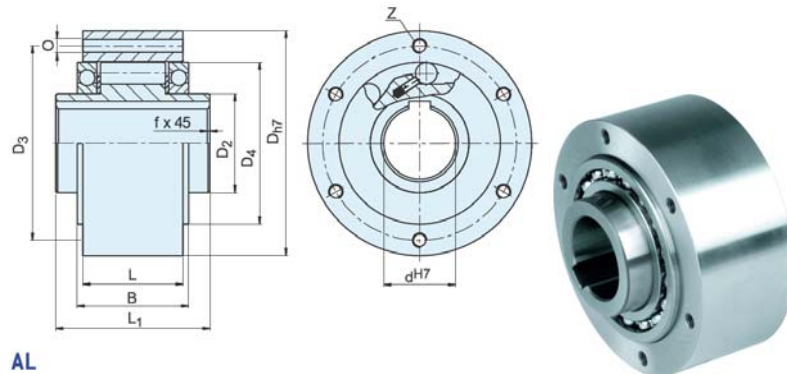


Installation and Maintenance Instructions Freewheel Type AL, ALM

To avoid premature failure of the freewheel or possible machine malfunction, installation of the freewheel should be carried out by suitably qualified personnel and according to the following instructions.

STIEBER will not accept liability in cases of non-compliance with these instructions!



AL

Type	Size	Overrunning speeds				Number											Weight	Drag torque
	d^{H7} [mm]	$T_{RN}^{(1)}$ [Nm]	$n_{max}^{(2)}$ [min ⁻¹]	$n_{max}^{(3)}$ [min ⁻¹]	D_{H7} [mm]	D_2 [mm]	D_4 [mm]	D_3 [mm]	0	z	L^1 [mm]	L^4 [mm]	B [mm]	t_1 [mm]	$b^{(4)}$ [mm]	f [mm]	[kg]	T_R [Ncm]
AL	12	55	4000	7200	62	20	42	51	5,5	3	42	20,3	27	2,4	4	0,5	0,5	3,4
	15	125	3600	6500	68	25	47	56	5,5	3	52	30,3	34,1	2,9	5	0,8	0,8	4,1
	20	181	2700	5600	75	30	55	64	5,5	4	57	34,3	39,1	3,5	6	0,8	1,0	8
	25	288	2100	4500	90	40	68	78	5,5	6	60	37,3	42,1	4,1	8	1,0	1,5	14
	30	500	1700	4100	100	45	75	87	6,6	6	68	44,3	49,1	4,1	8	1,0	2,2	23
	35	725	1550	3800	110	50	80	96	6,6	6	74	48,3	54,1	4,7	10	1,0	3,0	60
	40	1025	1150	3400	125	55	90	108	9	6	86	56,3	62,1	4,9	12	1,5	4,6	72
	45	1125	1000	3200	130	60	95	112	9	8	86	56,3	62,1	5,5	14	1,5	4,7	140
	50	2125	800	2800	150	70	110	132	9	8	92	63,3	69,1	5,5	14	1,5	7,2	180
	55	2625	750	2650	160	75	115	138	11	8	104	67	73,1	6,2	16	2,0	8,6	190
	60	3500	650	2450	170	80	125	150	11	10	114	78	84	6,8	18	2,0	10,5	240
	70	5750	550	2150	190	90	140	165	11	10	134	95	103	7,4	20	2,5	13,5	320
	80	8500	500	1900	210	105	160	185	11	10	144	100	108	8,5	22	2,5	18,2	330
	90	14500	450	1700	230	120	180	206	14	10	158	115	125	8,7	25	3,0	28,5	650
	100	20000	350	1450	270	140	210	240	18	10	182	120	131	9,9	28	3,0	42,5	830
	120	31250	250	1250	310	160	240	278	18	12	202	140	152	11,1	32	3,0	65,0	1080
150	70000	200	980	400	200	310	360	22	12	246	180	196	12,3	36	4,0	138,0	1240	
200	175000	150	750	520	260	400	460	26	18	326	240	265	15	45	5,0	315,0	3800	
250	287500	120	620	610	320	480	545	33	20	396	300	330	15	45	5,0	512,0	6100	
ALM	25	388	2100	2800	90	40	68	78	5,5	6	60	37,3	42,1	4,1	8	1,0	1,7	22
	30	588	1700	2500	100	45	75	87	6,6	6	68	44,3	49,1	4,1	8	1,0	2,5	37
	35	838	1550	2400	110	50	80	96	6,6	6	74	48,3	54,1	4,7	10	1,0	3,2	66

Description:

Freewheels of type AL / ALM are designed primarily for oil lubrication, and may be used as either overrunning clutches or backstops.

