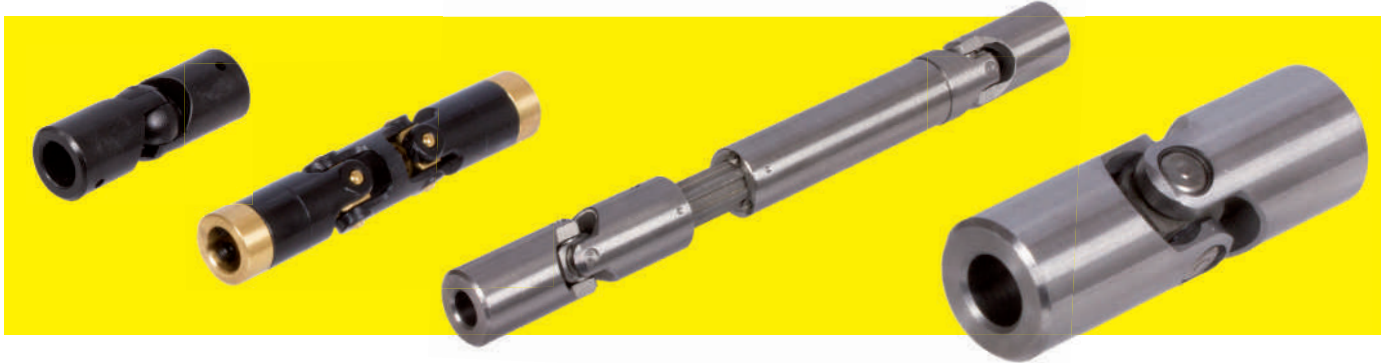
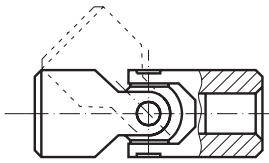


Overview Universal Joints

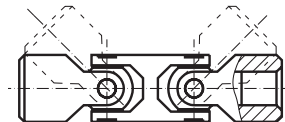


Single Universal Joints



Type	Material	Bearings	Bores mm	Torques* max. Nm	Speeds* max. min ⁻¹	Page
UKM	Plastic	Plain bearings	2 - 10	0,11 - 1,6	1000	406
GF	Plastic	Plain bearings	8 - 16	5 - 22	1000	405
KE	Steel	Plain bearings	0 - 40	2 - 550	1000	412
WEL	Steel	Plain bearings	6 - 30	6,6 - 430	800	408
RW	Steel	Plain bearings	6 - 45	6 - 820	500	413
WE	Steel	Plain bearings , hardened	6 - 40	7 - 504	800	409
WEN	Steel	Needle bearings, hardened	8 - 40	5,8 - 365	4000	410
WER	Stainless Steel 	Plain bearings	6 - 30	3,5 - 250	800	411

Double Universal Joints



Type	Material	Bearings	Bores mm	Torques* max. Nm	Speeds* max. min ⁻¹	Page
UKD	Plastic	Plain bearings	3 - 10	0,08 - 10	1000	406
WDL	Steel	Plain bearings	6 - 30	5,9 - 380	800	408
WD	Steel	Plain bearings , hardened	6 - 40	6,3 - 453	800	409
WDN	Steel	Needle bearings, hardened	10 - 40	19,8 - 328	4000	410
WDR	Stainless Steel 	Plain bearings	12 - 30	3,2 - 225	800	411

Telescopic Double Universal Joints



Type	Material	Bearings	Bores mm	Torques* max. Nm	Speeds* max. min ⁻¹	Page
UW	Plastic	Plain bearings	2 - 20	0,36 - 10,7	800	407
LW	Steel	Plain bearings	6 - 45	16 - 820	500	413
PW	Steel	Plain bearings , hardened	10 - 30	25 - 432	800	414
PWN	Steel	Needle bearings, hardened	10 - 35	20 - 293	4000	414
PWR	Stainless Steel 	Plain bearings	10 - 25	13 - 192	800	415

* The max. permissible speeds can differ for each size.
The max. permissible torques depend on the speed and working angle.
See details and notes on the product pages.

Belows Page 415



Universal Joints, General Information

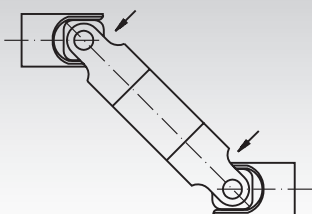
Universal joints and universal shafts are today, and will be in future, absolutely essential and versatile components for transferring rotary motion and transmitting torque from the driving to the driven unit.

If two shafts set at a certain angle are connected using a single universal joint and one shaft turns with constant velocity, the other shaft will move irregularly. This non-uniformity – also called gimbal error – means that angle of rotation of the second shaft slightly lags behind or leads the movement of the first shaft, with kind of sinus-shaped variations. The greater the oper-

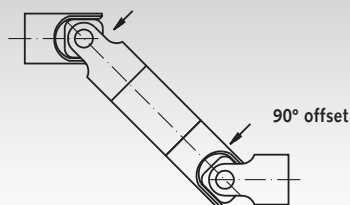
ating angle α , the greater the non-uniformity in motion of the second shaft.

Thus single universal joints are only used in applications where non-uniformity of rotation is acceptable. This non-uniformity can be compensated by either using two single universal joints in sequence – thus forming a universal shaft – or by using a double universal joint. When properly installed, the second universal joint can compensate the non-uniform rotation of the first universal joint, that is under the following preconditions, as described in DIN 808:

1. **Correct yoke orientation:** when two single universal joints are used, please make sure that the yokes of the inbound joints, or brackets for the bracket-version, are properly aligned – as for double universal joints.

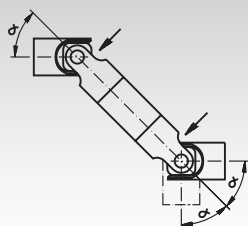


CORRECT: yoke orientation properly aligned

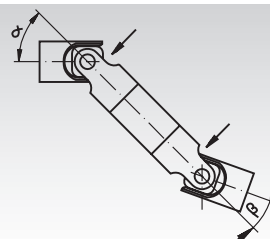


INCORRECT: yoke orientation offset by 90°

2. **The operating angle must be the same at both ends.**

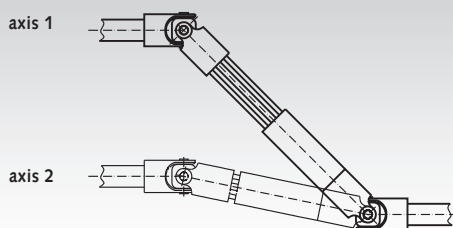


CORRECT : angle α is the same everywhere

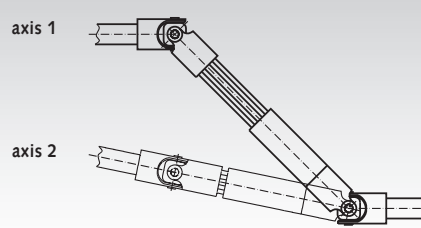


INCORRECT: angle α and β are different

3. **When position of driving and driven shaft is changed, they must always be moved in parallel.**

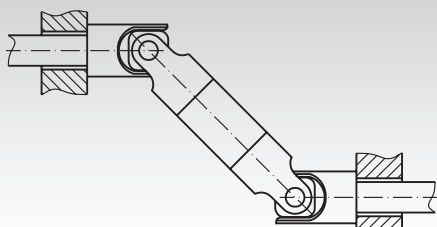


CORRECT : axis 1 is parallel to axis 2

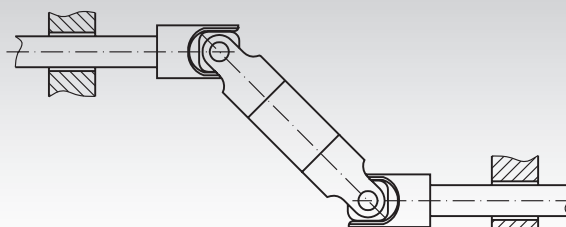


INCORRECT: axis 1 is not parallel to axis 2

4. **The universal-joint shaft – or the double universal joint – should be supported as close as possible to the universal joints.**



CORRECT : bearing positioned as close as possible



INCORRECT: bearing positioned is too far off the joint

The universal joints are supplied without pinholes and split pins. The length of the split pin is determined by the outer diameter of the universal joint, i.e. the pin must be flush when inserted.

We recommend Split Pins accord. to DIN 1481.

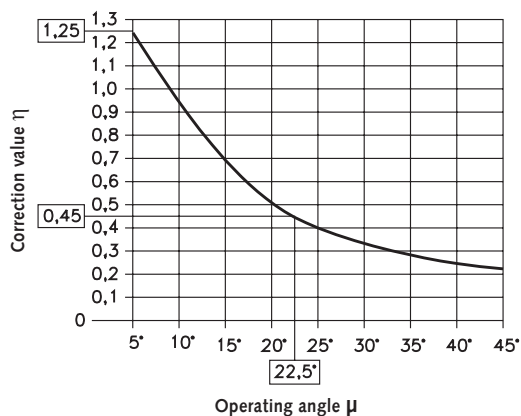
Bore Ø	6	8	10	12	16	20	25	32	40	50
Pin Ø	2	3	4	5	6	8	10	12	14	16

Calculating the Size of the Universal Joint

When selecting the most suitable universal joint, the highest transmittable torque is not the only decisive figure. Other operation conditions such as shock load, angle ratios, speeds etc. also need to be considered. The adjoining diagram therefore helps to determine a first rough sizing for the universal joint, and shows the respective reference values.

The respective reference value for smaller operating angles under 10°, between 0° and 5°, is 25% higher.

For larger operating angles above 40° to 45° (maximum) we can only recommend manual operation.



Corrective Values Subject to the Operating Angle.

Lubrication / Maintenance of Universal Joints

Maintenance of universal joints is limited to adequate lubrication, which has to be carried out at intervals (depending on the application). For dusty work environments, universal joints should be protected with bellows. The bellows can be filled with grease. This renders the joints maintenance-free.

Bellows
page 415



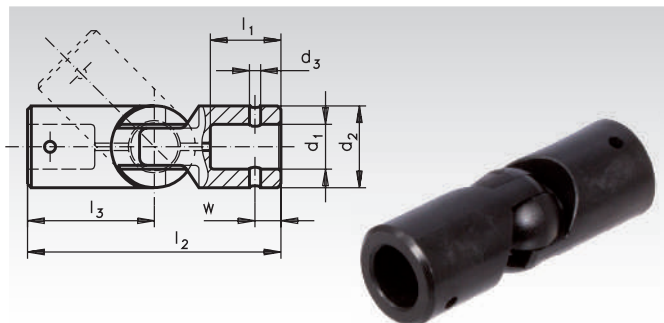
Ball Joints GF made from Plastic

Material: Acetal, glass-fibre reinforced.

Temperature range: -30°C to +50°C.

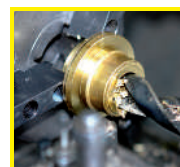
Max. operating angle 35°. Dimensions according to DIN 808.

For the joining, taper pins, dowel pins or grooved pins can be used. The joints are maintenance-free and can therefore be used in difficult-to-access parts of the machine. Other advantages compared to steel are less weight, corrosion resistance and chemical resistance.



Ordering Details: e.g.: Product No. 631 416 00, Ball joint GF, 8 mm bore

Product No.	Torque max. Nm	d ₁ mm	d ₂ mm	d ₃ mm	l ₁ mm	l ₂ mm	l ₃ mm	w mm	Speed at Operating Angle 10° max.	Weight g
631 416 00	5	8±0,04	16±0,2	3±0,1	10,5	40	20	4-0,1	1.000 min ⁻¹	9
631 420 00	15	12±0,05	20±0,2	3±0,1	17	62	31	6-0,1	1.000 min ⁻¹	18
631 425 00	22	16±0,05	25±0,2	6±0,1	20,5	74	37	10-0,1	1.000 min ⁻¹	35



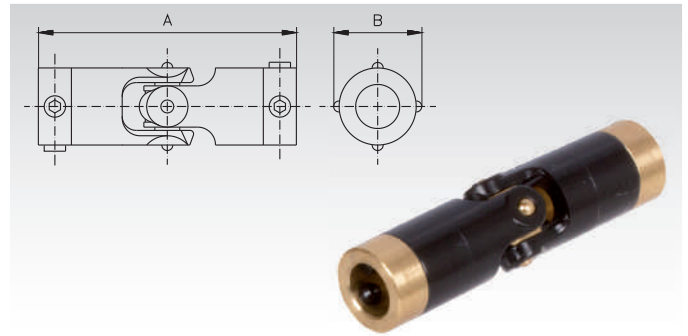
Reworking within 24h-service possible. Custom made parts on request.

Cardan Joints UKM made from Plastic

Material: Plastic acetal-homopolymer with metal caps worked into the ends. Metal caps and crosspiece made from brass.

Max. operating angle 45°.

These cardan joints are fixed on the shafts with Allen screws.



Ordering Details: e.g.: Product No. 630 230 00, Cardan Joint UKM, 2 mm bore

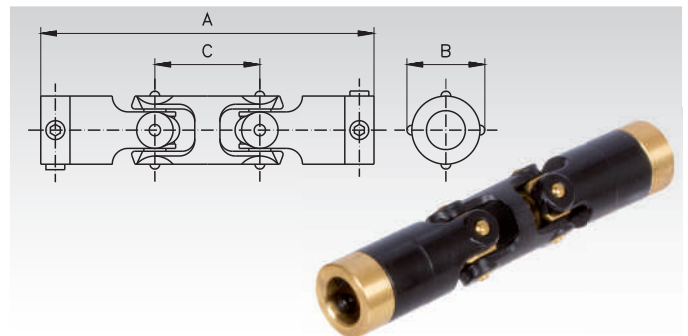
Product No.	Torque Nm	Bore ^{+0,03} mm	Bore depth mm	A mm	B mm	Weight g
630 230 00	0,11	2	9,3	27,2	7,1	3
630 231 00	0,11	3	9,3	27,2	7,1	3
630 234 00	0,36	3	13,1	37,6	11,1	8,5
630 235 00	0,36	4	13,1	37,6	11,1	8,5
630 239 00	0,85	4	15,7	46,2	14,3	17
630 240 00	0,85	6	15,7	46,2	14,3	17
630 243 00	1,6	6	22,3	67,6	17,5	34
630 244 00	1,6	8	22,3	67,6	17,5	34
630 245 00	1,6	10	22,3	67,6	17,5	34

Double Cardan Joints UKD made from Plastic

Material: Plastic acetal-homopolymer with metal caps worked into the ends. Metal caps and crosspiece made from brass.

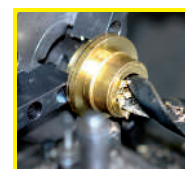
Max. operating angle 45°.

These cardan joints are fixed on the shafts with Allen screws.



Ordering Details: e.g.: Product No. 630 331 00, Cardan Joint UKD, 3 mm bore

Product No.	Torque Nm	Bore ^{+0,03} mm	Bore depth mm	A mm	B mm	C mm	Weight g
630 331 00	0,08	3	9,3	35,3	7,1	8,1	3,5
630 334 00	0,16	3	13,1	50,8	11,1	13,2	11,1
630 335 00	0,16	4	13,1	50,8	11,1	13,2	11,1
630 336 00	0,16	5	13,1	50,8	11,1	13,2	11,1
630 339 00	0,59	4	15,7	62,1	14,3	15,9	21,6
630 340 00	0,59	6	15,7	62,1	14,3	15,9	21,6
630 343 00	1,3	6	22,3	89,8	17,5	22,2	42,4
630 344 00	1,3	8	22,3	89,8	17,5	22,2	42,4
630 345 00	1,3	10	22,3	89,8	17,5	22,2	42,4



**Reworking within
24h-service possible.
Custom made parts
on request.**

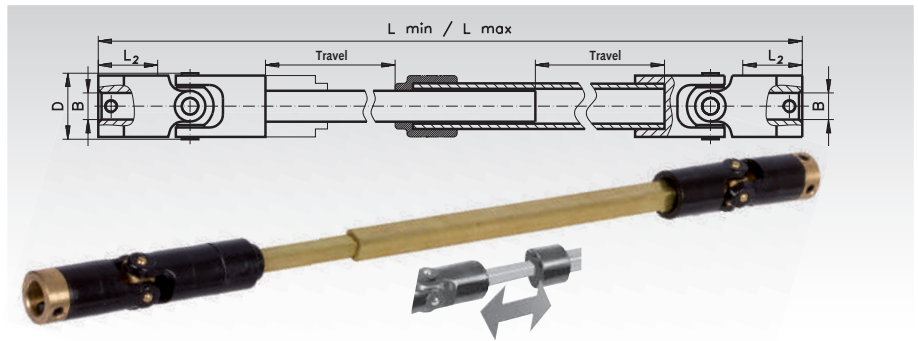
Telescopic Universal-Joint Shafts UW Made from Plastic and Brass

Material: Acetal (black).

Cross-pieces: Brass.

Joint faces are fitted with brass inserts, with 2 set screws per hub.

Temperature range: -20 °C to + 60 °C.



Ordering Details: e.g.: Product No. 630 811 00,
Telescopic Universal-Joint Shaft UW, 5 mm Bore

Product-No.	B+0,03** mm	D+/-1 mm	L min. mm	L max. mm	Travel mm	L ₂ mm	Peak Torque Nm*	Weight g
630 811 00 ¹⁾	5,00	11,1	240	389	149	13,1	0,36	36
630 814 00 ¹⁾	5,00	14,3	300	484	184	15,7	0,85	58
630 817 00 ¹⁾	10,00	17,5	450	730	280	22,3	1,60	168
630 823 00 ²⁾	10,00	23,0	464	745	281	17,0	2,80	241
630 828 00 ²⁾	12,70	28,5	500	784	284	20,0	5,60	457
630 836 00 ²⁾	20,00	36,5	564	868	304	21,0	10,70	827

* The stated peak torque refers to Lmin. (telescope retracted).

The max. torque for extended telescope has to be determined empirically and subject to the respective application.

** Bore-reducing bushes see below.

¹⁾ Joint faces fitted with brass inserts with 2 set screws per hub.

²⁾ Joints only fitted with metal inserts, without set screws.

Note

Telescopic universal-joint shafts (teleshafts) made from plastic and brass are practical if the distance between driving and driven unit varies during operation, or if changes in components need to be compensated or if, simply, fast disconnection of a drive unit is required.

These teleshafts are designed for light duty. Precisely-drawn, square brass tubes, which can easily be shortened, serve as

means of transmission. The profiled parts eliminate any torsional play which may occur inside the bushes due to tolerances. To shorten the teleshafts, please always cut off the same length on either side.

Bore-Reducing Bushes for Further Bores at Telescopic Universal-Joint Shafts, Product No. 630 811 00 to 630 836 00

Material:

Product No. 622 302 05 up to 622 304 05 made from brass.

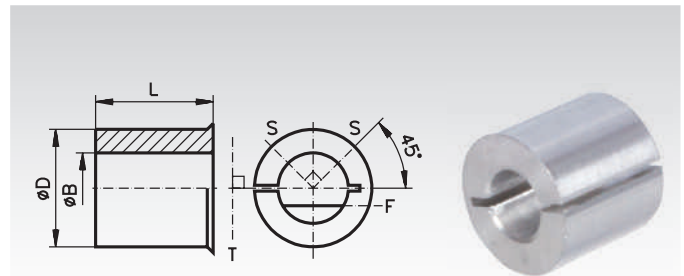
Product No. 622 303 05 up to 622 318 20 made from aluminium.

To guarantee an optimum shaft-hub connection, the bore-reducing bush should be used as follows:

"S" indicates the adjusting screw inside the adjusting-screw hub.

"T" indicates tangential attachment screws for the clamping hub.

"F" indicates the recommended positioning of the flattened shaft with adjusting-screw hubs.



Ordering Details: e.g.: Product No. 622 302 05, Bore-Reducing Bush, 2 mm Bore

Product No.	Matching Universal-Joint Shafts	Bore B+0,03 mm	L mm	D mm	Weight g	Product No.	Matching Universal-Joint Shafts	Bore B+0,03 mm	L mm	D mm	Weight g
622 302 05	630 811 00	2	4,3	5	1	622 305 12	630 828 00	5	10,7	12,7	3
622 303 05	630 811 00	3	4,3	5	1	622 306 12	630 828 00	6	10,7	12,7	3
622 304 05	630 811 00	4	4,3	5	1	622 308 12	630 828 00	8	10,7	12,7	3
622 303 05	630 814 00	3	4,3	5	1	622 309 12	630 828 00	9	10,7	12,7	3
622 304 05	630 814 00	4	4,3	5	1	622 310 12	630 828 00	10	10,7	12,7	3
622 304 10	630 817 00	4	8,1	10	1	622 310 20	630 836 00	10	20	20	6
622 305 10	630 817 00	5	8,1	10	1	622 312 20	630 836 00	12	20	20	6
622 306 10	630 817 00	6	8,1	10	1	622 314 20	630 836 00	14	20	20	6
622 308 10	630 817 00	8	8,1	10	1	622 315 20	630 836 00	15	20	20	6
622 304 10	630 823 00	4	8,1	10	1	622 316 20	630 836 00	16	20	20	6
622 305 10	630 823 00	5	8,1	10	1	622 318 20	630 836 00	18	20	20	6
622 306 10	630 823 00	6	8,1	10	1						
622 308 10	630 823 00	8	8,1	10	1						

Please note that concentricity and constant velocity can be influenced by mounted bushes. To achieve the best possible performance, we recommend using shafts of tolerance class h6. Undersized shafts are less effective. For the same reason we would

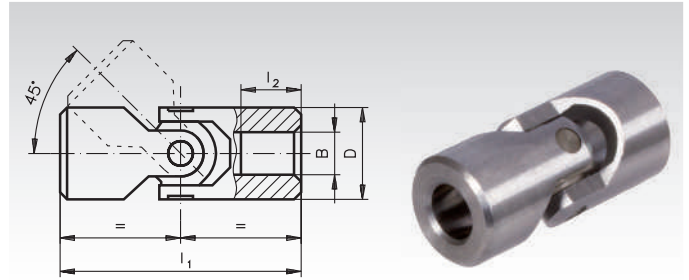
not recommend using flattened shafts with more than 1/4 of the diameter removed.

Single Universal Joints WEL Similar to DIN 808

Material: Steel.

Max. Operating Angle 45°.

These low-price, single universal joints are especially suited for manual operation at low torques. As the contact surfaces are not hardened/ground, they can only be used at high speeds for short intervals.



Ordering Details: e.g.: Product No. 630 613 00, Universal Joint WEL, 6 mm Bore

Product No.	BH7 mm	D mm	l ₁ mm	l ₂ mm	permissible max. Torques in Nm* at different Speeds							Weight kg
					100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹	
630 613 00	6	13	40	13	6,6	6	5,3	4,8	4,4	-	-	0,03
630 616 00	8	16	40	10	13	9	8	7	6	5,2	4,7	0,04
630 620 00	10	20	45	10	25	17	15	12	11	10	7	0,08
630 625 00	12	25	50	11	45	25	21	16	14	11	9	0,14
630 629 00	14	29	56	13	70	45	40	33	30	26	22	0,20
630 632 00	16	32	65	15	88	85	72	55	50	43	34	0,29
630 637 00	18	37	72	17	160	120	100	68	58	54	-	0,44
630 640 00	20	40	82	19	240	170	120	90	80	72	-	0,57
630 647 00	22	47	95	22	300	200	150	110	93	-	-	0,93
630 650 00	25	50	108	27	390	250	180	140	115	-	-	1,19
630 658 00	30	58	122	30	430	330	200	150	128	-	-	1,72

* Only for short intervals.

Bellows

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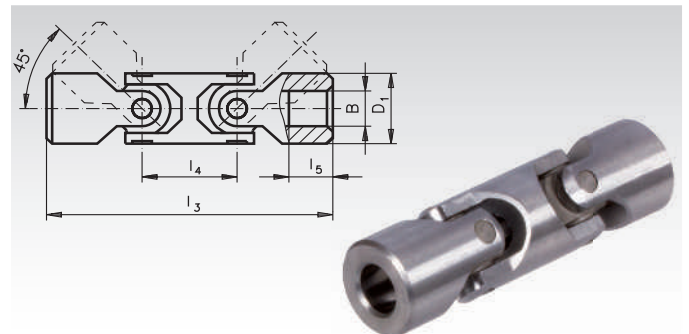


Double Universal Joints WDL Similar to DIN 808

Material: Steel.

Max. Operating Angle 90°.

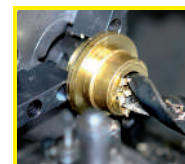
These low-price, single universal joints are especially suited for manual operation at low torques. As the contact surfaces are not hardened/ground, they can be only used at high speeds for short intervals.



Ordering Details: e.g.: Product No. 630 713 00, Universal Joint WDL, 6 mm Bore

Product No.	BH7 mm	D ₁ mm	l ₃ mm	l ₄ mm	l ₅ mm	permissible max. Torques in Nm* at different Speeds							Weight kg
						100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹	
630 713 00	6	13	63	23	13	5,9	5,4	4,8	4,3	3,9	-	-	0,07
630 716 00	8	16	67	27	10	11	8,1	7,2	6,3	5,4	4,7	4,2	0,07
630 720 00	10	20	74	29	10	22	15	13	11	9,9	9	6,3	0,08
630 722 00	12	22	74	29	11	40	22	19	14	12	10	8,1	0,13
630 725 00	14	25	85	33	13	63	40	36	29	27	23	20	0,19
630 729 00	16	29	100	35	19	79	76	64	49	45	38	30	0,31
630 732 00	18	32	112	39	20	144	108	90	61	52	48	-	0,44
630 740 00	20	40	128	46	19	216	153	108	81	72	64	-	0,82
630 741 00	22	40	145	46	25	270	180	135	99	83	-	-	0,94
630 750 00	25	50	163	59	24	350	225	160	126	103	-	-	1,56
630 758 00	30	58	182	66	30	380	295	180	135	115	-	-	2,43

* Only for short intervals.



**Reworking within
24h-service possible.
Custom made parts
on request.**

Precision Universal Joints Similar to DIN 808

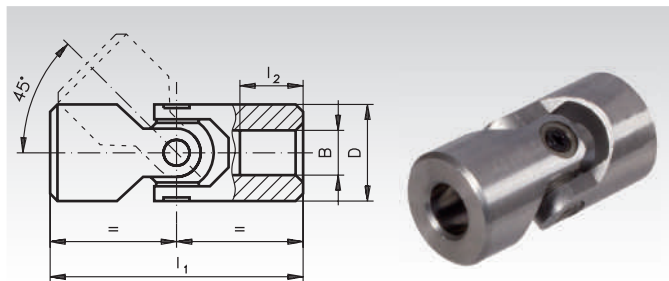
These single and double universal joints feature a simple design with very small tolerances and high precision and performance. A special grinding process realizes a perfect parallelism of the axes and the single parts of the joints - this guarantees an

extremely long service life. All contact surfaces are hardened, ground and lapped. These universal joints are used at high torques and high speeds up to max. 800 min⁻¹.

Single Precision Universal Joints WE Similar to DIN 808

Material: Steel 35SMnPb10, Bearing Parts 18NiCrMo5Pb.
Contact surfaces hardened, ground and lapped.

Max. Operating Angle 45°.



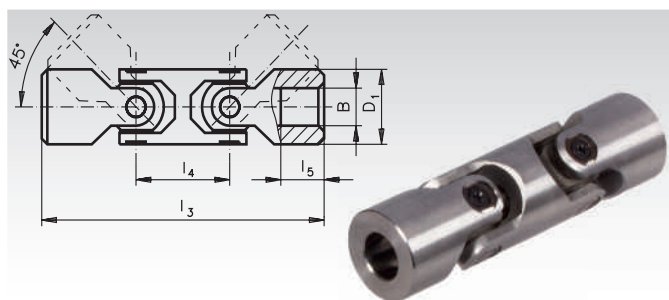
Ordering Details: e.g.: Product No. 631 215 00, Universal Joint WE, 6 mm Bore

Product No.	BH7 mm	D mm	l ₁ mm	l ₂ mm	permissible max. Torques in Nm at different Speeds							Weight kg
					100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹	
631 215 00	6	16	34	9	7	6,5	6,0	5,5	5,0	-	-	0,04
631 216 00	8	16	40	11	14	10	9,5	8,0	7,0	6,0	5,4	0,04
631 218 00	8	18	40	11	16	11	11	9	7,9	6,8	6,1	0,07
631 220 00	10	22	45	10	25	17	15	13	12	11	7,5	0,09
631 222 00	10	22	48	12	25	17	15	13	12	11	7,5	0,10
631 226 00	12	25	50	11	43	25	21	17	16	13	12	0,20
631 227 00	12	26	56	13	43	25	21	17	16	13	12	0,16
631 229 00	14	29	56	13	69	43	40	36	34	29	27	0,18
631 230 00	14	29	60	17	69	43	40	36	34	29	27	0,21
631 232 00	16	32	65	15	87	84	72	58	52	41	36	0,33
631 233 00	16	32	68	18	87	84	72	58	52	41	36	0,34
631 237 00	18	37	72	17	156	120	96	72	60	48	-	0,39
631 238 00	18	37	74	18	156	120	96	72	60	48	-	0,42
631 240 00	20	40	82	19	240	168	120	96	84	60	-	0,54
631 242 00	20	42	82	19	252	176	126	101	88	63	-	0,62
631 247 00	22	47	95	22	300	192	144	120	96	72	-	0,86
631 250 00	25	50	108	26	384	240	168	144	120	96	-	1,06
631 252 00	25	52	105	26	400	250	175	150	125	-	-	1,31
631 258 00	30	58	122	30	432	264	192	156	132	-	-	1,67
631 270 00	35	70	140	35	456	300	228	174	144	-	-	2,76
631 280 00	40	80	160	42	504	336	264	216	-	-	-	4,28

Double Precision Universal Joints WD Similar to DIN 808

Material: Steel 35SMnPb10, Bearing Parts 18NiCrMo5Pb.
Contact surfaces hardened, ground and lapped.

Max. Operating Angle 90°.



Ordering Details: e.g.: Product No 631 715 00, Universal Joint WD, 6 mm Bore

Product No.	BH7 mm	D ₁ mm	l ₃ mm	l ₄ mm	l ₅ mm	permissible max. Torques in Nm at different Speeds							Weight kg
						100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹	
631 715 00	6	16	61	27	- *	6,3	5,8	5,4	4,9	4,5	-	-	0,07
631 716 00	8	16	67	27	- *	12,6	9	8,5	7,2	6,3	5,4	4,8	0,07
631 720 00	10	20	75	30	- *	22	15,3	13	11,7	10,8	9,9	6,7	0,08
631 726 00	12	22	74	29	11	38	22	18	15	13	11	10	0,13
631 729 00	14	25	85	33	13	61	38	35	32	30	25	23	0,19
631 732 00	16	29	100	35	19	77	75	64	51	46	36	32	0,31
631 737 00	18	32	112	39	20	140	108	86	64	54	43	-	0,44
631 740 00	20	40	128	46	19	216	151	108	86	75	54	-	0,82
631 747 00	22	40	145	48	25	270	172	129	108	86	64	-	0,94
631 750 00	25	50	163	59	24	345	216	151	129	108	86	-	1,56
631 758 00	30	58	182	66	28	388	237	172	140	118	-	-	2,43
631 770 00	35	70	212	78	32	410	270	205	156	129	-	-	4,01
631 780 00	40	80	245	95	38	453	203	237	194	-	-	-	6,55

* Through-bore.

Precision Needle-Bearing Universal Joints DIN 808

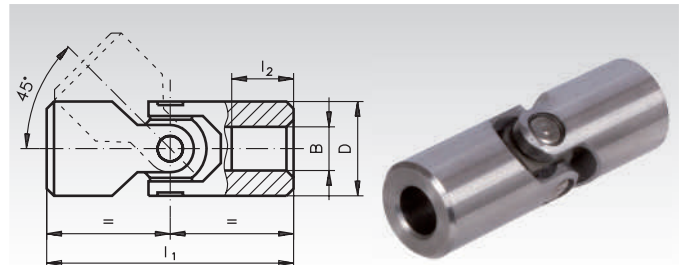
The needle-bearing universal joints have almost zero backlash, high accuracy and good turning properties. These special needle-rollers without cage can take high loads even at large operating angles. A special grinding process realizes a perfect parallelism of

the axes and the single parts of the joints - which guarantees an extremely long service life.

Single, Precision Universal Joints WEN with Needle-Roller Bearings, DIN 808

Material: Steel 35SMnPb10, Bearing Parts 18NiCrMo5Pb.

Max. Operating Angle 45°.



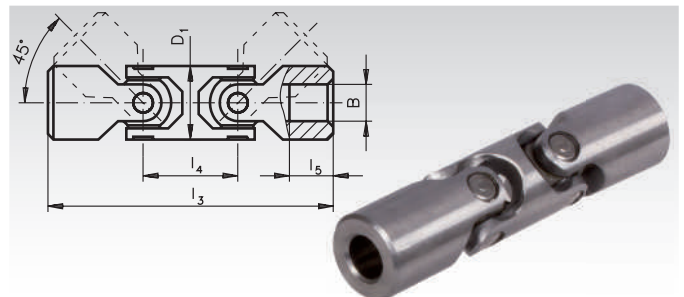
Ordering Details: e.g.: Product No. 631 116 00, Precision, Universal Joint WEN, 8 mm Bore

Product No.	BH7 mm	D mm	l ₁ mm	l ₂ mm	permissible max. Torques in Nm at different Speeds						Weight kg
					250 min ⁻¹	500 min ⁻¹	1000 min ⁻¹	2000 min ⁻¹	3000 min ⁻¹	4000 min ⁻¹	
631 116 00	8	16	52	15	5,8	5,8	5,8	5,8	-	-	0,05
631 122 00	10	20	62	18	22	17	14	11	10	9	0,10
631 126 00	14	25	74	20	34	29	24	22	20	18	0,18
631 132 00	16	32	86	24	65	55	45	40	37	32	0,33
631 137 00	18	37	72	17	75	61	50	45	40	36	0,40
631 140 00	20	40	108	30	140	120	100	80	70	65	0,71
631 150 00	25	50	132	38	200	170	130	110	90	85	1,33
631 163 00	30	63	166	45	300	270	230	190	160	140	2,78
631 170 00	35	70	140	35	326	277	237	198	168	-	2,75
631 180 00	40	80	180	50	365	303	255	205	186	-	4,93

Double, Precision Universal Joints WDN with Needle-Roller Bearings, DIN 808

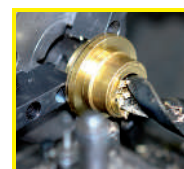
Material: Steel 35SMnPb10, Bearing Parts 18NiCrMo5Pb.

Max. Operating Angle 90°.



Ordering Details: e.g.: Product No. 631 620 00, Precision Universal Joint WDN, 10 mm Bore

Product No.	BH7 mm	D ₁ mm	l ₃ mm	l ₄ mm	l ₅ mm	Permissible Max. Torques in Nm at different Speeds						Weight kg
						250 min ⁻¹	500 min ⁻¹	1000 min ⁻¹	2000 min ⁻¹	3000 min ⁻¹	4000 min ⁻¹	
631 620 00	10	20	88	26	18	19,8	15,3	12,6	9,9	9	8	0,14
631 626 00	14	25	104	33	20	30	26	21	19	18	16	0,24
631 632 00	16	32	124	38	24	58	49	40	35	33	28	0,52
631 640 00	20	40	156	48	30	125	108	90	70	63	58	1,01
631 650 00	25	50	188	56	38	180	150	117	95	80	75	1,63
631 663 00	30	63	238	80	42	270	240	207	170	140	125	3,90
631 670 00	35	70	212	78	30	293	249	213	178	151	-	4,08
631 680 00	40	80	290	120	48	328	272,7	229,5	184,5	167,4	-	7,96



**Reworking within
24h-service possible.
Custom made parts
on request.**

Precision Universal Joints Similar to DIN 808 Stainless Steel 1.4301 (X5CrNi1810)

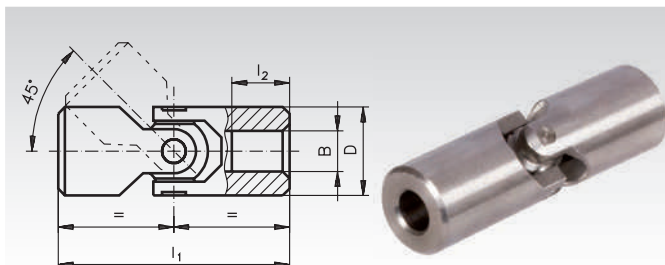
These single and double universal joints feature a simple design with very small tolerances and high precision and performance. These universal joints can be used at speeds up to max. 800 min⁻¹. The torques of the stainless precision universal joints amount less of the standard steel version.

At an operating angle of 45° only manual operation is possible.

Single Precision Universal Joints WER Similar to DIN 808, Stainless

Material: Stainless steel 1.4301.

Max. Operating Angle 45°.



