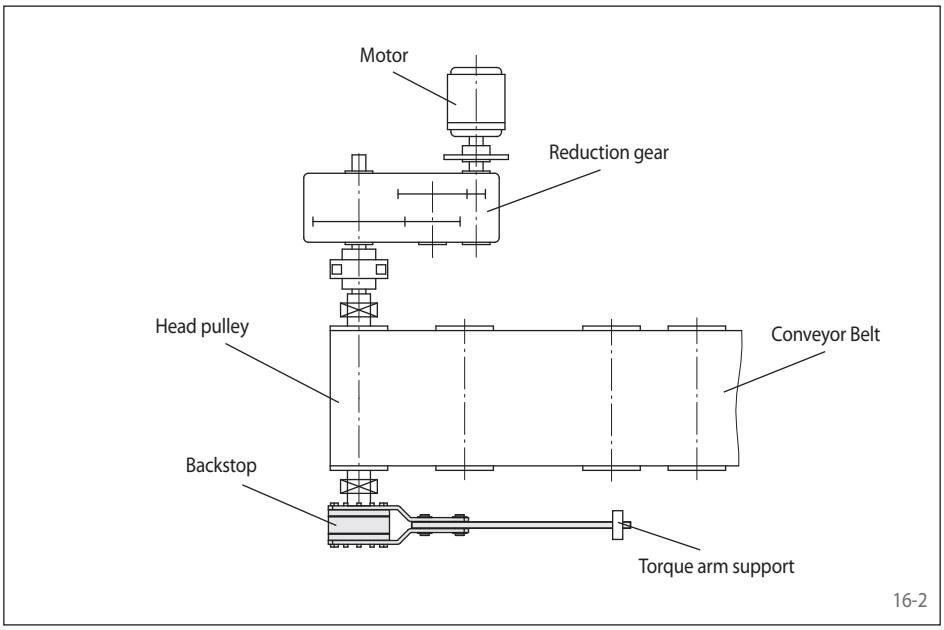
for installations with low speeds. The freewheels are designed for the use in inclined conveyor-belts, elevators or pumps. Taconite seals protect the freewheels from contamination with dust or dirt.

Features

Complete Freewheels FRHD with torque arm are sealed sprag freewheels with ball bearings. They are supplied oil-filled and ready for installation. The freewheels are arranged on through shafts or shaft ends.

Maximum torques up to 2 400 000 lb-ft.

Bores up to 21 inch.



16-2

Application example

Backstop FRHD 900 on the head pulley shaft of an inclined conveyor belt system. The torque arm is bolted to the freewheel. The back driving torque is restrained by the torque arm on the base plate.

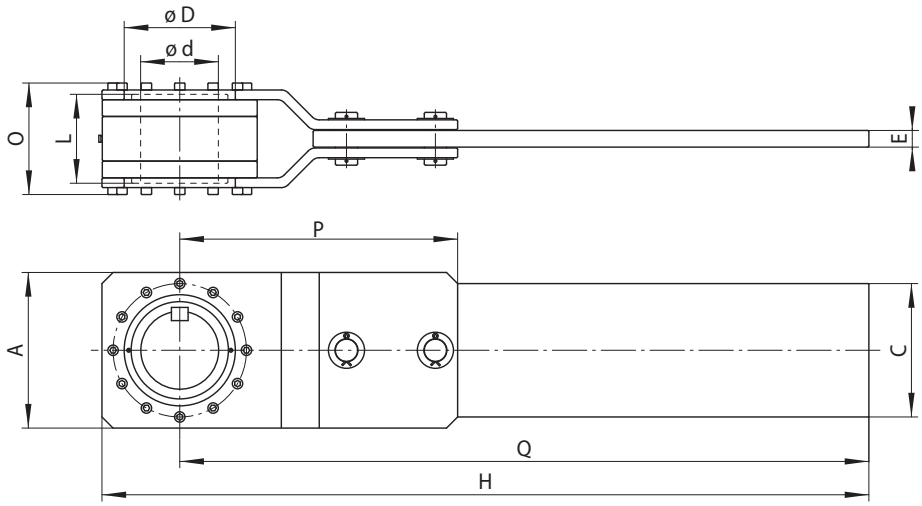

16-3

Mounting

The backdriving torque is restrained by the torque arm. The torque arm must not be clamped into position. It must have 0.5 inch play in the axial and in the radial direction.

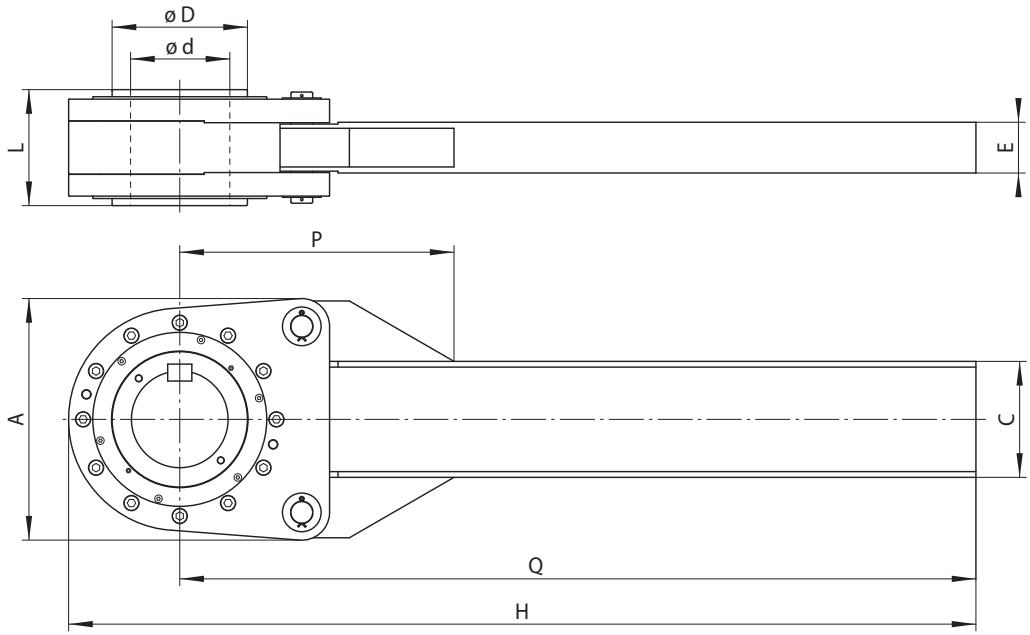
Complete Freewheel FRHD

with torque arm
with sprags



Size FRHD 700 to FRHD 950 and FRHD 1 050

17-1



Size FRHD 1 000 and FRHD 1 100 to FRHD 1 900

17-2

Backstop

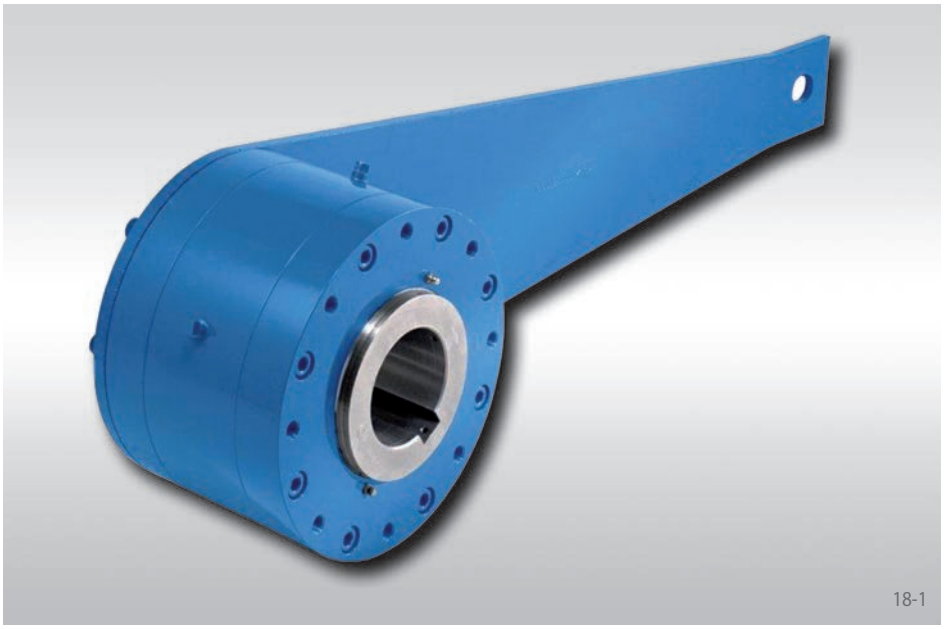
Standard type For universal use	Dimensions

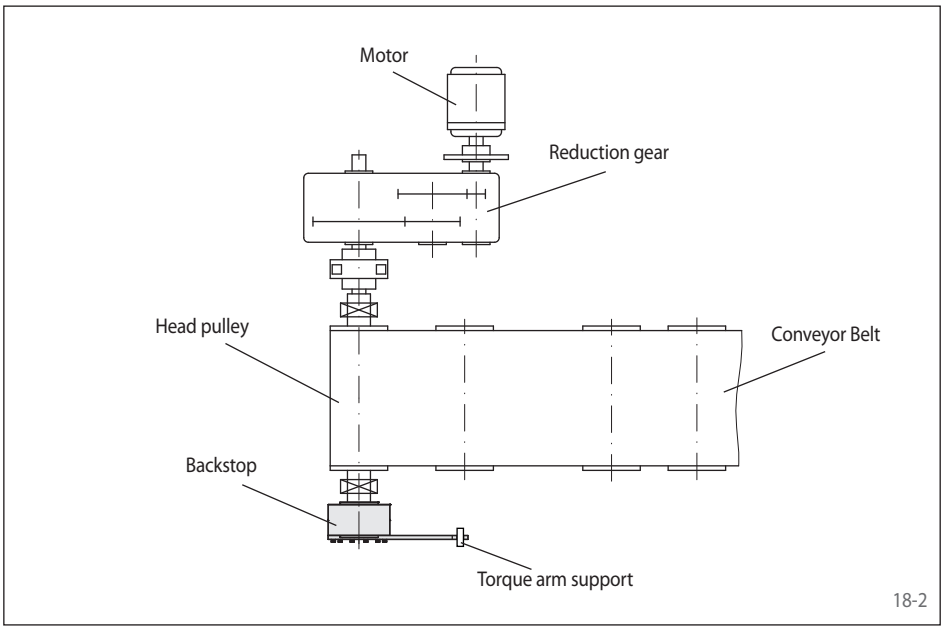
Freewheel Size	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Maximum speed inner ring freewheels rpm	Bore d max. inch	A inch	C inch	D inch	E inch	H inch	L inch	O inch	P inch	Q inch	Weight lbs
FRHD 700	7 500	3 750	620	3.44	8.00	6.00	5.25	0.50	36.00	6.00	6.75	16.38	32.00	135
FRHD 775	15 000	7 500	540	3.75	9.75	8.00	6.00	1.00	42.88	7.50	9.00	20.38	38.00	310
FRHD 800	24 000	12 000	460	4.50	10.50	10.00	7.00	1.00	43.25	8.00	9.50	22.13	38.00	360
FRHD 900	37 000	18 500	400	5.44	12.00	10.00	8.00	1.50	54.00	7.63	9.38	22.75	48.00	480
FRHD 950	46 000	23 000	360	7.00	14.00	12.00	10.00	1.50	69.00	8.00	10.00	25.00	62.00	530
FRHD 1 000	56 000	28 000	360	7.00	17.00	8.00	9.00	4.13	80.38	8.75	-	23.13	72.00	550
FRHD 1 050	90 000	45 000	360	7.00	14.00	12.00	10.00	1.50	79.00	10.50	12.50	29.00	72.00	600
FRHD 1 100	90 000	45 000	360	7.00	17.00	8.00	9.00	4.13	80.38	10.00	-	23.13	72.00	795
FRHD 1 200	185 000	92 500	250	9.00	23.00	10.00	12.00	4.94	89.00	11.00	-	28.00	78.00	1 300
FRHD 1 300	220 000	110 000	220	10.00	25.00	12.00	14.00	5.25	95.00	12.00	-	30.00	82.88	1 674
FRHD 1 400	280 000	140 000	200	12.00	30.00	18.00	16.00	6.25	107.00	13.00	-	36.00	94.00	2 200
FRHD 1 450	380 000	190 000	200	12.00	30.00	18.00	16.00	6.25	107.00	15.00	-	36.00	94.00	2 500
FRHD 1 500	580 000	290 000	200	12.00	31.00	18.00	15.13	6.25	107.00	17.62	-	36.00	94.00	2 440
FRHD 1 600	746 000	373 000	140	14.00	32.50	20.00	17.63	6.25	124.00	19.25	-	30.44	108.00	3 400
FRHD 1 700	1 250 000	625 000	120	18.00	42.50	24.50	23.00	7.88	140.00	20.00	-	48.00	120.00	7 000
FRHD 1 800	1 800 000	900 000	100	21.00	52.00	30.00	26.50	10.50	170.00	23.00	-	54.00	144.00	12 000
FRHD 1 900	2 400 000	1 200 000	60	21.00	52.00	30.00	27.00	10.50	216.00	27.00	-	54.00	192.00	14 000

See page 9 for determination of selection torque. • Keyway dimensions upon request by customers.

