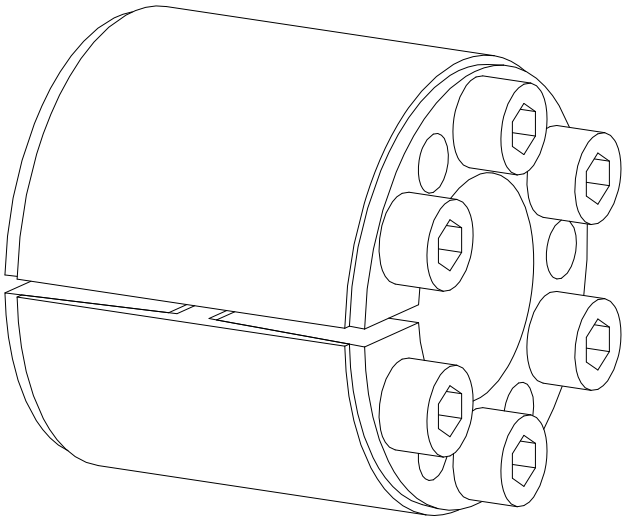
CLAMPEX® KTR 400



The **CLAMPEX®** clamping set is a frictionally engaged, detachable shaft-hub-connection for cylindrical shafts and bores without feather key.

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1 Technical data

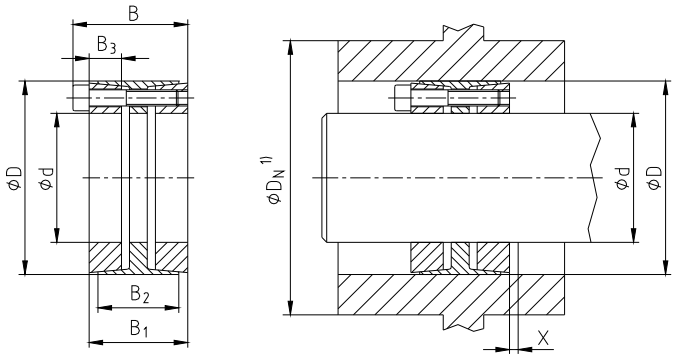

Illustration 1: CLAMPEX® KTR 400

1) These are the maximum screw tightening torques. They can be reduced to max. 40 % of the figures with T, F_{ax}, P_W and P_N being reduced proportionally.

Table 1: standard industrial applications

Dimensions [mm]					Clamping screws DIN EN 4762 – 12.9 μ_{total} = 0,14			Transmittable torque or axial force		Surface pressure between clamping set [N/mm²]		Weight [kg]
dxD	B	B1	B2	B3	M	z number	T_A 1) [Nm]	T [Nm]	F_{ax} [kN]	Shaft P_W	Hub P_N	
24 x 50	51	45	41	16	M6	6	17	712	59	205	85	0,54
25 x 50	51	45	41	16	M6	6	17	742	59	197	85	0,53
28 x 55	51	45	41	16	M6	8	17	831	59	176	78	0,50
30 x 55	51	45	41	16	M6	8	17	1187	79	219	103	0,47
32 x 60	51	45	41	16	M6	8	17	1266	79	205	95	0,77
35 x 60	51	45	41	16	M6	8	17	1385	79	187	95	0,71
38 x 65	51	45	41	16	M6	10	17	1880	99	216	109	1,25
40 x 65	51	45	41	16	M6	10	17	1979	99	205	109	1,21
42 x 75	53	45	41	16	M8	8	41	3071	146	289	140	1,16
45 x 75	53	45	41	16	M8	8	41	3290	146	269	140	1,08
48 x 80	70	62	58	23	M8	8	41	3518	147	196	93	1,45
50 x 80	70	62	58	23	M8	8	41	3664	147	188	93	1,38
55 x 85	70	62	58	23	M8	8	41	4031	147	171	88	1,49
60 x 90	70	62	58	23	M8	10	41	5497	183	196	103	1,60
65 x 95	70	62	58	23	M8	10	41	5955	183	181	98	1,70
70 x 110	86	76	70	28	M10	10	83	10182	291	219	111	3,12
75 x 115	86	76	70	28	M10	10	83	10910	291	204	107	3,29
80 x 120	86	76	70	28	M10	12	83	13964	349	230	122	3,46
85 x 125	86	76	70	28	M10	12	83	14837	349	216	118	3,64
90 x 130	86	76	70	28	M10	12	83	15710	349	204	113	3,81
95 x 135	86	76	70	28	M10	12	83	16583	349	193	109	3,98
100 x 145	110	98	92	35	M12	12	145	25415	508	214	112	6,12
110 x 155	110	98	92	35	M12	12	145	27956	508	195	105	6,62
120 x 165	110	98	92	35	M12	14	145	35581	593	208	115	7,12
130 x 180	128	114	108	41	M14	12	230	45333	697	193	106	9,98
140 x 190	128	114	108	41	M14	14	230	56957	814	209	117	10,62
150 x 200	128	114	108	41	M14	16	230	69743	930	223	127	11,26
160 x 210	128	114	108	41	M14	16	230	74392	930	209	121	11,91
170 x 225	162	146	136	52	M16	14	355	96123	1131	189	109	17,66
180 x 235	162	146	136	52	M16	16	355	116317	1292	203	119	18,49
190 x 250	162	146	136	52	M16	16	355	122779	1292	193	112	21,39
200 x 260	162	146	136	52	M16	16	355	129241	1292	183	108	22,36
220 x 285	162	146	136	52	M16	20	355	177706	1616	208	123	26,59
240 x 305	162	146	136	52	M16	22	355	213248	1777	210	126	28,70
260 x 325	162	146	136	52	M16	22	355	233398	1795	185	122	31,23
280 x 355	197	177	165	66	M20	18	690	336303	2402	192	121	46,77
300 x 375	197	177	165	66	M20	20	690	400360	2669	199	127	49,72
320 x 405	197	177	165	66	M20	21	690	448404	2803	196	124	60,52
340 x 425	197	177	165	66	M20	22	690	499116	2936	193	123	63,86
360 x 455	224	202	190	76	M22	21	930	627940	3489	188	119	86,78
380 x 475	224	202	190	76	M22	22	930	694389	3655	186	119	91,04
400 x 495	224	202	190	76	M22	24	930	797384	3987	193	125	95,30