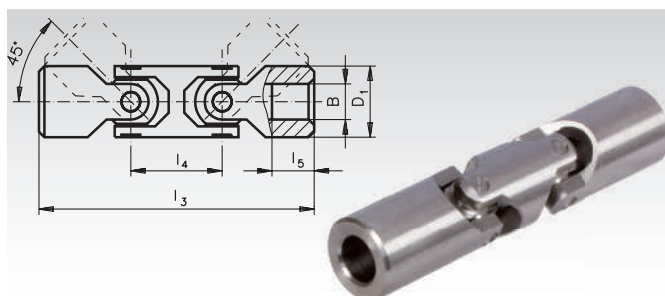
Ordering Details: e.g.: Product No. 631 992 15, Universal Joint WER, 6 mm Bore

Product-Nr.	BH7 mm	D mm	l ₁ mm	l ₂ mm	permissible max. Torques in Nm at different Speeds							Weight kg
					100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹	
631 992 15	6	13	50	18	3,5	3,3	3,0	2,8	2,5	-	-	0,04
631 992 16	8	16	58	19	7,0	5,0	4,8	4,0	3,5	3,0	2,7	0,06
631 992 20	10	22	76	25	12,5	8,5	7,3	6,5	6,0	5,5	3,8	0,13
631 992 26	12	25	86	29	21,5	12,5	10,3	8,5	7,8	6,5	6,0	0,23
631 992 29	14	29	90	30	34,3	21,5	19,8	18,0	16,8	14,3	13,3	0,33
631 992 32	16	32	95	30	43,3	42	36	28,8	25,8	20,5	18,0	0,42
631 992 37	18	37	108	35	78	60	48	36	30	29	-	0,65
631 992 40	20	40	108	32	120	84	60	48	42	30	-	0,75
631 992 47	22	47	127	38	150	96	72	60	48	36	-	1,26
631 992 50	25	50	140	44	192	120	84	72	60	48	-	1,52
631 992 57	30	58	178	58	216	132	96	78	66	-	-	2,60

Double Precision Universal Joints WDR Similar to DIN 808, Stainless

Material: Stainless steel 1.4301.

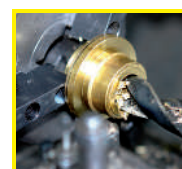
Max. Operating Angle 90°.



Ordering Details: e.g.: Product No. 631 997 26, Universal Joint WDR, 12 mm Bore

Product-Nr.	BH7 mm	D ₁ mm	l ₃ mm	l ₄ mm	l ₅ mm	permissible max. Torques in Nm at different Speeds							Weight kg
						100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹	
631 997 26	12	22	105	29	25	11,3	7,7	6,5	5,9	5,4	5,0	3,4	0,20
631 997 29	14	25	119	33	29	19,4	11,3	9,2	7,7	7,0	5,9	5,4	0,30
631 997 32	16	29	125	35	30	30,8	19,4	17,8	16,2	15,1	12,8	11,9	0,43
631 997 37	18	32	134	39	30	38,9	37,8	32,4	25,9	23,2	18,5	16,2	0,56
631 997 40	20	40	154	46	32	70	54	43	32	27	26	-	1,06
631 997 47	22	40	176	46	38	108	76	54	43	38	27	-	1,16
631 997 50	25	50	199	59	44	173	108	76	65	54	43	-	2,16
631 997 57	30	58	244	66	58	194	119	86	70	59	-	-	3,48

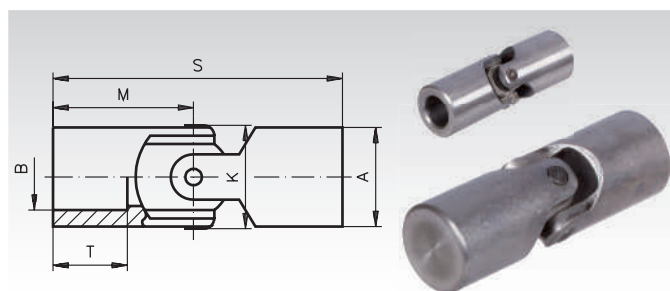
Bellows
page 415



**Reworking within
24h-service possible.
Custom made parts
on request.**

Cardan Joints KE According to the Old Standard DIN 7551 Similar to DIN 808 with and without Bore

Material: Steel C 45.
Max. Operating Angle 45°.



Ordering Details: e.g.: Product No. 630 110 00, Cardan Joint KE, 6 mm Bore

Product No. with Bore B	Product No. without Bore	Torque max. Nm	BH7 mm	A mm	S±1 mm	M mm	T mm	K mm	Weight	
									with Bore kg	without Bore kg
630 110 00	630 010 00	2	6	10	40	20	12	10,5	0,014	0,020
630 113 00	630 013 00	6	8	13	42	21	12	14	0,024	0,035
630 116 00	630 016 00	8	10	16	52	26	15	17,5	0,047	0,067
630 120 00	630 020 00	20	12	20	62	31	18	21,5	0,089	0,138
630 125 00	630 025 00	30	16	25	74	37	22	26,5	0,160	0,230
630 132 00	630 032 00	60	20	32	86	43	25	33,5	0,310	0,440
630 140 00	630 040 00	160	25	40	108	54	32	42	0,625	0,880
630 150 00	630 050 00	290	32	50	132	66	40	52,5	1,200	1,710
630 163 00	630 063 00	550	40	63	166	83	50	64	2,400	3,070

The cardan joints KE are, other than the cardan joints with needle-roller bearing, only sliding-contact bearings. Their scope of application is therefore limited to slow running drives. The respective maximum speeds depend on operating angle and load, but must never exceed 1000 min⁻¹. The maximum torque values listed in the table are limits, which must neither be exceeded. They may only be used to their full extend with intermittent operation or at low speed.

The following limit applies:

The product of speed (min⁻¹) x working angle (degrees) may not exceed the reference number 500. This means, e.g., for a working angle of 10 degrees a max. speed of 50 min⁻¹. If, however, the maximum torque is not taken to the limit, speed and working angle can be larger. At 0.5 x max. torque applies: speed x working angle, smaller or equal 4.000. In case of doubt choose larger joint.

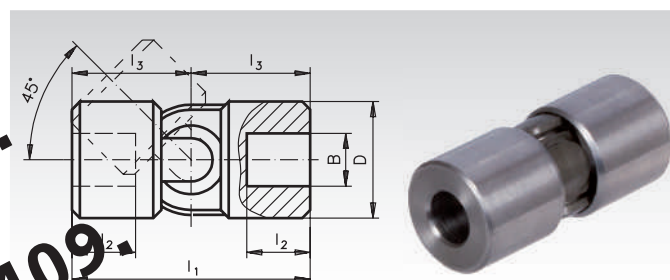
At continuous operation the cardan joints need to be sufficiently lubricated. If no drip-feed lubrication is possible (drip-feed lubricators see page 582)), lubricate the joints at least once a day. Another possibility is to cover the joints with a bellow, filled with a suitable lubricant.

Precision Single Universal Joints AR DIN 808

Material: Steel 11SMnPb30.

Max. Operating Angle 45°.

In their connecting dimensions, these universal joints comply with DIN 808. Their load capacity surpasses the performance required according to the DIN standard. The constructive features indicate that with extreme loads, e.g., shock or vibration loads, these joints should not be used.



Ordering Details: e.g.: Product No. 631 016 00, Universal Joint AR, 6 mm Bore

Product No.	norm. Bore max. Bore		D mm	l1 mm	l2 mm	l3 mm	Weight kg	permissible max. Torques in Nm at different Speeds							
	BH7 mm	mm						100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹	
631 016 00	6	6	16	34	19	17	0,06	7	7,5	6	5,5	5	-	-	
631 019 00	8	8	18	40	11	20	0,07	14	10	9,5	8	7	6	5,4	
631 022 00	10	10	22	48	12	24	0,10	21	14	12	11	10	9	6	
631 026 00	12	12	26	56	16	28	0,16	36	21	17	14	13	11	10	
631 029 00	14	14*	29	60	17	30	0,21	57	36	33	30	28	23,5	22	
631 032 00	16	16*	32	68	20	34	0,30	72	70	60	48	43	34	30	
631 037 00	19	19*	37	74	21	37	0,42	130	100	80	60	50	40	-	
631 042 00	22	22*	42	82	23	41	0,62	200	140	100	80	70	50	-	
631 047 00	25	24*	47	95	25	47,5	0,90	250	160	120	100	80	60	-	
631 052 00	25	27*	52	105	29	52,5	1,31	320	200	140	120	100	80	-	
631 058 00	30	32*	58	122	34	61	1,72	360	220	160	130	110	-	-	

When pin holes are bored, do not bore through brackets. Pin holes can therefore only be positioned between brackets. Feather-key grooves can also only be machined between brackets, i.e. the keyways have to be cut offset by 90° to the brackets.

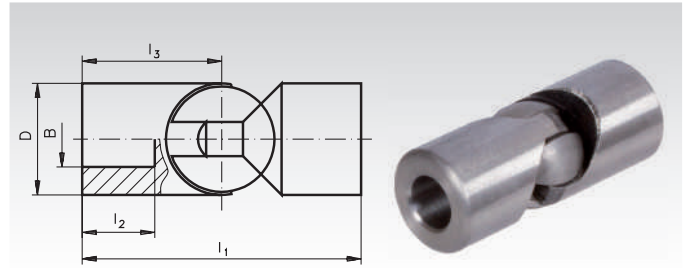
The joints must not be shortened. The outer part of the joints is a thin-walled sleeve, which is pressed onto the carrier and the brackets. This sleeve gives the brackets additional support.

Ball Joints RW

Material: Steel 11SMnPb30K.

Max. Operating Angle 35°.

Temperature range: -70°C to +160°C.



Ordering Details: e.g.: Product No. 631 313 00, Ball Joint RW, 6 mm Bore

Product No.	Torque max. Nm	BH7 mm	D mm	$l_1^{\pm 1}$ mm	l_3 mm	l_2 mm	Weight kg
631 313 00	6	6	13	35	17,5	10	0,03
631 316 00	8	8	16	40	20	10	0,05
631 320 00	20	10	20	50	25	13	0,09
631 324 00	30	12	24	60	30	14	0,14
631 328 00	50	14	28	70	35	17	0,24
631 332 00	60	16	32	80	40	19	0,36
631 336 00	120	18	36	90	45	22	0,52
631 340 00	160	20	40	100	50	24	0,71
631 345 00	200	22	45	110	55	26	1,10
631 350 00	290	25	50	125	62,5	30	1,30
631 355 00	440	30	55	135	67,5	35	1,70
631 360 00	520	35	60	165	82,5	42	2,20
631 365 00	700	40	65	190	95	46	3,00
631 370 00	820	45	70	210	105	52	4,30

Belows
page 415



The ball joints RW are simple, sliding-contact bearing elements and can only be used at low speeds. The respective maximum speeds depend on operating angle and load, but should possibly not exceed 500 min⁻¹. The maximum torque values listed in the table are limits, which must also never be exceeded. They may only be used to their full extend with intermittent operation or at low speed and small operating angle. Can be used from -70° to +160°C.

The following limit applies:

The product of speed (min⁻¹) x working angle (degrees) must not exceed the reference number 500. This means, e.g., for a working angle of 10 degrees a max. speed of 50 min⁻¹. If however the maximum torque is not used to the limit, speed and working angle can be larger. At 0.5 x max. torque applies: speed x working angle, smaller or equal 4.000. In case of doubt choose larger joint. Lubrication see car-dan joints KE page 412.

Slip shafts LW with ball joints

Material: Steel 11SMnPb30K.

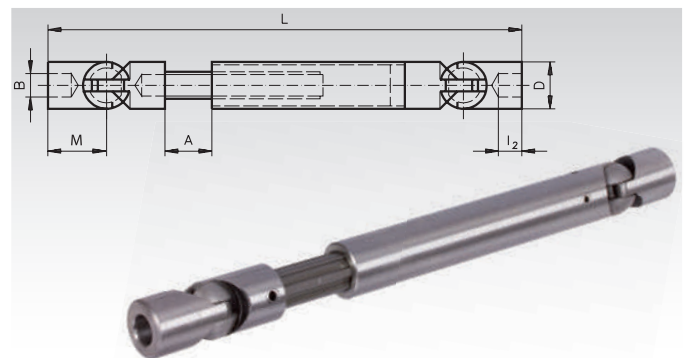
Max. operating angle per joint 35°.

With ball joints RW for power transmission in applications where longitudinal displacement occurs. The variation in length is effected with a multiple-spline shaft. Torques as for ball joints RW.

Other lengths on request.

Temperature range: -70°C to +160°C.

Ordering Details: e.g.: Product No. 631 520 00, Ball-Joint Shaft LW, 10 mm Bore



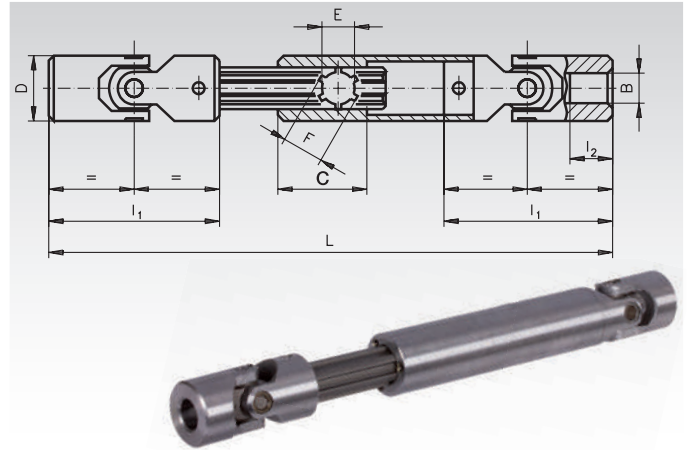
Product No.	Torque max. Nm	BH7 mm	l_2 mm	D mm	L Retracted mm	A mm	M mm	Weight kg	Profile similar DIN ISO 14 z x mm x mm
631 520 00	20	10	13	20	200	70	25	0,50	6 x 11 x 14
631 524 00	30	12	14	24	220	75	30	0,65	6 x 11 x 14
631 528 00	50	14	17	28	250	80	35	0,95	6 x 16 x 20
631 532 00	60	16	19	32	280	90	40	1,38	6 x 16 x 20
631 536 00	120	18	22	36	300	85	45	1,90	6 x 18 x 22
631 540 00	160	20	24	40	350	110	50	2,75	6 x 21 x 25
631 545 00	200	22	26	45	400	140	55	4,00	6 x 21 x 25
631 550 00	290	25	30	50	400	100	62,5	4,80	6 x 28 x 32
631 555 00	440	30	35	55	450	100	67,5	6,70	6 x 28 x 32
631 560 00	520	35	42	60	500	100	82,5	8,90	8 x 36 x 42
631 565 00	700	40	46	65	550	100	95	11,40	8 x 36 x 42
631 570 00	820	45	52	70	630	120	105	15,50	18 x 44 x 52
631 580 00	930	50	58	80	700	140	115	18,00	18 x 50 x 58

Slip shafts with joints PW

Material: Steel 35SMnPb10, Bearing Parts 18NiCrMo5Pb,
Splined shaft C45 cold drawn.

Max. Operating Angle per Joint 45°.

Other lengths on request.



Ordering Details: e.g.: Product No. 631 820 00, slip shaft PW, 10 mm Bore

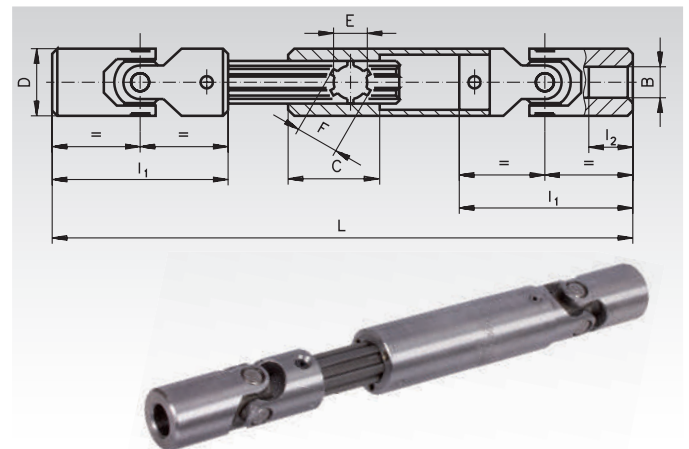
Product No.	Standard size									permissible max. Torques in Nm at different Speeds								Weight kg
	B ^{H7} mm	D mm	I ₁ mm	I ₂ mm	C mm	E mm	F mm	L _{min} mm	L _{max} mm	100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹		
631 820 00	10	22	45	10	40	11	14	170	230	25	17	14,5	13	12	11	7,5	0,37	
631 826 00	12	25	50	11	45	13	16	200	270	43	25	20,5	17	15,5	13	12	0,58	
631 829 00	14	29	56	13	45	13	16	210	280	68,5	43	39,5	36	33,5	28,5	26,5	0,85	
631 832 00	16	32	65	15	45	16	20	250	350	86,5	84	72	57,5	51,5	41	36	1,15	
631 837 00	18	37	72	17	45	16	20	270	370	156	120	96	72	60	48	-	1,56	
631 840 00	20	40	82	19	45	18	22	290	380	240	168	120	96	84	60	-	2,08	
631 847 00	22	47	95	22	48	21	25	330	430	300	192	144	120	96	72	-	3,33	
631 850 00	25	50	108	26	48	23	28	350	450	384	240	168	144	120	96	-	3,79	
631 858 00	30	58	122	30	50	26	32	400	510	432	264	192	156	132	-	-	5,59	

Slip shafts with joints with needle-roller bearings PWN

Material: Steel 35SMnPb10

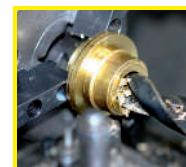
Max. Operating Angle per Joint 45°.

Other lengths on request.



Ordering Details: e.g.: Product No. 631 920 00, slip shaft PWN, 10 mm Bore

Product No.	BH7 mm	D mm	I ₁ mm	I ₂ mm	C mm	E mm	F mm	L _{min} mm	L _{max} mm	permissible max. Torques in Nm at different Speeds						Weight kg
										250 min ⁻¹	500 min ⁻¹	1000 min ⁻¹	2000 min ⁻¹	3000 min ⁻¹	4000 min ⁻¹	
631 920 00	10	20	62	18	40	11	14	170	200	20	15	13	10	9	8	0,33
631 925 00	14	25	74	20	45	13	16	220	270	31	26	22	20	18	16	0,58
631 932 00	16	32	86	24	45	16	20	250	320	59	50	41	36	33	29	1,15
631 937 00	18	37	92	27	45	16	20	270	370	68	55	45	41	36	32	1,56
631 940 00	20	40	108	30	45	18	22	290	360	126	108	90	72	63	59	2,08
631 947 00	22	47	122	33	48	21	25	330	430	146	119	97	79	69	64	3,33
631 950 00	25	50	132	38	48	23	28	350	435	180	153	117	99	81	77	3,79
631 963 00	30	63	166	45	50	32	38	400	490	270	243	207	171	144	126	6,00
631 970 00	35	70	140	35	70	32	38	500	600	293	249	213	178	151	-	10,00



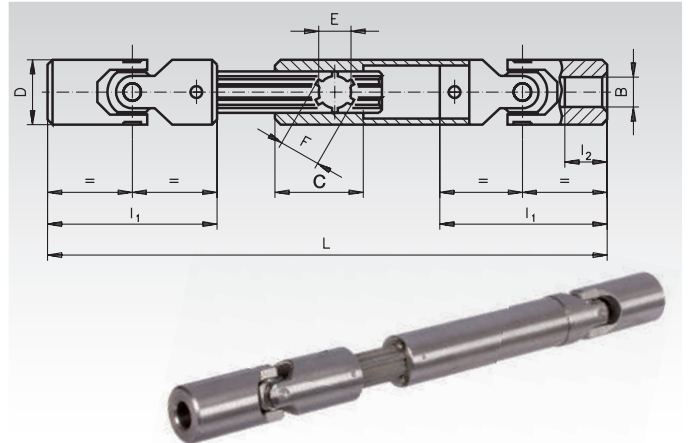
**Reworking within
24h-service possible.
Custom made parts
on request.**

Slip shafts with joints PWR

Material: Stainless steel 1.4301.

Max. operating angle per joint 45°.

Other lengths on request.



Ordering Details: e.g.: Product No. 631 998 20, Slip shaft with joints PWR, bore 10 mm

Product No.	BH7 mm	D mm	I ₁ mm	I ₂ mm	C mm	E mm	F mm	Standard size		permissible max torques in Nm at different Speeds							Weight kg
								L _{min} mm	L _{max} mm	100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹	
631 998 20	10	22	76	25	30	11	14	215	245	12,5	8,5	7	6,5	6	5,5	3,5	0,99
631 998 26	12	25	86	29	35	13	16	240	270	21,5	12,5	10	8,5	7,5	6,5	6	0,76
631 998 29	14	29	90	30	35	13	16	250	280	34	21,5	19,5	18	16,5	14	13	0,92
631 998 32	16	32	95	30	35	16	20	280	330	43	42	36	29	25,5	20,5	18	1,35
631 998 37	18	37	108	35	35	16	20	305	355	78	60	48	36	30	24	-	1,79
631 998 40	20	40	108	32	48	23	28	315	365	120	84	60	48	42	30	-	2,41
631 998 47	22	47	127	38	48	23	28	355	405	150	96	72	60	48	36	-	3,75
631 998 50	25	50	140	44	48	23	28	380	430	192	120	84	72	60	48	-	4,33

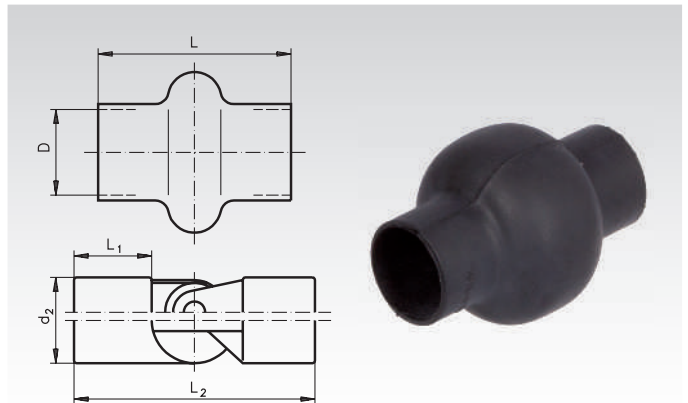
Bellows FSG (black) for Single-Universal Joints

Material: NBR, black. Hardness about 45 Shore A.
Mineral-oil resistant.

Single-fold bellows are used to protect ball and universal joints.

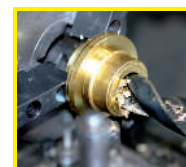
The shaft lengths L₁ and L₂ are estimated dimensions.

To securely fix the bellows on the joints, the connections should be fixed with hose fittings.

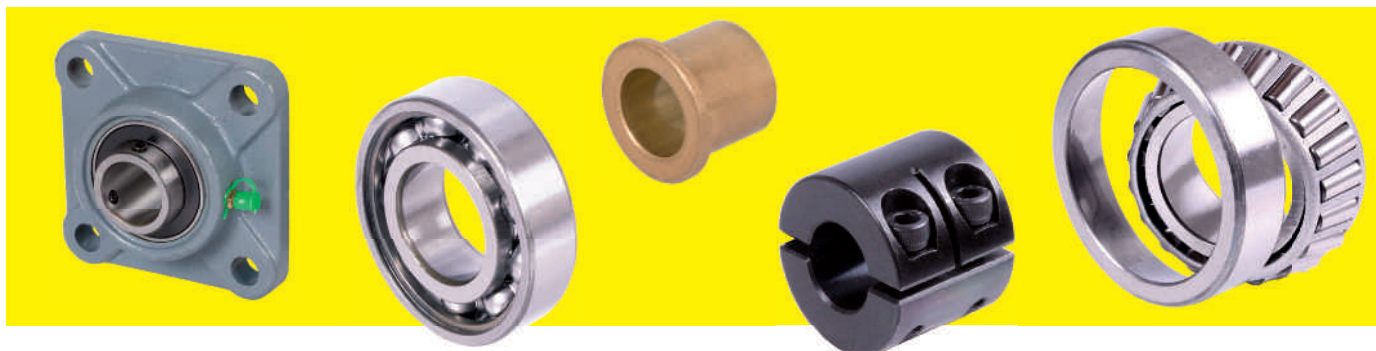


Ordering Details: e.g.: Product No. 630 516 00, Bellows FSG, inside diameter 16 mm

Product No.	Inside-Ø D mm	L mm	d ₂ mm	L ₁ mm	L ₂ mm	Weight g
630 516 00	16	32	16	9	34	5
630 518 00	18	38	18	11	40	6
630 520 00	20	56	20	14	50	8
630 522 00	22	40	22	13	48	7
630 525 00	25	66	25	22	74	12
630 526 00	26	45	26	15	56	10
630 528 00	28	58	28	20	70	9
630 529 00	29	50	29	17	60	12
630 532 00	32	60	32	19	68	15
630 533 00	32	75	32	23	80	18
630 536 00	36	82	36	26	90	22
630 540 00	42	75	40	29	100	24
630 545 00	47	90	45	31	110	31
630 550 00	52	95	50	36	125	40
630 555 00	58	95	55	45	120	48
630 570 00	70	96	70	56	140	67



**Reworking within
24h-service possible.
Custom made parts
on request.**



Bearing units

	Thermoplastic Pillow Block Bearings igubal® KSTM Page 418		Thermoplastic Pillow Block Bearings igubal® ESTM Page 418		Thermoplastic Flange Bearings igubal® EFSM Page 419		Thermoplastic Flange Bearings igubal® EFOM Page 419
	Light Duty Pillow Block Bearing HM with Bores for Drive-In Oiler Page 420		Cap Bearing Version L, with Red Brass Bushes for Compression Lubricators (Type Stauffer) Page 420		Heavy-Duty Pillow Block Bearings Version A, with Red Brass Bushes for Compression Lubricators (Type Stauffer) Page 421		Heavy-Duty Pillow Block Bearings Version B, without Bushes, for Compression Lubricators (Type Stauffer) Page 421
	Flange Bearings Version A, with Red Brass Bushes for Compression Lubricators (Type Stauffer) Page 422		Flange Bearings Version B, without Bushes, for Compression Lubricators (Type Stauffer) Page 422		Flange Bearings Version B, with Red Brass Bushes for Compression Lubricators (Type Stauffer) Page 422		Ball Pillow Block Bearings TUCP (Plastic / Stainless Steel) Page 424
	Protection Caps for Thermoplastic Pillow Bearings (Plastic) Page 424		Ball Flange Bearings TUCF (Plastic / Stainless Steel) Page 425		Ball Flange Bearings TUCFL (Plastic / Stainless Steel) Page 425		Ball Pillow Block Bearings UCP (Grey Cast Iron) Page 426
	Ball Pillow Block Bearings BBP (Two-Part Steel Sheet, Zinc Plated) Page 426		Ball Flange Bearings UCF (Grey Cast Iron) Page 427		Ball Flange Bearings UCFL (Grey Cast Iron) Page 427		Ball Flange Bearings UCFA (Grey Cast Iron) Page 428
	Ball Flange Bearings BPF (Two-Part Steel Sheet, Zinc Plated) Page 428		Ball Flange Bearings BPFL (Two-Part Steel Sheet, Zinc Plated) Page 428		Ball Pillow Block Bearings SSUCP (Stainless Steel) Page 429		Ball Pillow Block Bearings SSBPP (Stainless Steel) Page 429
	Ball Flange Bearings SSUCF (Stainless Steel) Page 430		Ball Flange Bearings SSUCFL (Stainless Steel) Page 430		Ball Flange Bearings SSBPF (Stainless Steel) Page 431		Ball Flange Bearings SSBPFL (Stainless Steel) Page 431
	Pillow Block Bearing Units BK, for Fixed Side Page 432		Pillow Block Bearing Units BF, for Support Side Page 432		Pillow Block Bearing Units EK, for Fixed Side Page 433		Pillow Block Bearing Units EF, for Support Side Page 433
	Flange Bearing Units FK, for Fixed Side Page 434		Flange Bearing Units FF, for Support Side Page 434				

Roller Bearings



Single Row Ball Bearings from SKF®

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Single Row Ball Bearings 2Z with Shields, from SKF®

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Single Row Ball Bearings 2RS with Seals, from SKF®

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Single Row Ball Bearings 2Z with Shields, from MÄDLER®

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Single Row Ball Bearings 2RS with Seals, from MÄDLER®

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Angular Contact Ball Bearings from SKF®

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Self aligning Ball Bearings from SKF®

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Cylindrical Roller Bearings from SKF®

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Spherical Roller Bearings from SKF®

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Tapered Roller Bearings from SKF®

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Radial Shaft Seals Design A

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Sintered Bronze Bushes



Bushes Version J Similar to DIN 1850 (DIN 4379 Version C) Made From Sintered Bronze For Plain Bearings

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Flange Bushes Version V Similar to DIN 1850 (DIN 4379 Version F) Made From Sintered Bronze For Plain Bearings

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Raw Material Made From Sintered Bronze with Bore for Plain Bearing Production

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Raw Material Made From Sintered Bronze without Bore for Plain Bearing Production

Page 446

Slotted Bushes



Cylindrical Bushes, Slotted (without any lubrication)

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Flange Bushes, Slotted (without any lubrication)

Page 447

Plastic Bushes



Bushes BP made from Polyamide 6.6 Die Cast for Plain Bearings -40°C to +80°C

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Bushes BBP made from Polyamide 6.6 Die Cast for Plain Bearings, -40°C to +80°C

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Cylindrical Bushes, plastic EP22™ -50°C to +170°C

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Flange Bushes, plastic EP22™ -50°C to +170°C

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Cylindrical Bushes, plastic EP43™ -40°C to +240°C

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Flange Bushes, plastic EP43™ -40°C to +240°C

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Drill Bushes



Cylindrical Drill Bushes DIN 179 Version A

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Cylindrical Flanged Drill Bushes DIN 172 Version A

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Adjusting Rings / Set Collars, Clamp collars / Shaft Collars



Adjusting Rings made from Steel, Steel Zinc-plated and Stainless Steel

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Clamp Collars, Slotted and 2-Part, from Steel burnished, Stainless Steel and Aluminium

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Clamp Collars, Double Wide, Slotted and 2-Part from Steel burnished and Stainless Steel

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Clamp Collars Slotted, with Thread, from Steel burnished and Stainless Steel

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Thermoplastic Pillow Block Bearings igubal® KSTM, connection measures like DIN 12240-4 (DIN 648) series K

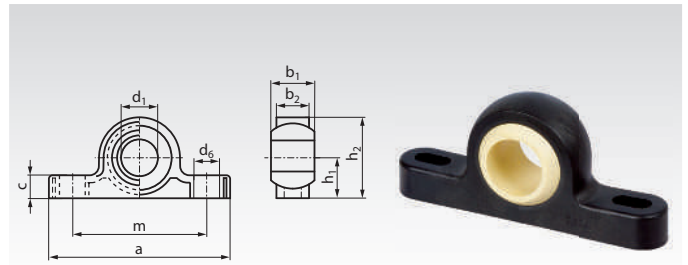
Material spherical ball: iglidur® W300, yellowish.

Material housing: igumid G, black.



- Maintenance-free, silent running and anti-vibrating.
- High strength at very low weight.
- Resistant against corrosion and many chemicals.
- Electrical and thermal isolating.
- The shaft must rotate inside the bore of the spherical ball. With a metal shaft, a sliding speed up to 30 m/min. may be possible. The spherical ball may only compensate shaft misalignment.

Temperature range: -30° to +80°C.



Ordering Details: e.g.: Product No. 620 550 05, Pillow Block igubal KSTM, 5mm

Product No. KSTM	d ₁ ^{E10} mm	h ₁ mm	h ₂ mm	b ₁ mm	b ₂ mm	a mm	m mm	c mm	d ₆ mm	Load Rating radial* static N	axial static N	Tilting angle α °	Weight g
620 550 05	5	7	14	8	6	34	26,3	4,0	3,3 x 4,6	350	300	30	1,7
620 550 06	6	10	18	9	7	43	34,5	5,5	4,5 x 6,0	550	300	29	2,9
620 550 08	8	10	20	12	9	47	35,5	6,0	4,5 x 7,0	650	400	25	4,6
620 550 10	10	14	26	14	10,5	62	48,5	7,5	5,5 x 8,0	750	500	25	8,6
620 550 12	12	14	28	16	12	65	49,5	8,5	5,5 x 9,0	1100	600	25	11,8
620 550 16	16	18	36	21	15	86	65,4	10,5	6,6 x 12	1500	1000	23	23,7
620 550 20	20	22	44	25	18	98	73	13	9,0 x 14	2350	1300	23	40,0
620 550 25	25	27	54	31	22	124	94	16	9,0 x 17	3300	1600	22	75,3
620 550 30	30	32	64	37	25	139	105	17	11 x 20	4050	2100	22	116,8

* At short term, the radial load may be twice as high.

Other versions or sizes on request.

Thermoplastic Pillow Block Bearings igubal® ESTM, connection measures like DIN 12240-4 (DIN 648) series E

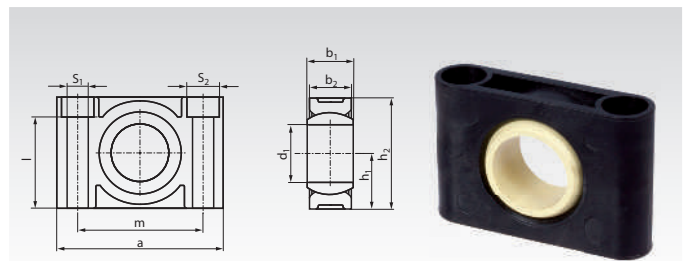
Material spherical ball: iglidur® W300, yellowish.

Material housing: igumid G, black.



- Maintenance-free, silent running and anti-vibrating.
- High strength at very low weight.
- Resistant against corrosion and many chemicals.
- Electrical and thermal isolating.
- The shaft must rotate inside the bore of the spherical ball. With a metal shaft, a sliding speed up to 30 m/min. may be possible. The spherical ball may only compensate shaft misalignment.

Temperature range: -30° to +80°C.



Ordering Details: e.g.: Product No. 620 551 08, Pillow Block igubal ESTM, 8mm

Product No. ESTM	d ₁ ^{E10} mm	h ₁ mm	h ₂ mm	b ₁ mm	b ₂ mm	a mm	m mm	s ₁ mm	s ₂ mm	l mm	Load rating* radial push static N	radial pull static N	Load rating* axial static N	Tilting angle α °	Weight g
620 551 08	8	9,5	19	8	9	31	22	4,5	-	-	2150	1250	300	22	5,0
620 551 10	10	11	22	9	10	36	26	5,5	-	-	2650	1700	350	22	7,1
620 551 12	12	13	26	10	10	38	28	5,5	-	-	3250	2250	375	22	9,0
620 551 16	16	17	34	13	13	50	37	6,6	10,6	27,6	4250	3350	550	22	17,5
620 551 20	20	20	40	16	16	62	46	9	14	31,4	5750	4250	700	22	27,4
620 551 25	25	24	48	20	18	72	54	9	14	39,4	9250	6750	1150	20	50,8
620 551 30	30	28	56	22	22	86	64	11	17	45,4	8250	5000	1250	20	79,7

* At short term, the load may be twice as high.

Other versions or sizes on request.

Thermoplastic Flange Bearings igubal® EFSM, with 4 Mounting Holes

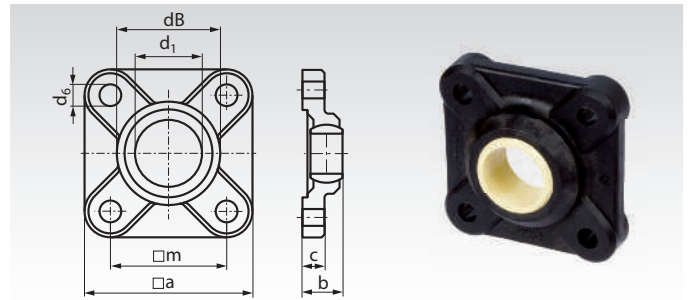
Material spherical ball: iglidur® W300, yellowish.

Material housing: igumid G, black.



- Maintenance-free, silent running and anti-vibrating.
- High strength at very low weight.
- Resistant against corrosion and many chemicals.
- Electrical and thermal isolating.
- The shaft must rotate inside the bore of the spherical ball. With a metal shaft, a sliding speed up to 30 m/min. may be possible. The spherical ball may only compensate shaft misalignment.

Temperature range: -30° to +80°C.



Ordering Details: e.g.: Product No. 621 550 04, Flange Bearing igubal EFSM, 4mm

Product No. EFSM	d ₁ ^{E10} mm	b mm	dB mm	a mm	m ^{±0,1} mm	c ^{±0,1} mm	d ₆ mm	Load Rating* radial static N	axial static N	Tilting angle α °	Weight g
621 550 04	4	8,5	14	25	17	4,5	3,2	500	100	28	2,6
621 550 05	5	8,5	14	25	17	4,5	3,2	500	150	29	2,7
621 550 06	6	8,5	14	25	17	4,5	3,2	500	150	25	2,8
621 550 08	8	10,5	18	33	22	5,5	4,3	700	225	25	5,9
621 550 10	10	12	21,9	38	26	6,5	5,3	1000	350	25	9,1
621 550 12	12	13	25	40	28	7	5,3	1250	425	21	11
621 550 15	15	15,5	30	49	34	8,5	6,4	1500	550	20	20,2
621 550 16	16	16,5	32	52	36	9	6,4	1600	675	27	23,3
621 550 17	17	18	35	54	38	10	6,4	1700	800	21	27,9
621 550 20	20	20	40	65	45	11	8,4	2000	1000	19	45
621 550 25	25	25	48,5	74	52	14	8,4	2800	1200	15	76
621 550 30	30	26	54,5	85	60	15	10,5	3000	1400	14	101

* At short term, the load may be twice as high.

