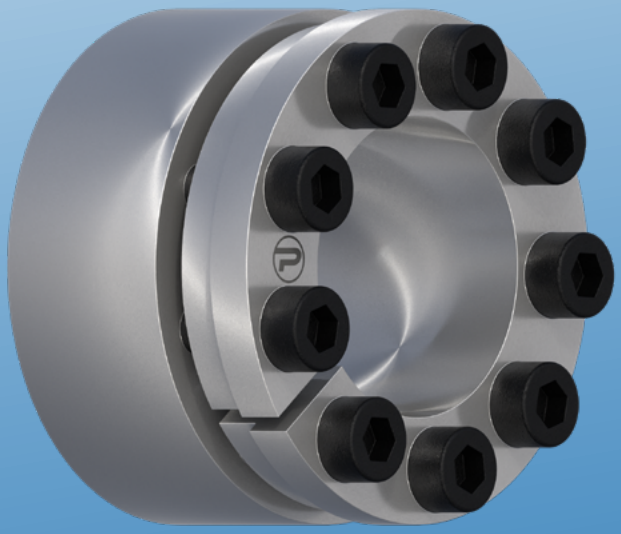
JENS S.



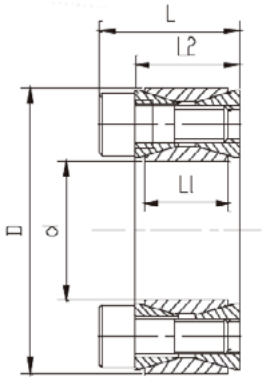
Locking devices

Easy installed and reliable keyless locking devices. Maintaining precise alignment enhances efficiency, reduces maintenance needs, and improves safety.

Type 01

Product information

Not self-centering
Medium torque
Recommended tolerance:
Shaft: h8
Hub: H8



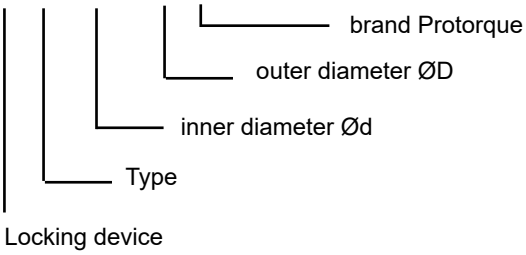
ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L (mm)	Transmitted axial force FT (kN)	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
19	47	17	20	26	31	298	286	116	8	M6x18	14.9
20	47	17	20	26	31	313	272	116	8	M6x18	14.9
22	47	17	20	26	31	345	247	116	8	M6x18	14.9
24	50	17	20	26	35	424	255	123	9	M6x18	14.9
25	50	17	20	26	35	441	245	123	9	M6x18	14.9
28	55	17	20	26	39	549	243	124	10	M6x18	14.9
30	55	17	20	26	39	588	227	124	10	M6x18	14.9
32	60	17	20	26	47	752	255	136	12	M6x18	14.9
35	60	17	20	26	47	822	233	136	12	M6x18	14.9
38	65	17	20	26	55	1042	250	146	14	M6x18	14.9
40	65	17	20	26	55	1097	238	146	14	M6x18	14.9
42	75	20	24	32	83	1740	291	163	12	M8x22	35
45	75	20	24	32	83	1864	271	163	12	M8x22	35
48	80	20	24	32	83	1988	254	153	12	M8x22	35
50	80	20	24	32	83	2071	244	153	12	M8x22	35
55	85	20	24	32	97	2658	259	168	14	M8x22	35
60	90	20	24	32	97	2900	238	158	14	M8x22	35
65	95	20	24	32	110	3587	250	171	16	M8x22	35
70	110	24	28	38	153	5345	268	171	14	M10x25	69
75	115	24	28	38	153	5727	250	163	14	M10x25	69
80	120	24	28	38	153	6108	235	156	14	M10x25	69
85	125	24	28	38	175	7417	252	172	16	M10x25	69
90	130	24	28	38	175	7854	238	165	16	M10x25	69
95	135	24	28	38	196	9326	254	179	18	M10x25	69
100	145	26	33	45	227	11362	258	178	14	M12x30	123.3
110	155	26	33	45	227	12498	234	166	14	M12x30	123.3
120	165	26	33	45	260	15578	245	178	16	M12x30	123.3
130	180	34	38	50	325	21095	217	156	20	M12x35	123.3
140	190	34	38	50	357	24993	221	163	22	M12x35	123.3
150	200	34	38	50	390	29217	225	169	24	M12x35	123.3
160	210	34	38	50	422	33756	229	174	26	M12x35	123.3
170	225	38	44	58	465	39483	212	160	22	M14x40	187
180	235	38	44	58	507	45606	218	167	24	M14x40	187
190	250	46	52	66	591	56163	199	152	28	M14x45	187
200	260	46	52	66	633	63342	203	156	30	M14x45	187
220	285	50	56	72	745	81960	200	154	26	M16x50	290
240	305	50	56	72	860	103162	211	166	30	M16x50	290
260	325	50	56	72	974	126669	221	177	34	M16x50	290
280	355	60	66	84	1124	157339	197	156	32	M18x60	400
300	375	60	66	84	1264	189653	207	166	36	M18x60	400

Type 01

ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L (mm)	Transmitted axial force FT (kN)	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
320	405	72	78	98	1651	264108	211	167	36	M20x70	580
340	425	72	78	98	1651	280614	199	159	36	M20x70	580
360	455	84	90	112	2017	363061	197	156	36	M22x80	780
380	475	84	90	112	2017	383232	186	149	36	M22x80	780
400	495	84	90	112	2017	403402	177	143	36	M22x80	780
420	515	84	90	112	2241	470633	187	153	40	M22x80	780
440	545	96	102	126	2634	579506	184	148	40	M24x90	1000
460	565	96	102	126	2634	605848	176	143	40	M24x90	1000
480	585	96	102	126	2766	663811	177	145	42	M24x90	1000
500	605	96	102	126	2898	724383	178	147	44	M24x90	1000
520	630	96	102	126	2963	770487	175	144	45	M24x90	1000
540	650	96	102	126	2963	800121	169	140	45	M24x90	1000
560	670	96	102	126	3161	885064	173	145	48	M24x90	1000
580	690	96	102	126	3293	954884	174	147	50	M24x90	1000
600	710	96	102	126	3293	987811	169	142	50	M24x90	1000
620	730	96	102	126	3424	1061550	170	144	52	M24x90	1000
640	750	96	102	126	3556	1137957	171	146	54	M24x90	1000
660	770	96	102	126	3688	1216963	172	147	56	M24x90	1000
680	790	96	102	126	3688	1253841	167	143	56	M24x90	1000
700	810	96	102	126	3951	1382913	173	150	60	M24x90	1000
720	830	96	102	126	3951	1422425	169	146	60	M24x90	1000
740	850	96	102	126	4083	1510688	169	148	62	M24x90	1000
760	870	96	102	126	4215	1601545	170	149	64	M24x90	1000
780	890	96	102	126	4280	1669384	169	148	65	M24x90	1000
800	910	96	102	126	4346	1738541	167	147	66	M24x90	1000
820	930	96	102	126	4478	1835982	168	148	68	M24x90	1000
840	950	96	102	126	4610	1936101	169	149	70	M24x90	1000
860	970	96	102	126	4741	2038809	169	150	72	M24x90	1000
880	990	96	102	126	4873	2144197	170	151	74	M24x90	1000
900	1010	96	102	126	4939	2222575	169	150	75	M24x90	1000
920	1030	96	102	126	5005	2302221	167	149	76	M24x90	1000
940	1050	96	102	126	5137	2414196	168	150	78	M24x90	1000
960	1070	96	102	126	5268	2528755	169	151	80	M24x90	1000
980	1090	96	102	126	5334	2613719	167	150	81	M24x90	1000
1000	1110	96	102	126	5400	2700000	166	149	82	M24x90	1000

