

## Centrifugally Lift Off Sprags Freewheels

### CENTRIFUGAL LIFT OFF SPRAG TYPES

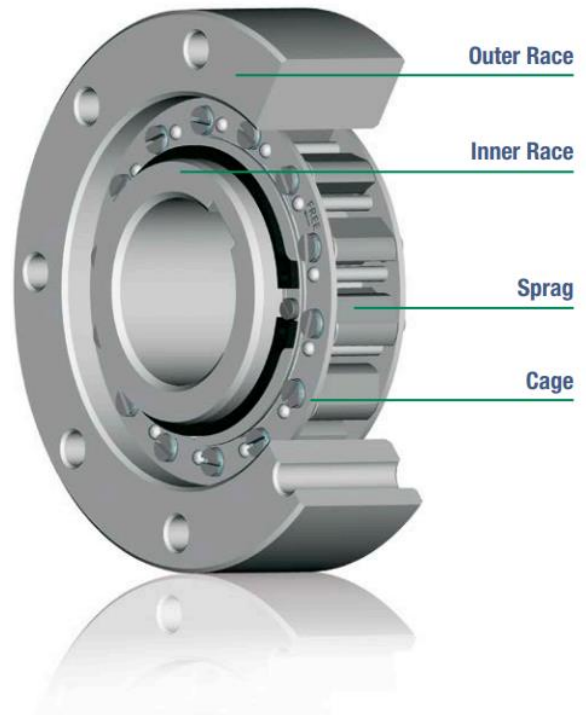
# RSXM

# RSCI 20-130

# RSCI 180-300



- High overrunning speed
- High torque capacity
- High eccentricity tolerances
- Accepts any lubricant



### **Sprag clutch**

which are most suitable as backstops, here mainly the contact-free versions.

### **OVERRUNNING CLUTCH**

for multiple-machine drives or to separate the inertia of masses of a driven machine from the driving machine after it has been switched off.

### **BACKSTOP**

to prevent a machine shaft turning backwards. In this case the overrunning clutch acts as a brake.

- Pos. 1 Outer race
- Pos. 2 Inner race
- Pos. 8 Cage
- Pos. 5 Spring

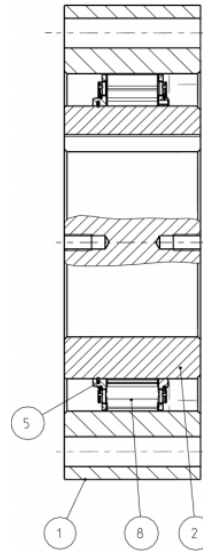


Fig. 1 Structure

When the torque is transmitted through the one-way clutch, the outer race (1) and the inner race (2) are coupled in a force-locked manner (see Fig. 2). For this purpose, clamping elements are used, the outer contours of which generates the force-locked coupling. The clamping elements are integrated into a cage (8) and are energized by springs into contact with the outer and inner race. The springs ensure rapid responding behavior of the one-way clutch at the start of torque transmission.

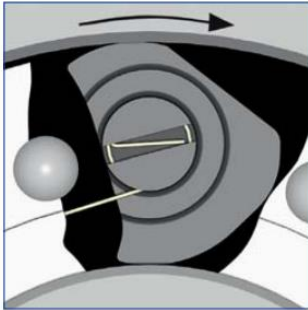


Fig.2 Torque transmission

In overrun operation, above the minimum permissible overrunning speed, the centrifugal force, in connection with the geometry of the clamping elements, generates a force which turns the clamping elements against the spring force (see Fig. 3). A contact-free position is brought about in this way so that wear-free operation of the one-way clutch can be achieved. The minimum permissible overrunning speed may only be lower for a short period during the start-up or shut-down stage otherwise the damage to the contact partner caused by wear and tear may lead to the failure of the one-way clutch.

