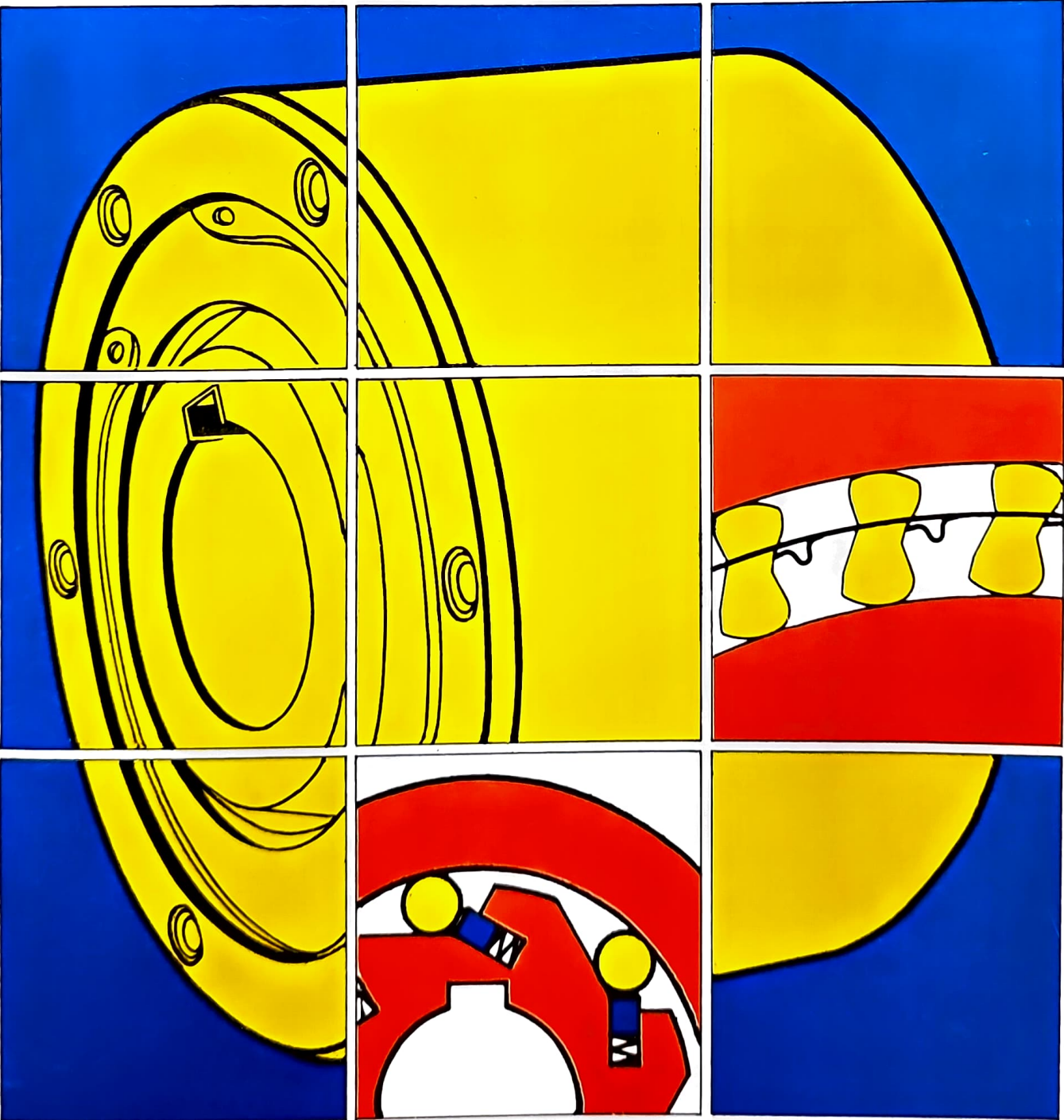


PRECISION ○

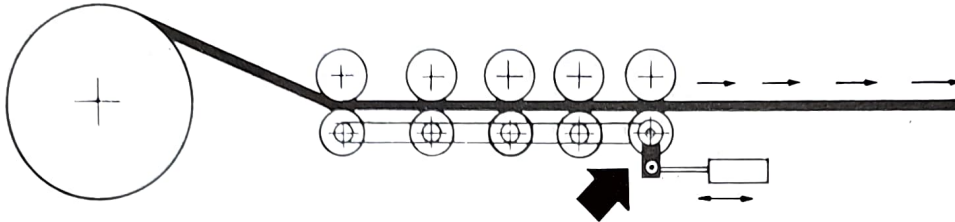
FREEWHEELS • FREILÄUFE • RUOTE LIBERE



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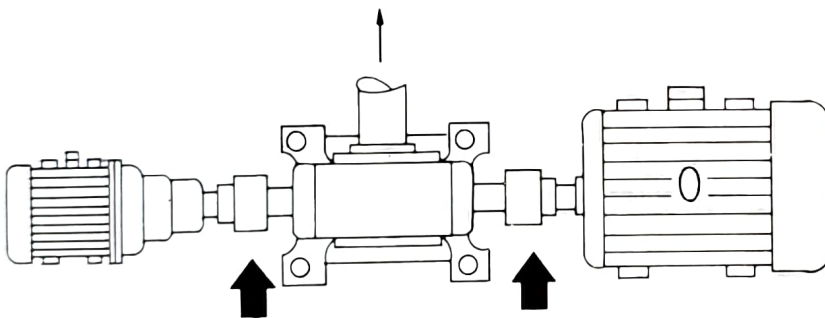
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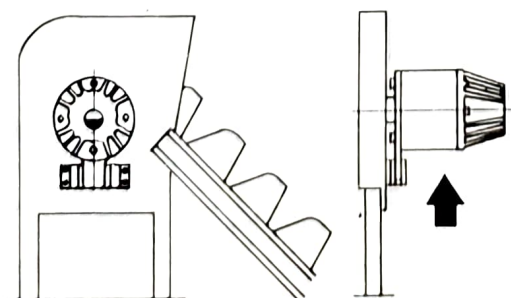
In this type of applications, reciprocating motion applied to the driving race of the clutch is transformed in to unidirectional intermittent motion at the driven race. Fig. 1 shows a typical Roll Feed mechanism for power presses. In this example reciprocating motion obtained by a pneumatic cylinder is applied to the outer race of the clutch, and infinite angular, intermittent unidirectional motion is available at feed roll.

OVERRUNNING :



Freewheel clutches are capable of overrunning at either the inner or outer race. This application is mainly required in stand by drives and compound drives. Fig. 2 shows a dual speed drive. Here two prime movers are connected to the input shaft of a gearbox through Freewheel clutch-couplings.

BACKSTOPPING :



In Backstopping applications, Freewheel clutches are used to prevent reverse rotation of drive shafts. With the outer race of the clutch anchored to a stationary member, the inner race can overrun freely in one direction of rotation, reverse rotation is instantaneously prevented by the automatic engagement of the clutch. Fig. 3 shows a sprag clutch used as a Backstop on head shaft of a bucket elevator.

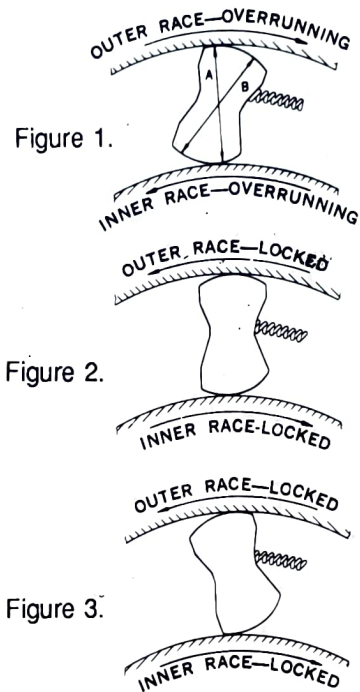
SPRAG CLUTCHES

Precision clutches utilize a full complement of sprags which are placed between concentric inner and outer races. A light spring ensures that the sprags are always in contact with the races, Torque is transmitted from one race to the other by wedging action of the sprags between the races. The sprags have a greater dimension (B) across one set of diametrically opposite corners than across the other (A) as shown in Figure 1. Precision clutches provide instantaneous engagement or disengagement without backlash.

FIGURE 1. Shows the sprags in a position to allow the inner race to overrun counter-clockwise or the outer race to Overrun in a clockwise direction.

FIGURE 2. The inner race has rotated clockwise and has forced the sprags to rotata counter-clockwise partially loading the clutch.

FIGURE 3. The sprags are fully loaded and loads can be transmitted through the sprags from a clockwise rotation of the outer race.



ROLLER CLUTCHES

These clutches operate on the principle of a roller on an inclined plane. Clutches utilizing this construction are equipped with individual spring-loaded rollers. The rollers are kept in engagement with the clutch inner and outer races through spring loaded plungers. Through this energization a constant contact of all rollers with the race members is assured.

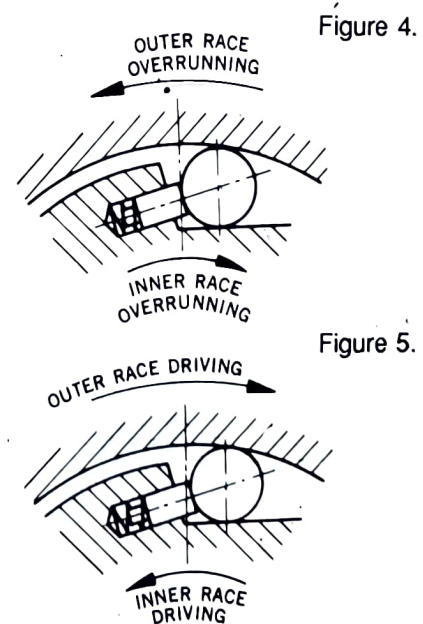
Figures 4 and 5 show the basic construction of the roller ramp clutches, namely, (1) cylindrical outer race (2) solid cylindrical rollers and (3) inner race with precision ground inclined ramps,

FIGURE 4. when the outer race is driven counter-clockwise or the inner race is driven clockwise, the roller is forced down the inclined ramp permitting freewheeling of the clutch.

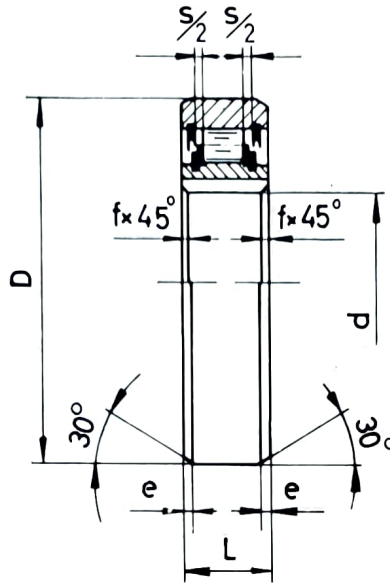
Although the races move the roller in an anti-wedge position, the spring-loaded plunger keeps the roller in very light contact with the races to assure instantaneous engagement when race rotation is reversed to transmit load.

FIGURE 5. When the outer race is driven clockwise or the inner race is driven counter-clockwise, the roller is forced up the inclined ramp locking the race and roller components to transmit load.

The rollers move along the inclined plane to a point where the distance between the races is slightly smaller than the roller diameter and consequently wedging occurs.



Freewheels with individually spring-loaded rollers.



Size d_{H7} mm	Nominal Torque ¹ T_N Nm	Overrunning speeds ²		D_{r6} mm	L mm	s mm	e mm	f mm	Weight kg
		n_{max} Innerrace RPM	n_{max} Outerrace RPM						
10	4,5	3500	5200	30	9	0,6	0,6	0,3	0,03
12	7,5	3200	4800	32	10	0,6	0,6	0,3	0,04
15	8,5	2800	4300	35	11	1,2	0,6	0,3	0,05
20	24	2200	3300	47	14	1,2	0,8	0,8	0,12
25	35	1900	2900	52	15	1,2	0,8	0,8	0,14
30	56	1600	2400	62	16	1,6	0,8	1	0,22
35	90	1300	2000	72	17	2,6	1,8	1	0,31
40	115	1200	1800	80	18	1,6	1,8	1	0,39
45	130	1000	1600	85	19	2,6	1,8	1	0,44
50	140	950	1500	90	20	2,6	1,8	1	0,49
55	190	800	1300	100	21	2,6	2,7	1	0,66
60	300	700	1100	110	22	1,6	2,7	1,5	0,81
80	580	600	900	140	26	2,6	2,7	1,5	1,41

Keywords :

PS 10, PS 12 to DIN 6885 page 1, other sizes page 3.

- 1) T_{max} is 2,5 x Nominal Torque (T_N) for short periods only.
- 2) The indicated maximum Overrunning (Idling) speeds are valid for pressure lubrication only.

For oil bath lubrication 65% of indicated speeds.

For grease lubrication 50% of indicated speeds.

If higher speeds are required other than those listed please consult.

The assembly dimensions of clutches PS are identical to those of ball-bearing sizes series 62.

Drive to the inner races is transmitted by a keyway and to the outer races by a press fit.

We recommend the following limits :

Shaft d_{H6} or $j6$ Bore D_{H7} or $J7$

This type of freewheels do not have the bearings, and hence the outer and inner races must be precisely centered and aligned with respect to each other by providing external bearing support.

While installing, a care should be taken that there is no relative axial force between inner and outer races of freewheel.

Press in and removal of inner and outer races should be done simultaneously.