Complete Freewheel FRHM

with torque arm
with sprags


18-1



18-2

Application as

- Backstop

for installations with low speeds. The freewheels are designed for the use in inclined conveyor-belts, elevators or pumps. Taconite seals protect the freewheels from contamination with dust or dirt.

Features

Complete Freewheels FRHM with torque arm are sealed sprag freewheels with ball bearings. They are designed for interchanging the Morse® CB units, supplied oil-filled and ready for installation

The freewheels FRHM are arranged on through shafts or shaft ends.

Maximum torques up to 56 000 lb-ft.

Bores up to 7 inch.

Application example

Backstop FRHM 900-12 on the head pulley shaft of an inclined conveyor. The back driving torque is restricted by the torque arm on the base plate.

Mounting

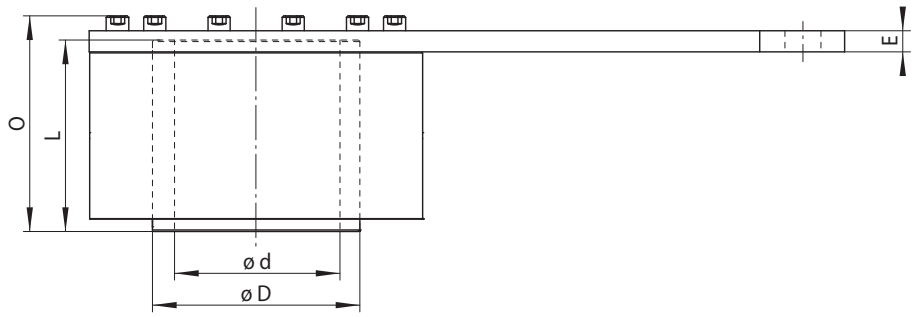
The back driving torque is restrained by the torque arm. The torque arm must not be clamped into position. It must have 0.5 inch play in the axial and in the radial direction.

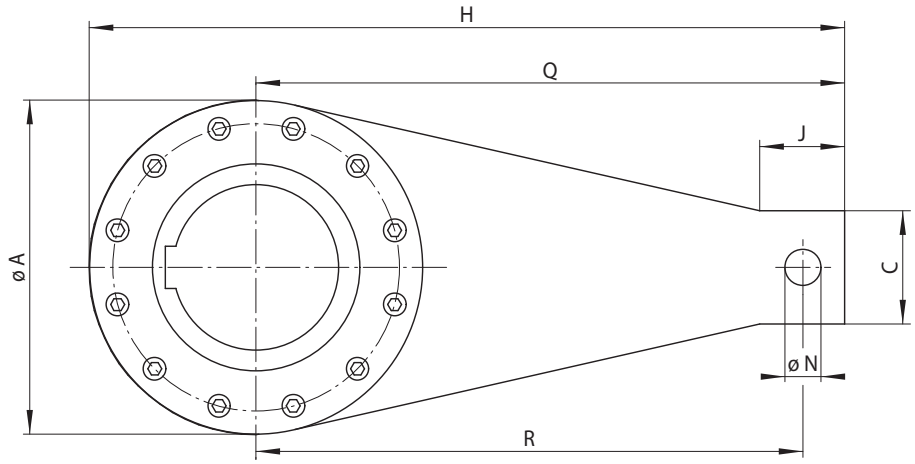
FRHM backstops are supplied for a clearance fit. Set screws on the inner ring are provided for axial retention, shaft collars are not required.

Complete Freewheel FRHM

with torque arm
with sprags

RINGSPANN®





19-1

Backstop

Standard type For universal use	Dimensions

Freewheel Size	Maximum torque M_M lb-ft	Nominal torque M_N 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 700-7	7500	3750	620	3.44	8.00	4.38	5.25	0.50	21.00	3.56	6.00	1.25	6.63	17.00	15.25	105
FRHM 775-7	15000	7500	540	3.75	9.75	4.38	6.00	0.50	21.88	3.56	7.50	1.25	8.13	17.00	15.25	160
FRHM 800-7	24000	12000	460	4.50	10.50	4.38	7.00	0.50	22.25	3.56	8.00	1.25	8.63	17.00	15.25	190
FRHM 800-12	24000	12000	460	4.50	10.50	4.75	7.00	0.50	25.50	3.56	8.00	1.25	8.63	20.25	18.63	200
FRHM 900-12	37000	18500	400	5.44	12.00	4.75	8.00	0.50	26.25	3.56	7.63	1.25	8.38	20.25	18.63	210
FRHM 900-19	37000	18500	400	5.44	12.00	4.75	8.00	0.88	30.63	3.56	7.63	1.50	8.75	24.63	22.88	220
FRHM 1000-19	56000	28000	360	7.00	16.50	4.75	9.00	0.88	32.89	3.56	8.75	1.50	9.13	24.63	22.88	270
FRHM 1000-30	56000	28000	360	7.00	16.50	5.25	9.00	0.88	33.25	3.56	8.75	1.75	9.13	25.00	23.00	275

See page 9 for determination of selection torque.
Keyway dimensions upon request by customers.
* Shaft length L and stirrup position J or pin position R should be considered. These dimensions may vary from the Morse® Series CB.

Complete Freewheels FA

with torque arm
with sprags and grease lubrication

Application as

- Backstop
- Indexing Freewheel

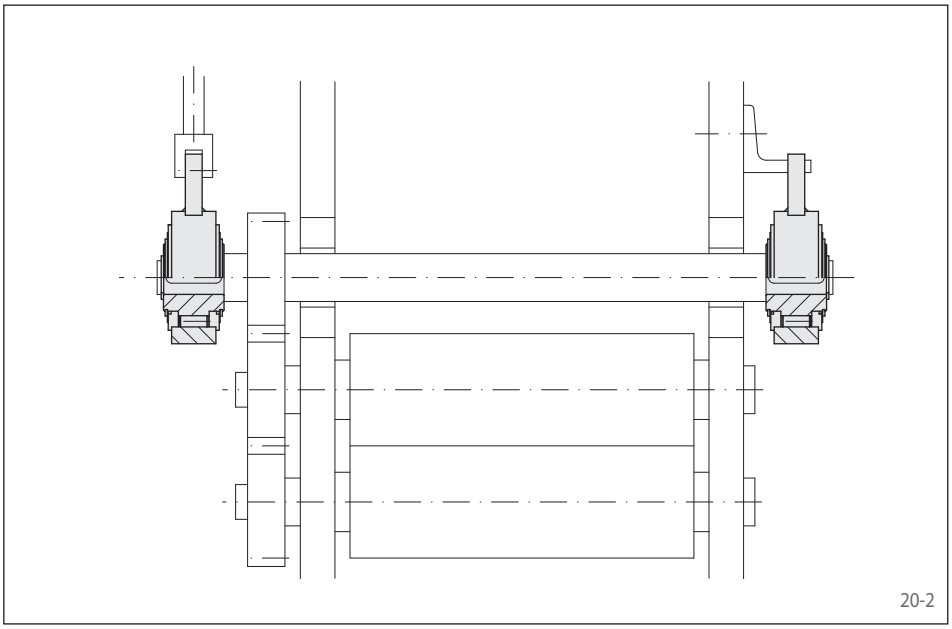
For application as backstop in installations with low speeds in freewheeling operation. For application as indexing freewheel in installations with low to medium total number of actuations.

Features

Complete Freewheels FA with torque arm are sprag freewheels with sleeve bearings. They are grease-lubricated and require no maintenance.

Maximum torques up to 3 690 lb-ft.

Bores up to 3.15 inch.

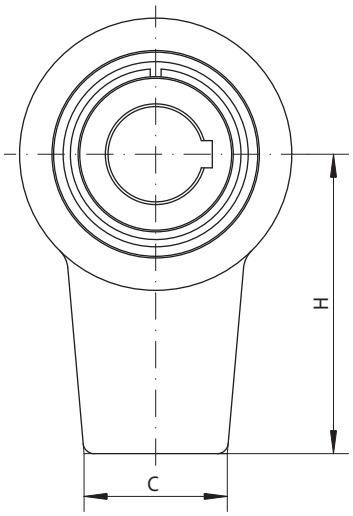


Application example

Two Complete Freewheels FA 57 in the roller feed of a sheet metal processing machine. The indexing freewheel arranged on the left is driven via a bell crank with an adjustable lift. This enables an infinite setting of the feed. The backstop arranged on the right prevents the indexing rollers from running backwards while the indexing freewheel carries out its back stroke. Often, an additional small brake is provided in order to prevent the accelerated sheet metal strip from advancing.

Complete Freewheels FA

with torque arm
with sprags and grease lubrication



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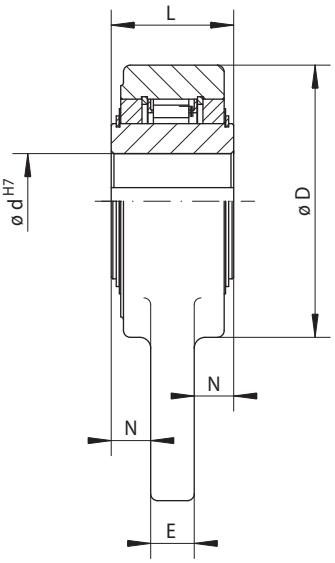

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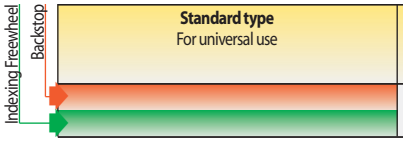


Standard type
For universal use

Dimensions

Freewheel Size	Type	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Max. speed inner ring freewheels rpm	Bore d max. inch	C inch	D inch	E inch	H inch	L inch	N inch	Weight lbs
FA 37	SF	340	170	250	0.984	1.378	2.992	0.472	3.543	1.378	0.453	2.2
FA 57	SF	930	465	170	1.650	1.969	3.937	0.630	4.921	1.772	0.571	5.5
FA 82	SF	2360	1180	130	2.560	2.362	5.512	0.709	6.299	2.362	0.827	12.2
FA 107	SF	3690	1845	90	3.350	3.150	6.693	0.787	7.087	2.559	0.886	18.8

See page 9 for determination of selection torque.
Keyway dimensions upon request by customers.