1 Technical data

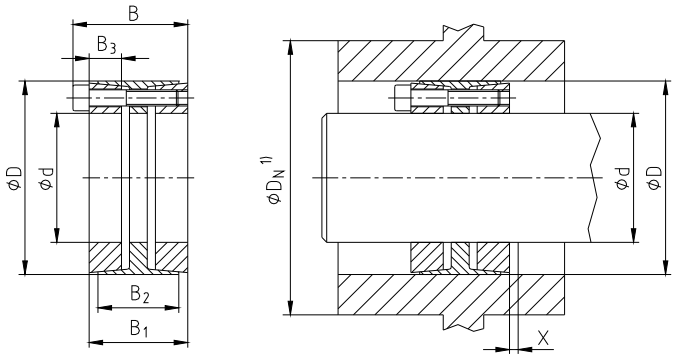

Illustration 1: CLAMPEX® KTR 400

1) These are the maximum screw tightening torques. They can be reduced to max. 40 % of the figures with T, F_{ax}, P_W and P_N being reduced proportionally.

Tabelle 2: applications with components subject to bending and torsion

Dimensions [mm]					Clamping screws DIN EN 4762 – 12.9 μ_{total} = 0,14			Transmittable torque or axial force		Transmittable bending moment	Surface pressure between clamping set [N/mm²]		Weight [kg]
dxD	B	B1	B2	B3	M	z number	T_A 1) [Nm]	T [Nm]	F_{ax} [kN]	$Mb_{perm.}$ [Nm]	Shaft P_W	Hub P_N	
24 x 50	51	45	41	16	M6	6	14	537	45	315	232	87	0,54
25 x 50	51	45	41	16	M6	6	14	555	44	328	224	87	0,53
28 x 55	51	45	41	16	M6	8	14	608	43	367	203	81	0,50
30 x 55	51	45	41	16	M6	8	14	880	58	459	250	106	0,47
32 x 60	51	45	41	16	M6	8	14	926	57	490	237	99	0,77
35 x 60	51	45	41	16	M6	8	14	993	56	536	219	100	0,71
38 x 65	51	45	41	16	M6	10	14	1311	69	748	257	118	1,25
40 x 65	51	45	41	16	M6	10	14	1361	68	787	247	118	1,21
42 x 75	53	45	41	16	M8	8	35	2278	107	827	328	143	1,16
45 x 75	53	45	41	16	M8	8	35	2408	107	886	309	145	1,08
48 x 80	70	62	58	23	M8	8	35	2467	103	1494	207	99	1,45
50 x 80	70	62	58	23	M8	8	35	2267	91	1779	196	97	1,38
55 x 85	70	62	58	23	M8	8	35	2408	88	1957	182	93	1,49
60 x 90	70	62	58	23	M8	10	35	3447	115	2134	203	107	1,60
65 x 95	70	62	58	23	M8	10	35	3633	112	2312	190	103	1,70
70 x 110	86	76	70	28	M10	10	69	6619	189	3659	222	113	3,12
75 x 115	86	76	70	28	M10	10	69	6950	185	3920	210	110	3,29
80 x 120	86	76	70	28	M10	12	69	9200	230	4181	231	123	3,46
85 x 125	86	76	70	28	M10	12	69	9613	226	4443	220	120	3,64
90 x 130	86	76	70	28	M10	12	69	10008	222	4704	210	116	3,81
95 x 135	86	76	70	28	M10	12	69	10383	219	4965	201	113	3,98
100 x 145	110	98	92	35	M12	12	120	16527	331	8687	219	115	6,12
110 x 155	110	98	92	35	M12	12	120	17658	321	9445	203	110	6,62
120 x 165	110	98	92	35	M12	14	120	22948	382	10304	214	119	7,12
130 x 180	128	114	108	41	M14	12	190	28502	438	15350	201	110	9,98
140 x 190	128	114	108	41	M14	14	190	36719	525	16531	215	120	10,62
150 x 200	128	114	108	41	M14	16	190	45796	611	17712	226	129	11,26
160 x 210	128	114	108	41	M14	16	190	47958	599	18893	215	124	11,91
170 x 225	162	146	136	52	M16	14	295	59316	698	32060	196	113	17,66
180 x 235	162	146	136	52	M16	16	295	73592	818	33946	209	122	18,49
190 x 250	162	146	136	52	M16	16	295	76340	804	35831	200	116	21,39
200 x 260	162	146	136	52	M16	16	295	78946	789	37717	192	113	22,36
220 x 285	162	146	136	52	M16	20	295	113209	1029	41489	213	125	26,59
240 x 305	162	146	136	52	M16	22	295	136190	1135	45261	214	129	28,70
260 x 325	162	146	136	52	M16	22	295	143090	1101	51099	193	127	31,23
280 x 355	197	177	165	66	M20	18	580	210027	1500	81312	200	126	46,77