Other versions or sizes on request.

Thermoplastic Flange Bearings igubal® EFOM, with 2 Mounting Holes

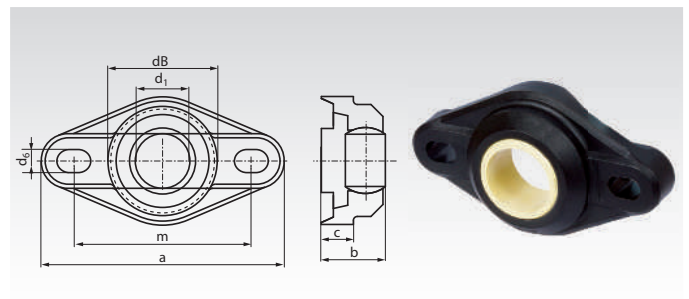
Material spherical ball: iglidur® W300, yellowish.

Material housing: igumid G, black.



- Maintenance-free, silent running and anti-vibrating.
- High strength at very low weight.
- Resistant against corrosion and many chemicals.
- Electrical and thermal isolating.
- The shaft must rotate inside the bore of the spherical ball. With a metal shaft, a sliding speed up to 30 m/min. may be possible. The spherical ball may only compensate shaft misalignment.

Temperature range: -30° to +80°C.



Ordering Details: e.g.: Product No. 621 551 04, Flange Bearing igubal EFOM, 8mm

Product No. EFOM	d ₁ ^{E10} mm	b mm	dB mm	a mm	h mm	m ^{±0,1} mm	c mm	d ₆ mm	Load Rating* radial static N	axial static N	Tilting angle α °	Weight g
621 551 04	4	8	14	33,8	16	24	4,5	3,2 x 5,0	375	200	28	1,9
621 551 05	5	8,5	14	33,8	16	24	4,5	3,2 x 5,0	375	200	29	2,3
621 551 06	6	8,5	14	33,8	16	24	4,5	3,2 x 5,0	400	250	25	1,8
621 551 08	8	10,5	18	44,2	22	31	5,5	4,3 x 6,5	550	350	25	4,1
621 551 10	10	12	22,2	52	26	36	6,5	5,3 x 8,0	1000	425	25	6,8
621 551 12	12	13	25	56,7	31	41	7	5,3 x 8,0	1100	550	21	8,9
621 551 15	15	15,5	29,8	68,6	36	50	8,5	6,4 x 10,0	1200	650	20	15,0
621 551 16	16	17,5	32	72,6	38	53	10	6,4 x 10,1	1400	700	27	17,7
621 551 17	17	18	34,8	74,6	41	55	10	6,4 x 10,2	1600	900	21	24,9
621 551 20	20	20	40	89	47	65	11	8,4 x 12,5	2750	900	19	32,8
621 551 25	25	25	48,5	101	58,5	75	14	8,4 x 12,6	3000	1500	15	58,5
621 551 30	30	26	55	118	65	87,5	15	10,5 x 16,0	3250	1750	14	78,9

* At short term, the load may be twice as high.

Other versions or sizes on request.

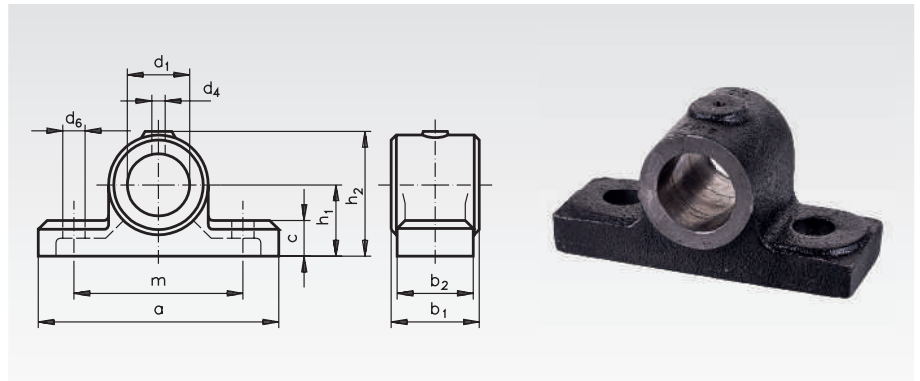
Light-Duty Pillow Block Bearings HM

Material: Grey Cast Iron.

Bore tolerance: ISO D9.

Front faces machined.

With Bores for Drive-In Oiler



Ordering Details: e.g.: Product No. 620 015 00,
Pillow Block Bearing HM, 15 mm Bore

Product No.	d ₁ mm	h ₁ * mm	h ₂ * mm	b ₁ mm	a mm	b ₂ * mm	m mm	c mm	d ₆ * mm	d ₄ mm	Weight kg
620 015 00	15	30	51	42	95	35	65	18,5	9x14**	5	0,6
620 020 00	20	30	51	42	95	35	65	18,5	9x14**	5	0,5
620 025 00	25	35	61	50	116	40	74	17,5	13	5	0,66
620 030 00	30	35	61	50	116	40	74	17,5	15	5	0,57
620 035 00	35	43	77	55	130	45	85	24	17	6	1,2
620 040 00	40	48	81	63	145	50	95	24	18	6	1,4

* Approx. dimensions (rough cast surfaces).

** Slot hole.

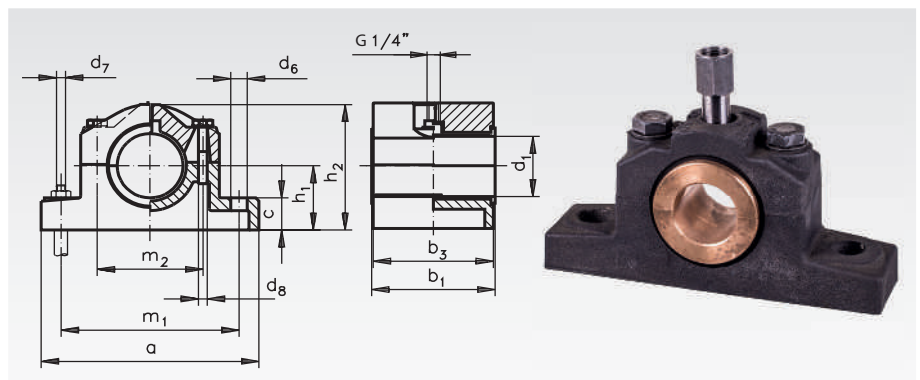
Cap Bearings DIN 505 Version L, with Red Brass Bush

Material: Grey Cast Iron.

Bush Rg7 (G-CuSn7ZnPb).

Bore Tolerance: ISO D10.

For compression lubricators type Stauffer.



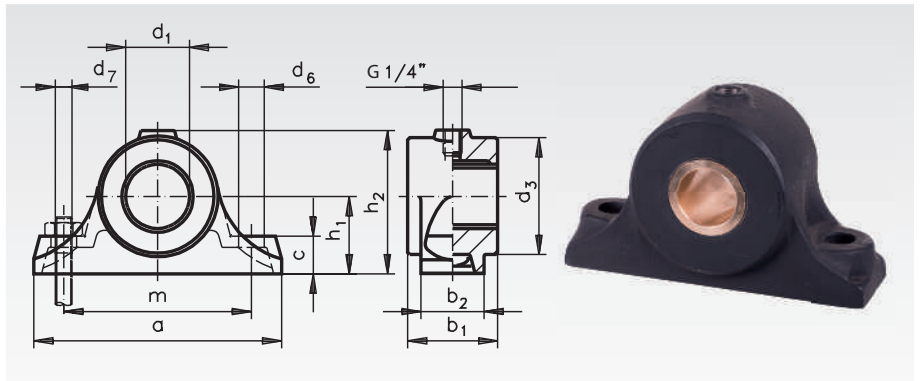
Ordering Details: e.g.: Product No. 620 325 00,
Cap Bearing DIN 505, 25 mm Bore

Product No.	d ₁ mm	h ₁ mm	h ₂ mm	b ₁ mm	a mm	b ₃ mm	c mm	d ₆ mm	d ₇ mm	d ₈ mm	m ₁ mm	m ₂ mm	Weight kg
620 325 00	25	40	78	45	165	40	22	15	M12	M10	125	65	1,6
620 330 00	30	40	78	45	165	40	22	15	M12	M10	125	65	1,6
620 335 00	35	50	95	50	180	45	25	15	M12	M10	140	75	2,25
620 340 00	40	50	95	50	180	45	25	15	M12	M10	140	75	2,25
620 345 00	45	60	114	55	210	50	30	19	M16	M12	160	90	3,25
620 350 00	50	60	114	55	210	50	30	19	M16	M12	160	90	3,25
620 360 00	60	70	132	60	225	55	35	19	M16	M12	175	100	4,35
620 370 00	70	80	154	65	270	60	40	24	M20	M16	210	120	7,1
620 380 00	80	90	170	75	290	70	45	24	M20	M16	230	130	10,2

Compression lubricators page 586.

Heavy-Duty Pillow Block Bearings DIN 504 Design A, with Red Brass Bush

Material: Grey Cast Iron.
 Bush Rg7 (G-CuSn7ZnPb).
Bore Tolerance: ISO D10.
 For compression lubricators type Stauffer.

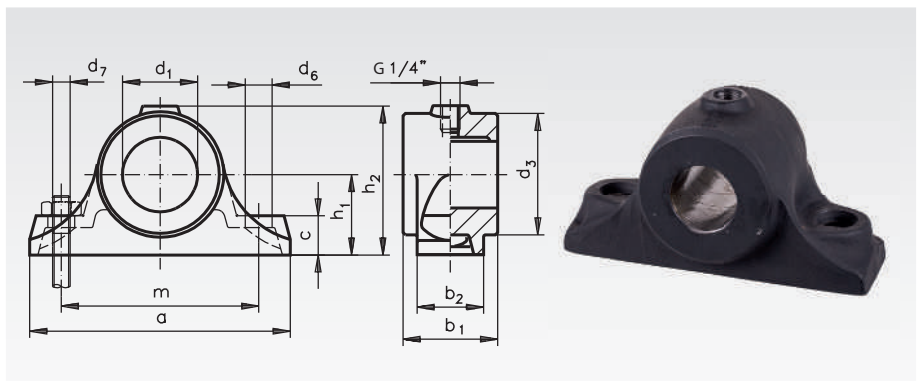


Ordering Details: e.g.: Product No. 620 130 00,
 Pillow Block Bearing DIN 504 A, 30 mm Bore

Product No.	d ₁ mm	h ₁ mm	h _{2 max.} mm	b ₁ mm	d ₃ mm	a mm	b ₂ mm	c mm	m mm	d ₆ mm	d ₇ mm	Weight kg
620 130 00	30	50	95	60	80	160	45	25	120	15	M12	3,0
620 140 00	40	60	110	70	90	190	50	30	140	19	M16	4,2
620 150 00	50	70	125	80	100	220	55	35	160	24	M20	5,5
620 160 00	60	80	145	90	120	240	60	35	180	24	M20	8,3
620 170 00	70	90	165	100	140	270	70	45	210	28	M24	11,6
620 180 00	80	100	185	100	160	300	80	45	240	28	M24	17,0

Heavy-Duty Pillow Block Bearings DIN 504 Design B, without Bush

Material: Grey Cast Iron.
Bore Tolerance: ISO D7.
 For compression lubricators type Stauffer.



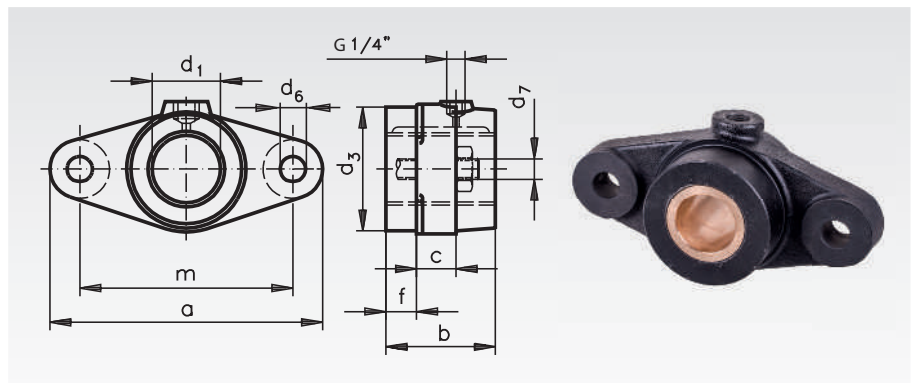
Ordering Details: e.g.: Product No. 620 220 00,
 Pillow Block Bearing DIN 504 B, 20 mm Bore

Product No.	d ₁ mm	h ₁ mm	h _{2 max.} mm	b ₁ mm	d ₃ mm	a mm	b ₂ mm	c mm	m mm	d ₆ mm	d ₇ mm	Weight kg
620 220 00	20	30	56	50	45	110	35	18	75	12	M10	1,3
620 225 00	25	40	75	60	60	140	40	25	100	15	M12	2,0
620 230 00	30	40	75	60	60	140	40	25	100	15	M12	2,0
620 235 00	35	50	95	60	80	160	45	25	120	15	M12	3,0
620 240 00	40	50	95	60	80	160	45	25	120	15	M12	3,0
620 245 00	45	60	110	70	90	190	50	30	140	19	M16	4,2
620 250 00	50	60	110	70	90	190	50	30	140	19	M16	4,2
620 260 00	60	70	125	80	100	220	55	35	160	24	M20	5,5
620 270 00	70	80	145	90	120	240	60	35	180	24	M20	8,3
620 280 00	80	90	165	100	140	270	70	45	210	28	M24	11,6

Compression lubricators (type Stauffer) page 586.

Flange Bearings DIN 502 Design A, with Red Brass Bush

Material: Grey Cast Iron.
 Bush Rg7 (G-CuSn7ZnPb).
Bore Tolerance: ISO D10.
 For compression lubricators type Stauffer.

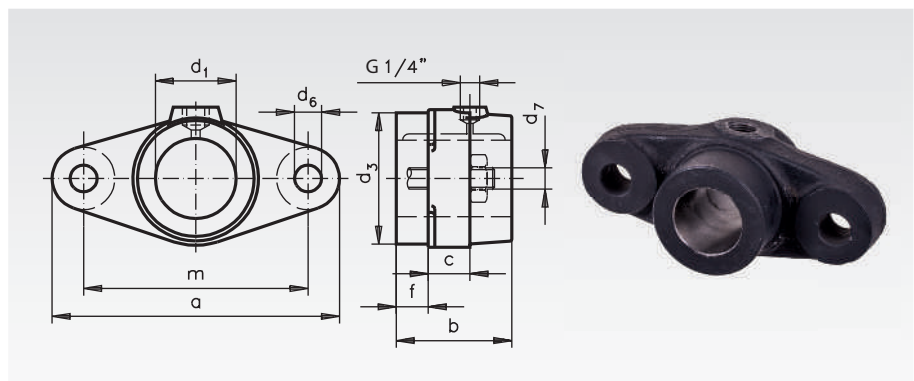


Ordering Details: e.g.: Product No. 621 025 00,
 Flange Bearing DIN 502 A, 25 mm Bore

Product No.	d ₁ mm	b mm	d ₃ ^{h9} mm	f mm	a mm	c mm	m mm	d ₆ mm	d ₇ mm	Weight kg
621 025 00	25	60	65	20	155	20	120	14	M12	1,4
621 030 00	30	60	65	20	155	20	120	14	M12	1,4
621 040 00	40	70	80	20	180	25	140	18	M16	3,0
621 050 00	50	80	90	20	210	30	160	22	M20	4,2

Flange Bearings DIN 502 Design B, without Bush

Material: Grey Cast Iron.
Bore Tolerance: ISO D7.
 For compression lubricators type Stauffer

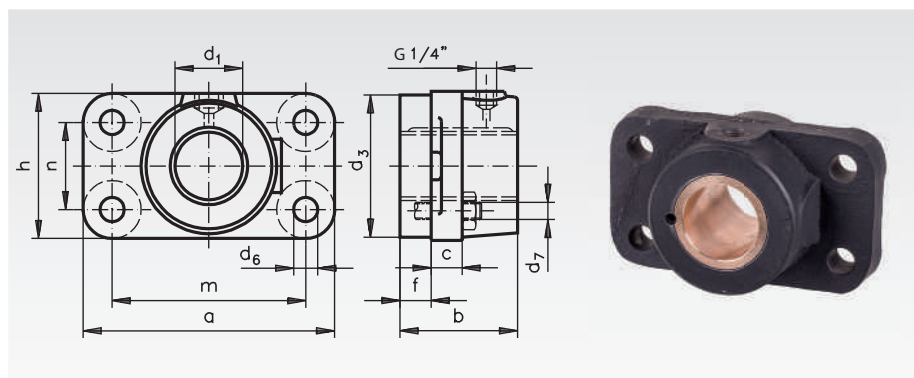


Ordering Details: e.g.: Product No. 621 125 00, Flange
 bearing DIN 502 B, 25 mm Bore

Product No.	d ₁ mm	b mm	d ₃ ^{h9} mm	f mm	a mm	c mm	m mm	d ₆ mm	d ₇ mm	Weight kg
621 125 00	25	60	50	20	135	20	100	14	M12	1,2
621 130 00	30	60	50	20	135	20	100	14	M12	1,2
621 135 00	35	60	65	20	155	20	120	14	M12	1,4
621 140 00	40	60	65	20	155	20	120	14	M12	1,4

Flange Bearing DIN 503 Design A, with Red Brass Bush

Material: Grey Cast Iron.
 Bush Rg7 (G-CuSn7ZnPb).
Bore Tolerance: ISO D10.
 For compression lubricators type Stauffer.



Ordering Details: e.g.: Product No. 621 240 00,
 Flange Bearing DIN 503 A, 40 mm Bore

Product No.	d ₁ mm	b mm	d ₃ ^{h9} mm	f mm	a mm	h mm	c mm	m mm	n mm	d ₆ mm	d ₇ mm	Weight kg
621 240 00	40	70	80	20	145	85	20	110	50	14	M12	3,1
621 250 00	50	80	100	20	175	105	25	130	60	18	M16	5,5
621 260 00	60	90	120	25	195	125	25	150	80	18	M16	8,1
621 270 00	70	100	140	25	220	150	30	170	100	22	M20	12,2
621 280 00	80	100	160	30	240	170	30	190	120	22	M20	14,9

Adjusting rings and clamping collars page 452.

Silver steel and precision shafts steel page 478.
 Compression lubricators page 586.

Technical Explanations for Ball Pillow Block Bearings and Ball Flange Bearings on Page 426-428

Bearings:	The nominal inside diameters correspond with the standard dimensions of the 6200 series bearings. The outer ring is spherical and allows an angular misalignment of $\pm 2^\circ$.	Maintenance:	Due to the perfect sealing, all bearing types are usually maintenance free. In special application they can, however be relubricated. See lubrication.
Housings:	The one-part housings are made from massive grey cast iron and the two-part ones are drawn from steel sheet. The grey cast iron housings are that rigidly built, that the full load capacity of the bearing can be used.	Temperatures:	Bearings and housings made from cast or steel sheet can be used in continuous operation from -30°C to $+100^\circ\text{C}$. Bearings for higher temperatures on request.
Materials:	Only high-quality materials are used for housing bearing, housing and all other components. Bearing: Bearing steel 100Cr6 Cast housing: GGL20 DIN 1691 Sheet-metal housing: St10-03 DIN 1623 Seal: synth. nitrile rubber (NBR)	Mounting on the shaft:	The housing bearings are supplied with longer inner ring and adjusting screw. The fixation on the shaft depends on the effective axial shifting force of the inner ring. The stability mainly depends on the quality and the tolerance zone of of the shaft. To facilitate the assembly, the inner rings are - other than the norm - produced with a plus tolerance.
Sealing:	All housing bearings are supplied with an efficient, heat and oil resitant rubber seal. The constructive design of the seal varies with the different bearing types.		

Tolerances of roller bearings:

Nominal $\varnothing$ of Bore d H7 mm	Tol. of Bore d μm	Inner Ring Bi μm	Nominal $\varnothing$ of Outer Rings D mm	Outer Rings D μm
10 - 18	+ 18 0	0 - 120	50 - 80	0 - 13
18 - 30	+ 21 0	0 - 120	80 - 120	0 - 15
30 - 50	+ 25 0	0 - 120	120 - 150	0 - 18

Tolerances of Cast Housings according to ISO 8062:

Nominal $\varnothing$ of Bore d mm	Tolerances of the connecting dimensions		
	UCP h mm	UCF i mm	UCFL, UCFA e mm
12 - 50	$\pm 0,15$	$\pm 0,5$	$\pm 0,7$

Lubrication:

All housing bearings are filled with a high-grade lithium-soap grease. In most mounting situations this lubricant-filling guarantees maintenance-free operation. In especially robust operating conditions with higher loads, speeds, temperatures, dirt etc. relubricating at shorter intervals may be required, depending on the application.

For relubrication we recommend using lithium-based grease. Under no circumstances use soda saponification.

Load bearing rating: The radial static and dynamic load bearing ratings are stated at the individual bearings (axial = 20% of radial).

Speed and load: The permissible speed is directly connected to the load and the play at bearing bore and shaft diameter

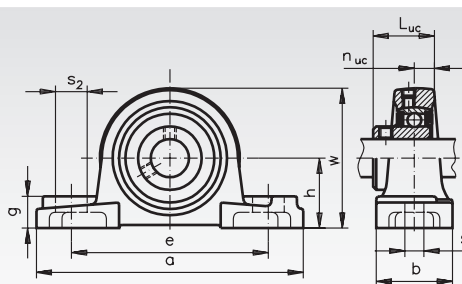
Ball Pillow Block Bearings TUCP, Thermoplastic Housing with Stainless Steel Bearing

Material: Housing: Thermoplast PBT, on choice black or white.

Rolling bearing: Stainless steel 1.4125 (X105CrMo17, AISI 440 C).

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is possible.

Delivery with stainless steel grease nipple.



Ordering Details: e.g.: Product No. 625 551 12, Ball Pillow Block Bearing TUCP 201, black, Bore 12mm

Product No. Black	Product No. White	TUCP No.	Bore mm	h mm	a mm	e mm	b mm	s ₁ mm	s ₂ mm	g mm	w mm	L _{UC} mm	n _{UC} mm	Housing Load Rating		Weight kg
														radial*	axial**	
625 551 12	625 561 12	201	12	33,3	127	95	38	11	14	14,2	65,5	31,0	12,7	7,7	5,0	0,30
625 551 15	625 561 15	202	15	33,3	127	95	38	11	14	14,2	65,5	31,0	12,7	7,7	5,0	0,30
625 551 17	625 561 17	203	17	33,3	127	95	38	11	14	14,2	65,5	31,0	12,7	7,7	5,0	0,30
625 551 20	625 561 20	204	20	33,3	127	95	38	11	14	14,2	65,5	31,0	12,7	7,7	5,0	0,28
625 551 25	625 561 25	205	25	36,5	140,5	105	38	11	14	14,5	71,0	34,0	14,3	10,0	8,1	0,34
625 551 30	625 561 30	206	30	42,9	163	119	46	14	18	17,8	84,0	38,1	15,9	10,6	5,8	0,52
625 551 35	625 561 35	207	35	47,6	170	127	48	14	18	18,0	94,5	42,9	17,5	10,8	7,5	0,73
625 551 40	625 561 40	208	40	49,2	184	137	54	14	18	19,5	99,0	49,2	19,0	11,1	8,5	1,00
625 551 45	625 561 45	209	45	54,0	192	146	54	17	20	23,0	106,0	49,2	19,0	11,4	9,0	1,15
625 551 50	625 561 50	210	50	57,2	206	159	60	17	20	23,0	114,0	51,6	19,0	11,8	9,6	1,34

* Maximum radial load if axial force = 0.

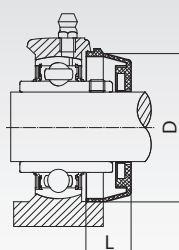
** Maximum axial load if radial force = 0.

Protection Caps for Thermoplastic Pillow Bearings TUCP, TUCF and TUCFL

Material: Thermoplast PBT, on choice black or white.

Open Design with sealing for shaft side or closed design.

The caps fit only on the one bearing side with the setscrews. They can get clipped on by hand by the customer.



Ordering Details: e.g.: Product No. 625 552 17, Protection Cap, black, Open Design, for Bearing Size 203

Product No. Black	Product No. White	Design	for bearing size	Bore mm	Ø D mm	Length L mm	Weight g
625 552 17	-	open	203	17	50	23	10
625 552 20	625 562 20	open	204	20	50	23	10
625 552 25	625 562 25	open	205	25	55	25	15
625 552 30	625 562 30	open	206	30	64	30	20
625 552 35	625 562 35	open	207	35	74,5	32	20
625 552 40	625 562 40	open	208	40	84	37	30
625 552 45	625 562 45	open	209	45	89	41	30
625 552 50	625 562 50	open	210	50	94	47	35
625 553 20	625 563 20	closed	201 - 204	-	50	23	10
625 553 25	625 563 25	closed	205	-	55	25	10
625 553 30	625 563 30	closed	206	-	64	30	15
625 553 35	625 563 35	closed	207	-	74,5	32	20
625 553 40	625 563 40	closed	208	-	84	37	30
625 553 45	625 563 45	closed	209	-	89	41	30
625 553 50	625 563 50	closed	210	-	94	47	35

Ball Flange Bearings TUCF, Thermoplastic Housing with Stainless Steel Bearing

Material: Housing: Thermoplast PBT,
on choice black or white.

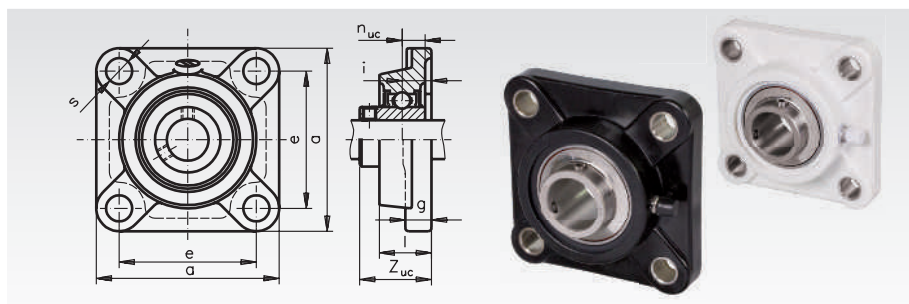
Rolling bearing: Stainless steel 1.4125
(X105CrMo17, AISI 440 C).



With 4 mounting holes.

The rolling bearing can be swiveled when
mounting to compensate shaft misalign-
ment. The shaft will get fastened with 2
setscrews. Lubricated for life at normal ope-
rating conditions. Re-lubricating is possible.

Delivery with stainless steel grease nipple.



Ordering Details: e.g.: Product No. 626 550 17, Ball Flange Bearing TUCF 203, black, Bore 17mm

Product No. Black	Product No. White	TUCF No.	Bore mm	a mm	e mm	i mm	g mm	l mm	s mm	Z _{uc} mm	n _{uc} mm	Housing Load Rating		Weight kg
												radial*	axial**	
626 550 12	626 560 12	201	12	86	63,5	18	13,4	27,8	11	36,3	12,7	16	3,7	0,30
626 550 15	626 560 15	202	15	86	63,5	18	13,4	27,8	11	36,3	12,7	16	3,7	0,30
626 550 17	626 560 17	203	17	86	63,5	18	13,4	27,8	11	36,3	12,7	16	3,7	0,30
626 550 20	626 560 20	204	20	86	63,5	18	13,4	27,8	11	36,3	12,7	16	3,7	0,28
626 550 25	626 560 25	205	25	95	70	17	14,0	28,0	11	36,7	14,3	13	3,4	0,35
626 550 30	626 560 30	206	30	107	83	19,2	14,3	31,5	11	41,4	15,9	18	3,4	0,50
626 550 35	626 560 35	207	35	118	92	21,5	15,5	34,8	13	46,9	17,5	18,5	3,5	0,74
626 550 40	626 560 40	208	40	130	102	23	17,0	37,5	14	53,2	19	19,1	3,8	0,98
626 550 45	626 560 45	209	45	137	105	24	19,0	41,0	17	54,2	19	19,4	3,9	1,12
626 550 50	626 560 50	210	50	143	111	25	21,0	43,0	17	57,6	19	19,7	4,0	1,30

* Maximum radial load if axial force = 0.

** Maximum axial load if radial force = 0.

Ball Flange Bearings TUCFL, Thermoplastic Housing with Stainless Steel Bearing

Material: Housing: Thermoplast PBT, on
choice black or white.

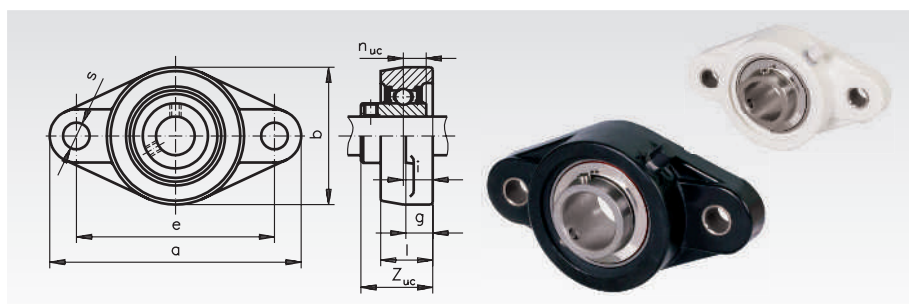
Rolling bearing: Stainless steel 1.4125
(X105CrMo17, AISI 440 C).



With 2 mounting holes.

The rolling bearing can be swiveled when
mounting to compensate shaft misalign-
ment. The shaft will get fastened with 2
setscrews. Lubricated for life at normal ope-
rating conditions. Re-lubricating is possible.

Delivery with stainless steel grease nipple.



Ordering Details: e.g.: Product No. 626 551 17, Ball Flange Bearing TUCFL 203, black, Bore 17mm

Product No. Black	Product No. White	TUCFL No.	Bore mm	a mm	b mm	e mm	i mm	g mm	l mm	s mm	Z _{uc} mm	n _{uc} mm	Housing Load Rating*		Weight kg
													vertical kN	horizontal kN	
626 551 12	626 561 12	201	12	113	65	90	15,4	11,4	26,5	11	31	12,7	8,5	11,8	0,26
626 551 15	626 561 15	202	15	113	65	90	15,4	11,4	26,5	11	31	12,7	8,5	11,8	0,26
626 551 17	626 561 17	203	17	113	65	90	15,4	11,4	26,5	11	31	12,7	8,5	11,8	0,26
626 551 20	626 561 20	204	20	113	65	90	15,4	11,4	26,5	11	31	12,7	8,5	11,8	0,24
626 551 25	626 561 25	205	25	131	69,5	99	17	13,5	29,1	11	34	14,3	11,1	11,4	0,30
626 551 30	626 561 30	206	30	148	80	117	19	13,3	30,5	11	38,1	15,9	14,2	16,5	0,45
626 551 35	626 561 35	207	35	164	90	130	18	16,1	32,8	13	42,9	17,5	14,9	16,9	0,64
626 551 40	626 561 40	208	40	176	100	144	21,5	20	37,5	14	49,2	19	15,2	17,4	0,89
626 551 45	626 561 45	209	45	188	108	148	24	21	41	17	49,2	19	15,4	17,6	1,02
626 551 50	626 561 50	210	50	197	115	157	25	21	43	17	51,6	19	15,7	18,0	1,21

* Not recommended for axial force.

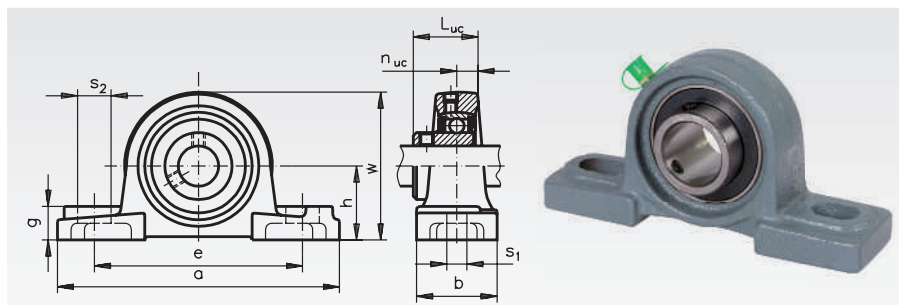
Ball Pillow Block Bearings UCP (Grey Cast Iron)

Material: Housing from grey cast iron.
Rolling bearing from bearing steel.

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is possible.

Technical explanations page 423.

Delivery with grease nipple.



Ordering Details: e.g.: Product No. 625 112 00, Ball Pillow Block Bearing UCP 201, Bore 12mm

Product No.	UCP No.	Bore mm	h mm	a mm	e mm	b mm	s ₁ mm	s ₂ mm	g mm	w mm	L _{UC} mm	n _{UC} mm	Bearing-Load Rating*		Weight kg
													dyn. C kN	stat. C ₀ kN	
625 112 00	201	12	30,2	127	96	38	13	19	15	62	31	12,7	9,9	6,2	0,61
625 115 00	202	15	30,2	127	96	38	13	19	15	62	31	12,7	9,9	6,2	0,61
625 117 00	203	17	30,2	127	96	38	13	19	15	62	31	12,7	9,9	6,0	0,61
625 120 00	204	20	33,3	127	96	38	13	19	15	65	31	12,7	9,9	6,0	0,65
625 125 00	205	25	36,5	140	105	38	13	19	16	70	34	14,3	10,8	7,0	0,79
625 130 00	206	30	42,9	165	121	48	17	21	18	83	38,1	15,9	15,1	10,0	1,27
625 135 00	207	35	47,6	167	126	48	17	21	19	92	42,9	17,5	19,9	13,7	1,56
625 140 00	208	40	49,2	184	136	54	17	21	19	98	49,2	19	22,6	15,7	1,97
625 145 00	209	45	54	190	146	54	17	21	20	106	49,2	19	25,2	17,8	2,27
625 150 00	210	50	57,2	206	159	58	20	25	22	112	51,6	19	27,1	19,7	2,70
625 160 00	212	60	69,8	241	184	70	20	25	25	138	65,1	25,4	47,8	33,0	4,80

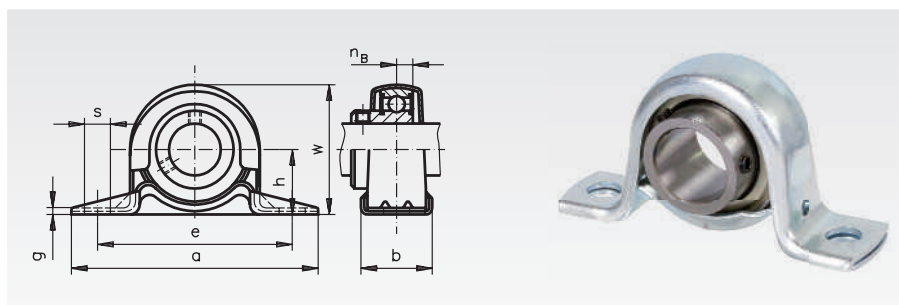
* Maximum radial load if axial force = 0. The axial load rating is approx. 20% of the radial load rating.

Ball Pillow Block Bearings BPP (Two-Part Steel Sheet, Zinc-Plated)

Material: Housing from two-part steel sheets, zinc-plated. Rolling bearing from bearing steel.

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is not possible.

Technical explanations page 423.



Ordering Details: e.g.: Product No. 625 212 00, Ball Pillow Block Bearing BPP 201, Bore 12mm

Product No.	BPP No.	Bore mm	h mm	a mm	e mm	b mm	s mm	g mm	w mm	n _B mm	Permissible Housing Load kN	Bearing-Load Rating*		Weight kg
												dyn. C kN	stat. C ₀ kN	
625 212 00	201	12	22,2	86	68	25	9,5	3,5	43,8	6	2,16	7,4	4,5	0,16
625 215 00	202	15	22,2	86	68	25	9,5	3,5	43,8	6	2,16	7,4	4,5	0,16
625 217 00	203	17	22,2	86	68	25	9,5	3,5	43,8	6	2,16	7,4	4,5	0,16
625 220 00	204	20	25,4	99	76	32	9,5	3,5	50,5	7	2,62	9,9	6,2	0,23
625 225 00	205	25	28,6	108	86	32	11,5	4	56,6	7,5	3,72	10,8	7,0	0,28
625 230 00	206	30	33,3	119	95	38	11,5	4	66,3	8	4,41	15,1	10,0	0,47
625 235 00	207	35	39,7	130	106	42	11	5	78	8,5	4,90	19,9	13,7	0,60

* Maximum radial load if axial force = 0. Regard the housing load. The axial load rating is approx. 20% of the radial load rating.

