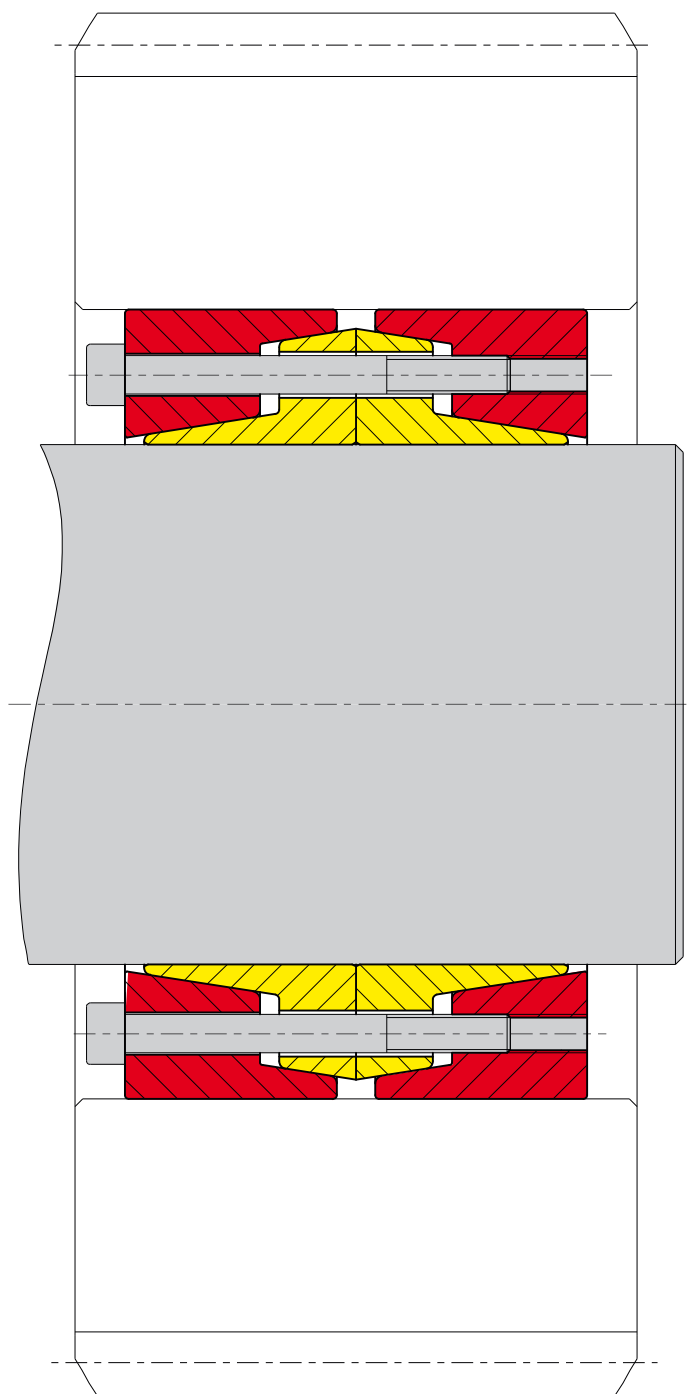
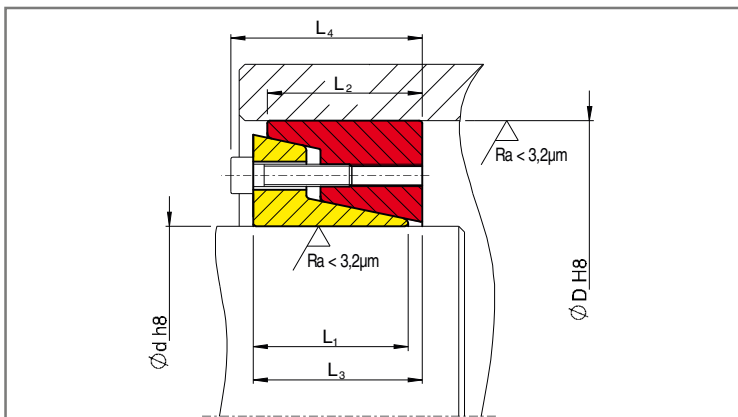


Locking Unit Type IS



Locking Unit Type IS

Series IS1



Code:

- M_t maximum transmissible torque of a shrink disc with $P_{ax}=0$
- P_{ax} maximum transmissible axial load of a shrink disc with $M_t=0$
- M_a required tightening torque of the tightening bolts (see also "Mounting and Removal Instructions")
- P_w surface pressure on shaft
- P_n surface pressure on hub

Dimensions L_3 and L_4 apply to untightened units.