300 x 375	197	177	165	66	M20	20	580	253018	1687	87120	206	132	49,72
320 x 405	197	177	165	66	M20	21	580	218947	1762	92928	203	128	60,52
340 x 425	197	177	165	66	M20	22	580	312383	1838	98736	201	128	63,86
360 x 455	224	202	190	76	M22	21	780	389170	2162	138624	196	124	86,78
380 x 475	224	202	190	76	M22	22	780	429232	2259	146325	195	125	91,04
400 x 495	224	202	190	76	M22	24	780	498899	2494	154027	201	130	95,30

2 Advice

2.1 General advice

Please read through these mounting instructions carefully before you start up the clamping set.
Please pay special attention to the safety instructions!
The mounting instructions are part of your product. Please keep them carefully and close to the clamping set.

2.2 Safety and advice symbols

	**D A N G E R !**	**Danger of injury to persons.**
	**C A U T I O N !**	**Damages on the machine possible.**
	**A T T E N T I O N !**	**Pointing to important items.**
	**W A R N I N G !**	**Hints concerning explosion protection.**

2.3 General hazard warnings

D A N G E R !
With assembly and disassembly of the clamping set it has to be made sure that the entire drive train is secured against accidental switch-on. You can be seriously hurt by rotating parts. Please make absolutely sure to read through and observe the following safety indications.

- All operations on and with the clamping set have to be performed taking into account "safety first".
- Please make sure to switch off the power pack before you perform your work on the clamping set.
- Secure the power pack against accidental switch-on, e. g. by providing warning signs at the place of switch-on or removing the fuse for current supply.
- Do not touch the operation area of the machine as long as it is in operation.
- Please secure the rotating drive parts against accidental contact. Please provide for the necessary protection devices and covers.

2.4 Intended use

You may only assemble and disassemble the clamping set if you

- have carefully read through the mounting instructions and understood them
- had technical training
- are authorized by your company

The clamping set may only be used in accordance with the technical data (see table 1 or 2). Unauthorized modifications on the clamping set are not admissible. We will not assume liability for any damage that may arise.
In the interest of further development we reserve the right for technical modifications.
The clamping set described in here corresponds to the technical status at the time of printing of these mounting instructions.

3 Storage

The clamping set is supplied in preserved condition and can be stored at a dry and covered place for 6 - 9 months.

C A U T I O N !
Humid storage rooms are not suitable.
Please make sure that condensation is not generated.