Ball Flange Bearings UCF (Grey Cast Iron)

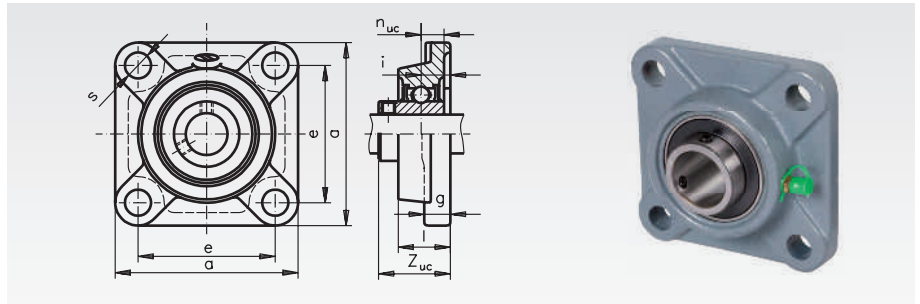
Material: Housing from grey cast iron.
Rolling bearing from bearing steel.

With 4 mounting holes.

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is possible.

Technical explanations page 423.

Delivery with grease nipple.



Ordering Details: e.g.: Product No. 626 012 00, Ball Flange Bearing UCF 201, Bore 12mm

Product No.	UCF No.	Bore mm	a mm	e mm	i mm	g mm	l mm	s mm	Z _{uc} mm	n _{uc} mm	Bearing-Load Rating*		Weight kg
											dyn. C kN	stat. C ₀ kN	
626 012 00	201	12	86	64	15	12	25,5	12	33,3	12,7	9,9	6,2	0,62
626 015 00	202	15	86	64	15	12	25,5	12	33,3	12,7	9,9	6,2	0,62
626 017 00	203	17	86	64	15	12	25,5	12	33,3	12,7	9,9	6,2	0,62
626 020 00	204	20	86	64	15	12	25,5	12	33,3	12,7	9,9	6,2	0,59
626 025 00	205	25	95	70	16	14	27	12	35,7	14,3	10,8	7,0	0,82
626 030 00	206	30	108	83	18	14	31	12	40,2	15,9	15,1	10,0	1,00
626 035 00	207	35	117	92	19	16	34	14	44,4	17,5	19,9	13,7	1,40
626 040 00	208	40	130	102	21	16	36	16	51,2	19	22,6	15,7	2,00
626 045 00	209	45	137	105	22	18	38	16	52,2	19	25,2	17,8	2,20
626 050 00	210	50	143	111	22	18	40	16	54,6	19	27,1	19,7	2,40
626 060 00	212	60	175	143	29	20	48	19	68,7	25,4	47,8	33,0	4,40

* Maximum radial load if axial force = 0. The axial load rating is approx. 20% of the radial load rating.

Ball Flange Bearings UCFL (Grey Cast Iron)

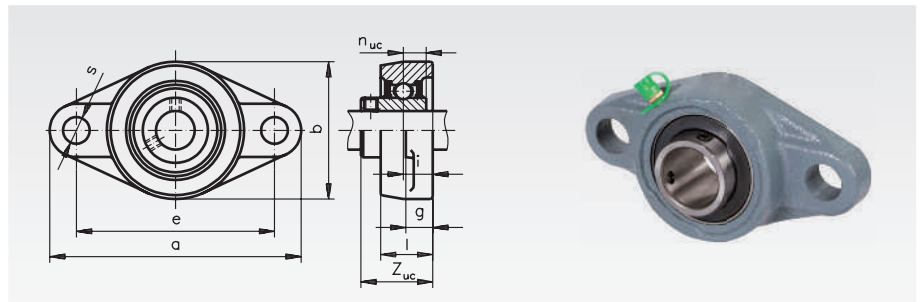
Material: Housing from grey cast iron.
Rolling bearing from bearing steel.

With 2 mounting holes.

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is possible.

Technical explanations page 423.

Delivery with grease nipple.



Ordering Details: e.g.: Product No. 626 112 00, Ball Flange Bearing UCFL 201, Bore 12mm

Product No.	UCFL No.	Bore mm	a mm	b mm	e mm	i mm	g mm	l mm	s mm	Z _{uc} mm	n _{uc} mm	Bearing-Load Rating*		Weight kg
												dyn. C kN	stat. C ₀ kN	
626 112 00	201	12	113	60	90	15	11	25,5	12	33,3	12,7	9,9	6,2	0,48
626 115 00	202	15	113	60	90	15	11	25,5	12	33,3	12,7	9,9	6,2	0,48
626 117 00	203	17	113	60	90	15	11	25,5	12	33,3	12,7	9,9	6,2	0,48
626 120 00	204	20	113	60	90	15	11	25,5	12	33,3	12,7	9,9	6,2	0,45
626 125 00	205	25	130	68	99	16	13	27	16	35,7	14,3	10,8	7,0	0,60
626 130 00	206	30	148	80	117	18	13	31	16	40,2	15,9	15,1	10,0	0,90
626 135 00	207	35	161	90	130	19	14	34	16	44,4	17,5	19,9	13,7	1,20
626 140 00	208	40	175	100	144	21	14	36	16	51,2	19	22,6	15,7	1,60
626 145 00	209	45	188	108	148,5	22	15	38	19	52,2	19	25,2	17,8	1,90
626 150 00	210	50	197	115	157	22	15	40	19	54,6	19	27,1	19,7	2,20

* Maximum radial load if axial force = 0. The axial load rating is approx. 20% of the radial load rating.

Ball Flange Bearings UCFA (Grey Cast Iron)

Material: Housing from grey cast iron.

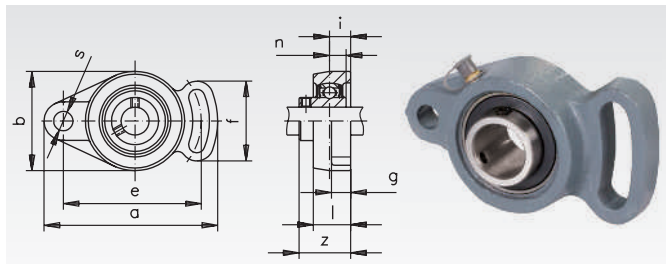
Rolling bearing from bearing steel.

With 2 mounting holes, one of them slotted.

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is possible. Technical explanations page 423.

Delivery with grease nipple.

Ordering Details: e.g.: Product No. 626 312 00, Ball Flange Bearing UCFA 201, Bore 12mm



Product No.	UCFA No.	Bore mm	a mm	b mm	e mm	i mm	g mm	l mm	s mm	f mm	Z _{uc} mm	n _{uc} mm	Bearing-Load Rating*		Weight kg
													dyn. C kN	stat. C ₀ kN	
626 312 00	201	12	98	60	78	15	11	25,5	10	50	33,3	12,7	9,9	6,2	0,47
626 315 00	202	15	98	60	78	15	11	25,5	10	50	33,3	12,7	9,9	6,2	0,47
626 317 00	203	17	98	60	78	15	11	25,5	10	50	33,3	12,7	9,9	6,2	0,47
626 320 00	204	20	98	60	78	15	11	25,5	10	50	33,3	12,7	9,9	6,2	0,47
626 325 00	205	25	124	70	98	16	13	27	12	65	35,7	14,3	10,8	7,0	0,68
626 330 00	206	30	141	83	117	18	13	31	12	72	40,2	15,9	15,1	10,0	1,00
626 335 00	207	35	155	96	130	19	14	34	14	82	44,2	17,5	19,9	13,7	1,50
626 340 00	208	40	171	105	144	21	14	38	14	87	50,2	19	22,6	15,7	1,90
626 345 00	209	45	179	111	148	22	14	40	16	90	52,2	19	25,2	17,8	2,03
626 350 00	210	50	189	116	157	22	14	40	16	94	54,6	19	27,1	19,7	2,38

* Maximum radial load if axial force = 0. The axial load rating is approx. 20% of the radial load rating.

Ball Flange Bearings BPF (Two-Part Steel Sheet, Zinc Plated)

Material: Housing from two-part steel sheets, zinc-plated.

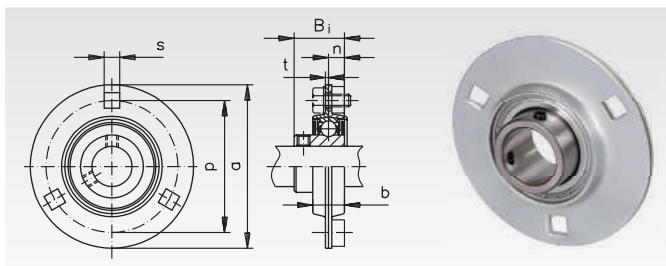
Rolling bearing from bearing steel.

With 3 mounting holes.

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is not possible.

Technical explanations page 423.

Ordering Details: e.g.: Product No. 626 412 00, Ball Flange Bearing BPF 201, Bore 12mm



Product No.	BPF No.	Bore mm	a mm	p mm	t mm	b mm	s mm	B _i mm	n mm	Permissible Housing Load kN	Bearing-Load Rating*		Weight kg
											dyn. C kN	stat. C ₀ kN	
626 412 00	201	12	81	63,5	2	14	7,1	22	6	2,65	7,4	4,5	0,27
626 415 00	202	15	81	63,5	2	14	7,1	22	6	2,65	7,4	4,5	0,27
626 417 00	203	17	81	63,5	2	14	7,1	22	6	2,65	7,4	4,5	0,27
626 420 00	204	20	90	71,5	2	16	9	25	7	3,09	9,9	6,2	0,33
626 425 00	205	25	95	76	2	18	9	27	7,5	3,53	10,8	7,0	0,38
626 430 00	206	30	113	90,5	2,6	19	11	30	8	4,90	15,1	10,0	0,62
626 435 00	207	35	122	100	2,6	22	11	32	8,5	6,23	19,9	13,7	0,82

* Maximum radial load if axial force = 0. Regard the housing load. The axial load rating is approx. 20% of the radial load rating.

Ball Flange Bearings BPFL (Two-Part Steel Sheet, Zinc-Plated)

Material: Housing from two-part steel sheets, zinc-plated.

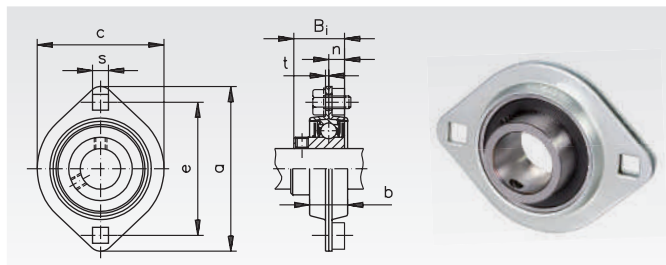
Rolling bearing from bearing steel.

With 2 mounting holes.

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is not possible.

Technical explanations page 423.

Ordering Details: e.g.: Product No. 626 512 00, Ball Flange Bearing BPFL 201, Bore 12mm



Product No.	BPFL No.	Bore mm	a mm	e mm	t mm	b mm	c mm	s mm	B _i mm	n mm	Permissible Housing Load kN	Bearing-Load Rating*		Weight kg
												dyn. C kN	stat. C ₀ kN	
626 512 00	201	12	81	63,5	2	14	59	7,1	22	6	2,65	7,4	4,5	0,19
626 515 00	202	15	81	63,5	2	14	59	7,1	22	6	2,65	7,4	4,5	0,19
626 517 00	203	17	81	63,5	2	14	59	7,1	22	6	2,65	7,4	4,5	0,19
626 520 00	204	20	91	71,5	2	16	67	9	25	7	3,09	9,9	6,2	0,24
626 525 00	205	25	96	76,0	2	18	71	9	27	7,5	3,53	10,8	7,0	0,28
626 530 00	206	30	113	90,5	2,6	19	85	11	30	8	4,90	15,1	10,0	0,38
626 535 00	207	35	123	100	2,6	20	94	11	32	8,5	6,23	19,9	13,7	0,58

* Maximum radial load if axial force = 0. Regard the housing load. The axial load rating is approx. 20% of the radial load rating.

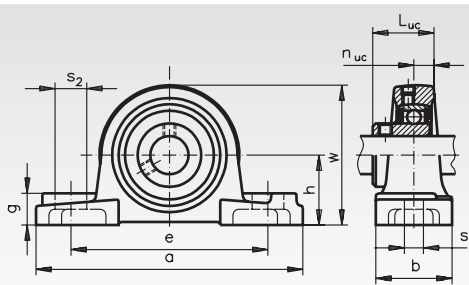
Ball Pillow Block Bearings SSUCP, Stainless Steel

Material: Housing: Stainless steel 1.4305 (X5CrNi18-10, AISI 304).

Rolling bearing: Stainless steel 1.4125 (X105CrMo17, AISI 440 C).

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is possible.

Delivery with stainless steel grease nipple.



Ordering Details: e.g.: Product No. 625 991 12, Ball Pillow Block Bearing SSUCP 201, Bore 12mm

Product No. Stainless	SSUCP No.	Bore mm	h mm	a mm	e mm	b mm	s ₁ mm	s ₂ mm	g mm	w mm	L _{UC} mm	n _{UC} mm	Bearing-Load Rating*		Weight kg
													dyn. C kN	stat. C ₀ kN	
625 991 12	201	12	33,3	127	95	38	13	19	15	65	31	12,7	12,8	6,7	0,84
625 991 15	202	15	33,3	127	95	38	13	19	15	65	31	12,7	12,8	6,7	0,82
625 991 17	203	17	33,3	127	95	38	13	19	15	65	31	12,7	12,8	6,7	0,81
625 991 20	204	20	33,3	127	95	38	13	19	15	65	31	12,7	12,8	6,7	0,81
625 991 25	205	25	36,5	140	105	38	13	16	16	70	34	14,3	14,0	7,9	0,99
625 991 30	206	30	42,9	163	121	48	17	21	18	83	38,1	15,9	19,5	11,3	1,62
625 991 35	207	35	47,6	167	127	48	17	21	19	94	42,9	17,5	25,7	15,3	2,08
625 991 40	208	40	49,2	184	137	54	17	25	19	100	49,2	19	29,5	18,2	2,65
625 991 45	209	45	54,0	190	146	54	17	22	20	108	49,2	19	31,7	20,7	2,90
625 991 50	210	50	57,2	206	159	60	20	25	22	114	51,6	19	35,1	23,2	2,59

* Maximum radial load if axial force = 0.

The axial load rating is approx. 20% of the radial load rating.

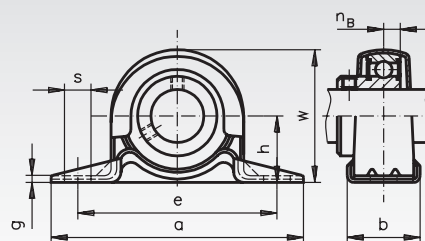
Ball Pillow Block Bearings SSBPP, Two-Part Sheet, Stainless Steel

Material: Housing from two-part sheets:

Stainless steel 1.4305 (X5CrNi18-10, AISI 304).

Rolling bearing: Stainless steel 1.4125 (X105CrMo17, AISI 440 C).

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is not possible.



Ordering Details: e.g.: Product No. 625 992 12, Ball Pillow Block Bearing SSBPP 201

Product No.	SSBPP No.	Bore mm	h mm	a mm	e mm	b mm	s mm	g mm	w mm	n _B mm	Permissible Housing Load kN	Bearing-Load Rating*		Weight kg
												dyn. C kN	stat. C ₀ kN	
625 992 12	201	12	22,2	86	68	25	9,5	3,5	43,8	6	2,16	9,6	4,8	0,19
625 992 15	202	15	22,2	86	68	25	9,5	3,5	43,8	6	2,16	9,6	4,8	0,19
625 992 17	203	17	22,2	86	68	25	9,5	3,5	43,8	6	2,16	9,6	4,8	0,19
625 992 20	204	20	25,4	98	76	32	9,5	3,5	50,5	7	2,62	12,9	6,7	0,23
625 992 25	205	25	28,6	108	86	32	11,5	4	56,6	7,5	3,72	14,0	7,9	0,32
625 992 30	206	30	33,3	117	95	38	11,5	4	66,3	8	4,41	19,5	11,3	0,50
625 992 35	207	35	39,7	130	106	42	11	5	78	8,5	4,90	25,7	15,3	0,60

* Maximum radial load if axial force = 0. Regard the housing load. The axial load rating is approx. 20% of the radial load rating.

Ball Flange Bearings SSUCF, Stainless Steel

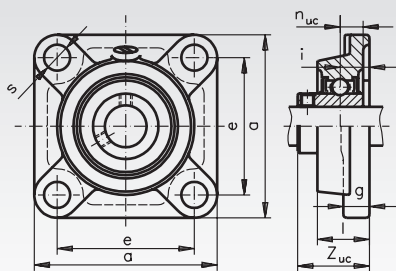
Material: Housing: Stainless steel 1.4305 (X5CrNi18-10, AISI 304).

Rolling bearing: Stainless steel 1.4125 (X105CrMo17, AISI 440 C).

With 4 mounting holes.

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is possible.

Delivery with stainless steel grease nipple.



Ordering Details: e.g.: Product No. 626 990 12, Ball Flange Bearing SSUCF 201, Bore 12mm

Product No. Stainless	SSUCF No.	Bore mm	a mm	e mm	i mm	g mm	l mm	s mm	Z _{uc} mm	n _{uc} mm	Bearing-Load Rating*		Weight kg
											dyn. C kN	stat. C ₀ kN	
626 990 12	201	12	86	64	15	12	25,5	12	33,3	12,7	12,8	6,7	0,84
626 990 15	202	15	86	64	15	12	25,5	12	33,3	12,7	12,8	6,7	0,82
626 990 17	203	17	86	64	15	12	25,5	12	33,3	12,7	12,8	6,7	0,81
626 990 20	204	20	86	64	15	12	25,5	12	33,3	12,7	12,8	6,7	0,79
626 990 25	205	25	95	70	16	14	27	12	35,7	14,3	14,0	7,9	1,02
626 990 30	206	30	108	83	18	14	31	12	40,2	15,9	19,5	11,3	1,42
626 990 35	207	35	117	92	19	16	34	14	44,4	17,5	25,7	15,3	1,98
626 990 40	208	40	130	102	21	16	36	16	51,2	19	29,5	18,2	2,55
626 990 45	209	45	137	105	22	18	38	16	52,2	19	31,7	20,7	3,00
626 990 50	210	50	143	111	22	18	40	16	54,6	19	35,1	23,2	3,29

* Maximum radial load if axial force = 0.

The axial load rating is approx. 20% of the radial load rating.

Ball Flange Bearings SSUCFL, Stainless Steel

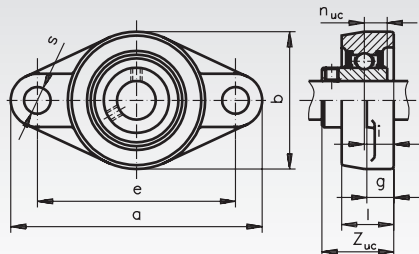
Material: Housing: Stainless steel 1.4305 (X5CrNi18-10, AISI 304).

Rolling bearing: Stainless steel 1.4125 (X105CrMo17, AISI 440 C).

With 2 mounting holes.

The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is possible.

Delivery with stainless steel grease nipple.



Ordering Details: e.g.: Product No. 626 991 12, Ball Flange Bearing SSUCFL 201, Bore 12mm

Product No. Stainless	SSUCFL No.	Bore mm	a mm	b mm	e mm	i mm	g mm	l mm	s mm	Z _{uc} mm	n _{uc} mm	Bearing-Load Rating*		Weight kg
												dyn. C kN	stat. C ₀ kN	
626 991 12	201	12	113	60	90	15	12	25,5	12	33,3	12,7	12,8	6,7	0,70
626 991 15	202	15	113	60	90	15	12	25,5	12	33,3	12,7	12,8	6,7	0,68
626 991 17	203	17	113	60	90	15	12	25,5	12	33,3	12,7	12,8	6,7	0,67
626 991 20	204	20	113	60	90	15	12	25,5	12	33,3	12,7	12,8	6,7	0,65
626 991 25	205	25	125	68	99	16	14	27	16	35,7	14,3	14,0	7,9	0,83
626 991 30	206	30	141	80	117	18	14	31	16	40,2	15,9	19,5	11,3	1,26
626 991 35	207	35	157	90	130	19	16	34	16	44,4	17,5	25,7	15,3	1,68
626 991 40	208	40	172	100	144	21	16	36	16	51,2	19	29,5	18,2	2,25
626 991 45	209	45	179	108	148	22	18	38	19	52,2	19	31,7	20,7	2,60
626 991 50	210	50	189	115	157	22	18	40	19	54,6	19	35,1	23,2	2,99

* Maximum radial load if axial force = 0.

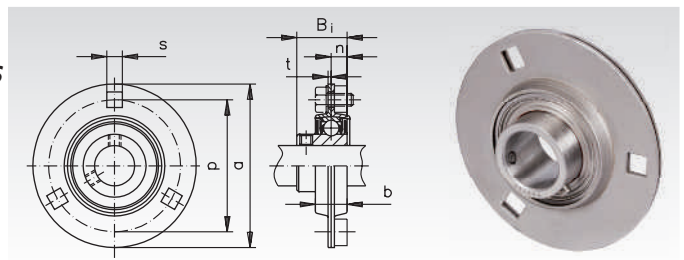
The axial load rating is approx. 20% of the radial load rating.

Ball Flange Bearings SSBPF, Two-Part Steel Sheet, Stainless Steel

Material: Housing from two-part sheets: Stainless steel 1.4305 (X5CrNi18-10, AISI 304). Rolling bearing: Stainless steel 1.4125 (X105CrMo17, AISI 440 C).

STAINLESS

With 3 mounting holes. The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is not possible.



Ordering Details: e.g.: Product No. 626 994 12, Ball Flange Bearing SSBPF 201

Product No.	SSBPF No.	Bore mm	a mm	p mm	t mm	b mm	s mm	B _i mm	n mm	Permissible Housing Load kN	Bearing-Load Rating* dyn. C kN	stat. C ₀ kN	Weight kg
626 994 12	201	12	81	63,5	2	14	7,1	22	6	2,65	9,6	4,8	0,27
626 994 15	202	15	81	63,5	2	14	7,1	22	6	2,65	9,6	4,8	0,27
626 994 17	203	17	81	63,5	2	14	7,1	22	6	2,65	9,6	4,8	0,27
626 994 20	204	20	90	71,5	2	16	9	25	7	3,09	12,9	6,7	0,33
626 994 25	205	25	95	76	2	18	9	27	7,5	3,53	14,0	7,9	0,38
626 994 30	206	30	113	90,5	2,6	19	11	30	8	4,90	19,5	11,3	0,62
626 994 35	207	35	122	100	2,6	22	11	32	8,5	6,23	25,7	15,3	0,82

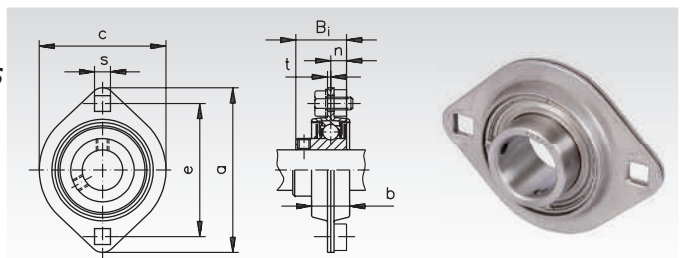
* Maximum radial load if axial force = 0. Regard the housing load. The axial load rating is approx. 20% of the radial load rating.

Ball Flange Bearings SSBPFL, Two-Part Steel Sheet, Stainless Steel

Material: Housing from two-part sheets: Stainless steel 1.4305 (X5CrNi18-10, AISI 304). Rolling bearing: Stainless steel 1.4125 (X105CrMo17, AISI 440 C).

STAINLESS

With 2 mounting holes. The rolling bearing can be swiveled when mounting to compensate shaft misalignment. The shaft will get fastened with 2 setscrews. Lubricated for life at normal operating conditions. Re-lubricating is not possible.

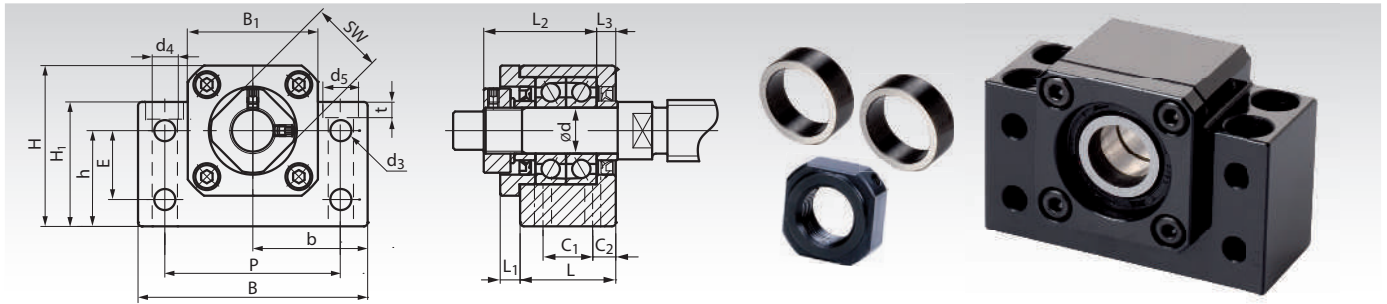


Ordering Details: e.g.: Product No. 626 995 12, Ball Flange Bearing SSBPFL 201

Product No.	SSBPFL No.	Bore mm	a mm	e mm	t mm	b mm	c mm	s mm	B _i mm	n mm	Permissible Housing Load kN	Bearing-Load Rating* dyn. C kN	stat. C ₀ kN	Weight kg
626 995 12	201	12	81	63,5	2	14	59	7,1	22	6	2,65	9,6	4,8	0,19
626 995 15	202	15	81	63,5	2	14	59	7,1	22	6	2,65	9,6	4,8	0,19
626 995 17	203	17	81	63,5	2	14	59	7,1	22	6	2,65	9,6	4,8	0,19
626 995 20	204	20	90	71,5	2	16	67	9	25	7	3,09	12,9	6,7	0,24
626 995 25	205	25	95	76,0	2	18	71	9	27	7,5	3,53	14,0	7,9	0,28
626 995 30	206	30	113	90,5	2,6	19	84	11	30	8	4,90	19,5	11,3	0,38
626 995 35	207	35	123	100	2,6	20	94	11	32	8,5	6,23	25,7	15,3	0,58

* Maximum radial load if axial force = 0. Regard the housing load. The axial load rating is approx. 20% of the radial load rating.

Pillow Block Bearing Units BK, for Fixed Side



Material: Housing from steel, all surfaces machined, burnished.
On request: nickel plated. Rolling bearing from bearing steel.

Ready-to-install housing bearing unit for trapezoidal and ballscrew spindle drives, for the fixed side. With two angular contact ball bearings, lightly preloaded, with seals. With 8 mounting holes.

Locknut and distance bushes are included. Due to the standard dimensions, these units can also replace parts of other suppliers.

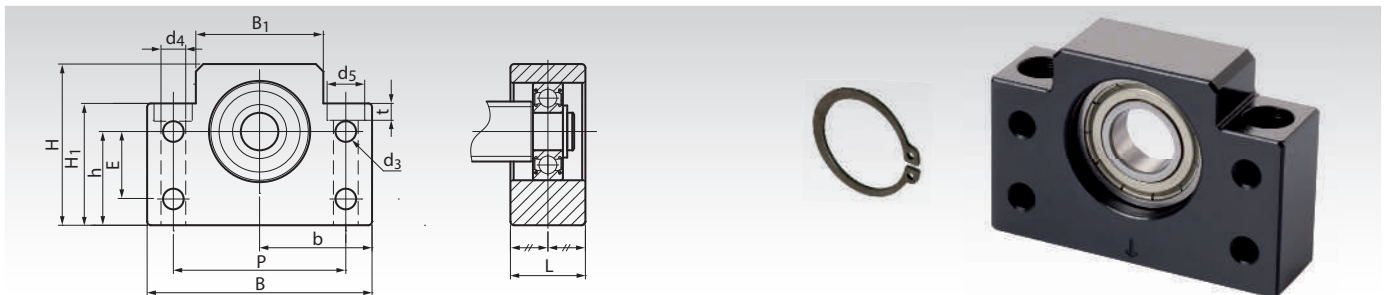
Spindle reworking on request (see page 435).

Matching counterpart for support side: Pillow Block Bearing BF.

Ordering Details: e.g.: Product No. 642 001 10, Ball Pillow Block Bearing Unit BK 10, Bore 10mm

Product No.	Type	d mm	L mm	L ₁ mm	L ₂ mm	L ₃ mm	B mm	H mm	b $\pm 0,02$ mm	h $\pm 0,02$ mm	B ₁ mm	H ₁ mm	E mm	P mm	C ₁ mm	C ₂ mm	d ₃ mm	d ₄ mm	d ₅ mm	t mm	SW mm	Weight kg
642 001 10	BK 10	10	25	5	29,5	5	60	39	30	22	34	32,5	15	46	13	6	5,5	6,3	10,5	6,5	16	0,39
642 001 12	BK 12	12	25	5	29,5	5	60	42	30	25	34	32,5	18	46	13	6	5,5	6,3	10,5	1,5	19	0,41
642 001 15	BK 15	15	27	6	32	6	70	47	35	28	38	38	18	54	15	6	5,5	6,3	10,5	6,5	22	0,57
642 001 17	BK 17	17	35	9	44	7	86	63	43	39	48	55	28	68	19	8	6,6	8,7	14,0	8,6	24	1,27
642 001 20	BK 20	20	35	8	43	8	88	59	44	34	50	50	22	70	19	8	6,6	8,7	14,0	8,5	30	1,19
642 001 25	BK 25	25	42	12	54	9	106	79	53	48	62	70	33	85	22	10	9	10,7	17,5	10,8	35	2,30
642 001 30	BK 30	30	45	14	61	9	128	88	64	51	74	78	33	102	23	11	11	13,7	20	13	40	3,32
642 001 35	BK 35	35	50	14	67	12	140	95	70	52	86	79	35	114	26	12	11	13,7	20	13	50	4,33
642 001 40	BK 40	40	61	18	76	15	160	109	80	60	98	90	37	130	33	14	14	17,7	26	17,5	50	6,50

Pillow Block Bearing Units BF, for Support Side



Material: Housing from steel, all surfaces machined, burnished.
On request: nickel plated. Rolling bearing from bearing steel.

Ready-to-install housing bearing unit for trapezoidal and ballscrew spindle drives, for the support side. With one movable single row deep groove ball bearing with shields (2Z). With 6 mounting holes.

Retaining ring for fixing on the spindle end is included.

Due to the standard dimensions, these units can also replace parts of other suppliers.

Spindle reworking on request (see page 435).

Matching counterpart for fixed side: Pillow Block Bearing BK.

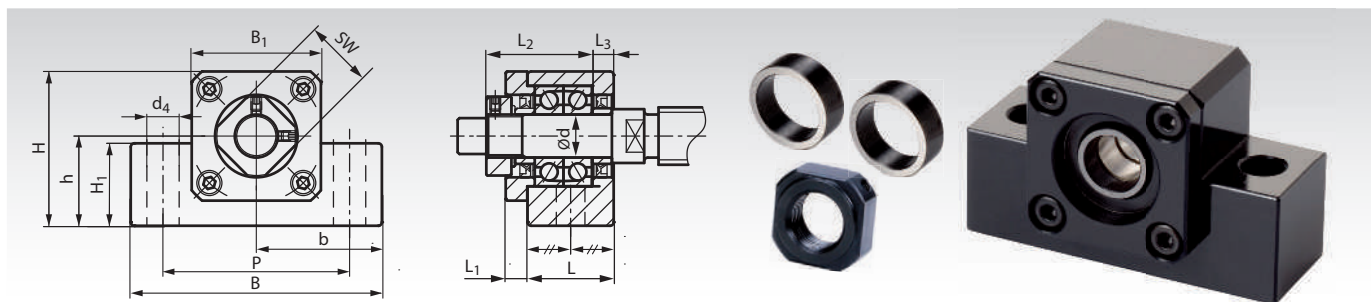
Ordering Details: e.g.: Product No. 642 002 10, Ball Pillow Block Bearing Unit BF 10, Bore 8mm

Product No.	Type	d mm	L mm	B mm	H mm	b $\pm 0,02$ mm	h $\pm 0,02$ mm	B ₁ mm	H ₁ mm	E mm	P mm	d ₃ mm	d ₄ mm	d ₅ mm	t mm	Weight kg
642 002 10	BF 10	8	20	60	39	30	22	34	32,5	15	46	5,5	6,3	10,8	5,0	0,29
642 002 12	BF 12	10	20	60	43	30	25	34	32,5	18	46	5,5	6,3	10,8	1,5	0,30
642 002 15	BF 15	15	20	70	48	35	28	40	38	18	54	5,5	6,3	11	6,5	0,38
642 002 17	BF 17	17	23	86	64	43	39	50	55	28	68	6,6	8,7	14	8,6	0,74
642 002 20	BF 20	20	26	88	60	44	34	52	50	22	70	6,6	8,7	14	8,6	0,76
642 002 25	BF 25	25	30	106	80	53	48	64	70	33	85	9	10,7	17,5	11	1,42
642 002 30	BF 30	30	32	128	89	64	51	76	78	33	102	11	13,7	20	13	1,97
642 002 35	BF 35	35	32	140	96	70	52	88	79	35	114	11	13,7	20	13	2,22
642 002 40	BF 40	40	37	160	110	80	60	100	90	37	130	14	17,7	26	17,5	3,27



Nickel plated on request.

Pillow Block Bearing Units EK, for Fixed Side



Material: Housing from steel, all surfaces machined, burnished.
On request: nickel plated. Rolling bearing from bearing steel.

Ready-to-install housing bearing unit for trapezoidal and ballscrew spindle drives, for the fixed side. With two angular contact ball bearings, lightly preloaded, with seals. With 2 mounting holes.

Locknut and distance bushes are included. Due to the standard dimensions, these units can also replace parts of other suppliers.

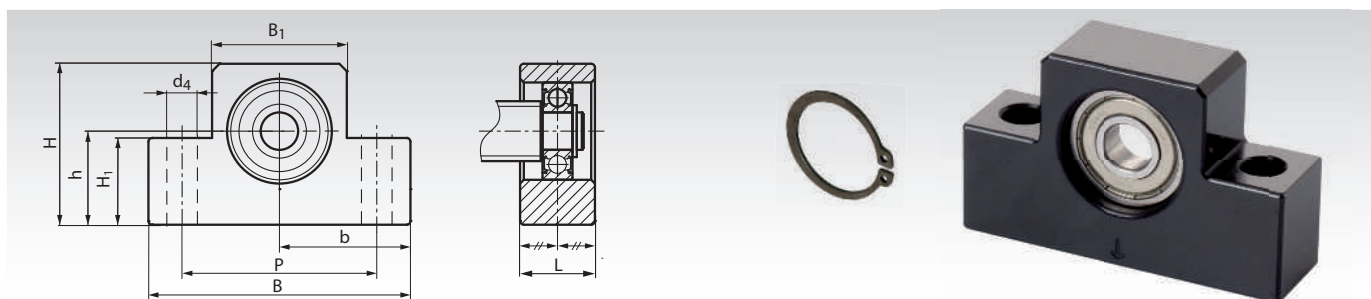
Spindle reworking on request (see page 435).

Matching counterpart for support side: Pillow Block Bearing EF.

Ordering Details: e.g.: Product No. 642 003 06, Ball Pillow Block Bearing Unit EK 6, Bore 6mm

Product No.	Type	d mm	L mm	L ₁ mm	L ₂ mm	L ₃ mm	B mm	H mm	b $\pm 0,02$ mm	h $\pm 0,02$ mm	B ₁ mm	H ₁ mm	P mm	d ₄ mm	SW mm	Weight kg
642 003 06	EK 06	6	20	5,5	22	3,5	42	25	21	13	20	12	30	5,2	12	0,14
642 003 08	EK 08	8	23	7	26	4	52	32	26	17	27	16	38	6,3	14	0,24
642 003 10	EK 10	10	24	6	29,5	6	70	43	35	25	36	24	52	9	16	0,46
642 003 12	EK 12	12	24	6	29,5	6	70	43	35	25	36	24	52	9	19	0,44
642 003 15	EK 15	15	25	6	32	5	80	50	40	30	40	25	60	11	22	0,55
642 003 20	EK 20	20	42	10	50	10	95	58	47,5	30	56	25	75	11	30	1,35

Pillow Block Bearing Units EF, for Support Side



Material: Housing from steel, all surfaces machined, burnished.
On request: nickel plated. Rolling bearing from bearing steel.

Ready-to-install housing bearing unit for trapezoidal and ballscrew spindle drives, for the support side. With one movable single row deep groove ball bearing with shields (2Z). With 2 mounting holes.

Retaining ring for fixing on the spindle end is included.

Due to the standard dimensions, these units can also replace parts of other suppliers.

Spindle reworking on request (see page 435).

Matching counterpart for fixed side: Pillow Block Bearing EK.