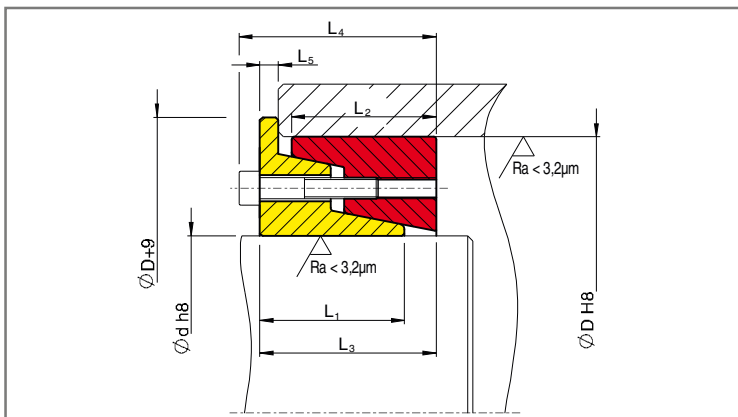
Type	d	x	D	M_t kNm	P_{ax} kN	L_1 mm	L_2 mm	L_3 mm	L_4 mm	B^*	M_a Nm	P_w N/mm ²	P_n	kg
IS 1	20	x	47	0,3	34	20	17	23	29	5 x M6	17	242	121	0,2
IS 1	22	x	47	0,4	34	20	17	23	29	5 x M6	17	220	121	0,2
IS 1	24	x	50	0,4	34	20	17	23	29	5 x M6	17	202	114	0,2
IS 1	25	x	50	0,4	34	20	17	23	29	5 x M6	17	194	114	0,2
IS 1	28	x	55	0,6	43	20	17	23	29	6 x M6	17	208	124	0,3
IS 1	30	x	55	0,6	43	20	17	23	29	6 x M6	17	194	124	0,3
IS 1	35	x	60	0,9	51	20	17	23	29	7 x M6	17	194	133	0,3
IS 1	40	x	65	1,0	51	20	17	23	29	8 x M6	17	194	140	0,3
IS 1	45	x	75	1,8	80	24	20	28	36	6 x M8	41	198	142	0,5
IS 1	50	x	80	2,3	92	24	20	28	36	7 x M8	41	208	156	0,6
IS 1	55	x	85	2,9	105	24	20	28	36	8 x M8	41	216	167	0,6
IS 1	60	x	90	3,2	107	24	20	28	36	8 x M8	41	198	158	0,7
IS 1	65	x	95	3,8	117	24	20	28	36	9 x M8	41	205	169	0,7
IS 1	70	x	110	6,0	171	29	24	35	45	8 x M10	83	223	172	1,3
IS 1	75	x	115	6,4	171	29	24	35	45	8 x M10	83	208	164	1,4
IS 1	80	x	120	6,8	170	29	24	35	45	8 x M10	83	195	157	1,4
IS 1	85	x	125	8,1	191	29	24	35	45	9 x M10	83	207	170	1,5
IS 1	90	x	130	9,6	213	29	24	35	45	10 x M10	83	217	181	1,6
IS 1	95	x	135	10,1	213	29	24	35	45	10 x M10	83	206	175	1,6
IS 1	100	x	145	11,2	224	33	28	38	50	8 x M12	145	200	163	2,2
IS 1	110	x	155	13,9	252	33	28	39	51	9 x M12	145	205	171	2,4
IS 1	120	x	165	16,8	280	33	28	39	51	10 x M12	145	209	179	2,6
IS 1	130	x	180	23,1	355	38	33	43	55	12 x M12	145	201	167	3,6
IS 1	140	x	190	23,5	336	38	33	43	55	12 x M12	145	186	158	3,9
IS 1	150	x	200	30,4	406	38	33	43	55	14 x M12	145	203	175	4,1
IS 1	160	x	210	34,8	435	38	33	43	55	15 x M12	145	204	179	4,3
IS 1	170	x	225	41,5	488	43	38	49	63	12 x M14	230	186	159	5,7
IS 1	180	x	235	51,2	569	43	38	49	63	14 x M14	230	205	178	6,0
IS 1	190	x	250	61,1	643	51	46	58	72	16 x M14	230	187	158	8,3
IS 1	200	x	260	71,6	716	51	46	57	71	18 x M14	230	200	171	8,6
IS 1	220	x	285	99,5	905	55	50	62	78	16 x M16	355	207	175	11
IS 1	240	x	305	108,0	900	55	50	62	78	16 x M16	355	189	164	12
IS 1	260	x	325	129,5	996	55	50	62	78	18 x M16	355	197	173	13
IS 1	280	x	355	169,7	1212	65	60	73	91	18 x M18	485	188	161	19
IS 1	300	x	375	199,8	1332	65	60	73	91	20 x M18	485	195	169	20
IS 1	320	x	405	274,5	1716	77	72	86	106	18 x M20	690	198	167	29
IS 1	340	x	425	289,8	1705	77	72	85	105	20 x M20	690	187	160	31
IS 1	360	x	455	384,7	2137	89	84	100	122	20 x M22	930	190	159	42
IS 1	380	x	475	430,0	2263	89	84	99	121	21 x M22	930	189	160	44
IS 1	400	x	495	449,7	2249	89	84	99	121	21 x M22	930	180	154	46
IS 1	420	x	515	545,5	2597	89	84	100	122	24 x M22	930	196	169	49
IS 1	440	x	545	659,9	3000	101	96	113	137	24 x M24	1200	190	161	64
IS 1	460	x	565	689,9	3000	101	96	113	137	24 x M24	1200	182	156	67
IS 1	480	x	585	719,9	3000	101	96	113	137	24 x M24	1200	174	150	69
IS 1	500	x	605	880,4	3522	101	96	113	137	28 x M24	1200	195	170	72