Mounting

When used as a backstop, the backdriving torque is supported by the torque arm. The torque arm must not be clamped into position. It must have 0.002 to 0.008 inch play in the axial and radial directions.

When used as an indexing freewheel, the torque arm serves as the indexing lever arm.

The torque arm is not heat treated enabling the customer alter the torque arm to suit his application.

The recommended tolerance of the shaft is + 0 / - 0.001 inch.

Complete Freewheels RFB

with torque arm and clamping collar or mounting flange with sprags and grease lubricated ball bearings

Application as

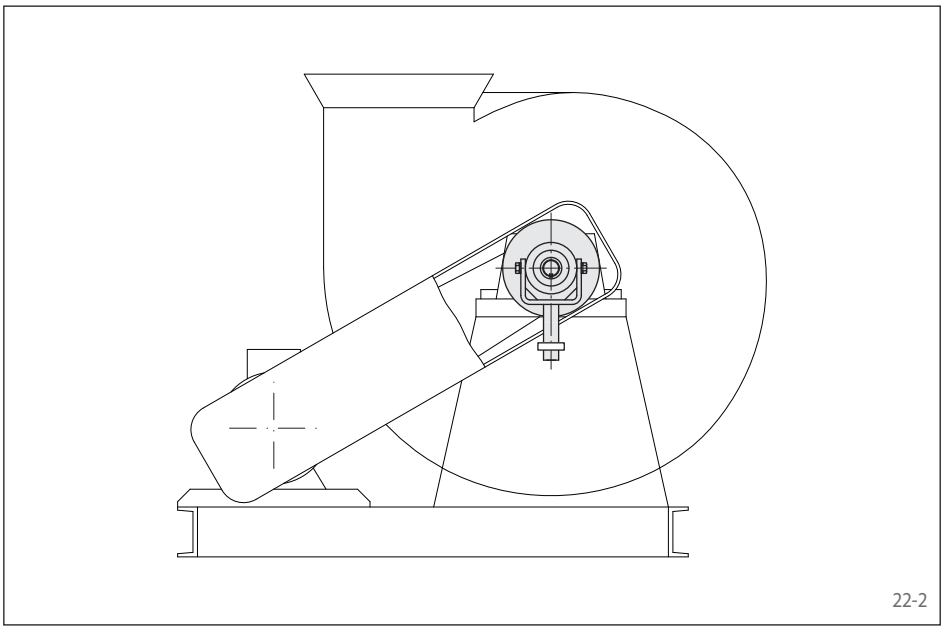
- Backstop

FeaturesFeatures

Complete Freewheels RFB are sprag freewheels with sealed grease lubricated ball bearings that require no maintenance. They are supplied with a clamping collar or a flange for direct mounting to standard bushings.

Maximum torques up to 900 lb-ft.

Bores up to 6 inch with clamping collar.



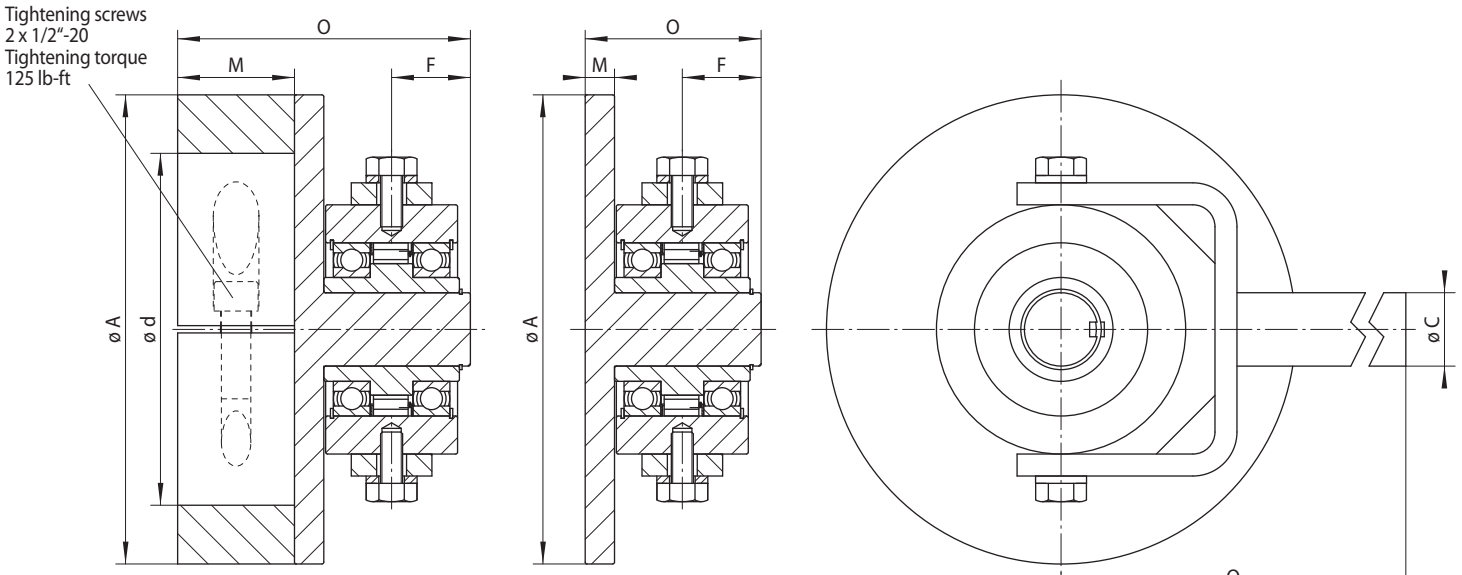
Application example

Complete Freewheel RFB as a backstop on a radial fan. The backstop prevents reverse rotation of the fan shaft from air flow or from incorrectly polarized drive motor.

Complete Freewheels RFB

RINGSPANN®

with torque arm and clamping collar or mounting flange with sprags and grease lubricated ball bearings



Size RFB 350 and 450 Type C with clamping collar

Size RFB 450 Type QD and Taper Lock with mounting flange

Backstop

Standard type For universal use	Dimensions

Freewheel Size	Type	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Maximum speed inner ring freewheels rpm	Bore d min. inch	Bore d max. inch	A inch	C* inch	F inch	M inch	O inch	Q inch	Connection/Bushing Type
RFB 350	C	700	350	1 800	1	3.94	6	1.25	1.34	2.0	5	16.63	Shaft end mounted
RFB 450	C	900	450	1 800	4	6.00	8	1.25	1.34	2.0	5	16.63	Shaft end mounted
RFB 450	QD	900	450	1 800	-	-	8	1.25	1.34	0.5	3	16.63	E F J
RFB 450	Taper Lock	900	450	1 800	-	-	8	1.25	1.34	0.5	3	16.63	3020 30525 2535 4030

See page 9 for determination of selection torque.

* A 3/4" inch diameter arm extension is available upon request.

Mounting

Backstops RFB are mounted with either a clamping collar to shaft end or a mounting flange that can be connected directly to a QD or Taper Lock bushing.

Additional shaft accessories may be required for RFB-TL designs, contact RINGSPANN.

Complete Freewheels FR … CA

with gear coupling
with sprags

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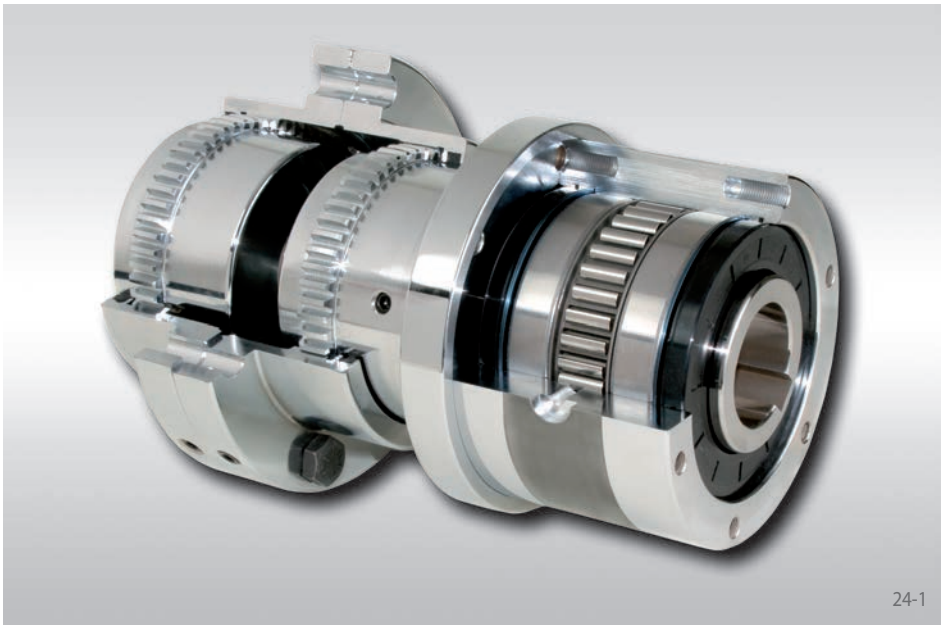


Application as

- Overrunning Clutch

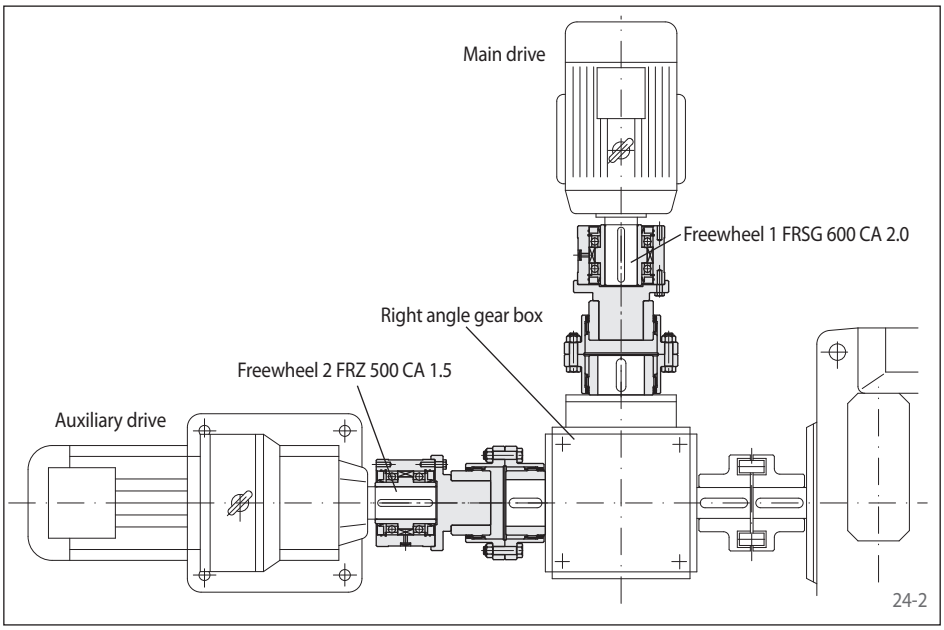
Features

Complete Freewheel FR … CA incorporate a freewheel FR … and a gear coupling. Freewheels are supplied oil or grease lubricated.

Maximum torques up to 55 000 lb-ft.