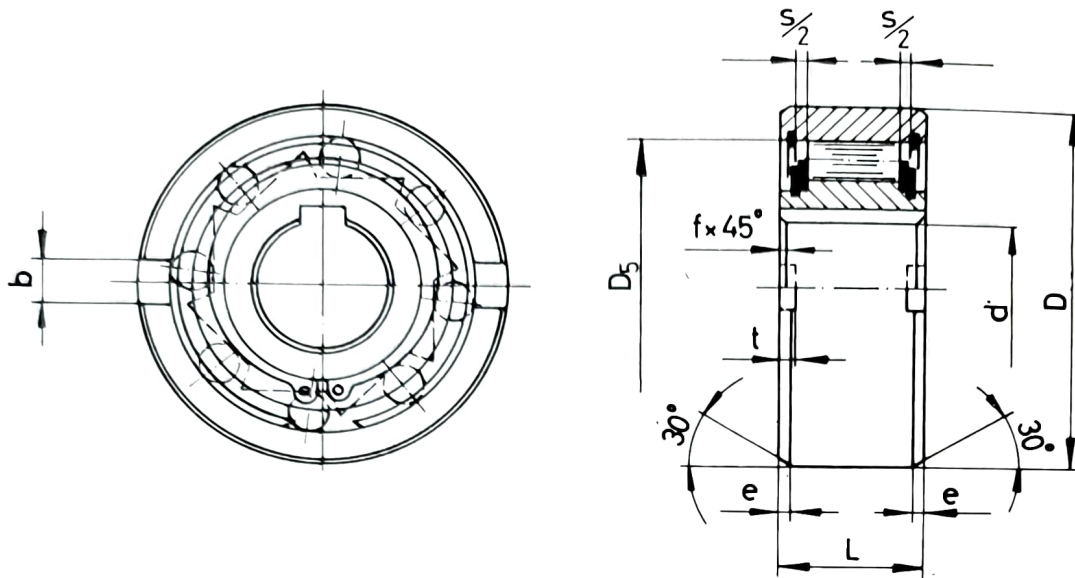
For indexing applications,

Freewheels can be supplied with stronger 'V' or 'VV' springs.

The best indexing accuracy is reached by using lubricating oils with a low viscosity of about 12 mm²/sec

at operating temperature.

Freewheels with individually spring-loaded rollers.



Size d^{H7} mm	Nominal Torque ¹ T_N Nm	Overrunning speed ²		D_{n6} mm	L mm	D_5 mm	Face groove		s mm	e mm	f mm	Weight kg
		n_{max} Innerrace RPM	n_{max} Outerrace RPM				b mm	t mm				
12	7	3300	5000	35	13	28	4	1,2	1,2	0,6	0,3	0,06
15	19	2400	3600	42	18	37	5	1,2	1,2	0,8	0,3	0,11
17	28	2300	3400	47	19	40	5	2,0	1,2	0,8	0,8	0,15
20	44	2100	3100	52	21	42	6	1,8	1,8	0,8	0,8	0,20
25	75	1700	2600	62	24	51	8	2,0	2,4	1	0,8	0,40
30	150	1400	2200	72	27	60	10	2,5	0,6	1,8	1	0,55
35	230	1200	1900	80	31	70	12	3,5	0,6	1,8	1	0,80
40	320	1100	1700	90	33	78	12	3,5	1,2	1,8	1	0,95
45	460	1000	1600	100	36	85	14	3,5	2,4	1,8	1	1,40
50	600	850	1350	110	40	92	14	4,5	1,2	1,8	1	1,80
60	1060	750	1050	130	46	110	18	5,5	1,2	2,6	1,5	2,80
70	1360	600	950	150	51	125	20	6,5	2,2	2,6	1,5	4,20
80	2000	550	850	170	58	140	20	7,5	1,2	2,6	1,5	6,10
90	2550	500	750	190	64	160	20	8,0	2,4	2,6	2	8,2
100	4100	450	680	215	73	175	24	8,5	2,4	2,6	2	12,6
120	6950	370	550	260	86	215	28	10	3,2	3	2,5	22
150	14300	300	460	320	108	260	32	12	3,2	3	2,5	42

Keywords : PSN 12, PSN 150 to DIN 6885 page 1, other sizes page 3.

- T_{max} is 2,5 x Nominal Torque (T_N) for short periods only.
- The indicated maximum Overrunning (Idling) speeds are valid for pressure lubrication only.

For oil bath lubrication 65% of indicated speeds.

For grease lubrication 50% of indicated speeds.

If higher speeds are required other than those listed please consult.

The assembly dimensions of clutches PSN are identical to those of roller-bearing sizes series NU 23.

Drive to the inner races is transmitted by a keyway, to the outer races by face grooves or by a press fit.

We recommend the following limits :

Shaft ϕ d_{n6} or j_6 Bore D^{H7} or $F7$ (drive transmitted by face grooves)
 D^{K6} (drive transmitted by press fit)

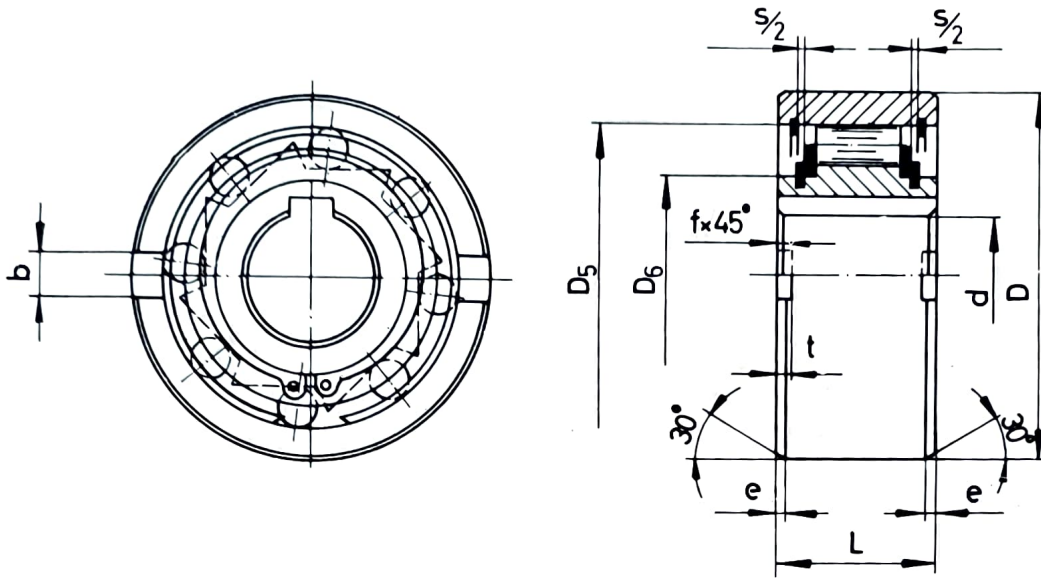
This type of freewheels do not have the bearings, and hence the outer and inner races must be precisely centered and aligned with respect to each other by providing external bearing support.

While installing, a care should be taken that there is no relative axial force between inner and outer races of freewheel.

Press in and removal of inner and outer races should be done simultaneously.

For indexing applications, Freewheels can be supplied with stronger 'V' or 'VV' springs. The best indexing accuracy is reached by using lubricating oils with a low viscosity of about 12 mm²/sec at operating temperature.

Freewheels with individually spring-loaded rollers.



Size d^{H7} mm	Nominal Torque ¹ T_N Nm	Overrunning speed ²		D_{h6} mm	D_5 mm	D_6 mm	L mm	s mm	f mm	e mm	Face groove		Weight kg
		n_{max} Innerrace RPM	n_{max} Outerrace RPM								b mm	t mm	
12	9.5	3100	6200	37	28	20	20	3	0.5	0.5	6	3	0,11
15	30	2300	5600	47	37	26	30	3	0.8	0.8	7	3.5	0,30
20	85	2000	4800	62	50	35	34	3	0.8	0.8	8	3.5	0,55
25	124	1700	4000	80	68	45	37	4	1	1	9	4	0,98
30	230	1500	3400	90	75	50	44	4	1	1	12	5	1,50
35	290	1300	2800	100	80	55	48	4	1	1	13	6	2,00
40	490	1200	2500	110	90	60	56	4	1.5	1.5	15	7	2,80
45	670	1050	2200	120	95	65	56	4	1.5	1.5	16	7	3,30
50	1100	950	2050	130	110	78	63	4	1.5	1.5	17	8	4,20
55	1250	850	1950	140	115	82	67	2	2	2	18	9	5,20
60	1800	800	1800	150	125	90	78	6	2	2	18	9	6,80
70	2650	650	1700	170	140	100	95	10	2.5	2.5	20	9	10,5
80	4000	500	1500	190	160	115	100	14	2.5	2.5	20	9	14,9
90	7500	400	1300	215	180	130	115	13	3	3	24	11	21,1
100	9500	350	1150	260	210	150	120	7	3	3	28	13	33,6
120	13900	230	900	300	240	180	140	10	4	4	32	18	51,5
150	27000	160	600	370	310	230	180	16	4	4	32	18	96,2
200	70000	125	460	480	400	300	240	16	5	5	40	25	230

Keyways : To DIN 6885 page 1

1) T_{max} is 2,5 X Nominal Torque (T_N) for Short periods only.

2) The indicated maximum Overrunning (Idling) speeds are valid for pressure lubrication only.

For oil bath lubrication 65% of indicated speeds.

For grease lubrication 50% of indicated speeds.

if higher speeds are required other than those listed please consult.

Drive to the inner races is transmitted by a keyway, to the outer races by face grooves or by a press fit.

We recommend the following limits :

Shaft d_{h6} or j_6 Bore D^{H7} or $F7$ (drive transmitted by face grooves)
 D^{K6} (drive transmitted by press fit)

This type of freewheels do not have the bearings, and hence the outer and inner races must be precisely centered and aligned with respect to each other by providing external bearing support.

While installing, a care should be taken that there is no relative axial force between inner and outer races of freewheel.

Press in and removal of inner and outer races should be done simultaneously.

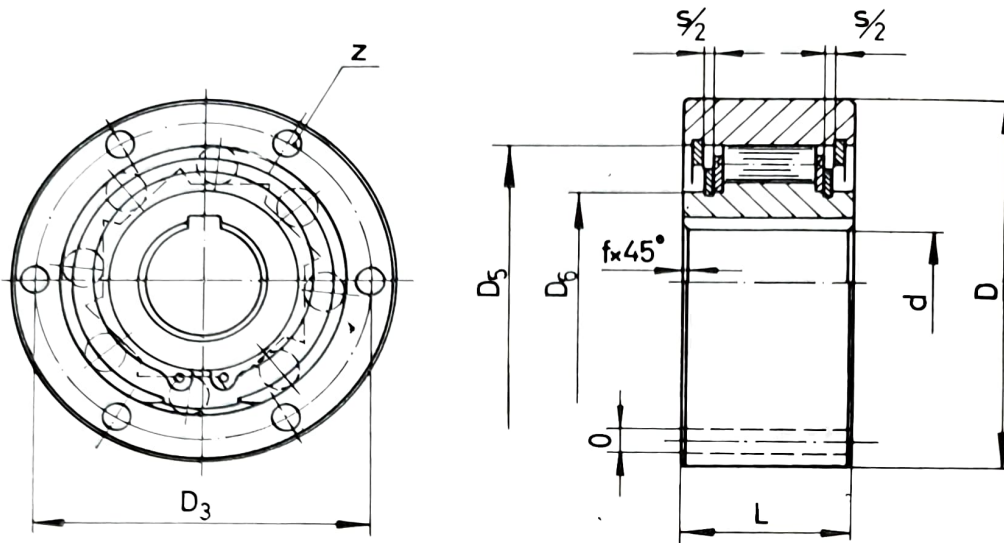
For indexing applications,

Freewheels can be supplied with stronger 'V' or 'VV' springs.

The best indexing accuracy is reached by using lubricating oils with a low viscosity of about 12 mm²/sec at operating temperature.

TYPE PA

Freewheels with individually spring-loaded rollers.



Size d^{H7} mm	Nominal Torque ¹ T_N Nm	Overrunning speeds ²		D_{h6} mm	L mm	D_5 mm	D_6 mm	D_3 mm	Z	O mm	f mm	s mm	Weight kg
		n_{max} Innerrace RPM	n_{max} Outerrace RPM										
12	9.5	3100	6200	47	20	28	20	38	3	5.5	0.5	3	0,21
15	30	2300	5600	55	30	37	26	45	3	5.5	0.8	3	0,44
20	85	2000	4800	68	34	50	35	58	4	5.5	0.8	3	0,70
25	124	1700	4000	90	37	68	45	78	6	5,5	1	4	1,30
30	230	1500	3400	100	44	75	50	87	6	6,6	1	4	2,00
35	290	1300	2800	110	48	80	55	96	6	6.6	1	4	2,60
40	490	1200	2500	125	56	90	60	108	6	9	1,5	4	3,90
45	670	1050	2200	130	56	95	65	112	8	9	1,5	4	4,00
50	1100	950	2050	150	63	110	78	132	8	9	1,5	5	6,00
55	1250	850	1950	160	67	115	82	138	8	11	2	5	7,20
60	1800	800	1800	170	78	125	90	150	10	11	2	6	9.20
70	2650	650	1700	190	95	140	100	165	10	11	2,5	11	11,8
80	4000	500	1500	210	100	160	115	185	10	11	2,5	14	15,6
90	7500	400	1300	230	115	180	130	206	10	14	3	15	24,7
100	9500	350	1150	270	120	210	150	240	10	18	3	7	35,8
120	13900	230	900	310	140	240	180	278	12	18	4	10	54,3
150	27000	160	600	400	180	310	230	360	12	22	4	16	116
200	70000	125	460	520	240	400	260	460	18	26	5	16	267
250	136000	100	380	610	300	480	320	545	20	33	5	30	461

Keywords : To DIN 6885 page 1

1) T_{max} is 2,5 X Nominal Torque (T_N) for Short periods only.

2) The indicated maximum Overrunning (Idling) speeds are valid for pressure lubrication only.

For Oil bath lubrication 65% of indicated speeds.

For grease lubrication 50% of indicated speeds.

If higher speeds are required other than those listed please consult.

This type of freewheels do not have the bearings, and hence the outer and inner races must be precisely centered and aligned with respect to each other by providing external bearing support.

While installing, a care should be taken that there is no relative axial force between inner and outer races of freewheel.

