



## Mounting Accessories

- Adapter Assemblies
- Withdrawal Sleeves
- Locknuts
- Lockwashers
- Lock plates

Adapter Assemblies and Applied Bearing Bore Numbers

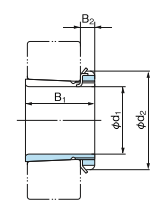
Bearing	Adapter Assembly series					
	H30	H31	H2	H32	H3	H23
Self-aligning Ball Bearings	12 K			04~22		
	22 K				04~22	
	13 K				04~22	
	23 K					04~22
Spherical Roller Bearings	230 K	24~/500				
	231 K		22~/500			
	222 K		24~64			05~22
	232 K			60~/500		18~56
	213 K				05~22	
	223 K					08~56
Ball Bearings for Bearing Units	UK2					05~18
	UKX					05~28
	UK3					05~20

Withdrawal Sleeves and Applied Bearing Bore Numbers

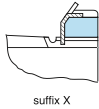
Bearing	Withdrawal Sleeve series						
	AH30	AH31	AH2	AH22	AH32	AH3	AH23
Self-aligning Ball Bearings	12 K		08~22				
	22 K		22				08~20
	13 K					08~22	
	23 K						08~22
Spherical Roller Bearings	230 K	24~/500					
	231 K		22~/500				
	222 K		22~34	36~64		08~20	
	232 K				18~40 60~/500		44~56
	213 K					08~22	
	223 K						08~56

Note: In case of spherical roller bearings without outer rib on inner ring, locknut may have a larger bore than the outside diameter of the inner ring. Please check the dimensions.

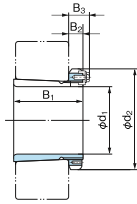
**Adapter Assemblies**  
Series H30 / HE30



Adapter Ass'y with Lockwasher



suffix X

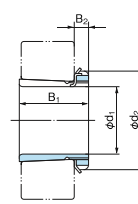


Adapter Ass'y with Lock Plate

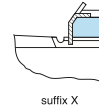
Bearing bore No.	Dimensions (mm)						Mass <sup>(1)</sup> (kg) (reference)	Adapter Ass'y No.		Part No.			
	H	HE	d <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>		H	HE	Adapter <sup>(2)</sup> sleeve	Locknut	Lockwasher	Lock Plate
24	110	107.95	145	72	22	—	1.96	H3024X	HE3024X	A3024X	ANL 24	AWL 24X	—
26	115	114.30	155	80	23	—	2.85	H3026	HE3026	A3026	ANL 26	AWL 26	—
28	125	127.00	165	82	24	—	3.18	H3028	HE3028	A3028	ANL 28	AWL 28	—
30	135	133.35	180	87	26	—	3.90	H3030	HE3030	A3030	ANL 30	AWL 30	—
32	140	139.70	190	93	28	—	5.20	H3032	HE3032	A3032	ANL 32	AWL 32	—
34	150	152.40	200	101	29	—	6.00	H3034	HE3034	A3034	ANL 34	AWL 34	—
36	160	165.10	210	109	30	—	6.85	H3036	HE3036	A3036	ANL 36	AWL 36	—
38	170	171.45	220	112	31	—	7.45	H3038	HE3038	A3038	ANL 38	AWL 38	—
40	180	177.80	240	120	32	—	9.20	H3040	HE3040	A3040	ANL 40	AWL 40	—
44	200	—	260	128	30	41	10.3	H3044	—	A3044	ANL 44	—	ALL 44
48	220	—	290	133	34	46	13.4	H3048	—	A3048	ANL 48	—	ALL 48
52	240	—	310	145	34	46	15.6	H3052	—	A3052	ANL 52	—	ALL 48
56	260	—	330	152	38	50	17.7	H3056	—	A3056	ANL 56	—	ALL 56
60	280	—	360	168	42	54	22.8	H3060	—	A3060	ANL 60	—	ALL 60
64	300	—	380	171	42	55	24.6	H3064	—	A3064	ANL 64	—	ALL 64
68	320	—	400	187	45	58	28.6	H3068	—	A3068	ANL 68	—	ALL 64
72	340	—	420	188	45	58	30.6	H3072	—	A3072	ANL 72	—	ALL 72
76	360	—	450	193	48	62	35.8	H3076	—	A3076	ANL 76	—	ALL 76
80	380	—	470	210	52	66	42.1	H3080	—	A3080	ANL 80	—	ALL 76
84	400	—	490	212	52	66	44.3	H3084	—	A3084	ANL 84	—	ALL 84
88	410	—	520	228	60	77	67.0	H3088	—	A3088	ANL 88	—	ALL 88
92	430	—	540	234	60	77	71.5	H3092	—	A3092	ANL 92	—	ALL 88
96	450	—	560	237	60	77	75.2	H3096	—	A3096	ANL 96	—	ALL 96
/500	470	—	580	247	68	85	81.8	H30/500	—	A30/500	ANL100	—	ALL 96

Notes: (1) The masses in the table are for H series.  
(2) The numbers in the table mean sleeves for H series.  
Sleeves for HE series have prefix AE instead of A.  
Remark: Suffix X means narrow axial slot type. For this type sleeves, only lockwashers with straight inner tab can be used.

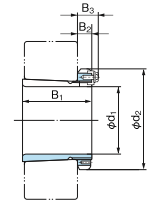
**Adapter Assemblies**  
Series H31 / HE31



Adapter Ass'y with Lockwasher



suffix X

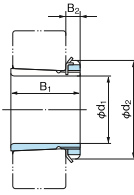


Adapter Ass'y with Lock Plate

Bearing bore No.	Dimensions (mm)						Mass <sup>(1)</sup> (kg) (reference)	Adapter Ass'y No.		Part No.			
	H	HE	d <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>		H	HE	Adapter <sup>(2)</sup> sleeve	Locknut	Lockwasher	Lock Plate
22	100	101.60	145	81	21	—	2.25	H3122X	HE3122X	A3122X	AN 22	AW 22X	—
24	110	107.95	155	88	22	—	2.64	H3124X	HE3124X	A3124X	AN 24	AW 24X	—
26	115	114.30	165	92	23	—	3.66	H3126	HE3126	A3126	AN 26	AW 26	—
28	125	127.00	180	97	24	—	4.34	H3128	HE3128	A3128	AN 28	AW 28	—
30	135	133.35	195	111	26	—	5.54	H3130	HE3130	A3130	AN 30	AW 30	—
32	140	139.70	210	119	28	—	7.70	H3132	HE3132	A3132	AN 32	AW 32	—
34	150	152.40	220	122	29	—	8.40	H3134	HE3134	A3134	AN 34	AW 34	—
36	160	165.10	230	131	30	—	9.50	H3136	HE3136	A3136	AN 36	AW 36	—
38	170	171.45	240	141	31	—	10.8	H3138	HE3138	A3138	AN 38	AW 38	—
40	180	177.80	250	150	32	—	12.1	H3140	HE3140	A3140	AN 40	AW 40	—
44	200	—	280	158	32	44	14.7	H3144	—	A3144	AN 44	—	AL 44
48	220	—	300	169	34	46	17.3	H3148	—	A3148	AN 48	—	AL 44
52	240	—	330	187	36	49	22.0	H3152	—	A3152	AN 52	—	AL 52
56	260	—	350	192	38	51	24.5	H3156	—	A3156	AN 56	—	AL 52
60	280	—	380	208	40	53	30.3	H3160	—	A3160	AN 60	—	AL 60
64	300	—	400	226	42	56	35.0	H3164	—	A3164	AN 64	—	AL 64
68	320	—	440	254	55	72	49.5	H3168	—	A3168	AN 68	—	AL 68
72	340	—	460	259	58	75	54.5	H3172	—	A3172	AN 72	—	AL 68
76	360	—	490	264	60	77	61.6	H3176	—	A3176	AN 76	—	AL 76
80	380	—	520	272	62	82	70.1	H3180	—	A3180	AN 80	—	AL 80
84	400	—	540	304	70	90	84.0	H3184	—	A3184	AN 84	—	AL 80
88	410	—	560	307	70	90	103	H3188	—	A3188	AN 88	—	AL 88
92	430	—	580	326	75	95	116	H3192	—	A3192	AN 92	—	AL 88
96	450	—	620	335	75	95	133	H3196	—	A3196	AN 96	—	AL 96
/500	470	—	630	356	80	100	143	H31/500	—	A31/500	AN100	—	AL 100

Notes: (1) The masses in the table are for H series.  
(2) The numbers in the table mean sleeves for H series.  
Sleeves for HE series have prefix AE instead of A.  
Remark: Suffix X means narrow axial slot type. For this type sleeves, only lockwashers with straight inner tab can be used.

**Adapter Assemblies**  
Series H2 / HE2 / HS2

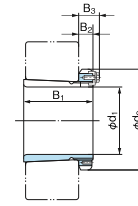


Bearing bore No.	Dimensions (mm)						Mass <sup>(1)</sup> (kg) (reference)	Adapter Ass'y No.			Part No.		
	H	HE	HS	d <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>		H	HE	HS	Adapter sleeve <sup>(2)</sup>	Locknut	Lockwasher
04	17	—	—	32	24	7	0.041	H204X	—	—	A204X	AN 04	AW 04X
05	20	19.050	—	38	26	8	0.070	H205X	HE205X	—	A205X	AN 05	AW 05X
06	25	25.400	22.225	45	27	8	0.099	H206X	HE206X	HS206X	A206X	AN 06	AW 06X
07	30	—	28.575	52	29	9	0.125	H207X	—	HS207X	A207X	AN 07	AW 07X
08	35	31.750	34.925	58	31	10	0.174	H208X	HE208X	HS208X	A208X	AN 08	AW 08X
09	40	38.100	—	65	33	11	0.226	H209X	HE209X	—	A209X	AN 09	AW 09X
10	45	44.450	41.275	70	35	12	0.274	H210X	HE210X	HS210X	A210X	AN 10	AW 10X
11	50	50.800	47.625	75	37	12	0.308	H211X	HE211X	HS211X	A211X	AN 11	AW 11X
12	55	—	53.975	80	38	13	0.346	H212X	—	HS212X	A212X	AN 12	AW 12X
13	60	57.150	60.325	85	40	14	0.401	H213X	HE213X	HS213X	A213X	AN 13	AW 13X
14	60	—	—	92	41	14	0.550	H214X	—	—	A214X	AN 14	AW 14X
15	65	63.500	66.675	98	43	15	0.708	H215X	HE215X	HS215X	A215X	AN 15	AW 15X
16	70	69.850	—	105	46	17	0.881	H216X	HE216X	—	A216X	AN 16	AW 16X
17	75	76.200	73.025	110	50	18	1.02	H217X	HE217X	HS217X	A217X	AN 17	AW 17X
18	80	—	79.375	120	52	18	1.18	H218X	—	HS218X	A218X	AN 18	AW 18X
19	85	82.550	85.725	125	55	19	1.37	H219X	HE219X	HS219X	A219X	AN 19	AW 19X
20	90	88.900	—	130	58	20	1.49	H220X	HE220X	—	A220X	AN 20	AW 20X
21	95	—	—	140	60	20	1.70	H221X	—	—	A221X	AN 21	AW 21X
22	100	101.600	—	145	63	21	1.93	H222X	HE222X	—	A222X	AN 22	AW 22X

Notes: <sup>(1)</sup> The masses in the table are for H series.  
<sup>(2)</sup> The numbers in the table mean sleeves for H series.  
Sleeves for HE or HS series have prefix AE or AS.

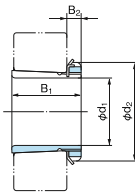
Remark: Suffix X means narrow axial slot type. For this type sleeves, only lockwashers with straight inner tab can be used.

**Adapter Assemblies**  
Series H32



Bearing bore No.	Dimensions (mm)					Mass (kg) (reference)	Adapter Ass'y No.	Part No.		
	d <sub>1</sub>	d <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>			Adapter sleeve	Locknut	Lockwasher
60	280	380	240	40	53	34.0	H3260	A3260	AN 60	AL 60
64	300	400	258	42	56	39.4	H3264	A3264	AN 64	AL 64
68	320	440	288	55	72	54.6	H3268	A3268	AN 68	AL 68
72	340	460	299	58	75	60.2	H3272	A3272	AN 72	AL 68
76	360	490	310	60	77	69.6	H3276	A3276	AN 76	AL 76
80	380	520	328	62	82	80.9	H3280	A3280	AN 80	AL 80
84	400	540	352	70	90	94.6	H3284	A3284	AN 84	AL 80
88	410	560	361	70	90	118	H3288	A3288	AN 88	AL 88
92	430	580	382	75	95	133	H3292	A3292	AN 92	AL 88
96	450	620	397	75	95	153	H3296	A3296	AN 96	AL 96
500	470	630	428	80	100	166	H32500	A32500	AN100	AL100

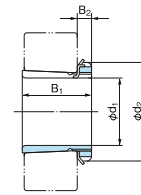
**Adapter Assemblies**  
Series H3 / HE3 / HS3



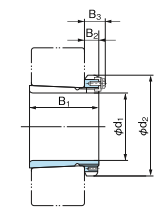
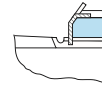
Bearing bore No.	Dimensions (mm)						Mass <sup>(1)</sup> (kg) (reference)	Adapter Ass'y No.			Part No.		
	H	HE	HS	d <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>		H	HE	HS	Adapter <sup>(2)</sup> sleeve	Locknut	Lockwasher
04	17	—	—	32	28	7	0.045	H304X	—	—	A304X	AN 04	AW 04X
05	20	19.050	—	38	29	8	0.075	H305X	HE305X	—	A305X	AN 05	AW 05X
06	25	25.400	22.225	45	31	8	0.109	H306X	HE306X	HS306X	A306X	AN 06	AW 06X
07	30	—	28.575	52	35	9	0.142	H307X	—	HS307X	A307X	AN 07	AW 07X
08	35	31.750	34.925	58	36	10	0.189	H308X	HE308X	HS308X	A308X	AN 08	AW 08X
09	40	38.100	—	65	39	11	0.248	H309X	HE309X	—	A309X	AN 09	AW 09X
10	45	44.450	41.275	70	42	12	0.302	H310X	HE310X	HS310X	A310X	AN 10	AW 10X
11	50	50.800	47.625	75	45	12	0.345	H311X	HE311X	HS311X	A311X	AN 11	AW 11X
12	55	—	53.975	80	47	13	0.393	H312X	—	HS312X	A312X	AN 12	AW 12X
13	60	57.150	60.325	85	50	14	0.459	H313X	HE313X	HS313X	A313X	AN 13	AW 13X
14	60	—	—	92	52	14	0.723	H314X	—	—	A314X	AN 14	AW 14X
15	65	63.500	66.675	98	55	15	0.830	H315X	HE315X	HS315X	A315X	AN 15	AW 15X
16	70	69.850	—	105	59	17	1.03	H316X	HE316X	—	A316X	AN 16	AW 16X
17	75	76.200	73.025	110	63	18	1.18	H317X	HE317X	HS317X	A317X	AN 17	AW 17X
18	80	—	79.375	120	65	18	1.37	H318X	—	HS318X	A318X	AN 18	AW 18X
19	85	82.550	85.725	125	68	19	1.56	H319X	HE319X	HS319X	A319X	AN 19	AW 19X
20	90	88.900	—	130	71	20	1.69	H320X	HE320X	—	A320X	AN 20	AW 20X
21	95	—	—	140	74	20	1.93	H321X	—	—	A321X	AN 21	AW 21X
22	100	101.600	—	145	77	21	2.18	H322X	HE322X	—	A322X	AN 22	AW 22X

Notes: <sup>(1)</sup> The masses in the table are for H series.  
<sup>(2)</sup> The numbers in the table mean sleeves for H series.  
 Sleeves for HE or HS series have prefix AE or AS.  
 Remark: Suffix X means narrow axial slot type. For this type sleeves, only lockwashers with straight inner tab can be used.