Further sizes on request. Technical changes to be reserved without notice.

*Tightening bolts DIN EN ISO 4762: Grade 12.9 When ordering please state: e.g. IS 1 x 200 x 260 (Type x Ød x Ø D)

Locking Unit Type IS

Series ISN 1



Code:

- M_t maximum transmissible torque of a shrink disc with $P_{ax}=0$
- P_{ax} maximum transmissible axial load of a shrink disc with $M_t=0$
- M_a required tightening torque of the tightening bolts (see also "Mounting and Removal Instructions")
- P_w surface pressure on shaft
- P_n surface pressure on hub

Dimensions L_3 and L_4 apply to untightened units.

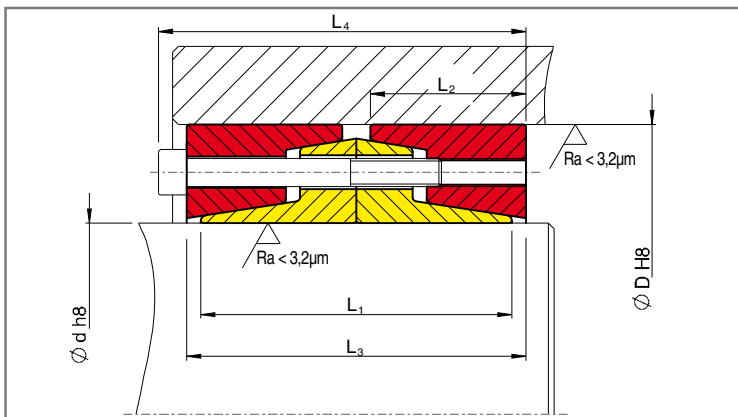
Type	d	x	D	M_t kNm	P_{ax} kN	L_1 mm	L_2 mm	L_3 mm	L_4 mm	L_5 mm	B*	M_a Nm	P_w N/mm ²	P_n	kg
ISN 1 20 x 47	20	x	47	0,3	28	20	17	23	29	3	6 x M6	17	185	93	0,2
ISN 1 22 x 47	22	x	47	0,3	28	20	17	23	29	3	6 x M6	17	168	93	0,2
ISN 1 24 x 50	24	x	50	0,3	28	20	17	23	29	3	6 x M6	17	154	87	0,2
ISN 1 25 x 50	25	x	50	0,3	28	20	17	23	29	3	6 x M6	17	148	87	0,2
ISN 1 28 x 55	28	x	55	0,5	37	20	17	23	29	3	8 x M6	17	176	105	0,3
ISN 1 30 x 55	30	x	55	0,6	37	20	17	23	29	3	8 x M6	17	164	105	0,3
ISN 1 35 x 60	35	x	60	0,7	42	20	17	23	29	3	9 x M6	17	158	109	0,3
ISN 1 40 x 65	40	x	65	0,9	46	20	17	23	29	3	10 x M6	17	154	112	0,3
ISN 1 45 x 75	45	x	75	1,6	69	24	20	28	36	4	8 x M8	41	168	121	0,5
ISN 1 50 x 80	50	x	80	2,0	80	24	20	28	36	4	9 x M8	41	170	127	0,6
ISN 1 55 x 85	55	x	85	2,4	87	24	20	28	36	4	10 x M8	41	171	133	0,6
ISN 1 60 x 90	60	x	90	2,6	87	24	20	28	36	4	10 x M8	41	157	126	0,7
ISN 1 65 x 95	65	x	95	3,4	105	24	20	28	36	4	12 x M8	41	174	143	0,7
ISN 1 70 x 110	70	x	110	4,8	137	29	24	34	44	5	10 x M10	83	177	136	1,3
ISN 1 75 x 115	75	x	115	5,1	137	29	24	35	45	5	10 x M10	83	166	130	1,4
ISN 1 80 x 120	80	x	120	6,1	151	29	24	34	44	5	10 x M10	83	171	138	1,4
ISN 1 85 x 125	85	x	125	7,0	165	29	24	35	45	5	12 x M10	83	175	144	1,5
ISN 1 90 x 130	90	x	130	7,4	165	29	24	34	44	5	12 x M10	83	166	138	1,6
ISN 1 95 x 135	95	x	135	8,0	163	29	24	35	45	5	12 x M10	83	157	133	1,6