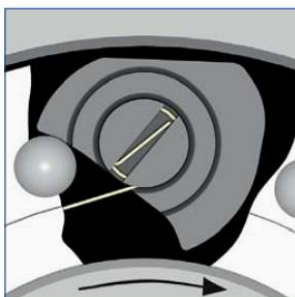


Fig.3 Contact-free position

## Centrifugally Lift Off Sprags Freewheels

# RSXM

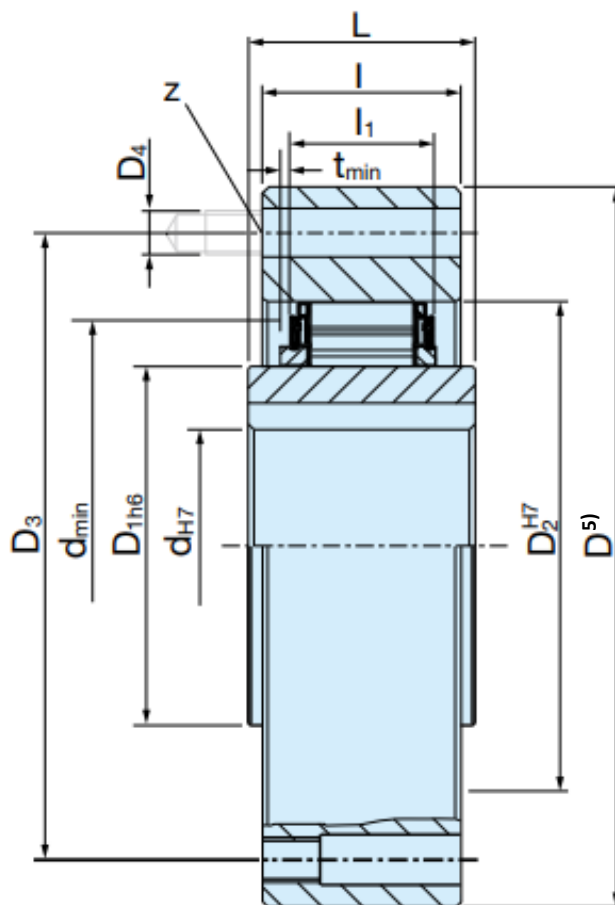
Small to medium backstop range



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

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

# RSXM



Type	Size	Bore dia.	Torque	Overrunning speeds			Number					Weight						
		$d^{H7}$ [mm]	$T_{KN}^{1)}$ [Nm]	$n_{max}^{2)}$ [min <sup>-1</sup> ]	$n_{min}^{3)}$ [min <sup>-1</sup> ]	$n_{imax}^{4)}$ [min <sup>-1</sup> ]	$D^{5)}$ [mm]	$D_{1h6}$ [mm]	$D_{2H7}$ [mm]	$D_3$ [mm]	$D_4$ [mm]		$z$ [nb]	$L$ [mm]	$l$ [mm]	$l_1$ [mm]	$t_{min}$ [mm]	$d_{min}$ [mm]
RSXM	31	20*	100	340	820	20000	85	31	55	70	M6	6	24	25	17	1	41	0,75
	38	25*	135	320	770	18500	90	38	62	75	M6	6	24	25	17	1	50	0,95
	46	25,30	425	300	530	13500	95	46	70	82	M6	6	35	35	25	1	53	1,4
	51	30,35	525	220	525	12500	105	51	75	90	M6	6	35	35	25	1	62	1,8
	56	35,40	625	210	500	11500	110	56	80	96	M6	8	35	35	25	1	70	1,8
	61	35,40	420	265	640	14000	120	61	85	105	M8	6	25	27	17	2	73	1,8
	66	35,40,45	850	200	480	10000	132	66	90	115	M8	8	35	35	25	1	78	2,7
	76	40,45,50	1100	190	460	9000	140	76	100	125	M8	8	35	35	25	1	90	3,1
	86	45,50	1450	180	440	8000	150	86	110	132	M8	8	40	40	25	1	100	4,2
	101	45,55,60,70	1950	175	420	6500	175	101	125	155	M10	8	50	50	25	1	117	7,3

### NOTES

1)  $T_{max} = 2 \times T_{KN}$

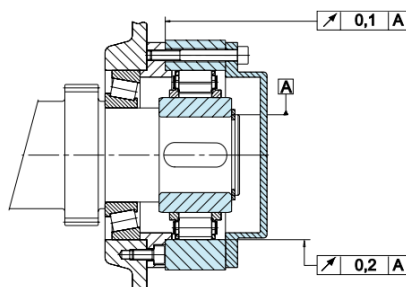
2) This maximum allowable torque transmission speed  $n_{max}$  must not be exceeded when transmitting torque.