**Adapter Assemblies**  
Series H23 / HE23



Adapter Ass'y with Lockwasher

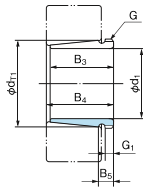


Adapter Ass'y with Lock Plate

Bearing bore No.	Dimensions (mm)						Mass <sup>(1)</sup> (kg) (reference)	Adapter Ass'y No.			Part No.		
	H	HE	d <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>		H	HE	Adapter <sup>(2)</sup> sleeve	Locknut	Lockwasher	Lock Plate
04	17	—	32	31	7	—	0.049	H2304X	—	A2304X	AN 04	AW 04X	—
05	20	19.05	38	35	8	—	0.087	H2305X	HE2305X	A2305X	AN 05	AW 05X	—
06	25	25.40	45	38	8	—	0.126	H2306X	HE2306X	A2306X	AN 06	AW 06X	—
07	30	—	52	43	9	—	0.165	H2307X	—	A2307X	AN 07	AW 07X	—
08	35	31.75	58	46	10	—	0.224	H2308X	HE2308X	A2308X	AN 08	AW 08X	—
09	40	38.10	65	50	11	—	0.280	H2309X	HE2309X	A2309X	AN 09	AW 09X	—
10	45	44.45	70	55	12	—	0.362	H2310X	HE2310X	A2310X	AN 10	AW 10X	—
11	50	50.80	75	58	12	—	0.420	H2311X	HE2311X	A2311X	AN 11	AW 11X	—
12	55	—	80	62	13	—	0.480	H2312X	—	A2312X	AN 12	AW 12X	—
13	60	57.15	85	65	14	—	0.556	H2313X	HE2313X	A2313X	AN 13	AW 13X	—
14	60	—	92	68	14	—	0.897	H2314X	—	A2314X	AN 14	AW 14X	—
15	65	63.50	98	73	15	—	1.05	H2315X	HE2315X	A2315X	AN 15	AW 15X	—
16	70	69.85	105	78	17	—	1.28	H2316X	HE2316X	A2316X	AN 16	AW 16X	—
17	75	76.20	110	82	18	—	1.45	H2317X	HE2317X	A2317X	AN 17	AW 17X	—
18	80	—	120	86	18	—	1.70	H2318X	—	A2318X	AN 18	AW 18X	—
19	85	82.55	125	90	19	—	1.94	H2319X	HE2319X	A2319X	AN 19	AW 19X	—
20	90	88.90	130	97	20	—	2.15	H2320X	HE2320X	A2320X	AN 20	AW 20X	—
21	95	—	140	101	20	—	2.45	H2321X	—	A2321X	AN 21	AW 21X	—
22	100	101.60	145	105	21	—	2.74	H2322X	HE2322X	A2322X	AN 22	AW 22X	—
24	110	107.95	155	112	22	—	3.20	H2324X	HE2324X	A2324X	AN 24	AW 24X	—
26	115	114.30	165	121	23	—	4.60	H2326	HE2326	A2326	AN 26	AW 26	—
28	125	127.00	180	131	24	—	5.52	H2328	HE2328	A2328	AN 28	AW 28	—
30	135	133.35	195	139	26	—	6.60	H2330	HE2330	A2330	AN 30	AW 30	—
32	140	139.70	210	147	28	—	9.15	H2332	HE2332	A2332	AN 32	AW 32	—
34	150	152.40	220	154	29	—	10.4	H2334	HE2334	A2334	AN 34	AW 34	—
36	160	165.10	230	161	30	—	11.3	H2336	HE2336	A2336	AN 36	AW 36	—
38	170	171.45	240	169	31	—	12.6	H2338	HE2338	A2338	AN 38	AW 38	—
40	180	177.80	250	176	32	—	13.9	H2340	HE2340	A2340	AN 40	AW 40	—
44	200	—	280	183	32	44	16.6	H2344	—	A2344	AN 44	—	AL 44
48	220	—	300	196	34	46	19.7	H2348	—	A2348	AN 48	—	AL 44
52	240	—	330	208	36	49	24.2	H2352	—	A2352	AN 52	—	AL 52
56	260	—	350	221	38	51	27.8	H2356	—	A2356	AN 56	—	AL 52

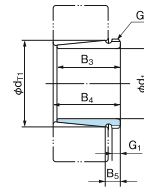
Notes: <sup>(1)</sup> The masses in the table are for H series.  
<sup>(2)</sup> The numbers in the table mean sleeves for H series.  
 Sleeves for HE series have prefix AE instead of A.  
 Remarks: 1. Suffix X means narrow axial slot type. For this type sleeves, only lockwashers with straight inner tab can be used.  
 2. In-core bore type HS series is also available.

**Withdrawal Sleeves**  
Series AH30 / AHX30



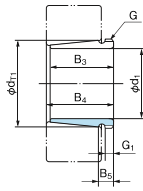
Bearing bore No.	Thread Nominal G	Dimensions (mm)						Mass (kg) (reference)	Withdrawal Sleeve No.	Locknut No.
		d1	B3	B4	dT1	B5	G1			
24	M 130×2	115	60	64	124.00	16	13	0.75	AHX3024	AN 26
26	M 140×2	125	67	71	134.50	17	14	0.93	AHX3026	AN 28
28	M 150×2	135	68	73	144.67	17	14	1.01	AHX3028	AN 30
30	M 160×3	145	72	77	154.92	18	15	1.15	AHX3030	AN 32
32	M 170×3	150	77	82	165.25	19	16	2.10	AH 3032	AN 34
34	M 180×3	160	85	90	175.83	20	17	2.50	AH 3034	AN 36
36	M 190×3	170	92	98	186.08	25	17	2.90	AH 3036	AN 38
38	Tr 205×4	180	96	102	196.50	24	18	3.40	AH 3038	HNL 41
40	Tr 215×4	190	102	108	206.92	25	19	3.80	AH 3040	HNL 43
44	Tr 235×4	200	111	117	227.58	26	20	7.40	AH 3044	HNL 47
48	Tr 260×4	220	116	123	248.00	27	21	8.80	AH 3048	HNL 52
52	Tr 280×4	240	128	135	268.83	29	23	10.7	AH 3052	HNL 56
56	Tr 300×4	260	131	139	289.08	30	24	12.0	AH 3056	HNL 60
60	Tr 320×5	280	145	153	310.08	32	26	14.4	AH 3060	HNL 64
64	Tr 345×5	300	149	157	330.33	33	27	16.0	AH 3064	HNL 69
68	Tr 365×5	320	162	171	351.42	34	28	19.5	AH 3068	HNL 73
72	Tr 385×5	340	167	176	371.67	36	30	21.0	AH 3072	HNL 77
76	Tr 410×5	360	170	180	391.92	37	31	23.5	AH 3076	HNL 82
80	Tr 430×5	380	183	193	412.83	39	33	27.2	AH 3080	HNL 86
84	Tr 450×5	400	186	196	433.00	40	34	29.1	AH 3084	HNL 90
88	Tr 470×5	420	194	205	453.67	41	35	32.1	AHX3088	HNL 94
92	Tr 490×5	440	202	213	474.17	43	37	35.3	AHX3092	HNL 98
96	Tr 520×6	460	205	217	494.42	44	38	40.0	AHX3096	HNL104
/500	Tr 540×6	480	209	221	514.58	46	40	42.5	AHX30/500	HNL108

**Withdrawal Sleeves**  
Series AH30 / AHX30



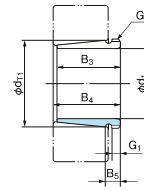
Bearing bore No.	Thread Nominal G	Dimensions (mm)						Mass (kg) (reference)	Withdrawal Sleeve No.	Locknut No.
		d1	B3	B4	dT1	B5	G1			
22	M 120×2	105	68	72	114.83	14	11	0.76	AHX3122	AN 24
24	M 130×2	115	75	79	125.33	15	12	0.95	AHX3124	AN 26
26	M 140×2	125	78	82	135.58	15	12	1.08	AHX3126	AN 28
28	M 150×2	135	83	88	145.92	17	14	1.28	AHX3128	AN 30
30	M 165×3	145	96	101	156.92	18	15	1.79	AHX3130	AN 33
32	M 180×3	150	103	108	167.42	19	16	3.20	AH 3132	AN 36
34	M 190×3	160	104	109	177.50	19	16	3.50	AH 3134	AN 38
36	M 200×3	170	116	122	188.33	22	19	4.20	AH 3136	AN 40
38	Tr 210×4	180	125	131	198.75	26	20	4.90	AH 3138	HN 42
40	Tr 220×4	190	134	140	209.42	27	21	5.60	AH 3140	HN 44
44	Tr 240×4	200	145	151	230.17	29	23	10.4	AH 3144	HN 48
48	Tr 260×4	220	154	161	250.83	31	25	12.1	AH 3148	HN 52
52	Tr 290×4	240	172	179	272.25	32	26	16.2	AH 3152	HN 58
56	Tr 310×5	260	175	183	292.42	34	28	17.6	AH 3156	HN 62
60	Tr 330×5	280	192	200	313.67	36	30	21.0	AH 3160	HN 66
64	Tr 350×5	300	209	217	335.00	37	31	24.7	AH 3164	HN 70
68	Tr 370×5	320	225	234	356.25	39	33	29.0	AH 3168	HN 74
72	Tr 400×5	340	229	238	376.42	41	35	33.1	AH 3172	HN 80
76	Tr 420×5	360	232	242	396.67	42	36	35.8	AH 3176	HN 84
80	Tr 440×5	380	240	250	417.17	44	38	38.9	AH 3180	HN 88
84	Tr 460×5	400	266	276	439.17	46	40	46.0	AH 3184	HN 92
88	Tr 480×5	420	270	281	459.42	48	42	49.2	AHX3188	HN 96
92	Tr 510×6	440	285	296	480.58	49	43	57.7	AHX3192	HN102
96	Tr 530×6	460	295	307	501.33	51	45	63.1	AHX3196	HN106
/500	Tr 550×6	480	313	325	522.67	53	47	70.9	AHX31/500	HN110

**Withdrawal Sleeves**  
Series AH2



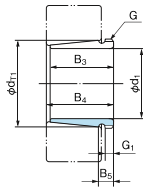
Bearing bore No.	Thread Nominal G	Dimensions (mm)							Mass (kg) (reference)	Withdrawal Sleeve No.	Locknut No.
		$d_1$	$B_3$	$B_4$	$d_1$	$B_5$	$G_1$ (reference)				
08	M 45 × 1.5	35	25	27	41.50	9	6	0.094	AH 208	AN 09	
09	M 50 × 1.5	40	26	29	46.67	9	6	0.104	AH 209	AN 10	
10	M 55 × 2	45	28	31	51.15	10	7	0.130	AH 210	AN 11	
11	M 60 × 2	50	29	32	56.83	10	7	0.167	AH 211	AN 12	
12	M 65 × 2	55	32	35	62.00	11	8	0.175	AH 212	AN 13	
13	M 75 × 2	60	32.5	36	67.08	11	8	0.242	AH 213	AN 15	
14	M 80 × 2	65	33.5	37	72.17	11	8	0.255	AH 214	AN 16	
15	M 85 × 2	70	34.5	38	77.25	11	8	0.280	AH 215	AN 17	
16	M 90 × 2	75	35.5	39	82.33	11	8	0.306	AH 216	AN 18	
17	M 95 × 2	80	38.5	42	87.50	12	9	0.353	AH 217	AN 19	
18	M 100 × 2	85	40	44	92.67	12	9	0.427	AH 218	AN 20	
19	M 105 × 2	90	43	47	97.83	13	10	0.486	AH 219	AN 21	
20	M 110 × 2	95	45	49	103.00	13	10	0.525	AH 220	AN 22	
21	M 115 × 2	100	47	51	108.08	14	11	0.580	AH 221	AN 23	
22	M 120 × 2	105	50	54	113.33	14	11	0.647	AH 222	AN 24	
24	M 130 × 2	115	53	57	123.50	15	12	0.755	AH 224	AN 26	
26	M 140 × 2	125	53	57	133.50	15	12	0.815	AH 226	AN 28	
28	M 150 × 2	135	56	61	143.75	16	13	1.00	AH 228	AN 30	
30	M 160 × 3	145	60	65	154.00	17	14	1.16	AH 230	AN 32	
32	M 170 × 3	150	64	69	164.25	18	15	1.91	AH 232	AN 34	
34	M 180 × 3	160	69	74	174.58	19	16	2.21	AH 234	AN 36	
36	M 190 × 3	170	69	74	184.58	19	16	2.34	AH 236	AN 38	
38	Tr 205 × 4	180	73	78	194.58	23	17	2.94	AH 238	HNL41	
40	Tr 215 × 4	190	77	82	204.83	24	18	3.12	AH 240	HNL43	
44	Tr 235 × 4	200	85	91	225.58	24	18	6.10	AH 244	HNL47	
48	Tr 260 × 4	220	96	102	246.17	28	22	8.16	AH 248	HNL52	
52	Tr 280 × 4	240	105	111	266.83	29	23	9.89	AH 252	HNL56	
56	Tr 300 × 4	260	105	113	287.00	29	23	10.4	AH 256	HNL60	

**Withdrawal Sleeves**  
Series AH22 / AH32 / AHX32



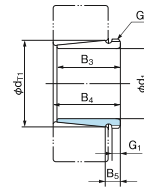
Bearing bore No.	Thread Nominal G	Dimensions (mm)							Mass (kg) (reference)	Withdrawal Sleeve No.	Locknut No.
		$d_1$	$B_3$	$B_4$	$d_1$	$B_5$	$G_1$ (reference)				
36	M 200 × 3	170	105	110	187.50	20	17	3.70	AH 2236	AN 40	
38	Tr 210 × 4	180	112	117	197.75	24	18	4.30	AH 2238	HN 42	
40	Tr 220 × 4	190	118	123	208.17	25	19	4.70	AH 2240	HN 44	
44	Tr 240 × 4	200	130	136	229.17	26	20	9.20	AH 2244	HN 48	
48	Tr 260 × 4	220	144	150	250.25	27	21	11.1	AH 2248	HN 52	
52	Tr 290 × 4	240	155	161	271.00	29	23	14.0	AH 2252	HN 58	
56	Tr 310 × 5	260	155	163	291.08	30	24	15.2	AH 2256	HN 62	
60	Tr 330 × 5	280	170	178	312.17	32	26	18.1	AH 2260	HN 66	
64	Tr 350 × 5	300	180	190	333.08	33	27	20.2	AH 2264	HN 70	
18	M 100 × 2	85	63	67	94.50	13	10	0.576	AHX3218	AN 20	
19	M 105 × 2	90	67	71	99.75	14	11	0.680	AH 3219	AN 21	
20	M 110 × 2	95	73	77	105.25	14	11	0.767	AHX3220	AN 22	
21	M 115 × 2	100	78	82	110.67	14	11	0.890	AH 3221	AN 23	
22	M 125 × 2	105	82	86	116.00	14	11	1.04	AHX3222	AN 25	
24	M 135 × 2	115	90	94	126.50	16	13	1.30	AHX3224	AN 27	
26	M 145 × 2	125	98	102	137.00	18	15	1.60	AHX3226	AN 29	
28	M 155 × 3	135	104	109	147.58	18	15	1.90	AHX3228	AN 31	
30	M 165 × 3	145	114	119	158.25	20	17	2.30	AHX3230	AN 33	
32	M 180 × 3	150	124	130	168.92	23	20	4.09	AH 3232	AN 36	
34	M 190 × 3	160	134	140	179.42	27	24	4.81	AH 3234	AN 38	
36	M 200 × 3	170	140	146	189.92	27	24	5.31	AH 3236	AN 40	
38	Tr 210 × 4	180	145	152	200.08	31	25	5.90	AH 3238	AN 42	
40	Tr 220 × 4	190	153	160	210.75	31	25	6.67	AH 3240	AN 44	
60	Tr 330 × 5	280	228	236	316.33	40	34	26.0	AH 3260	HN 66	
64	Tr 350 × 5	300	246	254	337.67	42	36	30.6	AH 3264	HN 70	
68	Tr 370 × 5	320	264	273	359.08	44	38	35.8	AH 3268	HN 74	
72	Tr 400 × 5	340	274	283	379.75	46	40	41.6	AH 3272	HN 80	
76	Tr 420 × 5	360	284	294	400.50	48	42	46.3	AH 3276	HN 84	
80	Tr 440 × 5	380	302	312	421.83	50	44	52.5	AH 3280	HN 88	
84	Tr 460 × 5	400	321	331	443.25	52	46	59.4	AH 3284	HN 92	
88	Tr 480 × 5	420	330	341	463.92	54	48	64.7	AHX3288	HN 96	
92	Tr 510 × 6	440	349	360	485.33	56	50	75.6	AHX3292	HN102	
96	Tr 530 × 6	460	364	376	506.50	58	52	83.6	AHX3296	HN106	
/500	Tr 550 × 6	480	393	405	528.75	60	54	94.7	AHX32500	HN110	

**Withdrawal Sleeves**  
Series AH3 / AHX30



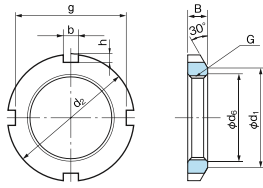
Bearing bore No.	Thread Nominal G	Dimensions (mm)						Mass (kg) (reference)	Withdrawal Sleeve No.	Locknut No.
		$d_1$	$B_3$	$B_4$	$d_1$	$B_5$	$G_1$ (reference)			
08	M 45×1.5	35	29	32	41.92	9	6	0.096	AH 308	AN 09
09	M 50×1.5	40	31	34	47.08	9	6	0.109	AH 309	AN 10
10	M 55×2	45	35	38	52.33	10	7	0.137	AHX310	AN 11
11	M 60×2	50	37	40	57.38	11.5	7	0.161	AHX311	AN 12
12	M 65×2	55	40	43	62.38	14.5	8	0.189	AHX312	AN 13
13	M 75×2	60	42	45	67.83	11	8	0.253	AH 313	AN 15
14	M 80×2	65	43	47	73.00	11	8	0.280	AH 314	AN 16
15	M 85×2	70	45	49	78.17	11	8	0.313	AH 315	AN 17
16	M 90×2	75	48	52	83.42	11	8	0.365	AH 316	AN 18
17	M 95×2	80	52	56	88.67	12	9	0.429	AHX317	AN 19
18	M 100×2	85	53	57	93.75	12	9	0.461	AHX318	AN 20
19	M 105×2	90	57	61	99.00	13	10	0.532	AHX319	AN 21
20	M 110×2	95	59	63	104.17	13	10	0.582	AHX320	AN 22
21	M 115×2	100	62	66	109.25	15	12	0.600	AHX321	AN 23
22	M 120×2	105	63	67	114.33	15	12	0.663	AHX322	AN 24
24	M 130×2	115	69	73	124.75	16	13	0.875	AHX324	AN 26
26	M 140×2	125	74	78	135.08	17	14	1.03	AHX326	AN 28
28	M 150×2	135	77	82	145.42	17	14	1.15	AHX328	AN 30
30	M 165×3	145	83	88	155.83	18	15	1.55	AHX330	AN 33
32	M 180×3	150	88	93	166.17	19	16	2.73	AH 332	AN 36
34	M 190×3	160	93	98	176.50	20	17	3.19	AH 334	AN 38