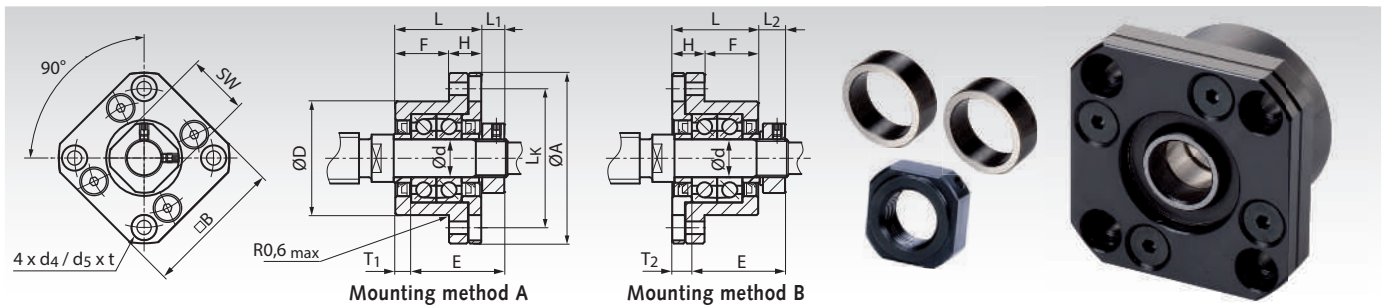
Ordering Details: e.g.: Product No. 642 004 06, Ball Pillow Block Bearing Unit EF 6, Bore 6mm

Product No.	Type	d mm	L mm	B mm	H mm	b $\pm 0,02$ mm	h $\pm 0,02$ mm	B ₁ mm	H ₁ mm	P mm	d ₄ mm	Weight kg
642 004 06	EF 06	6	12	42	25	21	13	20	12	30	5,2	0,07
642 004 08	EF 08	6	14	52	32	26	17	27	16	38	6,3	0,13
642 004 10	EF 10	8	20	70	43	35	25	36	24	52	9	0,33
642 004 12	EF 12	10	20	70	43	35	25	36	24	52	9	0,32
642 004 15	EF 15	15	20	80	49	40	30	41	25	60	9	0,38
642 004 20	EF 20	20	26	95	58	47,5	30	56	25	75	11	0,63



Nickel plated on request.

Flange Bearing Units FK, for Fixed Side



Material: Housing from steel, all surfaces machined, burnished.
On request: nickel plated. Rolling bearing from bearing steel.

Ready-to-install housing bearing unit for trapezoidal and ballscrew spindle drives, for the fixed side. With two angular contact ball bearings, lightly preloaded, with seals. With 4 mounting holes.

Locknut and distance bushes are included. Due to the standard dimensions, these units can also replace parts of other suppliers.

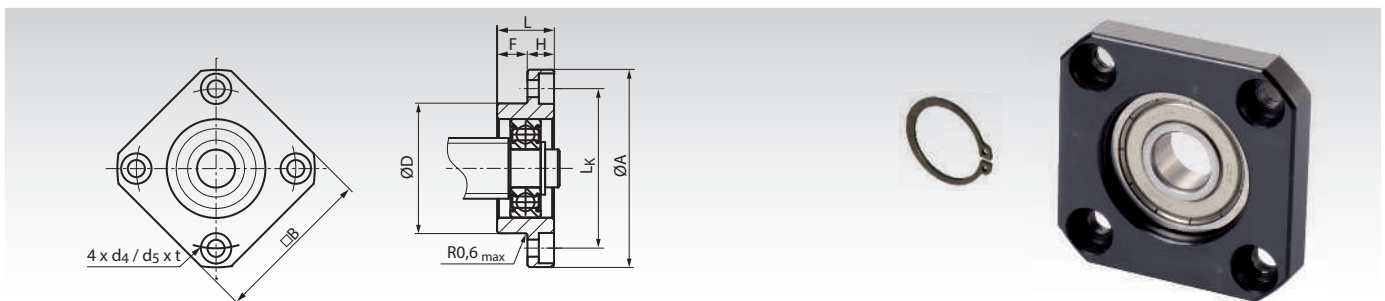
Spindle reworking on request (see page 435).

Matching counterpart for support side: Flange Bearing FF.

Ordering Details: e.g.: Product No. 642 005 06, Flange Bearing Unit FK 6, Bore 6mm

Product No.	Type	d mm	L mm	H mm	F mm	E mm	D ^{g6} mm	A mm	L _k mm	B mm	L ₁ mm	T ₁ mm	L ₂	T ₂	d ₄ mm	d ₅ mm	t mm	SW mm	Weight kg
642 005 06	FK 06	6	20	7	13	22	22	36	28	28	5,5	3,5	6,5	4,5	3,4	6	3,3	12	0,08
642 005 08	FK 08	8	23	9	14	26	28	43	35	35	7,0	4	8	5	3,4	6	3,3	14	0,15
642 005 10	FK 10	10	27	10	17	29,5	34	52	42	42	7,3	5	8,5	6	4,5	8	4	16	0,21
642 005 12	FK 12	12	27	10	17	29,5	36	54	44	44	7,3	5	8,5	6	4,5	8	4	19	0,22
642 005 15	FK 15	15	32	15	17	36	40	63	50	52	9,8	6	12	8	5,5	9,5	6	22	0,39
642 005 17	FK 17	17	45	22	23	47	50	77	62	61	11,0	9	14	12	6,6	11	10	24	0,85
642 005 20	FK 20	20	52	22	30	50	57	85	70	68	7,8	10	12	14	6,5	11	10	30	1,09
642 005 25	FK 25	25	57	27	30	60	63	98	80	79	12,8	10	20	17	9	15	13	35	1,49
642 005 30	FK 30	30	62	30	32	61	75	117	95	93	10,8	12	17	18	11	17,5	15	40	2,32

Flange Bearing Units FF, for Support Side



Material: Housing from steel, all surfaces machined, burnished.
On request: nickel plated. Rolling bearing from bearing steel.

Ready-to-install housing bearing unit for trapezoidal and ballscrew spindle drives, for the support side. With one movable single row deep groove ball bearing with shields (2Z). With 4 mounting holes.

Retaining ring for fixing on the spindle end is included.

Due to the standard dimensions, these units can also replace parts of other suppliers.

Spindle reworking on request (see page 435).

Matching counterpart for fixed side: Flange Bearing FK.

Ordering Details: e.g.: Product No. 642 006 06, Flange Bearing Unit FF 6, Bore 6mm

Product No.	Type	d mm	L mm	H mm	F mm	D ^{g6} mm	A mm	L _k mm	B mm	d ₄ mm	d ₅ mm	t mm	Weight kg
642 006 06	FF 06	6	10	6	4	22	36	28	28	3,4	6,0	3,3	0,04
642 006 10	FF 10	8	12	7	5	28	43	35	35	3,4	6,0	3,3	0,07
642 006 12	FF 12	10	15	7	8	34	52	42	42	4,2	8	4,4	0,11
642 006 15	FF 15	15	17	9	8	40	63	50	52	5,2	9,5	5,4	0,20
642 006 17	FF 17	17	20	11	9	50	77	62	61	6,6	11	8,6	0,35
642 006 20	FF 20	20	20	11	9	57	85	70	68	6,3	11	6,5	0,27
642 006 25	FF 25	25	24	14	10	63	98	80	79	8,7	14	8,6	0,67
642 006 30	FF 30	30	27	18	9	75	117	95	93	10,7	17,5	10,8	1,07



Nickel plated on request.

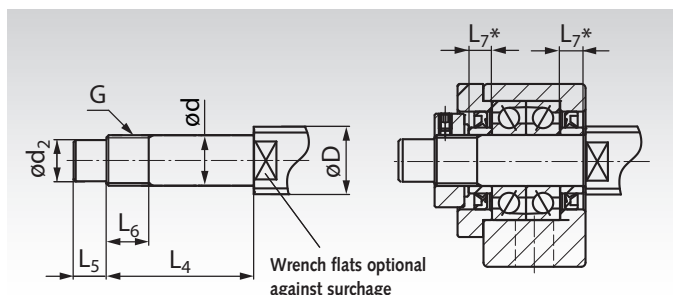
Shaft Reworking and Bearing Load Data for Spindle Bearing Units BK, EK and FK (Fixed Side)

Shaft Reworking:

At **MÄDLER®**, trapezoidal and ballscrew spindles can get reworked, fitting to the bearing units. The spindle reworking in the drawing is just a recommendation. Due to the customer's request, the length L_5 could be shorter or longer and the shaft end could get a keyway DIN 6885.

Bearing Load Data:

The loading rates and speed limits shown in the table are the limits just for the bearings. The limits of the spindles are much lower, depending on the diameter, length and material.



Recommended Shaft Reworking for Fixed Side Units

Bearing-Unit Type	Spindle-Ø D		dg ⁶ mm	d ₂ ^{h7} mm	L ₄ ±0,2 mm	L ₅ ±0,2 mm	G mm	L ₆ ±0,2 mm	L ₇ ¹⁾ mm	Bearing Load Data			
	KGT mm	TR mm								Bearing Type	Load rating axial dyn.C kN	stat.C ₀ kN	Speed limit min ⁻¹
EK 06 / FK 06	8	10*	6	4	28	8	M6x0,75	8	5	706 A P5	2,03	0,80	46.400
EK 08 / FK 08	10/12	12*/14	8	6	32	9	M8x1	10	5,5	708 A P5	3,35	1,45	35.200
BK 10	12/14/15	16	10	8	36	15	M10x1	16	5,5	7000 A P5	5,0	2,34	29.440
EK 10 / FK 10	12/14/15	16	10	8	36	15	M10x1	11	5,5	7000 A P5	5,0	2,34	29.440
BK 12	14/15/16	18	12	10	36	15	M12x1	14	5,5	7001 A P5	5,4	2,71	25.760
EK 12 / FK 12	14/15/16	18	12	10	36	15	M12x1	11	5,5	7001 A P5	5,4	2,71	25.760
BK 15	18/20	20*/24	15	12	40	20	M15x1	12	6	7002 A P5	3,2	2,36	22.080
EK 15	18/20	20*/24	15	12	47	20	M15x1	13	10	7002 A P5	3,2	2,36	22.080
FK 15	18/20	20*/24	15	12	47	20	M15x1	13	10	7002 A P5	3,2	2,36	22.080
BK 17 / FK 17	20/25	24/28	17	15	53	23	M17x1	17	7	7203 A P5	10,1	5,45	18.400
BK 20	25/28/30	30/36	20	17	53	25	M20x1	15	8	7004 A P5	10,3	6,10	16.560
EK 20 / FK 20	25/28/30	30/36	20	17	62	25	M20x1	17	11	7204 A P5	13,6	7,55	15.640
BK 25	30/32/36	36	25	20	65	30	M25x1,5	18	9	7205 A P5	15,4	9,45	13.800
FK 25	30/32/36	36	25	20	76	30	M25x1,5	20	15	7205 A P5	15,4	9,45	13.800
BK 30 / FK 30	36/40	36*/40	30	25	72	38	M30x1,5	25	9	7206 A P5	21,3	13,6	11.040
BK 35	45	36*/40	35	30	81	45	M35x1,5	28	12	7207 A P5	28,2	18,5	9.660
BK 40	50	50	40	35	93	50	M40x1,5	35	15	7208 A P5	33,5	23,3	8.832

¹⁾ The matching distance bushes are included in the scope of delivery of bearing units BK, EK and FK.

* A rest of the thread grooves may remain visible.

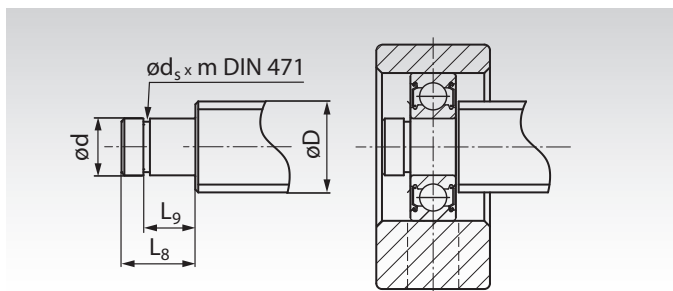
Shaft Reworking and Bearing Load Data for Spindle Bearing Units BF, EF and FF (Support Side)

Shaft Reworking:

At **MÄDLER®**, trapezoidal and ballscrew spindles can get reworked, fitting to the bearing units. The spindle reworking in the drawing is just a recommendation. Due to the customer's request, the length L_8 could be shorter or longer and the shaft end could get a keyway DIN 6885.

Bearing Load Data:

The loading rates and speed limits shown in the table are the limits just for the bearings. The limits of the spindles are much lower, depending on the diameter, length and material.



Recommended Shaft Reworking for Support Side Units

Bearing-Unit Type	Spindle-Ø D		dg ⁶ mm	d _s ^{-0,15} mm	L ₈ ±0,2 mm	L ₉ ±0,2 mm	mH ¹³ mm	DIN 471 ¹⁾ mm	Bearing Load Data			
	KGT mm	TR mm							Bearing Type	Load rating axial dyn.C kN	stat.C ₀ kN	Speed limit min ⁻¹
EF 06 / FF 06	8	10*	6	5,7	9	6,8	0,8	6	606-2Z	2,3	0,8	37.000
EF 08	10/12	10*/12	6	5,7	9	6,8	0,8	6	606-2Z	2,3	0,8	37.000
BF 10 / EF 10 / FF 10	12/14/15	12*/14	8	7,6	10	7,9	0,9	8	608-2Z	3,3	1,4	34.000
BF 12 / EF 12 / FF 12	14/15/16	16/18	10	9,6	11	9,15	1,15	10	6000-2Z	4,6	2,0	31.000
BF 15 / EF 15 / FF 15	18/20	20*/24	15	14,3	13	10,15	1,15	15	6002-2Z	5,6	2,8	23.000
BF 17 / FF 17	20/25	24/28	17	16,2	16	13,15	1,15	17	6203-2Z	9,6	4,8	17.000
BF 20	25/28/30	30/36	20	19,0	16	13,15	1,15	20	6004-2Z	9,4	5,0	15.000
EF 20 / FF 20	25/28/30	30/36	20	19,0	19	15,35	1,35	20	6204-2Z	12,8	6,7	14.000
BF 25 / FF 25	30/32/36	36	25	23,9	20	16,35	1,35	25	6205-2Z	14,0	7,9	12.000
BF 30 / FF 30	36/40	36*/40	30	28,6	21	17,75	1,75	30	6206-2Z	19,5	11,3	9.500
BF 35	40/45	36/40	35	33	22	18,75	1,75	35	6207-2Z	16,0	10,4	9.000
BF 40	50	50	40	38	23	19,95	1,95	40	6208-2Z	29,5	18,0	8.000

¹⁾ The retaining ring DIN 471 is included in the scope of delivery of bearing units BF, EF and FF.

* A rest of the thread grooves may remain visible.

Single Row Deep Groove Ball Bearings SKF®, inner diameter 3 - 17 mm

Material: Bearing steel.

- Standard ball bearings in premium-quality.
- Most common bearing type.
- Usable for high speed.
- Insensitive in use and maintenance.
- On choice: Open, with friction-free metal shields 2Z (= ZZ)
or with contacting rubber NBR seals 2RS1 / 2RSH.

Temperature range: -30°C to +90°C (for short time up to +110°C).

Clearance CN: Normal bearing play. **Clearance C3:** Greater play.

Other versions or other bearing types on request.



Ordering Details: e.g.: Product No., quantity

Product No. Clearance CN	Product No. Clearance C3	Main dimensions			Version	Load rating radial			Speed base min ⁻¹	Speed limit min ⁻¹	Weight g
		d mm	D mm	B mm		dyn.C kN	stat.C ₀ kN	P _u * kN			
623-2Z-SKF	623-2Z-C3-SKF	3	10	4	shielded on both sides	0,54	0,18	0,007	130.000	60.000	1,5
624-2Z-SKF	624-2Z-C3-SKF	4	13	5	shielded on both sides	0,94	0,29	0,012	110.000	53.000	3,1
625-SKF	-	5	16	5	open	1,14	0,38	0,016	95.000	60.000	5
625-2Z-SKF	625-2Z-C3-SKF	5	16	5	shielded on both sides	1,14	0,38	0,016	95.000	48.000	5
625-2RS1-SKF	-	5	16	5	sealed on both sides	1,14	0,38	0,016	95.000	48.000	5
626-SKF	626-C3-SKF	6	19	6	open	2,34	0,95	0,04	80.000	50.000	8,4
626-2Z-SKF	626-2Z-C3-SKF	6	19	6	shielded on both sides	2,34	0,95	0,04	80.000	40.000	8,4
626-2RSH-SKF	626-2RSH-C3-SKF	6	19	6	sealed on both sides	2,34	0,95	0,04	-	24.000	8,4
607-2Z-SKF	607-2Z-C3-SKF	7	19	6	shielded on both sides	2,34	0,95	0,04	85.000	43.000	7,5
607-2RSH-SKF	607-2RSH-C3-SKF	7	19	6	sealed on both sides	2,34	0,95	0,04	-	24.000	7,5
627-2Z-SKF	627-2Z-C3-SKF	7	22	7	shielded on both sides	3,45	1,37	0,057	70.000	36.000	13
627-2RSH-SKF	627-2RSH-C3-SKF	7	22	7	sealed on both sides	3,45	1,37	0,057	-	22.000	12
608-SKF	-	8	22	7	open	3,45	1,37	0,057	75.000	48.000	12
608-2Z-SKF	608-2Z-C3-SKF	8	22	7	shielded on both sides	3,45	1,37	0,057	75.000	38.000	12
608-2RSH-SKF	608-2RSH-C3-SKF	8	22	7	sealed on both sides	3,45	1,37	0,057	-	22.000	12
609-2Z-SKF	609-2Z-C3-SKF	9	24	7	shielded on both sides	3,9	1,66	0,071	70.000	34.000	14
609-2RSH-SKF	609-2RSH-C3-SKF	9	24	7	sealed on both sides	3,9	1,66	0,071	-	19.000	14
629-2Z-SKF	629-2Z-C3-SKF	9	26	8	shielded on both sides	4,75	1,96	0,083	60.000	30.000	20
629-2RSH-SKF	629-2RSH-C3-SKF	9	26	8	sealed on both sides	4,75	1,96	0,083	-	19.000	20
61800-SKF	-	10	19	5	open	1,38	0,59	0,025	80.000	48.000	5,5
61800-2Z-SKF	-	10	19	5	shielded on both sides	1,38	0,59	0,025	80.000	38.000	5,5
61800-2RS1-SKF	-	10	19	5	sealed on both sides	1,38	0,59	0,025	-	22.000	5,5
6000-SKF	6000-C3-SKF	10	26	8	open	4,75	1,96	0,083	67.000	40.000	19
6000-2Z-SKF	6000-2Z-C3-SKF	10	26	8	shielded on both sides	4,75	1,96	0,083	67.000	34.000	19
6000-2RSH-SKF	6000-2RSH-C3-SKF	10	26	8	sealed on both sides	4,75	1,96	0,083	-	19.000	19
6200-SKF	6200-C3-SKF	10	30	9	open	5,4	2,36	0,1	56.000	34.000	32
6200-2Z-SKF	6200-2Z-C3-SKF	10	30	9	shielded on both sides	5,4	2,36	0,1	56.000	28.000	32
6200-2RSH-SKF	6200-2RSH-C3-SKF	10	30	9	sealed on both sides	5,4	2,36	0,1	-	17.000	32
6300-2Z-SKF	6300-2Z-C3-SKF	10	35	11	shielded on both sides	8,52	3,4	0,143	50.000	26.000	53
6300-2RSH-SKF	6300-2RSH-C3-SKF	10	35	11	sealed on both sides	8,52	3,4	0,143	-	15.000	53
61801-SKF	-	12	21	5	open	1,43	0,67	0,028	70.000	43.000	6,3
61801-2Z-SKF	-	12	21	5	shielded on both sides	1,43	0,67	0,028	70.000	36.000	6,3
61801-2RS1-SKF	-	12	21	5	sealed on both sides	1,43	0,67	0,028	-	20.000	6,3
6001-SKF	6001-C3-SKF	12	28	8	open	5,4	2,36	0,1	60.000	38.000	22
6001-2Z-SKF	6001-2Z-C3-SKF	12	28	8	shielded on both sides	5,4	2,36	0,1	60.000	30.000	22
6001-2RSH-SKF	6001-2RSH-C3-SKF	12	28	8	sealed on both sides	5,4	2,36	0,1	-	17.000	22
6201-SKF	6201-C3-SKF	12	32	10	open	7,28	3,1	0,132	50.000	32.000	37
6201-2Z-SKF	6201-2Z-C3-SKF	12	32	10	shielded on both sides	7,28	3,1	0,132	50.000	26.000	37
6201-2RSH-SKF	6201-2RSH-C3-SKF	12	32	10	sealed on both sides	7,28	3,1	0,132	-	15.000	37
6301-2Z-SKF	6301-2Z-C3-SKF	12	37	12	shielded on both sides	10,1	4,15	0,176	45.000	22.000	60
6301-2RSH-SKF	6301-2RSH-C3-SKF	12	37	12	sealed on both sides	10,1	4,15	0,176	-	14.000	60
61802-2Z-SKF	-	15	24	5	shielded on both sides	1,56	0,8	0,034	60.000	30.000	7,4
61802-2RS1-SKF	-	15	24	5	sealed on both sides	1,56	0,8	0,034	-	17.000	7,4
6002-SKF	6002-C3-SKF	15	32	9	open	5,85	2,85	0,12	50.000	32.000	30
6002-2Z-SKF	6002-2Z-C3-SKF	15	32	9	shielded on both sides	5,85	2,85	0,12	50.000	26.000	30
6002-2RSH-SKF	6002-2RSH-C3-SKF	15	32	9	sealed on both sides	5,85	2,85	0,12	-	14.000	30
6202-SKF	6202-C3-SKF	15	35	11	open	8,06	3,75	0,16	43.000	28.000	45
6202-2Z-SKF	6202-2Z-C3-SKF	15	35	11	shielded on both sides	8,06	3,75	0,16	43.000	22.000	45
6202-2RSH-SKF	6202-2RSH-C3-SKF	15	35	11	sealed on both sides	8,06	3,75	0,16	-	13.000	45
6302-SKF	6302-C3-SKF	15	42	13	open	11,9	5,4	0,228	38.000	24.000	82
6302-2Z-SKF	6302-2Z-C3-SKF	15	42	13	shielded on both sides	11,9	5,4	0,228	38.000	19.000	82
6302-2RSH-SKF	6302-2RSH-C3-SKF	15	42	13	sealed on both sides	11,9	5,4	0,228	-	12.000	82
61803-2Z-SKF	-	17	26	5	shielded on both sides	1,68	0,93	0,039	56.000	28.000	8,2
61803-2RS1-SKF	-	17	26	5	sealed on both sides	1,68	0,93	0,039	-	16.000	8,2
6003-SKF	6003-C3-SKF	17	35	10	open	6,37	3,25	0,137	45.000	28.000	39
6003-2Z-SKF	6003-2Z-C3-SKF	17	35	10	shielded on both sides	6,37	3,25	0,137	45.000	22.000	39
6003-2RSH-SKF	6003-2RSH-C3-SKF	17	35	10	sealed on both sides	6,37	3,25	0,137	-	13.000	39
6203-SKF	6203-C3-SKF	17	40	12	open	9,95	4,75	0,2	38.000	24.000	65
6203-2Z-SKF	6203-2Z-C3-SKF	17	40	12	shielded on both sides	9,95	4,75	0,2	38.000	19.000	65
6203-2RSH-SKF	6203-2RSH-C3-SKF	17	40	12	sealed on both sides	9,95	4,75	0,2	-	12.000	65
6303-SKF	6303-C3-SKF	17	47	14	open	14,3	6,55	0,275	34.000	22.000	120
6303-2Z-SKF	6303-2Z-C3-SKF	17	47	14	shielded on both sides	14,3	6,55	0,275	34.000	17.000	120
6303-2RSH-SKF	6303-2RSH-C3-SKF	17	47	14	sealed on both sides	14,3	6,55	0,275	-	11.000	120

* Fatigue load limit.

Single Row Deep Groove Ball Bearings SKF®, inner diameter 20 - 50 mm

Material: Bearing steel.

- Standard ball bearings in premium-quality.
- Most common bearing type.
- Usable for high speed.
- Insensitive in use and maintenance.
- On choice: Open, with friction-free metal shields 2Z (= ZZ)
or with contacting rubber NBR seals 2RS1 / 2RS.

Temperature range: -30°C to +90°C (for short time up to +110°C).

Clearance CN: Normal bearing play. **Clearance C3:** Greater play.

Other versions or other bearing types on request.

Ordering Details: e.g.: product No., quantity



Product No. Clearance CN	Product No. Clearance C3	Main dimensions			Version	Load rating radial			Speed base min ⁻¹	Speed limit min ⁻¹	Weight g
		d mm	D mm	B mm		dyn.C kN	stat.C ₀ kN	P _u * kN			
6004-SKF	6004-C3-SKF	20	42	12	open	9,95	5	0,212	38.000	24.000	69
6004-2Z-SKF	6004-2Z-C3-SKF	20	42	12	shielded on both sides	9,95	5	0,212	38.000	19.000	69
6004-2RS-SKF	6004-2RS-C3-SKF	20	42	12	sealed on both sides	9,95	5	0,212	-	11.000	69
6204-SKF	6204-C3-SKF	20	47	14	open	13,5	6,55	0,28	32.000	20.000	110
6204-2Z-SKF	6204-2Z-C3-SKF	20	47	14	shielded on both sides	13,5	6,55	0,28	32.000	17.000	110
6204-2RS-SKF	6204-2RS-C3-SKF	20	47	14	sealed on both sides	13,5	6,55	0,28	-	10.000	110
6304-SKF	6304-C3-SKF	20	52	15	open	16,8	7,8	0,335	30.000	19.000	140
6304-2Z-SKF	6304-2Z-C3-SKF	20	52	15	shielded on both sides	16,8	7,8	0,335	30.000	15.000	140
6304-2RS-SKF	6304-2RS-C3-SKF	20	52	15	sealed on both sides	16,8	7,8	0,335	-	9.500	140
6005-SKF	6005-C3-SKF	25	47	12	open	11,9	6,55	0,275	32.000	20.000	80
6005-2Z-SKF	6005-2Z-C3-SKF	25	47	12	shielded on both sides	11,9	6,55	0,275	32.000	16.000	80
6005-2RS-SKF	6005-2RS-C3-SKF	25	47	12	sealed on both sides	11,9	6,55	0,275	-	9.500	80
6205-SKF	6205-C3-SKF	25	52	15	open	14,8	7,8	0,335	28.000	18.000	130
6205-2Z-SKF	6205-2Z-C3-SKF	25	52	15	shielded on both sides	14,8	7,8	0,335	28.000	14.000	130
6205-2RS-SKF	6205-2RS-C3-SKF	25	52	15	sealed on both sides	14,8	7,8	0,335	-	8.500	130
6305-SKF	6305-C3-SKF	25	62	17	open	23,4	11,6	0,49	24.000	16.000	230
6305-2Z-SKF	6305-C3-SKF	25	62	17	shielded on both sides	23,4	11,6	0,49	24.000	13.000	230
6305-2RS1-SKF	6305-2RS1-C3-SKF	25	62	17	sealed on both sides	23,4	11,6	0,49	-	7.500	230
6006-SKF	6006-C3-SKF	30	55	13	open	13,8	8,3	0,355	28.000	17.000	120
6006-2Z-SKF	6006-2Z-C3-SKF	30	55	13	shielded on both sides	13,8	8,3	0,355	28.000	14.000	120
6006-2RS1-SKF	6006-2RS1-C3-SKF	30	55	13	sealed on both sides	13,8	8,3	0,355	-	8.000	120
6206-SKF	6206-C3-SKF	30	62	16	open	20,3	11,2	0,475	24.000	15.000	200
6206-2Z-SKF	6206-2Z-C3-SKF	30	62	16	shielded on both sides	20,3	11,2	0,475	24.000	12.000	200
6206-2RS1-SKF	6206-2RS1-C3-SKF	30	62	16	sealed on both sides	20,3	11,2	0,475	-	7.500	200
6306-SKF	6306-C3-SKF	30	72	19	open	29,6	16	0,67	20.000	13.000	350
6306-2Z-SKF	6306-2Z-C3-SKF	30	72	19	shielded on both sides	29,6	16	0,67	20.000	11.000	350
6306-2RS1-SKF	6306-2RS1-C3-SKF	30	72	19	sealed on both sides	29,6	16	0,67	-	6.300	350
6007-SKF	6007-C3-SKF	35	62	14	open	16,8	10,2	0,44	24.000	15.000	160
6007-2Z-SKF	6007-2Z-C3-SKF	35	62	14	shielded on both sides	16,8	10,2	0,44	24.000	12.000	160
6007-2RS1-SKF	6007-2RS1-C3-SKF	35	62	14	sealed on both sides	16,8	10,2	0,44	-	7.000	160
6207-SKF	6207-C3-SKF	35	72	17	open	27	15,3	0,66	20.000	13.000	290
6207-2Z-SKF	6207-2Z-C3-SKF	35	72	17	shielded on both sides	27	15,3	0,66	20.000	10.000	290
6207-2RS1-SKF	6207-2RS1-C3-SKF	35	72	17	sealed on both sides	27	15,3	0,66	-	6.300	290
6307-SKF	6307-C3-SKF	35	80	21	open	35,1	19	0,82	19.000	12.000	460
6307-2Z-SKF	6307-2Z-C3-SKF	35	80	21	shielded on both sides	35,1	19	0,82	19.000	9.500	460
6307-2RS1-SKF	6307-2RS1-C3-SKF	35	80	21	sealed on both sides	35,1	19	0,82	-	6.000	460
6008-SKF	6008-C3-SKF	40	68	15	open	17,8	11,6	0,49	22.000	14.000	190
6008-2Z-SKF	6008-2Z-C3-SKF	40	68	15	shielded on both sides	17,8	11,6	0,49	22.000	11.000	190
6008-2RS1-SKF	6008-2RS1-C3-SKF	40	68	15	sealed on both sides	17,8	11,6	0,49	-	6.300	190
6208-SKF	6208-C3-SKF	40	80	18	open	32,5	19	0,8	18.000	11.000	370
6208-2Z-SKF	6208-2Z-C3-SKF	40	80	18	shielded on both sides	32,5	19	0,8	18.000	9.000	370
6208-2RS1-SKF	6208-2RS1-C3-SKF	40	80	18	sealed on both sides	32,5	19	0,8	-	5.600	370
6308-SKF	6308-C3-SKF	40	90	23	open	42,3	24	1,02	17.000	11.000	630
6308-2Z-SKF	6308-2Z-C3-SKF	40	90	23	shielded on both sides	42,3	24	1,02	17.000	8.500	630
6308-2RS1-SKF	6308-2RS1-C3-SKF	40	90	23	sealed on both sides	42,3	24	1,02	-	5.000	630
6009-SKF	6009-C3-SKF	45	75	16	open	22,1	14,6	0,64	20.000	12.000	250
6009-2Z-SKF	6009-2Z-C3-SKF	45	75	16	shielded on both sides	22,1	14,6	0,64	20.000	10.000	250
6009-2RS1-SKF	6009-2RS1-C3-SKF	45	75	16	sealed on both sides	22,1	14,6	0,64	-	5.600	250
6209-SKF	6209-C3-SKF	45	85	19	open	35,1	21,6	0,92	17.000	11.000	410
6209-2Z-SKF	6209-2Z-C3-SKF	45	85	19	shielded on both sides	35,1	21,6	0,92	17.000	8.500	410
6209-2RS1-SKF	6209-2RS1-C3-SKF	45	85	19	sealed on both sides	35,1	21,6	0,92	-	5.000	410
6309-SKF	6309-C3-SKF	45	100	25	open	55,3	31,5	1,34	15.000	9.500	830
6309-2Z-SKF	6309-2Z-C3-SKF	45	100	25	shielded on both sides	55,3	31,5	1,34	15.000	7.500	830
6309-2RS1-SKF	6309-2RS1-C3-SKF	45	100	25	sealed on both sides	55,3	31,5	1,34	-	4.500	830
6010-SKF	6010-C3-SKF	50	80	16	open	22,9	16	0,71	18.000	11.000	260
6010-2Z-SKF	6010-2Z-C3-SKF	50	80	16	shielded on both sides	22,9	16	0,71	18.000	9.000	260
6010-2RS1-SKF	6010-2RS1-C3-SKF	50	80	16	sealed on both sides	22,9	16	0,71	-	5.000	260
6210-SKF	6210-C3-SKF	50	90	20	open	37,1	23,2	0,98	15.000	10.000	460
6210-2Z-SKF	6210-2Z-C3-SKF	50	90	20	shielded on both sides	37,1	23,2	0,98	15.000	8.000	460
6210-2RS1-SKF	6210-2RS1-C3-SKF	50	90	20	sealed on both sides	37,1	23,2	0,98	-	4.800	460
6310-SKF	6310-C3-SKF	50	110	27	open	65	38	1,6	13.000	8.500	1050
6310-2Z-SKF	6310-2Z-C3-SKF	50	110	27	shielded on both sides	65	38	1,6	13.000	6.700	1050
6310-2RS1-SKF	6310-2RS1-C3-SKF	50	110	27	sealed on both sides	65	38	1,6	-	4.300	1050

* Fatigue load limit.

Single Row Deep Groove Ball Bearings **MÄDLER®**, inner diameter 3 - 17 mm

Material: Bearing steel.

- Standard ball bearings in high quality.
- Most common bearing type.
- Usable for high speed.
- Insensitive in use and maintenance.
- On choice: With friction-free metal shields ZZ (= ZZ) or with contacting rubber seals 2RS.

Temperature range: -30°C to +90°C (for short time up to +110°C).

Clearance CN: Normal bearing play. **Clearance C3:** Greater play.

Other versions or other bearing types on request.

Ordering Details: e.g.: Product No., quantity



Product No. Clearance CN	Product No. Clearance C3	Main dimensions			Version	Load rating radial		Speed limit min ⁻¹	Weight g
		d mm	D mm	B mm		dyn. C kN	stat. C ₀ kN		
623-ZZ-MAE	623-ZZ-C3-MAE	3	10	4	shielded on both sides	0,63	0,22	50.000	1,7
624-ZZ-MAE	624-ZZ-C3-MAE	4	13	5	shielded on both sides	1,30	0,49	40.000	3,0
625-ZZ-MAE	625-ZZ-C3-MAE	5	16	5	shielded on both sides	1,73	0,67	36.000	4,9
625-2RS-MAE	625-2RS-C3-MAE	5	16	5	sealed on both sides	1,73	0,67	25.000	4,9
626-ZZ-MAE	626-ZZ-C3-MAE	6	19	6	shielded on both sides	2,34	0,89	32.000	7,9
626-2RS-MAE	626-2RS-C3-MAE	6	19	6	sealed on both sides	2,34	0,89	22.000	7,9
607-ZZ-MAE	607-ZZ-C3-MAE	7	19	6	shielded on both sides	2,34	0,89	36.000	7,5
607-2RS-MAE	607-2RS-C3-MAE	7	19	6	sealed on both sides	2,34	0,89	22.000	7,5
627-ZZ-MAE	-	7	22	7	shielded on both sides	3,30	1,37	30.000	12,9
627-2RS-MAE	-	7	22	7	sealed on both sides	3,30	1,37	20.000	12,9
608-ZZ-MAE	608-ZZ-C3-MAE	8	22	7	shielded on both sides	3,30	1,37	34.000	12,2
608-2RS-MAE	608-2RS-C3-MAE	8	22	7	sealed on both sides	3,30	1,37	20.000	12,2
609-ZZ-MAE	-	9	24	7	shielded on both sides	3,35	1,43	32.000	14,7
609-2RS-MAE	-	9	24	7	sealed on both sides	3,35	1,43	19.000	14,7
629-ZZ-MAE	-	9	26	8	shielded on both sides	4,55	1,97	28.000	19,3
629-2RS-MAE	-	9	26	8	sealed on both sides	4,55	1,97	18.000	19,3
61800-ZZ-MAE	61800-ZZ-C3-MAE	10	19	5	shielded on both sides	1,72	0,84	24.000	5,5
61800-2RS-MAE	61800-2RS-C3-MAE	10	19	5	sealed on both sides	1,72	0,84	17.000	5,5
61900-ZZ-MAE	61900-ZZ-C3-MAE	10	22	6	shielded on both sides	2,70	1,27	22.000	10
61900-2RS-MAE	61900-2RS-C3-MAE	10	22	6	sealed on both sides	2,70	1,27	15.500	10
6000-ZZ-MAE	6000-ZZ-C3-MAE	10	26	8	shielded on both sides	4,55	1,97	31.000	19
6000-2RS-MAE	6000-2RS-C3-MAE	10	26	8	sealed on both sides	4,55	1,97	19.000	19
6200-ZZ-MAE	6200-ZZ-C3-MAE	10	30	9	shielded on both sides	5,10	2,39	24.000	32
6200-2RS-MAE	6200-2RS-C3-MAE	10	30	9	sealed on both sides	5,10	2,39	17.000	32
6300-ZZ-MAE	-	10	35	11	shielded on both sides	8,10	3,47	22.000	53
6300-2RS-MAE	-	10	35	11	sealed on both sides	8,10	3,47	15.000	53
61801-ZZ-MAE	61801-ZZ-C3-MAE	12	21	5	shielded on both sides	1,92	1,04	20.000	6,3
61801-2RS-MAE	61801-2RS-C3-MAE	12	21	5	sealed on both sides	1,92	1,04	14.000	6,3
61901-ZZ-MAE	-	12	24	6	shielded on both sides	2,89	1,46	20.000	10
61901-2RS-MAE	-	12	24	6	sealed on both sides	2,89	1,46	14.000	10
6001-ZZ-MAE	6001-ZZ-C3-MAE	12	28	8	shielded on both sides	5,10	2,84	27.000	22
6001-2RS-MAE	6001-2RS-C3-MAE	12	28	8	sealed on both sides	5,10	2,84	17.000	22
6201-ZZ-MAE	6201-ZZ-C3-MAE	12	32	10	shielded on both sides	6,80	3,06	22.000	37
6201-2RS-MAE	6201-2RS-C3-MAE	12	32	10	sealed on both sides	6,80	3,06	15.000	37
6301-ZZ-MAE	-	12	37	12	shielded on both sides	9,70	5,09	20.000	60
6301-2RS-MAE	-	12	37	12	sealed on both sides	9,70	5,09	14.000	60
61802-ZZ-MAE	61802-ZZ-C3-MAE	15	24	5	shielded on both sides	2,07	1,26	17.000	7,4
61802-2RS-MAE	61802-2RS-C3-MAE	15	24	5	sealed on both sides	2,07	1,26	12.000	7,4
61902-ZZ-MAE	-	15	28	7	shielded on both sides	4,35	2,26	17.000	20
61902-2RS-MAE	-	15	28	7	sealed on both sides	4,35	2,26	12.000	20
6002-ZZ-MAE	6002-ZZ-C3-MAE	15	32	9	shielded on both sides	5,60	2,84	23.000	30
6002-2RS-MAE	6002-2RS-C3-MAE	15	32	9	sealed on both sides	5,60	2,84	14.000	30
6202-ZZ-MAE	6202-ZZ-C3-MAE	15	35	11	shielded on both sides	7,65	3,72	20.000	45
6202-2RS-MAE	6202-2RS-C3-MAE	15	35	11	sealed on both sides	7,65	3,72	12.000	45
6302-ZZ-MAE	-	15	42	13	shielded on both sides	11,40	5,43	17.000	82
6302-2RS-MAE	-	15	42	13	sealed on both sides	11,40	5,43	12.000	82
61803-ZZ-MAE	-	17	26	5	shielded on both sides	2,63	1,57	15.000	8,2
61803-2RS-MAE	-	17	26	5	sealed on both sides	2,63	1,57	10.500	8,2
61903-ZZ-MAE	-	17	30	7	shielded on both sides	4,60	2,55	15.000	20
61903-2RS-MAE	-	17	30	7	sealed on both sides	4,60	2,55	10.500	20
6003-ZZ-MAE	6003-ZZ-C3-MAE	17	35	10	shielded on both sides	6,00	3,25	21.000	39
6003-2RS-MAE	6003-2RS-C3-MAE	17	35	10	sealed on both sides	6,00	3,25	13.000	39
6203-ZZ-MAE	6203-ZZ-C3-MAE	17	40	12	shielded on both sides	9,55	4,79	17.000	65
6203-2RS-MAE	6203-2RS-C3-MAE	17	40	12	sealed on both sides	9,55	4,79	12.000	65
6303-ZZ-MAE	-	17	47	14	shielded on both sides	13,60	6,58	15.000	120

Single Row Deep Groove Ball Bearings **MÄDLER®**, inner diameter 20 - 50 mm

Material: Bearing steel.