ISN 1 100 x 145	100	x	145	10	196	33	28	39	51	5	11 x M12	145	175	142	2,2
ISN 1 110 x 155	110	x	155	11	196	33	28	39	51	5	11 x M12	145	159	133	2,4
ISN 1 120 x 165	120	x	165	16	264	33	28	39	51	5	12 x M12	145	186	159	2,6
ISN 1 130 x 180	130	x	180	20	301	38	33	43	55	5	16 x M12	145	170	142	3,6
ISN 1 140 x 190	140	x	190	21	301	38	33	43	55	5	16 x M12	145	158	134	3,9
ISN 1 150 x 200	150	x	200	25	332	38	33	43	55	5	18 x M12	145	166	143	4,1
ISN 1 160 x 210	160	x	210	27	339	38	33	43	55	5	18 x M12	145	156	137	4,3
ISN 1 170 x 225	170	x	225	35	414	44	38	50	64	6	16 x M14	230	158	135	5,7
ISN 1 180 x 235	180	x	235	42	465	44	38	50	64	6	18 x M14	230	168	145	6,0
ISN 1 190 x 250	190	x	250	51	537	52	46	58	72	6	21 x M14	230	156	132	8,3
ISN 1 200 x 260	200	x	260	62	620	52	46	58	72	6	24 x M14	230	170	145	8,6
ISN 1 220 x 285	220	x	285	79	719	57	50	64	80	7	21 x M16	355	164	139	11
ISN 1 240 x 305	240	x	305	92	763	57	50	64	80	7	21 x M16	355	158	137	12
ISN 1 260 x 325	260	x	325	112	863	57	50	64	80	7	24 x M16	355	167	147	13
ISN 1 280 x 355	280	x	355	145	1039	65	60	73	91	10	24 x M18	485	159	136	19
ISN 1 300 x 375	300	x	375	175	1168	72	60	80	91	12	24 x M18	485	167	145	20
ISN 1 320 x 405	320	x	405	242	1510	87	72	95	105	15	24 x M20	690	170	144	29
ISN 1 340 x 425	340	x	425	257	1510	87	72	96	106	15	24 x M20	690	160	137	31
ISN 1 360 x 455	360	x	455	338	1879	99	84	110	122	15	24 x M22	930	156	130	42
ISN 1 380 x 475	380	x	475	357	1879	89	84	99	121	15	27 x M22	930	147	125	44
ISN 1 400 x 495	400	x	495	438	2192	99	84	110	122	15	28 x M22	930	163	140	46
ISN 1 420 x 515	420	x	515	493	2349	89	84	99	121	15	30 x M22	930	167	144	49
ISN 1 440 x 545	440	x	545	566	2573	101	96	113	137	15	30 x M24	1200	161	137	64
ISN 1 460 x 565	460	x	565	592	2573	101	96	113	137	15	33 x M24	1200	154	132	67
ISN 1 480 x 585	480	x	585	617	2571	101	96	113	137	15	33 x M24	1200	148	128	69
ISN 1 500 x 605	500	x	605	723	2892	101	96	113	137	15	36 x M24	1200	160	139	72

Further sizes on request. Technical changes to be reserved without notice.