Item number description for Protorque locking devices

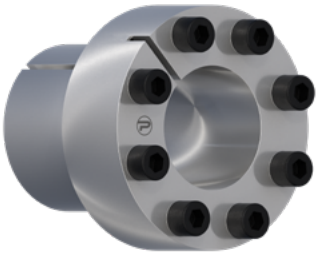
LD 01 100 X 145 P

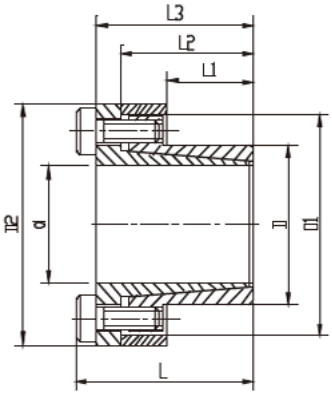


Type 02

Product information

Self centering
Medium-high torque
Recommended tolerance:
Shaft: 8
Hub: H8





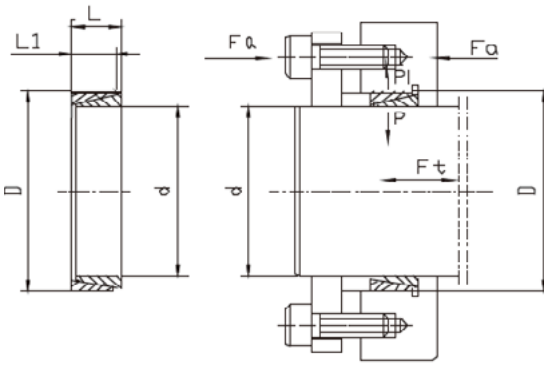
ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L (mm)	ø D2 (mm)	ø D1 (mm)	Transmitted axial force FT (kN)	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
8	15	12	21	24	28	28	25	10	39	299	159	4	M4x10	5.2
9	16	14	23	27	31	32	28	10	44	227	128	4	M4x12	5.2
10	16	14	23	27	31	32	28	10	49	205	128	4	M4x12	5.2
11	18	14	23	27	31	34	30	10	53	186	114	4	M4x12	5.2
12	18	14	23	27	31	34	30	10	58	171	114	4	M4x12	5.2
14	23	14	23	27	31	39	35	10	68	146	89	4	M4x12	5.2
15	24	16	29	36	42	45	40	16	120	196	123	3	M6x18	17
16	24	16	29	36	42	45	40	16	128	184	123	3	M6x18	17
18	26	18	31	38	44	47	42	21	191	194	134	4	M6x18	17
19	27	18	31	38	44	48	43	21	202	183	129	4	M6x18	17
20	28	18	31	38	44	49	44	21	213	174	124	4	M6x18	17
22	32	25	38	45	51	54	48	21	234	114	78	4	M6x18	17
24	34	25	38	45	51	56	50	21	255	105	74	4	M6x18	17
25	34	25	38	45	51	56	50	21	266	100	74	4	M6x18	17
28	39	25	38	45	51	61	55	27	373	112	81	5	M6x18	17
30	41	25	38	45	51	63	57	32	480	126	92	6	M6x18	17
32	43	30	43	50	56	65	59	32	511	98	73	6	M6x18	17
35	47	30	43	50	56	69	63	43	747	120	89	8	M6x18	17
38	50	30	43	50	56	72	66	43	811	110	84	8	M6x18	17
40	53	32	45	52	58	75	69	48	959	110	83	9	M6x18	17
42	55	32	45	52	58	77	71	48	1007	105	80	9	M6x18	17
45	59	40	56	64	72	85	79	79	1781	130	99	8	M8x22	42
48	62	40	56	64	72	88	82	79	1900	122	94	8	M8x22	42
50	65	50	66	74	82	92	85	99	2473	117	90	10	M8x22	42
55	71	50	66	74	82	98	91	99	2721	106	82	10	M8x22	42
60	77	50	66	74	82	104	97	99	2968	97	76	10	M8x22	42
65	84	50	66	74	82	111	104	99	3215	90	69	10	M8x22	42
70	90	60	80	91	101	122	115	127	4430	89	69	8	M10x25	84
75	95	60	80	91	101	126	119	142	5338	93	74	9	M10x25	84
80	100	65	85	96	106	131	124	190	7595	108	86	12	M10x25	84
85	106	65	85	96	106	137	130	190	8069	101	81	12	M10x25	84
90	112	65	85	96	106	143	136	222	9968	112	90	14	M10x25	84
95	120	65	85	96	106	153	144	222	10522	106	84	14	M10x25	84
100	125	65	89	102	114	162	153	273	13651	124	99	12	M12x30	145
110	140	70	94	107	119	177	168	273	15016	105	82	12	M12x30	145
120	155	90	114	127	139	195	185	364	21844	99	77	16	M12x30	145
130	165	90	114	127	139	205	195	364	23664	92	72	16	M12x30	145
140	175	90	114	127	139	215	205	364	25485	85	68	16	M12x30	145
150	185	90	114	127	139	225	215	364	27305	80	64	16	M12x30	145

Type 03

Product information

Not self-centering
Low torque
Recommended tolerance:
Basic dimensions: ≤38mm
Shaft: h6
Hub: H7

Basic dimensions: ≥40mm
Shaft: h8
Hub: H8



ød (mm)	øD (mm)	L1 (mm)	L (mm)	Loaded axial pressure Fa (kN)	Transmitted axial force FT (KN)	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²
8	11	3.7	4.5	5.0	1.06	4.2	100	70
9	12	3.7	4.5	13.3	1.29	5.8	100	79
10	13	3.7	4.5	14.4	1.53	7.6	100	86
12	15	3.7	4.5	14.5	1.65	9.9	100	80
13	16	3.7	4.5	14.6	1.76	11.5	100	81
14	18	5.3	6.3	23.8	2.70	18.9	100	77
15	19	5.3	6.3	24.3	2.94	22.1	100	79
16	20	5.3	6.3	24.5	3.18	25.4	100	81
17	21	5.3	6.3	24.9	3.29	28.0	100	80
18	22	5.3	6.3	25.3	3.53	31.8	100	82
19	24	5.3	6.3	29.7	3.76	35.8	100	80
20	25	5.3	6.3	30.1	3.88	38.8	100	79
22	26	5.3	6.3	28.9	4.35	47.9	100	86
24	28	5.3	6.3	30.0	4.70	56.4	100	86
25	30	5.3	6.3	32.4	4.94	61.7	100	84
28	32	5.3	6.3	32.6	5.53	77.4	100	88
30	35	5.3	6.3	35.5	5.88	88.2	100	86
32	36	5.3	6.3	36.7	6.23	100	100	88
35	40	6.0	7.0	45.7	7.76	136	100	88
36	42	6.0	7.0	48.2	8.00	144	100	86
38	44	6.0	7.0	49.7	8.47	161	100	87
40	45	6.6	8.0	58.8	9.8	195	100	89
42	48	6.6	8.0	62.6	10.2	215	100	87
45	52	8.6	10	92.2	14.3	323	100	87
48	55	8.6	10	94.6	15.3	367	100	88
50	57	8.6	10	96.5	15.9	397	100	88
55	62	8.6	10	101.8	17.4	479	100	88
56	64	10.4	12	128.4	21.5	603	100	88
60	68	10.4	12	133.4	23.0	691	100	88
63	71	10.4	12	137.3	24.2	763	100	89
65	73	10.4	12	140.4	25.0	814	100	89
70	79	12.2	14	176	31.6	1107	100	89
71	80	12.2	14	178	32	1136	100	89
75	84	12.2	14	189.6	33.8	1266	100	89
80	91	15.0	17	251	44.2	1769	100	88
90	101	15.0	17	272.4	49.9	2244	100	89
100	114	18.7	21	377.7	69	3452	100	88
110	124	18.7	21	415	76	4178	100	89
120	134	18.7	21	440.2	82.8	4967	100	89
130	148	25.3	28	654.2	121	7896	100	88