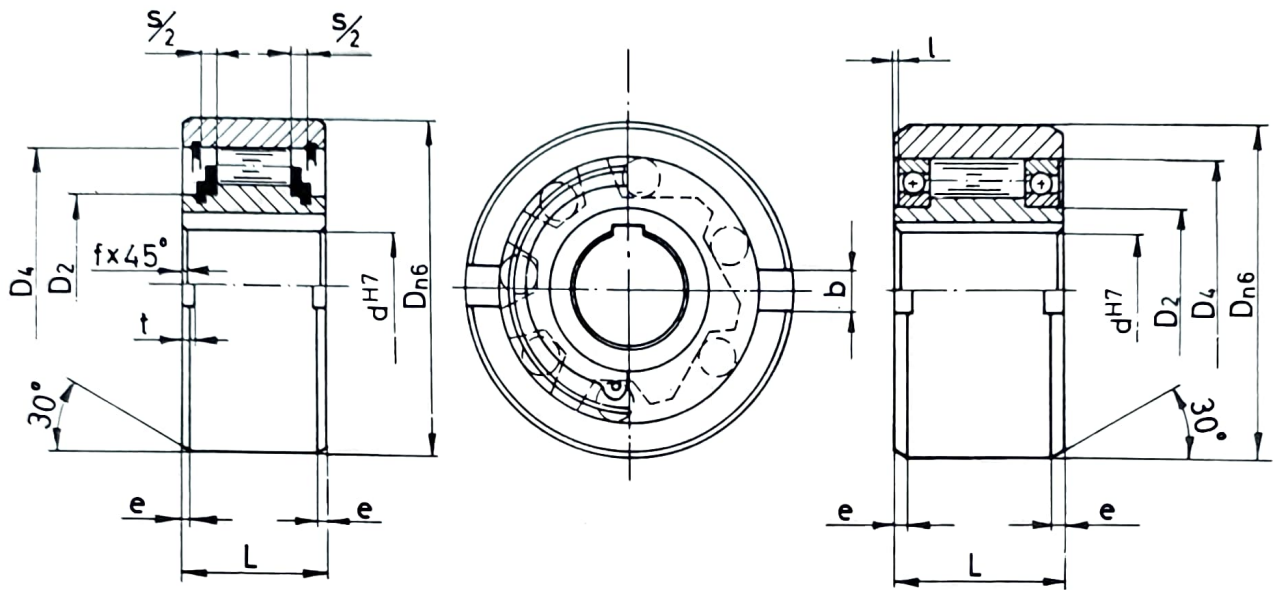
Press in and removal of inner and outer races should be done simultaneously.

For indexing applications,

Freewheels can be supplied with stronger 'V' or 'VV' springs.

The best indexing accuracy is reached by using lubricating oils with a low viscosity of about 12 mm²/sec at operating temperature.

Freewheels with individually spring-loaded rollers.



Size	dH7 mm	Overrun speed ²		Dn6 mm	D2 mm	D4 mm	L mm	s mm	f mm	e mm	b mm	t mm	l mm	Weight kg
		Innerrace n _{max} min ⁻¹	Outerrace n _{max} min ⁻¹											
12	9,5	1000	1000	37	20	28	20	4,5	0,5	0,8	6	3	-	0,11
15	30	750	750	47	26	37	30	4,5	0,8	1,2	7	3,5	-	0,30
20	72	560	560	62	35	50	36	5,5	0,8	1,2	8	3,5	-	0,55
25	124	1400	3400	80	40	68	40	-	1	1,8	9	4	0,2	1,2
30	230	1300	3000	90	45	75	48	-	1	1,8	12	5	0,2	1,8
35	290	1100	2800	100	50	80	53	-	1	1,8	13	6	1,2	2,4
40	490	950	2500	110	55	90	63	-	1,5	1,8	15	7	2,2	3,3
45	670	900	2400	120	60	95	63	-	1,5	2,6	16	7	2,2	4,0
50	1100	850	2000	130	70	110	80	-	1,5	2,6	17	8,5	2,7	5,7
55	1250	720	1960	140	75	115	80	-	2	2,6	18	9	4,2	6,5
60	1800	680	1800	150	80	125	95	-	2	2,6	18	9	3,2	8,9
70	2650	580	1600	170	90	140	110	-	2,5	2,6	20	9	1,1	13,5
80	4000	480	1400	190	105	160	125	-	2,5	2,6	20	9	0,0	19
90	7500	380	1250	215	120	180	140	-	3	3,6	24	11,5	0,6	27
100	9500	350	1100	260	140	210	150	-	3	3,6	28	14,5	2,6	45
120	16000	250	950	300	160	240	180	-	4	3,6	32	18	2,0	67

Keywords : DIN 6885/page 1

1) Nominal torque

$T_{MAX} = 2.5 \times T_N$ for brief periods only

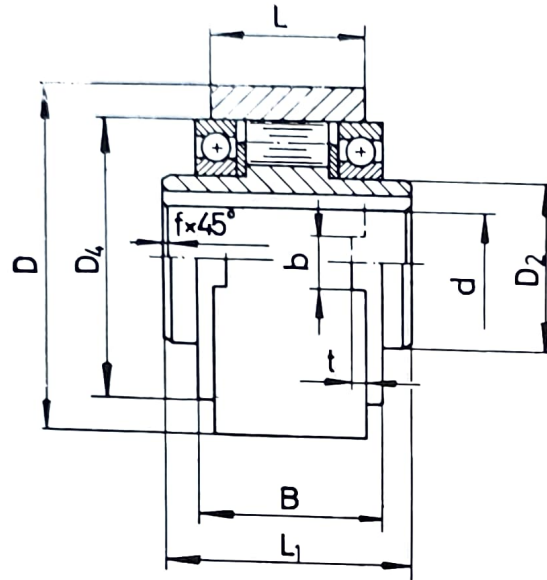
2) For oil bath lubrication

For circulation oiling 180%

For grease lubrication 50%

* PNR 12-20 with friction bearing steel on steel
PNR 25-120 with Ball Bearings.

Freewheels with individually spring-loaded rollers



Size d ^{H7} mm	Nominal Torque ¹ T _N Nm	Overrunning speed ²		D _{h6} mm	D ₂ mm	D ₄ mm	L mm	L ₁ mm	B mm	f mm	Face groove		Weight kg
		n _{max} Innerrace RPM	n _{max} Outerrace RPM								b mm	t mm	
25	124	1400	3400	80	40	68	37	60	42,1	1	9	4	1,5
30	230	1300	3000	90	45	75	44	68	49,1	1	12	5	2,2
35	290	1100	2800	100	50	80	48	74	54,1	1	13	6	3,0
40	490	950	2500	110	55	90	56	86	62,1	1,5	15	7	4,4
45	670	900	2400	120	60	95	56	86	62,1	1,5	16	7	4,5
50	1100	850	2000	130	70	110	63	92	69,1	1,5	17	8	6,8
55	1250	720	1960	140	75	115	67	104	73,1	2	18	9	8,0
60	1800	680	1800	150	80	125	78	114	84	2	18	9	10,0
70	2650	580	1600	170	90	140	95	134	103	2,5	20	9	12,0
80	4000	480	1400	190	105	160	100	144	108	2,5	20	9	16
90	7500	380	1250	215	120	180	115	158	125	3	24	11	26
100	9500	350	1100	260	140	210	120	182	131	3	28	13	38
120	13900	250	950	300	160	240	140	202	152	3	32	18	56
150	27000	180	750	370	200	310	180	246	196	4	32	18	120
200	70000	120	550	480	260	400	240	326	265	5	40	25	274
250	136000	100	450	580	320	480	300	396	330	5	45	30	488

Keyways : To DIN 6885 page 1

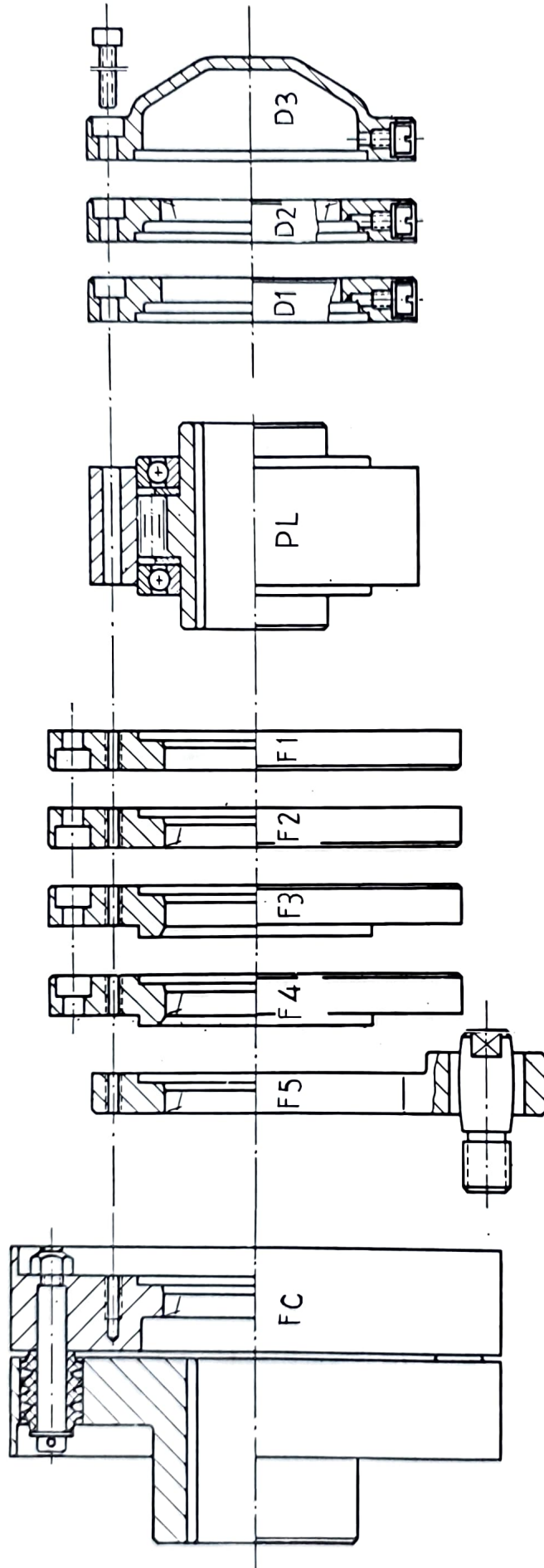
1) T_{max} is 2.5 x Nominal Torque (T_N) for short periods only.

2) The indicated maximum Overrunning (Idling) speeds are valid for oil bath lubrication only.

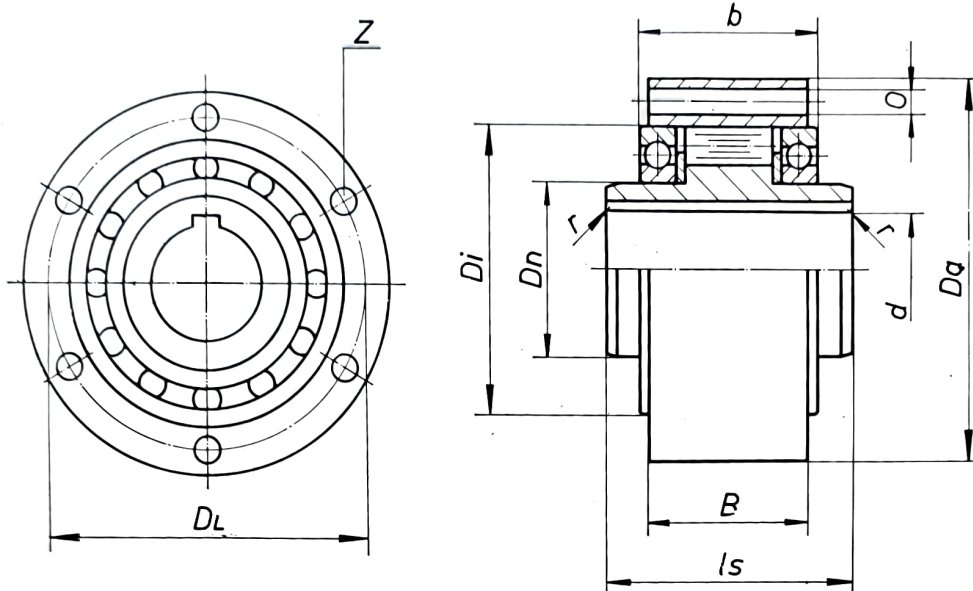
For pressure lubrication 180% of indicated speeds.

For grease lubrication 50% of indicated speeds.

If higher speeds are required other than those listed please consult.



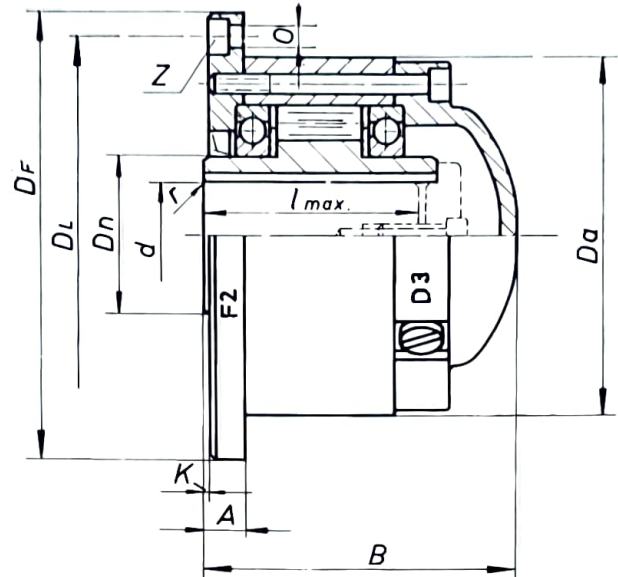
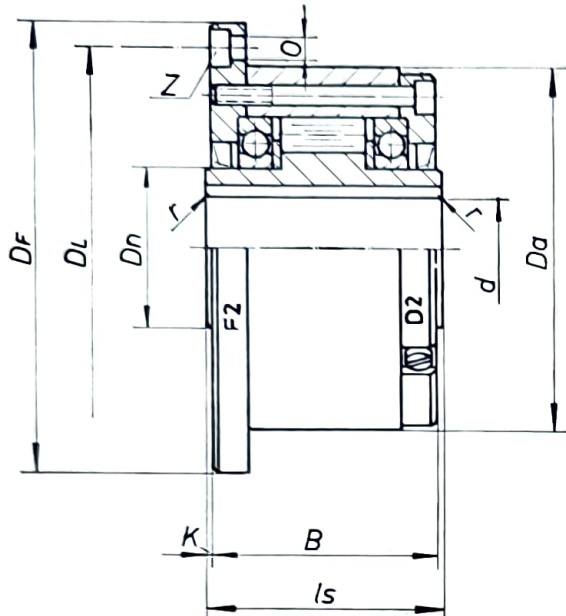
Freewheels with individually spring loaded rollers and ball bearings.