*Tightening bolts DIN EN ISO 4762: Grade 12.9 When ordering please state: e.g. ISN 1 x 460 x 565 (Type x $\varnothing d$ x $\varnothing D$)

Locking Unit Type IS

Series IS4



Code:

- M_t maximum transmissible torque of a shrink disc with $P_{ax}=0$
- P_{ax} maximum transmissible axial load of a shrink disc with $M_t=0$
- M_a required tightening torque of the tightening bolts (see also "Mounting and Removal Instructions")
- P_w surface pressure on shaft
- P_n surface pressure on hub

Dimensions L_3 and L_4 apply to untightened units.

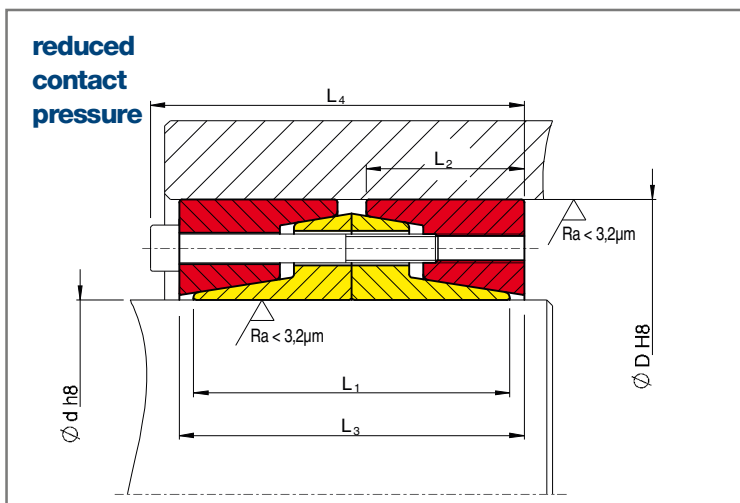
Type	d	x	D	M_t kNm	P_{ax} kN	L_1 mm	L_2 mm	L_3 mm	L_4 mm	B*	M_a Nm	P_w N/mm ²	P_n	kg
IS 4	30	x	55	0,9	60	40	17	46	52	6 x M6	17	132	85	0,5
IS 4	35	x	60	1,2	71	40	17	46	52	7 x M6	17	135	93	0,6
IS 4	40	x	65	1,5	75	40	17	46	52	8 x M6	17	125	90	0,6
IS 4	45	x	75	2,5	111	48	20	56	64	6 x M8	41	136	98	1,1
IS 4	50	x	80	3,0	120	48	20	56	64	7 x M8	41	133	100	1,1
IS 4	55	x	85	3,8	138	48	20	56	64	8 x M8	41	139	108	1,2
IS 4	60	x	90	4,3	143	48	20	56	64	8 x M8	41	132	106	1,3
IS 4	65	x	95	5,3	163	48	20	56	64	9 x M8	41	139	114	1,4
IS 4	70	x	110	7,6	217	58	24	68	78	8 x M10	83	142	109	2,6
IS 4	75	x	115	8,2	219	58	24	68	78	8 x M10	83	133	105	2,7
IS 4	80	x	120	8,7	217	58	24	68	78	8 x M10	83	124	100	2,8
IS 4	85	x	125	10,4	245	58	24	68	78	9 x M10	83	132	108	3,0
IS 4	90	x	130	12	272	58	24	68	78	10 x M10	83	138	116	3,1
IS 4	95	x	135	13	271	58	24	68	78	10 x M10	83	131	111	3,3
IS 4	100	x	145	16	317	66	28	76	88	8 x M12	145	127	104	4,5
IS 4	110	x	155	19	340	66	28	76	88	9 x M12	145	124	104	4,8
IS 4	120	x	165	23	377	66	28	76	88	10 x M12	145	126	108	5,2
IS 4	130	x	180	29	453	76	33	86	98	12 x M12	145	122	101	7,2
IS 4	140	x	190	32	453	76	33	86	98	12 x M12	145	113	96	7,7
IS 4	150	x	200	40	528	76	33	86	98	14 x M12	145	123	106	8,2
IS 4	160	x	210	45	566	76	33	86	98	15 x M12	145	123	108	8,6
IS 4	170	x	225	53	622	86	38	98	112	12 x M14	230	113	96	11
IS 4	180	x	235	65	726	86	38	98	112	14 x M14	230	124	108	12
IS 4	190	x	250	79	829	102	46	114	128	16 x M14	230	114	96	17
IS 4	200	x	260	93	933	102	46	114	128	17 x M14	230	121	103	17
IS 4	220	x	285	126	1141	110	50	122	138	16 x M16	355	125	106	22
IS 4	240	x	305	137	1141	110	50	122	138	16 x M16	355	115	99	24
IS 4	260	x	325	167	1284	110	50	122	138	18 x M16	355	119	106	26
IS 4	280	x	355	219	1562	130	60	146	164	18 x M18	485	114	97	38
IS 4	300	x	375	260	1735	130	60	146	164	18 x M18	485	118	102	40
IS 4	320	x	405	357	2230	154	72	170	190	18 x M20	690	120	101	58
IS 4	340	x	425	379	2230	154	72	170	190	20 x M20	690	113	97	62
IS 4	360	x	455	501	2784	178	84	198	220	18 x M22	930	115	97	85
IS 4	380	x	475	555	2923	178	84	198	220	20 x M22	930	115	97	89
IS 4	400	x	495	585	2923	178	84	198	220	20 x M22	930	109	93	93
IS 4	420	x	515	658	3132	178	84	198	220	22 x M22	930	111	96	97
IS 4	440	x	545	796	3616	202	96	226	250	22 x M24	1200	108	92	128
IS 4	460	x	565	832	3616	202	96	226	250	22 x M24	1200	103	88	134
IS 4	480	x	585	868	3616	202	96	226	250	24 x M24	1200	99	85	139
IS 4	500	x	605	984	3938	202	96	226	250	26 x M24	1200	103	90	144
IS 4	520	x	630	1024	3938	202	96	226	250	25 x M24	1200	99	86	157
IS 4	540	x	650	1063	3938	202	96	226	250	26 x M24	1200	96	84	162
IS 4	560	x	670	1181	4219	202	96	226	250	27 x M24	1200	99	87	168
IS 4	580	x	690	1224	4219	202	96	226	250	27 x M24	1200	96	84	173
IS 4	600	x	710	1266	4219	202	96	226	250	27 x M24	1200	92	82	179