4 Assembly

The clamping set is generally delivered in assembled condition.

Tolerances, surfaces

A good rotating process is sufficient:
Rz ≤ 16µm

Highest permissible tolerance:
d = h8/H8 - shaft/hub

4.1 Components of the clamping set KTR 400

Component	Quantity	Designation
1	1	front pressure ring (slotted)
2	1	back pressure ring (slotted)
3	1	external ring (slotted)
4	see table 1 and 2	cap screw DIN EN ISO 4762

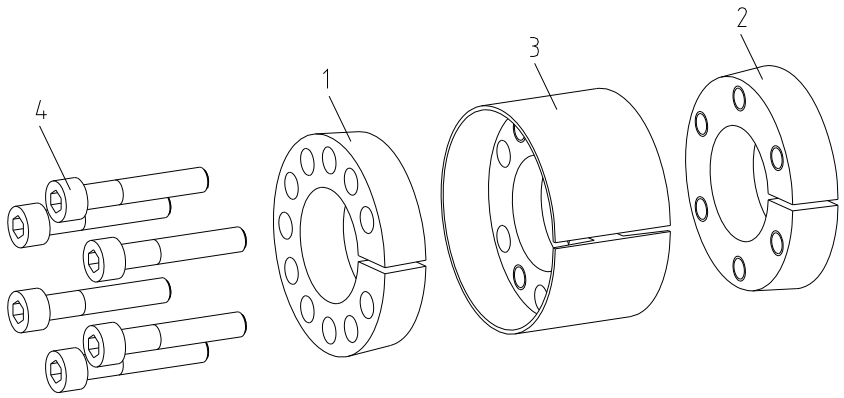

Illustration 2: CLAMPEX® KTR 400

C A U T I O N !
Inspect the clamping set before assembly so that the slots of component 1, 2 and 3 are flush with each other.

A T T E N T I O N !
Dirty or used clamping sets must be disassembled before the installation in order to be cleaned. Afterwards a thin fluid oil has to be lightly applied (e. g. Castrol 4 in 1 or Klüber Quitsch Ex).

4 Assembly

4.2 Advice on the clamping set

A T T E N T I O N !
Provide for free space between the pressure ring in the back and the hub/shaft for a subsequent disassembly.

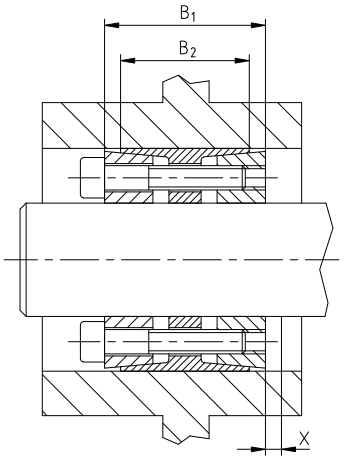

Illustration 3: free space for the disassembly

Formula to calculate space x left for disassembly:

$$x = \frac{(B_1 - B_2)}{2}$$

Dimensions for B_1 and B_2 see table 1 and 2.

4.3 Assembly of the clamping set

- Inspect the fit of shaft and hub for the specified tolerance (h8/H8).
- Clean the contact surfaces of the clamping set as well as the shaft and hub (see illustration 4) and afterwards apply a thin fluid oil lightly (e. g. Castrol 4 in 1 or Klüber Quitsch-Ex).

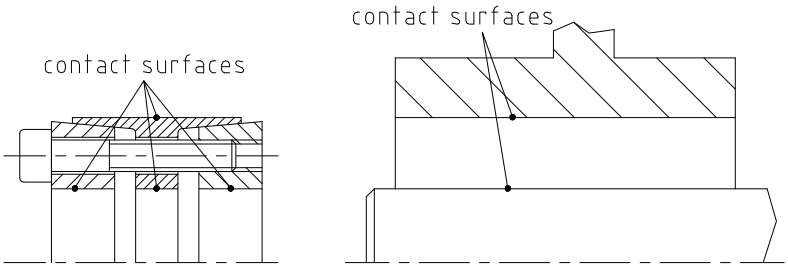

Illustration 4: cleaning of the contact surfaces

C A U T I O N !
Oils and greases containing molybdenum disulphide or high-pressure additives, additives of teflon or silicone as well as internal lubricants must not be used.

- Unscrew the clamping screws slightly. To make the assembly easier, fix the pressure rings in the front and in the back via the respective forcing thread by 2 clamping screws (see illustration 5 and 6). Insert clamping set KTR 400 between shaft and hub.