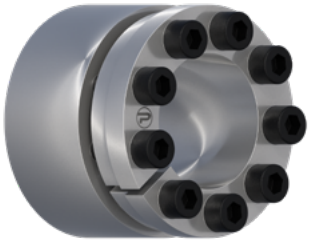
Type 03

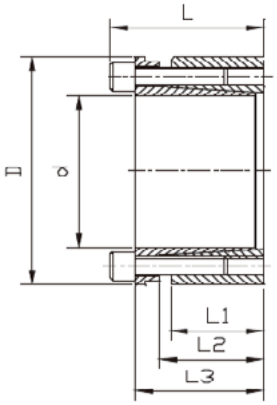
ød (mm)	øD (mm)	L1 (mm)	L (mm)	Loaded axial pressure Fa (kN)	Transmitted axial force FT (KN)	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²
140	158	25.3	28	689	131	9146	100	89
150	168	25.3	28	727.5	140	10505	100	89
160	178	25.3	28	764.5	149	11948	100	90
170	191	30	33	982.5	188	16014	100	89
180	201	30	33	1027.2	199	17950	100	90
190	211	30	33	1071	210	19987	100	90
200	224	34.8	38	1314	257	25696	100	89
210	234	34.8	38	1366	270	28326	100	90
220	244	34.8	38	1420	283	31098	100	90
230	257	39.5	43	1705	335	38570	100	89
240	267	39.5	43	1767	351	42068	100	90
250	280	44	48	2060	407	50906	100	90
260	290	44	48	2132	425	55205	100	90
270	300	44	48	2207	442	59678	100	91
280	313	49	53	2536	507	71072	100	90
290	323	49	53	2632	525	76103	100	90
300	333	49	53	2704	542	81338	100	90
320	360	59	65	3492	697	111504	100	89
340	380	59	65	3672	740	125870	100	89
360	400	59	65	3858	784	141106	100	90
380	420	59	65	4069	828	157235	100	90
400	440	59	65	4256	871	174213	100	91
420	460	59	65	4444	915	192085	100	91
440	480	59	65	4634	958	210805	100	92

Type 04

Product information

Self-centering
High torque
Recommended tolerance:
Shaft: h8
Hub: H8





ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L (mm)	Transmitted axial force FT (kN)	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
19	47	26	31	39	45	32	307	193	78	4	M6x25	17
20	47	26	31	39	45	32	323	183	78	4	M6x25	17
22	47	26	31	39	45	32	355	166	78	4	M6x25	17
24	50	26	31	39	45	48	582	229	110	6	M6x25	17
25	50	26	31	39	45	48	606	220	110	6	M6x25	17
28	55	26	31	39	45	48	679	196	100	6	M6x25	17
30	55	26	31	39	45	48	727	183	100	6	M6x25	17
32	60	26	31	39	45	65	1033	229	122	8	M6x25	17
35	60	26	31	39	45	65	1130	209	122	8	M6x25	17
38	65	26	31	39	45	65	1227	193	113	8	M6x25	17
40	65	26	31	39	45	65	1292	183	113	8	M6x25	17
42	75	30	36	47	55	87	1835	204	115	6	M8x30	41
45	75	30	36	47	55	87	1966	191	115	6	M8x30	41
48	80	30	36	47	55	87	2097	179	107	6	M8x30	41
50	80	30	36	47	55	87	2184	172	107	6	M8x30	41
55	85	30	36	47	55	116	3202	208	135	8	M8x30	41
60	90	30	36	47	55	116	3493	191	127	8	M8x30	41
65	95	30	36	47	55	116	3784	176	120	8	M8x30	41
70	110	40	46	57	67	189	6607	199	127	8	M10x35	83
75	115	40	46	62	72	189	7079	186	121	8	M10x35	83
80	120	40	46	62	72	189	7551	174	116	8	M10x35	83
85	125	40	46	62	72	236	10029	205	139	10	M10x35	83
90	130	40	46	62	72	236	10619	193	134	10	M10x35	83
95	135	40	46	62	72	236	11209	183	129	10	M10x35	83
100	145	46	52	77	89	275	13738	176	121	8	M12x45	145
110	155	46	52	77	89	275	15111	160	114	8	M12x45	145
120	165	46	52	77	89	343	20606	183	133	10	M12x45	145
130	180	46	52	77	89	412	26788	203	147	12	M12x45	145
140	190	51	59	84	98	373	26142	154	114	8	M14x45	230
150	200	51	59	84	98	467	35016	180	135	10	M14x45	230
160	210	51	59	84	98	467	37351	169	129	10	M14x45	230
170	225	51	59	84	98	560	47617	191	144	12	M14x45	230
180	235	51	59	84	98	560	50418	180	138	12	M14x45	230
190	250	51	59	84	98	700	66526	213	162	15	M14x45	230
200	260	51	59	84	98	700	70027	202	156	15	M14x45	230
220	285	64	72	100	116	757	83243	158	122	12	M16x60	355
240	305	64	72	100	116	946	113517	182	143	15	M16x60	355
260	325	64	72	100	116	1135	147560	201	161	18	M16x60	355
280	355	75	83	123	141	1226	171582	172	136	16	M18x80	485
300	375	75	83	123	141	1379	206809	181	145	18	M18x80	485
320	405	90	98	142	162	1766	282493	181	143	18	M20x100	690

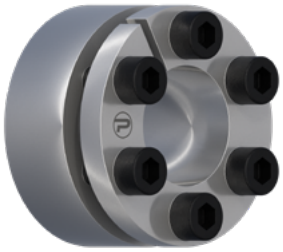
Type 04

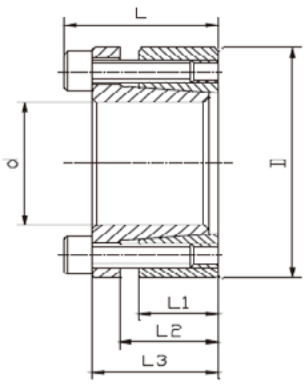
ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L (mm)	Transmitted axial force FT (kN)	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
340	425	90	98	142	162	2060	350180	199	159	21	M20x100	690
360	455	110	118	166	188	2164	389480	161	127	18	M22x110	930
380	475	110	118	166	188	2524	479638	178	142	21	M22x110	930
400	495	110	118	166	188	2524	504878	186	150	21	M22x110	930