3) This minimum allowable overrunning speed  $n_{min}$  should not be reduced under continuous operation. Possible reduction of this minimum speed in request.

4) Inner race overruns.  
Keyway to DIN 6885.1  
\*Keyway to DIN 6885.3

5) Tolerance +1

### MOUNTING EXAMPLE



- Pos. 1      Outer race
- Pos. 2      Inner race
- Pos. 3      Circlip
- Pos. 8      Cage

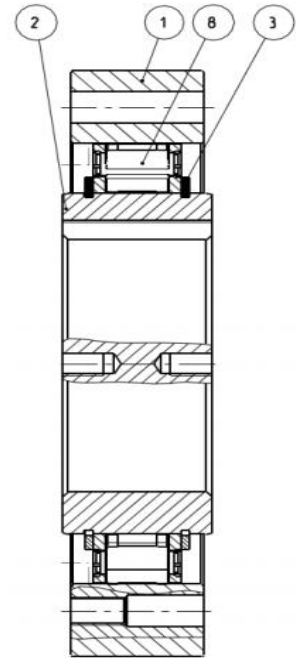


Fig. 1 Structure

When the torque is transmitted through the one-way clutch, the outer race (1) and the inner race (2) are coupled in a force-locked manner (see Fig. 2). For this purpose, clamping elements are used, the outer contours of which generates the force-locked coupling. The clamping elements are integrated into a cage (8) and are energized by springs into contact with the outer and inner race. The springs ensure rapid responding behavior of the one-way clutch at the start of torque transmission.

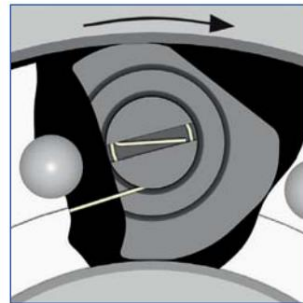


Fig.2 Torque transmission

In overrun operation, above the minimum permissible overrunning speed, the centrifugal force, in connection with the geometry of the clamping elements, generates a force which turns the clamping elements against the spring force (see Fig. 3). A contact-free position is brought about in this way so that wear-free operation of the one-way clutch can be achieved. The minimum permissible overrunning speed may only be lower for a short period during the start-up or shut-down stage otherwise the damage to the contact partner caused by wear and tear may lead to the failure of the one-way clutch.

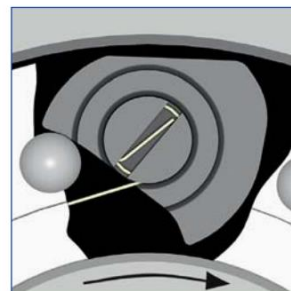


Fig.3 Contact-free position

## Centrifugally Lift Off Sprags Freewheels

# RSCI 20-130



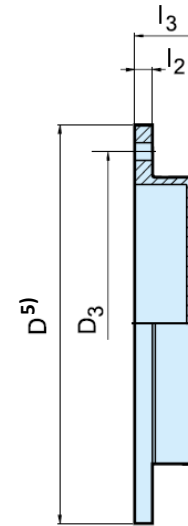
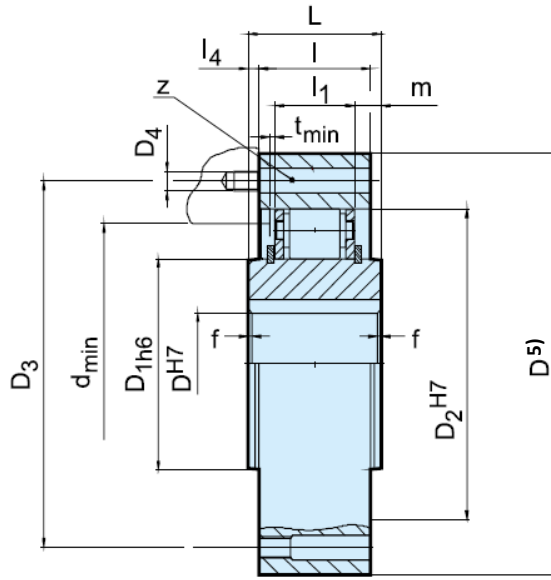
Type RSCI is a centrifugal lift off sprag type freewheel with the inner race rotating. Only the inner race is designed for freewheeling. It is a non self-supported type.