**Withdrawal Sleeves**  
Series AH23 / AHX23



Bearing bore No.	Thread Nominal G	Dimensions (mm)						Mass (kg) (reference)	Withdrawal Sleeve No.	Locknut No.
		$d_1$	$B_3$	$B_4$	$d_1$	$B_5$	$G_1$ (reference)			
08	M 45×1.5	35	40	43	42.75	10	7	0.128	AH 2308	AN 09
09	M 50×1.5	40	44	47	48.00	11	7	0.164	AH 2309	AN 10
10	M 55×2	45	50	53	53.17	15	9	0.209	AHX2310	AN 11
11	M 60×2	50	54	57	58.42	16	10	0.253	AHX2311	AN 12
12	M 65×2	55	58	61	63.63	17.5	11	0.297	AHX2312	AN 13
13	M 75×2	60	61	64	69.08	15	12	0.395	AH 2313	AN 15
14	M 80×2	65	64	68	74.42	15	12	0.466	AHX2314	AN 16
15	M 85×2	70	68	72	79.75	15	12	0.534	AHX2315	AN 17
16	M 90×2	75	71	75	85.00	15	12	0.597	AHX2316	AN 18
17	M 95×2	80	74	78	90.17	16	13	0.670	AHX2317	AN 19
18	M 100×2	85	79	83	95.50	17	14	0.779	AHX2318	AN 20
19	M 105×2	90	85	89	100.83	19	16	0.886	AHX2319	AN 21
20	M 110×2	95	90	94	106.25	19	16	0.988	AHX2320	AN 22
21	—	—	—	—	—	—	—	—	—	—
22	M 125×2	105	98	102	116.92	19	16	1.35	AHX2322	AN 25
24	M 135×2	115	105	109	127.42	20	17	1.60	AHX2324	AN 27
26	M 145×2	125	115	119	138.08	22	19	2.00	AHX2326	AN 29
28	M 155×3	135	125	130	148.92	23	20	2.33	AHX2328	AN 31
30	M 165×3	145	135	140	159.42	27	24	2.82	AHX2330	AN 33
32	M 180×3	150	140	146	169.92	27	24	4.70	AH 2332	AN 36
34	M 190×3	160	146	152	180.42	27	24	5.30	AH 2334	AN 38
36	M 200×3	170	154	160	190.92	29	26	5.90	AH 2336	AN 40
38	Tr 210×4	180	160	167	201.25	32	26	6.50	AH 2338	HN 42
40	Tr 220×4	190	170	177	211.75	36	30	7.50	AH 2340	HN 44
44	Tr 240×4	200	181	189	232.75	36	30	13.4	AH 2344	HN 48
48	Tr 260×4	220	189	197	253.42	36	30	15.5	AH 2348	HN 52
52	Tr 290×4	240	205	213	274.75	36	30	20.0	AH 2352	HN 58
56	Tr 310×5	260	212	220	295.33	36	30	21.5	AH 2356	HN 62

**Locknuts**  
Series AN / ANL

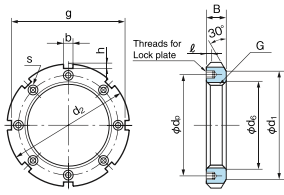


No.	Thread Nominal G	Dimensions (mm)							Mass (kg) (reference)	Lockwasher No.
		d <sub>1</sub>	d <sub>2</sub>	B	b	h	g	d <sub>s</sub>		
AN 02	M 15×1	21	25	5	4	2	21	15.5	0.010	AW 02
AN 03	M 17×1	24	28	5	4	2	24	17.5	0.013	AW 03
AN 04	M 20×1	26	32	6	4	2	28	20.5	0.019	AW 04
AN 05	M 25×1.5	32	38	7	5	2	34	25.8	0.025	AW 05
AN 06	M 30×1.5	38	45	7	5	2	41	30.8	0.043	AW 06
AN 07	M 35×1.5	44	52	8	5	2	48	35.8	0.053	AW 07
AN 08	M 40×1.5	50	58	9	6	2.5	53	40.8	0.085	AW 08
AN 09	M 45×1.5	56	65	10	6	2.5	60	45.8	0.119	AW 09
AN 10	M 50×1.5	61	70	11	6	2.5	65	50.8	0.148	AW 10
AN 11	M 55×2	67	75	11	7	3	69	56	0.158	AW 11
AN 12	M 60×2	73	80	11	7	3	74	61	0.174	AW 12
AN 13	M 65×2	79	85	12	7	3	79	66	0.203	AW 13
AN 14	M 70×2	85	92	12	8	3.5	85	71	0.242	AW 14
AN 15	M 75×2	90	98	13	8	3.5	91	76	0.287	AW 15
AN 16	M 80×2	95	105	15	8	3.5	98	81	0.397	AW 16
AN 17	M 85×2	102	110	16	8	3.5	103	86	0.451	AW 17
AN 18	M 90×2	108	120	16	10	4	112	91	0.556	AW 18
AN 19	M 95×2	113	125	17	10	4	117	96	0.658	AW 19
AN 20	M 100×2	120	130	18	10	4	122	101	0.698	AW 20
AN 21	M 105×2	126	140	18	12	5	130	106	0.845	AW 21
AN 22	M 110×2	133	145	19	12	5	135	111	0.965	AW 22
AN 23	M 115×2	137	150	19	12	5	140	116	1.01	AW 23
AN 24	M 120×2	138	155	20	12	5	145	121	1.08	AW 24
AN 25	M 125×2	148	160	21	12	5	150	126	1.19	AW 25
AN 26	M 130×2	149	165	21	12	5	155	131	1.25	AW 26
AN 27	M 135×2	160	175	22	14	6	163	136	1.55	AW 27
AN 28	M 140×2	160	180	22	14	6	168	141	1.56	AW 28
AN 29	M 145×2	171	190	24	14	6	178	146	2.00	AW 29
AN 30	M 150×2	171	195	24	14	6	183	151	2.03	AW 30
AN 31	M 155×3	182	200	25	16	7	186	156.5	2.21	AW 31
AN 32	M 160×3	182	210	25	16	7	196	161.5	2.59	AW 32
AN 33	M 165×3	193	210	26	16	7	196	166.5	2.43	AW 33
AN 34	M 170×3	193	220	26	16	7	206	171.5	2.80	AW 34
AN 36	M 180×3	203	230	27	18	8	214	181.5	3.07	AW 36
AN 38	M 190×3	214	240	28	18	8	224	191.5	3.39	AW 38
AN 40	M 200×3	226	250	29	18	8	234	201.5	3.69	AW 40

No.	Thread Nominal G	Dimensions (mm)							Mass (kg) (reference)	Lockwasher No.
		d <sub>1</sub>	d <sub>2</sub>	B	b	h	g	d <sub>s</sub>		
ANL 24	M 120×2	133	145	20	12	5	135	121	0.780	AWL24
ANL 26	M 130×2	143	155	21	12	5	145	131	0.880	AWL26
ANL 28	M 140×2	151	165	22	14	6	153	141	0.990	AWL28
ANL 30	M 150×2	164	180	24	14	6	168	151	1.38	AWL30
ANL 32	M 160×3	174	190	25	16	7	176	161.5	1.56	AWL32
ANL 34	M 170×3	184	200	26	16	7	186	171.5	1.72	AWL34
ANL 36	M 180×3	192	210	27	18	8	194	181.5	1.95	AWL36
ANL 38	M 190×3	202	220	28	18	8	204	191.5	2.08	AWL38
ANL 40	M 200×3	218	240	29	18	8	224	201.5	2.98	AWL40

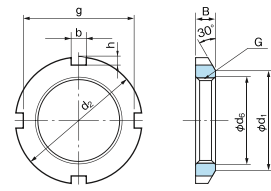


**Locknuts**  
Series AN / ANL



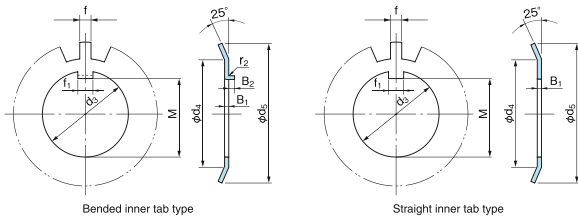
No.	Thread Nominal G	Dimensions (mm)											Mass (kg) (reference)	Lockwasher No.
		d <sub>1</sub>	d <sub>2</sub>	B	b	h	g	d <sub>6</sub>	l	s	d <sub>p</sub>	φ <sub>d1</sub>		
AN 44	Tr 220×4	250	280	32	20	10	260	222	15	M 8×1.25	238	5.20	AL 44	
AN 48	Tr 240×4	270	300	34	20	10	280	242	15	M 8×1.25	258	5.95	AL 44	
AN 52	Tr 260×4	300	330	36	24	12	306	262	18	M 10×1.5	281	8.05	AL 52	
AN 56	Tr 280×4	320	350	38	24	12	326	282	18	M 10×1.5	301	9.05	AL 52	
AN 60	Tr 300×4	340	380	40	24	12	356	302	18	M 10×1.5	326	11.8	AL 60	
AN 64	Tr 320×5	360	400	42	24	12	376	322.5	18	M 10×1.5	345	13.1	AL 64	
AN 68	Tr 340×5	400	440	55	28	15	410	342.5	21	M 12×1.75	372	23.1	AL 68	
AN 72	Tr 360×5	420	460	58	28	15	430	362.5	21	M 12×1.75	392	25.1	AL 68	
AN 76	Tr 380×5	450	490	60	32	18	454	382.5	21	M 12×1.75	414	30.9	AL 76	
AN 80	Tr 400×5	470	520	62	32	18	484	402.5	27	M 16×2	439	36.9	AL 80	
AN 84	Tr 420×5	490	540	70	32	18	504	422.5	27	M 16×2	459	43.5	AL 80	
AN 88	Tr 440×5	510	560	70	36	20	520	442.5	27	M 16×2	477	45.3	AL 88	
AN 92	Tr 460×5	540	580	75	36	20	540	462.5	27	M 16×2	497	50.4	AL 88	
AN 96	Tr 480×5	560	620	75	36	20	580	482.5	27	M 16×2	527	62.2	AL 96	
AN 100	Tr 500×5	580	630	80	40	23	584	502.5	27	M 16×2	539	63.3	AL 100	
ANL 44	Tr 220×4	242	260	30	20	9	242	222	12	M 6×1	229	3.09	ALL 44	
ANL 48	Tr 240×4	270	290	34	20	10	270	242	15	M 8×1.25	253	5.16	ALL 48	
ANL 52	Tr 260×4	290	310	34	20	10	290	262	15	M 8×1.25	273	5.67	ALL 48	
ANL 56	Tr 280×4	310	330	38	24	10	310	282	15	M 8×1.25	293	6.78	ALL 56	
ANL 60	Tr 300×4	336	360	42	24	12	336	302	15	M 8×1.25	316	9.62	ALL 60	
ANL 64	Tr 320×5	356	380	42	24	12	356	322.5	15	M 8×1.25	335	9.94	ALL 64	
ANL 68	Tr 340×5	376	400	45	24	12	376	342.5	15	M 8×1.25	355	11.7	ALL 64	
ANL 72	Tr 360×5	394	420	45	28	13	394	362.5	15	M 8×1.25	374	12.0	ALL 72	
ANL 76	Tr 380×5	422	450	48	28	14	422	382.5	18	M 10×1.5	398	14.9	ALL 76	
ANL 80	Tr 400×5	442	470	52	28	14	442	402.5	18	M 10×1.5	418	16.9	ALL 76	
ANL 84	Tr 420×5	462	490	52	32	14	462	422.5	18	M 10×1.5	438	17.4	ALL 84	
ANL 88	Tr 440×5	490	520	60	32	15	490	442.5	21	M 12×1.75	462	26.2	ALL 88	
ANL 92	Tr 460×5	510	540	60	32	15	510	462.5	21	M 12×1.75	482	29.6	ALL 88	
ANL 96	Tr 480×5	530	560	60	36	15	530	482.5	21	M 12×1.75	502	28.3	ALL 96	
ANL100	Tr 500×5	550	580	68	36	15	550	502.5	21	M 12×1.75	522	33.6	ALL 96	

**Nuts for withdrawal sleeves**  
Series HN / HNL



No.	Thread Nominal G	Dimensions (mm)								Mass (kg) (reference)
		d <sub>1</sub>	d <sub>2</sub>	B	b	h	g	d <sub>6</sub>		
HN 42	Tr 210×4	238	270	30	20	10	250	212	4.75	
HN 44	Tr 220×4	250	280	32	20	10	260	222	5.35	
HN 48	Tr 240×4	270	300	34	20	10	280	242	6.20	
HN 52	Tr 260×4	300	330	36	24	12	306	262	8.55	
HN 58	Tr 290×4	330	370	40	24	12	346	292	11.8	
HN 62	Tr 310×5	350	390	42	24	12	366	312.5	13.4	
HN 66	Tr 330×5	380	420	52	28	15	390	332.5	20.4	
HN 70	Tr 350×5	410	450	55	28	15	420	352.5	25.2	
HN 74	Tr 370×5	430	470	58	28	15	440	372.5	28.2	
HN 80	Tr 400×5	470	520	62	32	18	484	402.5	40.0	
HN 84	Tr 420×5	490	540	70	32	18	504	422.5	46.9	
HN 88	Tr 440×5	510	560	70	36	20	520	442.5	48.5	
HN 92	Tr 460×5	540	580	75	36	20	540	462.5	55.0	
HN 96	Tr 480×5	560	620	75	36	20	580	482.5	67.0	
HN 102	Tr 510×6	590	650	80	40	23	604	513	69.0	
HN 106	Tr 530×6	610	670	80	40	23	624	533	78.0	
HN 110	Tr 550×6	640	700	80	40	23	654	553	92.5	
HNL 41	Tr 205×4	232	250	30	18	8	234	207	3.43	
HNL 43	Tr 215×4	242	260	30	20	9	242	217	3.72	
HNL 47	Tr 235×4	262	280	34	20	9	262	237	4.60	
HNL 52	Tr 260×4	290	310	34	20	10	290	262	5.80	
HNL 56	Tr 280×4	310	330	38	24	10	310	282	6.72	
HNL 60	Tr 300×4	336	360	42	24	12	336	302	9.60	
HNL 64	Tr 320×5	356	380	42	24	12	356	322.5	10.3	
HNL 69	Tr 345×5	384	410	45	28	13	384	347.5	11.5	
HNL 73	Tr 365×5	404	430	48	28	13	404	367.5	14.2	
HNL 77	Tr 385×5	422	450	48	28	14	422	387.5	15.0	
HNL 82	Tr 410×5	452	480	52	32	14	452	412.5	19.0	
HNL 86	Tr 430×5	472	500	52	32	14	472	432.5	19.8	
HNL 90	Tr 450×5	490	520	60	32	15	490	452.5	23.8	
HNL 94	Tr 470×5	510	540	60	32	15	510	472.5	25.0	
HNL 98	Tr 490×5	550	580	60	36	15	550	492.5	34.0	
HNL104	Tr 520×6	570	600	68	36	15	570	523	37.0	
HNL108	Tr 540×6	590	630	68	40	20	590	543	43.5	