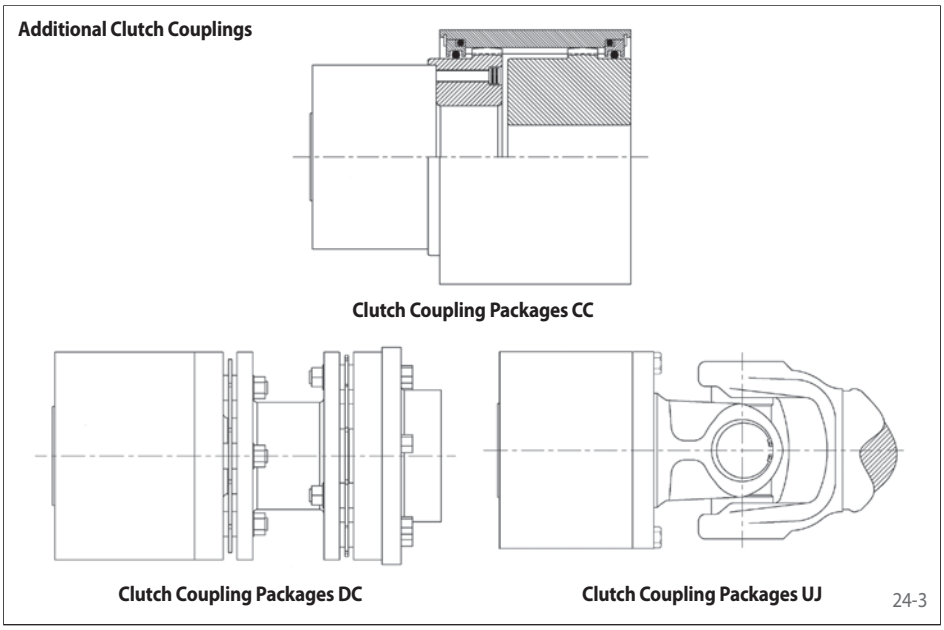
Bores up to 7 inch.

Complete Freewheels FR … CA allow for removal of the assembly without moving the connected equipment. The clutch should always be mounted on the low temperature shaft of the application.



Application Example

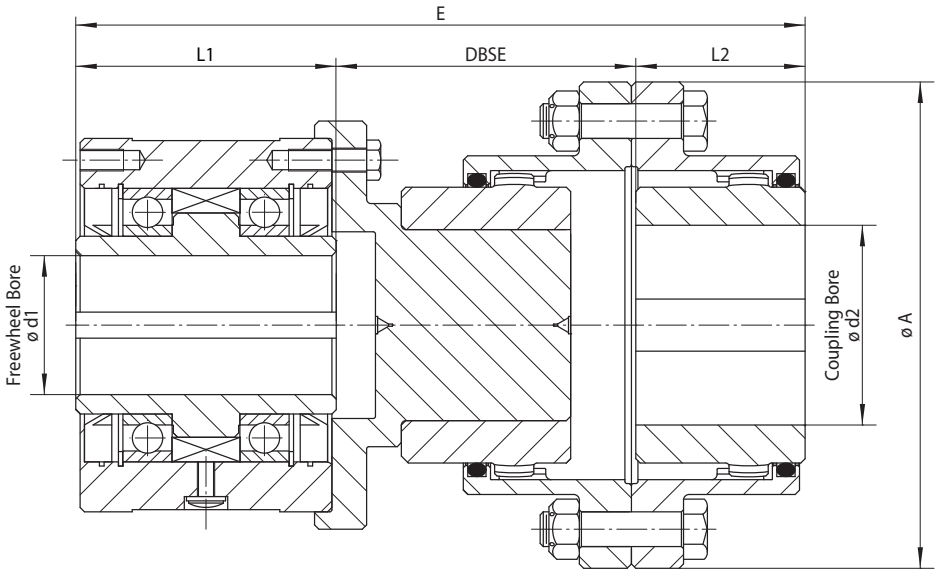
Two Complete Freewheels FR … CA with gear coupling as overrunning clutches in the drive unit of a tube mill with additional auxiliary drive. A freewheel FRSG 600 CA 2.0 (Freewheel 1) is arranged between the main drive and the right angle gear box. A freewheel FRZ 500 CA 1.5 (Freewheel 2) with sprag lift-off Z (page 26) is positioned between the auxiliary drive and the right angle gear box. If the auxiliary drive is operating, Freewheel 2 works in the driving operation and the Freewheel 1 overruns at a low speed (freewheel operation). When driving via the main drive, the unit is driven thru Freewheel 1 (driving operation) Freewheel 2 overruns and automatically disengages the auxiliary drive (freewheeling operation). With the high speed, the type with sprag lift-off Z is used. There is no contact of the sprags during freewheeling and therefore no wear.



Complete Freewheels FRS … CA and FRSG … CA

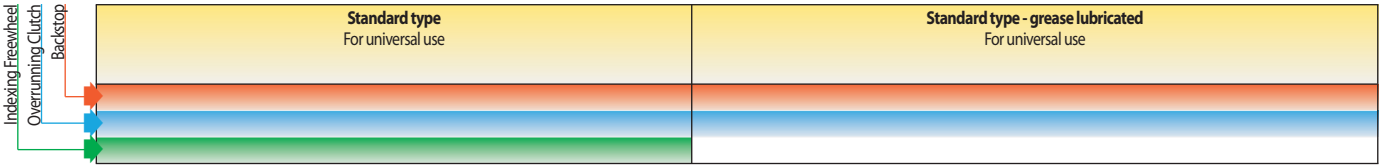
RINGSPANN®

with gear coupling
with sprags



Freewheel FR … CA

25-1



Freewheel Size	Coupling Size	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Max. speed inner ring freewheels/ overruns rpm	Max. speed outer ring freewheels/ overruns rpm	Freewheel Size	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Max. speed inner ring freewheels/ overruns rpm	Max. speed outer ring freewheels/ overruns rpm
FRS 300 CA	F 1.0	420	210	2500	2600	FRSG 300 CA	420	210	3600	3600
FRS 400 CA	F 1.0	670	335	1900	2100	FRSG 400 CA	670	335	3600	3600
FRS 500 CA	F 1.5	1600	800	1400	1900	FRSG 500 CA	1600	800	3600	3600
FRS 550 CA	F 2.0	3050	1525	1175	1600	FRSG 550 CA	3050	1525	3600	3600
FRS 600 CA	F 2.0	3900	1950	1100	1500	FRSG 600 CA	3900	1950	3600	3600
FRS 650 CA	F 2.5	5400	2700	900	1250	FRSG 650 CA	5400	2700	3600	3600
FRS 700 CA	F 3.0	11050	5525	790	1150	FRSG 700 CA	11050	5525	1800	1800
FRS 750 CA	F 3.5	18700	9350	790	1150	FRSG 750 CA	18700	9350	1800	1800
FRS 775 CA	F 4.0	17000	8500	750	1050	FRSG 775 CA	17000	8500	1800	1800
FRS 800 CA	F 4.0	22200	11100	700	950	FRSG 800 CA	22200	11100	1800	1800
FRS 900 CA	F 4.5	33600	16800	700	950	FRSG 900 CA	33600	16800	1200	1200
FRS 1000 CA	F 5.0	55000	27500	630	800	FRSG 1000 CA	55000	27500	1200	1200

See page 9 for determination of selection torque.

Freewheel Size	Bore max. Freewheel d1 inch	Bore max. Coupling d2 inch	A inch	DBSE inch	E inch	L1 inch	L2 inch	Weight* lbs
FR … 300 CA	0.750	1.750	4.560	3.500	7.688	2.500	1.688	15
FR … 400 CA	1.125	1.750	4.560	3.750	8.188	2.750	1.688	18
FR … 500 CA	1.312	2.313	6.000	4.188	9.625	3.500	1.938	32
FR … 550 CA	1.625	2.875	7.000	5.000	10.688	3.250	2.438	46
FR … 600 CA	2.000	2.875	7.000	4.313	10.500	3.750	2.438	55
FR … 650 CA	2.500	3.750	8.375	5.125	11.656	3.500	3.031	91
FR … 700 CA	2.938	4.375	9.438	6.875	15.469	5.000	3.594	137
FR … 750 CA	3.438	5.000	11.000	8.750	18.938	6.000	4.188	235
FR … 775 CA	3.750	5.875	12.500	9.500	20.250	6.000	4.750	321
FR … 800 CA	4.500	5.875	12.500	7.688	18.438	6.000	4.750	343
FR … 900 CA	5.438	6.500	13.625	9.125	20.813	6.375	5.313	487
FR … 1000 CA	7.000	7.125	15.500	10.125	22.781	6.625	6.031	740

* Note Weights are based on Solid Coupling hubs. Weights will vary with required bores. • Keyway dimensions upon request by customers.

Mounting

The gear coupling and stub adapter with fasteners are supplied loose. Depending on the desired freewheeling direction, the gear coupling can me mounted on either the drive or driven shaft.

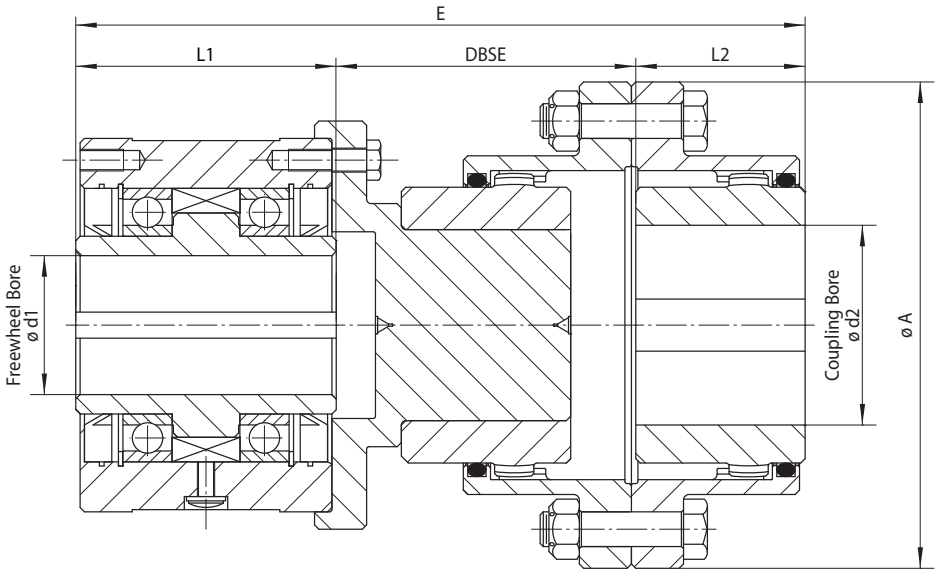
Labyrinth Seals

Labyrinth seals are available to provide additional protection for harsh environments.