Type 05

Product information

Self-centering
Medium-high torque
Recommended tolerance:
Shaft: h8
Hub: H8



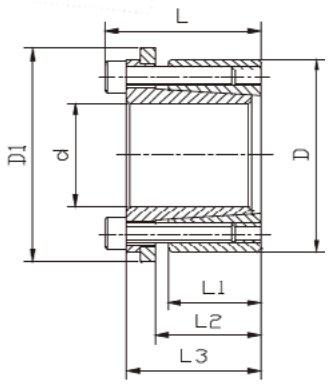


ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L (mm)	Transmitted axial forc FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
19	47	17	22	28	34	29	273	262	106	5	M6x20	13
20	47	17	22	28	34	29	287	249	106	5	M6x20	13
22	47	17	22	28	34	29	316	227	106	5	M6x20	13
24	50	17	22	28	34	34	413	249	120	6	M6x20	13
25	50	17	22	28	34	34	431	239	120	6	M6x20	13
28	55	17	22	28	34	34	482	213	109	6	M6x20	13
30	55	17	22	28	34	34	517	199	109	6	M6x20	13
32	60	17	22	28	34	46	734	249	133	8	M6x20	13
35	60	17	22	28	34	46	803	227	133	8	M6x20	13
38	65	17	22	28	34	46	872	210	122	8	M6x20	13
40	65	17	22	28	34	46	918	199	122	8	M6x20	13
42	75	20	25	33	41	74	1563	261	146	7	M8x25	32
45	75	20	25	33	41	74	1674	244	146	7	M8x25	32
50	80	20	25	33	41	74	1860	219	137	7	M8x25	32
55	85	20	25	33	41	85	2340	228	148	8	M8x25	32
60	90	20	25	33	41	85	2553	209	139	8	M8x25	32
65	95	20	25	33	41	96	3110	217	149	9	M8x25	32
70	110	24	30	40	50	138	4830	243	154	8	M10x30	36
75	115	24	30	40	50	138	5184	226	148	8	M10x30	65
80	120	24	30	40	50	138	5530	212	142	8	M10x30	65
85	125	24	30	40	50	156	6610	225	153	9	M10x30	65
90	130	24	30	40	50	156	6998	212	147	9	M10x30	65
95	135	24	30	40	50	173	8208	223	157	10	M10x30	65
100	145	26	32	44	56	195	9742	221	152	8	M12x35	110
110	155	26	32	44	56	195	10716	201	143	8	M12x35	110
120	165	26	32	44	56	219	13154	207	151	9	M12x35	110
130	180	34	40	52	64	292	18996	195	141	12	M12x35	110
140	190	34	40	54	68	291	20336	180	133	9	M14x40	170
150	200	34	40	54	68	323	24211	187	140	10	M14x40	170
160	210	34	40	54	68	355	28408	192	147	11	M14x40	170
170	225	44	50	64	78	387	32929	153	115	12	M14x40	170
180	235	44	50	64	78	387	34866	144	110	12	M14x40	170
190	250	44	50	64	78	484	45996	171	130	15	M14x40	170
200	260	44	50	64	78	484	48416	162	125	15	M14x40	170
220	285	50	56	75	91	548	60291	147	113	12	M16x50	275
240	305	50	56	75	91	685	82218	168	132	15	M16x50	275
260	325	50	56	75	91	731	95009	166	133	16	M16x50	275
280	355	60	66	87	105	910	127341	160	126	16	M18x50	385
300	375	60	66	87	105	1023	153479	168	134	18	M18x50	385
320	405	74	81	101	121	1388	222065	140	110	18	M20x50	580
340	425	74	81	101	121	1619	275271	153	123	21	M20x50	580
360	455	86	94	116	138	1697	305480	131	104	18	M22x60	780
380	475	86	94	116	138	1980	376193	145	116	21	M22x60	780
400	495	86	94	116	138	1980	395993	137	111	21	M22x60	780

Type 06

Product information

Self-centering
Medium torque
Recommended tolerance:
Shaft: h8
Hub: H8



ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L (mm)	ø D1 (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
19	47	26	31	39	45	53	21	202	127	51	4	M6x20	17
20	47	26	31	39	45	53	21	213	121	51	4	M6x20	17
22	47	26	31	39	45	53	21	234	110	51	4	M6x20	17
24	50	26	31	39	45	56	32	384	151	73	6	M6x20	17
25	50	26	31	39	45	56	32	400	145	73	6	M6x20	17
28	55	26	31	39	45	61	32	448	129	66	6	M6x20	17
30	55	26	31	39	45	61	32	480	121	66	6	M6x20	17
32	60	26	31	39	45	66	43	683	151	81	8	M6x20	17
35	60	26	31	39	45	66	43	747	138	81	8	M6x20	17
38	65	26	31	39	45	71	43	811	127	74	8	M6x20	17
40	65	26	31	39	45	71	43	853	121	74	8	M6x20	17
42	75	30	36	47	55	81	58	1216	135	76	6	M8x30	41
45	75	30	36	47	55	81	58	1302	126	76	6	M8x30	41
48	80	30	36	47	55	86	58	1389	119	71	6	M8x30	41
50	80	30	36	47	55	86	58	1447	114	71	6	M8x30	41
55	85	30	36	47	55	91	77	2124	138	89	8	M8x30	41
60	90	30	36	47	55	96	77	2317	127	84	8	M8x30	41
65	95	30	36	47	55	101	77	2510	117	80	8	M8x30	41
70	110	40	46	57	67	116	125	4381	132	84	8	M10x35	83
75	115	40	46	62	72	121	125	4694	123	80	8	M10x35	83
80	120	40	46	62	72	126	125	5007	115	77	8	M10x35	83
85	125	40	46	62	72	131	156	6651	136	92	10	M10x35	83
90	130	40	46	62	72	136	156	7042	128	89	10	M10x35	83
95	135	40	46	62	72	141	156	7433	121	85	10	M10x35	83
100	145	46	52	77	89	151	182	9104	117	81	8	M12x45	145
110	155	46	52	77	89	161	182	10015	106	75	8	M12x45	145
120	165	46	52	77	89	171	228	13653	122	88	10	M12x45	145
130	180	46	52	77	89	186	273	17747	135	97	12	M12x45	145
140	190	51	59	84	98	196	248	17328	102	75	8	M14x45	230
150	200	51	59	84	98	206	309	23207	119	89	10	M14x45	230
160	210	51	59	84	98	216	309	24754	112	85	10	M14x45	230
170	225	51	59	84	98	231	371	31561	126	95	12	M14x45	230
180	235	51	59	84	98	241	371	33417	119	91	12	M14x45	230
190	250	51	59	84	98	256	464	44097	141	107	15	M14x45	230
200	260	51	59	84	98	266	464	46418	134	103	15	M14x45	230
220	285	64	72	100	116	291	501	55147	105	81	12	M16x60	355
240	305	64	72	100	116	311	627	75207	120	95	15	M16x60	355
260	325	64	72	100	116	331	752	97775	133	107	18	M16x60	355
280	355	75	83	123	141	361	812	113657	114	90	16	M18x80	485
300	375	75	83	123	141	381	913	136987	120	96	18	M18x80	485

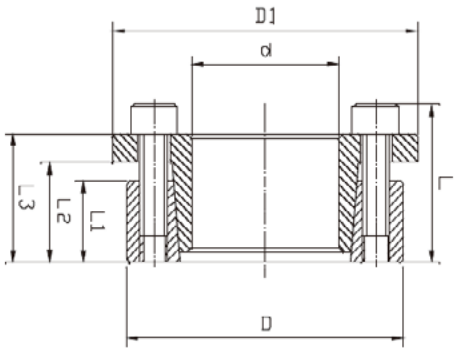
Type 06

ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L (mm)	ø D1 (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
320	405	90	98	142	162	411	1170	187177	120	95	18	M20x100	690
340	425	90	98	142	162	431	1365	232015	132	195	21	M20x100	690
360	455	110	118	166	188	461	1433	257988	107	84	18	M22x110	930
380	475	110	118	166	188	481	1672	317711	118	94	21	M22x110	930
400	495	110	118	166	188	501	1672	334433	123	100	21	M22x110	930