The main components are: Outer race, inner race, ball bearings, drive rollers, spring elements and V-seal rings.

The basic units (AL or ALM) may be fitted with flanges F2, F4, F5, cover plates D2, D3 or flexible couplings of type KEE or KMS.

NOTE:

Up to size 50 the dimension "L" in our catalogue includes two flat-seals of 0.25mm.

If the freewheels are fitted with customer's parts that are designed according to the catalogue-dimensions, these seals **have** to be used!

If **STIEBER** flanges and cover plates are used, the seals **will not** be mounted.

The units may be installed so that either the inner or outer race overruns. The maximum permissible overrunning speeds quoted in table 2 must not be exceeded.

Prior to Installation:

The freewheels should be unpacked and installed in a clean working environment.

- For units despatched "dry" the corrosion inhibitor should be removed using flushing oil.
- Care must be taken that the ball bearings are not loaded radially or axially during installation.
- The inner race should be fitted to a shaft of h6 or j6 tolerance.
The mounting register for the outer race should be of H7 tolerance.
- When using the freewheel as a backstop, using cover plate F5, the torque reaction pin must be centralised in the oblong slot of the cover. The pin should protrude through the slot to make the keyface accessible.
- The freewheeling direction should be checked prior to installation.
To reverse the freewheeling direction of a unit fitted with covers, simply remove the cover plates and reinstall at opposite ends of the freewheel.
- Tighten the bolts to the torque specified in table 1. The bolts are of 10.9 quality. Secure them with Loctite 243 or equivalent.
- The outer race must not be moved axially if covers are not installed.

CAUTION: RISK OF INJURY

When cover plates are removed, the freewheel should always be held so that the bore is horizontal, otherwise the inner race and bearings may slip from the outer race.

Installation:

The unit should be installed as an assembly.

- Install the inner race onto the shaft, ensuring alignment of the keyways.
- Apply any axial load exclusively to the inner race. The inner race must be retained axially on the shaft - circlips or a retainer plate are suitable.
- The screws used for flange plates F2, F4 and F5 should be of 8.8 quality. Tighten to the torque specified in table 1.
- Secure the screws with Loctite 243 or equivalent

Table 1:

Size	Bolt	Tightening Torque [Nm] ± 7%		Oil Plugs	
		8.8	10.9	Size	Tightening Torque [Nm]
12-25	M5	5,9	8,3	M5	4,5
30-35	M6	9,9	14	M6	7
40-50	M8	24	34	M8	18
55-80	M10	47	66	M10	33
90	M12	82	115	M12	63
100-120	M16	200	280	M16	150
150	M20	390	550	M20	300
200	M24	670	950		
250	M30	1350	1900		

Table 2: (Based on oil lubrication)

Type	Size	max. Torque [Nm]	Overrunning Speed	
			Inner Race	Outer Race
			[rpm]	[rpm]
AL	12	110	4000	7200
	15	250	3600	6500
	20	362	2700	5600
	25	576	2100	4500
	28	1000	1700	4100
	30	1000	1700	4100
	35	1450	1550	3800
	40	2050	1150	3400
	45	2250	1000	3200
	50	4250	800	2800
	55	5250	750	2650
	60	7000	650	2450
	70	11500	550	2150
	80	17000	500	1900
	90	29000	450	1700
	100	40000	350	1450
	120	62500	250	1250
150	140000	200	980	
200	350000	150	750	
250	575000	120	620	
ALM	25	776	2100	2800
	30	1176	1700	2500
	35	1676	1550	2400

After Installation:

After Installation ensure the unit freewheels in the required direction.