Bearings must be provided to ensure concentricity of the inner and outer races and support axial and radial loads, as shown overleaf. Concentricity and run-out limits must be observed. The RSCI type accepts all types of lubricant currently used in power transmission equipment.

It is possible to mount these freewheels directly in gear-boxes without separate lubrication. An oil mist is generally sufficient. Grease lubrication may be acceptable if the unit works mostly in overrunning condition, as on E-motors.

When used as a backstop, it must be checked that the overrunning speed will not go below the minimum speed given in the characteristics table.

## RSCI



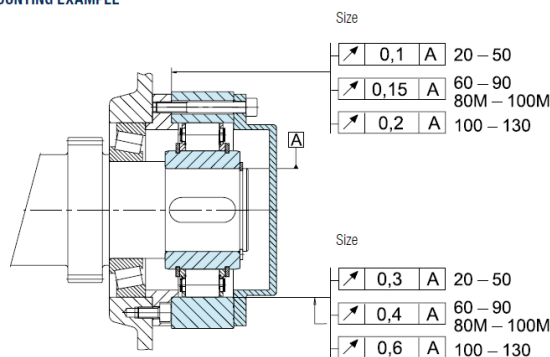
## F8

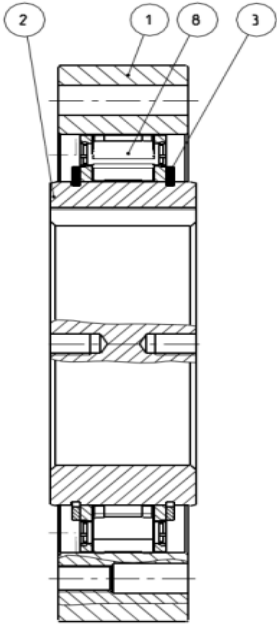
Type	Size	Speeds					Number										Weight						
	$d^{H7}$ [mm]	$T_{KN}^{1)}$ [Nm]	$n_{max}^{2)}$ [min <sup>-1</sup> ]	$n_{min}^{3)}$ [min <sup>-1</sup> ]	$n_{max}^{4)}$ [min <sup>-1</sup> ]	$D^{5)}$ [mm]	$D_{th6}$ [mm]	$D_2^{H7}$ [mm]	$D_3$ [mm]	$D_4$ [mm]	$z$	$L$ [mm]	$l$ [mm]	$l_1$ [mm]	$l_4$ [mm]	$f \times 45^\circ$ [mm]	$d_{min}$ [mm]	$m$ [mm]	$t_{mm}$ [mm]	$l_2$ [mm]	$l_3$ [mm]	RSCI [kg]	F8 [kg]
RSCI	20	212	315	750	15000	90	36	66	78	M6	6	35	35	25	0	0,8	52	5	1	8	16	1,5	0,3
	25	319	300	725	14000	95	40	70	82	M6	6	35	35	25	0	1,0	56	5	1	8	16	1,6	0,4
	30	375	290	700	11000	100	45	75	87	M6	6	35	35	25	0	1,5	62	5	1	8	16	1,8	0,4
	35	550	280	670	11000	110	50	80	96	M6	8	35	35	25	0	1,5	66	5	1	8	16	2,1	0,5
	40	800	260	630	8000	125	60	90	108	M8	8	35	35	25	0	1,5	76	5	1	10	21	2,7	0,7
	45	912	255	610	7000	130	65	95	112	M8	8	35	35	25	0	1,5	82	5	1	10	21	2,9	0,9
	50	1400	235	560	6000	150	80	110	132	M8	8	40	40	25	0	1,5	100	7,5	1	10	21	4,3	1
	60	2350	210	510	6000	175	85	125	155	M10	8	60	50	36	5	2,0	110	12	2	12	35	6,5	1,8
	70	3050	195	470	4000	190	100	140	165	M10	12	60	50	36	5	2,0	120	12	2	12	35	8,6	1,9
	80	4500	180	440	4000	210	120	160	185	M10	12	70	60	36	5	2,0	140	17	3	12	35	12,5	2,6
	80M	5800	155	375	4000	210	120	160	185	M10	12	70	60	46	5	2,0	140	12	2	12	35	13,1	2,6
	90	5600	170	410	3000	230	140	180	206	M12	12	80	70	36	5	2,5	165	22	3	12	35	17,4	3,0
	90M	8700	145	350	3000	245	140	180	206	M12	12	80	70	46	5	2,5	160	17	2	12	35	18,3	3,0
	100	10500	145	355	3000	290	140	210	258	M16	12	90	80	52,6	5	2,5	180	18,6	3	15	37	28	5,0
	100M	16000	140	340	2400	290	170	210	258	M16	12	90	80	63	5	2,5	200	13,5	2	12	35	30	5,0
130	15750	135	330	2400	322	170	240	278	M16	12	90	80	52,6	5	3,0	210	18,6	3	15	37	35	6,0	