Type 07

Product information

Self-centering
Medium torque
Recommended tolerance:
Shaft: h8
Hub: H8

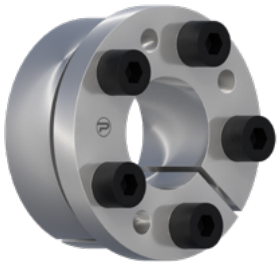


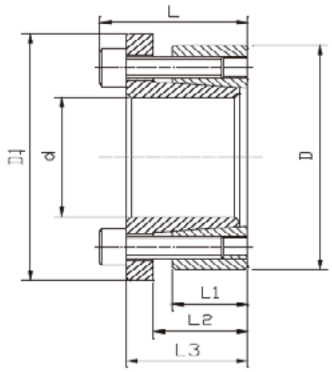
ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
19	47	17	22	28	34	26	243	234	94	5	M6x20	17
20	47	17	22	28	34	26	256	222	94	5	M6x20	17
22	47	17	22	28	34	26	282	202	94	5	M6x20	17
24	50	17	22	28	34	31	368	222	106	6	M6x20	17
25	50	17	22	28	34	31	383	213	106	6	M6x20	17
28	55	17	22	28	34	31	429	190	97	6	M6x20	17
30	55	17	22	28	34	31	460	177	97	6	M6x20	17
32	60	17	22	28	34	41	655	222	118	8	M6x20	17
35	60	17	22	28	34	41	716	203	118	8	M6x20	17
38	65	17	22	28	34	41	778	187	109	8	M6x20	17
40	65	17	22	28	34	41	819	178	109	8	M6x20	17
42	75	20	25	33	41	65	1361	227	127	7	M8x25	41
45	75	20	25	33	41	65	1458	212	127	7	M8x25	41
50	80	20	25	33	41	65	1620	191	119	7	M8x25	41
55	85	20	25	33	41	74	2037	199	129	8	M8x25	41
60	90	20	25	33	41	74	2223	182	121	8	M8x25	41
65	95	20	25	33	41	83	2710	189	129	9	M8x25	41
70	110	24	30	40	50	120	4203	211	134	8	M10x30	83
75	115	24	30	40	50	120	4754	197	128	8	M10x30	83
80	120	24	30	40	50	120	4804	184	123	8	M10x30	83
85	125	24	30	40	50	135	5742	195	133	9	M10x30	83
90	130	24	30	40	50	135	6080	184	128	9	M10x30	83
95	135	24	30	40	50	150	7131	194	137	10	M10x30	83
100	145	26	32	44	56	175	8732	198	137	8	M12x35	145
110	155	26	32	44	56	175	9605	180	128	8	M12x35	145
120	165	26	32	44	56	196	11787	186	135	9	M12x35	145
130	180	34	40	52	64	162	17024	175	126	12	M12x35	145
140	190	34	40	54	68	267	18703	166	122	9	M14x40	230
150	200	34	40	54	68	297	22259	172	129	10	M14x40	230
160	210	34	40	54	68	326	26119	177	135	11	M14x40	230
170	225	44	50	64	78	356	30276	140	106	12	M14x40	230
180	235	44	50	64	78	356	32057	133	102	12	M14x40	230
190	250	44	50	64	78	445	42302	157	119	15	M14x40	230
200	260	44	50	64	78	445	44528	149	115	15	M14x40	230
220	285	50	56	75	91	481	52902	129	100	12	M16x50	355
240	305	50	56	75	91	601	72135	148	116	15	M16x50	355
260	325	50	56	75	91	641	83370	145	116	16	M16x50	355
280	355	60	66	87	105	803	112463	141	111	16	M18x50	500
300	375	60	66	87	105	904	135562	148	118	18	M18x50	500
320	405	74	81	101	121	1234	197493	140	110	18	M20x50	690
340	425	74	81	101	121	1440	244816	153	123	21	M20x50	690
360	455	86	94	116	138	1512	272218	131	104	18	M22x60	930
380	475	86	94	116	138	1764	335239	145	116	21	M22x60	930
400	495	86	94	116	138	1764	352884	137	111	21	M22x60	930

Type 15

Product information

Self-centering
Medium-high torque
Recommended tolerance:
Shaft: h8
Hub: H8



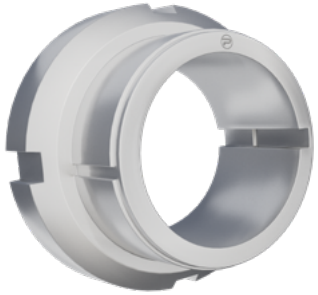


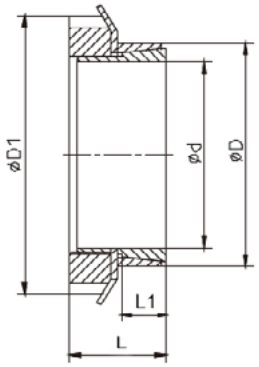
ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L (mm)	ø D1 (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
14	55	17	22	30	38	62	37	259	415	106	4	M8x25	41
16	55	17	22	30	38	62	37	296	363	106	4	M8x25	41
18	55	17	22	30	38	62	37	333	357	117	4	M8x25	41
19	55	17	22	30	38	62	37	352	338	117	4	M8x25	41
20	55	17	22	30	38	62	37	370	321	117	4	M8x25	41
22	55	17	22	30	38	62	37	407	292	117	4	M8x25	41
24	55	17	22	30	38	62	37	445	268	117	4	M8x25	41
25	55	17	22	30	38	62	37	463	257	117	4	M8x25	41
28	55	17	22	30	38	62	37	519	229	117	4	M8x25	41
30	55	17	22	30	38	62	37	556	214	117	4	M8x25	41
24	65	17	22	30	38	72	46	556	335	124	5	M8x25	41
25	65	17	22	30	38	72	46	579	321	124	5	M8x25	41
28	65	17	22	30	38	72	46	649	287	124	5	M8x25	41
30	65	17	22	30	38	72	46	695	268	124	5	M8x25	41
32	65	17	22	30	38	72	46	741	251	124	5	M8x25	41
35	65	17	22	30	38	72	46	811	230	124	5	M8x25	41
38	65	17	22	30	38	72	46	917	211	124	5	M8x25	41
40	65	17	22	30	38	72	46	966	201	124	5	M8x25	41
30	80	20	25	33	41	87	65	972	318	119	7	M8x25	41
32	80	20	25	33	41	87	65	1037	299	119	7	M8x25	41
35	80	20	25	33	41	87	65	1134	273	119	7	M8x25	41
38	80	20	25	33	41	87	65	1231	251	119	7	M8x25	41
40	80	20	25	33	41	87	65	1296	239	119	7	M8x25	41
42	80	20	25	33	41	87	65	1361	227	119	7	M8x25	41
45	80	20	25	33	41	87	65	1458	212	119	7	M8x25	41
48	80	20	25	33	41	87	65	1555	199	119	7	M8x25	41
50	80	20	25	33	41	87	65	1620	191	119	7	M8x25	41

Type 17

Product information

Not self-centering
Medium-low torque
Recommended tolerance:
Shaft: h8
Hub: H8



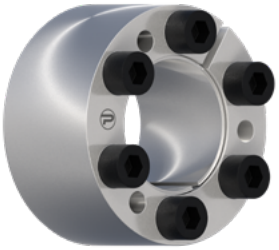


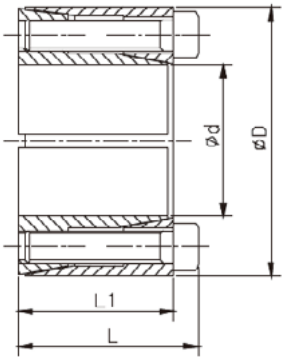
ød (mm)	øD (mm)	L (mm)	L1 (mm)	ø D1 (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
14	25	17	6.5	32	7	52	241	135	1	M20x1	95
15	25	17	6.5	32	7	56	225	135	1	M20x1	95
16	25	17	6.5	32	7	60	211	135	1	M20x1	95
18	30	17.5	6.5	38	10	91	256	154	1	M25x1.5	160
19	30	18	6.5	38	10	96	242	154	1	M25x1.5	160
20	30	18	6.5	38	10	102	230	154	1	M25x1.5	160
24	35	18	6.5	45	12	139	218	150	1	M30x1.5	220
25	35	18	6.5	45	12	144	210	150	1	M30x1.5	220
28	40	18	6.5	52	15	215	248	174	1	M35x1.5	340
30	40	20	8	52	15	230	188	141	1	M35x1.5	340
35	45	22	8	58	19	331	199	155	1	M40x1.5	480
40	50	25	10	65	24	477	176	141	1	M45x1.5	680
45	55	26	10	70	27	617	180	147	1	M50x1.5	870
48	60	26	10	75	28	669	171	137	1	M55x2	970
50	60	26	10	75	28	697	164	137	1	M55x2	970
55	65	27	12	80	29	796	129	109	1	M60x2	1100
60	70	29	12	85	32	946	129	111	1	M65x2	1300