Size d^{H7} mm	Nominal Torque ¹ T_N Nm	Overrunning speed ²		D_a^{H7} mm	l_s mm	D_i mm	D_n mm	D_L mm	Z	O mm	B mm	b mm	r mm	Weight kg
		n_{max} Innerrace RPM	n_{max} Outerrace RPM											
12	29	2400	4800	62	42	42	20	51	3	5,5	20	27	0,5	0,48
15	50	1800	4300	68	52	47	25	56	3	5,5	30	34	0,8	0,80
20	84	1500	3700	75	57	55	30	64	4	5,5	34	39	0,8	1,00
25	124	1300	3100	90	60	68	40	78	6	5,5	37	42	1	1,60
30	230	1150	2600	100	68	75	45	87	6	7	44	49	1	2,30
35	290	1000	2200	110	74	80	50	96	6	7	48	54	1	3,00
40	490	900	1900	125	86	90	55	108	6	9	56	62	1,5	4,50
45	670	800	1700	130	86	95	60	112	8	9	56	62	1,5	4,60
50	1100	750	1600	150	92	110	70	132	8	9	63	69	1,5	7,10
55	1250	650	1500	160	104	115	75	138	8	11	67	73	2	8,40
60	1800	600	1400	170	114	125	80	150	10	11	78	84	2	10,6
70	2650	500	1300	190	134	140	90	165	10	11	95	103	2,5	13,4
80	4000	400	1150	210	144	160	105	185	10	11	100	108	2,5	18,0
90	7500	300	1000	230	158	180	120	206	10	13	115	125	3	28,0
100	9500	250	900	270	182	210	140	240	10	17	120	131	3	42,0
120	13900	180	700	310	202	240	160	278	12	17	140	152	4	62,0
150	27000	120	450	400	246	310	200	360	12	22	180	196	4	134

Keyway tolerances to DIN 6885 sheet 1

- 1) T_{max} is 2.5 X Nominal Torque (T_N) for short periods only.
- 2) The max. overrunning speeds are for oil bath lubrication only.
 For pressure lubrication max. speed = 150 %
 For grease lubrication max. speed = 50 %



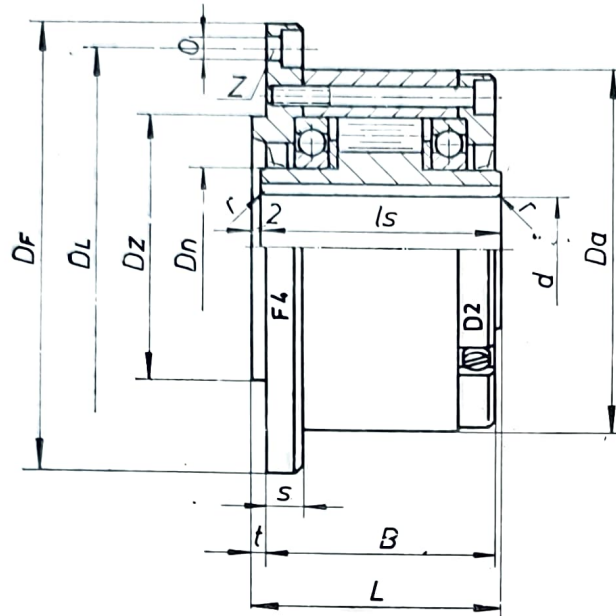
Size d ^{H7} mm	Nominal Torque ¹ T _N Nm	Overrunning speed ²		Da h7 mm	Is mm	DF mm	DL mm	Z -	O mm	A mm	F2-D2	F2-D3	K mm	r mm	lmax mm
		n _{max} Innerrace RPM	n _{max} Outerrace RPM								B mm	B mm			
12	29	2400	4800	62	42	85	72	3	5,8	11	40	57	1	0,5	38
15	50	1800	4300	68	52	92	78	3	5,8	11	50	66	1	0,8	48
20	84	1500	3700	75	57	98	85	4	5,8	11,5	55	72	1	0,8	53
25	124	1300	3100	90	60	118	104	4	7	11,5	58	75	1	1	55
30	230	1150	2600	100	68	128	114	6	7	12	66	83	1	1	63
35	290	1000	2200	110	74	138	124	6	7	13	71	88	1,5	1	69
40	490	900	1900	125	86	160	142	6	9	15	83	102	1,5	1,5	80
45	670	800	1700	130	86	165	146	8	9	15	83	102	1,5	1,5	80
50	1100	750	1600	150	92	185	166	8	9	14,5	88	110	2	1,5	86
55	1250	650	1500	160	104	204	182	8	11	18,5	100	126	2	2	97
60	1800	600	1400	170	114	214	192	10	11	18	110	136	2	2	107
70	2650	500	1300	190	134	234	212	10	11	19,5	130	157	2	2,5	127
80	4000	400	1150	210	144	254	232	10	11	22	140	166	2	2,5	137
90	7500	300	1000	230	158	278	254	10	13	21,5	153	183	2,5	3	150
100	9500	250	900	270	182	335	305	10	17	31	176	210	3	3	172
120	13900	180	700	310	202	375	345	12	17	31	196	230	3	4	192
150	27000	120	450	400	246	485	445	12	22	33	240	278	3	4	236

Keyways : To DIN 6885 page 1

- 1) T_{max} is 2.5 x Nominal Torque (T_N) for short periods only.
- 2) The maximum overrunning speeds are for oil bath lubrication only.
For pressure lubrication 150% of indicated speeds.
For grease lubrication 50% of indicated speeds.
If higher speeds are required other than those listed please consult.

When ordering please indicate direction of rotation :

- " R " when viewed from cover, D2/D3 inner race overruns in clockwise direction.
 - " L " when viewed from cover, D2/D3 inner race overruns in anticlockwise direction.
- Freewheels with special bore sizes are available.



Size d ^{h7} mm	Nominal Torque ¹ T _N Nm	Overrunning speed ²		Da mm	ls mm	DF mm	DL mm	Z	O mm	DZ h7 mm	t mm	Dn mm	L mm	B mm	S mm	r mm	Weight kg
		n _{max} Innerrace RPM	n _{max} Outerrace RPM														
12	29	2400	4800	62	42	85	72	3	5,8	42	3	20	44	40	10	0,5	0,9
15	50	1800	4300	68	52	92	78	3	5,8	47	3	25	54	50	10	0,8	1,3
20	84	1500	3700	75	57	98	85	4	5,8	55	3	30	59	55	10,5	0,8	1,7
25	124	1300	3100	90	60	118	104	4	7	68	3	40	62	58	10,5	1	2,6
30	230	1150	2600	100	68	128	114	6	7	75	3	45	70	66	11	1	3,5
35	290	1000	2200	110	74	138	124	6	7	80	3,5	50	76	71	11,5	1	4,5
40	490	900	1900	125	86	160	142	6	9	90	3,5	55	88	83	13,5	1,5	6,9
45	670	800	1700	130	86	165	146	8	9	95	3,5	60	88	83	13,5	1,5	7,1
50	1100	750	1600	150	92	185	166	8	9	110	4	70	94	88	12,5	1,5	10,1
55	1250	650	1500	160	104	204	182	8	11	115	4	75	106	100	16,5	2	13,1
60	1800	600	1400	170	114	214	192	10	11	125	4	80	116	110	16	2	15,6
70	2650	500	1300	190	134	234	212	10	11	140	4	90	136	130	17,5	2,5	20,4
80	4000	400	1150	210	144	254	232	10	11	160	4	105	146	140	20	2,5	26,7
90	7500	300	1000	230	158	278	254	10	13	180	4,5	120	160	153	19	3	39,0
100	9500	250	900	270	182	335	305	10	17	210	5	140	184	176	28	3	66,0
120	13900	180	700	310	202	375	345	12	17	240	5	160	204	196	28	4	91,0
150	27000	120	450	400	246	485	445	12	22	310	5	200	248	240	30	4	186

Keyways : To DIN 6885 page 1

- 1) T_{max} is 2.5 x Nominal Torque (T_N) for short periods only.
- 2) The maximum overrunning speeds are for oil bath lubrication only.

For pressure lubrication 150% of indicated speeds.

For grease lubrication 50% of indicated speeds.

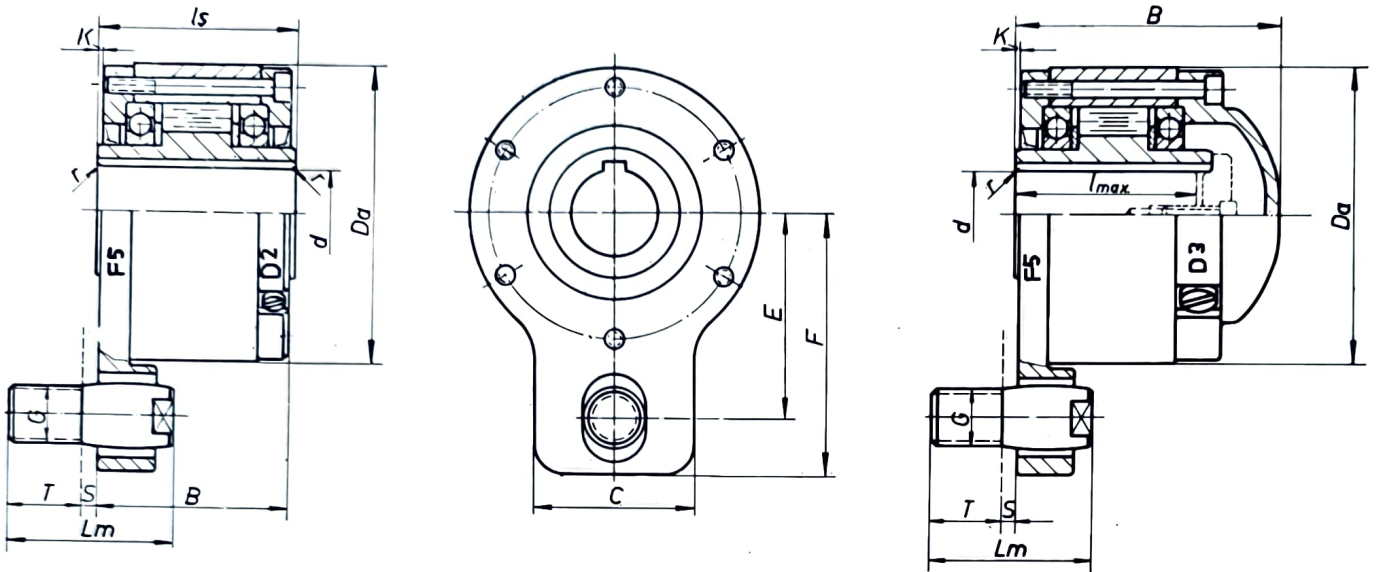
If higher speeds are required other than those listed please consult.

When ordering please indicate direction of rotation :

" R " when viewed from cover D2 inner race overruns in clockwise direction.

" L " when viewed from cover D2 inner race overruns in anticlockwise direction.

Freewheels with special bore sizes are available.

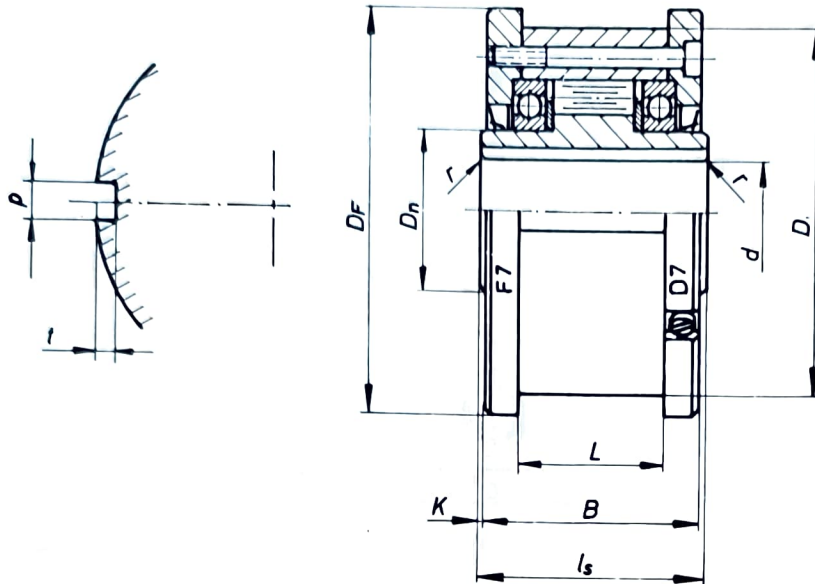


Size d _{H7} mm	Nominal Torque ¹ T _N Nm	n _{max} ² Innerrace RPM	Da mm	ls mm	F5-D2 B mm	F5-D3 B mm	C mm	E mm	F mm	G	Lm mm	S mm	T mm	K mm	r mm	lmax mm
12	29	2400	62	42	40	57	35	44	58	M 12	40	5	15	1	0,5	38
15	50	1800	68	52	50	66	35	47	62	M 12	40	5	15	1	0,8	48
20	84	1500	75	57	55	72	45	54	74	M 16	46	5	20	1	0,8	53
25	124	1300	90	60	58	75	45	62	82	M 16	46	5	20	1	1	55
30	230	1150	100	68	66	83	55	68	90	M 20X2	56	5	25	1	1	63
35	290	1000	110	74	71	88	55	76	98	M 20X2	56	6	25	1,5	1	69
40	490	900	125	86	83	102	65	85	110	M 24X2	62	6	30	1,5	1,5	80
45	670	800	130	86	83	102	65	90	115	M 24X2	62	6	30	1,5	1,5	80
50	1100	750	150	92	83	110	75	102	132	M 30X2	75	6	35	2	1,5	86
55	1250	650	160	104	100	126	75	108	138	M 30X2	75	6	35	2	2	97
60	1800	600	170	114	110	136	80	112	145	M 30X2	75	6	35	2	2	107
70	2650	500	190	134	130	157	90	135	172	M 36X2	100	6	45	2	2,5	127
80	4000	400	210	144	140	166	100	145	185	M 40x2	105	6	50	2	2,5	137
90	7500	300	230	158	153	183	120	155	200	M 48x2	120	7	55	2,5	3	150
100	9500	250	270	182	176	210	130	180	230	M 52x2	135	8	60	3	3	172
120	13900	180	310	202	196	230	160	205	260	M 60x2	140	8	65	3	4	192
150	27000	120	400	246	240	278	190	255	315	M 72x2	165	8	75	3	4	236

Keyways : To DIN 6885 page 1

- 1) T_{max} is 2.5 x Nominal Torque (T_N) for short periods only.
- 2) The maximum overrunning speeds are for oil bath lubrication only.
For pressure lubrication 150% of indicated speeds.
For grease lubrication 50% of indicated speeds.
If higher speeds are required other than those listed please consult.