- Standard ball bearings in high quality.
- Most common bearing type.
- Usable for high speed.
- Insensitive in use and maintenance.
- On choice: With friction-free metal shields ZZ (= ZZ)
or with contacting rubber seals 2RS.

Temperature range: -30°C to +90°C (for short time up to +110°C).

Clearance CN: Normal bearing play. **Clearance C3:** Greater play.

Other versions or other bearing types on request.

Ordering Details: e.g.: Product No., quantity



Product No. Clearance CN	Product No. Clearance C3	Main dimensions			Version	Load rating radial		Speed limit min ⁻¹	Weight g
		d mm	D mm	B mm		dyn. C kN	stat. C ₀ kN		
61804-ZZ-MAE	61804-ZZ-C3-MAE	20	32	7	shielded on both sides	4,00	2,47	13.000	20
61804-2RS-MAE	61804-2RS-C3-MAE	20	32	7	sealed on both sides	4,00	2,47	9.100	20
61904-ZZ-MAE	-	20	37	9	shielded on both sides	6,40	3,70	12.000	40
61904-2RS-MAE	-	20	37	9	sealed on both sides	6,40	3,70	8.400	40
6004-ZZ-MAE	6004-ZZ-C3-MAE	20	42	12	shielded on both sides	9,40	5,03	15.000	69
6004-2RS-MAE	6004-2RS-C3-MAE	20	42	12	sealed on both sides	9,40	5,03	11.000	69
6204-ZZ-MAE	6204-ZZ-C3-MAE	20	47	14	shielded on both sides	12,8	6,65	14.000	110
6204-2RS-MAE	6204-2RS-C3-MAE	20	47	14	sealed on both sides	12,8	6,65	10.000	110
6304-ZZ-MAE	6304-ZZ-C3-MAE	20	52	15	shielded on both sides	15,9	7,88	13.000	140
6304-2RS-MAE	6304-2RS-C3-MAE	20	52	15	sealed on both sides	15,9	7,88	9.500	140
61805-ZZ-MAE	-	25	37	7	shielded on both sides	4,50	3,15	10.000	20
61805-2RS-MAE	-	25	37	7	sealed on both sides	4,50	3,15	7.000	20
61905-ZZ-MAE	-	25	42	9	shielded on both sides	7,05	4,55	10.000	50
61905-2RS-MAE	-	25	42	9	sealed on both sides	7,05	4,55	7.000	50
6005-ZZ-MAE	6005-ZZ-C3-MAE	25	47	12	shielded on both sides	10,1	5,85	13.000	80
6005-2RS-MAE	6005-2RS-C3-MAE	25	47	12	sealed on both sides	10,1	5,85	9.500	80
6205-ZZ-MAE	6205-ZZ-C3-MAE	25	52	15	shielded on both sides	14,0	7,88	12.000	130
6205-2RS-MAE	6205-2RS-C3-MAE	25	52	15	sealed on both sides	14,0	7,88	8.400	130
6305-ZZ-MAE	-	25	62	17	shielded on both sides	20,6	11,5	10.000	230
6305-2RS-MAE	-	25	62	17	sealed on both sides	20,6	11,5	7.000	230
61806-ZZ-MAE	-	30	42	7	shielded on both sides	4,70	3,65	9.000	30
61806-2RS-MAE	-	30	42	7	sealed on both sides	4,70	3,65	6.300	30
61906-ZZ-MAE	-	30	47	9	shielded on both sides	7,25	5,00	8.500	50
61906-2RS-MAE	-	30	47	9	sealed on both sides	7,25	5,00	6.000	50
6006-ZZ-MAE	-	30	55	13	shielded on both sides	13,2	8,30	10.000	120
6006-2RS-MAE	-	30	55	13	sealed on both sides	13,2	8,30	7.000	120
6206-ZZ-MAE	-	30	62	16	shielded on both sides	19,5	11,3	9.500	200
6206-2RS-MAE	-	30	62	16	sealed on both sides	19,5	11,3	6.500	200
6306-2RS-MAE	-	30	72	19	sealed on both sides	26,7	15,2	6.500	350
61907-ZZ-MAE	-	35	55	10	shielded on both sides	10,6	7,25	7.500	80
61907-2RS-MAE	-	35	55	10	sealed on both sides	10,6	7,25	5.300	80
6007-ZZ-MAE	-	35	62	14	shielded on both sides	16,0	10,4	9.000	160
6007-2RS-MAE	-	35	62	14	sealed on both sides	16,0	10,4	6.300	160
6207-ZZ-MAE	-	35	72	17	shielded on both sides	25,7	15,2	8.500	290
6207-2RS-MAE	-	35	72	17	sealed on both sides	25,7	15,2	6.000	290
6307-2RS-MAE	-	35	80	21	sealed on both sides	33,5	19,2	6.000	460
61908-ZZ-MAE	-	40	62	12	shielded on both sides	13,7	10,0	6.300	120
61908-2RS-MAE	-	40	62	12	sealed on both sides	13,7	10,0	4.410	120
6008-ZZ-MAE	-	40	68	15	shielded on both sides	16,8	11,8	8.500	190
6008-2RS-MAE	-	40	68	15	sealed on both sides	16,8	11,8	6.300	190
6208-ZZ-MAE	-	40	80	18	shielded on both sides	29,5	18,0	8.000	370
6208-2RS-MAE	-	40	80	18	sealed on both sides	29,5	18,0	5.600	370
6308-2RS-MAE	-	40	90	23	sealed on both sides	40,8	24,0	4.900	630
61809-ZZ-MAE	-	45	58	7	shielded on both sides	5,35	5,25	6.000	140
61809-2RS-MAE	-	45	58	7	sealed on both sides	5,35	5,25	4.200	140
6009-ZZ-MAE	-	45	75	16	shielded on both sides	21,0	14,8	8.000	250
6009-2RS-MAE	-	45	75	16	sealed on both sides	21,0	14,8	5.600	250
6209-ZZ-MAE	-	45	85	19	shielded on both sides	31,5	20,5	7.000	410
6209-2RS-MAE	-	45	85	19	sealed on both sides	31,5	20,5	4.900	410
6309-ZZ-MAE	-	45	100	25	shielded on both sides	52,8	31,8	6.300	830
6309-2RS-MAE	-	45	100	25	sealed on both sides	52,8	31,8	4.400	830
6010-ZZ-MAE	-	50	80	16	shielded on both sides	22,0	16,2	7.000	260
6010-2RS-MAE	-	50	80	16	sealed on both sides	22,0	16,2	5.000	260
6210-ZZ-MAE	-	50	90	20	shielded on both sides	35,0	23,2	6.700	460
6210-2RS-MAE	-	50	90	20	sealed on both sides	35,0	23,2	4.700	460
6310-ZZ-MAE	-	50	110	27	shielded on both sides	61,8	38,1	6.000	1050
6310-2RS-MAE	-	50	110	27	sealed on both sides	61,8	38,1	4.200	1050

Angular Contact Ball Bearings SKF®, Single Row, inner diameter 10 - 30 mm

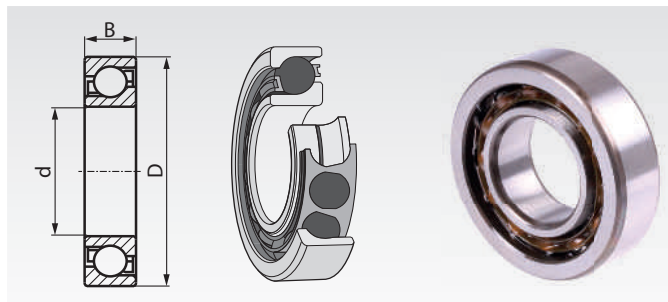
Material: Bearing steel.

- Angular contact ball bearings in premium-quality.
- For common axial and radial load.
- Usable for high speed.
- Basic version for one bearing per bearing point (shaft end).
- A second bearing point (opposite bearing) is required.

Temperature range: -30°C to +90°C (for short time up to +110°C).

Other versions or sizes on request.

Ordering Details: e.g.: Product No., quantity



Product No.	SKF-code	Main dimensions			Version	Load rating radial			Speed base min ⁻¹	Speed limit min ⁻¹	Weight g
		d mm	D mm	B mm		dyn.C kN	stat.C ₀ kN	P ₀ * kN			
647 710 01	7200 BEP	10	30	9	basic	7,02	3,35	0,14	30.000	30.000	30
647 710 02	7201 BEP	12	32	10	basic	7,61	3,8	0,16	26.000	26.000	36
647 710 05	7202 BEP	15	35	11	basic	8,84	4,8	0,204	24.000	24.000	45
647 710 08	7203 BEP	17	40	12	basic	10,4	5,5	0,236	20.000	20.000	64
647 710 13	7204 BEP	20	47	14	basic	13,3	7,65	0,325	18.000	18.000	110
647 710 22	7205 BEP	25	52	15	basic	14,8	9,3	0,40	15.000	15.000	130
647 710 29	7206 BEP	30	62	16	basic	22,5	14,3	0,61	13.000	13.000	190

Supplementary designations:

B = 40° contact angle.

E = Optimized internal design.

P = Injection moulded window-type cage of glass fibre reinforced polyamide 66, ball centred.

* Fatigue load limit.

Self Aligning Ball Bearings SKF®, Double Row, inner diameter 10 - 50 mm

Material: Bearing steel.

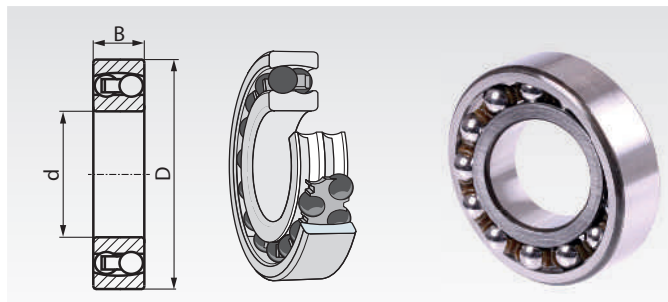
- Self aligning ball bearings in premium-quality.
- For middle-high, common axial and radial load.
- Usable at angular displacement.
- Usable for high speed.

Temperature range: -30°C to +90°C (for short time up to +110°C).

Clearance CN: Normal bearing play. **Clearance C3:** Greater play.

Other versions or sizes on request.

Ordering Details: e.g.: Product No., quantity



Product No. Clearance CN	SKF-Code	Product No. Clearance C3	SKF-Code	Main dimensions			Version	Load radial		α* Grad	Speed limit min ⁻¹	Weight g
				d mm	D mm	B mm		dyn.C kN	stat.C ₀ kN			
647 730 12	1200 ETN9	-	-	10	30	9	basic, open	5,53	1,18	2,5	36.000	34
647 730 14	2200 E-2RS1TN9	-	-	10	30	14	sealed on both sides	5,53	1,18	1,5	17.000	48
647 730 16	1201 ETN9	-	-	12	32	10	basic, open	6,24	1,43	2,5	32.000	40
647 730 18	2201 E-2RS1TN9	-	-	12	32	14	sealed on both sides	6,24	1,43	1,5	16.000	53
647 730 24	1202 ETN9	647 733 24	1202 ETN9/C3	15	35	11	basic, open	7,41	1,76	2,5	28.000	49
647 730 26	2202 E-2RS1TN9	647 733 26	2202 E-2RS1TN9/C3	15	35	14	sealed on both sides	7,41	1,76	1,5	14.000	58
647 730 32	1203 ETN9	647 733 32	1203 ETN9/C3	17	40	12	basic, open	8,84	2,2	2,5	24.000	73
647 730 34	2203 E-2RS1TN9	-	-	17	40	16	sealed on both sides	8,84	2,2	1,5	12.000	89
647 730 40	1204 ETN9	647 733 40	1204 ETN9/C3	20	47	14	basic, open	12,7	3,4	2,5	20.000	120
647 730 42	2204 E-2RS1TN9	647 733 42	2204 E-2RS1TN9/C3	20	47	18	sealed on both sides	12,7	3,4	1,5	10.000	140
647 730 48	1205 ETN9	647 733 48	1205 ETN9/C3	25	52	15	basic, open	14,3	4,0	2,5	18.000	140
647 730 50	2205 E-2RS1TN9	647 733 50	2205 E-2RS1TN9/C3	25	52	18	sealed on both sides	14,3	4,0	1,5	9.000	160
647 730 56	1206 ETN9	647 733 56	1206 ETN9/C3	30	62	16	basic, open	15,6	4,65	2,5	15.000	220
647 730 58	2206 E-2RS1TN9	-	-	30	62	20	sealed on both sides	15,6	4,65	1,5	7.500	260
647 730 64	1207 ETN9	647 733 64	1207 ETN9/C3	35	72	17	basic, open	19,0	6,0	2,5	13.000	320
647 730 66	2207 E-2RS1TN9	647 733 66	2207 E-2RS1TN9/C3	35	72	23	sealed on both sides	19,0	6,0	1,5	6.300	410
647 730 72	1208 ETN9	647 733 72	1208 ETN9/C3	40	80	18	basic, open	19,9	6,95	2,5	11.000	420
647 730 74	2208 E-2RS1TN9	-	-	40	80	23	sealed on both sides	19,9	6,95	1,5	5.600	500
647 730 82	1209 ETN9	647 733 82	1209 ETN9/C3	45	85	19	basic, open	22,9	7,8	2,5	11.000	470
647 730 84	2209 E-2RS1TN9	-	-	45	85	23	sealed on both sides	22,9	7,8	1,5	5.300	530
647 730 90	1210 ETN9	647 733 90	1210 ETN9/C3	50	90	20	basic, open	26,5	9,15	2,5	10.000	530
647 730 92	2210 E-2RS1TN9	-	-	50	90	23	sealed on both sides	22,9	8,15	1,5	4.800	570

Supplementary designations:

E = Optimized internal design.

TN9 = Injection moulded snap-type cage of glass fibre reinforced polyamide 66, ball centred

2RS1 = Sheet steel reinforced contact seal of acrylonitrile-butadiene rubber (NBR) on both sides.

C3 = greater bearing clearance.

* Max. disalignement.

Cylindrical Roller Bearings SKF®, Single Row, inner diameter 15 - 50 mm

Material: Bearing steel.

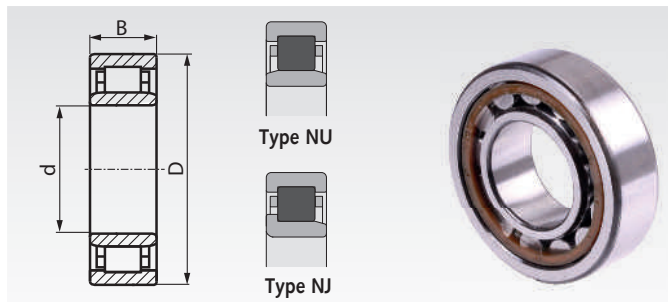
- Cylindrical roller bearings in premium-quality.
- For high radial load.
- Displaceable in both directions (type NU) or in one direction (Type NJ).
- Usable for high speed, with groove and 3 lubrication holes.
- Easy to mount (the inner ring is loose).

Temperature range: -30°C to +90°C (for short time up to +110°C).

Clearance CN: Normal bearing play. **Clearance C3:** Greater play.

Other versions or sizes on request.

Ordering Details: e.g.: Product No., quantity



Product No. Clearance CN	SKF- Code	Product No. Clearance C3	SKF- Code	Main dimensions d mm D mm B mm	Displaceability of the inner ring	Load radial dyn.C kN stat.C ₀ kN	s* mm	Speed limit min ⁻¹	Weight g
647 750 01	NU 202 ECP	647 753 01	NU 202 ECP/C3	15 35 11	to both sides	12,5 10,2	1,0	26.000	47
647 750 02	NJ 202 ECP	-	-	15 35 11	to one side	12,5 10,2	1,0	26.000	48
647 750 03	NU 203 ECP	647 753 03	NU 203 ECP/C3	17 40 12	to both sides	17,2 14,3	1,0	22.000	68
647 750 04	NJ 203 ECP	647 753 04	NJ 203 ECP/C3	17 40 12	to one side	17,2 14,3	1,0	22.000	70
647 750 13	NU 204 ECP	647 753 13	NU 204 ECP/C3	20 47 14	to both sides	25,1 22,0	1,0	19.000	110
647 750 14	NJ 204 ECP	647 753 14	NJ 204 ECP/C3	20 47 14	to one side	25,1 22,0	1,0	19.000	110
647 750 28	NU 205 ECP	647 753 28	NU 205 ECP/C3	25 52 15	to both sides	28,6 27,0	1,3	16.000	130
647 750 29	NJ 205 ECP	647 753 29	NJ 205 ECP/C3	25 52 15	to one side	28,6 27,0	1,3	16.000	140
647 750 52	NU 206 ECP	647 753 52	NU 206 ECP/C3	30 62 16	to both sides	44,0 36,5	1,3	14.000	200
647 750 53	NJ 206 ECP	647 753 53	NJ 206 ECP/C3	30 62 16	to one side	44,0 36,5	1,3	14.000	200
647 750 62	NU 207 ECP	647 753 62	NU 207 ECP/C3	35 72 17	to both sides	56,0 48,0	1,3	12.000	290
647 750 63	NJ 207 ECP	647 753 63	NJ 207 ECP/C3	35 72 17	to one side	56,0 48,0	1,3	12.000	300
647 750 78	NU 208 ECP	647 753 78	NU 208 ECP/C3	40 80 18	to both sides	62,0 53,0	1,4	11.000	370
647 750 79	NJ 208 ECP	647 753 79	NJ 208 ECP/C3	40 80 18	to one side	62,0 53,0	1,4	11.000	390
647 750 95	NU 209 ECP	647 753 95	NU 209 ECP/C3	45 85 19	to both sides	69,5 64,0	1,2	9.500	430
647 750 96	NJ 209 ECP	647 753 96	NJ 209 ECP/C3	45 85 19	to one side	69,5 64,0	1,2	9.500	440
647 751 12	NU 210 ECP	647 754 12	NU 210 ECP/C3	50 90 20	to both sides	73,5 69,5	1,5	9.000	480
647 751 13	NJ 210 ECP	647 754 13	NJ 210 ECP/C3	50 90 20	to one side	73,5 69,5	1,5	9.000	490

Supplementary designations:

EC = Optimized internal design.

P = Injection moulded window-type cage of glass fibre reinforced polyamide 66, ball centred.

C3 = greater bearing clearance.

* Max. displacement from the middle.

Spherical Roller Bearings SKF®, Double Row, inner diameter 25 - 50 mm

Material: Bearing steel.

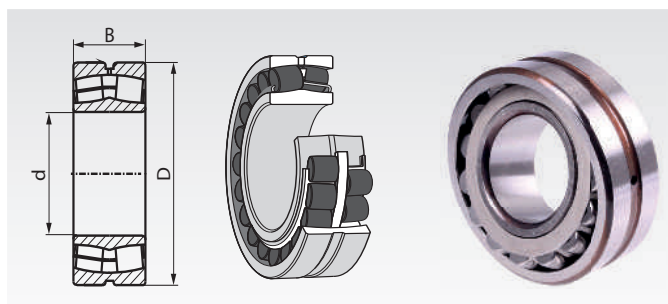
- Spherical roller bearings in premium-quality.
- For very high radial load and common high axial load in both directions.
- Usable at angular displacement.
- Usable for high speed, with groove and 3 lubrication holes.

Temperature range: -30°C to +150°C (for short time up to +200°C).

Clearance CN: Normal bearing play. **Clearance C3:** Greater play.

Other versions or sizes on request.

Ordering Details: e.g.: Product No., quantity



Product No. Clearance CN	SKF- Code	Product No. Clearance C3	SKF- Code	Main dimensions d mm D mm B mm	Load rating radial dyn.C kN stat.C ₀ kN	α* Grad	P _u ** kN	Speed base min ⁻¹	Speed limit min ⁻¹	Weight g
647 760 12	22205 E	647 763 12	22205 E/C3	25 52 18	49,0 44	2	4,75	13.000	17.000	260
647 760 14	22206 E	647 763 14	22206 E/C3	30 62 20	64,0 60	2	6,4	10.000	14.000	290
647 760 16	22207 E	647 763 16	22207 E/C3	35 72 23	86,5 85	2	9,3	9.000	12.000	450
647 760 18	22208 E	647 763 18	22208 E/C3	40 80 23	96,5 90	2	9,8	8.000	11.000	530
647 760 22	22209 E	647 763 22	22209 E/C3	45 85 23	102,0 98	2	10,8	7.500	10.000	580
647 760 28	22210 E	647 763 28	22210 E/C3	50 90 23	104,0 108	2	11,8	7.000	9.500	630

Supplementary designations:

E = Two pressed window-type steel cages, flangeless inner ring and guide ring centred on the inner ring.

C3 = greater bearing clearance.

* Max. disalignment.

** Fatigue load limit.

Tapered Roller Bearings SKF®, Single Row, inner diameter 15 - 50 mm

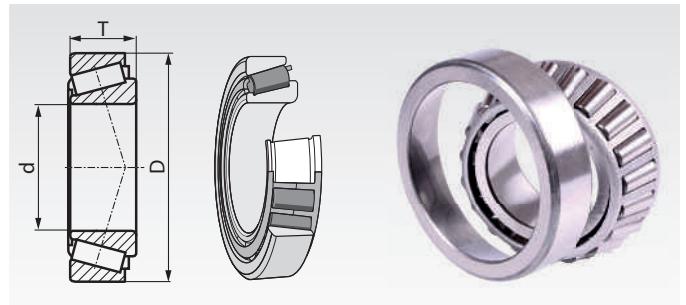
Material: Bearing steel.

- Tapered roller bearings in premium-quality.
- For common axial and radial load.
- Usable for low speed to middle speed.
- Easy to mount (the outer ring is loose).

Temperature range: -30°C to +90°C (for short time up to +110°C).

Other versions or sizes on request.

Ordering Details: e.g.: Product No., quantity



Product No.	SKF-Code	Main dimensions			Version	Load rating radial		P _u * kN	Speed base min ⁻¹	Speed limit min ⁻¹	Weight g
		d mm	D mm	T mm		dyn. C kN	stat. C ₀ kN				
647 770 10	30302 J2	15	42	14,25	standard size	22,4	20,0	2,08	13.000	18.000	95
647 770 11	30203 J2	17	40	13,25	kompakt size	19,0	18,6	1,83	13.000	18.000	75
647 770 12	30303 J2	17	47	15,25	medium size	28,1	25,0	2,75	12.000	16.000	130
647 770 14	32004 X/Q	20	42	15	ISO-size	24,2	27,0	2,70	12.000	16.000	97
647 770 15	30204 J2/Q	20	47	15,25	medium size	27,5	28,0	3,00	11.000	15.000	120
647 770 16	30304 J2/Q	20	52	16,25	heavy size	34,1	32,5	3,60	11.000	14.000	170
647 770 19	32005 X/Q	25	47	15	ISO-size	27,0	32,5	3,25	11.000	14.000	110
647 770 20	30205 J2/Q	25	52	16,25	medium size	30,8	33,5	3,45	10.000	13.000	150
647 770 23	30305 J2/Q	25	62	18,25	heavy size	44,6	43,0	4,75	9.000	12.000	260
647 770 29	32006 X/Q	30	55	17	ISO-size	35,8	44,0	4,55	9.000	12.000	170
647 770 30	30206 J2/Q	30	62	17,25	medium size	40,2	44,0	4,80	8.500	11.000	230
647 770 34	30306 J2/Q	30	72	20,75	heavy size	56,1	56,0	6,40	7.500	10.000	390
647 770 39	32007 X/Q	35	62	18	ISO-size	49,0	54,0	5,85	8.500	11.000	220
647 770 41	30207 J2/Q	35	72	18,25	medium size	51,2	56,0	6,10	7.000	9.500	320
647 770 44	30307 J2/Q	35	80	22,75	heavy size	72,1	73,5	8,30	6.700	9.000	520
647 770 54	32008 X/Q	40	68	19	ISO-size	52,8	71,0	7,65	7.000	9.500	270
647 770 57	30208 J2/Q	40	80	19,75	medium size	61,6	68,0	7,65	6.300	8.500	420
647 770 61	30308 J2/Q	40	90	25,25	heavy size	85,8	95,0	10,80	6.000	8.000	720
647 770 64	32009 X/Q	45	75	20	ISO-size	58,3	80,0	8,80	6.300	8.500	340
647 770 67	30209 J2/Q	45	85	20,75	medium size	66,0	76,5	8,65	6.000	8.000	480
647 770 73	30309 J2/Q	45	100	27,25	heavy size	108,0	120,0	14,30	5.300	7.000	970
647 770 78	32010 X/Q	50	80	20	ISO-size	60,5	88,0	9,65	6.000	8.000	370
647 770 83	30210 J2/Q	50	90	21,75	medium size	76,5	91,5	10,40	5.600	7.500	540
647 770 90	30310 J2/Q	50	110	29,25	heavy size	143,0	140,0	16,60	5.300	6.300	1250

Supplementary designations:

J2 = Steel cage in special version.

X = Boundary dimensions changed to conform to ISO

Q = Optimized contact geometry and surface finish.

* Fatigue load limit.

**Locknuts,
Lockwashers
page 515**



**Hook Wrenches
page 517**



Radial Shaft Seals Design A, for Shaft Diameter 6 to 30 mm

Material:: Elastomer: NBR.

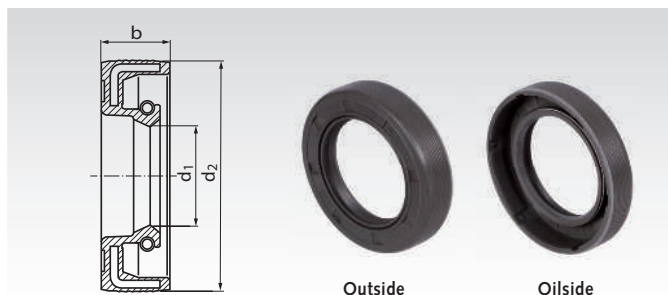
Stiffening ring and tension spring from steel.

- According to DIN 3760 Design A respectively ISO 6194-1 figure 1 and in many additional sizes.
- Most common design, with one seal lip.
- For oil- and grease-lubricated applications.
- For high speed, sliding speed up to 14m/s.

Recommended tolerances: Housing bore H8, shaft-Ø h11,

Shaft roughness R_a 0.2 to 0.8 μm .

Temperature range: -40°C to +100°C (for short time up to +120°C).



Ordering Details: e.g.: Product No. 647 900 05, Radial Shaft Seal Design A, 6x16x5mm

Product No.	d ₁ mm	d ₂ mm	b mm	Weight g
647 900 05	6	16	5	1,7
647 900 06	6	16	7	1,8
647 900 07	6	22	7	3,8
647 900 08	7	22	7	3,6
647 900 12	8	22	7	4,0
647 900 14	10	19	7	2,7
647 900 17	10	22	7	3,4
647 900 18	10	24	7	4,0
647 900 20	10	26	7	4,4
647 900 21	12	19	5	1,5
647 900 22	12	22	5	2,5
647 900 23	12	22	6	2,8
647 900 24	12	22	7	3,6
647 900 25	12	24	7	3,8
647 900 27	12	28	7	5,3
647 900 28	12	30	7	6,1
647 900 29	12	32	7	6,5
647 900 31	14	24	7	4,0
647 900 32	14	25	5	3,0
647 900 34	14	30	7	5,8
647 900 35	15	24	7	3,3
647 900 36	15	25	5	2,6
647 900 38	15	26	7	4,0
647 900 39	15	30	7	6,2
647 900 40	15	32	7	6,4
647 900 41	15	35	7	8,5
647 900 43	15	40	10	12,9
647 900 45	16	28	7	4,8
647 900 48	16	30	7	5,5
647 900 49	16	32	7	6,3
647 900 50	16	35	7	7,5
647 900 51	17	28	7	4,4
647 900 52	17	29	5	4,1
647 900 53	17	30	7	6,0
647 900 54	17	32	7	6,1
647 900 55	17	35	7	8,5
647 900 57	17	40	7	10,9
647 900 58	17	40	10	11,6
647 900 59	18	28	7	4,1
647 900 61	18	30	7	5,5
647 900 62	18	32	7	6,7
647 900 63	18	35	7	7,9
647 900 66	19	30	7	5,7
647 900 68	19	32	7	6,7
647 900 70	20	30	5	3,7
647 900 71	20	30	7	5,5
647 900 73	20	32	7	6,3
647 900 76	20	35	7	8,7
647 900 77	20	35	10	10,2
647 900 80	20	36	7	8,4
647 900 82	20	40	7	10,5
647 900 84	20	42	7	11,7
647 900 87	20	47	7	15,2
647 900 88	20	47	10	18,8
647 900 89	20	52	7	17,9
647 900 90	20	52	10	22,5

Product No.	d ₁ mm	d ₂ mm	b mm	Weight g
647 900 93	22	32	7	5,7
647 900 94	22	35	7	7,0
647 900 96	22	38	8	10,0
647 900 97	22	40	7	10,1
647 900 98	22	40	10	13,3
647 901 02	22	47	7	15,2
647 901 06	24	35	7	6,7
647 901 07	24	37	7	7,7
647 901 08	24	40	7	9,6
647 901 12	25	35	7	6,4
647 901 13	25	37	5	5,7
647 901 15	25	37	7	7,2
647 901 16	25	38	7	7,9
647 901 17	25	40	5	7,6
647 901 18	25	40	7	9,0
647 901 19	25	40	8	9,7
647 901 20	25	40	10	12,2
647 901 23	25	42	7	10,1
647 901 24	25	42	10	13,0
647 901 27	25	45	10	16,3
647 901 29	25	47	7	13,2
647 901 30	25	47	10	17,3
647 901 31	25	50	10	19,6
647 901 32	25	52	7	18,4
647 901 33	25	52	8	17,8
647 901 34	25	52	10	21,3
647 901 35	25	62	7	25,5
647 901 37	25	62	10	28,8
647 901 39	26	37	7	7,3
647 901 40	26	38	5	6,2
647 901 41	26	38	7	8,3
647 901 43	26	47	7	13,5
647 901 44	27	37	7	6,4
647 901 49	28	38	7	6,7
647 901 51	28	40	7	8,0
647 901 53	28	42	7	10,1
647 901 54	28	42	8	10,2
647 901 57	28	47	7	14,1
647 901 59	28	52	7	15,6
647 901 60	28	52	10	20,1
647 901 61	30	40	7	7,4
647 901 64	30	42	7	8,3
647 901 65	30	42	8	9,7
647 901 67	30	45	7	10,5
647 901 68	30	45	8	11,9
647 901 69	30	46	7	10,9
647 901 71	30	47	7	11,9
647 901 72	30	47	8	13,1
647 901 73	30	47	10	15,2
647 901 76	30	50	7	13,8
647 901 77	30	50	10	16,8
647 901 78	30	52	7	15,5
647 901 79	30	52	8	17,1
647 901 80	30	52	10	20,0
647 901 81	30	55	7	17,5
647 901 82	30	55	10	22,1
647 901 83	30	62	7	23,4
647 901 84	30	62	10	26,9
647 901 85	30	72	10	37,5

Radial Shaft Seals Design A, for Shaft Diameter 32 to 50 mm

Material:: Elastomer: NBR.

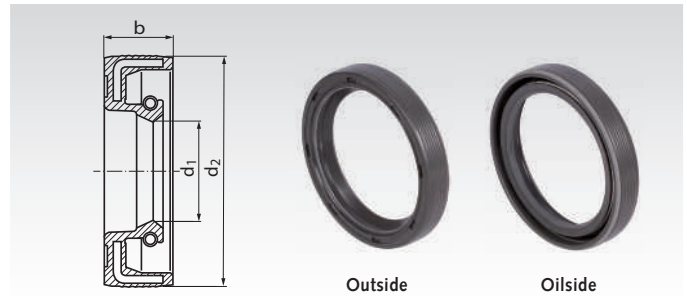
Stiffening ring and tension spring from steel.

- According to DIN 3760 Design A respectively ISO 6194-1 figure 1 and in many additional sizes.
- Most common design, with one seal lip.
- For oil- and grease-lubricated applications.
- For high speed, sliding speed up to 14m/s.

Recommended tolerances: Housing bore H8, shaft-Ø h11,

Shaft roughness R_a 0.2 to 0.8 μm .

Temperature range: -40°C to +100°C (for short time up to +120°C).