Type 18

Product information

Self-centering
Medium-high torque
Recommended tolerance:
Shaft: h8
Hub: H8



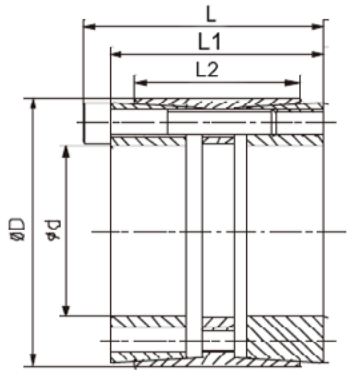


ød (mm)	øD (mm)	L1 (mm)	L (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
10	20	13	15.5	3.8	19	89	45	4	M2.5x12	1.2
11	22	13	15.5	3.8	21	81	41	4	M2.5x12	1.2
12	22	13	15.5	3.8	23	75	41	4	M2.5x12	1.2
14	26	17	20	5.5	39	71	38	4	M3x16	2.1
15	28	17	20	5.5	42	66	35	4	M3x16	2.1
16	32	17	21	9.6	77	107	54	4	M4x16	4.9
17	35	21	25	9.6	82	81	40	4	M4x20	4.9
18	35	21	25	9.6	87	77	40	4	M4x20	4.9
19	35	21	25	9.6	91	73	40	4	M4x20	4.9
20	38	21	26	15.7	157	113	60	4	M5x20	10
22	40	21	26	15.7	173	103	57	4	M5x20	10
24	47	26	32	22.3	268	110	56	4	M6x24	17
25	47	26	32	22.3	279	105	56	4	M6x24	17
28	50	26	32	33.5	468	141	79	6	M6x24	17
30	55	26	32	33.5	502	132	72	6	M6x24	17
32	55	26	32	33.5	535	123	72	6	M6x24	17
35	60	31	37	44.6	781	125	73	8	M6x28	17
38	65	31	37	44.6	848	115	67	8	M6x28	17
40	65	31	37	44.6	892	110	67	8	M6x28	17
42	75	36	44	60.6	1272	122	68	6	M8x34	41
45	75	36	44	60.6	1363	113	68	6	M8x34	41
48	80	36	44	80.8	1938	142	85	8	M8x34	41
50	80	36	44	80.8	2019	136	85	8	M8x34	41

Type 19

Product information

Self-centering
Very high torque
Recommended tolerance:
Shaft: h8
Hub: H8



ød (mm)	øD (mm)	L (mm)	L1 (mm)	L2 (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
25	55	46	40	32	64	799	314	107	6	M6x35	17
28	55	46	40	32	64	895	281	107	6	M6x35	17
30	55	46	40	32	64	959	262	107	6	M6x35	17
35	60	60	54	44	75	1306	185	83	7	M6x45	17
38	75	62	54	44	135	2567	308	121	7	M8x50	41
40	75	62	54	44	135	2702	293	121	7	M8x50	41
42	75	62	54	44	135	2837	279	121	7	M8x50	41
45	75	62	54	44	135	3040	260	121	7	M8x50	41
48	80	72	64	56	154	3707	216	102	8	M8x55	41
50	80	72	64	56	154	3861	207	102	8	M8x55	41
55	85	72	64	56	174	4779	212	108	9	M8x55	41
60	90	72	64	56	193	5793	216	113	10	M8x55	41
65	95	72	64	56	193	6276	199	107	10	M8x55	41
70	110	88	78	70	313	10951	235	120	10	M10x60	83
75	115	88	78	70	313	11733	220	115	10	M10x60	83
80	120	88	78	70	344	13768	227	121	11	M10x60	83
85	125	88	78	70	376	15959	233	127	12	M10x60	83
90	130	88	78	70	376	16898	220	122	12	M10x60	83
95	135	88	78	70	376	17837	208	117	12	M10x60	83
100	145	112	100	90	501	25029	211	113	11	M12x80	145
110	155	112	100	90	546	30039	209	115	12	M12x80	145
120	165	112	100	90	637	38226	224	127	14	M12x80	145
130	180	130	116	104	743	28270	201	117	12	M14x90	230
140	190	130	116	104	866	60654	217	129	14	M14x90	230
150	200	130	116	104	928	69628	217	132	15	M14x90	230
160	210	130	116	104	990	79220	217	134	16	M14x90	230
170	225	164	148	134	1186	100851	206	116	14	M16x110	360
180	235	164	148	134	1271	114414	208	119	15	M16x110	360
190	250	164	148	134	1356	128814	210	119	16	M16x110	360
200	260	164	148	134	1356	135594	200	115	16	M16x110	360
220	285	164	148	134	1526	167805	204	118	18	M16x110	360
240	305	166	150	134	1626	195100	182	131	20	M16x110	360
260	325	166	150	134	1707	221930	176	129	21	M16x110	360
280	355	197	177	165	2244	314194	179	131	18	M20x130	690
300	375	197	177	165	2494	374042	186	138	20	M20x130	690
320	405	197	177	165	2618	418936	183	134	21	M20x130	690
340	425	197	177	165	2743	466307	180	134	22	M20x130	690
360	455	225	203	190	3208	577426	173	130	21	M22x150	930
380	475	225	203	190	3361	638541	172	130	22	M22x150	930
400	495	225	203	190	3666	733255	178	137	24	M22x150	930
420	515	225	203	190	3666	769918	169	131	24	M22x150	930
440	535	225	203	190	3666	807670	162	130	24	M22x150	930
460	555	225	203	190	3666	844390	155	128	24	M22x150	930

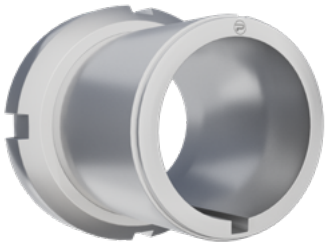
Type 19

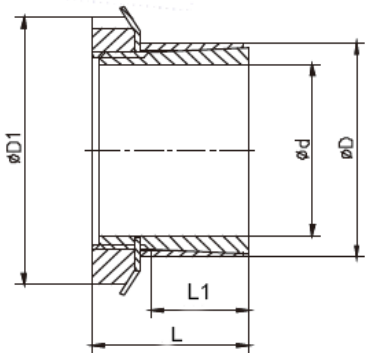
ød (mm)	øD (mm)	L (mm)	L1 (mm)	L2 (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
480	575	225	203	190	4275	1027650	173	145	28	M22x150	930
500	595	225	203	190	4275	1071000	166	140	28	M22x150	930
520	615	225	203	190	4600	1193400	171	144	30	M22x150	930
540	635	225	203	190	4600	1239300	164	139	30	M22x150	930
560	655	225	203	190	4896	1371050	169	144	32	M22x150	930
580	675	225	203	190	4896	1419500	163	141	32	M22x150	930
600	695	225	203	190	5040	1514700	163	141	33	M22x150	930

Type 21

Product information

Self-centering
Medium-high torque
Recommended tolerance:
Shaft: h8
Hub: H8



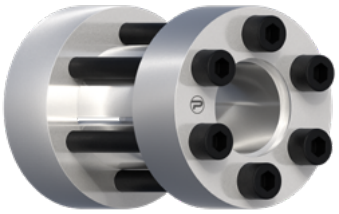


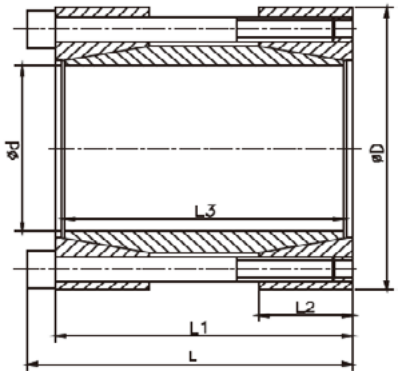
ød (mm)	øD (mm)	L (mm)	L1 (mm)	ø D1 (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Contacting pressure hub P1 N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
15	25	31	20	32	9	77	91	55	1	M20x1	95
18	30	33	21	38	13	125	98	59	1	M25x1.5	160
19	30	33	21	38	13	132	93	59	1	M25x1.5	160
20	30	33	21	38	13	139	88	59	1	M25x1.5	160
24	35	38	25	45	15	202	74	51	1	M30x1.5	220
25	35	38	25	45	15	210	71	51	1	M30x1.5	220
28	40	44	28	52	20	312	76	53	1	M35x1.5	340
30	40	44	28	52	20	335	71	53	1	M35x1.5	340
35	45	45	28	58	25	483	75	58	1	M40x1.5	480
40	50	46	28	65	31	696	82	66	1	M45x1.5	680
45	55	47	28	70	36	902	84	69	1	M50x1.5	870
50	60	47	28	75	37	1014	77	64	1	M55x2	970
55	65	48	28	80	38	1158	73	61	1	M60x2	1100
60	70	50	28	85	41	1379	73	62	1	M65x2	1300