**Lockwashers**  
Series AW / AWL

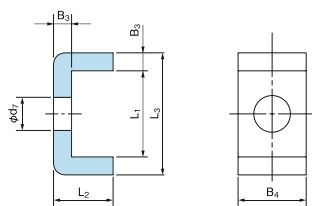


No.		Dimensions (mm)											Locknut No.
Bended inner tab	Straight inner tab	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	f <sub>1</sub>	M	B <sub>1</sub>	B <sub>2</sub>	r <sub>2</sub>	f	No. of Teeth	Mass (kg/100pcs) (reference)	
AW 02	AW 02X	15	21	28	4	13.5	1	2.5	1	4	13	0.253	AN 02
AW 03	AW 03X	17	24	32	4	15.5	1	2.5	1	4	13	0.313	AN 03
AW 04	AW 04X	20	26	36	4	18.5	1	2.5	1	4	13	0.350	AN 04
AW 05	AW 05X	25	32	42	5	23	1.2	2.5	1	5	13	0.640	AN 05
AW 06	AW 06X	30	38	49	5	27.5	1.2	2.5	1	5	13	0.780	AN 06
AW 07	AW 07X	35	44	57	6	32.5	1.2	2.5	1	5	15	1.04	AN 07
AW 08	AW 08X	40	50	62	6	37.5	1.2	2.5	1	6	15	1.23	AN 08
AW 09	AW 09X	45	56	69	6	42.5	1.2	2.5	1	6	17	1.52	AN 09
AW 10	AW 10X	50	61	74	6	47.5	1.2	2.5	1	6	17	1.60	AN 10
AW 11	AW 11X	55	67	81	8	52.5	1.2	4	1	7	17	1.96	AN 11
AW 12	AW 12X	60	73	86	8	57.5	1.5	4	1.2	7	17	2.53	AN 12
AW 13	AW 13X	65	79	92	8	62.5	1.5	4	1.2	7	19	2.90	AN 13
AW 14	AW 14X	70	85	98	8	66.5	1.5	4	1.2	8	19	3.34	AN 14
AW 15	AW 15X	75	90	104	8	71.5	1.5	4	1.2	8	19	3.56	AN 15
AW 16	AW 16X	80	95	112	10	76.5	1.8	4	1.2	8	19	4.64	AN 16
AW 17	AW 17X	85	102	119	10	81.5	1.8	4	1.2	8	19	5.24	AN 17
AW 18	AW 18X	90	108	126	10	86.5	1.8	4	1.2	10	19	6.23	AN 18
AW 19	AW 19X	95	113	133	10	91.5	1.8	4	1.2	10	19	6.70	AN 19
AW 20	AW 20X	100	120	142	12	96.5	1.8	6	1.2	10	19	7.65	AN 20
AW 21	AW 21X	105	126	145	12	100.5	1.8	6	1.2	12	19	8.26	AN 21
AW 22	AW 22X	110	133	154	12	105.5	1.8	6	1.2	12	19	9.40	AN 22
AW 23	AW 23X	115	137	159	12	110.5	2	6	1.5	12	19	10.8	AN 23
AW 24	AW 24X	120	138	164	14	115	2	6	1.5	12	19	10.5	AN 24
AW 25	AW 25X	125	148	170	14	120	2	6	1.5	12	19	11.8	AN 25
AW 26	AW 26X	130	149	175	14	125	2	6	1.5	12	19	11.3	AN 26
AW 27	AW 27X	135	160	185	14	130	2	6	1.5	14	19	14.4	AN 27
AW 28	AW 28X	140	160	192	16	135	2	8	1.5	14	19	14.2	AN 28
AW 29	AW 29X	145	171	202	16	140	2	8	1.5	14	19	16.8	AN 29
AW 30	AW 30X	150	171	205	16	145	2	8	1.5	14	19	15.5	AN 30
AW 31	AW 31X	155	182	212	16	147.5	2.5	8	1.5	16	19	20.9	AN 31
AW 32	AW 32X	160	182	217	18	154	2.5	8	1.5	16	19	22.2	AN 32
AW 33	AW 33X	165	193	222	18	157.5	2.5	8	1.5	16	19	24.1	AN 33
AW 34	AW 34X	170	193	232	18	164	2.5	8	1.5	16	19	24.7	AN 34
AW 36	AW 36X	180	203	242	20	174	2.5	8	1.5	18	19	26.8	AN 36
AW 38	AW 38X	190	214	252	20	184	2.5	8	1.5	18	19	27.8	AN 38
AW 40	AW 40X	200	226	262	20	194	2.5	8	1.5	18	19	29.3	AN 40

No.		Dimensions (mm)											Locknut No.
Bended inner tab	Straight inner tab	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	f <sub>1</sub>	M	B <sub>1</sub>	B <sub>2</sub>	r <sub>2</sub>	f	No. of Teeth	Mass (kg/100pcs) (reference)	
AWL 24	AWL 24X	120	133	155	14	115	2	6	1.5	12	19	7.70	ANL 24
AWL 26	AWL 26X	130	143	165	14	125	2	6	1.5	12	19	8.70	ANL 26
AWL 28	AWL 28X	140	151	175	16	135	2	8	1.5	14	19	10.9	ANL 28
AWL 30	AWL 30X	150	164	190	16	145	2	8	1.5	14	19	11.3	ANL 30
AWL 32	AWL 32X	160	174	200	18	154	2.5	8	1.5	16	19	16.2	ANL 32
AWL 34	AWL 34X	170	184	210	18	164	2.5	8	1.5	16	19	19.0	ANL 34
AWL 36	AWL 36X	180	192	220	20	174	2.5	8	1.5	18	19	18.0	ANL 36
AWL 38	AWL 38X	190	202	230	20	184	2.5	8	1.5	18	19	20.5	ANL 38
AWL 40	AWL 40X	200	218	250	20	194	2.5	8	1.5	18	19	21.4	ANL 40

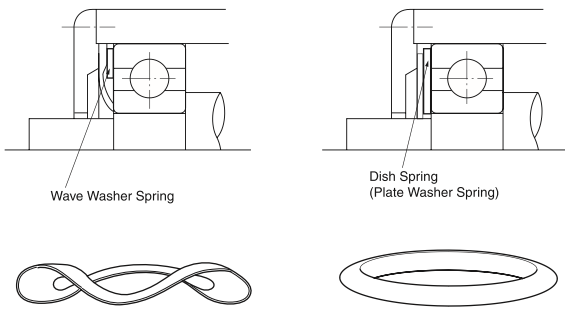
Remark: Narrow slot adapters with part numbers with an X suffix in the series H2, H3 and H23 use straight type inner tabs. Wide slot adapters with part numbers with an X suffix can use either bended or straight inner tabs.

**Lock Plates**  
Series AL / ALL



No.	Dimensions (mm)						Mass (kg/100pcs) (reference)	Nut No.
	B <sub>3</sub>	B <sub>4</sub>	L <sub>2</sub>	d <sub>7</sub>	L <sub>1</sub>	L <sub>3</sub>		
AL 44	4	20	12	9	22.5	30.5	2.60	AN44 , AN48
AL 52	4	24	12	12	25.5	33.5	3.39	AN52 , AN56
AL 60	4	24	12	12	30.5	38.5	3.79	AN60
AL 64	5	24	15	12	31	41	5.35	AN64
AL 68	5	28	15	14	38	48	6.65	AN68 , AN72
AL 76	5	32	15	14	40	50	7.96	AN76
AL 80	5	32	15	18	45	55	8.20	AN80 , AN84
AL 88	5	36	15	18	43	53	9.00	AN88 , AN92
AL 96	5	36	15	18	53	63	10.4	AN96
AL 100	5	40	15	18	45	55	10.5	AN100
ALL 44	4	20	12	7	13.5	21.5	2.12	ANL44
ALL 48	4	20	12	9	17.5	25.5	2.29	ANL48, ANL52
ALL 56	4	24	12	9	17.5	25.5	2.92	ANL56
ALL 60	4	24	12	9	20.5	28.5	3.16	ANL60
ALL 64	5	24	15	9	21	31	4.56	ANL64, ANL68
ALL 72	5	28	15	9	20	30	5.03	ANL72
ALL 76	5	28	15	12	24	34	5.28	ANL76, ANL80
ALL 84	5	32	15	12	24	34	6.11	ANL84
ALL 88	5	32	15	14	28	38	6.45	ANL88, ANL92
ALL 96	5	36	15	14	28	38	7.29	ANL96, ANL100

■ Dish Spring for Bearings



The application for electrical motors may sometimes require that the bearings be provided with appropriate preload when assembled. In case of motors the residual clearance 0 after mounting is best for low noise. Preload has the following various purposes and effects.

<Purpose of Preload>

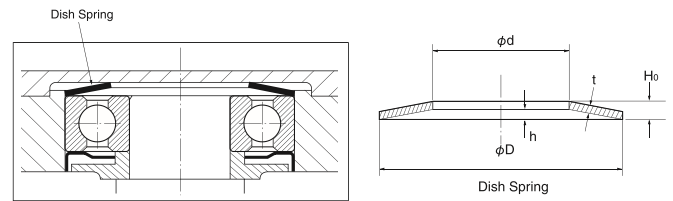
- (1) Enhances rotating accuracy of shaft. Minimizes axial movements and helps to prevent vibration and decrease noise.
- (2) Prevents fretting caused by external vibration.
- (3) Increases rigidity of a shaft (that is, preloading can help to decrease the deflection of shafting).

<Preloading method>

Use of springs (wave washer spring or dish spring) "Constant pressure" preloading. The preload for electrical motor bearings may be calculated by using the following equations.  
 $T_p$  = Preload Force (kgf)  $d$  = Inner Ring Bore Diameter (mm)

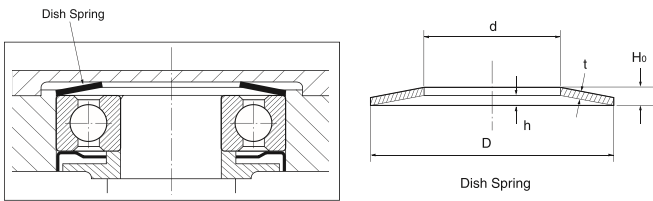
$T_p = (0.4 \sim 0.8)d$  or  $T_p = 0.6d \sim 3$

Preload by Dish Springs for Bearings



Bearing No.	Bearing I.D (dmm)	Spring No.	Target Preload (Tp N)		Recommended Preload (N)	Flexure (dmm)	Spring Hgt (Ho mm)
			$T_p = (0.4 \sim 0.8)d$ Range	$T_p = 0.6d \sim 3$			
6001	12	HDS-28	47.0~94.1	41.2	88.7	0.25	0.75
6002	15	HDS-32	58.8~117.6	58.8	100.0	0.41	0.64
6003	17	HDS-35b	66.6~133.3	70.6	110.0	0.28	0.87
6004	20	HDS-42	78.4~156.8	88.2	116.0	0.38	0.97
6005	25	HDS-47	98.0~196.0	117.6	145.0	0.38	1.07
6006	30	HDS-55	117.6~235.2	147.0	163.0	0.56	0.89
6007	35	HDS-62	137.2~274.4	176.4	168.0	0.48	1.27
6008	40	HDS-68	156.8~313.6	205.8	183.0	0.64	1.01
6009	45	HDS-75	176.4~352.8	235.2	236.0	0.56	1.19
6010	50	HDS-80b	196.0~392.0	264.6	256.0	0.58	1.57
6011	55	HDS-90b	215.6~431.2	294.0	321.0	0.55	1.75
6200	10	HDS-30	39.2~78.4	29.4	84.2	0.28	0.77
6201	12	HDS-32	47.0~94.1	41.2	82.6	0.28	0.77
6202	15	HDS-35b	58.8~117.6	58.8	110.0	0.28	0.87
6203	17	HDS-40	66.6~133.3	70.6	107.0	0.33	0.92
6204	20	HDS-47	78.4~156.8	88.2	145.0	0.38	1.07
6205	25	HDS-52	98.0~196.0	117.6	128.0	0.38	1.07
6206	30	HDS-62	117.6~235.2	147.0	168.0	0.48	1.27
6207	35	HDS-72b	137.2~274.4	176.4	219.0	0.45	1.45
6208	40	HDS-80b	156.8~313.6	205.8	256.0	0.58	1.57
6209	45	HDS-85	176.4~352.8	235.2	344.0	0.55	1.75
6210	50	HDS-90b	196.0~392.0	264.6	321.0	0.55	1.75
6300	10	HDS-35a	39.2~78.4	29.4	62.0	0.28	0.77
6301	12	HDS-37	47.0~94.1	41.2	108.0	0.33	0.92
6302	15	HDS-42	58.8~117.6	58.8	116.0	0.38	0.97
6303	17	HDS-47	66.6~133.3	70.6	145.0	0.38	1.07
6304	20	HDS-52	78.4~156.8	88.2	128.0	0.38	1.07
6305	25	HDS-62	98.0~196.0	117.6	168.0	0.48	1.27
6306	30	HDS-72a	117.6~235.2	147.0	253.0	0.55	1.55
6307	35	HDS-80a	137.2~274.4	176.4	221.0	0.58	1.57
6308	40	HDS-90a	156.8~313.6	205.8	276.0	0.55	1.75
6309	45	HDS-100a	176.4~352.8	235.2	266.0	0.63	1.82
6310	50	HDS-110a	196.0~392.0	264.6	304.0	0.78	1.97

Dish Spring List for Bearings

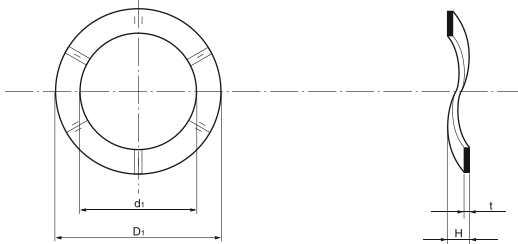


Size	Applicable Bearing No.	Dish Spring Size (mm)					Spring Load (N)				Unit (mm)
		D	d	t	h	Ho	Flexure 0.5h		Flexure 0.75h		
							P	δ	P	δ	
HDS-10	EL3 623	9.8	6.2	0.20	0.20	0.40	18.40	0.10	23.20	0.15	
HDS-13	EL4 624	12.8	7.2	0.25	0.25	0.50	23.90	0.13	29.70	0.19	
HDS-16	R4 EL5 625 634	15.8	8.2	0.30	0.30	0.55	19.40	0.15	23.40	0.23	
HDS-19a	R5 EL6 626 635	18.8	9.2	0.30	0.35	0.65	26.60	0.18	31.50	0.26	
HDS-19b	EL7 607	10.2	10.2			0.70	41.20		50.80		
HDS-22	R7 EL8 608 627 636	21.8	12.3	0.35	0.40	0.75	38.40	0.20	46.60	0.30	
HDS-24	EL9 609 628	23.7					68.80		81.30		
HDS-26	R9 6000 629 637	25.7	14.3	0.40	0.50	0.90	54.30	0.25	64.10	0.38	
HDS-28	6001 638	27.7				1.00	88.70		113.00		
HDS-30	6200	29.7	17.3				84.20		102.00		
HDS-32	6002 6201	31.7		0.50			82.60		100.00		
HDS-35a	6300	34.6	20.4		0.55	1.05	62.70	0.28	76.00	0.41	
HDS-35b	6003 6202	34.6	22.4			1.15	110.00		139.00		
HDS-37	6301	36.6	20.4	0.60	0.65	1.25	108.00	0.33	132.00	0.49	
HDS-40	6203	39.6	25.5				107.00		131.00		
HDS-42	6004	41.6				1.35	116.00		135.00		
HDS-47	6005 6204 6303	46.5	30.5				145.00		177.00		
HDS-52	6205 6304	51.5	35.5	0.70	0.75	1.45	128.00	0.38	156.00	0.56	
HDS-55	6006	54.5	40.5				133.00		163.00		
HDS-62	6007 6206 6305	61.5	50.5	0.80	0.95	1.75	168.00	0.48	200.00	0.71	
HDS-68	6008	67.5	61.5			0.85	1.65	148.00	0.43	183.00	0.64
HDS-72a		71.5	45.5		1.10	2.10	253.00	0.55	312.00	0.83	
HDS-72b	6207	50.5	0.90	1.90	219.00	0.45	286.00	0.68			
HDS-75	6009	74.5	55.5	1.00	0.75	1.75	177.00	0.38	236.00	0.56	
HDS-80a	6307	79.5	50.5		1.15	2.15	221.00	0.58	266.00	0.86	
HDS-80b	6010 6208	55.5					256.00		308.00		
HDS-85	6209	84.5	60.5				344.00		445.00		
HDS-90a	6308	89.5			1.10	2.30	276.00	0.55	357.00	0.83	
HDS-90b	6011 6210	65.5					321.00		416.00		
HDS-95	6012	94.5	75.5		0.85	2.05	260.00	0.43	351.00	0.64	
HDS-100a	6309	99.0	65.5	1.20	1.25	2.45	266.00	0.63	331.00	0.94	
HDS-100b	6013 6211	70.5					303.00		376.00		
HDS-110a	6310	109.0	70.5		1.55	2.75	304.00	0.78	353.00	1.16	
HDS-110b	6014 6212	75.5					339.00		393.00		
HDS-115	6015	114.0	90.5		1.30	2.50	321.00	0.65	396.00	0.98	
HDS-120a	6311	119.0	75.5		1.55	2.75	249.00	0.78	289.00	1.16	