### NOTES

- $T_{max} = 2 \times T_{KN}$
  - This maximum allowable torque transmission speed  $n_{max}$  must not be exceeded when transmitting torque
  - This minimum allowable overrunning speed  $n_{min}$  should not be reduced under continuous operation. Possible reduction of this minimum speed on request
  - Inner race overruns  
Keyway to DIN 6885.1
  - Tolerance +1
- Cover F8 must be ordered separately

### MOUNTING EXAMPLE





- |        |            |
|--------|------------|
| Pos. 1 | Outer race |
| Pos. 2 | Inner race |
| Pos. 3 | Circlip    |
| Pos. 8 | Cage       |

Fig. 1 Structure

When the torque is transmitted through the one-way clutch, the outer race (1) and the inner race (2) are coupled in a force-locked manner (see Fig. 2). For this purpose, clamping elements are used, the outer contours of which generates the force-locked coupling. The clamping elements are integrated into a cage (8) and are energized by springs into contact with the outer and inner race. The springs ensure rapid responding behavior of the one-way clutch at the start of torque transmission.

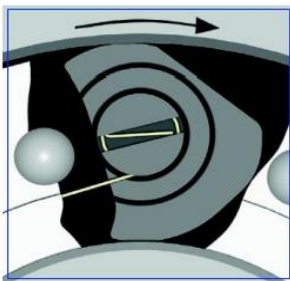


Fig.2 Torque transmission

In overrun operation, above the minimum permissible overrunning speed, the centrifugal force, in connection with the geometry of the clamping elements, generates a force which turns the clamping elements against the spring force (see Fig. 3). A contact-free position is brought about in this way so that wear-free operation of the one-way clutch can be achieved. The minimum permissible overrunning speed may only be lower for a short period during the start-up or shut-down stage otherwise the damage to the contact partner caused by wear and tear may lead to the failure of the one-way clutch.

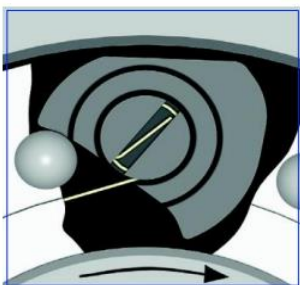


Fig.3 Contact-free position

## Centrifugally Lift Off Sprags Freewheels

# RSCI 180-300

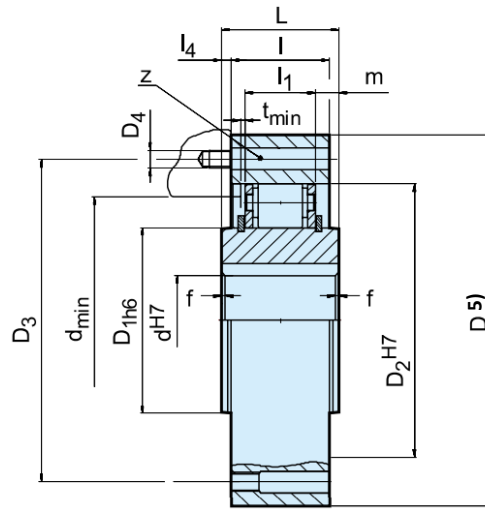


Type RSCI is a centrifugal lift off sprag type freewheel with the inner race rotating. Only the inner race is designed for freewheeling.