When ordering please indicate direction of rotation :
 " R " when viewed from cover, D2/D3 inner race overruns in clockwise direction.
 " L " when viewed from cover, D2/D3 inner race overruns in anticlockwise direction.
 Freewheels with special bore sizes are available.



Size d ^{h7} mm	Nominal Torque ¹ T _N Nm	Overrunning speed ²		D h7 mm	ls mm	DF mm	P mm	t mm	Dn mm	L mm	B mm	K mm	r mm	Weight kg
		n _{max} Innerrace RPM	n _{max} Outerrace RPM											
12	29	2400	4800	62	42	70	4	2,4	20	20	40	1	0,5	0,9
15	50	1800	4300	68	52	76	5	2,9	25	28	50	1	0,8	1,3
20	84	1500	3700	75	57	84	6	3,5	30	34	55	1	0,8	1,7
25	124	1300	3100	90	60	99	8	4,1	40	35	58	1	1	2,6
30	230	1150	2600	100	68	109	8	4,1	45	43	66	1	1	3,5
35	290	1000	2200	110	74	119	10	4,7	50	45	71	1,5	1	4,5
40	490	900	1900	125	86	135	12	4,9	55	53	83	1,5	1,5	6,9
45	670	800	1700	130	86	140	14	5,5	60	53	83	1,5	1,5	7,1
50	1100	750	1600	150	92	160	14	5,5	70	64	88	2	1,5	10,1
55	1250	650	1500	160	104	170	16	6,2	75	66	100	2	2	13,1
60	1800	600	1400	170	114	182	18	6,8	80	78	110	2	2	15,6
70	2650	500	1300	190	134	202	20	7,4	90	95	130	2	2,5	20,4
80	4000	400	1150	210	144	222	22	8,5	105	100	140	2	2,5	26,7
90	7500	300	1000	230	158	242	25	8,7	120	115	153	2,5	3	39,0
100	9500	250	900	270	182	282	28	9,9	140	120	176	3	3	66,0
120	13900	180	700	310	202	322	32	11,1	160	140	196	3	4	91,0
150	27000	120	450	400	246	412	36	12,3	200	180	240	3	4	186

Keyways : To DIN 6885 page 1

- 1) T_{max} is 2.5 x Nominal Torque (T_N) for short periods only.
- 2) The maximum overrunning speeds are for oil bath lubrication only.
For pressure lubrication 150% of indicated speeds.
For grease lubrication 50% of indicated speeds.
If higher speeds are required other than those listed please consult.

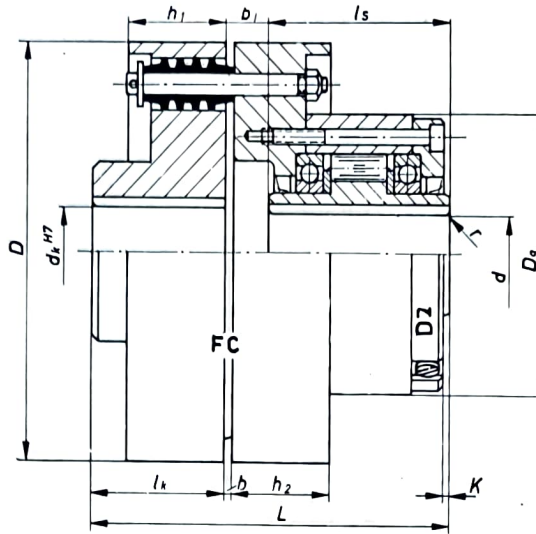
When ordering please indicate direction of rotation :

" R " when viewed from cover, D7 inner race overruns in clockwise direction.

" L " when viewed from cover, D7 inner race overruns in anticlockwise direction.

Freewheels with special bore sizes are available.

Freewheels with flexible coupling.



Model	Nominal Torque ¹ T_N Nm	Overrunning speed ²		ϕd H7 mm	ϕdk H7 mm	ϕDa mm	l_s mm	k mm	ϕD mm	L mm	h_1 mm	b_1 mm	l_k mm	b mm	h_2 mm	r mm	weight kg	
		n_{max} Innerrace RPM	n_{max} Outerrace RPM															
PL 12.FC-D2	29	2400	4800	12	12...	25	62	42	1	97	89	30	12	35	3	20	0,5	3
PL 15.FC-D2	50	1800	4300	15	16...	30	68	52	1	112	109	35	17	40	3	25	0,8	4,4
PL 20.FC-D2	84	1500	3700	20	16...	30	75	57	1	112	113,5	35	16,5	40	3	25	0,8	4,6
PL 25.FC-D2	124	1300	3100	25	20...	40	90	60	1	130	126,5	35	16,5	50	3	25	1	6,4
PL 30.FC-D2	230	1150	2600	30	20...	50	100	68	1	160	146	40	18	60	2	40	1	11
PL 35.FC-D2	290	1000	2200	35	25...	65	110	74	1,5	190	166	40	17	75	2	40	1	17
PL 40.FC-D2	490	900	1900	40	25...	65	125	86	1,5	190	176	40	15	75	2	40	1,5	19
PL 45.FC-D2	670	800	1700	45	25...	65	130	86	1,5	190	176	40	15	75	2	40	1,5	19
PL 50.FC-D2	1100	750	1600	50	30...	75	150	92	2	225	204,5	50	22,5	90	3	50	1,5	31
PL 55.FC-D2	1250	650	1500	55	35...	90	160	104	2	270	230,5	60	26,5	100	3	60	2	47
PL 60.FC-D2	1800	600	1400	60	35...	90	170	114	2	270	241	60	27	100	3	60	2	49
PL 70.FC-D2	2650	500	1300	70	45...	110	190	134	2	340	309,5	70	35,5	140	3	70	2,5	90
PL 80.FC-D2	4000	400	1150	80	55...	125	210	144	2	380	337	70	33	160	3	70	2,5	107
PL 90.FC-D2	7500	300	1000	90	65...	140	230	158	2,5	440	384,5	85	46,5	180	4	85	3	170
PL 100.FC-D2	9500	250	900	100	75...	160	270	182	3	500	419	85	37	200	4	85	3	230
PL 120.FC-D2	13900	180	700	120	85...	180	310	202	3	560	471	100	49	220	4	100	4	330
PL 150.FC-D2	27000	120	450	150	95...	200	400	246	3	640	543	100	47	250	4	100	4	500

Keyways : To DIN 6885 page 1

- T_{max} is 2.5 x Nominal Torque (T_N) for short periods only.
- The maximum overrunning speeds are for oil bath lubrication only.
For pressure lubrication 150% of indicated speeds.
For grease lubrication 50% of indicated speeds.
If higher speeds are required other than those listed please consult.

When ordering please indicate direction of rotation :

' R ' when viewed from cover, D2 inner race overruns in clockwise direction.

' L ' when viewed from cover, D2 inner race overruns in anticlockwise direction.

Freewheels with special bore sizes are available.

SERVICE FACTOR K				
Driven Machine	Type of load	Driving machine Electricmotor, Turbine	Engine	
			4-8 Cyl	1-3 Cyl.
Generators, Fans, Rotodynamic Pumps	Steady loads	1,2...1,4	1,3...1,8	1,7...2,4
Elevators, Conveyers, light duty textile machine	minor shocks	1,4...2,0	1,6...2,4	2,0...2,6
Mine compressors, Piston pumps	heavy shocks	1,8...2,5	2,0...2,6	2,5...3,2
Rotary furnaces, Rolling mills, Cement grinding mills	severe shocks	2,0...3,0	2,5...3,5	3,0...4,5

Construction

Double cage Freewheels are precision and compact devices with individually spring loaded sprags which transmit high torques within a small space. They consist of individual sprags, a ribbon spring, an outer cage & an inner cage. The sprags are precision made from a wear resisting chrome alloy steel. A specially formed ribbon spring is used to energize the sprags individually and align them axially. The inner and outer cages are made from high grade steel and hardened. The spring ensures optimum energization of sprags and also it holds the sprags and cages together before mounting. The use of double cage construction ensures that all the sprags share the load equally and it is impossible for a single sprag to fail due to overload. Compact construction, high torque capacity, remarkable operational safety & reliability makes the Double Cage an indispensable element in various applications.

Assembly

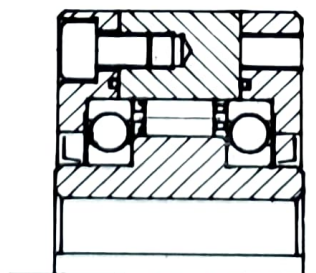
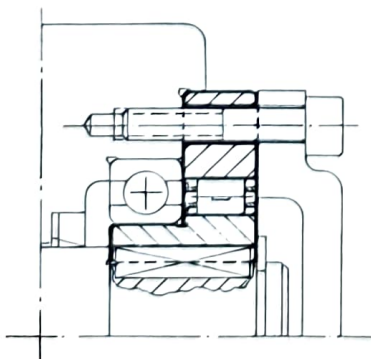
Double cage Freewheels are supplied as complete units in which the sprags are guided and held by the inner and outer cages and the ribbon spring. They can be easily assembled in cylindrical inner and outer races of the mechanism. Please note following points for manufacturing inner and outer races and also for assembly of Double cage in it.

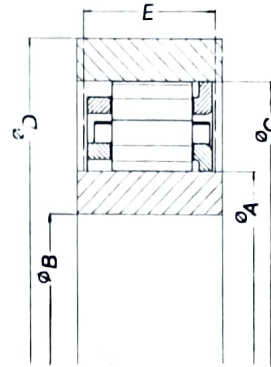
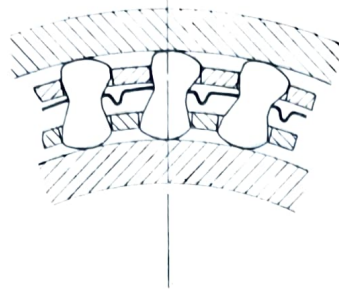
1. While designing the inner and outer races, diameters and tolerances should confirm to the sizes given in the table. Also it is very important to maintain minimum wall Thickness for the races. It is advisable to keep wall thickness of races higher than the minimum stated.
2. For races made from case hardening steel, minimum case depth should be 1.2 mm. after grinding and hardness of case should be 60-62 RC. The core hardness should be 35-45 RC.
3. Surface finish of the races, which are in contact with the sprags must not exceed 6.3 um.
4. Maximum and minimum radial sprag space must not exceed values given in table, taking into account all bearing clearances and tolerances. Taper between the race surfaces must not exceed



0.007 mm. per 25 mm. length. The double cage Freewheel is not self-centering. The Mounting is to be provided with the bearings so that the maximum co-axiality is achieved between the two races.

5. The axial guide for Double Cage should be through outer race. The centering flanges of the inner and outer cages must be away from undercuts and chamfers on the races, as shown in the examples below.
6. We recommend a chamfer of 30° and 2 mm long on inner and outer races to facilitate the assembly of Double Cage in the races.
7. The inner and outer races should be slightly rotated in the freewheeling direction, while fitting the Double Cage freewheels. Direction of freewheeling can be changed easily by putting the Double cage into races in opposite direction.
8. We can provide Double Cage Freewheels with 'Clips' attached to the outer cage, which ensures frictional connection with the outer race. This is necessary under the conditions of very rapid acceleration or deceleration. Please consult us in such applications.