Complete Freewheels FRX … CA and FRZ … CA

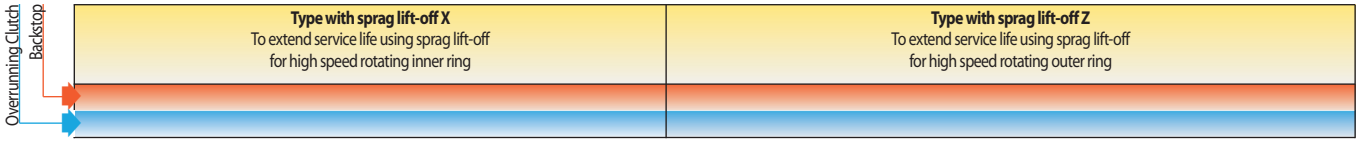
RINGSPANN®

with gear coupling
with sprag lift-off …



Freewheel FR … CA

26-1

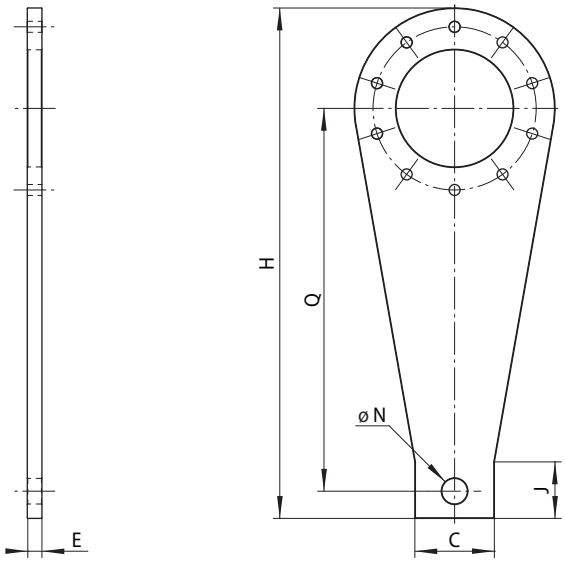


Freewheel Size	Coupling Size	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Sprag lift-off at inner ring speed rpm	Max. speed inner ring freewheels/ overruns rpm	Max. speed outer ring drives rpm	Freewheel Size	Max. torque M_M lb-ft	Nominal torque M_N lb-ft	Sprag lift-off at outer ring speed rpm	Max. speed outer ring freewheels/ overruns rpm	Max. speed inner ring drives rpm
FRX 400 CA	F 1.0	250	125	860	4000	340	FRZ 400 CA	560	280	800	2600	320
FRX 500 CA	F 1.5	850	425	750	4000	300	FRZ 500 CA	1070	535	1400	2050	560
FRX 550 CA	F 2.0	1500	750	700	4000	280	FRZ 550 CA	2760	1380	1550	1800	620
FRX 600 CA	F 2.0	2000	1000	670	4000	265	FRZ 600 CA	3530	1765	1450	1650	580
FRX 650 CA	F 2.5	3500	1750	610	3100	240	FRZ 650 CA	5000	2500	1300	1400	520
FRX 700 CA	F 3.0	8100	4050	350	2600	140	FRZ 700 CA	10500	5250	1160	1200	465
FRX 750 CA	F 3.5	14600	7300	320	2400	125	FRZ 750 CA	17500	8750	1160	1200	465
FRX 775 CA	F 4.0	14800	7400	320	2100	125	FRZ 775 CA	15000	6500	950	1050	380
FRX 800 CA	F 4.0	29000	14500	250	1800	100	FRZ 800 CA	17400	8700	880	975	350
FRX 900 CA	F 4.5	30000	15000	250	650	100	FRZ 900 CA	26000	13000	720	925	288

See page 9 for determination of selection torque.

Freewheel Size	Bore max. Freewheel d1 inch	Bore max. Coupling d2 inch	A inch	DBSE inch	E inch	L1 inch	L2 inch	Weight* lbs
FR … 400 CA	1.125	1.750	4.560	3.750	8.188	2.750	1.688	18
FR … 500 CA	1.312	2.313	6.000	4.188	9.625	3.500	1.938	32
FR … 550 CA	1.625	2.875	7.000	5.000	10.688	3.250	2.438	46
FR … 600 CA	2.000	2.875	7.000	4.313	10.500	3.750	2.438	55
FR … 650 CA	2.500	3.750	8.375	5.125	11.656	3.500	3.031	91
FR … 700 CA	2.938	4.375	9.438	6.875	15.469	5.000	3.594	137
FR … 750 CA	3.438	5.000	11.000	8.750	18.938	6.000	4.188	235
FR … 775 CA	3.750	5.875	12.500	9.500	20.250	6.000	4.750	321
FR … 800 CA	4.500	5.875	12.500	7.688	18.438	6.000	4.750	343
FR … 900 CA	5.438	6.500	13.625	9.125	20.813	6.375	5.313	487

* Note Weights are based on Solid Coupling hubs. Weights will vary with required bores. • Keyway dimensions upon request by customers.



Torque arms TA for Complete Freewheels FR …

27-1

Torque Arm	C	E	H	J	N	Q	Weight
	inch	inch	inch	inch	inch	inch	lbs
TA 300	2.00	0.375	8.375	1.000	0.53125	6.250	2
TA 400	2.00	0.375	8.625	1.000	0.53125	6.250	3
TA 500	2.00	0.375	9.000	1.125	0.53125	6.250	3
TA 550	2.25	0.375	10.125	1.375	0.78125	7.000	4
TA 600	2.50	0.375	11.500	1.500	0.78125	8.000	5
TA 650	3.00	0.375	13.625	1.750	0.78125	9.500	6
TA 700	3.00	0.500	15.000	2.000	1.31250	10.500	7
TA 750	3.75	0.500	18.375	2.375	1.28125	12.875	9
TA 775	4.00	0.500	20.000	2.500	1.53125	13.500	14
TA 800	4.00	0.500	21.000	2.750	1.53125	14.625	16
TA 900	4.75	0.875	30.500	3.375	1.53125	22.875	17
TA 1000	5.25	0.875	32.000	3.375	1.78125	23.000	51

Torque Arms TA

Torque Arms TA are offered as an accessory for Freewheels FRS, FRSG and FRX when used as a backstop.

The torque arms are supplied pre-drilled and ready for installation.

Installation

The torque arm must not be rigidly anchored but must be restrained by either a non-threaded pin or an angle iron bracket.

When a pin is used the diameter of the pin must be 1/32 of an inch smaller than the pin hole diameter N of the torque arm.

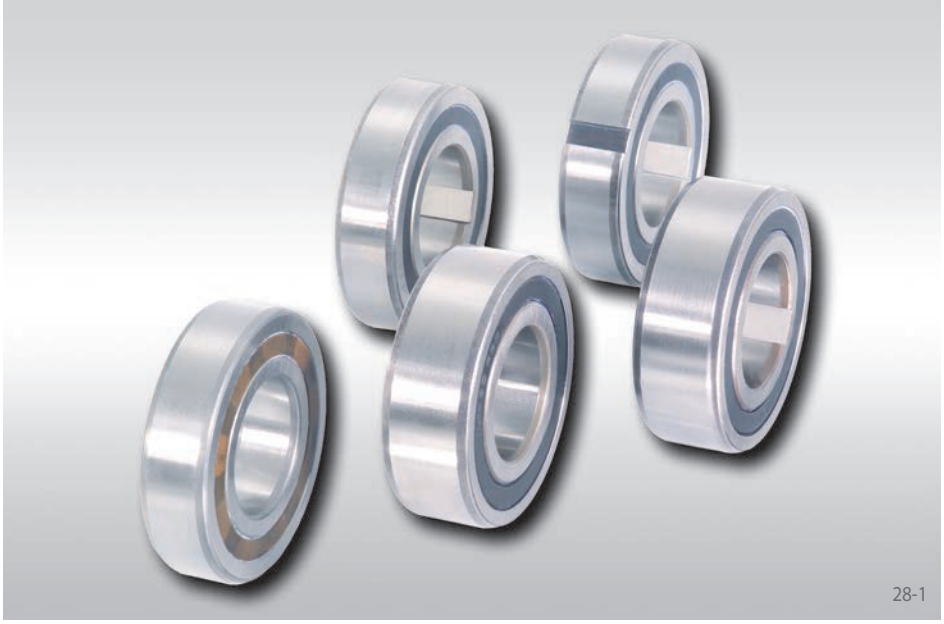
27-1

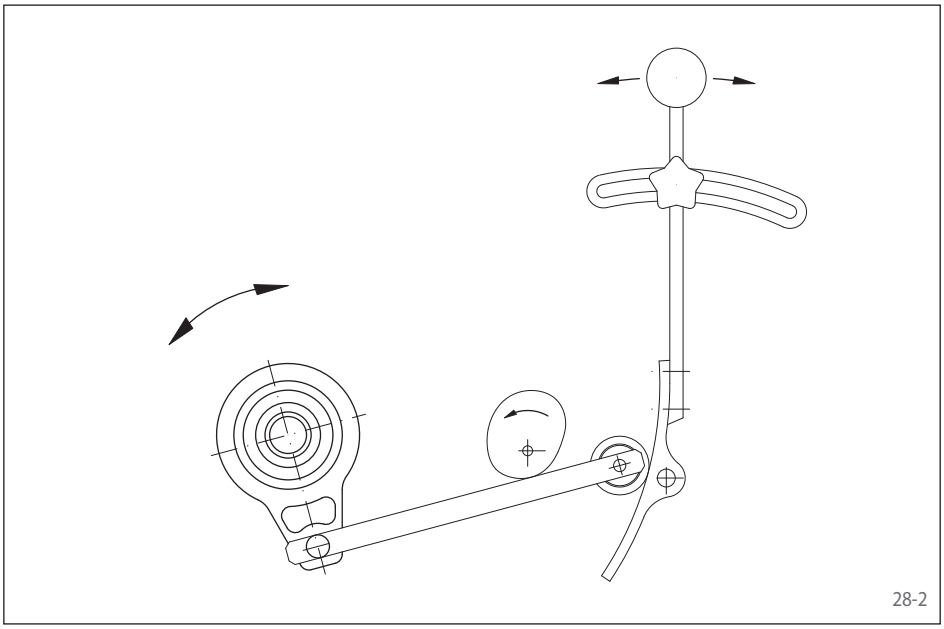
End Covers

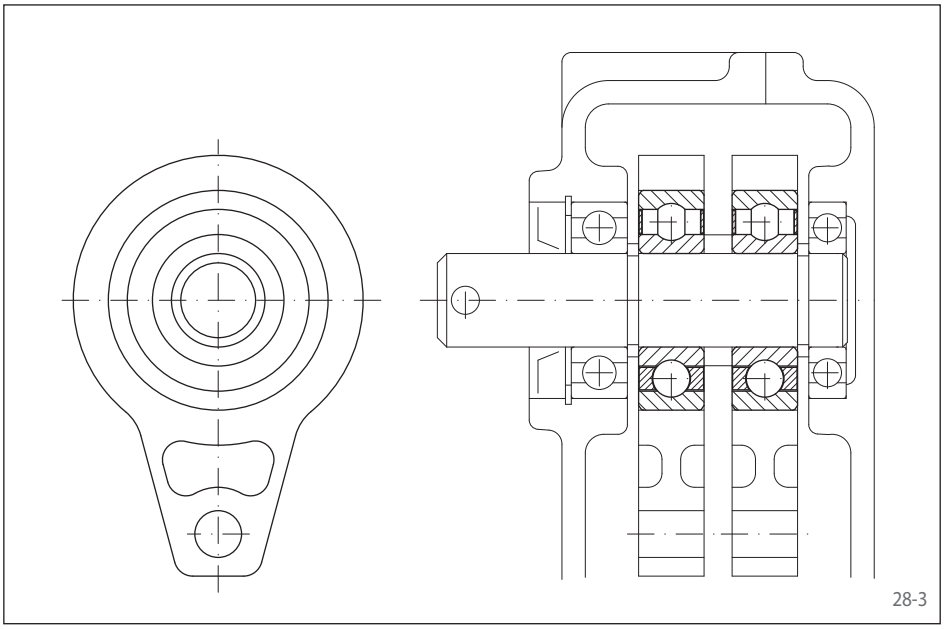
End covers are available to protect operating personnel from coming in contact with the rotating shaft for all Complete Freewheels FR … . Contact fatory for availability.

Internal Freewheels ZZ …

with ball bearing properties







Application as

- Backstop
- Overrunning Clutch
- Indexing Freewheel

Features

Internal Freewheels ZZ … are sprag freewheels with bearing support and ball bearing properties. The freewheels are supplied grease-filled for normal operating conditions.

The freewheel is assembled into the customer housing, allowing a compact, space-saving solution.

Maximum torques up to 480 lb-ft/650 Nm. The torque is transmitted on the inner ring and/or on the outer ring by press fit or keyway connection.

Bores up to 1.575 inch/40 mm.

The following series are available:

Series	Torque transmission on outer ring by keyway	Torque transmission on outer ring by press fit	Torque transmission on inner ring by keyway	Torque transmission on inner ring by press fit	2RS-seals	Page
ZZ		●		●		29
ZZ … 2RS		●		●	●	30
ZZ … P2RS		●	●		●	30
ZZ … P		●	●			31
ZZ … PP	●		●			31

The Internal Freewheels ZZ of the sizes ZZ 6201 to ZZ 6207 have the same dimensions as the respective ball bearings of series 62.