Type 22

Product information

External rigid shaft coupling
Medium Torque
Recommended tolerance:
Shaft: h8

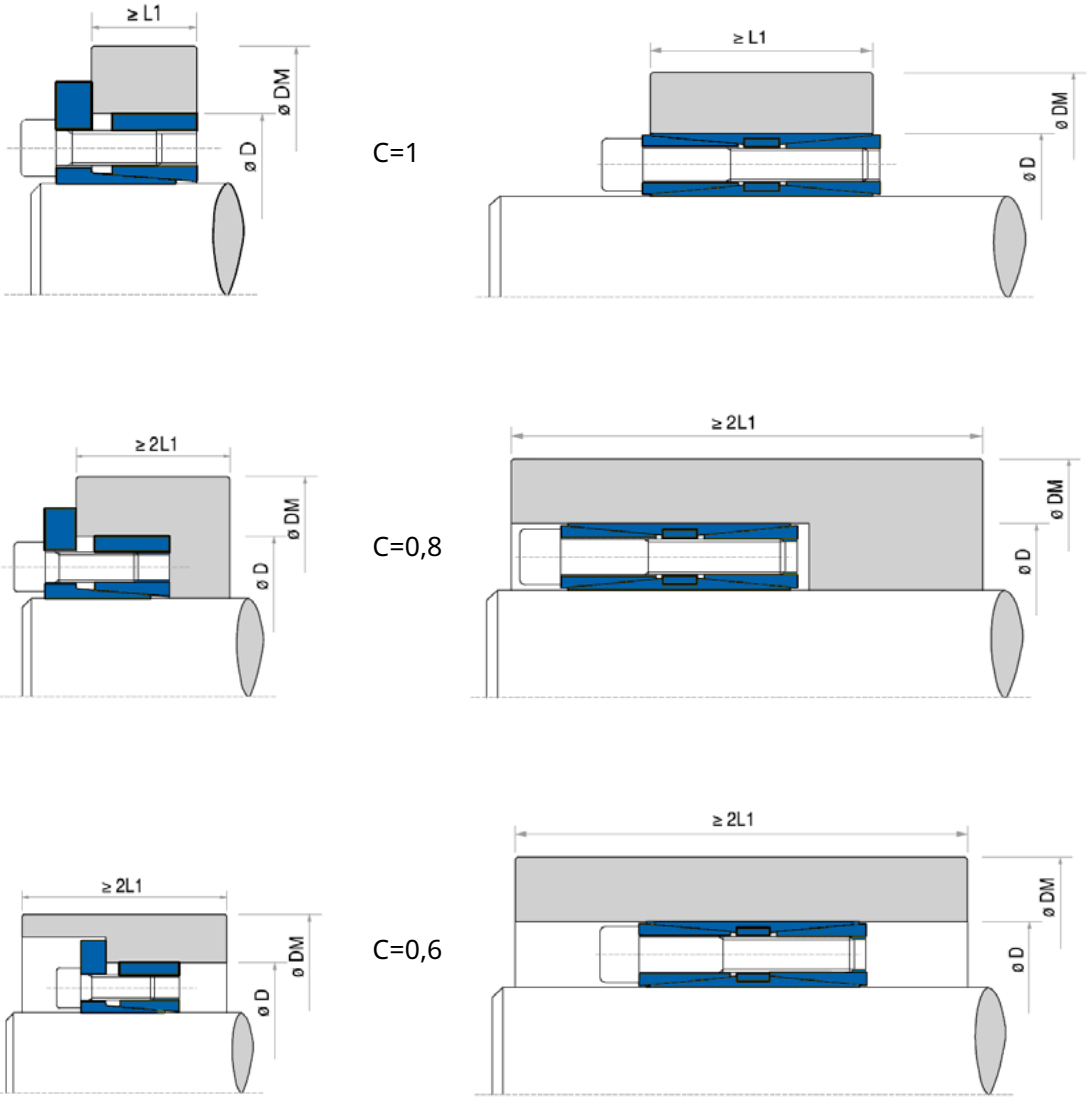




ød (mm)	øD (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L (mm)	Transmitted axial force FT **(kN)**	Transmitted torque MT (Nm)	Contacting pressure shaft P N/mm²	Locking screw n	locking screw size	Locking torque Ts (Nm)
15	45	50	16	44	56	21	158	188	4	M6x45	17
16	50	50	16	44	56	21	168	176	4	M6x45	17
17	50	50	16	44	56	21	179	166	4	M6x45	17
18	50	50	16	44	56	21	190	157	4	M6x45	17
19	50	50	16	44	56	21	200	149	4	M6x45	17
20	50	50	16	44	56	21	211	141	4	M6x45	17
24	55	60	18.5	54	66	32	378	144	6	M6x55	17
25	55	60	18.5	54	66	32	394	138	6	M6x55	17
28	60	60	18.5	54	66	32	442	123	6	M6x55	17
30	60	60	18.5	54	66	32	473	115	6	M6x55	17
32	63	60	18.5	54	66	32	505	108	6	M6x55	17
35	75	75	22	67	83	39	682	98	4	M8x70	42
38	75	75	22	67	83	39	741	90	4	M8x70	42
40	75	75	22	67	83	39	780	86	4	M8x70	42
42	78	75	22	67	83	39	819	82	4	M8x70	42
45	85	85	24.5	76	93	59	1317	101	6	M8x80	42
48	90	85	24.5	76	93	59	1405	95	6	M8x80	42
50	90	85	24.5	76	93	59	1463	91	6	M8x80	42
55	94	85	24.5	76	93	78	2147	110	8	M8x80	42
60	100	85	24.5	76	93	78	2343	101	8	M8x80	42
65	105	85	24.5	76	93	78	2538	93	8	M8x80	42
70	115	100	29	90	110	93	3239	87	6	M10x95	83
75	120	100	29	90	110	93	3471	81	6	M10x95	83

Calculation of min. hub diameter DM

By installing Protorque loking assemblies the surface pressure Pn, existing between th eclamping outer ring and related hub bore, generates a stress. To calculate the minimum hub diameter DM the formula normally used for thick hollow cylinder is valid. Depending from hub shape and length with respect to the dimension L1 of locking assemblies, the real stresses change. Factor C must be considered in fuction of aplication type.



For minimum hub diameter DM calculation following formula muste be applied:
DM ≥ D x K
(D = outer diameter on locking device)

where K is equal to: $K = \sqrt{\frac{\sigma_{02} + (C \times P_1)}{\sigma_{02} - (C \times P_1)}}$

P_1 = Hub pressure (see catalog for each type)

σ_{02} = Yield limit for chosen material

C = Application type

See table of coefficient K on page 20.