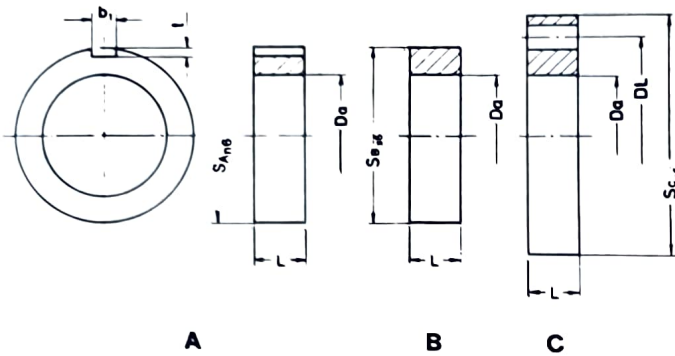
TYPE	A mm	C mm	SPRAG SPACE mm	E mm	D mm	B mm	NO. OF SPRAGS	TORQUE NM
DC-2222 G	22.225	38.885	8.330 ± 0.075	10.0	49.8	17.30	12	74
DC-2534 G	25.340	42.000	8.330 ± 0.075	10.0	52.8	20.20	12	80
DC-2776	27.762	44.422	8.330 ± 0.075	13.5	57.2	21.60	14	139
DC-3034	30.340	47.000	8.330 ± 0.075	13.5	61.4	23.50	14	145
DC-3175	31.750	48.410	8.330 ± 0.075	13.5	62.5	24.60	16	189
DC-3175 A	31.750	48.410	8.330 ± 0.075	16.0	62.5	24.60	16	240
DC-3492	34.920	51.580	8.330 ± 0.075	13.5	65.5	27.60	16	170
DC-3809 A	38.092	54.752	8.330 ± 0.075	16.0	70.4	29.70	18	324
DC-3834	38.340	55.000	8.330 ± 0.075	13.5	70.4	29.70	18	251
DC-4127	41.275	57.935	8.330 ± 0.075	13.5	74.2	32.00	18	265
DC-4445 G	44.450	61.110	8.330 ± 0.075	10.0	78.7	34.50	18	183
DC-4445 A	44.450	61.110	8.330 ± 0.075	16.0	78.7	34.50	20	424
DC-4972	49.721	66.381	8.330 ± 0.075	13.5	85.4	38.80	22	366
DC-5080 A	50.800	67.460	8.330 ± 0.075	16.0	86.4	39.60	22	440
DC-5134	51.340	68.000	8.330 ± 0.075	13.5	87.1	40.10	22	375
DC-5476	54.765	71.425	8.330 ± 0.075	13.5	91.7	42.60	24	480
DC-5476 A	54.765	71.425	8.330 ± 0.075	16.0	91.7	42.60	24	618
DC-5476 B	54.765	71.425	8.330 ± 0.075	21.0	91.7	42.60	24	907
DC-5476 C	54.765	71.425	8.330 ± 0.075	25.4	91.7	42.60	24	1165
DC-5715 A	57.150	73.810	8.330 ± 0.075	16.0	97.2	44.20	24	620
DC-5776 A	57.760	74.420	8.330 ± 0.075	16.0	97.7	44.90	26	711
DC-5834 A	58.340	75.000	8.330 ± 0.075	16.0	99.5	45.50	26	715
DC-5834 C	58.340	75.000	8.330 ± 0.075	25.4	99.5	45.50	26	1360
DC-6191 B	61.910	78.580	8.330 ± 0.075	21.0	101.1	48.50	26	1118
DC-6334	63.340	80.000	8.330 ± 0.075	13.5	103.4	49.90	26	510
DC-6334 B	63.340	80.000	8.330 ± 0.075	21.0	103.4	49.90	26	950
DC-6350 A	63.500	80.160	8.330 ± 0.075	16.0	103.6	50.10	26	720
DC-6834 A	68.340	85.000	8.330 ± 0.075	16.0	108.5	52.50	26	776
DC-6834 B	68.340	85.000	8.330 ± 0.075	21.0	108.5	52.50	26	1250
DC-6985 A	69.850	86.510	8.330 ± 0.075	16.0	110.9	52.80	26	820
DC-7221	72.217	88.877	8.330 ± 0.075	13.5	114.3	56.10	30	794
DC-7221 A	72.217	88.877	8.330 ± 0.075	16.0	114.3	56.10	30	1023
DC-7221 B	72.217	88.877	8.330 ± 0.075	21.0	114.3	56.10	30	1504
DC-7334 B	73.340	90.000	8.330 ± 0.075	21.0	117.2	57.10	30	1550
DC-7620 A	76.200	92.860	8.330 ± 0.075	16.0	121.5	59.20	30	1100
DC-7834 B	78.340	95.000	8.330 ± 0.075	21.0	123.3	60.50	30	1640
DC-7969	79.698	96.358	8.330 ± 0.075	13.5	123.9	61.90	34	981
DC-7969 C	79.698	96.358	8.330 ± 0.075	25.4	123.9	61.90	34	2396
DC-8260 C	82.600	99.260	8.330 ± 0.075	25.4	130.5	64.40	34	2850
DC-8334 A	83.340	100.000	8.330 ± 0.075	16.0	131.6	64.90	34	1220
DC-8334 C	83.340	100.000	8.330 ± 0.075	25.4	131.6	64.90	34	2420
DC-8729 A	87.290	103.960	8.330 ± 0.075	16.0	133.6	67.80	34	1477
DC-9334 C	93.340	110.000	8.330 ± 0.075	25.4	139.1	69.50	34	2950
DC-9834 C	98.340	115.000	8.330 ± 0.075	25.4	146.5	73.50	34	3120
DC-10160 C	101.600	118.260	8.330 ± 0.075	25.4	150.2	76.50	40	3740
DC-10323 A	103.231	119.891	8.330 ± 0.075	16.0	154.2	80.20	40	1900
DC-10323 B	103.231	119.891	8.330 ± 0.075	21.0	154.2	80.20	40	3000
DC-10834 C	108.340	125.000	8.330 ± 0.075	25.4	162.1	84.50	40	4000
DC-11739 A	117.391	134.051	8.330 ± 0.075	16.0	172.1	90.10	40	2160
DC-12334 A	123.340	140.000	8.330 ± 0.075	16.0	183.6	96.20	50	2825
DC-12334 C	123.340	140.000	8.330 ± 0.075	25.4	183.6	96.20	50	5650

INNER AND OUTER RACES TYPE DW

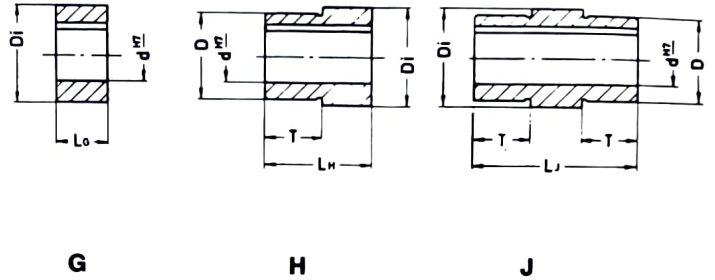


To be used with Double Cage freewheels type DC

Outer races



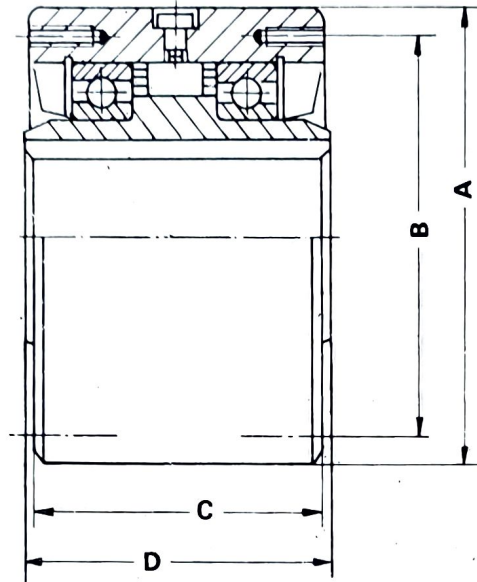
Inner races



TYPE	d H7	LG	LH	LJ	D j6	T	Di +0,008 -0,005	L	SA n6	b1 P9	t1	SB s6	SC g6	DL ±0,1	Number and size of Holes	Da ±0,013
DW 230 A DW 230 B DW 230 C								16 16 16	72	6	3,5	72	95	78	8x7	54,75 54,75 54,75
DW 230 G-10 DW 230 G-15 DW 230 G-20	10 15 20	16 16 16					38,092 38,092 38,092									
DW 230 H-10 DW 230 H-15 DW 230 H-20	10 15 20		33 33 33		35 35 35	17 17 17	38,092 38,092 38,092									
DW 230 J-10 DW 230 J-15 DW 230 J-20	10 15 20			50 50 50	35 35 35	17 17 17	38,092 38,092 38,092									
DW 167 A DW 167 B DW 167 C								16 16 16	90	10	5	90	110	95	8x9	71,427 71,427 71,427
DW 167 G-25 DW 167 G-30 DW 167 G-35	25 30 35	16 16 16					54,765 54,765 54,765									
DW 167 H-25 DW 167 H-30 DW 167 H-35	25 30 35		35 35 35		50 50 50	19 19 19	54,765 54,765 54,765									
DW 167 J-25 DW 167 J-30 DW 167 J-35	25 30 35			54 54 54	50 50 50	19 19 19	54,765 54,765 54,765									
DW 168 A DW 168 B DW 168 C								21 21 21	110	14	5,5	110	140	120	8x11	88,882 88,882 88,882
DW 168 G-40 DW 168 G-45 DW 168 G-50	40 45 50	21 21 21					72,217 72,217 72,217									
DW 168 H-40 DW 168 H-45 DW 168 H-50	40 45 50		42 42 42		65 65 65	21 21 21	72,217 72,217 72,217									
DW 168 J-40 DW 168 J-45 DW 168 J-50	40 45 50			63 63 63	65 65 65	21 21 21	72,217 72,217 72,217									
DW 235 A DW 235 B DW 235 C								16 16 16	150	20	7,5	150	190	170	8x11	119,893 119,893 119,893
DW 235 G-55 DW 235 G-60 DW 235 G-75	55 60 75	16 16 16					103,231 103,231 103,231									
DW 235 H-55 DW 235 H-60 DW 235 H-75	55 60 75		43 43 43		100 100 100	27 27 27	103,231 103,231 103,231									
DW 235 J-55 DW 235 J-60	55 60			70 70	100 100	27 27	103,231 103,231									

Keyway to DIN 6885 sheet 1
Bolts min. grade 8.8

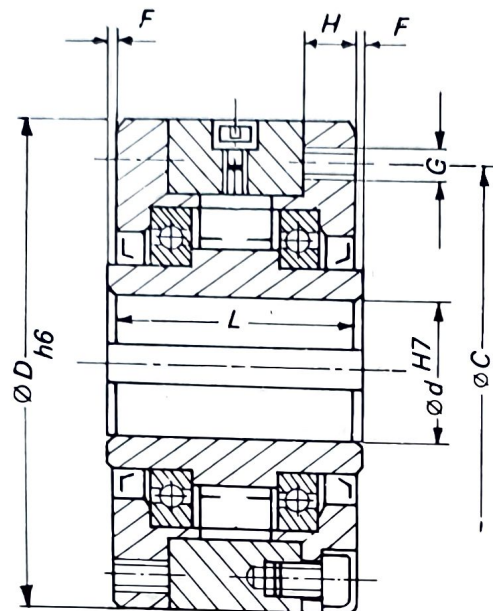
Special sizes available on request.
All dimensions are in mm.
Measurements and design are subject to modifications.



Model	Torque Nm	Maximum ¹ Overrunning RPM		Max. ² imum bore mm	Keyway mm	A mm	B mm	C mm	D mm	Mounting Holes			Approx. Wt. Kg.
		Inner race	Outer race							Nos.	Thread Size UNF	Depth mm	
SF-300	210	2900	800	19.0	4.76x2.38	76.20 76.15	66.7	60.3	63.5	4	1/4"	13	1.5
SF-400	413	2700	800	22.2	4,76x2,38	88.90 88,85	73,0	66,7	69,9	4	5/16"	16	2,2
SF-500	1172	2400	750	33,2	6,33x2,38	107,95 107,90	92,1	85,7	88,9	4	5/16"	16	4,0
SF-600	2070	2100	700	50,8	12,7x4,76	136,53 136,47	120,7	92,9	95,3	6	5/16"	16	7,0
SF-700	5517	1500	500	74.5	15.8x3.16	180.92 180.89	158.8	123.8	127.0	6	3/8"	19	16.0
SF750	9379	1500	500	87.3	19.05x4.76	222.22 ±0.025	177.8	149.2	152.4	6	1/2"	25.40	38.0
SF-800	15862	1300	475	112.7	25.4x6.35	253.98 ±0.025	227.0	149.2	152.4	8	1/2"	25.40	48.0
SF-900	22758	1200	400	138.1	25.4x6.35	304.76 ±0.038	247.65	158.7	161.9	10	5/8"	31.75	72.0
SF-1000	29655	1200	325	163.5	31.75x9.53	380.96 ±0.038	298.45	171.4	177.8	12	5/8"	31.75	115.0

1) The max overrunning speeds are for oil bath lubrication only.
If higher outer race overrunning speeds are required other than those listed please consult.

2) Bore & Keyway size to be specified by customer while ordering.
Only maximum size of bore & keyway stated in table.



Type	Nominal Torque Nm	Bore Diameter, d ^{H7}		D ^{h6} mm	L mm	F mm	H mm	C mm	Z No. of Holes	G	Weight kg.
		Stand mm	Max. mm								
RF 12	100	14	14	75	48	0,5	10	60	4	M 6	1,4
RF 14	150	17	17	80	48	0,5	10	67	6	M 6	1,6
RF 16	200	22	22	90	50	0,5	11	75	6	M 6	2,1
RF 20	330	28	30	105	52	0,5	12	88	6	M 8	2,7
RF 24	470	35	40	120	55	1	13	102	6	M 8	3,7
RF 27	590	45	50	135	70	3,5	18	115	6	M10	5,6
RF 28	710	45	50	135	75	1	18	115	6	M10	6,3
RF 35	1050	60	65	165	100	7,5	18	145	8	M10	11
RF 39	1350	70	75	180	105	7,5	18	160	10	M10	13,2
RF 53	2450	90	95	250	150	6,5	25	225	8	M12	42

Keyway according to DIN 6885, Sheet 1 or Sheet 3 depending on bore size.

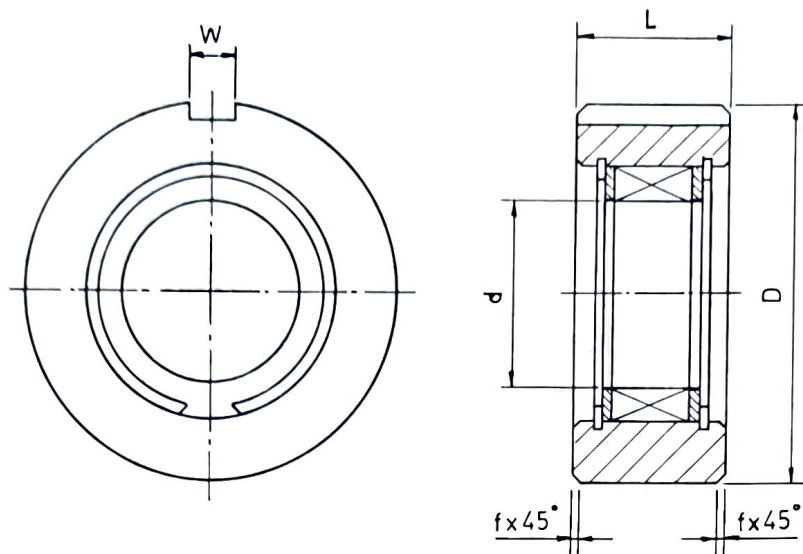
Application

Freewheels type RF can be used as overrunning clutch backstop and feed indexing unit. Outer and inner rings of the freewheel are supported by ball bearings, so that pulleys gear wheels chainwheels, clutches etc. can be attached to the outer ring. Due to the built in ball bearings, the machine element attached does not need an additional bearing.