The series ZZ … 2RS and ZZ … P2RS have 2RS seals.

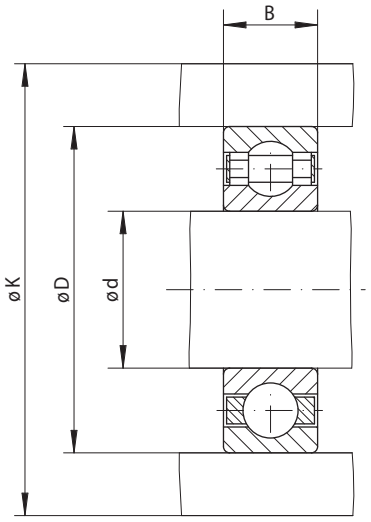
Application example

Two Internal Freewheels ZZ 6206 as indexing freewheels in the drive of the metering roller of a seed spreader. The freewheels are built in an infinitely variable oil bath gearbox. Two cam disks that are off set by 180° are arranged on the gearbox shaft. By means of torque arms, these drive the outer rings of the two adjacent Internal Freewheels, which then gradually turn the metering shaft. The infinite speed settings of the gearbox's drive shaft are executed by means of the respective pivoting of the roller support plate, so that the torque arms can execute lifts of differing amounts.

Internal Freewheels ZZ

for press fit on the outer ring with sprags, bearing supported

RINGSPANN®



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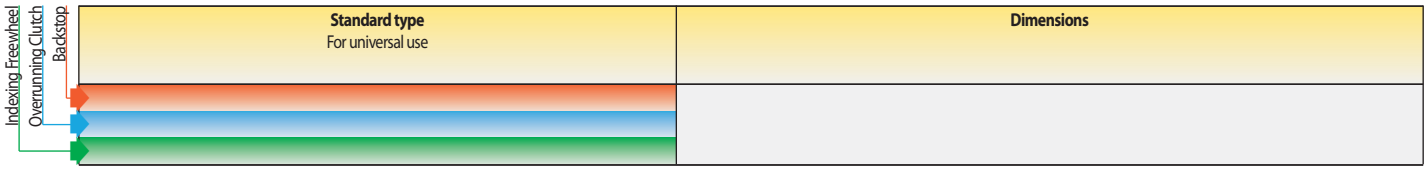


Freewheel Size	Maximum torque M_M		Nominal torque M_N		Maximum speed	Load rating of bearing support dynamic C		static C_0		Bore d		B		D		K		Weight	
	lb-ft	Nm	lb-ft	Nm	rpm	lbf	N	lbf	N	inch	mm	inch	mm	inch	mm	inch	mm	lbs	kg
ZZ 8	3.8	5,0	1.9	2.5	15000	720	3200	194	860	0.315	8	0.354	9	0.866	22	1.063	27	0.05	0.02
ZZ 6201	13.8	18.6	6.9	9.3	10000	1370	6100	610	2700	0.472	12	0.394	10	1.260	32	1.535	39	0.09	0.04
ZZ 6202	38.6	52.0	19.3	26.0	9400	1350	6000	830	3700	0.591	15	0.433	11	1.378	35	1.654	42	0.14	0.06
ZZ 6203	50.4	68.0	25.2	34.0	8200	1650	7350	1025	4550	0.669	17	0.472	12	1.575	40	2.008	51	0.18	0.08
ZZ 6204	96.2	130.0	48.1	65.0	6800	2250	10000	1415	6300	0.787	20	0.551	14	1.850	47	2.283	58	0.26	0.12
ZZ 6205	118.6	160.0	59.3	80.0	5600	2475	11000	1575	7000	0.984	25	0.591	15	2.047	52	2.480	63	0.33	0.15
ZZ 6206	251.8	340.0	125.9	170.0	4000	3375	15000	2250	10000	1.181	30	0.630	16	2.441	62	2.874	73	0.55	0.25
ZZ 6207	259.2	350.0	129.6	175.0	3600	2810	12500	1620	7200	1.378	35	0.669	17	2.835	72	3.346	85	0.66	0.30
ZZ 40	481.4	650.0	240.7	325.0	3000	3485	15500	2755	12250	1.575	40	0.866	22	3.150	80	3.710	94	1.10	0.50

See page 9 for determination of selection torque.

Mounting

The torque is transmitted on the inner ring and outer ring by press fit. In order to transmit the torques specified in the table, the outer ring must be installed in a housing with an external diameter K. The housing should be 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 D must be ISO N6 and the tolerance of the shaft must be ISO n6.

The permissible operating temperature of the freewheel is -40°F to +175°F.

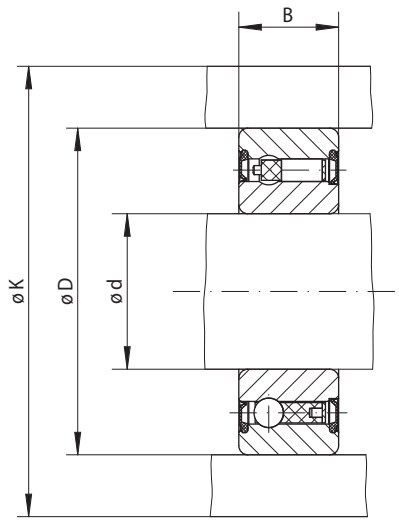
Lubrication

The freewheels are supplied grease-filled for normal operating conditions. However, the freewheels can also be connected to the customer´s oil lubrication system; this is particularly recommended in the case of higher speeds.

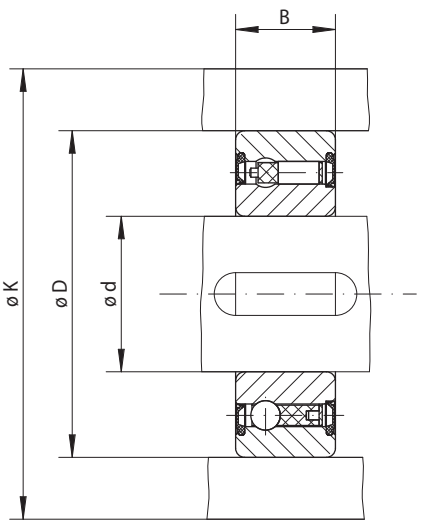
Internal Freewheels ZZ … 2RS and ZZ … P2RS

RINGSPANN®

for press fit on the outer ring with sprags, bearing supported and sealed



ZZ … 2RS 30-1



ZZ … P2RS 30-2

Freewheel Size Series ZZ … 2RS	Series ZZ … P2RS	Maximum torque M_M lb-ft	Maximum torque M_M Nm	Nominal torque M_N lb-ft	Nominal torque M_N Nm	Maximum speed rpm	Load rating of bearing support dynamic C lbf	dynamic C N	static C_0 lbf	static C_0 N	Bore d inch	Bore d mm	B inch	B mm	D inch	D mm	K inch	K mm	Weight lbs	Weight kg
ZZ 8 2RS*		3.8	5.0	1.9	2.5	15000	742	3300	193	860	0.315	8	0.354	9	0.865	22	1.060	27	0.044	0.02
ZZ 12 2RS	ZZ 12 P2RS	13.8	18.6	6.9	9.3	10000	1371	6100	630	2800	0.472	12	0.551	14	1.260	32	1.540	39	0.110	0.05
ZZ 15 2RS	ZZ 15 P2RS	25.2	34.0	12.6	17.0	8400	1663	7400	764	3400	0.591	15	0.630	16	1.378	35	1.654	42	0.154	0.07
ZZ 17 2RS	ZZ 17 P2RS	44.0	60.0	22.0	30.0	7350	1776	7900	854	3800	0.669	17	0.669	17	1.575	40	2.008	51	0.198	0.09
ZZ 20 2RS	ZZ 20 P2RS	74.0	100.0	37.0	50.0	6000	2113	9400	1012	4500	0.787	20	0.748	19	1.850	47	2.283	58	0.330	0.15
ZZ 25 2RS	ZZ 25 P2RS	126.0	170.0	63.0	85.0	5200	2405	10700	1237	5500	0.984	25	0.787	20	2.047	52	2.480	63	0.396	0.18
ZZ 30 2RS	ZZ 30 P2RS	204.4	276.0	102.2	138.0	4200	2630	11700	1461	6500	1.181	30	0.827	21	2.441	62	2.874	73	0.594	0.27
ZZ 35 2RS	ZZ 35 P2RS	259.2	350.0	129.6	175.0	3600	2832	12600	1641	7300	1.378	35	0.866	22	2.835	72	3.346	85	0.881	0.40
ZZ 40 2RS	ZZ 40 P2RS	481.4	650.0	240.7	325.0	3000	3835	15500	2765	12300	1.575	40	1.063	27	3.150	80	3.710	94	1.322	0.60

See page 9 for determination of selection torque.
Keyway according to DIN 6885, page 3 • Tolerance of keyway width JS10.
* Only one RS seal on the ball bearing side. Locking from this side the freewheeling direction of the inner ring is clockwise free.

Mounting

Series ZZ … 2RS:
The torque is transmitted on the inner ring and outer ring by press fit.

Series ZZ … P2RS:
The torque is transmitted on the inner ring by keyway connection and on the outer ring by press fit.

In order to transmit the torques specified in the table, the outer ring must be installed in a housing with an external diameter K. The housing should be 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 the factory regarding the transmissible torque.

The tolerance of the housing bore "D" must be ISO N6 and the tolerance of the shaft must be ISO n6.

The permissible operating temperature of the freewheel is +40°F to +140°F. Please contact the factory if the temperature is different than the given values.

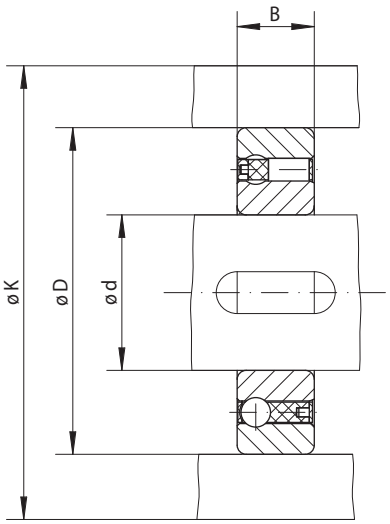
Lubrication

The freewheels are supplied grease-filled and with two RS seals.