Ordering Details: e.g.: Product No. 647 901 86, Radial Shaft Seal Design A, 32x42x7mm

Product No.	d ₁ mm	d ₂ mm	b mm	Weight g
647 901 86	32	42	7	7,4
647 901 89	32	45	7	9,5
647 901 92	32	47	7	11,0
647 901 96	32	50	8	14,1
647 901 97	32	50	10	15,8
647 901 98	32	52	7	14,4
647 902 02	32	62	10	26,6
647 902 05	33	45	7	9,8
647 902 10	34	62	10	27,1
647 902 11	35	45	7	8,3
647 902 13	35	47	7	10,2
647 902 17	35	50	7	12,4
647 902 18	35	50	8	14,2
647 902 19	35	50	10	15,8
647 902 20	35	52	7	13,6
647 902 21	35	52	8	15,1
647 902 22	35	52	10	17,7
647 902 24	35	55	7	15,4
647 902 25	35	55	8	17,7
647 902 26	35	55	10	22,5
647 902 27	35	56	10	21,2
647 902 28	35	58	10	22,1
647 902 30	35	62	7	21,3
647 902 31	35	62	8	22,8
647 902 32	35	62	10	24,9
647 902 34	35	72	10	38,6
647 902 35	35	72	12	38,9
647 902 36	35	80	12	48,4
647 902 37	36	47	7	9,3
647 902 38	36	50	7	11,9
647 902 39	36	52	7	13,0
647 902 43	38	50	7	10,7
647 902 44	38	52	7	12,0
647 902 45	38	52	8	13,8
647 902 47	38	55	7	14,2
647 902 55	38	62	10	24,6
647 902 56	38	72	10	34,4
647 902 60	40	52	7	12,8
647 902 61	40	52	8	12,9
647 902 62	40	55	7	13,6
647 902 63	40	55	8	15,1
647 902 64	40	56	8	16,2
647 902 67	40	58	10	20,8
647 902 69	40	60	10	26,9
647 902 71	40	62	7	18,9
647 902 72	40	62	8	19,9
647 902 73	40	62	10	24,7
647 902 74	40	65	10	26,9
647 902 76	40	68	8	26,5
647 902 77	40	68	10	29,2
647 902 79	40	72	7	28,8
647 902 80	40	72	10	34,6
647 902 82	40	80	10	42,4

Product No.	d ₁ mm	d ₂ mm	b mm	Weight g
647 902 88	42	55	7	12,3
647 902 89	42	55	8	14,2
647 902 91	42	60	7	16,1
647 902 92	42	62	7	18,2
647 902 93	42	62	8	19,4
647 902 94	42	62	10	22,6
647 902 95	42	65	10	25,2
647 902 99	42	72	8	28,8
647 903 00	42	72	10	32,6
647 903 02	44	60	10	19,4
647 903 03	44	62	10	22,1
647 903 04	44	65	10	24,6
647 903 06	45	58	7	13,8
647 903 07	45	60	7	14,8
647 903 08	45	60	8	16,5
647 903 09	45	60	10	18,9
647 903 10	45	62	7	17,0
647 903 11	45	62	8	17,8
647 903 12	45	62	10	22,1
647 903 13	45	65	8	21,3
647 903 14	45	65	10	24,5
647 903 18	45	72	8	26,5
647 903 19	45	72	10	31,2
647 903 20	45	75	8	30,1
647 903 21	45	75	10	32,6
647 903 22	45	80	10	46,2
647 903 23	45	85	10	47,0
647 903 26	46	65	10	23,5
647 903 29	48	62	8	16,2
647 903 30	48	65	10	22,2
647 903 32	48	72	7	23,8
647 903 33	48	72	8	25,5
647 903 34	48	72	10	28,2
647 903 35	50	62	7	12,8
647 903 37	50	65	8	18,0
647 903 38	50	65	10	25,0
647 903 39	50	68	8	23,3
647 903 40	50	68	10	24,0
647 903 41	50	70	10	25,8
647 903 42	50	72	8	23,6
647 903 43	50	72	10	32,1
647 903 44	50	72	12	36,3
647 903 45	50	75	10	36,1
647 903 46	50	80	8	31,6
647 903 47	50	80	10	43,4
647 903 48	50	85	10	49,7
647 903 49	50	90	10	58,5

Other sizes and types on request.

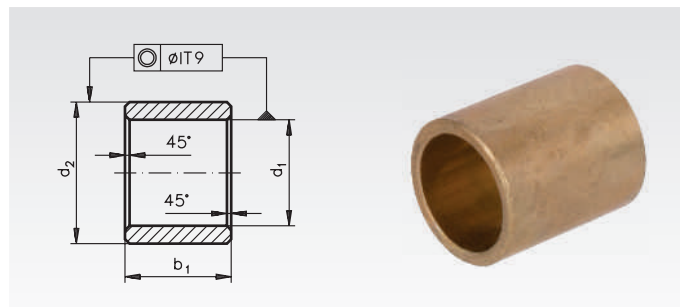
Bushes, Design J Similar to DIN 1850 (DIN 4379 Version C) Made from Sintered Bronze

Self lubricating, oil coated, pressed ready-to-install and ¹⁾ kalibrated. After press-fitting them into a rigid bearing housing with a mounting hole H7, these bearings have a bore of H7.

Edges chamfered at 45°, at choice of the manufacturer.

The concentricity tolerance refers to d_2 .

¹⁾ no statement regarding the surface roughness according to DIN 3141 (prenorm) can be given due to the porous structure of the sintered metal.



Ordering Details: e.g.: Product No. 623 302 00, Bronze Bush, 3 mm Bore

Product No.	$d_1^{F7/G7}$ mm	d_2^{s7} mm	$b_1^{\pm 0,1}$ mm	Weight g
623 302 00	3	6	4	0,56
623 303 00	3	6	6	0,86
623 304 00	4	7	4	0,70
623 306 00	4	8	4	1,01
623 306 05	5	8	8	1,64
623 308 00	5	8	10	2,05
623 309 00	5	8	16	3,28
623 309 05	6	9	6	1,42
623 311 00	6	9	10	2,37
623 311 05	6	9	12	2,84
623 311 10	6	9	16	3,79
623 312 00	6	10	6	1,96
623 313 00	6	10	10	3,27
623 313 05	6	10	12	3,92
623 313 10	6	10	16	5,23
623 313 15	6	12	6	3,41
623 316 00	8	11	8	2,40
623 316 05	8	11	12	3,60
623 317 00	8	12	8	3,37
623 318 00	8	12	12	5,05
623 318 05	8	12	20	8,42
623 321 00	10	13	10	3,63
623 322 00	10	14	16	8,08
623 323 00	10	16	10	8,20
623 325 00	12	15	12	5,11
623 326 00	12	15	20	8,52
623 327 00	12	16	12	7,06
623 328 00	12	18	12	10,70
623 328 05	12	18	16	14,27
623 328 10	12	18	20	17,83
623 331 00	14	18	22	14,78
623 331 05	14	20	12	12,85
623 332 00	14	20	14	14,99
623 335 00	15	19	20	14,30
623 336 00	15	21	16	18,16
623 339 00	16	20	16	12,15
623 340 00	16	20	20	15,28
623 341 00	16	20	25	18,95
623 341 05	16	20	32	24,26
623 342 00	16	22	16	19,18
623 343 00	16	22	20	23,95
623 343 05	16	22	30	35,93
623 346 00	18	22	18	15,14
623 347 00	18	24	18	23,83
623 348 00	18	24	28	37,09

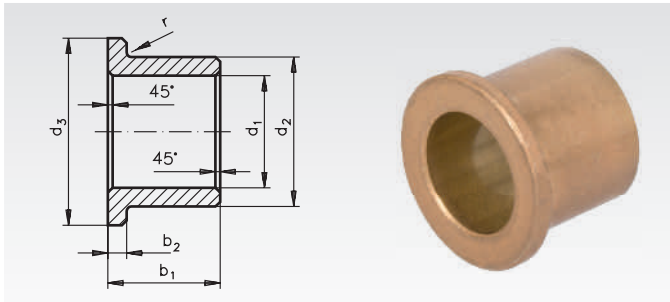
Product No.	$d_1^{F7/G7}$ mm	d_2^{s7} mm	$b_1^{\pm 0,1}$ mm	Weight g
623 349 00	18	25	18	28,59
623 351 00	20	24	32	29,79
623 352 00	20	25	16	18,92
623 352 05	20	25	20	23,65
623 353 00	20	25	25	29,58
623 353 05	20	25	30	35,48
623 354 00	20	26	20	29,22
623 354 05	20	26	25	36,53
623 354 10	20	26	30	43,83
623 354 15	20	26	32	46,75
623 355 00	20	28	25	50,49
623 356 00	22	28	22	34,85
623 358 00	25	30	20	28,94
623 359 00	25	30	25	36,20
623 359 05	25	30	30	43,44
623 359 10	25	30	40	57,92
623 359 15	25	32	20	41,94
623 360 00	25	32	25	52,43
623 360 05	25	32	30	62,92
623 360 10	25	32	32	67,11
623 360 15	25	32	40	83,89
623 362 00	28	36	28	73,07
623 363 00	30	38	20	57,21
623 364 00	30	38	24	68,65
623 365 00	30	38	30	85,80
623 365 05	30	38	40	114,40
623 366 00	30	40	30	90,82
623 367 00	32	40	32	96,87
623 369 00	35	44	28	103,60
623 370 00	35	44	35	129,90
623 371 00	35	45	35	147,26
623 372 00	36	45	36	139,20
623 374 00	40	46	32	86,82
623 374 05	40	46	40	108,53
623 375 00	40	50	25	118,30
623 376 00	40	50	40	189,31
623 377 00	45	55	45	236,67
623 378 00	45	56	45	263,11
623 379 00	50	56	32	107,04
623 379 05	50	56	50	167,25
623 380 00	50	60	32	185,13
623 380 05	50	60	40	231,42
623 381 00	50	60	50	289,27

Technical Data:

Surface pressure: max. 35 N/mm²,
depending on speed and diameter

Loctite bonding products (bearing
adhesive) page 812.

Flange Bushes Version V Similar to DIN 1850 (DIN 4379 Shape F) Made from Sintered Bronze for Plain Bearings



Self lubricating, oil coated, pressed ready-to-install and ¹⁾ kalibrated. After press-fitting them into a rigid bearing housing with a mounting hole H7, these bearings have a bore of H7.

Ordering Details: e.g.: Product No. 623 501 00, Flange Bronze Bush, 3 mm Bore

Product No.	d ₁ ^{G8} mm	d ₂ ^{S8} mm	d ₃ ^{js13} mm	b ₁ ^{js13} mm	b ₂ ^{js14} mm	Weight g
623 501 00	3	6	9	4	1,5	0,92
623 502 00	3	6	9	10	1,5	1,77
623 504 00	4	8	12	4	2	1,79
623 504 05	4	8	12	12	2	3,87
623 508 00	6	10	14	6	2	3,03
623 509 00	6	10	14	10	2	4,38
623 510 00	6	10	14	16	2	6,40
623 512 00	8	12	16	8	2	4,53
623 513 00	8	12	16	12	2	6,22
623 514 00	8	12	16	16	2	7,91
623 517 00	10	13	16	10	1,5	9,08
623 518 00	10	13	16	16	1,5	6,50
623 518 05	10	15	20	10	3	9,34
623 518 10	10	16	22	10	3	11,80
623 518 15	10	16	22	16	3	16,72
623 520 00	12	15	18	12	1,5	5,89
623 521 00	12	15	18	16	1,5	7,60
623 521 05	12	17	22	20	2,5	18,33
623 522 00	12	17	22	12	3	11,71
623 523 00	12	18	24	20	3	22,91
623 524 00	14	18	22	14	2	11,10
623 527 00	16	20	24	16	2	13,96
623 528 00	16	20	24	20	2	17,17
623 528 05	16	22	28	25	3	34,71
623 529 00	16	22	28	16	3	23,95
623 530 00	16	22	28	20	3	28,63
623 532 00	18	22	26	18	2	17,10
623 533 00	18	24	30	18	3	28,97
623 534 00	20	24	28	16	2	17,03
623 535 00	20	24	28	20	2	20,70
623 535 05	20	26	32	15	3	21,77
623 536 00	20	26	32	16	3	28,94
623 537 00	20	26	32	20	3	34,45
623 538 00	20	26	32	25	3	41,69
623 538 05	20	26	32	32	3	51,94
623 539 00	20	28	35	20	4	49,67
623 540 00	25	30	35	20	2,5	33,20
623 541 00	25	30	35	25	2,5	40,38
623 541 05	25	32	39	25	3,5	64,58
623 542 00	28	33	38	22	2,5	39,96
623 542 05	28	33	38	36	2,5	62,42
623 543 00	28	36	44	22	4	72,72
623 544 00	30	38	46	20	4	71,36
623 544 05	30	38	46	25	4	85,67
623 544 10	30	38	46	30	4	99,97
623 547 00	36	45	54	28	4,5	128,44
623 547 05	36	45	54	36	4,5	159,12
623 551 00	36	45	54	22	4,5	105,42
623 550 00	40	46	52	40	3	117,83
623 552 00	40	50	60	25	5	147,26
623 552 05	40	50	60	40	5	218,27
623 555 00	50	60	70	32	5	219,32
623 555 05	50	60	70	50	5	323,46

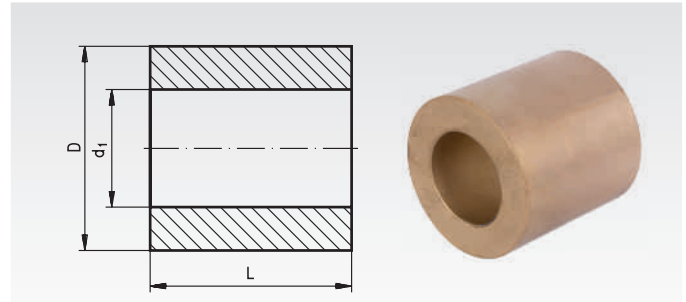
Edges chamfered at 45°, at choice of the manufacturer.

The concentricity tolerance refers to d₂.

¹⁾ no statement regarding the surface roughness according to DIN 3141 (prenorm) can be given due to the porous structure of the sintered metal.

Dimension r: For bores 3 - 8 mm = 0.3 mm, bores 9 - 22 mm = 0.6 mm, bores 25 - 40 mm = 0.8 mm

Raw Material of Sintered Bronze with Bore for Plain Bearing Production



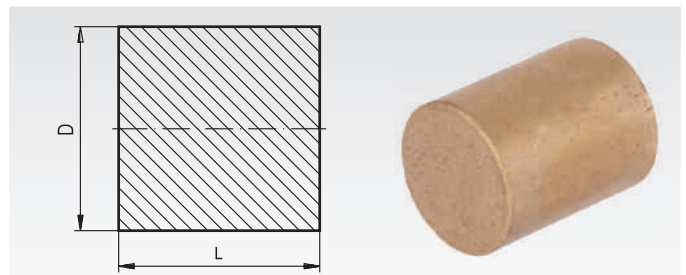
Tube of sintered bronze to be machined into plain bearings.

After machining, the work piece should be coated with lubricants.

Ordering Details: e.g.: Product No. 623 390 20, Raw Material, 38/66 x 65mm

Tube Product No.	d ₁ mm	D mm	L mm	Weight kg
623 390 20	38±1	66±1,5	65±2	0,99
623 390 25	38±1	66±1,5	120±2	1,84
623 390 30	45±1	105±1,5	120±2	5,68
623 390 35	53±1	85±1,5	65±2	1,51
623 390 37	53±1	85±1,5	120±2	2,79
623 390 38	68±1	104±1,5	65±2	2,12
623 390 40	68±1	104±1,5	120±2	3,91
623 390 45	83±1	123±1,5	65±2	2,82
623 390 47	83±1	123±1,5	120±2	5,21
623 390 48	98±1	142±1,5	65±2	3,61
623 390 50	98±1	142±1,5	120±2	6,66

Raw Material of Sintered Bronze without Bore for Plain Bearing Production



Solid material of sintered bronze to be machined into plain bearings. After machining, the work piece should be coated with lubricants.

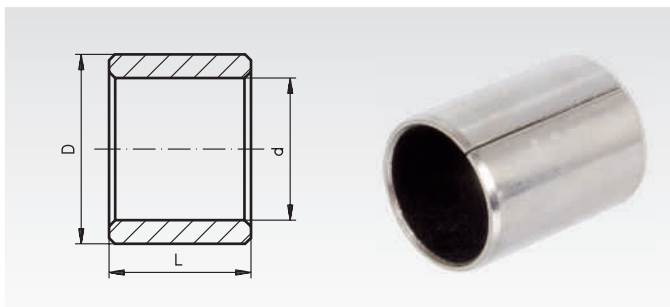
Ordering Details: e.g.: Product No. 623 395 20, Raw Material 15 x 30 mm

Solid Material Product No.	D mm	L mm	Weight kg
623 395 20	15±0,8	30±1,5	0,04
623 395 23	20±0,8	25±1,5	0,06
623 395 25	20±0,8	50±1,5	0,11
623 395 27	25±0,8	25±1,5	0,08
623 395 30	25±0,8	50±1,5	0,16
623 395 33	32±0,8	40±1,5	0,22
623 395 35	32±0,8	80±1,5	0,43
623 395 40	42±0,8	50±1,5	0,46
623 395 43	42±0,8	100±2	0,92
623 395 45	45±1	90±2	0,96
623 395 47	52±1	60±2	0,82
623 395 48	52±1	120±2	1,64
623 395 50	62±1,5	120±2	2,43
623 395 55	70±1,5	120±2	3,09

Technical Data:

Surface pressure: max. 35 N/mm², dependent on speed and diameter.

Cylindrical Bushes, Slotted (Without Any Lubrication)



Plain bearing bush from steel sheet with multi-porous bronze layer and sliding surface from PTFE-lead-compound. Specially suited for lubrication-free running, for high loads, extrem temperatures.

Ordering Details: e.g.: Product No. 624 003 04, Cylindrical Bush, 3 mm Bore

Product No.	d x D x L mm	Weight g	Product No.	d x D x L mm	Weight g
624 003 04	3 x 4,5 x 4	0,1	624 016 20	16 x 18 x 20	8,1
624 003 05	3 x 4,5 x 5	0,3	624 016 25	16 x 18 x 25	10,1
624 003 06	3 x 4,5 x 6	0,4	624 018 20	18 x 20 x 20	8,9
624 004 04	4 x 5,5 x 4	0,3	624 020 10	20 x 23 x 10	8,8
624 004 06	4 x 5,5 x 6	0,6	624 020 12	20 x 23 x 12	8,8
624 004 08	4 x 5,5 x 8	0,9	624 020 15	20 x 23 x 15	11,6
624 005 05	5 x 7,0 x 5	0,7	624 020 20	20 x 23 x 20	15,1
624 005 08	5 x 7,0 x 8	1,1	624 020 30	20 x 23 x 30	23,0
624 006 05	6 x 8,0 x 5	0,7	624 022 20	22 x 25 x 20	16,6
624 006 06	6 x 8,0 x 6	0,9	624 024 25	24 x 27 x 25	23,8
624 006 10	6 x 8,0 x 10	1,7	624 025 15	25 x 28 x 15	14,2
624 007 10	7 x 9,0 x 10	1,8	624 025 20	25 x 28 x 20	10,0
624 008 06	8 x 10 x 6	1,2	624 025 25	25 x 28 x 25	23,9
624 008 08	8 x 10 x 8	1,7	624 025 30	25 x 28 x 30	28,4
624 008 10	8 x 10 x 10	2,1	624 025 40	25 x 28 x 40	37,3
624 009 10	9 x 11 x 10	2,2	624 026 15	26 x 30 x 15	15,6
624 010 06	10 x 12 x 6	1,9	624 026 20	26 x 30 x 20	26,1
624 010 08	10 x 12 x 8	2,0	624 026 30	26 x 30 x 30	39,0
624 010 10	10 x 12 x 10	2,5	624 028 20	28 x 32 x 20	28,8
624 010 12	10 x 12 x 12	2,9	624 028 25	28 x 32 x 25	39,0
624 010 15	10 x 12 x 15	3,8	624 030 12	30 x 34 x 12	17,5
624 010 20	10 x 12 x 20	5,3	624 030 15	30 x 34 x 15	22,9
624 012 06	12 x 14 x 6	1,7	624 030 20	30 x 34 x 20	30,9
624 012 08	12 x 14 x 8	2,0	624 030 30	30 x 34 x 30	46,1
624 012 10	12 x 14 x 10	3,0	624 030 35	30 x 34 x 35	53,0
624 012 12	12 x 14 x 12	3,7	624 032 20	32 x 36 x 20	32,0
624 012 15	12 x 14 x 15	4,7	624 032 25	32 x 36 x 25	40,2
624 012 20	12 x 14 x 20	6,1	624 035 20	35 x 39 x 20	35,4
624 014 10	14 x 16 x 10	3,6	624 035 40	35 x 39 x 40	70,8
624 014 20	14 x 16 x 20	7,1	624 038 30	38 x 42 x 30	56,9
624 015 10	15 x 17 x 10	3,8	624 040 20	40 x 44 x 20	40,0
624 015 12	15 x 17 x 12	4,5	624 040 30	40 x 44 x 30	60,2
624 015 15	15 x 17 x 15	5,7	624 040 50	40 x 44 x 50	101,5
624 015 20	15 x 17 x 20	7,6	624 050 30	50 x 55 x 30	95,0
624 016 10	16 x 18 x 10	4,6	624 050 50	50 x 55 x 50	159,9
624 016 15	16 x 18 x 15	6,1			

Construction

Tin-plated steel back (incl. edges). Multi-porous bronze layer, sliding surface PTFE-lead-compound.

Technical data

Stat. surface pressure	max. 250 N/mm ²
Dyn. bearing load	max. 56 N/mm ²
Friction coefficient	von 0.03 - 0.20
Sliding speed	max. 2 m/s
Temperature range	-195°C to + 280°C
Therm. conductivity	40 W/K · m

Recommended mounting tolerances

Housing bore H7, shaft tolerance up to 55 Ø f7 above 55 Ø h8

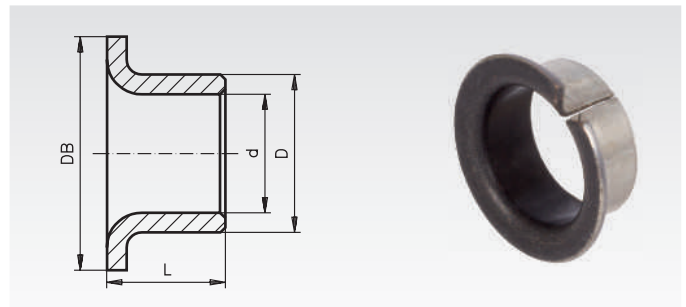
Paired contact surface

Recommended: hardened contact surfaces with a surface roughness of R_z3 and finer.

Main characteristics

Self lubricating and maintenance free, ready to install. Perfectly suited for lower sliding speeds. Low wear, low friction coefficient, no „stick slip“. Perfectly suited for circular, swivelling and partly for axial movement. Can be used at extremely high bearing loads. No moisture absorption. High corrosion resistance.

Flange Bushes, Slotted (Without Any Lubrication)



Plain bearing flange bush from steel sheet with multi-porous bronze layer and sliding surface from PTFE-lead-compound. Specially suited for lubrication-free running, for high loads, extrem temperatures.

Ordering Details: e.g.: Product No. 624 103 04, Flange Bush, 3mm Bore

Product No.	d x D / DB x L mm	Weight g
624 103 04	3 x 4,5 / 7 x 5	0,3
624 104 04	4 x 5,5 / 9 x 5,6	0,5
624 105 05	5 x 7 / 10 x 6	0,9
624 106 06	6 x 8 / 12 x 7	1,4
624 108 06	8 x 10 / 15 x 5,5	1,9
624 108 08	8 x 10 / 15 x 9,5	2,3
624 110 08	10 x 12 / 18 x 9	2,9
624 110 12	10 x 12 / 18 x 12	4,0
624 112 15	12 x 14 / 20 x 17	5,6
624 114 15	14 x 16 / 22 x 17	6,2
624 115 12	15 x 17 / 23 x 12	5,0
624 115 20	15 x 17 / 23 x 17	8,5
624 116 20	16 x 18 / 24 x 17	9,1
624 118 12	18 x 20 / 26 x 12	6,6
624 120 12	20 x 23 / 30 x 11,5	13,7
624 122 20	22 x 25 / 32 x 21,5	21,0
624 125 25	25 x 28 / 35 x 26,5	27,3
624 130 30	30 x 34 / 42 x 30	53,3
624 135 20	35 x 39 / 47 x 26	46,0
624 135 40	35 x 39 / 47 x 40	81,4
624 140 40	40 x 44 / 53 x 26	92,0
624 150 40	50 x 55 / 60 x 22	145,8

Note:

According to DIN ISO 3547 the supplied bush may be unround and with open slot. After pressing the slotted bush into an H7-bore, it usually is round and the gap (the slot) is closed.

Loctite bonding products (bearing adhesive) page 812.

Mounting instructions

The edges of the mounting hole must be rounded or chamfered. We recommend using an arbor press for mounting. The gliding surface must not be damaged. The butt joint must be located opposite the load area. Once mounted the bearing has pressfit. Glueing is possible, but not necessary.

Application range

Where no lubrication is possible: textile machinery, controls and instruments, packing plants, electronic goods, medical equipment, paper machines, food-processing machines, brake and pump manufacturing, etc.

Where lubrication is often neglected:

agricultural and construction machinery, fork lift trucks, etc.

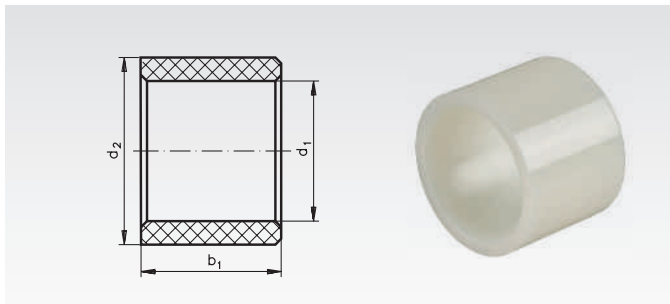
Where lubricants should be used sparingly:

car and motorbike manufacture, machine tool building, conveyor plants, escalator manufacture, hoisting devices, turbine manufacturing, steel construction for hydraulic engineering, etc.

Service life

The service life of the bearing depends on ambient conditions as: sliding speed, load, temperature, on-time, paired contact surface, etc. For lower wear, please regard the load and mounting instructions above, and protect the bearing from corrosive influences and large amounts of dirt.

Bushes BP, Polyamide 6.6 Die Cast

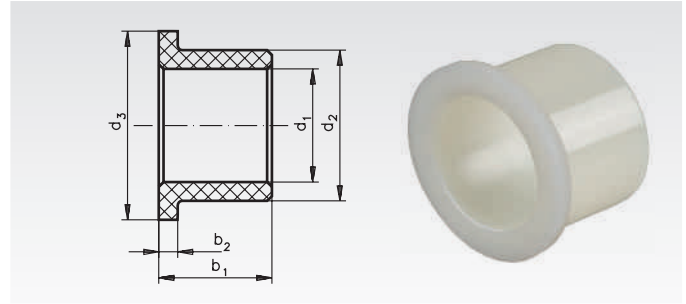


Plain bearing bush from low cost thermoplast. Low friction. Specially suited for simpler applications at normal temperatures.

Ordering Details: e.g.: Product No. 623 708 00, Bush BP, 8 mm Bore

Product No.	d ₁ mm	Tolerance mm	d ₂ mm	Tolerance mm	b ₁ mm	Weight g
623 708 00	8	+0,06 +0,10	12	+0,10	10	1,0
623 709 00	8	+0,06 +0,10	14	+0,10	10	1,3
623 711 00	10	+0,08 +0,12	12	+0,10	10	0,5
623 712 00	10	+0,08 +0,12	14	+0,10	10	1,0
623 713 00	10	+0,08 +0,12	16	+0,12	10	1,5
623 715 00	12	+0,10 +0,14	14	+0,10	10	0,7
623 716 00	12	+0,10 +0,14	16	+0,12	10	1,0
623 717 00	12	+0,10 +0,14	18	+0,12	14	1,0
623 721 00	15	+0,12 +0,18	20	+0,12	15	2,5
623 722 00	15	+0,12 +0,18	22	+0,14	15	3,5
623 723 00	15	+0,12 +0,18	25	+0,14	15	5,5
623 725 00	16	+0,13 +0,19	20	+0,12	15	2,0
623 726 00	16	+0,13 +0,19	22	+0,14	15	3,2
623 727 00	16	+0,13 +0,19	24	+0,14	15	4,2
623 732 00	20	+0,16 +0,23	24	+0,14	15	2,5
623 733 00	20	+0,16 +0,23	25	+0,14	15	3,0
623 734 00	20	+0,16 +0,23	26	+0,14	20	5,0
623 735 00	20	+0,16 +0,23	28	+0,15	20	7,0
623 736 00	20	+0,16 +0,23	30	+0,15	20	9,0
623 740 00	25	+0,18 +0,25	30	+0,15	20	5,0
623 741 00	25	+0,18 +0,25	30	+0,15	32	7,8
623 742 00	25	+0,18 +0,25	32	+0,15	20	7,0
623 743 00	25	+0,18 +0,25	35	+0,18	20	10,5
623 746 00	28	+0,20 +0,28	32	+0,15	20	4,2
623 748 00	28	+0,20 +0,28	38	+0,18	19	11,2
623 750 00	30	+0,21 +0,30	35	+0,18	20	5,7
623 751 00	30	+0,21 +0,30	36	+0,18	30	10,5
623 752 00	30	+0,21 +0,30	40	+0,18	30	18,0
623 754 00	32	+0,22 +0,32	36	+0,18	30	7,5
623 755 00	32	+0,22 +0,32	40	+0,18	30	15,5
623 762 00	40	+0,24 +0,36	45	+0,20	40	14,5
623 763 00	40	+0,24 +0,36	48	+0,20	40	25,0
623 764 00	40	+0,24 +0,36	50	+0,20	40	32,0
623 768 00	50	+0,30 +0,43	56	+0,22	50	43,0
623 769 00	50	+0,30 +0,43	60	+0,22	50	48,5
623 771 00	54	+0,32 +0,46	62	+0,22	60	48,5
623 774 00	60	+0,34 +0,48	70	+0,24	60	68,0

Flanged Bushes BBP, Polyamide 6.6 Die Cast



Plain bearing flange bush from low cost thermoplast. Low friction. Specially suited for simpler applications at normal temperatures.

Ordering Details: e.g.: Product No. 623 806 00, Flange Bush BBP, 6 mm Bore

Product No.	d ₁ mm	Tolerance mm	d ₂ mm	Tolerance mm	d ₃ mm	b ₂ mm	b ₁ mm	Weight g
623 806 00	6	+0,06 +0,10	10	+0,10	15	1,5	8	0,8
623 808 00	8	+0,06 +0,10	12	+0,10	16	2	6	0,8
623 809 00	8	+0,06 +0,10	14	+0,10	20	2	10	1,7
623 811 00	10	+0,08 +0,12	12	+0,10	16	2	6	0,6
623 812 00	10	+0,08 +0,12	14	+0,10	20	2	10	1,3
623 813 00	10	+0,08 +0,12	16	+0,12	20	2	10	1,8
623 815 00	12	+0,10 +0,14	14	+0,10	20	2	10	1,0
623 816 00	12	+0,10 +0,14	16	+0,12	20	2	10	1,5
623 819 00	14	+0,11 +0,17	20	+0,12	30	2	24	2,8
623 825 00	16	+0,13 +0,19	20	+0,12	28	2	15	2,8
623 826 00	16	+0,13 +0,19	22	+0,14	30	2	15	4,0
623 827 00	16	+0,13 +0,19	24	+0,14	30	2	15	5,0
623 832 00	20	+0,16 +0,23	24	+0,14	30	2	15	3,0
623 833 00	20	+0,16 +0,23	25	+0,14	30	2	15	3,5
623 834 00	20	+0,16 +0,23	26	+0,14	30	2	12	3,5
623 835 00	20	+0,16 +0,23	26	+0,14	32	2	15	4,5
623 836 00	20	+0,16 +0,23	26	+0,14	32	3	20	5,8
623 837 00	20	+0,16 +0,23	30	+0,15	36	3	20	9,7
623 840 00	25	+0,18 +0,25	30	+0,15	36	3	20	6,0
623 841 00	25	+0,18 +0,25	32	+0,15	40	3	20	8,5
623 842 00	25	+0,18 +0,25	35	+0,18	45	3	20	12,7
623 843 00	25	+0,18 +0,25	35	+0,18	45	4	30	18,5
623 846 00	28	+0,20 +0,28	32	+0,15	40	4	30	8,0
623 848 00	28	+0,20 +0,28	38	+0,18	48	4	30	20,0
623 850 00	30	+0,21 +0,30	32	+0,15	40	4	30	5,0
623 851 00	30	+0,21 +0,30	35	+0,18	45	4	30	11,5
623 852 00	30	+0,21 +0,30	38	+0,18	48	4	30	17,0
623 854 00	32	+0,22 +0,32	35	+0,18	45	4	30	8,5
623 855 00	32	+0,22 +0,32	38	+0,18	48	4	30	18,5
623 856 00	32	+0,22 +0,32	40	+0,18	50	4	30	19,0
623 862 00	40	+0,24 +0,36	44	+0,20	54	5	40	16,5
623 863 00	40	+0,24 +0,36	48	+0,20	58	5	40	30,0
623 864 00	40	+0,24 +0,36	50	+0,20	60	5	40	36,0
623 868 00	50	+0,30 +0,43	56	+0,22	70	5	50	34,5
623 869 00	50	+0,30 +0,43	60	+0,22	70	5	50	52,0
623 874 00	60	+0,34 +0,48	70	+0,24	80	5	60	74,0

Description and technical data

Material: Thermoplastic polyamide 6.6.

- Low cost.
- Low friction, suitable for lubrication-free running.
- High moisture absorption, low dimension stability.

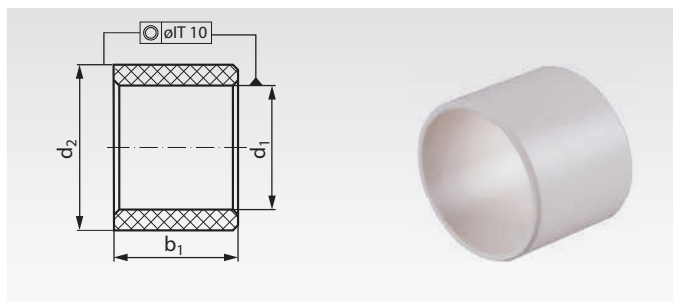
Typical for polyamide parts is the high moisture absorption. But if the bushes and flange bushings are conditioned, i.e. saturated with moisture before mounting, then usually dimensional changes due to the degree of moisture play a much smaller role than dimensional changes due to temperature.

Technical data:

Surface pressure max.:	18 N/mm ² , dependant on sliding speed and bearing temperature
Sliding Speed:	2 m/s
Lubrication:	usually not required
Bearing clearance:	about 0.01 mm per mm shaft-Ø
Bearing temperature:	-40°C up to +80°C.
Coefficient of linear expansion:	8 x 10 ⁻⁵
Moisture absorption max.:	7.5%
Moisture absorption at 20°C and 50% rel. humidity:	2.4%

Mounting hole: tolerance H7.

Plain Bearings, Thermoplastic EP22™

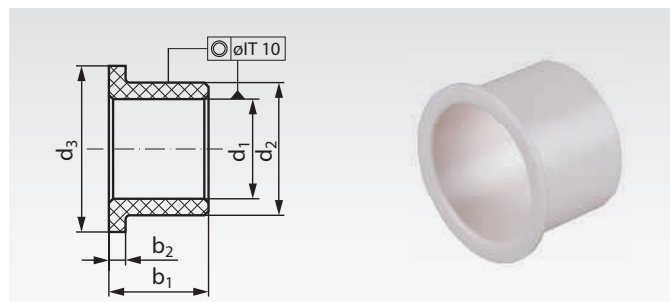


Plain bearing bush made from thermoplastic with high dimension accuracy. Low friction. Specially suited for dry-running and for use at very low up to middle high temperatures. Colour: white.

Ordering Details: e.g.: Product No. 627 208 06, Bush EP22, 8 mm Bore

Product No.	d ₁ mm	d ₂ mm	b ₁ ^{h13} mm	Tolerance d ₁ [*] mm	Weight g
627 208 06	8	10	6	+0,025 +0,083	0,2
627 208 08	8	10	8	+0,025 +0,083	0,3
627 208 10	8	10	10	+0,025 +0,083	0,4
627 208 12	8	10	12	+0,025 +0,083	0,5
627 208 15	8	10	15	+0,025 +0,083	0,6
627 210 04	10	12	4	+0,025 +0,083	0,2
627 210 06	10	12	6	+0,025 +0,083	0,3
627 210 08	10	12	8	+0,025 +0,083	0,4
627 210 10	10	12	10	+0,025 +0,083	0,5
627 210 15	10	12	15	+0,025 +0,083	0,7
627 210 20	10	12	20	+0,025 +0,083	1,0
627 212 10	12	14	10	+0,032 +0,102	0,6
627 212 12	12	14	12	+0,032 +0,102	0,7
627 212 15	12	14	15	+0,032 +0,102	0,9
627 212 20	12	14	20	+0,032 +0,102	1,2
627 214 12	14	16	12	+0,032 +0,102	0,9
627 214 15	14	16	15	+0,032 +0,102	1,0
627 214 20	14	16	20	+0,032 +0,102	1,4
627 214 25	14	16	25	+0,032 +0,102	1,7
627 215 15	15	17	15	+0,032 +0,102	1,1
627 215 20	15	17	20	+0,032 +0,102	1,4
627 215 25	15	17	25	+0,032 +0,102	1,7
627 216 15	16	18	15	+0,032 +0,102	1,2
627 216 20	16	18	20	+0,032 +0,102	1,6
627 216 25	16	18	25	+0,032 +0,102	1,8
627 218 20	18	20	20	+0,032 +0,102	1,8
627 218 25	18	20	25	+0,032 +0,102	2,0
627 220 10	20	23	10	+0,040 +0,124	1,5
627 220 15	20	23	15	+0,040 +0,124	2,2
627 220 20	20	23	20	+0,040 +0,124	2,9
627 220 25	20	23	25	+0,040 +0,124	3,9
627 220 30	20	23	30	+0,040 +0,124	4,4
627 225 15	25	28	15	+0,040 +0,124	2,7
627 225 20	25	28	20	+0,040 +0,124	3,6
627 230 20	30	34	20	+0,040 +0,124	6,2
627 230 30	30	34	30	+0,040 +0,124	9,3
627 240 30	40	44	30	+0,050 +0,150	12,2
627 240 40	40	44	40	+0,050 +0,150	16,3
627 250 40	50	55	40	+0,050 +0,150	25,4
627 250 50	50	55	50	+0,050 +0,150	31,7
627 260 40	60	65	40	+0,050 +0,150	30,2
627 260 60	60	65	60	+0,050 +0,150	45,4

Flanged Plain Bearings, Thermoplastic EP22™



Plain bearing flange bush from thermoplastic with high dimension accuracy. Low friction. Specially suited for dry-running and for use at very low up to middle high temperatures. Colour: white.