Installation

Freewheels type RF are supplied complete with oil filling, ready for installation. The built in ball bearings absorb axial and radial forces. The line of application of power on the outer ring should be between the two ball bearings - particularly if the freewheel is used as a feed indexing unit. Tolerance of the shaft should be ISO h6 or j6.

Direct Mounted Sprag Clutches

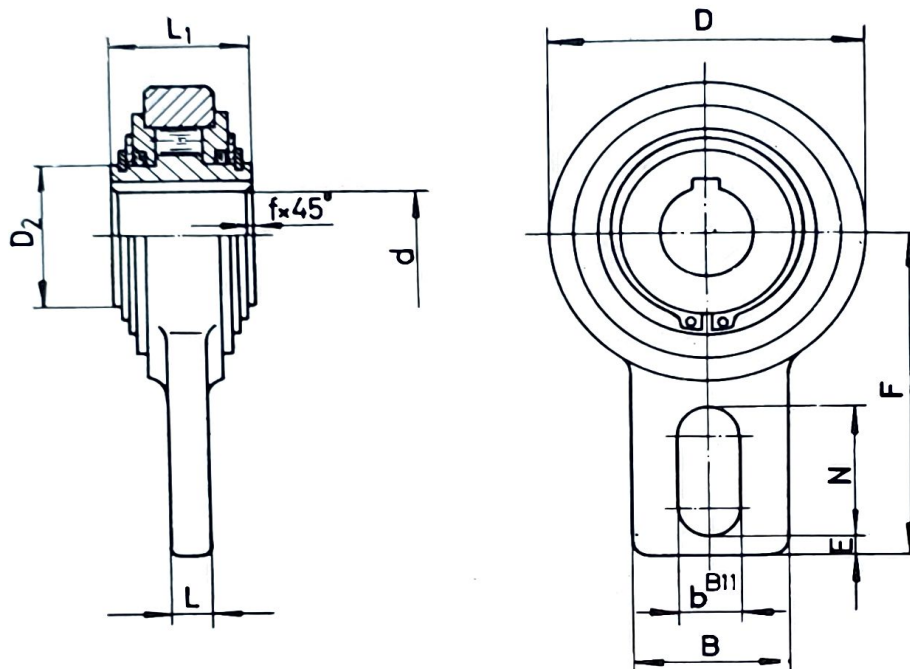


Type	Nominal Torque T_N Nm	Shaft Speed n_{max} RPM	D^{h7} mm	Shaft Dia d^{h6} mm	L mm	Keyway W mm	F mm
DM-033	101	3000	67.13	31.75	28.20	6.35 x 3.18	1.50
DM-002	190	2800	73.02	34.92	32.20	9.52 x 4.44	1.50
DM-034	223	2500	84.09	38.10	32.00	9.52 x 4.44	2.00
DM-003	320	2000	88.90	44.45	40.10	9.52 x 4.44	2.00
DM-035	300	2000	93.24	44.45	32.00	9.52 x 4.44	2.00
DM-004	452	2000	101.60	50.80	48.10	12.70 x 6.35	2.00
DM-056	430	2000	112.54	50.80	35.10	12.70 x 6.35	2.00
DM-005	562	1750	111.15	57.15	48.10	12.70 x 6.35	2.00
DM-057	527	1750	122.45	57.15	35.10	12.70 x 6.35	2.00
DM-036	594	1750	111.15	63.50	44.70	12.70 x 6.35	2.00
DM-039	690	1750	124.73	69.85	46.20	12.70 x 6.35	2.50
DM-040	780	1500	132.10	76.20	46.20	12.70 x 6.35	2.50
DM-037	1197	1500	146.71	82.60	51.00	12.70 x 6.35	2.50
DM-042	1616	1500	166.67	88.90	51.00	15.87 x 7.90	2.50
DM-203	2203	1500	172.23	95.25	60.60	15.87 x 7.90	2.50
DM-038	2440	1500	181.89	101.60	60.60	15.87 x 7.90	2.50

Direct mounted (DM) type sprag clutches are specifically designed for use as Backstops where for compactness of design it is necessary to mount the clutch so that an existing shaft serves as the inner race. This type of clutch is suitable for use in Gear Boxes and similar equipment where concentricity between shaft and housing is assured with the help of bearings and adequate lubrication is available.

To ensure satisfactory performance of these units, it is particularly recommended that 'PRECISION' review the working conditions and mounting arrangements.

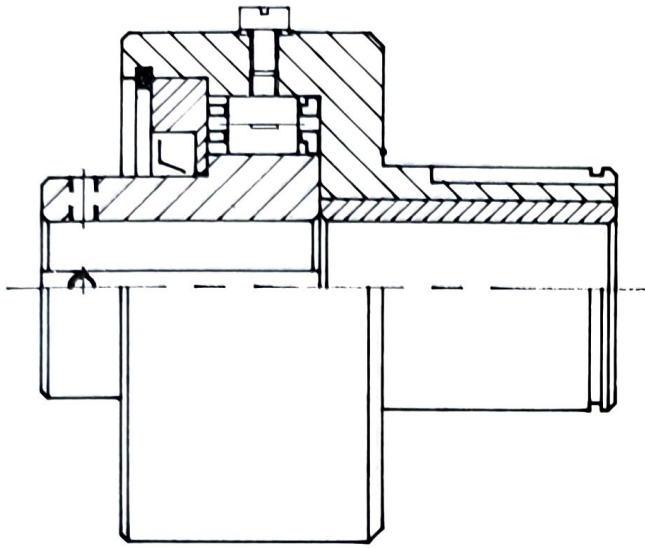
The shaft which acts as an inner race should be hardened to case depth of 1.2 mm after grinding. Surface hardness should be 60 - 62 HRC and core hardness should be 35 - 45 HRC. Surface finish of the shaft should not exceed 6.3 μ m. and taper not to exceed 0.007 mm. per 25 mm length. Shaft and housing should be concentric within 0.02 mm. The clutch should be push fit (without pressing) in the housing bore. shaft end should have 3 mm long chamfer at 15° angle to ensure easy mounting of the clutch.



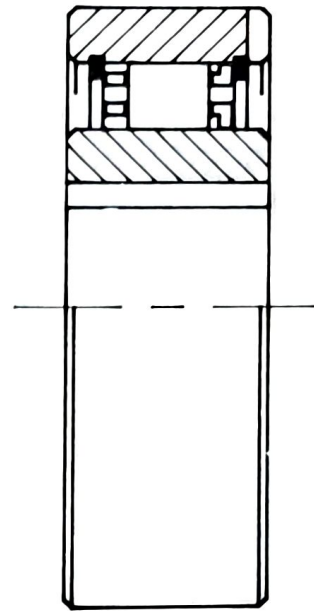
Size d^{H7} mm	Torque ¹ T_N Nm	Overrunning speed ² n_{max} RPM	D mm	D ₂ mm	L ₁ mm	L mm	B mm	F mm	b ^{B11} mm	N mm	E mm	f mm	Weight kg
20	460	450	83	42	35	12	40	90	15	35	5	0,8	1,3
25	460	450	83	42	35	12	40	90	15	35	5	0,8	1,3
30	2000	320	118	50	54	15	40	110	15	35	8	1	3,5
35	2000	320	118	60	54	15	40	110	15	35	8	1	3,4
40	2000	320	118	60	54	15	40	110	15	35	8	1	3,3
45	3000	280	155	90	54	15	40	140	18	35	10	1	5,5
50	3000	280	155	90	54	15	40	140	18	35	10	1	5,4
55	3000	280	155	90	54	15	40	140	18	35	10	1	5,3
60	3000	280	155	90	54	15	40	140	18	35	10	1	5,2
70	3000	280	155	90	54	15	40	140	18	35	10	1	5,0
80	5000	200	190	110	64	20	80	155	20	40	10	1,5	8,7

Keyways : To DIN 6885 page 1

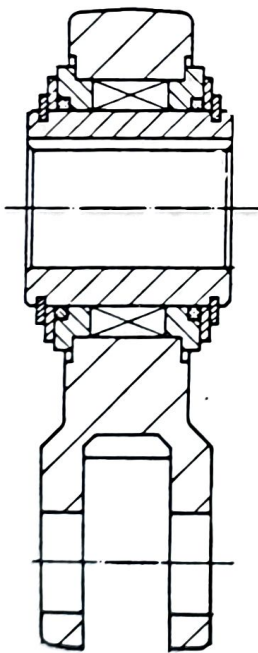
- 1) When used as indexing clutch the torque $T_{max} = 0.3 \times T_N$
- 2) If higher speeds are required other than those listed please consult.



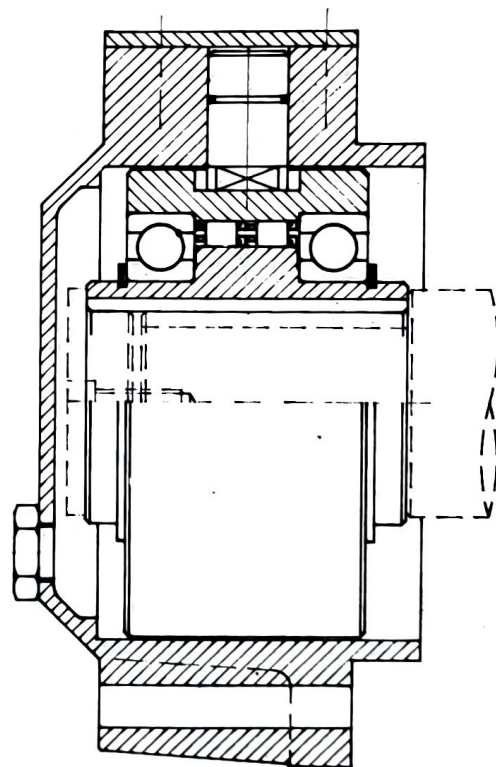
Sprag Clutch With Sleeve Bearing



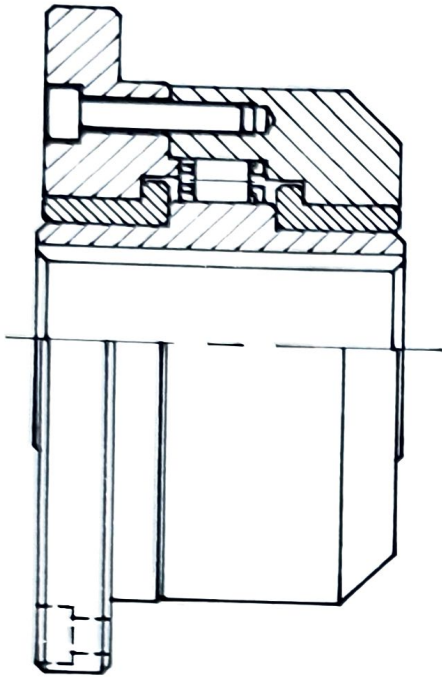
Freewheel With Double Cage Sprag.



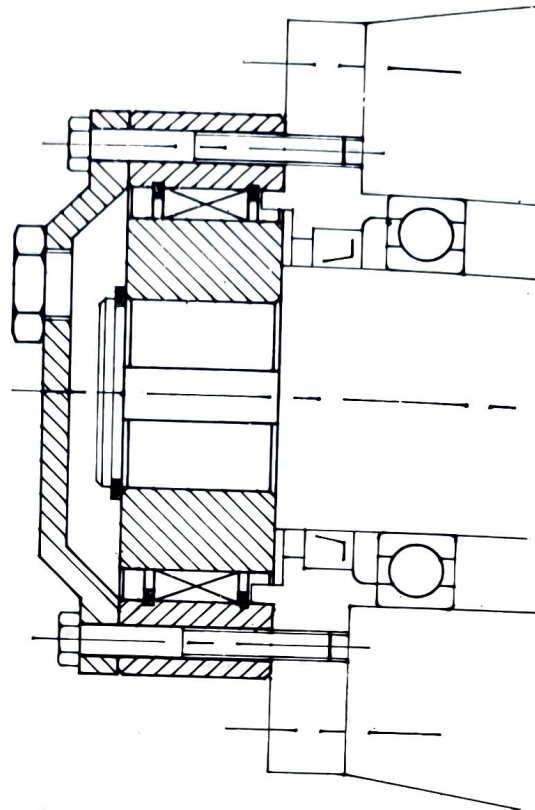
Special Freewheel For Pickup Trailer



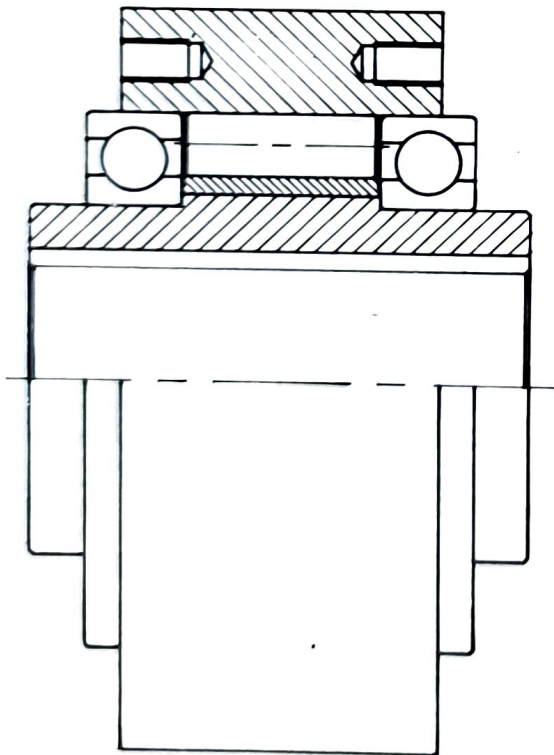
Sprag Type Backstop With Ball bearings
For Gear-Box Application



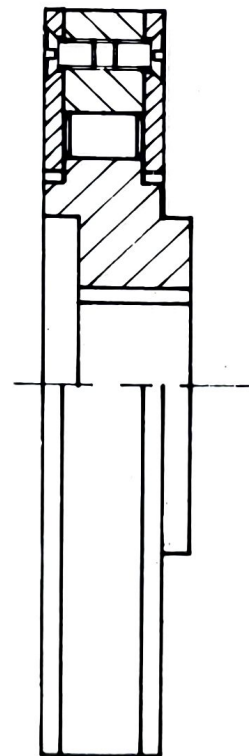
Sprag Type Freewheel With Bush Bearings For paper Machinery.