Size	Applicable Bearing No.	Dish Spring Size (mm)					Spring Load (N)				Unit (mm)	
		D	d	t	h	Ho	Flexure 0.5h		Flexure 0.75h			
							P	δ	P	δ		
HDS-120b	6213	119.0	85.5									
HDS-125	6016 6214	124.0	90.5	1.20	1.55	2.75	291.00	0.78	305.00	1.16		
HDS-130a	6312	85.5					438.00		533.00			
HDS-130b	6017 6215	129.0	95.5		1.70	3.20	540.00	0.85	657.00	1.28		
HDS-140a	6313	90.5					368.00		448.00			
HDS-140b	6018 6216	139.0	101.0	1.50	1.75	3.25	469.00	0.88	563.00	1.31		
HDS-150a	6314	95.5					313.00		381.00			
HDS-150b	6217	149.0	106.0		1.70	3.20	371.00	0.85	452.00	1.28		
HDS-160a	6315	101.0					365.00		440.00			
HDS-160b	6218	159.0	101.0		1.85	3.45	422.00	0.93	508.00	1.39		
HDS-170a	6316	111.0	1.60				403.00		469.00			
HDS-170b	6219	169.0			2.05	3.65	467.00	1.03	544.00	1.54		
HDS-180a	6317	121.0					706.00		866.00			
HDS-180b	6220	179.0	126.0		2.20	4.20	758.00	1.10	930.00	1.65		
HDS-190a	6318	189.0	121.0				629.00		762.00			
HDS-190b	6221	189.0	131.0	2.00	2.30	4.30	711.00	1.15	861.00	1.73		
HDS-200a	6319	198.0	141.0				692.00		815.00			
HDS-200b	6222	198.0	141.0		2.50	4.50	786.00	1.25	925.00	1.88		
HDS-215a	6320	213.0	151.0		2.20		772.00	1.10	986.00	1.65		
HDS-225	6321	223.0			2.30	4.60	783.00	1.15	989.00	1.73		
HDS-230	6226	228.0	161.0		2.60	4.90	870.00	1.30	1060.00	1.95		
HDS-240	6322	238.0			2.85	5.15	864.00	1.43	1020.00	2.14		
HDS-250	6228	248.0			2.50	5.00	819.00	1.25	1030.00	1.88		
HDS-260	6324	258.0	171.0		3.00	5.50	951.00	1.50	1130.00	2.25		
HDS-270	6230	268.0			3.10	5.60	960.00	1.55	1130.00	2.33		
HDS-280	6326	278.0	181.0	2.50			917.00		1060.00			
HDS-290	6232	288.0			3.25	5.75	892.00	1.63	1030.00	2.44		
HDS-300	6328	298.0	193.0				791.00		917.00			
HDS-310	6234	308.0	202.0		3.10	6.10	1070.00	1.55	1330.00	2.33		
HDS-320a	6330	318.0	212.0		3.20	6.20	1080.00	1.60	1340.00	2.40		
HDS-340a	6332	338.0	232.0	3.00	3.60	6.60	1220.00	1.80	1450.00	2.70		
HDS-360a	6334	358.0	242.0		3.90	6.90	1210.00	1.95	1410.00	2.93		
HDS-380	6336	378.0	252.0				1060.00		1230.00			
HDS-400	6338	398.0	262.0	3.50	4.20	7.70	1520.00	2.10	1810.00	3.15		
HDS-420	6340	418.0	272.0	4.00	3.80	7.80	159.00	1.90	2030.00	2.85		

Material: Carbon spring steel between S65CM and S75CM (JIS)  
 Hardness: between HRC38 and HRC45

Wave Springs for Bearings (Reference)



$W=0.6d-3$      $W$ : Preload(Kgf)/ $d$ : Bore diameter  
 $L=(1.94 \times dm^3 \times W)/(E \times b \times 13 \times N)(mm)$   
 $L$ : elastic displacement (mm)  
 $dm=(d1+D1)/2$  (mm)     $b=(D1-d1)/2$  (mm)  
 $t$ : thickness of sheet (mm)  
 $E=20000$  (kgf/mm<sup>2</sup>)  
 $N$ : wave number

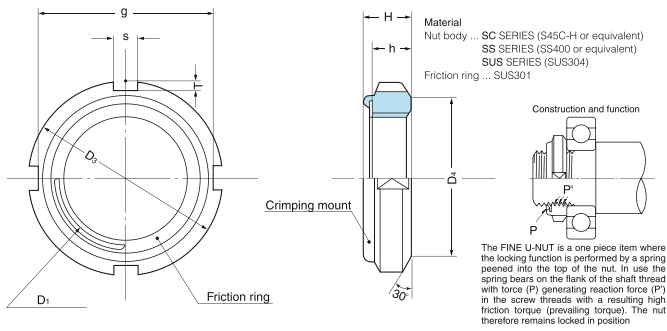
Spring No.	Outside Diameter of Bearing (mm)	d <sub>1</sub> : Bore Diameter of Spring (mm)	D <sub>1</sub> : Outside Diameter of Spring (mm)	H: Height of Spring (mm)	t: Thickness of Sheet (mm)	Wave Number	Spring Constant (mm/kgf)	Applied Bearing No.					
W22	22	14.5	21	2.4	0.2	3	0.2576	6900					
W26	26	19.5	24.8	3.2	0.2	3	0.9139		6000				
W28	28	20.9	26.9	3	0.25	3	0.3488	6902	6001				
W30	30	22	28.5	4.1	0.25	3	0.3796	6903		6200			
W32	32	23.5	30.5	4	0.25	3	0.4310		6002	6201			
W35	35	26.4	33.9	3.5	0.3	3	0.3242		6003	6202	6300		
W40	40	29.8	38.3	5	0.3	3	0.4120		6203				
W42	42	30.1	40.6	4.5	0.3	3	0.3732	6905	6004			6302	
W47	47	33.7	45.5	5	0.3	3	0.4688	6906	6005	6204	6303		
W52	52	38.5	50	7.2	0.3	3	0.6683		6205	6304			
W62	62	47.2	60.2	6.5	0.4	3	0.4458	6908	6007	6206	6305	6403	
W72	72	55	70.5	7	0.45	3	0.4190	6910		6207	6306	6404	
W80	80	61.3	77.8	8.5	0.45	3	0.5359	6911	6010	6208	6307	6405	
W90	90	69	88.5	7	0.6	3	0.2777	6913	6011	6210	6308	6406	
W100	100	79.3	98.8	6.5	0.7	3	0.2529	6914	6013	6211	6309	6407	
W110	110	88.9	108.9	8	0.8	3	0.2263	6916	6014	6212	6310	6408	
W120	120	95.8	118.9	8.5	0.8	3	0.2505	6917		6213	6311	6409	
W130	130	108.3	128.3	11	0.8	3	0.3872	6919	6017	6215	6312	6410	
W140	140	112.4	138.4	11	0.8	3	0.3548	6920	6018	6216	6313	6411	

Material: Spring Steel (JIS G3311/JIS G3506)HARDNESS: HRC40-50/SURFACE TREATMENT PHOSPHATE COATING

- Notes: 1. 't' means thickness of raw sheet.  
 2. 'd<sub>1</sub>' means inscribed circle and 'D<sub>1</sub>' means circumscribed circle.  
 3. 'H' means the height of spring of which the tops of 3 waves indicate same height first of all when it is compressed between 2 parallel plates

Convenient Locking Nuts for Bearings

Dimension Table for Fine U-NUT



Thread accuracy: ISO6H(JIS CLASS2) Unit: mm

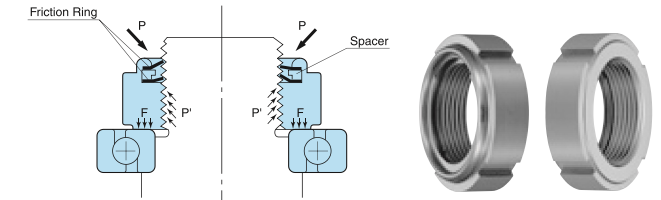
SC Series	SS Series	SUS Series	Designation of thread $D_1$	$D_2$	$D_4$	$g$	$T$	$S$	$h$	$H$	Perpendicularity of bearing surface
FU00SC	FU00SS	FU00SUS	M10×0.75	18	13.5	14.4	1.8	3	4	5.2	± 0.3
FU01SC	FU01SS	FU01SUS	M12×1.0	22	17	18.4	1.8	3	4	5.4	
FU02SC	FU02SS	FU02SUS	M15×1.0	25	21	21.4	1.8	4	5	6.5	
FU03SC	FU03SS	FU03SUS	M17×1.0	28	24	24.2	1.8	4	5	6.4	
FU04SC	FU04SS	FU04SUS	M20×1.0	32	26	28.4	1.8	4	6	7.7	
FU05SC	FU05SS	FU05SUS	M25×1.5	38	32	34	2	5	7	9.1	
FU06SC	FU06SS	FU06SUS	M30×1.5	45	38	41	2	5	7	9.1	
FU07SC	FU07SS	FU07SUS	M35×1.5	52	44	48	2	5	8	10.2	
FU08SC	FU08SS	FU08SUS	M40×1.5	58	50	53	2.5	6	9	11.2	
FU09SC	FU09SS	FU09SUS	M45×1.5	65	56	60	2.5	6	10	12.5	
FU10SC	FU10SS	FU10SUS	M50×1.5	70	61	65	2.5	6	11	13.5	
FU11SC	FU11SS	FU11SUS	M55×2.0	75	67	69	3	7	11	13.5	
FU12SC	FU12SS	FU12SUS	M60×2.0	80	73	74	3	7	11	13.5	
FU13SC	FU13SS	FU13SUS	M65×2.0	85	79	79	3	7	12	15	
FU14SC	FU14SS	FU14SUS	M70×2.0	92	85	85	3.5	8	12	15	
FU15SC	FU15SS	FU15SUS	M75×2.0	98	90	91	3.5	8	13	15.8	
FU16SC	FU16SS	FU16SUS	M80×2.0	105	95	98	3.5	8	15	18.6	
FU17SC	FU17SS	FU17SUS	M85×2.0	110	102	103	3.5	8	16	19.2	
FU18SC	FU18SS	FU18SUS	M90×2.0	120	108	112	4	10	16	20.3	
FU19SC	FU19SS	FU19SUS	M95×2.0	125	113	117	4	10	17	21.3	
FU20SC	FU20SS	FU20SUS	M100×2.0	130	120	122	4	10	18	22.3	
FU21SC	—	—	M105×2.0	140	126	130	4	12	18	22.3	
FU22SC	—	—	M110×2.0	145	133	135	5	12	19	23.3	
FU23SC	—	—	M115×2.0	150	137	140	5	12	19	23.3	
FU24SC	—	—	M120×2.0	155	138	145	5	12	20	24.3	
FU25SC	—	—	M125×2.0	160	148	150	5	12	21	25.4	
FU26SC	—	—	M130×2.0	165	149	155	5	12	21	25.4	
FU27SC	—	—	M135×2.0	175	160	163	6	14	22	26.6	
FU28SC	—	—	M140×2.0	180	160	168	6	14	22	26.6	
FU29SC	—	—	M145×2.0	190	171	178	6	14	24	28.6	
FU30SC	—	—	M150×2.0	195	171	183	6	14	24	28.3	

\* Dimensions may be subject to change without notice due to our policy of product improvements.

Construction and Function

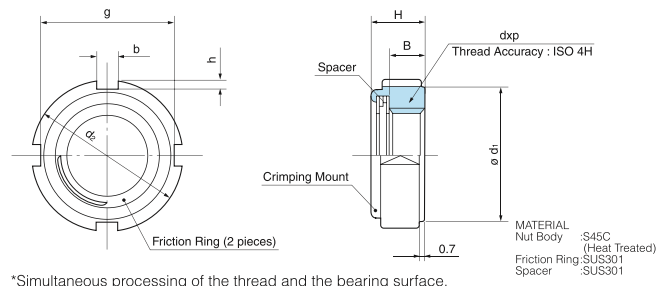
The TWIN FU-NUT has two friction rings and a spacer which are secured to the upper surface of the nut, as shown below. The two friction rings are arranged so that

stress  $P$  generated by the spring action and the reaction  $P'$  act symmetrically about the shaft centre. This arrangement ensures an even contact force  $F$  around the contact face.



- Accuracy of thread is ISO 4H
- Excellent locking performance
- Bearing surface run out to thread form is held to within a few microns
- Simple assembly, as for a standard nut

Dimension Table for Twin FU-NUT

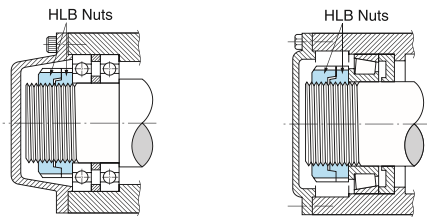


\*Simultaneous processing of the thread and the bearing surface.

Dimensions in millimeters

Code No.	$d \cdot p$	$\phi d_1$	$d_2$	$H$	$B$	$b$	$h$	$g$	$t_{min}=B+3.5p$	Allowable axial dead load (kN)	
TFU02SC	M15 × 1	21	25	9.9	7	4	1.8	21.4	10.5	34.1	
TFU03SC	M17 × 1	23.5	28	10.1	7	4	2	24	10.5	38.6	
TFU04SC	M20 × 1	27	32	12.3	9	4	2	28	12.5	59.4	
TFU05SC	M25 × 1.5	33	38	14.2	10	5	2	34	15.3	80.8	
TFU06SC	M30 × 1.5	40	45	16.5	12	5	2	41	15.3	97.0	
TFU07SC	M35 × 1.5	47	52	16.5	14.3	±0.5	10	5	±0.2	17.3	137.8
TFU08SC	M40 × 1.5	52	58	17.6	13	6	2.5	53	18.3	171.4	
TFU09SC	M45 × 1.5	59	65	19.7	15	6	2.5	60	20.3	224.5	
TFU10SC	M50 × 1.5	64	70	20.8	16	6	2.5	65	21.3	266.8	

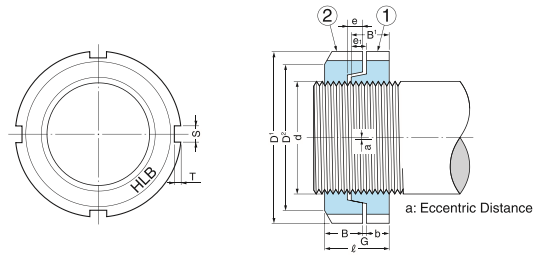
Convenient HLB Locking Nuts for Bearings



Structure and Function

Locking performance of HLB nuts is based on the principle of a wedge. After a lower nut is tightened, the upper nut is tightened by hand. In this case, there is the clearance(G) between the lower nut and the upper nut.

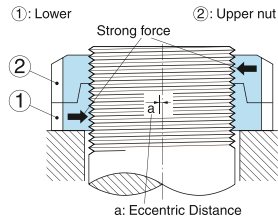
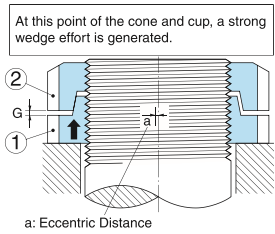
The clearance(G) generates strong force and this force works to prevent the nuts from loosening, when the upper nut is tightened up to 0 clearance. Because the cone of the lower nut and the cup of the upper nut are eccentric.



Material: SS400, S45C or SUS304  
Outside shapes are standardized in JIS B 1554 and thread accuracy depends on ISO6H(JIS CLASS2).

Unit: mm

Nut No.	d × p	Nut ①				Nut ②				Common to ① and ②		Set Height L		Perpendicularity of the base (max)	Weight of 1 set (g)
		D <sup>1</sup>	B <sup>1</sup>	e <sub>1</sub>	b	D <sup>2</sup>	D <sup>2</sup>	B	e	S	T	(min)	(max)		
HLB-01	M12 × 1	22	6	2.5	3.5	22	17	6	2.7	3	2	9.5	10.5	0.05	17
HLB-02	M15 × 1	25	7	2.5	4.5	25	21	7	2.7	4	2	11.5	12.5	0.05	23
HLB-03	M17 × 1	28	7	2.5	4.5	28	24	7	2.7	4	2	11.5	12.5	0.05	29
HLB-04	M20 × 1	32	8	2.5	5.5	32	26	8	2.7	4	2	13.5	14.5	0.05	43
HLB-05	M25 × 1.5	38	10	4	6	38	32	10	4.2	5	2	16	17.5	0.05	72
HLB-06	M30 × 1.5	45	10	4	6	45	38	10	4.2	5	2	16	17.5	0.05	103
HLB-07	M35 × 1.5	52	11	4	7	52	44	11	4.2	5	2	18	19.5	0.05	150
HLB-08	M40 × 1.5	58	9	4	5	58	50	12	4.2	6	2.5	17	18.5	0.05	170
HLB-09	M45 × 1.5	65	10	4	6	65	56	13	4.2	6	2.5	19	20.5	0.05	240
HLB-10	M50 × 1.5	70	11	4	7	70	61	14	4.2	6	2.5	21	22.5	0.05	285
HLB-11	M55 × 2	75	11	5	6	75	67	15	5.2	7	3	21	23	0.07	310
HLB-12	M60 × 2	80	11	5	6	80	73	15	5.2	7	3	21	23	0.07	340
HLB-13	M65 × 2	85	12	5	7	85	79	12	5.2	7	3	19	21	0.07	330
HLB-14	M70 × 2	92	12	5	7	92	85	12	5.2	8	3.5	19	21	0.07	390
HLB-15	M75 × 2	98	13	5	8	98	90	13	5.2	8	3.5	21	23	0.07	480
HLB-16	M80 × 2	105	15	5	10	105	95	15	5.2	8	3.5	25	27	0.07	660
HLB-17	M85 × 2	110	16	5	11	110	102	16	5.2	8	3.5	27	29	0.07	760
HLB-18	M90 × 2	120	16	5	11	120	108	16	5.2	10	4	27	29	0.07	940
HLB-19	M95 × 2	125	17	5	12	125	113	17	5.2	10	4	29	31	0.07	1000
HLB-20	M100 × 2	130	18	5	13	130	120	18	5.2	10	4	31	33	0.07	1230
HLB-21	M105 × 2	140	18	6	12	140	126	18	6.5	12	5	30	32	0.1	1500
HLB-22	M110 × 2	145	19	6	13	145	133	19	6.5	12	5	32	34	0.1	1600
HLB-23	M115 × 2	150	19	6	13	150	137	19	6.5	12	5	32	34	0.1	1700
HLB-24	M120 × 2	155	20	7	13	155	138	20	7.5	12	5	33	35	0.1	1800
HLB-25	M125 × 2	160	21	7	14	160	148	21	7.5	12	5	35	37	0.1	1900
HLB-26	M130 × 2	165	21	7	14	165	149	21	7.5	12	5	35	37	0.1	2100
HLB-27	M135 × 2	175	22	7	15	175	160	22	7.5	14	6	37	39	0.1	2600
HLB-28	M140 × 2	180	22	7	15	180	160	22	7.5	14	6	37	39	0.1	2700
HLB-29	M145 × 2	190	24	8	16	190	171	24	8.5	14	6	40	43	0.1	3400
HLB-30	M150 × 2	195	24	8	16	195	171	24	8.5	14	6	40	43	0.1	3550
HLB-31	M155 × 3	200	25	8	17	200	182	25	8.5	16	7	42	45	0.1	3800
HLB-32	M160 × 3	210	25	8	17	210	182	25	8.5	16	7	42	45	0.1	4200
HLB-33	M165 × 3	210	26	9	17	210	193	26	9.5	16	7	43	46	0.1	4300
HLB-34	M170 × 3	220	26	9	17	220	193	26	9.5	16	7	43	46	0.1	4750
HLB-36	M180 × 3	230	27	9	18	230	203	27	9.5	18	8	45	48	0.1	5000
HLB-38	M190 × 3	240	28	9	18	240	214	28	9.5	18	8	46	49	0.1	5500
HLB-40	M200 × 3	250	29	9	19	250	226	29	9.5	18	8	48	51	0.1	6300





## Hydraulic Nuts for Bearings

When larger bearings are mounted and dismantled, the work is considerably eased by using hydraulic nuts. See Fig.2 and Fig.3 in

case of mounting and Fig.4 and Fig.5 in case of dismantling.