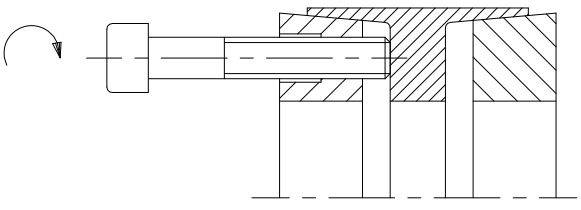

Illustration 5: fixing of the front pressure ring

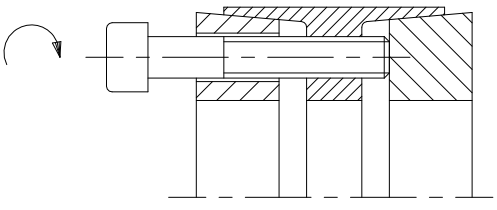

Illustration 6: fixing of the back pressure ring

4 Assembly

4.3 Assembly of the clamping set

- Remove the clamping screws used for fixing and screw them into the threads of the back pressure ring.
- Slightly tighten the clamping screws manually and align the clamping set with the hub component.
- With KTR 400 please make sure that the pressure rings are parallel to each other and in an angle of 90° to the shaft/hub.
- Tighten the clamping screws stepwise and with several revolutions evenly crosswise to the tightening torque mentioned in table 1 or 2, respectively. Repeat this process until a revolution of the screws by ¼ is no longer possible. Afterwards tighten the clamping screws one after another at the tightening torque mentioned over one revolution.

☞ **A T T E N T I O N !**
During the assembly there can be a slight axial displacement of the hub towards the shaft.

4.4 Disassembly of the clamping set

STOP **D A N G E R !**
Unfastened or falling drive parts can cause injuries to persons or damages to the machines. Secure the drive parts before the disassembly.

- Release all clamping screws evenly one after the other and unscrew them.
- Screw the clamping screws into the forcing threads of the front pressure ring (component 1) (see illustration 7).
- Tighten the clamping screws evenly crosswise by ¼ revolution. Increase the forcing torque stepwise until the front pressure ring (component 1) and the external ring (component 3) are separated.
- Screw the clamping screws into the forcing threads of the external ring (component 3) (see illustration 6).
- Tighten the clamping screws evenly crosswise by ¼ revolution. Increase the forcing torque stepwise until the back pressure ring (component 2) and the external ring (component 3) are separated.
- Remove the unscrewed clamping set between shaft and hub.

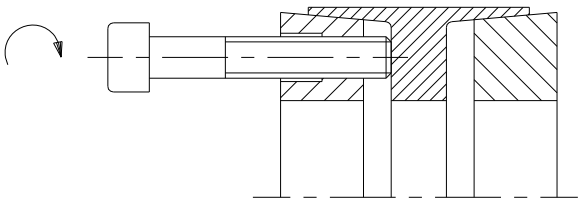

Illustration 7: disassembly of the front pressure ring

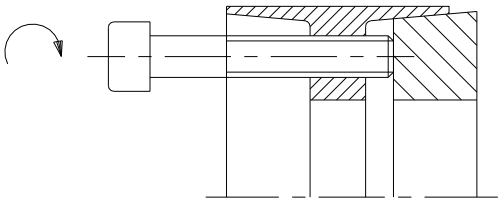

Illustration 8: disassembly of the back pressure ring

! **C A U T I O N !**
If this advice is not observed or the operating conditions are not considered with the selection of the clamping set the functional efficiency of the clamping set may be affected.

<u>Disposal of waste:</u> ***Defective clamping sets must be cleaned and scrapped.***

4 Assembly

4.5 Spares inventory, customer service addresses

A stock of clamping sets at the site of operation is a basic condition to ensure the operational readiness of the drive components.

Contact addresses of the KTR partners for spare parts and orders can be obtained from the KTR homepage at www.ktr.com.

5 Advice for the use in explosive applications according to ATEX 95

For the use in explosive applications the type and size of clamping set (applying for category 3 only) has to be selected in a way that starting from the peak torque of the machine including all operating parameters to the rated torque of the clamping set there is a service factor of at least s = 2.

CLAMPEX® clamping sets are not part of the standard 94/9/EG, since

- this product is a torsionally rigid, backlash-free, frictionally engaged connection with one or more taper clamping ring(s) by means of several screws.
  (Clamping screws have to be secured, e. g. by means of a medium strength adhesive).
- due to the design of clamping sets a fracture/failure does not have to be expected (frictional heat is only caused by improper assembly/tightening torques, i. e. not in case of proper use).