Backstop Without bearings For Gear-Boxes.



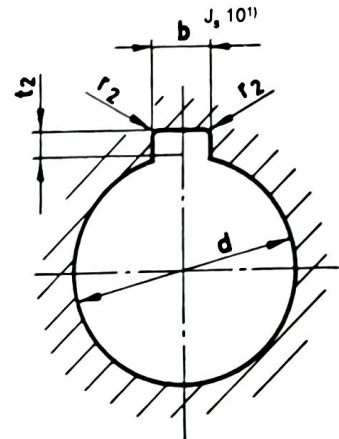
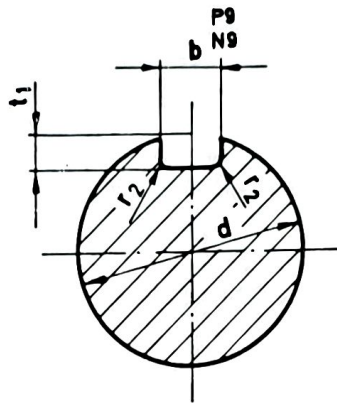
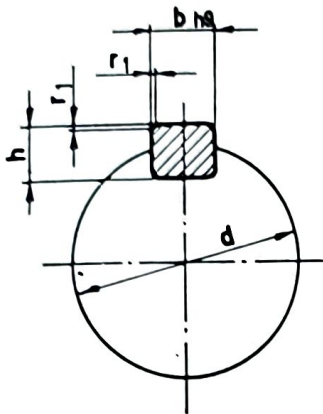
Indexing Freewheel With Tungsten Carbide Inserts And stronger Springs.



Special Indexing Freewheel For Electrical Circuit breaker.

DIMENSION AND TOLERANCES OF KEYWAYS

DIN 6885 Sheet 1 And Sheet 3



d	DIN 6885 sheet 1						DIN 6885 sheet 3				
	d x h	t ₁	t ₂	r ₁	r ₂	b x h	t ₁	t ₂	r ₁	r ₂	
FROM 6 to 8	2 x 2	1,2+0,1	1 +0,1	0,2	0,2						
FROM 8 to 10	3 x 3	1,8+0,1	1,4+0,1	0,2	0,2						
FROM 10 to 12	4 x 4	2,5+0,1	1,8+0,1	0,2	0,2						
FROM 12 to 17	5 x 5	3,0+0,1	2,3+0,1	0,3	0,2	5x 3	1,9+0,1	1,20,1	0,2	0,2	
FROM 17 to 22	6 x 6	3,5+0,1	2,8+0,1	0,3	0,2	6x 4	2,5+0,1	1,6+0,1	0,4	0,4	
FROM 22 to 30	8 x 7	4,0+0,2	3,3+0,2	0,5	0,2	8x 5	3,1+0,2	2,0+0,1	0,4	0,4	
FROM 30 to 38	10 x 8	5,0+0,2	3,3+0,2	0,5	0,3	10x 6	3,7+0,2	2,4+0,1	0,4	0,4	
FROM 38 to 44	12 x 8	5,0+0,2	3,3+0,2	0,5	0,3	12x 6	3,9+0,2	2,2+0,1	0,5	0,5	
FROM 44 to 50	14 x 9	5,5+0,2	3,8+0,2	0,5	0,3	14x 6	4,0+0,2	2,1+0,1	0,5	0,5	
FROM 50 to 58	16 x 10	6,0+0,2	4,3+0,2	0,5	0,3	16x 7	4,7+0,2	2,4+0,1	0,5	0,5	
FROM 58 to 65	18 x 11	7,0+0,2	4,4+0,2	0,5	0,3	18x 7	4,8+0,2	2,3+0,1	0,5	0,5	
FROM 65 to 75	20 x 12	7,5+0,2	4,9+0,2	0,7	0,5	20x 8	5,4+0,2	2,7+0,1	0,6	0,6	
FROM 75 to 85	22 x 14	9,0+0,2	5,4+0,2	0,7	0,5	22x 9	6,0+0,2	3,1+0,2	0,6	0,6	
FROM 85 to 95	25 x 14	9,0+0,2	5,4+0,2	0,7	0,5	25x 9	6,2+0,2	2,9+0,2	0,6	0,6	
FROM 95 to 110	28 x 16	10 +0,2	6,4+0,2	0,7	0,5	28x10	6,9+0,2	3,2+0,2	0,7	0,7	
FROM 110 to 130	32 x 18	11 +0,3	7,4+0,2	0,7	0,5	32x11	7,6+0,2	3,5+0,2	0,7	0,7	
FROM 130 to 150	36 x 20	12 +0,3	8,4+0,3	1,1	0,8	36x12	8,3+0,2	3,8+0,2	1,0	1,0	
FROM 150 to 170	40 x 22	13 +0,3	9,4+0,3	1,1	0,8						
FROM 170 to 200	45 x 25	15 +0,3	10,4+0,3	1,1	0,8						
FROM 200 to 230	50 x 28	17 +0,3	11,4+0,3	1,1	0,8						
FROM 230 to 260	56 x 32	20 +0,3	12,4+0,3	1,8	1,4						
FROM 260 to 290	63 x 32	20 +0,3	12,4+0,3	1,8	1,4						

Keyway tolerances for hardened components are not given in DIN 6885

Freewheels are oil lubricated in most of the applications, especially for indexing and high speed overrunning. When freewheels are used inside a transmission, splash lubrication or oil bath lubrication is recommended. When freewheels are installed outside the transmission, totally enclosed freewheel with oil seals should be used.

In indexing applications low viscosity oil of 12 mm²/sec should be used to achieve optimum indexing characteristics. If in some special cases grease lubrication is required, the recommended brands should be used. Please note that grease inhibits spring loading of the locking elements and reduces indexing accuracy as compared to oil lubrication. To overcome this effect most of the freewheel types can be supplied with stronger springs on request.

Freewheel has to be filled with oil prior to starting up. First oil change should be after about 50 operating hours. Next oil change approx. Every 2000 hours. For high speed and/or dusty environment oil change should be after every 1000 hours. Lubrication must be checked from time to time and if necessary the freewheel must be flushed with thin oil and lubrication must be changed.

Freewheels are frictionally-engaged couplings. In order to obtain maximum service life of both lubricant and freewheel, oils of type CL conforming to DIN 51 517, Part 2 or CLP conforming to DIN 51 517, Part 3 should be employed. Under no circumstances should oils containing additives such as molybdenum disulphide, graphite etc., be used. In the following table, we have compiled a list of lubricants proven to be of value in the lubrication of freewheels. Only if these or truly equivalent lubricants are used we can assume warranty for our products.

	Oil lubrication			Grease lubrication
	-20°C...+20°C	+20°C...+50°C	+50°C...+80°C	
Operating temperature	-20°C...+20°C	+20°C...+50°C	+50°C...+80°C	
Viscosity at 40°C	10 mm ² /sec	22 mm ² /sec	46 mm ² /sec	
AGIP	AGIP SIC 10 AGIP OSO 10	AGIP SIC 22, AGIP OSO 22	AGIP SIC 46, AGIP OSO 46	AGIP GR MU 2
ARAL	Aral Vitam GF 10 Aral Vitam DE 10	Aral Vitam GF 22, Aral Vitam DE 22	Aral Vitam GF 46 Aral Vitam DE 46	Aralub FK 2
BP	BP Energol HLP-D 10, BP Energol HLP 10	BP Energol HL 22, BP Energol HLP-D 22 BP Energol HLP 22	BP Energol HL 46, BP Energol HLP-D 46 BP Energol HLP 46	BP Energrease LS 2, BP Olex PR 9142
CALYPSOL	Calypsol Bison OIL SR 10, MSR 10	Calypsol Bison OIL SR 22, MSR 22	Calypsol Bison OIL SR 46, MSR 46	Calypsol H 442 Calypsol Aluplex 2 EP
CASTROL	CASTROL HYSPIIN VG 10, CASTROL HYSPIIN AWS 10	CASTROL HYSPIIN VG 22, CASTROL HYSPIIN AWS 22	CASTROL HYSPIIN VG 46, CASTROL HYSPIIN AWS 46	CASTROL BNS, CASTROL LZV
CHEVRON	Chevron EP Hydraulic Oil 10	Chevron EP Hydraulic Oil 22	Chevron EP Hydraulic Oil 46	Chevron Dura-Lith Grease 2, Chevron Polyurea EP Grease 2
ESSO	NUTO H 10	NUTO H 22	NUTO H 46	BEACON 2
FINA	FINA CIRKAN 10, FINA HYDRAN 10	FINA CIRKAN 22, FINA HYDRAN 22,	FINA CIRKAN 46, FINA GIRAN RH 46	FINA MARSON AX 2
FUCHS	RENOLIN MR 3, RENOLIN B 3	RENOLIN DTA 5, RENOLIN MR 5, RENILIN B 5	RENOLIN DTA 15, RENOLIN MR 15, RENOLIN B 15	RENOLIT FWA 160, RENOPLEX EP 2
KLUBER	CRUCOLAN 10, LAMORA 10	CRUCOLAN 22, LAMORA 22	CRUCOLAN 46 LAMORA 46	ISOFLEX LDS 18 SPECIAL A
MOBIL	Mobil Velocite Oil No. 6, Mobil D.T.E. 21	Mobil Velocite Oil No. 10, Mobil D.T.E. 22	Mobil D.T.E. Oil Medium, Mobil D.T.E. 25	Mobilux 2
OPTIMOL	ULTRA 2035 VG 10	ULTRA 5025 VG 22	ULTRA 5045 VG 46, HYDO 5045 EVG 46	LONGTIME PD 2, OLIT 2
REINER	REINER B 3	REINER B 5	REINER B 15	URETHYN LT 60
SHELL	Tellus Oel C 10, Tellus Oel 10	Tellus Oel C 22, Tellus Oel 22	Tellus Oel C 46, Tellus Oel 46	Alvania Fett R 2, Retinax A
TEXACO	Rando Oil 10, Rando Oil HD A-10	Rando Oil HD A-22	Rando Oil 46, Rando Oil HD B-46	Multifak 20, Texando FO 20, Multifak 2
TOTAL	TOTAL Azolla 10	TOTAL Azolla 22	TOTAL Azolla 46	TOTAL Multis
VALVOLINE	VALVOLINE R-60	VALVOLINE R-100 VALVOLINE ETC-20	VALVOLINE WA-4 VALVOLINE ETC-30	VALVOLINE LB-2

APPLICATION DATA SHEET

PRECISION 

Company name and address _____

Contact person _____

Telephone _____

Date _____

1.0 Application

Please draw a rough sketch with brief description on reverse side of this sheet.

2.0 Torque on the freewheel clutch

2.1 Continuous torque

T_N = _____ Nm

2.2 Max. torque, incl. shock torque

T_{max} = _____ Nm

2.3 How often do shock loads occur ?

_____ rpm

2.4 Duration of shock

_____ s

2.5 How is the torque transmitted ?

From outer to inner race

From inner to outer race

2.6 Drive

Electric motor/turbine/pneumatic cylinder/hydraulic cylinder/

Petrol engine/Diesel engine (No. of cylinders _____)

3.0 For applications as overrunning freewheel/back stop

3.1 Which race is overrunning ?

Outer race / inner race

3.2 Max. possible speed of outer race/inner race when transmitting torque

n_{max} = _____ rpm

3.3 permanent speed when transmitting load

n = _____ rpm

3.4 Speed/range when transmitting load for non-constant drives

n_{min} _____ rpm n_{max} _____ rpm

3.5 Speed conditions when overrunning

	Speed Outer/race	Speed Inner/race	Relative speed	% of operating hours
max.				
average				
min.				

3.6 In which speed/range must the clutch be ready to engage ?

n_{min} _____ n_{max} _____

4. For application as indexing clutch

4.1 Which part of the freewheel oscillates ?

Outer race / inner race

4.2 No. of indexes per minute

f = _____ rpm

4.3 Indexing angle

from _____ ° to _____ °

5. Installation conditions

5.1 Mounting position

horizontal / vertical

5.2 Installation within/outside of closed housing

5.3 Type of sealing

t = _____ ° to _____ °C

5.4 Surrounding temperature

grease/oil submersion/oil mist/pressure lubrication
_____ viscosity _____ mm²/s at _____ °C

5.5 Lubrication

5.6 name of lubricant

Sleeve bearing (clearance max.) _____ mm

5.7 Centering of inner and outer parts

ball and roller bearing (type _____)

5.8 Direction of rotation

acc. to catalogue clockwise R/ counterclockwise L or acc. to attached drawing

6. Expected requirement

once _____ pcs.

monthly _____ pcs.

yearly _____ pcs.

PLEASE PHOTOCOPY

Our range of freewheel clutches cover a wide range of sizes and capacities which will handle the majority of industrial applications. However there are applications which require special designs to meet specialized requirements. We offer engineering assistance in both design and application in meeting these requirements. Please forward your application requirements to us.