### 1. Structure

with two hydraulic connection bores on OD and on end face

Hydraulic nuts consist of two basic components: an internally threaded steel cylinder (1) with a circular groove in one face, and an annular piston (2) which is inserted into the cylinder.

Two O-rings (3) between cylinder and piston serve as seals.

When oil is pumped into the pressure chamber (6), the force with which the piston is ejected is sufficient to mount or dismount bearings.

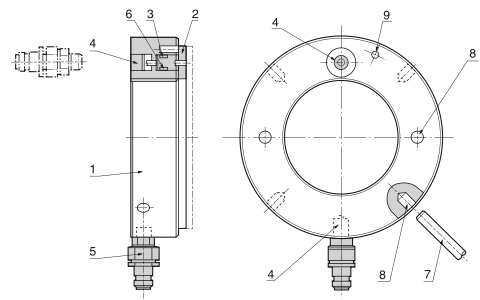
The hydraulic medium is oil and can be fed through two hydraulic connection bores G1/4(4) by a pressure source (e.g. a hand pump). The

connection bores are located on the end face and also on the OD. All hydraulic nuts are equipped with a nipple (5) for quick coupling to the oil supply; the threaded hole not being used is plugged by a closure nipple with ball, which is supplied with hydraulic nuts.

Unthreaded holes (8) are provided to take a drift of suitable length so that the screwing on of the nut is facilitated. Two of these holes are in the side faces and four around the circumference.

The nut should be carefully turned until it abuts the bearing and the piston is fully retracted into the cylinder.

And another unthreaded hole (9) is provided to take an indicator to measure the stroke of the piston.



1: Cylinder 2: Piston 3: O-ring 4: Connecting bore G1/4 5: Nipple G1/4  
6: Pressure chamber 7: Bar for rotating cylinder 8: Hole for bar  
9: Hole for indicator to measure the stroke

Fig.1. Structure

### 2. Threads

Hydraulic nuts up to and including size 40 have metric ISO threads to tolerance 6H(ISO 965/III-1980) and the larger nuts from size 41 have metric ISO trapezoidal threads to tolerance 7H(ISO 2901-1977).

The mating thread on the shaft should be made to tolerance 6g(ISO 2901-1977) for the sizes and tolerance 7e(ISO 2901-1977) for the sizes with trapezoidal thread.

### 3. Material

The cylinders of nuts up to and including size 58 are made of hardened steel and the matching pistons are made of carbon chromium (bearing) steel. From size 60 the cylinders and pistons are made of construction steel.

### 4. Maintenance

If hydraulic nuts are not to be used for some time, they should be protected against corrosion. The holes for the oil supply leads should also be plugged.

If oil leaves the hydraulic nut when the piston is operated, this generally means that the seal is torn or damaged and must be replaced. To do this, the piston should be pressed out of the ring. To facilitate this operation, three auxiliary holes with closure nipples are provided in the full face of the cylinder. Using pins, which are supplied with the nut, the piston can be pushed out of the cylinder.

**5. How to use**

**5.1 Mounting**

(1) When mounting rolling bearings with a tapered bore on a tapered seating, adapter sleeve or withdrawal sleeve, the hydraulic nut is screwed on to a threaded section of the shaft or on to the sleeve thread until it abuts the bearing inner ring (Fig.2), or a special nut (Fig.3), or an end plate attached to the shaft end.

(2) The piston is in the initial position, i.e. it is fully retracted.

(3) A pump is used to inject pressurised oil into the nut. This displaces the piston axially and the bearing is pressed up on to the tapered seating. The permissible stroke (axial displacement) has been chosen to enable all bearings having bores with a taper of 1:12 or 1:30 to be mounted in a single operation.

(4) After mounting has been completed, the return valve of the pump should be opened, so that the pressurised oil can leave the nut. To completely empty the oil, the piston must be returned to its original position. This is most easily accomplished by screwing the nut further up the shaft or sleeve thread.

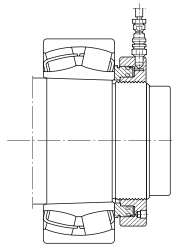


Fig.2. The threaded section of a shaft

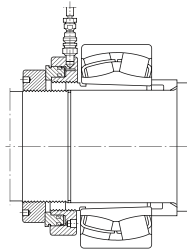


Fig.3. Sleeve thread

**5.2 Dismounting**

(1) When dismantling rolling bearings from withdrawal or adapter sleeves, the hydraulic nut is screwed on to the sleeve thread until it rests against the bearing inner ring (Fig.4), or a special nut, or against a special support ring (Fig.5).

(2) By displacing the piston, the sleeve will be withdrawn from the bearing bore, or the bearing will be pressed off the adapter sleeve.

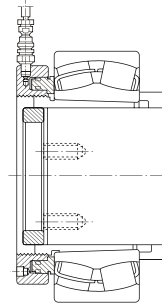


Fig.4. Sleeve thread

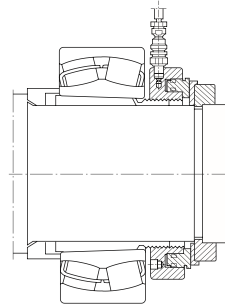


Fig.5. Sleeve thread and special supporting ring

**6. Pumps**

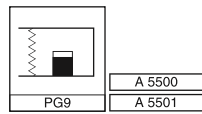
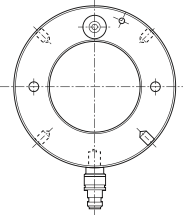
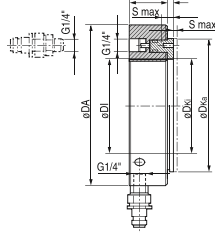
The pumps required to operate the hydraulic nuts should be suitable for pressures of 60 to 80 Mpa.

**7. Pressure media**

Normal machine oils having a viscosity of 300 mm<sup>2</sup>/s at the operating temperature are suitable pressure media. For mounting in the cold, less viscous oils should be used, e.g. oils for transformers.



**Convenient HLB Locking Nuts for Bearings**  
Hydraulic Nuts A 5500 and A 5501 with metric thread

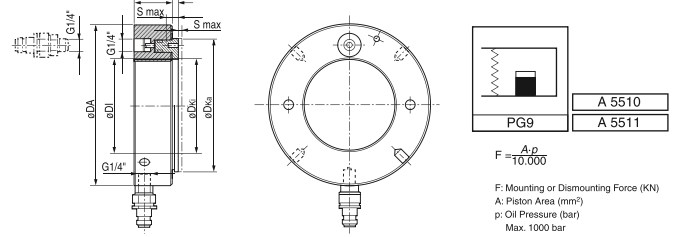


$F = \frac{A \cdot p}{10.000}$   
F: Mounting or Dismounting Force (KN)  
A: Piston Area (mm<sup>2</sup>)  
p: Oil Pressure (bar)  
Max. 1000 bar

Thread D <sub>1</sub> (mm)	Article No.		Plain Bore D <sub>1</sub> (mm)	Article No. Bore	OD DA (mm)	Height S (mm)	Projecting Length C (mm)	Stroke Smax (mm)	Ring Piston (mm)		Piston Area A <sub>p</sub> (mm <sup>2</sup> )	Weight (Steel) Ca (kg)
	Right Hand	Left Hand							dD <sub>o</sub>	dD <sub>o</sub> c		
M 50 × 1.5	A 5500.1001	A 5500.1002	46.7	A 5500.1005	114	38	4	5	50.5	85	2.900	2.70
M 55 × 2	A 5500.1101	A 5500.1102	51.1	A 5500.1105	120	38	4	5	55.5	90	3.150	2.75
M 60 × 2	A 5500.1201	A 5500.1202	56.1	A 5500.1205	125	38	5	5	60.5	95	3.300	2.80
M 65 × 2	A 5500.1301	A 5500.1302	61.1	A 5500.1305	130	38	5	5	65.5	101	3.600	3.00
M 70 × 2	A 5500.1401	A 5500.1402	66.1	A 5500.1405	135	38	5	5	70.5	107	3.800	3.20
M 75 × 2	A 5500.1501	A 5500.1502	71.1	A 5500.1505	140	38	5	5	75.5	112	4.000	3.40
M 80 × 2	A 5500.1601	A 5500.1602	76.1	A 5500.1605	146	38	5	5	80.5	117	4.200	3.70
M 85 × 2	A 5500.1701	A 5500.1702	81.1	A 5500.1705	150	38	5	5	85.5	122	4.400	3.75
M 90 × 2	A 5500.1801	A 5500.1802	86.1	A 5500.1805	156	38	5	5	90.5	127	4.700	4.00
M 95 × 2	A 5500.1901	A 5500.1902	91.1	A 5500.1905	162	38	5	5	95.5	133	4.900	4.30
M 100 × 2	A 5500.2001	A 5500.2002	96.1	A 5500.2005	166	38	6	5	100.5	138	5.100	4.40
M 105 × 2	A 5500.2101	A 5500.2102	101.1	A 5500.2105	172	38	6	5	105.5	143	5.300	4.65
M 110 × 2	A 5500.2201	A 5500.2202	106.1	A 5500.2205	178	38	6	5	110.5	149	5.600	4.95
M 115 × 2	A 5500.2301	A 5500.2302	111.1	A 5500.2305	182	38	6	5	115.5	154	5.800	5.00
M 120 × 2	A 5500.2401	A 5500.2402	116.1	A 5500.2405	188	38	6	5	120.5	159	6.000	5.25
M 125 × 2	A 5500.2501	A 5500.2502	121.1	A 5500.2505	192	38	6	5	125.5	164	6.200	5.35
M 130 × 2	A 5500.2601	A 5500.2602	126.1	A 5500.2605	198	38	6	5	130.5	170	6.400	5.65
M 135 × 2	A 5500.2701	A 5500.2702	131.1	A 5500.2705	204	38	6	5	135.5	175	6.600	5.90
M 140 × 2	A 5500.2801	A 5500.2802	136.1	A 5500.2805	208	38	7	5	140.5	180	6.800	6.00
M 145 × 2	A 5500.2901	A 5500.2902	141.1	A 5500.2905	214	39	7	5	145.5	186	7.300	6.50
M 150 × 2	A 5500.3001	A 5500.3002	146.1	A 5500.3005	220	39	7	5	150.5	191	7.500	6.60
M 155 × 3	A 5500.3101	A 5500.3102	149.8	A 5500.3105	226	39	7	5	155.5	198	8.100	6.95
M 160 × 3	A 5500.3201	A 5500.3202	154.8	A 5500.3205	232	40	7	6	160.5	204	8.600	7.90
M 165 × 3	A 5500.3301	A 5500.3302	159.8	A 5500.3305	238	40	7	6	165.5	209	8.900	7.90
M 170 × 3	A 5500.3401	A 5500.3402	164.8	A 5500.3405	244	41	7	6	170.5	215	9.400	8.40
M 180 × 3	A 5500.3601	A 5500.3602	174.8	A 5500.3605	256	41	7	6	180.5	227	10.300	9.15
M 190 × 3	A 5500.3801	A 5500.3802	184.8	A 5500.3805	270	42	8	7	191	239	11.500	10.5
M 200 × 3	A 5500.4001	A 5500.4002	194.8	A 5500.4005	282	43	8	8	201	251	12.500	11.5
TR 205 × 4	A 5500.4101	A 5500.4102	200.2	A 5500.4105	288	43	8	8	207	256	12.800	12.0
TR 210 × 4	A 5500.4201	A 5500.4202	205.2	A 5500.4205	294	44	8	9	212	262	13.400	12.5
TR 215 × 4	A 5500.4301	A 5500.4302	210.2	A 5500.4305	300	44	8	9	217	267	13.700	13.0
TR 220 × 4	A 5500.4401	A 5500.4402	215.2	A 5500.4405	306	44	8	9	222	273	14.400	13.5
TR 225 × 4	A 5500.4501	A 5500.4502	220.2	A 5500.4505	312	45	8	9	227	280	15.200	14.5
TR 230 × 4	A 5500.4601	A 5500.4602	225.2	A 5500.4605	318	45	8	9	232	285	15.500	14.5
TR 235 × 4	A 5500.4701	A 5500.4702	230.2	A 5500.4705	326	46	8	10	237	291	16.200	16.0
TR 240 × 4	A 5500.4801	A 5500.4802	235.2	A 5500.4805	330	46	9	10	242	296	16.500	16.0

Thread D <sub>1</sub> (mm)	Article No.		Plain Bore D <sub>1</sub> (mm)	Article No. Bore	OD DA (mm)	Height S (mm)	Projecting Length C (mm)	Stroke Smax (mm)	Ring Piston (mm)		Piston Area A <sub>p</sub> (mm <sup>2</sup> )	Weight (Steel) Ca (kg)
	Right Hand	Left Hand							dD <sub>o</sub>	dD <sub>o</sub> c		
TR 250 × 4	A 5500.5001	A 5500.5002	245.2	A 5500.5005	342	46	9	10	252	307	17.600	17.5
TR 260 × 4	A 5500.5201	A 5500.5202	255.2	A 5500.5205	356	47	9	11	262	319	18.800	19.0
TR 270 × 4	A 5500.5401	A 5500.5402	265.2	A 5500.5405	368	48	9	12	272	330	19.800	20.5
TR 280 × 4	A 5500.5601	A 5500.5602	275.2	A 5500.5605	380	49	9	12	282	341	21.100	22.0
TR 290 × 4	A 5500.5801	A 5500.5802	285.2	A 5500.5805	390	49	9	13	292	353	22.400	22.5
TR 300 × 4	A 5500.6001	A 5500.6002	295.2	A 5500.6005	404	51	10	14	302	364	23.600	25.5
TR 310 × 5	A 5500.6201	A 5500.6202	304.7	A 5500.6205	416	52	10	14	312	375	24.900	27.0
TR 320 × 5	A 5500.6401	A 5500.6402	314.7	A 5500.6405	428	53	10	14	322	387	26.300	29.5
TR 330 × 5	A 5500.6601	A 5500.6602	324.7	A 5500.6605	438	53	10	14	332	397	27.000	30.0
TR 340 × 5	A 5500.6801	A 5500.6802	334.7	A 5500.6805	450	54	10	14	342	408	28.400	31.5
TR 345 × 5	A 5500.6901	A 5500.6902	339.7	A 5500.6905	456	54	10	14	347	414	29.400	32.5
TR 350 × 5	A 5500.7001	A 5500.7002	344.7	A 5500.7005	464	56	10	14	352	420	29.900	35.0
TR 360 × 5	A 5500.7201	A 5500.7202	354.7	A 5500.7205	472	56	10	15	362	431	31.300	35.5
TR 365 × 5	A 5500.7301	A 5500.7302	359.7	A 5500.7305	482	57	11	15	367	436	31.700	38.5
TR 370 × 5	A 5500.7401	A 5500.7402	364.7	A 5500.7405	486	57	11	16	372	442	32.800	39.0
TR 380 × 5	A 5500.7601	A 5500.7602	374.7	A 5500.7605	498	58	11	16	382	452	33.500	40.5
TR 385 × 5	A 5500.7701	A 5500.7702	379.7	A 5500.7705	504	58	11	16	387	459	34.700	41.0
TR 400 × 5	A 5500.8001	A 5500.8002	394.7	A 5500.8005	522	60	11	17	402	475	36.700	45.5
TR 410 × 5	A 5500.8201	A 5500.8202	404.7	A 5500.8205	534	61	11	17	412	486	38.300	48.0
TR 420 × 5	A 5500.8401	A 5500.8402	414.7	A 5500.8405	546	61	11	17	422	498	40.000	50.0
TR 430 × 5	A 5500.8601	A 5500.8602	424.7	A 5500.8605	556	62	11	17	432	508	40.800	52.0
TR 440 × 5	A 5500.8801	A 5500.8802	434.7	A 5500.8805	566	62	12	17	442	519	42.500	54.0
TR 450 × 5	A 5500.9001	A 5500.9002	444.7	A 5500.9005	580	64	12	17	452	530	44.100	57.5
TR 460 × 5	A 5500.9201	A 5500.9202	454.7	A 5500.9205	590	64	12	17	462	541	45.100	60
TR 470 × 5	A 5500.9401	A 5500.9402	464.7	A 5500.9405	602	65	12	18	472	552	46.900	62
TR 480 × 5	A 5500.9601	A 5500.9602	474.7	A 5500.9605	612	65	12	19	482	563	48.600	63
TR 490 × 5	A 5500.9801	A 5500.9802	484.7	A 5500.9805	624	66	12	19	492	573	49.500	66
TR 500 × 5	A 5501.0001	A 5501.0002	494.7	A 5501.0005	636	67	12	19	502	585	51.500	70
TR 510 × 6	A 5501.0201	A 5501.0202	503.7	A 5501.0205	648	68	12	20	512	595	53.300	74
TR 520 × 6	A 5501.0401	A 5501.0402	513.7	A 5501.0405	658	68	13	20	522	606	54.300	75
TR 530 × 6	A 5501.0601	A 5501.0602	523.7	A 5501.0605	670	69	13	21	532	617	56.200	79
TR 540 × 6	A 5501.0801	A 5501.0802	533.7	A 5501.0805	682	69	13	21	542	629	58.200	81
TR 550 × 6	A 5501.1001	A 5501.1002	543.7	A 5501.1005	693	70	13	21	552	639	59.200	84
TR 560 × 6	A 5501.1201	A 5501.1202	553.7	A 5501.1205	704	71	13	22	562	650	61.200	88
TR 570 × 6	A 5501.1401	A 5501.1402	563.7	A 5501.1405	716	72	13	23	572	661	63.200	91
TR 580 × 6	A 5501.1601	A 5501.1602	573.7	A 5501.1605	726	72	13	23	582	671	64.200	94