Further sizes on request. Technical changes to be reserved without notice.

* Tightening bolts DIN EN ISO 4762: Grade 12.9 When ordering please state: e.g. IS4 x 100 x 145 (Type x Ø d x Ø D)

Locking Unit Type IS

Series IS 4.1



Code:

- M_t maximum transmissible torque of a shrink disc with $P_{ax}=0$
- P_{ax} maximum transmissible axial load of a shrink disc with $M_t=0$
- M_a required tightening torque of the tightening bolts (see also "Mounting and Removal Instructions")
- P_w surface pressure on shaft
- P_n surface pressure on hub

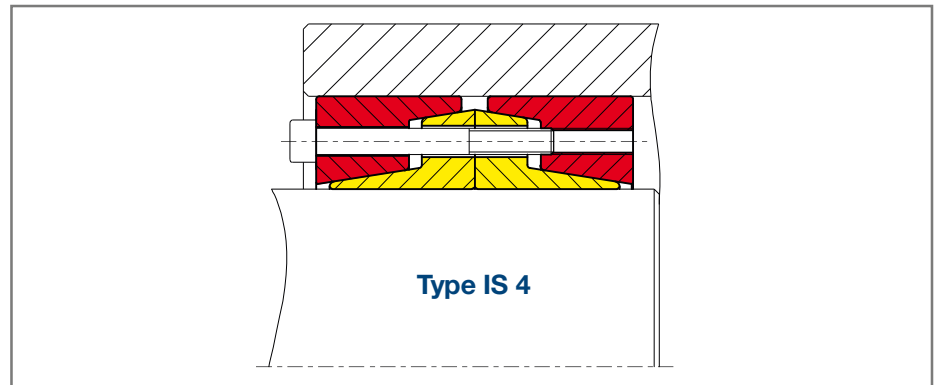
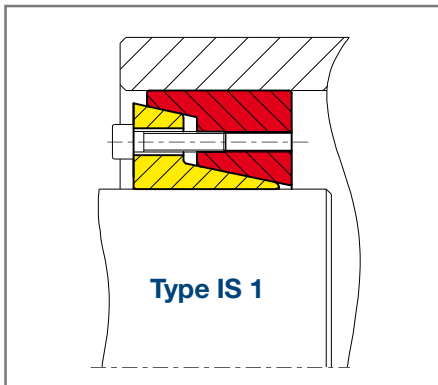
Dimensions L_3 and L_4 apply to untightened units.