Calculation of min. hub diameter DM

Table of Coefficient K

Pressure generated on the hub (Pn N/mm²)	Pressure generated on the hub (Application type C)	Yield point N/mm²										
		150	180	200	220	250	270	300	350	400	450	600
60	C=0.6	1.28	1.25	1.20	1.18	1.15	1.14	1.12	1.10	1.09	1.08	1.06
	C=0.8	1.39	1.30	1.24	1.23	1.22	1.20	1.18	1.15	1.12	1.11	1.08
	C=1	1.52	1.42	1.36	1.32	1.28	1.25	1.22	1.18	1.16	1.14	1.10
65	C=0.6	1.30	1.25	1.22	1.20	1.18	1.15	1.13	1.11	1.10	1.09	1.07
	C=0.8	1.44	1.35	1.30	1.28	1.24	1.22	1.20	1.16	1.14	1.12	1.09
	C=1	1.60	1.45	1.40	1.35	1.30	1.28	1.24	1.20	1.18	1.16	1.12
70	C=0.6	1.34	1.26	1.24	1.22	1.18	1.16	1.15	1.12	1.11	1.10	1.07
	C=0.8	1.48	1.38	1.34	1.30	1.25	1.23	1.20	1.18	1.15	1.13	1.10
	C=1	1.65	1.50	1.45	1.40	1.34	1.30	1.26	1.22	1.20	1.17	1.13
75	C=0.6	1.30	1.28	1.25	1.23	1.20	1.18	1.16	1.14	1.12	1.11	1.08
	C=0.8	1.52	1.42	1.36	1.32	1.28	1.25	1.22	1.18	1.16	1.14	1.11
	C=1	1.74	1.55	1.48	1.42	1.36	1.33	1.30	1.25	1.20	1.18	1.13
80	C=0.6	1.39	1.31	1.28	1.25	1.21	1.20	1.18	1.15	1.13	1.11	1.08
	C=0.8	1.58	1.45	1.39	1.35	1.30	1.27	1.24	1.20	1.18	1.15	1.11
	C=1	1.81	1.61	1.53	1.46	1.39	1.36	1.31	1.26	1.22	1.20	1.14
85	C=0.6	1.42	1.34	1.30	1.27	1.23	1.21	1.19	1.16	1.14	1.12	1.09
	C=0.8	1.63	1.49	1.42	1.38	1.32	1.29	1.26	1.22	1.19	1.16	1.12
	C=1	1.90	1.67	1.57	1.50	1.42	1.39	1.34	1.28	1.24	1.21	1.15
90	C=0.6	1.46	1.36	1.32	1.28	1.25	1.22	1.20	1.17	1.15	1.13	1.09
	C=0.8	1.69	1.53	1.46	1.40	1.34	1.31	1.28	1.23	1.20	1.18	1.13
	C=1	2.00	1.73	1.62	1.54	1.46	1.41	1.36	1.30	1.26	1.22	1.16
95	C=0.6	1.49	1.39	1.34	1.30	1.26	1.24	1.21	1.18	1.15	1.14	1.10
	C=0.8	1.75	1.57	1.49	1.43	1.37	1.34	1.30	1.25	1.21	1.19	1.14
	C=1	2.11	1.80	1.68	1.59	1.49	1.44	1.39	1.32	1.27	1.24	1.17
100	C=0.6	1.53	1.41	1.36	1.32	1.28	1.25	1.22	1.19	1.16	1.14	1.11
	C=0.8	1.81	1.61	1.53	1.46	1.39	1.36	1.31	1.26	1.22	1.20	1.14
	C=1	2.24	1.87	1.73	1.63	1.53	1.48	1.41	1.34	1.29	1.25	1.18
105	C=0.6	1.56	1.44	1.39	1.34	1.29	1.27	1.24	1.20	1.17	1.15	1.11
	C=0.8	1.88	1.66	1.56	1.50	1.42	1.38	1.33	1.28	1.24	1.21	1.15
	C=1	2.38	1.95	1.79	1.68	1.56	1.51	1.44	1.36	1.31	1.27	1.19
110	C=0.6	1.60	1.47	1.41	1.36	1.31	1.28	1.25	1.21	1.18	1.16	1.12
	C=0.8	1.96	1.71	1.60	1.53	1.44	1.41	1.35	1.29	1.25	1.22	1.16
	C=1	2.55	2.04	1.86	1.73	1.60	1.54	1.47	1.38	1.33	1.28	1.20
115	C=0.6	1.64	1.50	1.43	1.36	1.33	1.30	1.26	1.22	1.19	1.17	1.12
	C=0.8	2.04	1.76	1.64	1.56	1.47	1.43	1.37	1.31	1.26	1.23	1.17
	C=1	2.75	2.13	1.93	1.79	1.64	1.58	1.50	1.41	1.34	1.30	1.21
120	C=0.6	1.69	1.53	1.46	1.40	1.34	1.31	1.28	1.23	1.20	1.18	1.13
	C=0.8	2.13	1.81	1.69	1.60	1.50	1.45	1.39	1.33	1.28	1.24	1.18
	C=1	3.00	2.24	2.00	1.84	1.69	1.61	1.53	1.43	1.36	1.31	1.22
125	C=0.6	1.73	1.56	1.48	1.43	1.36	1.33	1.29	1.24	1.21	1.18	1.13
	C=0.8	2.24	1.87	1.73	1.63	1.53	1.48	1.41	1.34	1.29	1.25	1.18
	C=1	3.32	2.35	2.08	1.91	1.73	1.65	1.56	1.45	1.38	1.33	1.24
130	C=0.6	1.78	1.59	1.51	1.45	1.38	1.35	1.30	1.25	1.22	1.19	1.14
	C=0.8	2.35	1.93	1.78	1.67	1.56	1.50	1.44	1.36	1.30	1.27	1.19
	C=1	3.74	2.49	2.17	1.97	1.78	1.69	1.59	1.48	1.40	1.35	1.25
135	C=0.6	1.83	1.62	1.54	1.47	1.40	1.36	1.32	1.27	1.23	1.20	1.15
	C=0.8	2.48	2.00	1.83	1.71	1.59	1.53	1.46	1.38	1.32	1.28	1.20
	C=1	4.36	2.65	2.27	2.04	1.83	1.73	1.62	1.50	1.42	1.36	1.26
140	C=0.6	1.88	1.66	1.56	1.50	1.42	1.38	1.33	1.28	1.24	1.21	1.15
	C=0.8	2.63	2.07	1.88	1.75	1.62	1.55	1.48	1.39	1.33	1.29	1.21
	C=1	5.39	2.83	2.38	2.12	1.88	1.78	1.66	1.53	1.44	1.38	1.27
145	C=0.6	1.94	1.69	1.59	1.52	1.44	1.40	1.35	1.29	1.25	1.22	1.16
	C=0.8	2.80	2.15	1.94	1.80	1.65	1.58	1.50	1.41	1.35	1.30	1.22
	C=1	7.68	3.05	2.50	2.21	1.94	1.82	1.69	1.55	1.46	1.40	1.28
150	C=0.6	2.00	1.73	1.62	1.54	1.46	1.41	1.36	1.30	1.26	1.23	1.16
	C=0.8	3.00	2.24	2.00	1.84	1.69	1.61	1.53	1.43	1.36	1.31	1.23
	C=1	-	3.32	2.65	2.30	2.00	1.87	1.73	1.58	1.48	1.41	1.29
155	C=0.6	2.06	1.77	1.65	1.57	1.48	1.43	1.38	1.31	1.27	1.24	1.17
	C=0.8	3.25	2.33	2.06	1.89	1.72	1.65	1.55	1.45	1.38	1.33	1.23
	C=1	-	3.66	2.80	2.40	2.06	1.92	1.77	1.61	1.51	1.43	1.30
160	C=0.6	2.13	1.81	1.69	1.60	1.50	1.45	1.39	1.33	1.28	1.24	1.18
	C=0.8	3.55	2.43	2.13	1.94	1.76	1.67	1.58	1.47	1.39	1.34	1.24
	C=1	-	4.12	3.00	2.52	2.13	1.98	1.81	1.64	1.53	1.45	1.31
165	C=0.6	2.21	1.86	1.72	1.62	1.52	1.47	1.41	1.34	1.29	1.25	1.18
	C=0.8	3.96	2.55	2.21	2.00	1.80	1.71	1.60	1.49	1.41	1.35	1.25
	C=1	-	4.80	3.23	2.65	2.21	2.04	1.86	1.67	1.55	1.47	1.33