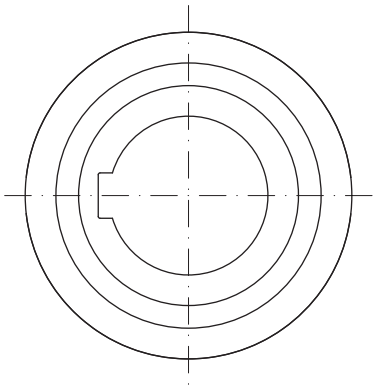
Internal Freewheels ZZ … P and ZZ … PP

RINGSPANN®

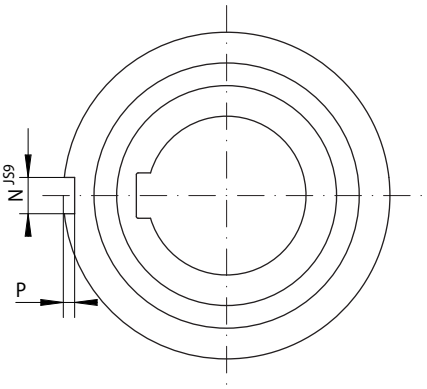
for press fit or keyway connection on the outer ring with sprags, bearing supported



31-1



ZZ … P



ZZ … PP

31-2

Freewheel Size Series ZZ … P	Freewheel Size Series ZZ … PP	Maximum torque M_M lb-ft	Maximum torque M_M Nm	Nominal torque M_N lb-ft	Nominal torque M_N Nm	Maximum speed rpm	Load rating of bearing support dynamic C lbf	dynamic C N	static C_0 lbf	static C_0 N	Bore d inch	Bore d mm	B inch	B mm	D inch	D mm	K inch	K mm	Weight lbs	Weight kg
ZZ 6201 P		13.8	18.6	6.9	9.3	10000	1371	6100	629	2800	0.472	12*	0.394	10	1.260	32	1.535	39	0.09	0.04
ZZ 6202 P	ZZ 6202 PP	25.2	34.0	12.6	17.0	8400	1665	7400	764	3400	0.591	15*	0.433	11	1.378	35	1.654	42	0.13	0.06
ZZ 6203 P	ZZ 6203 PP	44.0	60.0	22.0	30.0	7350	1780	7900	854	3800	0.669	17*	0.472	12	1.575	40	2.008	51	0.15	0.07
ZZ 6204 P	ZZ 6204 PP	74.0	100.0	37.0	50.0	6000	2115	9400	1012	4500	0.787	20*	0.551	14	1.850	47	2.283	58	0.24	0.11
ZZ 6205 P	ZZ 6205 PP	126.0	170.0	63.0	85.0	5200	2405	10700	1236	5500	0.984	25*	0.591	15	2.047	52	2.480	63	0.30	0.14
ZZ 6206 P	ZZ 6206 PP	204.4	276.0	102.2	138.0	4200	2630	11700	1461	6500	1.181	30*	0.630	16	2.441	62	2.874	73	0.46	0.21
ZZ 6207 P	ZZ 6207 PP	259.2	350.0	129.6	175.0	3600	2835	12600	1641	7300	1.378	35*	0.669	17	2.835	72	3.346	85	0.66	0.30
ZZ 40 P	ZZ 40 PP	481.4	650.0	240.7	325.0	3000	3485	15500	2765	12300	1.575	40	0.866	22	3.150	80	3.710	94	1.10	0.50

See page 9 for determination of selection torque.
Keyway according to DIN 6885, page 1 • Tolerance of keyway width JS10.
* Keyway according to DIN 6885, page 3 • Tolerance of keyway width JS10.

Mounting

Series ZZ … P:
The torque is transmitted on the inner ring by keyway connection and on the outer ring by press fit.

Series ZZ … PP:
The torque is transmitted on the inner and on the outer ring by keyway connection.

In order to transmit the torques specified in the table, the outer ring must be installed in a housing with an external diameter K. The housing should be 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 the factory regarding the transmissible torque.

The tolerance of the housing bore "D" must be ISO N6 and the tolerance of the shaft must be ISO k6.

The permissible operating temperature of the freewheel is +40°F to +140°F. Please contact the factory if the temperature is different than the given values.

Lubrication

The freewheels are supplied grease-filled.

Internal Freewheels RC

for keyway connection on the outer ring with sprags

RINGSPANN®

Application as

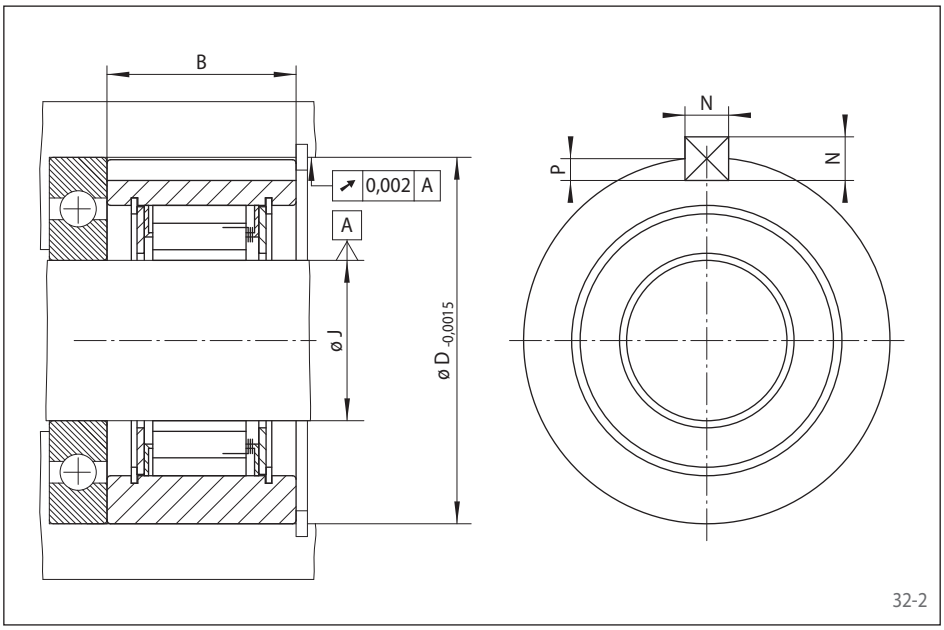
- Backstop
- Overrunning Clutch

Features

Internal Freewheels RC are sprag freewheels without inner ring or bearing support. The customer's hardened and ground shaft is used as the inner ring.

Maximum torques up to 1 240 lb-ft.

The freewheel is incorporated into the customer's housing, allowing for a compact, space saving solution.



Mounting

Internal Freewheels RC require bearing support and a shaft hardened to HRC 58-62 with a 0.060 inch case depth after grinding to a 16 micro finish. Concentric alignment of the shaft and housing bore is required.

Lubrication

Internal Freewheels RC require either grease or oil lubrication. Lubrications containing molybdenum disulphide must not be used.

Backstop

Standard type
For universal use

Dimensions

Freewheel Size	Maximum torque M_M lb-ft	Nominal torque M_N lb-ft	Housing Bore Diameter D inch	Freewheel Diameter D inch	B inch	Shaft Diameter J inch	Keyway N x P inch	Use with bearing	Weight lbs
RC 205	220	110	2.0482	2.0463	1.000	0.929/0.930	$^3/_{16}$ x $^3/_{32}$	205	0.75
RC 206	390	195	2.4422	2.4403	1.125	1.289/1.290	$^1/_4$ x $^1/_8$	206	1.00
RC 207	650	325	2.8360	2.8341	1.125	1.656/1.657	$^1/_4$ x $^1/_8$	207	1.25
RC 208	900	450	3.1510	3.1491	1.250	1.840/1.841	$^3/_8$ x $^3/_{16}$	208	1.75
RC 210	1 240	620	3.5447	3.5248	1.250	2.208/2.209	$^3/_8$ x $^3/_{16}$	210	2.00

See page 9 for determination of selection torque.

Internal Freewheels RCD

RINGSPANN®

specifically designed as an interchange backstop for Dodge® TXT shaft mounted reducers with sprags

Application as

- Backstop

Features

Internal Freewheels RCD are sprag freewheels without bearing support. They are specifically designed as interchange backstops for Dodge® shaft mounted reducers.

The freewheel is incorporated into the customer's housing, allowing for a compact, space saving solution.

Interchange Chart

RINGSPANN®	TXT Series	Obsolete TXT Series	TDT Series	TD Series	Backstop Part Number
RCD-3	309A 315A 325A				243106
RCD-4	409A 415A 425A				244106
RCD-5	509 515 525 509B 515A 525A 515B 525B				245154
RCD-6	609 615 625 T16	605 No. 16A	615 625 615A 625A	615 625	246092
RCD-7	709 715 725 T17	705 No. 17A	715 725	715 725 715A 725A	247260
RCD-8/9	815 825 915 926 No. 8 No. 9	No. 18	815 825 915 926 1115 1125	815 825 815A 825A 915 1115 1125	249260
RCD-10/12	1015 1024 1215 1225	805 T 18	1015 1024 1215 1225	926 1015 1024 1215 1225	250260
RCD-13		905	1325		272259

Dodge® is a registered trademark of Baldor Electric Company.

Mounting

Internal Freewheels RCD are used to interchange backstops installed by the gearbox manufacturer. Installation instructions and recommendations by the gearbox manufacturer should be followed for the safe operation and longevity of the backstop.

Lubrication

Oil lubrication as specified by the gearbox manufacturer should be used. Lubrications containing molybdenum disulphide must not be used.

Interchange Chart

RINGSPANN®

for Marland, Formsprag, Morse®/EPT and Renold with RINGSPANN Freewheels

RINGSPANN®	Marland		Formsprag	Morse®/EPT	Renold
	Clutch	RINGSPANN			
FRS 300	RMS-12N		FSO-/HPI-/HSB-300	MG-/MI-300A	SO/SX300
FRS 400	RMS-14	RMS-14/RMS-18	FSO-/HPI-/HSB-400	MG-/MI-400A	SO/SX400
FRS 500	RMS-21	RMS-21	FSO-/HPI-/HSB-500	MG-/MI-500A	SO/SX500
FRS 550	RMS-26	RMS-26	FSO-/HPI-/HSB 550		
FRS 600	RMS-32	RMS-32	FSO-/HPI-/HSB-600	MG-/MI-600A	SO/SX600
FRS 650	RMS-40	RMS-40	FSO-/HPI-/HSB-650		
FRS 700	RMS-47	RMS-47	FSO-/HPI-/HSB-700	MG-/MI-700A	SO/SX700
FRS 750	RMS-55	RMS-55	HPI-/FS-/HSB-750	MG-/MI-750	SO/SX750
FRS 800	RMS-72	RMS-72	HPI-/FS-/HSB-800	MG-/MI-800	SO/SX800
FRS 900	RMS-87	RMS-87	HPI-/FS-/HSB-900	MG-/MI-900A	SO/SX900
FRS 1 000	RMS-112	RMS-112	HPI-/FS-/HSB-1 027	MG-/MI-1 000A	SO/SX1 027
FRSG 300	RMS-12 FG			MO-300A*	SO/SX300
FRSG 400	RMS-14 FG	RMS-14 FG/RMS-18 FG		MO-400A*	SO/SX400
FRSG 500	RMS-21 FG	RMS-21 FG		MO-500A*	SO/SX500
FRSG 550	RMS-26 FG	RMS-26 FG			
FRSG 600	RMS-32 FG	RMS-32 FG		MO-600A*	SO/SX600
FRSG 650	RMS-40 FG	RMS-40 FG			
FRSG 700	RMS-47 FG	RMS-47 FG		MO-700A*	SO/SX700
FRSG 750	RMS-55 FG	RMS-55 FG	FSO-750		
FRSG 800	RMS-72 FG	RMS-72 FG	FSO-800		SO/SX800
FRSG 900	RMS-87 FG	RMS-87 FG	FSO-900		SO/SX900
FRSG 1 000	RMS-112 FG	RMS-112 FG	FSO-1 027		SO/SX1 027
FRX 400	RMI-14	RMX-14	FRB-400		
FRX 500	RMI-21	RMX-21	FRB-500		
FRX 550	RMI-26	RMX-26			
FRX 600	RMI-32	RMX-32	FRB-600		
FRX 650	RMI-40	RMX-40	FRB-650		
FRX 700	RMI-47	RMX-47	FRB-700		
FRX 750	RMI-55	RMX-55	FRB-750		
FRX 800	RMI-72	RMX-72	FRB-800		
FRX 900	RMI-87	RMX-87	FRB-900		
FRHM 775-7				CB 7**	
FRHM 800-7				CB 7**	
FRHM 800-12				CB 12**	
FRHM 900-12				CB 12**	
FRHM 900-19				CB 19**	
FRHM 1 000-19				CB 19**	
FRHM 1 000-30				CB 30**	
RC 205		R205	FS 20-5	B205A	
RC 206		R206	FS 20-6	B206A	
RC 207		R207	FS 20-7	B207A	
RC 208		R208	FS 20-8	B208A	
RC 210		R210	FS 20-10	B210A	

*Grease filled with labyrith seals • ** Interchange is dependent on the maximum required bore of the RINGSPANN FRHM. See Page 19. • Morse is a registered trademark of Borg Warner.