Type	d	x	D	M_t kNm	P_{ax} kN	L_1 mm	L_2 mm	L_3 mm	L_4 mm	B*	M_a Nm	P_w N/mm ²	P_n N/mm ²	kg
IS 4.1	100	x	145	11	224	66	28	76	86	8 x M10	83	90	73	4
IS 4.1	110	x	155	13	240	66	28	76	86	9 x M10	83	88	73	5
IS 4.1	120	x	165	16	267	66	28	76	86	10 x M10	83	89	77	5
IS 4.1	130	x	180	20	312	76	33	86	96	12 x M10	83	84	70	7
IS 4.1	140	x	190	22	320	76	33	86	96	12 x M10	83	80	68	8
IS 4.1	150	x	200	27	364	76	33	86	96	14 x M10	83	85	73	8
IS 4.1	160	x	210	31	390	76	33	86	96	15 x M10	83	85	75	9
IS 4.1	170	x	225	38	449	86	38	98	110	12 x M12	145	82	70	11
IS 4.1	180	x	235	47	524	86	38	98	110	14 x M12	145	90	78	12
IS 4.1	190	x	250	57	599	102	46	114	126	16 x M12	145	82	69	17
IS 4.1	200	x	260	67	674	102	46	114	126	18 x M12	145	88	75	17
IS 4.1	220	x	285	91	828	110	50	122	136	16 x M14	230	91	77	22
IS 4.1	240	x	305	99	822	110	50	122	136	16 x M14	230	83	72	24
IS 4.1	260	x	325	122	937	110	50	122	136	18 x M14	230	87	76	26
IS 4.1	280	x	355	181	1294	130	60	146	162	18 x M16	355	94	81	38
IS 4.1	300	x	375	215	1431	130	60	146	162	20 x M16	355	97	84	40
IS 4.1	320	x	405	276	1725	154	72	170	188	18 x M18	485	93	78	58
IS 4.1	340	x	425	294	1732	154	72	170	188	20 x M18	485	88	75	62
IS 4.1	360	x	455	372	2065	178	84	198	216	22 x M18	485	85	72	85
IS 4.1	380	x	475	393	2068	178	84	198	216	22 x M18	485	81	69	89
IS 4.1	400	x	495	414	2068	178	84	198	216	24 x M18	485	77	66	93
IS 4.1	420	x	515	507	2412	178	84	198	216	26 x M18	485	86	74	97
IS 4.1	440	x	545	530	2409	202	96	226	246	24 x M20	690	72	61	128
IS 4.1	460	x	565	554	2409	202	96	226	246	22 x M20	690	69	59	134
IS 4.1	480	x	585	578	2409	202	96	226	246	24 x M20	690	66	57	139
IS 4.1	500	x	605	703	2811	202	96	226	246	26 x M20	690	74	64	144
IS 4.1	520	x	630	731	2811	202	96	226	246	26 x M20	690	71	62	157
IS 4.1	540	x	650	759	2811	202	96	226	246	26 x M20	690	68	60	162
IS 4.1	560	x	670	843	3012	202	96	226	246	30 x M20	690	71	62	168
IS 4.1	580	x	690	873	3012	202	96	226	246	30 x M20	690	68	60	173
IS 4.1	600	x	710	903	3012	202	96	226	246	30 x M20	690	66	59	179

Further sizes on request.
Technical changes to be reserved without notice.

*Tightening bolts DIN EN ISO 4762: Grade 12.9
When ordering please state: e.g. IS 4.1 x 170 x 225 (Type x $\varnothing d$ x $\varnothing D$)

Technical Specification



Locking assemblies of type IS are used for transmitting torque and axial load from the shaft to the hub. They are installed between shaft and hub. The clamping force for transmitting the torque is produced by tightening the bolts spreading the slotted locking unit.

Concentricity

The locking units of type IS are self-centering with an excellent concentricity thanks to the flat taper.

Tolerance

Commercially available shafts with a fit in accordance with h8 and h9 can be used; hub bore tolerance as per H8.

Surface quality

The peak-to-valley height should not exceed 16 µm (better results can certainly be achieved by turning).

Tightening bolts

The bolts for the unit of type IS are of quality 12.9 (DIN EN ISO 4762) to be mounted with a thin oil coat.