Prior to use, check that the unit contains oil to the correct level.

The drag torque produced when freewheeling is about 1/1000 of the nominal torque.

Dismantling:

To remove the unit, please follow the installation section in reverse sequence.

Lubrication and Maintenance:

Freewheels supplied with covers fitted (except cover D3) may be factory filled with oil. The oil used has a viscosity of ISO-VG 22. An oil change may be necessary according to the application details.

Recommended lubricants are specified in the table below.

To check oil level

The cover plates D2 and D3 have 2 oil bores at the circumference positioned at 12 and 4 o'clock.

To check oil level, (or top up) the oil bores should be at 12 and 8 (or 4) o'clock.

- Remove top and lateral oil plug. Top up until oil seeps from the lateral hole.
- Re-fit and tighten all plugs to the torque specified in the table 1 above.
- For oil change remove all oil plugs and position holes at 6 and 10 (or 2) o'clock.
- Refill as described above.
- The lubricating oil should be changed after approximately 10 hours operation. Further oil changes should be made after every 2000 hours. (In arduous applications change oil every 1000 operating hours).
- With ambient temperatures above 80°C, check lubrication regularly.
- For operating temperatures below -20°C and above 100°C contact the technical department of your lubricant suppliers.
- For indexing applications, oil types with a kinematic viscosity of about 10mm²/s at the normal operating temperature are recommended.

Lubricants with slip additives such as graphite, Molykote or similar agents should be avoided

If grease lubrication is to be used please consult your **STIEBER** stockist. Excessive grease may lead to malfunction of the freewheel.

If grease lubrication is required drain existing oil first. Only 30 to 40% of the free space between the races should be grease filled.

The overrunning speed must not exceed 50% of the speeds specified in table 2.

Recommended Lubricants

	Ambient temperature				Grease
	-40°C to -15°C	-15°C to +15°C	+15°C to +30°C	+30°C to +50°C	
	Operating temperature				
	-20°C to +20°C	+10°C to +50°C	+40°C to +70°C	+50°C to +85°C	
	Oil				
ISO - VG DIN 51519	10	22	46	100	
ARAL	SUMOROL CM10	SUMOROL CM22	MOTANOL HK46	DEGOL CL100T	ARALUB HL2
BP	ENERGOL CS10	ENERGOL CS22	ENERGOL CS46	ENERGOL RC100	ENERGREASE LS2
DEA	ASTRON HL10	ASTRON HL22	ASTRON HL46	ASTRON HL100	GLISSANDO 20
ESSO	NUTO H10 SPINESSO 10	NUTO H22 SPINESSO 22	NUTO H46 TERESSO 46	NUTO H100	BEACON 2
FUCHS	RENOLIN MR3	RENOLIN DTA22	RENOLIN DTA46	RENOLIN MR30	RENOLIT LZR2
KLÜBER	CRUCOLAN 10	CRUCOLAN 22	CRUCOLAN 46	CRUCOLAN 100	POLYLUB WH2
MOBIL	VELOCITE N66	VELOCITE N610	VACTRA MEDIUM VG46	VACTRA HEAVY VG100	MOBILUX 2
SHELL	MORLINA 10	MORLINA 22	MORLINA 46	MORLINA 100	ALVANIA G2
TOTAL	AZZOLA ZS10	AZZOLA ZS22	AZZOLA ZS46	AZZOLA ZS100	MULTIS 2
Alternatively we strongly recommend the use of multigrade oils SAE 10W-40 at working temperature between 0° and +80 ° C.					

The ambient temperature is to be taken as a guide line. The operating temperature is determinant for the choice of the viscosity.

Corrosion inhibitor: Rivolta KSP

Time of protection: 6 to 12 months

Recommendation: Prior to use, remove corrosion inhibitor using flushing oil.

The maximum overrunning speeds given in our literature apply to oil lubricated units. For grease lubrication the quoted speeds must be halved. Please refer to the "Lubrication & Maintenance" section in our main catalogue.