Primarily designed as a backstop, this type can be also used as an overrunning clutch in crawl drives, where

the overrunning speed is high but the driving speed is low and does not exceed the maximum driving speed shown in the table. Centering of the outer race must use the inner bore. The centering spigot must not contact the sprag cage.

# RSCI



Type	Size	Torque	Speeds			D <sup>5)</sup>	D <sup>1h6</sup>	D <sup>2H7</sup>	D <sub>3</sub>	D <sub>4</sub>	Number	L	l	l <sub>1</sub>	l <sub>4</sub>	f x 45°	d <sub>min</sub>	m	t <sub>min</sub>	Weight
			T <sub>KN</sub> <sup>1)</sup> [Nm]	n <sub>max</sub> <sup>2)</sup> [min <sup>-1</sup> ]	n <sub>min</sub> <sup>3)</sup> [min <sup>-1</sup> ]															
RSCI	180	31500	115	285	1300	412	240	310	360	M20	12	90	80	53	5	3,5	280	18,6	3	59
	180 M	50000	90	220	1300	422	240	310	370	M20	18	120	120	83	0	4	280	18,5	2	92
	180 II	63000	115	285	1300	412	240	310	360	M20	24	160	160	118	0	3,5	280	22	3	116
	180 II-M	100000	90	220	1300	425	240	310	370	M24	24	240	240	176	0	4	280	31	3	190
	220	42500	110	265	1100	470	290	360	410	M20	16	105	80	60	12,5	4	330	19,5	3	90
	220 M	68000	85	205	1100	480	290	360	410	M24	16	120	120	83	0	4	330	18,5	2	109
	220 II	85000	110	265	1100	480	290	360	430	M24	18	160	160	130	0	4	330	15	3	159
	220 II-M	136000	85	205	1100	490	290	360	425	M30	20	240	240	176	0	4	330	32	2	249
	240	52000	105	250	1100	500	320	390	440	M20	16	105	90	60	7,5	4	360	15	2	95
	240 M	83000	80	195	1100	520	320	390	440	M24	16	120	120	83	0	4	360	18,5	2	137
	240 II	104000	105	250	1100	520	320	390	440	M24	24	180	180	132	0	4	360	24	2	191
	240 II-M	166000	80	195	1100	530	320	390	455	M30	24	240	240	181	0	4	360	32	2	250
	260	65000	100	240	1000	550	360	430	500	M24	16	105	105	60	0	4	400	22,5	2	130
	260 M	100000	75	185	1000	580	360	430	500	M24	24	125	125	83	0	4	400	21	2	183
	260 II	130000	100	240	1000	580	360	430	500	M24	24	210	210	132	0	4	400	39	2	262
	260 II-M	200000	75	185	1000	580	360	430	500	M30	24	250	250	176	0	4	400	37	2	369
	300	78000	90	225	1000	630	410	480	560	M24	24	105	105	60	0	4	460	22,5	3	174
	300 M	125000	70	175	1000	630	410	480	560	M24	24	125	125	83	0	4	460	21	3	210
	300 II	156000	90	225	1000	630	410	480	560	M24	24	210	210	134	0	4	460	38	3	351
	300 II-M	250000	70	175	1000	630	410	480	560	M30	24	250	250	182,6	0	4	460	33,7	3	457

### NOTES

- 1)  $T_{max} = 2 \times T_{KN}$
  - 2) This maximum allowable torque transmission speed  $n_{max}$  must not be exceeded when transmitting torque
  - 3) This minimum allowable overrunning speed  $n_{min}$  should not be reduced under continuous operation. Possible reduction of this minimum speed on request
  - 4) Inner race overruns  
Keyway to DIN 6885.1
  - 5) Tolerance +1
- Cover F8 must be ordered separately

### MOUNTING EXAMPLE