**Convenient HLB Locking Nuts for Bearings**  
**Hydraulic Nuts A 5500 and A 5501 with metric thread and Plain bore**



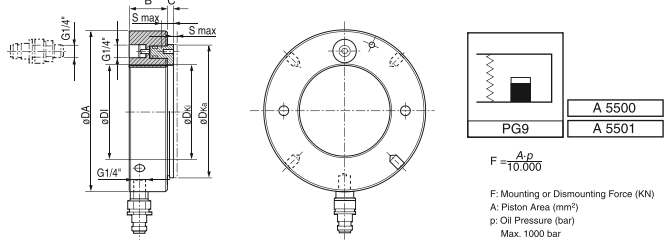
Thread D1 (mm)	Article No.		Plain Bore D (mm)	Article No. Bore	OD DA (mm)	Height S (mm)	Projecting Length C (mm)	Stroke Smax (mm)	Ring Piston (mm)		Piston Area A <sub>p</sub> (mm <sup>2</sup> )	Weight (Steel) C <sub>a</sub> (kg)
	Right Hand	Left Hand							φD <sub>a</sub>	φD <sub>k</sub>		
TR 600 × 6	A 5501.2001	A 5501.2002	593.7	A 5501.2005	748	73	13	23	602	693	67.300	100
TR 630 × 6	A 5501.2601	A 5501.2602	623.7	A 5501.2605	782	74	14	23	632	726	72.900	110
TR 650 × 6	A 5501.3001	A 5501.3002	643.7	A 5501.3005	804	75	14	23	652	747	76.200	115
TR 670 × 6	A 5501.3401	A 5501.3402	663.7	A 5501.3405	826	76	14	24	672	768	79.500	120
TR 690 × 6	A 5501.3801	A 5501.3802	683.7	A 5501.3805	848	77	14	25	692	791	84.200	127
TR 710 × 7	A 5501.4201	A 5501.4202	702.7	A 5501.4205	870	78	15	25	712	812	87.700	135
TR 750 × 7	A 5501.5001	A 5501.5002	742.7	A 5501.5005	912	79	15	25	752	855	95.200	146
TR 800 × 7	A 5501.6001	A 5501.6002	792.7	A 5501.6005	965	80	16	25	802	908	103.900	161
TR 850 × 7	A 5501.7001	A 5501.7002	842.7	A 5501.7005	1020	83	16	26	852	962	114.600	181
TR 900 × 7	A 5501.8001	A 5501.8002	892.7	A 5501.8005	1075	86	17	30	902	1015	124.100	205
TR 950 × 8	A 5501.9001	A 5501.9002	941.7	A 5501.9005	1126	86	17	30	952	1069	135.700	218
TR 1000 × 8	A 5502.0001	A 5502.0002	991.7	A 5502.0005	1180	88	17	34	1002	1122	145.800	239

Thread D1 (mm)	Article No.		Plain Bore D (mm)	Article No. Bore	OD DA (mm)	Height S (mm)	Projecting Length C (mm)	Stroke Smax (mm)	Ring Piston (mm)		Piston Area A <sub>p</sub> (mm <sup>2</sup> )	Weight (Steel) C <sub>a</sub> (kg)
	Right Hand	Left Hand							φD <sub>a</sub>	φD <sub>k</sub>		
M 50 × 1.5	A 5510.1001	A 5510.1002	46.7	A 5510.1005	114	38	4	5	50.5	104	2.900	2.70
M 55 × 2	A 5510.1101	A 5510.1102	51.1	A 5510.1105	120	38	4	5	55.5	109	3.150	2.75
M 60 × 2	A 5510.1201	A 5510.1202	56.1	A 5510.1205	125	38	5	5	60.5	115	3.300	2.80
M 65 × 2	A 5510.1301	A 5510.1302	61.1	A 5510.1305	130	38	5	5	65.5	121	3.600	3.00
M 70 × 2	A 5510.1401	A 5510.1402	66.1	A 5510.1405	135	38	5	5	70.5	127	3.800	3.20
M 75 × 2	A 5510.1501	A 5510.1502	71.1	A 5510.1505	140	38	5	5	75.5	132	4.000	3.40
M 80 × 2	A 5510.1601	A 5510.1602	76.1	A 5510.1605	146	38	5	5	80.5	137	4.200	3.70
M 85 × 2	A 5510.1701	A 5510.1702	81.1	A 5510.1705	150	38	5	5	85.5	142	4.400	3.75
M 90 × 2	A 5510.1801	A 5510.1802	86.1	A 5510.1805	156	38	5	5	90.5	147	4.700	4.00
M 95 × 2	A 5510.1901	A 5510.1902	91.1	A 5510.1905	162	38	5	5	95.5	153	4.900	4.30
M 100 × 2	A 5510.2001	A 5510.2002	96.1	A 5510.2005	166	38	6	5	100.5	158	5.100	4.40
M 105 × 2	A 5510.2101	A 5510.2102	101.1	A 5510.2105	172	38	6	5	105.5	163	5.300	4.65
M 110 × 2	A 5510.2201	A 5510.2202	106.1	A 5510.2205	178	38	6	5	110.5	169	5.600	4.95
M 115 × 2	A 5510.2301	A 5510.2302	111.1	A 5510.2305	182	38	6	5	115.5	174	5.800	5.00
M 120 × 2	A 5510.2401	A 5510.2402	116.1	A 5510.2405	188	38	6	5	120.5	179	6.000	5.25
M 125 × 2	A 5510.2501	A 5510.2502	121.1	A 5510.2505	192	38	6	5	125.5	184	6.200	5.35
M 130 × 2	A 5510.2601	A 5510.2602	126.1	A 5510.2605	198	38	6	5	130.5	190	6.400	5.65
M 135 × 2	A 5510.2701	A 5510.2702	131.1	A 5510.2705	204	38	6	5	135.5	195	6.600	5.90
M 140 × 2	A 5510.2801	A 5510.2802	136.1	A 5510.2805	208	38	7	5	140.5	200	6.800	6.00
M 145 × 2	A 5510.2901	A 5510.2902	141.1	A 5510.2905	214	39	7	5	145.5	206	7.300	6.50
M 150 × 2	A 5510.3001	A 5510.3002	146.1	A 5510.3005	220	39	7	5	150.5	211	7.500	6.60
M 155 × 3	A 5510.3101	A 5510.3102	149.8	A 5510.3105	226	39	7	5	155.5	218	8.100	6.95
M 160 × 3	A 5510.3201	A 5510.3202	154.8	A 5510.3205	232	40	7	6	160.5	224	8.600	7.60
M 165 × 3	A 5510.3301	A 5510.3302	159.8	A 5510.3305	238	40	7	6	165.5	229	8.900	7.90
M 170 × 3	A 5510.3401	A 5510.3402	164.8	A 5510.3405	244	41	7	6	170.5	235	9.400	8.40
M 180 × 3	A 5510.3601	A 5510.3602	174.8	A 5510.3605	256	41	7	6	180.5	247	10.300	9.15
M 190 × 3	A 5510.3801	A 5510.3802	184.8	A 5510.3805	270	42	8	7	191	259	11.500	10.5
M 200 × 3	A 5510.4001	A 5510.4002	194.8	A 5510.4005	282	43	8	8	201	271	12.500	11.5
TR 205 × 4	A 5510.4101	A 5510.4102	200.2	A 5510.4105	288	43	8	8	207	276	12.800	12.0
TR 210 × 4	A 5510.4201	A 5510.4202	205.2	A 5510.4205	294	44	8	9	212	282	13.400	12.5
TR 215 × 4	A 5510.4301	A 5510.4302	210.2	A 5500.4305	300	44	8	9	217	287	13.700	13.0
TR 220 × 4	A 5510.4401	A 5510.4402	215.2	A 5510.4405	306	44	8	9	222	293	14.400	13.5
TR 225 × 4	A 5510.4501	A 5510.4502	220.2	A 5510.4505	312	45	8	9	227	300	15.200	14.5
TR 230 × 4	A 5510.4601	A 5510.4602	225.2	A 5510.4605	318	45	8	9	232	305	15.500	14.5
TR 235 × 4	A 5510.4701	A 5510.4702	230.2	A 5510.4705	326	46	8	10	237	311	16.200	16.0
TR 240 × 4	A 5510.4801	A 5510.4802	235.2	A 5510.4805	330	46	9	10	242	316	16.500	16.0

Thread D1 (mm)	Article No.		Plain Bore D1 (mm)	Article No. Bore	OD D2 (mm)	Height S (mm)	Projecting Length C (mm)	Stroke Smax. (mm)	Ring Piston (mm)		Piston Area A <sub>k</sub> (mm <sup>2</sup> )	Weight (Steel) G <sub>a</sub> (kg)
	Right Hand	Left Hand							φD <sub>1c</sub>	φD <sub>2c</sub>		
TR 250 × 4	A 5510.5001	A 5510.5002	245.2	A 5510.5005	342	46	9	10	252	329	17,600	17.5
TR 260 × 4	A 5510.5201	A 5510.5202	255.2	A 5510.5205	356	47	9	11	262	341	18,800	19.0
TR 270 × 4	A 5510.5401	A 5510.5402	265.2	A 5510.5405	368	48	9	12	272	352	19,800	20.5
TR 280 × 4	A 5510.5601	A 5510.5602	275.2	A 5510.5605	380	49	9	12	282	363	21,100	22.0
TR 290 × 4	A 5510.5801	A 5510.5802	285.2	A 5510.5805	390	49	9	13	292	375	22,400	22.5
TR 300 × 4	A 5510.6001	A 5510.6002	295.2	A 5510.6005	404	51	10	14	302	386	23,600	25.5
TR 310 × 5	A 5510.6201	A 5510.6202	304.7	A 5510.6205	416	52	10	14	312	397	24,900	27.0
TR 320 × 5	A 5510.6401	A 5510.6402	314.7	A 5510.6405	428	53	10	14	322	409	26,300	29.5
TR 330 × 5	A 5510.6601	A 5510.6602	324.7	A 5510.6605	438	53	10	14	332	419	27,000	30.0
TR 340 × 5	A 5510.6801	A 5510.6802	334.7	A 5510.6805	450	54	10	14	342	430	28,400	31.5
TR 345 × 5	A 5510.6901	A 5510.6902	339.7	A 5510.6905	456	54	10	14	347	436	29,400	32.5
TR 350 × 5	A 5510.7001	A 5510.7002	344.7	A 5510.7005	464	56	10	14	352	442	29,900	35.0
TR 360 × 5	A 5510.7201	A 5510.7202	354.7	A 5510.7205	472	56	10	15	362	455	31,300	35.5
TR 365 × 5	A 5510.7301	A 5510.7302	359.7	A 5510.7305	482	57	11	15	367	460	31,700	38.5
TR 370 × 5	A 5510.7401	A 5510.7402	364.7	A 5510.7405	486	57	11	16	372	466	32,800	39.0
TR 380 × 5	A 5510.7601	A 5510.7602	374.7	A 5510.7605	498	58	11	16	382	476	33,500	40.5
TR 385 × 5	A 5510.7701	A 5510.7702	379.7	A 5510.7705	504	58	11	16	387	483	34,700	41.0
TR 400 × 5	A 5510.8001	A 5510.8002	384.7	A 5510.8005	522	60	11	17	402	499	36,700	45.5
TR 410 × 5	A 5510.8201	A 5510.8202	404.7	A 5510.8205	534	61	11	17	412	510	38,300	48.0
TR 420 × 5	A 5510.8401	A 5510.8402	414.7	A 5510.8405	546	61	11	17	422	522	40,000	50.0
TR 430 × 5	A 5510.8601	A 5510.8602	424.7	A 5510.8605	556	62	11	17	432	532	40,800	52.5
TR 440 × 5	A 5510.8801	A 5510.8802	434.7	A 5510.8805	566	62	12	17	442	543	42,500	54.0
TR 450 × 5	A 5510.9001	A 5510.9002	444.7	A 5510.9005	580	64	12	17	452	554	44,100	57.5
TR 460 × 5	A 5510.9201	A 5510.9202	454.7	A 5510.9205	590	64	12	17	462	565	45,100	60
TR 470 × 5	A 5510.9401	A 5510.9402	464.7	A 5510.9405	602	65	12	18	472	576	46,900	62
TR 480 × 5	A 5500.9601	A 5500.9602	474.7	A 5500.9605	612	65	12	19	482	583	48,600	63
TR 490 × 5	A 5500.9801	A 5500.9802	484.7	A 5500.9805	624	66	12	19	492	573	49,500	66
TR 500 × 5	A 5501.0001	A 5501.0002	494.7	A 5501.0005	636	67	12	19	502	585	51,500	70
TR 510 × 6	A 5501.0201	A 5501.0202	503.7	A 5501.0205	648	68	12	20	512	595	53,300	74
TR 520 × 6	A 5501.0401	A 5501.0402	513.7	A 5501.0405	658	68	13	20	522	606	54,300	75
TR 530 × 6	A 5501.0601	A 5501.0602	523.7	A 5501.0605	670	69	13	21	532	617	56,200	79
TR 540 × 6	A 5501.0801	A 5501.0802	533.7	A 5501.0805	682	69	13	21	542	629	58,200	81
TR 550 × 6	A 5501.1001	A 5501.1002	543.7	A 5501.1005	693	70	13	21	552	639	59,200	84
TR 560 × 6	A 5501.1201	A 5501.1202	553.7	A 5501.1205	704	71	13	22	562	650	61,200	88
TR 570 × 6	A 5501.1401	A 5501.1402	563.7	A 5501.1405	716	72	13	23	572	661	63,200	91
TR 580 × 6	A 5501.1601	A 5501.1602	573.7	A 5501.1605	726	72	13	23	582	671	64,200	94

Thread D1 (mm)	Article No.		Plain Bore D1 (mm)	Article No. Bore	OD D2 (mm)	Height S (mm)	Projecting Length C (mm)	Stroke Smax. (mm)	Ring Piston (mm)		Piston Area A <sub>k</sub> (mm <sup>2</sup> )	Weight (Steel) G <sub>a</sub> (kg)
	Right Hand	Left Hand							φD <sub>1c</sub>	φD <sub>2c</sub>		
TR 600 × 6	A 5501.2001	A 5501.2002	593.7	A 5501.2005	748	73	13	23	602	693	67,300	100
TR 630 × 6	A 5501.2601	A 5501.2602	623.7	A 5501.2605	782	74	14	23	632	726	72,900	110
TR 650 × 6	A 5501.3001	A 5501.3002	643.7	A 5501.3005	804	75	14	23	652	747	76,200	115
TR 670 × 6	A 5501.3401	A 5501.3402	663.7	A 5501.3405	826	76	14	24	672	768	79,500	120
TR 690 × 6	A 5501.3801	A 5501.3802	683.7	A 5501.3805	848	77	14	25	692	791	84,200	127
TR 710 × 7	A 5501.4201	A 5501.4202	702.7	A 5501.4205	870	78	15	25	712	812	87,700	135
TR 750 × 7	A 5501.5001	A 5501.5002	742.7	A 5501.5005	912	79	15	25	752	855	95,200	146
TR 800 × 7	A 5501.6001	A 5501.6002	792.7	A 5501.6005	965	80	16	25	802	908	103,900	161
TR 850 × 7	A 5501.7001	A 5501.7002	842.7	A 5501.7005	1020	83	16	26	852	962	114,600	181
TR 900 × 7	A 5501.8001	A 5501.8002	892.7	A 5501.8005	1075	86	17	30	902	1015	124,100	205
TR 950 × 8	A 5501.9001	A 5501.9002	941.7	A 5501.9005	1126	86	17	30	952	1069	135,700	218
TR 1000 × 8	A 5502.0001	A 5502.0002	991.7	A 5502.0005	1180	88	17	34	1002	1122	145,800	239