Hub thickness

The outside diameter of the hub D_N has to be dimensioned amply because the hub is expanded due to the clamping force of the locking unit (elastic deformation). The following equation derived from the equation for thick-walled pipes under internal pressure can be used to calculate the outside diameter with sufficient accuracy:

$$D_N \geq D \cdot \sqrt{\frac{\sigma_{0,2N} + P_N \cdot C}{\sigma_{0,2N} - P_N \cdot C}}$$

$\sigma_{0,2N}$ Yield strengths of the hub material

P_N hub bore pressure

C factor based on the width of the hub over the locking unit

$C=1$ for hubs which are as wide as the locking unit

$C=0,6$ for hubs which are twice as wide as the locking unit

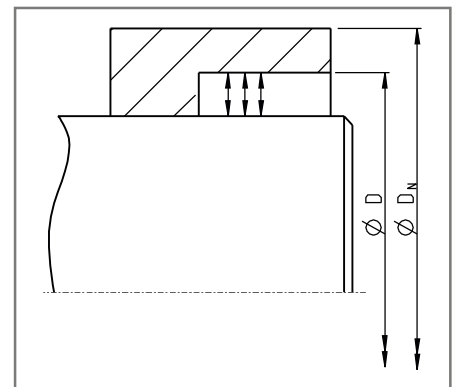
Regardless of the hub width the yield strength of the hub material should always be higher than the applied pressure P_N .

Application of locking units with hollow shafts

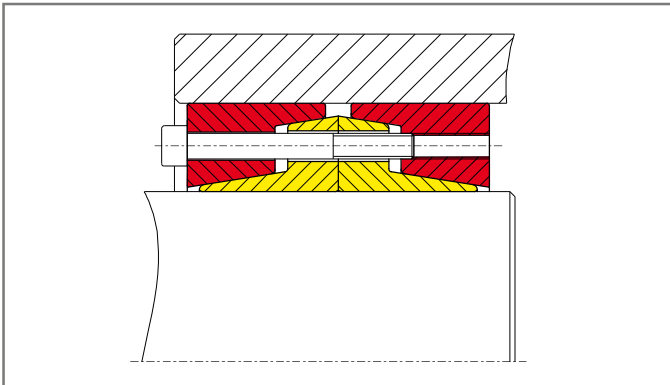
use the following equation to determine the bore diameter increased by the equation for thick-walled pipes, if locking units are to be mounted on hollow shafts:

$$d_i \leq d \cdot \sqrt{\frac{\sigma_{0,2S} - 2P_S \cdot C}{\sigma_{0,2S}}}$$

The bore diameter d_i can be increased by shrinking in a supporting sleeve.



Mounting and Removal Instructions for **Locking Unit IS**



Mounting

The STÜWE locking units IS are supplied ready to be mounted. Therefore they should not be dismantled prior to employing the unit for the first time. Do not use additional Lubricant!

1. Degrease shaft and hub bore.
2. Slightly oil hub bore hole and shaft with hydraulic oil (e.g. HLP 46 or HLP 68).
3. Loosen the tightening bolts, but do not remove them completely. Screw a minimum of three bolts into the additional tap-holes. By doing this a good fit will be achieved and canting of the locking unit will be avoided.

- When using Type IS 4 or IS 4.1 three bolts each have to be fitted into the jacking tap-holes of the external and the internal pressure ring.

4. Mount the locking unit and align the complete arrangement.
5. Relocate the tightening bolts to the tightening tap-holes.



Do not tighten the tightening bolts before the shaft is mounted.

6. Tighten all tightening bolts uniformly, **crosswise** one by one, over several revolutions. All bolts have to be tightened until the correct full tightening torque is achieved.

Check the correct full tightening torque of **all bolts** one after the other by means of a torque wrench. **All bolts** must be tightened correctly.

Dismounting

1. Loosen all tightening bolts in repeated steps, initially not more than a quarter turn per bolt, crosswise one after the other. Do not completely loosen the bolts.



Under no circumstances should the locking bolts be completely removed as this could be dangerous and result in injury.

2. Dismount as many bolts as jacking tap-holes are present and screw the bolts into them.
3. Fasten the jacking bolts, crosswise one after the other, until the connection is loose.
4. Jacking bolts on both sides of a slot have to be fastened consecutively.

Re-mounting

1. Control the complete locking until for wear and tear before re-using it.
2. When using Type IS 4 make sure to assemble the locking unit in correct order.
3. When disassembled completely clean and degrease all parts properly, then slightly oil them with hydraulic oil (e.g. HLP 46 or HLP 68).
4. Reassemble the locking unit.
5. Continue as described under "Mounting".