Interchange Chart

RINGSPANN®

FRHD Series - for Formsprag, Marland, Falk, Stephens Adamson and Morse®

Manufacturer	RINGSPANN®		Formsprag	Marland		Falk	Stephens Adamson	Morse®
Size	FRHD 700		LLH 700	BC 3MA		1045 NRTHB	HD 215	
Max. Bore (inch)	3.44		2.94	2.94		2.50	2.94	
Torque Rating (lb-ft)	33750		5000	3000		2100	3333	
Size	FRHD 775		LLH 750	BC 6MA		1075 NRT	HD 315	CB 7
Max. Bore (inch)	3.75		3.44	3.69		3.94	3.94	4
Torque Rating (lb-ft)	7500		7000	6000		10000	6666	6500
Size	FRHD 800		LLH 800	BC 12MA		1075 NRT	HD 415	CB 12
Max. Bore (inch)	4.5		4.44	4.5		3.94	4.94	5.25
Torque Rating (lb-ft)	12000		13000	12000		10000	11667	12000
Size	FRHD 900		LLH 900	BC 18MA		1085 NRT	HD 600	CB 19
Max. Bore (inch)	5.44		5.44	5.44		5.19	6	6.25
Torque Rating (lb-ft)	18500		18000	18000		16000	20833	19000
Size	FRHD 950		LLH 1027	BC 27MA		1095 NRT	HD 700	CB 30
Max. Bore (inch)	7		7	6.5		5.5	7	7.75
Torque Rating (lb-ft)	23000		27000	27000		28000	27083	30000
Size	FRHD 1000		LLH 1027	BC 27MA		1095 NRT	HD 700	CB 30
Max. Bore (inch)	7		7	6.5		5.5	7	7.75
Torque Rating (lb-ft)	28000		27000	27000		28000	27083	30000
Size	FRHD 1050	FRHD 1100	LLH 1051	BC 45MA		1105 NRT	HD 800	CB 45
Max. Bore (inch)	7	7	7	7		7.44	8	8.5
Torque Rating (lb-ft)	45000	45000	45000	45000		45000	45833	45000
Size	FRHD 1200		LLH 1250	BC 63MA		1115 NRT	HD 900	CB 65
Max. Bore (inch)	9		9	8		8.44	9	9.5
Torque Rating (lb-ft)	92500		65000	63000		75000	66667	65000
Size	FRHD 1300		LLH 1300	BC 90MA		1125 NRT	HD 1000	
Max. Bore (inch)	10		10	9		9	10	
Torque Rating (lb-ft)	110000		90000	90000		105000	92500	
Size	FRHD 1400		LLH 1375	BC 135MA		1135 NRT	HD 1200	CB 150
Max. Bore (inch)	12		11	10		10.5	12	11.5
Torque Rating (lb-ft)	140000		135000	135000		150000	145833	150000
Size	FRHD 1450		LLH 2000	BC 180MA		1145 NRT	HD 1400	CB 250
Max. Bore (inch)	12		13.25	11.75		12	14	13.5
Torque Rating (lb-ft)	190000		200000	180000		212000	208333	250000
Size	FRHD 1500		LLH 2400	BC 240MA	BC 300MA	1155 NRT	HD 1600	
Max. Bore (inch)	12		15.5	14	14	13.25	16	
Torque Rating (lb-ft)	290000		265000	240000	300000	249000	316667	
Size	FRHD 1600		LLH 3500	BC 300MA	BC 375MA	1165 NRT	HD 1600	
Max. Bore (inch)	14		20	14	18	15.5	16	
Torque Rating (lb-ft)	373000		375000	300000	375000	346000	316667	
Size	FRHD 1700		LLH 5000	BC 375MA	BC 540MA	1175 NRT	HD 1800	
Max. Bore (inch)	18		20	18	21	17.5	18	
Torque Rating (lb-ft)	625000		700000	375000	540000	519000	416666	
Size	FRHD 1800		LLH 5000	BC 720MA	BC 940MA	1185 NRT		
Max. Bore (inch)	21		20	21	21	20		
Torque Rating (lb-ft)	900000		700000	720000	940000	747000		
Size	FRHD 1900			BC 1200 MA				
Max. Bore (inch)	21			23.5				
Torque Rating (lb-ft)	1200000			1200000				

The above is a functional interchange reference, please verify dimensional interchange details. • Morse® is a registered trademark of Borg Warner

Questionnaire for selecting RINGSPANN Backstops

RINGSPANN®

Please photocopy or use the PDF-File from our website!

Company: .....
Address: .....
.....
Name: .....
Department: .....

Date: .....
Inquiry Ref.: .....
Phone: .....
Fax: .....
E-mail: .....

1. Where will the Backstop be used?

1.1 Type of machine:

_____

In the case of conveyor belts:

Angle of the steepest segment _____°
Multiple-drive? ❑ Yes ❑ No
If yes, number of drives _____

1.2 Backstop location:

❑ on the gearbox
❑ on the motor
❑ elsewhere: _____

1.3 Arrangement:

❑ on a shaft end
Diameter: _____ inch
Length: _____ inch
❑ on a through shaft
Diameter: _____ inch
❑ on a pulley
❑ on a sprocket
❑ elsewhere: _____
_____

1.4 If possible, please include specification, data sheet, sketch or drawing with connection dimensions.

_____
_____
_____
_____
_____
_____

2. Operating data

2.1 Speed at the backstop location (backstop shaft) n_{sp} = _____ rpm

Would it be possible to arrange the backstop on a high speed shaft? (higher speed = lower torque = smaller backstop) If neccesary please give further details on the drawing.

2.2 Nominal power of motor
P_0 = _____ hp

2.3 Must the backstop also absorb the peak torque that occurs if the drive motor is started in the locking direction of the backstop (incorrectly poled drive motor)? If yes, the backstop must be substantially oversized.
❑ Yes ❑ No

2.4 Maximum backdriving torque
M_{max} = _____ lb-ft

2.5 Lifting capacity of the conveyor system
P_L = _____ hp

2.6 Number of daily stops: _____

2.7 Daily operating time: _____ hours

3. Installation conditions

3.1 ❑ Open, outside
❑ Open, in a closed room
❑ In the machine housing
❑ Lubrication by means of oil bath or oil mist in the machine housing
❑ Connection to the central lubrication system is possible

Name of lubricant:

_____

Kinematic viscosity:
_____ cst ____ °F ____ °C

3.2 Should the backstop be releasable?
❑ No ❑ Yes, in an emergency
❑ Yes, frequently

3.3 Ambient temperature on the backstop:
from _____ °F to _____ °F

3.4 Other (e.g. accessibility, dust susceptibility and other environmental influences that could be of significance):

_____
_____
_____

3.5 Are there any elastic elements/components located between the backstop and the installation that is to be backstopped (elastic couplings generate considerable peak torques at the moment of stopping)?
❑ Yes ❑ No

4. Estimated requirements

_____ Pieces _____ Pieces/month _____ Pieces/year

5. Enclosures

❑ Specifications ❑ Data sheet ❑ Sketch/drawing

Questionnaire for selecting RINGSPANN Overrunning Clutches

RINGSPANN®

Please photocopy or use the PDF-File from our website!

Company: ..... Date: .....
Address: ..... Inquiry Ref.: .....
..... Phone: .....
Name: ..... Fax: .....
Department: ..... E-mail: .....

1. Where will the Overrunning Clutch be used?

1.1 Type of machine, machine group or installation, in which the overrunning clutch will be used:

1.2 Arrangement of the overrunning clutch (if possible, please include specification, data sheet, sketch or drawing with connection dimensions).

2. Operating data

2.1 In driving operation the drive of the overrunning clutch will be carried out by:

- ❑ Asynchronous motor
  - ❑ direct start-up
  - ❑ λ-Δ-start-up
- ❑ Other electric motor
  Type: _____
- ❑ Combustion engine
  Type: _____
  Number of cylinders: ____
- ❑ Turbine
- ❑ Other (please explain in more detail):

2.2 To be transmitted in driving operation:
Power: _____ hp or
Torque: _____ lb-ft

2.3 Maximum torque _____ lb-ft
(Important for drives that develop their maximum torque below their nominal speed.)

2.4 Speed

1. in driving operation:
   from _____ rpm to _____ rpm
2. in freewheeling operation:
   (when overrunning clutch is disengaged)
   Primary part (driver)
   from _____ rpm to _____ rpm
   Secondary part (driven machine)
   from _____ rpm to _____ rpm

2.5 Should the overrunning clutch be combined with a shaft coupling?

- ❑ with an elastic coupling
- ❑ with a torsionally stiff coupling
- ❑ _____

2.6 If, upon start up, larger masses are to be accelerated:
Moment of inertia: J = _____ lb-ft²
Speed of mass: n = _____ rpm

2.7 Torque fluctuations/torsional vibrations during driving operation generate the following torque limits

- ❑ Minimum torque M_{min} = _____ lb-ft
- ❑ Maximum torque M_{max} = _____ lb-ft
- ❑ Min-/Max.-torque is not known

2.8 Daily operating time: _____ hours (hr)
thereof _____ (hr) driving operation
____ (hr) freewheeling operation

3. Installation conditions

3.1
- ❑ Open, outside
- ❑ Open, in a closed room
- ❑ in the machine housing
  - ❑ Lubrication by means of oil bath or oil mist in the machine housing
  - ❑ Connection to the central lubrication system is possible

Name of lubricant: _____

Kinematic viscosity
_____ cst ____ °F ____ °C

3.2 Ambient temperature on the freewheel:
from _____ °F to _____ °F

3.3 Other (e.g. accessibility, dust susceptibility and other environmental influences that could be of significance):

4. Estimated requirements

_____ Pieces (one-off)
_____ Pieces/month
_____ Pieces/year

5. Enclosures

- ❑ Specifications
- ❑ Data sheet
- ❑ Sketch/drawing

Questionnaire for selecting RINGSPANN Indexing Freewheels

RINGSPANN®

Please photocopy or use the PDF-File from our website!

Company: .....
Address: .....
.....
Name: .....
Department: .....

Date: .....
Inquiry Ref.: .....
Phone: .....
Fax: .....
E-mail: .....

1. Where will the Indexing Freewheel be used?

1.1 Type of machine, machine group or installation, in which the indexing freewheel will be used:

1.2 Arrangement of the indexing freewheel (if possible, please include specification, data sheet, sketch or drawing with connection dimensions).

2. Operating data

2.1 Index angle of the indexing freewheel:
from _____ ° to _____ °

2.2 Number of actuations (indexes) per minute:
from _____ /min to _____ /min

2.3 The back and forth movement is made by
- ❑ freewheel outer ring
- ❑ freewheel inner ring
- ❑ _____

2.4 The back and forth movement is generated by
- ❑ bell crank
- ❑ hydraulic cylinder
- ❑ pneumatic cylinder
- ❑ cam disk or plate
- ❑ other (please explain in more detail):

2.5 Proposed shaft dimensions:
Diameter _____ inch
Length _____ inch

2.6 Normal torque:
M = _____ lb-ft
Maximum torque:
M_{max} = _____ lb-ft
(including peaks)

2.7 Daily operating time:
_____ hours

3. Installation conditions

3.1
- ❑ Open, outside
- ❑ Open, in a closed room
- ❑ in the machine housing
  - ❑ Lubrication by means of oil bath or oil mist in the machine housing
  - ❑ Connection to the central lubrication system is possible

  Name of lubricant:
  _____
  Kinematic viscosity:
  _____ cst ____ °F ____ °C

3.2 Ambient temperature on freewheel:
from _____ °F to _____ °F

3.3 Other (e.g. accessibility, dust susceptibility and other environmental influences that could be of significance):

4. Estimated requirement

_____ Pieces _____ Pieces/month _____ Pieces/year

5. Enclosures

❑ Specifications ❑ Data sheet ❑ Sketch/drawing

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