**Convenient HLB Locking Nuts for Bearings**  
 Hydraulic Nuts A 5500 and A 5501 with imperial screw thread (UN or ACME thread form)



Thread DI (*)	Article No.		OD DA (mm)	Height B (mm)	Projecting Length C (mm)	Stroke Smax. (mm)	Ring Piston (mm)		Piston Area A <sub>p</sub> (mm <sup>2</sup> )	Weight (Steel) Ca. (kg)
	Right Hand	Left Hand					φD <sub>h</sub>	φD <sub>k</sub>		
UN 1.967-18TPI	A 5500.1003	A 5500.1004	114	38	4	5	50.5	85	2.900	2.70
UN 2.157-18TPI	A 5500.1103	A 5500.1104	120	38	4	5	55.5	90	3.150	2.75
UN 2.360-18TPI	A 5500.1203	A 5500.1204	125	38	5	5	60.5	95	3.300	2.80
UN 2.548-18TPI	A 5500.1303	A 5500.1304	130	38	5	5	65.5	101	3.600	3.00
UN 2.751-18TPI	A 5500.1403	A 5500.1404	135	38	5	5	70.5	107	3.800	3.25
UN 2.933-12TPI	A 5500.1503	A 5500.1504	140	38	5	5	75.5	112	4.000	3.40
UN 3.137-12TPI	A 5500.1603	A 5500.1604	146	38	5	5	80.5	117	4.200	3.75
UN 3.340-12TPI	A 5500.1703	A 5500.1704	150	38	5	5	85.5	122	4.400	3.80
UN 3.527-12TPI	A 5500.1803	A 5500.1804	156	38	5	5	90.5	127	4.700	4.00
UN 3.730-12TPI	A 5500.1903	A 5500.1904	162	38	5	5	95.5	133	4.900	4.30
UN 3.918-12TPI	A 5500.2003	A 5500.2004	166	38	6	5	100.5	138	5.100	4.40
UN 4.122-12TPI	A 5500.2103	A 5500.2104	172	38	6	5	105.5	143	5.300	4.70
UN 4.325-12TPI	A 5500.2203	A 5500.2204	178	38	6	5	110.5	149	5.600	4.95
UN 4.716-12TPI	A 5500.2403	A 5500.2404	188	38	6	5	120.5	159	6.000	5.25
UN 5.106-12TPI	A 5500.2603	A 5500.2604	198	38	6	5	130.5	170	6.400	5.65
UN 5.497-12TPI	A 5500.2803	A 5500.2804	208	38	7	5	140.5	180	6.800	6.00
UN 5.888-12TPI	A 5500.3003	A 5500.3004	220	39	7	5	150.5	191	7.500	6.60
UN 6.284-8TPI	A 5500.3203	A 5500.3204	232	40	7	6	160.5	204	8.600	7.60
UN 6.659-8TPI	A 5500.3403	A 5500.3404	244	41	7	6	170.5	215	9.400	8.40
UN 7.066-8TPI	A 5500.3603	A 5500.3604	256	41	7	6	180.5	227	10.300	9.15
UN 7.472-8TPI	A 5500.3803	A 5500.3804	270	42	8	7	191	239	11.500	10.5
UN 7.847-8TPI	A 5500.4003	A 5500.4004	282	43	8	8	201	251	12.500	11.5
UN 8.628-8TPI	A 5500.4403	A 5500.4404	306	44	8	9	222	273	14.400	13.5
UN 9.442-6TPI	A 5500.4803	A 5500.4804	330	46	9	10	242	296	16.500	16.0

Thread DI (*)	Article No.		OD DA (mm)	Height B (mm)	Projecting Length C (mm)	Stroke Smax. (mm)	Ring Piston (mm)		Piston Area A <sub>p</sub> (mm <sup>2</sup> )	Weight (Steel) Ca. (kg)
	Right Hand	Left Hand					φD <sub>h</sub>	φD <sub>k</sub>		
UN 10.192-6TPI	A 5500.5203	A 5500.5204	356	47	9	11	262	319	18.800	19.0
UN 11.004-6TPI	A 5500.5603	A 5500.5604	380	49	9	12	282	341	21.100	22.0
UN 11.785-6TPI	A 5500.6003	A 5500.6004	404	51	10	14	302	364	23.600	25.5
UN 12.562-6TPI	A 5500.6403	A 5500.6404	428	53	10	14	322	387	26.300	29.5
ACME 13.339-5TPI	A 5500.6803	A 5500.6804	450	54	10	14	342	408	28.400	31.5
ACME 14.170-5TPI	A 5500.7203	A 5500.7204	472	56	10	15	362	431	31.300	35.5
ACME 14.957-5TPI	A 5500.7603	A 5500.7604	498	58	11	16	382	452	33.500	40.5
ACME 15.745-5TPI	A 5500.8003	A 5500.8004	522	60	11	17	402	475	36.700	45.5
ACME 16.532-5TPI	A 5500.8403	A 5500.8404	546	61	11	17	422	498	40.000	50
ACME 17.319-5TPI	A 5500.8803	A 5500.8804	566	62	12	17	442	519	42.500	54
ACME 18.107-5TPI	A 5500.9203	A 5500.9204	590	64	12	17	462	541	45.100	60
ACME 18.894-5TPI	A 5500.9603	A 5500.9604	612	65	12	19	482	563	48.600	63
ACME 19.682-5TPI	A 5501.0003	A 5501.0004	636	67	12	19	502	585	51.500	70
ACME 20.867-4TPI	A 5501.0603	A 5501.0604	670	69	13	21	532	617	56.200	79
ACME 22.048-4TPI	A 5501.1203	A 5501.1204	704	71	13	22	562	650	61.200	88
ACME 23.623-4TPI	A 5501.2003	A 5501.2004	748	73	13	23	602	693	67.300	100
ACME 24.804-4TPI	A 5501.2603	A 5501.2604	782	74	14	23	632	726	72.900	110
ACME 26.379-4TPI	A 5501.3403	A 5501.3404	826	76	14	24	672	768	79.500	120
ACME 27.961-3TPI	A 5501.4203	A 5501.4204	870	78	15	25	712	812	87.700	135
ACME 29.536-3TPI	A 5501.5003	A 5501.5004	912	79	15	25	752	855	95.200	145
ACME 31.504-3TPI	A 5501.6003	A 5501.6004	965	80	16	25	802	908	103.900	160
ACME 33.473-3TPI	A 5501.7003	A 5501.7004	1020	83	16	26	852	962	114.600	180
ACME 35.441-3TPI	A 5501.8003	A 5501.8004	1075	86	17	30	902	1015	124.100	205
ACME 37.410-3TPI	A 5501.9003	A 5501.9004	1126	86	17	30	952	1069	135.700	220

## ■ Bearing Heater Ecological and High Functional Bearing Heater

### ● Use

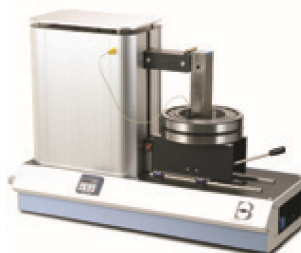
When hydraulic tools or oil injection method cannot be used, the only alternative is often to heat the bearings or bearing rings before mounting or dismounting.

If heaters are correctly used they are excellent aids both for the occasional mounting or dismounting operation as well as for the regular requirements of line operation.

### ● Caution

Heating should always be done with care and it should be remembered that bearings should not be strongly heated and certainly not to temperatures above 120°C.

Greased and sealed bearings should generally not be heated.



IHE0320, IHE0340  
IHE0620, IHE0640

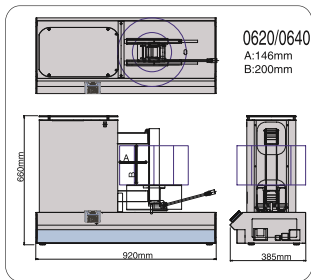
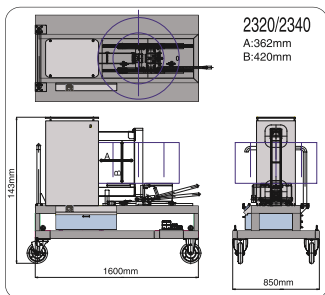
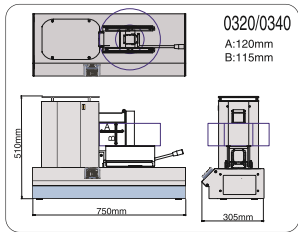
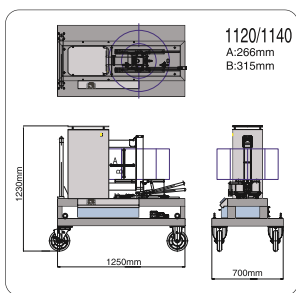
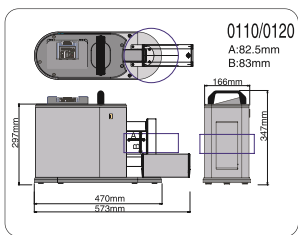


IHE0110  
IHE0120

Inverter Driven Bearing Heater Standard Specifications

Items	detail Items	1kVA100V	1kVA200V	3.3kVA	3.3kVA	6.6kVA	6.6kVA	11.8kVA	11.8kVA	23kVA	23kVA	
type		IHE0110	IHE0120	IHE0320	IHE0340	IHE0620	IHE0640	IHE1120	IHE1140	IHE2320	IHE2340	
<b>Heating Capacity</b>		1kVA	1kVA	3.3kVA	3.3kVA	6.6kVA	6.6kVA	11.8kVA	11.8kVA	23kVA	23kVA	
<b>Applicable Bearing Size</b>	Minimal bore diameter (mmφ)	20	20	35	35	35	35	50	50	50	50	
	Maximum outside diameter (mmφ)	200	200	300	300	350	350	600	600	800	800	
	Thickness (mm)	70	70	110	110	200	200	300	300	400	400	
	Weight (kg)	12	12	40	40	80	80	300	300	600	600	
<b>Heating Bearing type</b>	Can heat pre-greased bearing	Yes										
	Can heat sealed bearing	Yes										
<b>Power Supply Characteristics</b>	Phase	Single	Single	Three	Three	Three	Three	Three	Three	Three	Three	
	Voltage (V)	100-120V	200-240V	200-240V	380-480V	200-240V	380-480V	200-240V	380-480V	200-240V	380-480V	
	Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	
	Input Current (A) (maximum)	16.1A	9.7A	12.8A	7.5A	30.0A	16.1A	56.9A	29A	97A	49.6A	
<b>Dimensions of body</b>	H (mm)	347	347	510	510	660	660	1230	1230	1435	1435	
	D (mm)	175	175	305	305	385	385	700	700	850	850	
	W (mm)	573	573	750	750	920	920	1250	1250	1600	1600	
	Total weight (kg)	14	14	42	42	72	72	172	172	278	278	
<b>Control Specifications</b>	Temperature Control Mode	Range	0 ~ 250°C									
		temp. sensor type	K-type									
		Accuracy	1°C									
	Time Control Mode	Range	0-60min									
Accuracy		1s										
Power Reduction	By 10%	50-100%										
Demagnetization	Accuracy	300μT(3G)										
<b>Operation Spec.</b>	Operation	Operator with LEDs										
	Sequence Operation	Yes										
<b>Temp. Display</b>	Temp. Display	Celsius/Fahrenheit										
<b>Environment specifications</b>	Application site	Application site	Indoor (no corrosive gas,dust,etc)									
		Overvoltage Category	2	2	3	3	3	3	3	3	3	3
	Ambient Operating Temp.	Pollution Degree	2	2	2	2	2	2	2	2	2	2
		Altitude	-10°C ~ 35°C									
Ambient Operating Humidity.	2000m max											
		92% RH max										
<b>I-type core</b>	N-CI-1815	(bore diameter 20 ~ 35)	●	●								
	N-CI-1825	(bore diameter 35 ~ 50)	●	●								
	N-CI-1835	(bore diameter 50above)	●	●								
	N-CI-2525	(bore diameter 35 ~ 50)			●		●					
	N-CI-2535	(bore diameter 50 ~ 70)			●		●					
	N-CI-2545	(bore diameter 70above)			●		●					
	N-CI-3725	(bore diameter 35 ~ 50)					●	●				
	N-CI-3735	(bore diameter 50 ~ 80)					●	●				
	N-CI-3755	(bore diameter 80above)					●	●				
	N-CI-5235	(bore diameter 50 ~ 80)							●	●		
	N-CI-5255	(bore diameter 80 ~ 100)							●	●		
	N-CI-5270	(bore diameter 100above)							●	●		
N-CI-6735	(bore diameter 50 ~ 80)									●		
N-CI-6755	(bore diameter 80 ~ 130)									●		
N-CI-6785	(bore diameter 130above)									●		
<b>temperature sensor</b>	N-CTC-300	length 300mm	●	●								
	N-CTC-500	length 500mm			●	●	●					
	N-CTC-1000	length 1000mm						●	●	●	●	





**Three Features**

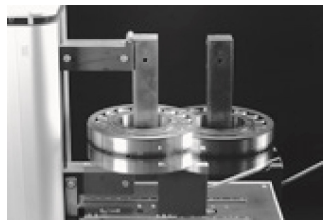
Versatile and Wide Range Use	Induction Bearing Heater is designed mainly for heating up bearings. However, it can heat up bushings, gears, pulleys, couplings and other ring shaped objects.
Built-in Demagnetization Function	Induction Bearing Heater is all digitally controlled and demagnetizes bearings automatically after heating. Also, it can demagnetize bearings manually.
Temperature Control and Timer Control	Induction Bearing Heater has two control modes: Temperature Control Mode and Timer Control Mode. In Temperature Control Mode, Temperature can be set up to 250C as standard. Depending on region where it is used, temperature indication of Celsius can be changed to Fahrenheit and vice versa with Control Panel operation. Temperature retention function keeps bearing at the set temperature infinitely after it is reached until Stop is pressed. In Timer Control Mode, time can be set up to 60 minutes.

**Three Advantages**

Even Heating without Damage to Bearing	Use of direct flame or blow torch to heat up bearings is hazardous, risky, and causes uneven thermal expansion and/or material alteration. Induction Bearing Heater adopts electromagnetic induction principle to heat bearing(s) evenly to be thermally expanded without any damage to bearing(s). This feature eliminates unnecessary trouble to improve work efficiency.
Quick and Efficient Heating without Fire	Induction Bearing Heater has exciting coils embedded into a core as primary winding as in a transformer. AC current flowing in the coils induces a secondary current around the inner ring of bearing to generate heat necessary for its expansion due to bearing's own electrical resistance. This leads to little waste of energy (low energy loss) and quick heating of bearing (work) only. The induction Heating Method of non-use of fire accomplishes High Safety, Reliability and Work Efficiency for drastic shortening of the time necessary for Shrink Fit Process.
Clean Heating without Impurities Intruded	The shrink fit process using an oil bath requires extra time and cost for cleaning after fitting bearing(work) even though new oil is used. Induction Bearing Heater, without the use of oil, enables heating cleanly even a grease sealed bearing that will retain original pre-lubrication inside bearing. This leads to improvement of working environment because no oil storage management is required.

### Slide type Bearing Installation Table

Once bearing and I-type core are installed in Slide Type Bearing Installation Table, all you have to do is to move the table to the heating position along the guide by pushing the lever. This device enables easy mounting and dismounting of even a hot and/or heavy bearing.



### Fault Tolerance

In the case of heating unwittingly without installing the temperature sensor on the work (bearing) and in any other abnormal incident that should happen, Bearing Heater detects the fault(s) to stop heating automatically. In this manner, for Safe Operation of Bearing Heater, all possible measures conceivable are taken.

### Operation Information Availability

Operation Panel is common to all types of ETOH's induction Bearing Heater and easy-to-use, user friendly, and can be operated instinctively at sight of the push-button symbols representing the individual elemental commands of Bearing Heater, as the result of our searching user's convenience. The external control signal inputs and outputs are equipped as standard and they allow Bearing Heater to be embedded into your FA system.

### Small and Sensitive Temperature Sensor

Small and sensitive temperature sensor continuously monitors the bearing temperature to ensure precise detection of bearing (work) temperature even at high temperature rising rate as well as when the sensor is set in a confined small area.

### Broad Range of Work Size

ETOH's induction Bearing Heater accommodates broad range of work (bearing) size by selecting I-type core suitable for the work inner ring diameter.

### Optimal Heating with Accordance with Bearing (work) Applied

ETOH's induction Bearing Heater senses the electrical properties of the work (bearing) and the I-type core to heat the work (bearing) in the optimal condition. ETOH's induction Bearing Heater is featured to have convenient Power Reduction Function of setting the reduction rate 50%-100% by 10% for a delicate work (bearing) necessary to be heated amply and slowly.

### Compatibility with a Wide Range of Various Voltage of Power Supply

ETOH's Induction Bearing Heater is compatible with a wide range of various voltages and various frequencies of power supplies around the globe. Stationary types of Bearing Heater are connected to 3-phase AC power Supply while portable types are connected to single phase AC power supply.