Ordering Details: e.g.: Product No. 627 308 05, Flange Bush EP22, 8 mm Bore

Product No.	d ₁ mm	d ₂ mm	d ₃ mm	b ₁ ^{h13} mm	b ₂ ^{h13} mm	Tolerance d ₁ [*] mm	Weight g
627 308 05	8	10	15	5,5	1,0	+0,025 +0,083	0,4
627 308 07	8	10	15	7,5	1,0	+0,025 +0,083	0,5
627 308 10	8	10	15	10	1,0	+0,025 +0,083	0,5
627 310 07	10	12	18	7	1,0	+0,025 +0,083	0,6
627 310 09	10	12	18	9	1,0	+0,025 +0,083	0,7
627 310 12	10	12	18	12	1,0	+0,025 +0,083	0,8
627 310 15	10	12	18	15	1,0	+0,025 +0,083	1,0
627 310 17	10	12	18	17	1,0	+0,025 +0,083	1,1
627 312 07	12	14	20	7	1,0	+0,032 +0,102	0,6
627 312 09	12	14	20	9	1,0	+0,032 +0,102	0,8
627 312 12	12	14	20	12	1,0	+0,032 +0,102	1,2
627 312 15	12	14	20	15	1,0	+0,032 +0,102	1,3
627 312 17	12	14	20	17	1,0	+0,032 +0,102	1,4
627 312 20	12	14	20	20	1,0	+0,032 +0,102	1,5
627 314 12	14	16	22	12	1,0	+0,032 +0,102	0,9
627 314 17	14	16	22	17	1,0	+0,032 +0,102	1,5
627 315 09	15	17	23	9	1,0	+0,032 +0,102	1,0
627 315 12	15	17	23	12	1,0	+0,032 +0,102	1,2
627 315 17	15	17	23	17	1,0	+0,032 +0,102	1,5
627 315 20	15	17	23	20	1,0	+0,032 +0,102	1,8
627 316 12	16	18	24	12	1,0	+0,032 +0,102	1,3
627 316 17	16	18	24	17	1,0	+0,032 +0,102	1,7
627 318 12	18	20	26	12	1,0	+0,032 +0,102	1,4
627 318 17	18	20	26	17	1,0	+0,032 +0,102	2,1
627 320 11	20	23	30	11,5	1,5	+0,040 +0,124	2,4
627 320 16	20	23	30	16,5	1,5	+0,040 +0,124	3,2
627 320 21	20	23	30	21,5	1,5	+0,040 +0,124	3,9
627 325 11	25	28	35	11,5	1,5	+0,040 +0,124	2,9
627 325 16	25	28	35	16,5	1,5	+0,040 +0,124	3,9
627 325 21	25	28	35	21,5	1,5	+0,040 +0,124	4,9
627 330 16	30	34	42	16	2,0	+0,040 +0,124	6,4
627 330 26	30	34	42	26	2,0	+0,040 +0,124	9,5
627 330 40	30	34	42	40	2,0	+0,040 +0,124	13,9
627 340 16	40	44	52	16	2,0	+0,050 +0,150	8,4
627 340 26	40	44	52	26	2,0	+0,050 +0,150	12,4
627 340 50	40	44	52	50	2,0	+0,050 +0,150	22,2
627 350 26	50	55	63	26	2,0	+0,050 +0,150	18,8
627 350 60	50	55	63	60	2,0	+0,050 +0,150	40,4
627 360 50	60	65	73	50	2,0	+0,050 +0,150	40,5
627 360 70	60	65	73	70	2,0	+0,050 +0,150	55,6

* After press-fitting in bore H7 (in toleranc center).

Description and technical data

Material: Thermoplast polybutylenterephthalat, modified (PBT + PTFE), white.

- Good price/performance ratio with high dimension accuracy
- Low friction, suitable also for lubrication-free running.
- Low Temperatures suited until -50°C.

Operating Conditions :

dry : very good.

oiled: good.

water: very good.

Field of application:

Domestic appliances, chemical equipment, office equipment, sports equipment, automotive (pedals, steering, axes), ...

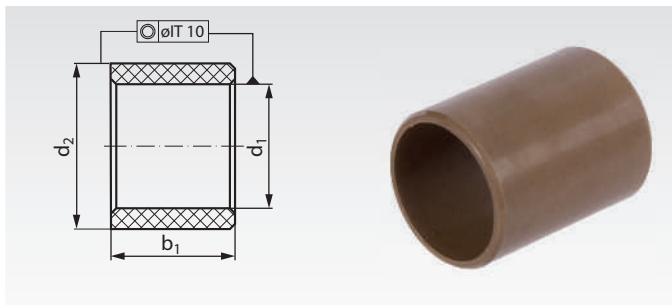
Technical data:

Surface pressure:	max. 50 N/mm ² .
Sliding Speed:	max. 1,0 m/s.
p _v -value for A _H /A _C =5	0,05 N/mm ² x m/s.
p _v -value for A _H /A _C =10	0,10 N/mm ² x m/s.
p _v -value for A _H /A _C =20	0,20 N/mm ² x m/s.
Temperature range	-50°C to + 170°C.
Coefficient of friction	0,22 to 0,37 (dry).
Shaft surface finish	Ra 0,1 to 0,5 µm (ground).
Shaft hardness	> 200 HV.

Recommended mounting tolerances:

Housing bore H7, recommended shaft tolerance h9.

Plain Bearings, Thermoplastic EP43™



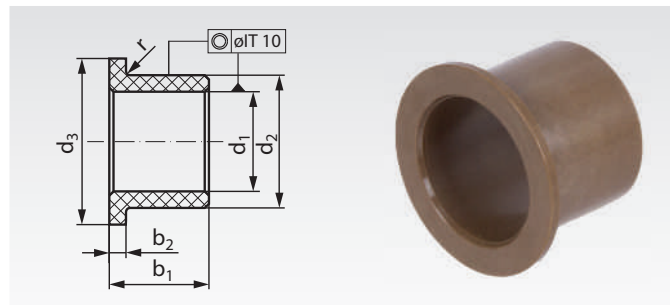
Plain bearing bush made from high sophisticated thermoplastic. Very low friction. Specially suited for dry-running and for use under water and at high temperatures. Colour: brown.

Ordering Details: e.g.: Product No. 627 008 06, Bush EP43, 8 mm Bore

Product No.	d ₁ mm	d ₂ mm	b ₁ ^{h13} mm	Tolerance d ₁ * mm	Weight g
627 008 06	8	10	6	+0,013 +0,071	0,2
627 008 08	8	10	8	+0,013 +0,071	0,3
627 008 10	8	10	10	+0,013 +0,071	0,4
627 008 12	8	10	12	+0,013 +0,071	0,5
627 008 15	8	10	15	+0,013 +0,071	0,6
627 010 04	10	12	4	+0,013 +0,071	0,2
627 010 06	10	12	6	+0,013 +0,071	0,3
627 010 08	10	12	8	+0,013 +0,071	0,4
627 010 10	10	12	10	+0,013 +0,071	0,5
627 010 15	10	12	15	+0,013 +0,071	0,7
627 010 20	10	12	20	+0,013 +0,071	1,0
627 012 10	12	14	10	+0,016 +0,086	0,6
627 012 12	12	14	12	+0,016 +0,086	0,7
627 012 15	12	14	15	+0,016 +0,086	0,9
627 012 20	12	14	20	+0,016 +0,086	1,2
627 014 15	14	16	15	+0,016 +0,086	1,0
627 014 20	14	16	20	+0,016 +0,086	1,4
627 014 25	14	16	25	+0,016 +0,086	1,7
627 015 15	15	17	15	+0,016 +0,086	1,1
627 015 20	15	17	20	+0,016 +0,086	1,4
627 015 25	15	17	25	+0,016 +0,086	1,7
627 020 15	20	23	15	+0,020 +0,104	2,2
627 020 20	20	23	20	+0,020 +0,104	2,9
627 020 30	20	23	30	+0,020 +0,104	4,4
627 025 15	25	28	15	+0,020 +0,104	2,7
627 025 20	25	28	20	+0,020 +0,104	3,6

* After press-fitting in bore H7 (in toleranc center).

Flanged Plain Bearings, Thermoplastic EP43™



Plain bearing flange bush from high sophisticated thermoplastic. Very low friction. Specially suited for dry-running and for use under water and at high temperatures. Colour: brown.

Ordering Details: e.g.: Product No. 627 108 05, Flange Bush EP43, 8 mm Bore

Product No.	d ₁ mm	d ₂ mm	d ₃ mm	b ₁ ^{h13} mm	b ₂ ^{h13} mm	r mm	Tolerance d ₁ * mm	Weight g
627 108 05	8	10	15	5,5	1,0	0,3	+0,013 +0,071	0,4
627 108 07	8	10	15	7,5	1,0	0,3	+0,013 +0,071	0,5
627 108 10	8	10	15	10	1,0	0,3	+0,013 +0,071	0,5
627 110 07	10	12	18	7	1,0	0,3	+0,013 +0,071	0,6
627 110 09	10	12	18	9	1,0	0,3	+0,013 +0,071	0,7
627 110 12	10	12	18	12	1,0	0,3	+0,013 +0,071	0,8
627 110 15	10	12	18	15	1,0	0,3	+0,013 +0,071	1,0
627 110 17	10	12	18	17	1,0	0,3	+0,013 +0,071	1,1
627 112 07	12	14	20	7	1,0	0,3	+0,016 +0,086	0,6
627 112 09	12	14	20	9	1,0	0,3	+0,016 +0,086	0,8
627 112 12	12	14	20	12	1,0	0,3	+0,016 +0,086	1,2
627 112 15	12	14	20	15	1,0	0,3	+0,016 +0,086	1,3
627 112 17	12	14	20	17	1,0	0,3	+0,016 +0,086	1,4
627 112 20	12	14	20	20	1,0	0,3	+0,016 +0,086	1,5
627 114 12	14	16	22	12	1,0	0,3	+0,016 +0,086	0,9
627 114 17	14	16	22	17	1,0	0,3	+0,016 +0,086	1,5
627 115 09	15	17	23	9	1,0	0,3	+0,016 +0,086	1,0
627 115 12	15	17	23	12	1,0	0,3	+0,016 +0,086	1,2
627 115 17	15	17	23	17	1,0	0,3	+0,016 +0,086	1,5
627 115 20	15	17	23	20	1,0	0,3	+0,016 +0,086	1,8
627 116 17	16	18	24	17	1,0	0,3	+0,016 +0,086	1,7
627 120 11	20	23	30	11,5	1,5	0,5	+0,020 +0,104	2,4
627 120 16	20	23	30	16,5	1,5	0,5	+0,020 +0,104	3,2
627 120 21	20	23	30	21,5	1,5	0,5	+0,020 +0,104	3,9
627 125 11	25	28	35	11,5	1,5	0,5	+0,020 +0,104	2,9
627 125 16	25	28	35	16,5	1,5	0,5	+0,020 +0,104	3,9
627 125 21	25	28	35	21,5	1,5	0,5	+0,020 +0,104	4,9

* After press-fitting in bore H7 (in toleranc center).

Description and technical data

Material: Thermoplast polyphenylensulfid, reinforced, modified (PPS + PTFE + aramid), brown.

- Good chemical and hydrolysis resistance.
- Low friction, optimised for dry running conditions.
- High dimensional stability.

Operating Conditions :

dry : very good.

oiled: good.

water: very good.

field of application:

Domestic appliances, conveyors, machinery, cash slot machines and many more.

Technical data:

Surface pressure.: max. 83 N/mm².

Sliding Speed: max. 1,0 m/s.

p_v-value for A_H/A_C=5 0,22 N/mm² x m/s.

p_v-value for A_H/A_C=10 0,90 N/mm² x m/s .

p_v-value for A_H/A_C=20 3,59 N/mm² x m/s .

Temperature range -40°C to + 240°C.

Coefficient of friction 0,11 to 0,20 (dry).

Shaft surface finish Ra 0,2 to 0,8 µm (ground).

Shaft hardness > 200 HV.

Recommended mounting tolerances:

Housing bore H7, recommended shaft tolerance h9.

Cylindrical Drill Bushes similar to the old Standard DIN 179, Design A

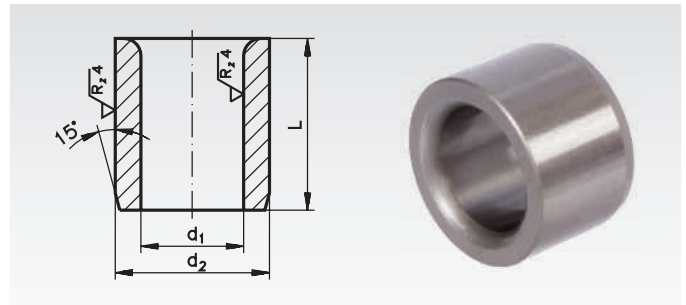
Material: up to bore 5.0 mm 1.2210 above 1.0718
Hardened, ground to tolerance inside and outside.

Hardness: 62 HRC.

Bore rounded at edge.

Mounting hole: tolerance H7.

Other dimensions and designs on request.



Ordering Details: e.g.: Product No. 622 204 08, Cylindrical Drill Bushes 4 x 8 mm

Product No.	d ₁ ^{F7} mm	d ₂ ⁿ⁶ mm	L mm	Weight g
622 204 08	4	7	8	1,6
622 204 12	4	7	12	2,3
622 205 08	5	8	8	1,9
622 205 12	5	8	12	2,8
622 206 10	6	10	10	4,0
622 206 16	6	10	16	6,1
622 208 10	8	12	10	4,8
622 208 16	8	12	16	7,7
622 210 12	10	15	12	9,0
622 210 20	10	15	20	15,0
622 212 12	12	18	12	13,0
622 212 20	12	18	20	22,0
622 213 16	13	22	16	30,0
622 214 16	14	22	16	27,0
622 214 28	14	22	28	49,0
622 215 16	15	22	16	25,0
622 215 28	15	22	28	44,0
622 216 16	16	26	16	40,0
622 216 28	16	26	28	71,0
622 218 16	18	26	16	34,0
622 218 28	18	26	28	60,0
622 220 20	20	30	20	60,0
622 222 20	22	30	20	50,0
622 225 20	25	35	20	72,0
622 230 25	30	42	25	130,0

Loctite bonding products (bearing adhesive) page 812.

Cylindrical, Flanged Drill Bushes similar to the old Standard DIN 172, Design A

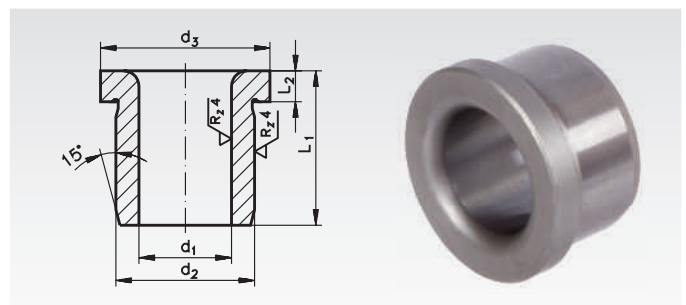
Material: 1.0718.
Hardened, ground to tolerance inside and outside.

Hardness: 62 HRC.

Bore rounded at flange side.

Mounting hole: tolerance H7.

Other dimensions and designs on request.



Ordering Details: e.g.: Product No. 622 104 08, Flanged Drill Bushes 4 x 8 mm

Product No.	d ₁ ^{F7} mm	d ₂ ⁿ⁶ mm	d ₃ mm	L ₂ mm	L ₁ mm	Weight g
622 104 08	4	7	10	2,5	8	2,3
622 104 12	4	7	10	2,5	12	3,1
622 105 08	5	8	11	2,5	8	2,6
622 105 12	5	8	11	2,5	12	3,6
622 106 10	6	10	13	3,0	10	5,0
622 106 16	6	10	13	3,0	16	7,4
622 108 10	8	12	15	3,0	10	6,1
622 108 16	8	12	15	3,0	16	9,0
622 110 12	10	15	18	3,0	12	10,7
622 110 20	10	15	18	3,0	20	16,7
622 112 12	12	18	22	4,0	12	16,5
622 112 20	12	18	22	4,0	20	25,3
622 115 16	15	22	26	4,0	16	29,0
622 116 16	16	26	30	4,0	16	46,0
622 118 16	18	26	30	4,0	16	39,0
622 120 20	20	30	34	5,0	20	67,0
622 122 20	22	30	34	5,0	20	57,0
622 126 20	26	35	39	5,0	20	74,0

Loctite bonding products (bearing adhesive) page 812.

Shaft Collars with Set Screw (Adjusting Rings) According to the Old Standard DIN 703

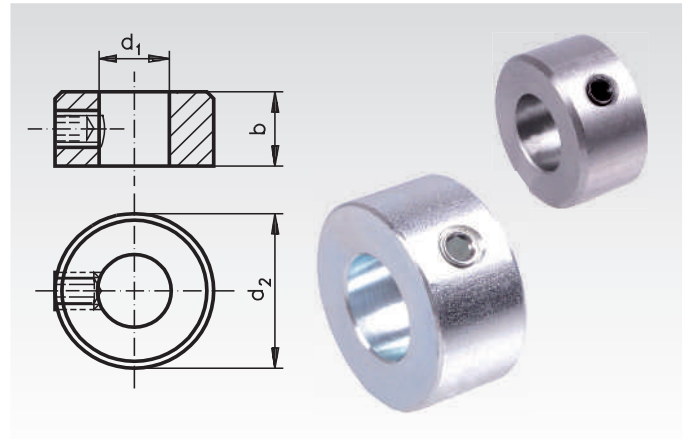
Material: Steel, blank.
Steel, zinc-plated.

Heavy-duty series. With allen set screw made from steel / steel zinc-plated, like DIN EN ISO 4027, but strength 12.9. From size $d_1=70\text{mm}$ with 2 set screws, with offset 135° .

Blank turned and kalibrated. Bores tolerance H8.

Large chamfer on one side of the outside diameter.

Temperature range: -40°C to $+175^\circ\text{C}$.



Ordering Details: e.g.: Product No. 623 220 00,
Collar DIN 703, 20 mm Bore

Product No. Steel blank	Product No. Steel zinc-plated	d_1 mm	d_2 mm	b mm	Screw mm	Weight kg p. %
623 220 00*	623 882 20*	20*	40	20	M8	14,6
623 225 00	623 882 25	25	56	22	M10	33,8
623 230 00	623 882 30	30	63	22	M10	41,5
623 235 00	623 882 35	35	70	22	M10	49,6
623 240 00	623 882 40	40	80	28	M12	82,7
623 245 00	623 882 45	45	80	28	M12	75,3
623 250 00	623 882 50	50	90	28	M12	96,3
623 255 00	623 882 55	55	90	28	M12	87,1
623 260 00	623 882 60	60	100	28	M12	110,0
623 265 00	623 882 65	65	100	28	M12	99,6
623 270 00	623 882 70	70	110	32	M16	141,0
623 275 00	623 882 75	75	110	32	M16	127,0
623 280 00	623 882 80	80	125	32	M16	181,0
623 285 00	623 882 85	85	125	32	M16	165,0
623 290 00	623 882 90	90	125	32	M16	148,0

* Size 20 is not part of the old standard DIN 703.

Other sizes and inch-sizes on request.

Shaft Collars with Set Screw (Adjusting Rings) DIN 705 A

Material: Steel, blank.
Steel, zinc-plated.
Stainless steel 1.4305.

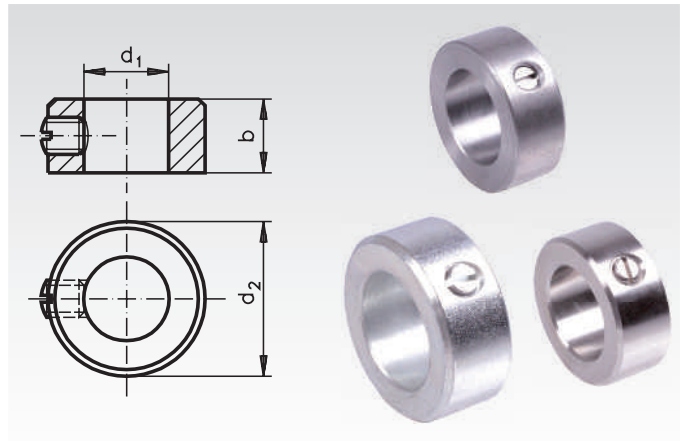


Light-duty series. With set screw made from steel, steel zinc-plated or stainless steel. Up to size $d_1=70\text{mm}$ with one slotted screw, DIN EN 27434. From size $d_1=80\text{mm}$ with 2 allen screws like DIN EN ISO 4027, but strength 12.9, with offset 135° .

Blank turned and kalibrated. Bores tolerance H8. Large chamfer on one side of the outside diameter.

Temperature range: -40°C to $+175^\circ\text{C}$.

Ordering Details: e.g.: Product No. 623 003 00,
Collar DIN 705 A, 3 mm Bore



Product No. Steel blank	Product No. Steel zinc-plated	Product No. Stainless Steel	d_1 mm	d_2 mm	b mm	Screw mm	Weight kg p. %
623 003 00	623 880 03	-	3	7	5	M2	0,123
623 004 00	623 880 04	623 990 04	4	8	5	M2,5	0,145
623 005 00	623 880 05	623 990 05	5	10	6	M3	0,280
623 006 00	623 880 06	623 990 06	6	12	8	M4	0,548
623 007 00	623 880 07	623 990 07	7	12	8	M4	0,488
623 008 00	623 880 08	623 990 08	8	16	8	M4	0,94
623 009 00*	623 880 09*	623 990 09*	9	18*	10*	M5	1,51
623 010 00	623 880 10	623 990 10	10	20	10	M5	1,85
623 012 00	623 880 12	623 990 12	12	22	12	M6	2,52
623 014 00	623 880 14	623 990 14	14	25	12	M6	3,17
623 015 00	623 880 15	623 990 15	15	25	12	M6	2,98
623 016 00	623 880 16	623 990 16	16	28	12	M6	3,84
623 018 00	623 880 18	623 990 18	18	32	14	M6	6,00
623 020 00	623 880 20	623 990 20	20	32	14	M6	5,30
623 022 00	623 880 22	623 990 22	22	36	14	M6	6,90
623 025 00	623 880 25	623 990 25	25	40	16	M8	9,56
623 030 00	623 880 30	623 990 30	30	45	16	M8	11,1
623 035 00	623 880 35	623 990 35	35	56	16	M8	18,7
623 040 00	623 880 40	623 990 40	40	63	18	M10	26,1
623 045 00	623 880 45	623 990 45	45	70	18	M10	31,7
623 050 00	623 880 50	623 990 50	50	80	18	M10	42,9
623 055 00	623 880 55	-	55	80	18	M10	37,3
623 060 00	623 880 60	-	60	90	20	M10	55,2
623 065 00	623 880 65	-	65	100	20	M10	70,8
623 070 00	623 880 70	-	70	100	20	M10	62,6
623 080 00	623 880 80	-	80	110	22	M12	76,8
623 090 00	623 880 90	-	90	125	22	M12	101,0
623 100 00	623 881 00	-	100	140	25	M12	147,0

* At size 9, the outer dimensions are not like DIN 705.

Other sizes and inch-sizes on request.

Shaft Collars, Clamp Collars Single-Split

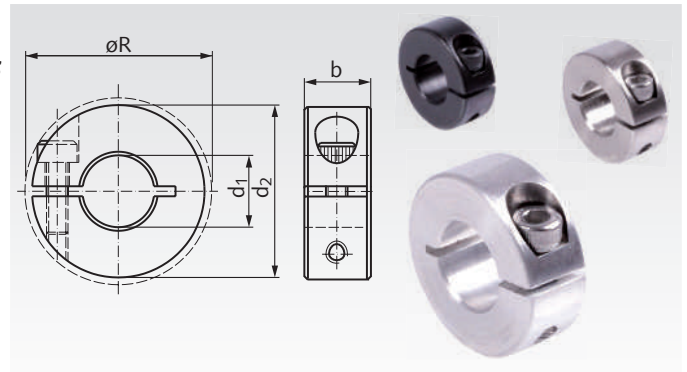
Material: Steel C45 burnished. Screw steel 12.9.
Stainless steel 1.4301. Screw stainless steel A2-70.
Aluminium. Screw stainless steel A2-70.

STAINLESS

Features: does not damage the shaft, stronger clamping force than with set collars, even distribution of clamping forces, easy readjustment, precision honed bores.
The threads of the screws DIN 912 are covered with a layer of nylon.

Tolerance b: +0.08 mm
-0.25 mm

Temperature range: -40°C to +175°C.



Ordering Details: e.g.: Product No. 623 103 00, Clamp Collar, 3 mm Bore

Product No. Steel	Product No. Stainless Steel	Product No. Aluminium	d ₁ mm	d ₂ mm	R mm	b mm	Screw DIN 912	Weight Steel g	Weight Alum. g
623 103 00	623 991 03	623 661 03	3	16	20,7	9	M3 x 8	11	4
623 104 00	623 991 04	623 661 04	4	16	20,7	9	M3 x 8	11	4
623 105 00	623 991 05	623 661 05	5	16	20,7	9	M3 x 8	10	4
623 106 00	623 991 06	623 661 06	6	16	20,7	9	M3 x 8	10	4
623 107 00	623 991 07	623 661 07	7	18	22,4	9	M3 x 8	13	5
623 108 00	623 991 08	623 661 08	8	18	22,4	9	M3 x 8	12	5
623 109 00	623 991 09	623 661 09	9	24	26	9	M3 x 8	23	8
623 110 00	623 991 10	623 661 10	10	24	26	9	M3 x 8	22	8
623 111 00	623 991 11	623 661 11	11	28	31,8	11	M4 x 12	39	14
623 112 00	623 991 12	623 661 12	12	28	31,8	11	M4 x 12	38	13
623 113 00	623 991 13	623 661 13	13	30	33,9	11	M4 x 12	43	15
623 114 00	623 991 14	623 661 14	14	30	33,9	11	M4 x 12	42	15
623 115 00	623 991 15	623 661 15	15	34	39,4	13	M5 x 14	65	23
623 116 00	623 991 16	623 661 16	16	34	39,4	13	M5 x 14	63	22
623 117 00	623 991 17	623 661 17	17	36	41,2	13	M5 x 14	72	25
623 118 00	623 991 18	623 661 18	18	36	41,2	13	M5 x 14	69	24
623 119 00	623 991 19	623 661 19	19	40	46,4	15	M6 x 16	100	35
623 120 00	623 991 20	623 661 20	20	40	46,4	15	M6 x 16	97	34
623 121 00	623 991 21	623 661 21	21	42	48,1	15	M6 x 16	107	37
623 122 00	623 991 22	623 661 22	22	42	48,1	15	M6 x 16	103	36
623 123 00	623 991 23	623 661 23	23	45	50,8	15	M6 x 16	122	42
623 124 00	623 991 24	623 661 24	24	45	50,8	15	M6 x 16	117	40
623 125 00	623 991 25	623 661 25	25	45	50,8	15	M6 x 16	114	40
623 126 00	623 991 26	623 661 26	26	48	53,7	15	M6 x 18	133	46
623 128 00	623 991 28	623 661 28	28	48	53,7	15	M6 x 18	123	43
623 130 00	623 991 30	623 661 30	30	54	58,6	15	M6 x 18	163	56
623 132 00	623 991 32	623 661 32	32	54	58,6	15	M6 x 18	156	54
623 134 00	623 991 34	623 661 34	34	57	61,6	15	M6 x 18	174	60
623 135 00	623 991 35	623 661 35	35	57	61,6	15	M6 x 18	171	59
623 136 00	623 991 36	623 661 36	36	57	61,6	15	M6 x 18	163	56
623 138 00	623 991 38	623 661 38	38	60	65	15	M6 x 18	178	61
623 140 00	623 991 40	623 661 40	40	60	65	15	M6 x 18	163	56
623 142 00	623 991 42	623 661 42	42	73	79,4	19	M8 x 25	367	127
623 145 00	623 991 45	623 661 45	45	73	79,4	19	M8 x 25	344	119
623 148 00	623 991 48	623 661 48	48	78	84,2	19	M8 x 25	392	135
623 150 00	623 991 50	623 661 50	50	78	84,2	19	M8 x 25	370	128
623 155 00	623 991 55	—	55	82	88,8	19	M8 x 25	380	—
623 160 00	623 991 60	—	60	88	94,0	19	M8 x 25	425	—
623 165 00	623 991 65	—	65	93	99,8	19	M8 x 25	450	—
623 170 00	623 991 70	—	70	98	104,5	19	M8 x 25	480	—
623 175 00	623 991 75	—	75	103	109,1	19	M8 x 25	510	—
623 180 00	623 991 80	—	80	108	113,8	19	M8 x 25	535	—

Remarks to collars from steel

The black oxide on the clamping collars is formulated as part of the total performance of the product. It enhances the holding ability of the collar, it efficiently reduces slipping on the shaft,

has anti-stick-slip characteristics and helps to keep the torque rating of the screw within its designed parameters. The oxide layer also provides corrosion protection.

Shaft Collars, Clamp Collars Double-Split

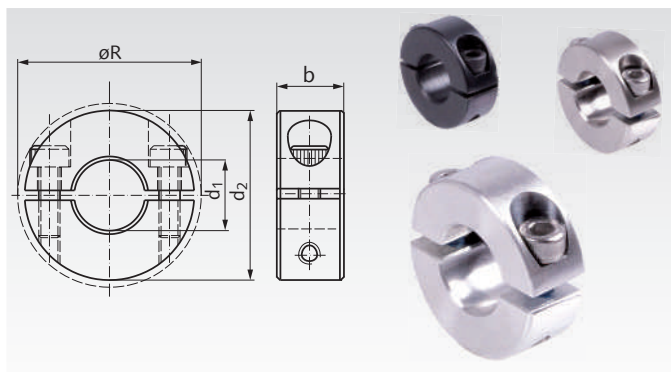
Material: Steel C45 burnished. Screws steel 12.9.
Stainless steel 1.4301. Screws stainless steel A2-70.
Aluminium. Screws stainless steel A2-70.

STAINLESS

Features: does not damage the shaft, stronger clamping force than with set collars, even distribution of clamping forces, easy readjustment, precision honed bores.
The threads of the screws DIN 912 are covered with a layer of nylon.

Tolerance b: +0.08 mm
-0.25 mm

Temperature range: -40°C to +175°C.



Ordering Details: e.g.: Product No. 623 403 00, Double-split Clamp Collar, 3 mm Bore

Product No. Steel	Product No. Stainless Steel	Product No. Aluminium	d_1 mm	d_2 mm	R mm	b mm	Screws DIN 912	Weight Steel g	Weight Alum. g
623 403 00	623 994 03	623 664 03	3	16	20,7	9	M3 x 8	12	4
623 404 00	623 994 04	623 664 04	4	16	20,7	9	M3 x 8	11	4
623 405 00	623 994 05	623 664 05	5	16	20,7	9	M3 x 8	11	4
623 406 00	623 994 06	623 664 06	6	16	20,7	9	M3 x 8	10	3
623 407 00	623 994 07	623 664 07	7	18	22,4	9	M3 x 8	13	4
623 408 00	623 994 08	623 664 08	8	18	22,4	9	M3 x 8	12	4
623 409 00	623 994 09	623 664 09	9	24	26	9	M3 x 8	25	9
623 410 00	623 994 10	623 664 10	10	24	26	9	M3 x 8	24	8
623 411 00	623 994 11	623 664 11	11	28	31,8	11	M4 x 12	40	14
623 412 00	623 994 12	623 664 12	12	28	31,8	11	M4 x 12	39	13
623 413 00	623 994 13	623 664 13	13	30	33,9	11	M4 x 12	45	16
623 414 00	623 994 14	623 664 14	14	30	33,9	11	M4 x 12	43	15
623 415 00	623 994 15	623 664 15	15	34	39,4	13	M5 x 14	68	23
623 416 00	623 994 16	623 664 16	16	34	39,4	13	M5 x 14	65	22
623 417 00	623 994 17	623 664 17	17	36	41,2	13	M5 x 14	74	26
623 418 00	623 994 18	623 664 18	18	36	41,2	13	M5 x 14	71	24
623 419 00	623 994 19	623 664 19	19	40	46,4	15	M6 x 16	104	36
623 420 00	623 994 20	623 664 20	20	40	46,4	15	M6 x 16	101	35
623 421 00	623 994 21	623 664 21	21	42	48,1	15	M6 x 16	113	39
623 422 00	623 994 22	623 664 22	22	42	48,1	15	M6 x 16	107	37
623 423 00	623 994 23	623 664 23	23	45	50,8	15	M6 x 16	127	44
623 424 00	623 994 24	623 664 24	24	45	50,8	15	M6 x 16	122	42
623 425 00	623 994 25	623 664 25	25	45	50,8	15	M6 x 16	120	41
623 426 00	623 994 26	623 664 26	26	48	53,7	15	M6 x 18	139	48
623 428 00	623 994 28	623 664 28	28	48	53,7	15	M6 x 18	128	44
623 430 00	623 994 30	623 664 30	30	54	58,6	15	M6 x 18	171	59
623 432 00	623 994 32	623 664 32	32	54	58,6	15	M6 x 18	161	56
623 434 00	623 994 34	623 664 34	34	57	61,6	15	M6 x 18	181	62
623 435 00	623 994 35	623 664 35	35	57	61,6	15	M6 x 18	172	60
623 436 00	623 994 36	623 664 36	36	57	61,6	15	M6 x 18	169	59
623 438 00	623 994 38	623 664 38	38	60	65	15	M6 x 18	183	63
623 440 00	623 994 40	623 664 40	40	60	65	15	M6 x 18	172	59
623 442 00	623 994 42	623 664 42	42	73	79,4	19	M8 x 25	383	132
623 445 00	623 994 45	623 664 45	45	73	79,4	19	M8 x 25	360	124
623 448 00	623 994 48	623 664 48	48	78	84,2	19	M8 x 25	414	143
623 450 00	623 994 50	623 664 50	50	78	84,2	19	M8 x 25	386	133
623 455 00	623 994 55	—	55	82	88,8	19	M8 x 25	395	—
623 460 00	623 994 60	—	60	88	94,0	19	M8 x 25	440	—
623 465 00	623 994 65	—	65	93	99,8	19	M8 x 25	465	—
623 470 00	623 994 70	—	70	98	104,5	19	M8 x 25	495	—
623 475 00	623 994 75	—	75	103	109,1	19	M8 x 25	525	—
623 480 00	623 994 80	—	80	108	113,8	19	M8 x 25	550	—

Remarks to collars from steel

The black oxide on the clamping collars is formulated as part of the total performance of the product. It enhances the holding ability of the collar, it efficiently reduces slipping on the shaft,

has anti-stick-slip characteristics and helps to keep the torque rating of the screw within its designed parameters. The oxide layer also provides corrosion protection.

Shaft Collars, Clamp Collars Double Wide, Single-Split

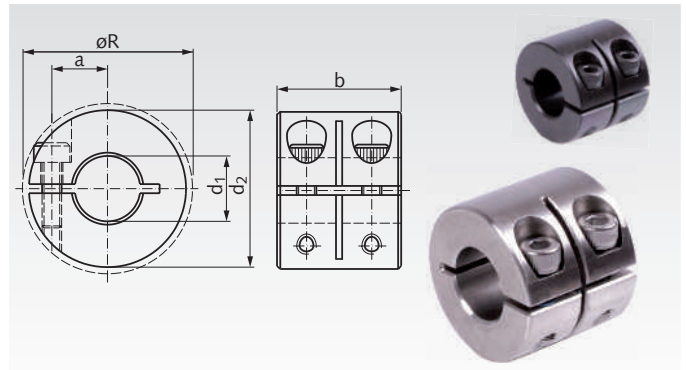
Material: Steel C45 burnished, screws steel 12.9.
Stainless steel 1.4301,
screws stainless steel A2-70.



Features: does not damage the shaft, stronger clamping force than with set collars, even distribution of clamping forces, easy readjustment, precision honed bores.
The threads of the screws DIN 912 are covered with a layer of nylon.

Tolerance b: +0.08 mm
-0.25 mm

Temperature range: -40°C to +175°C.



Ordering Details: e.g.: Product No. 624 106 00, Clamp Collar, 6mm

Product No. Steel	Product No. Stainless Steel	d ₁ mm	d ₂ mm	R mm	b mm	a mm	Screw DIN 912	Tightening Torque		Weight g
								Steel Nm	Stainless steel Nm	
624 106 00	624 991 06	6 ^{+0,05}	16	20,1	20	5,2	M3 x 8	2,1	1,1	20
624 108 00	624 991 08	8 ^{+0,07}	18	21,3	20	6,0	M3 x 8	2,1	1,1	24
624 110 00	624 991 10	10 ^{+0,07}	24	25,6	20	8,5	M3 x 8	2,1	1,1	48
624 112 00	624 991 12	12 ^{+0,07}	28	31,7	24	10,0	M4 x 12	4,6	2,5	78
624 116 00	624 991 16	16 ^{+0,07}	34	38,5	29	12,0	M5 x 14	9,5	5,4	130
624 120 00	624 991 20	20 ^{+0,07}	40	46,3	33	14,5	M6 x 16	16	9,6	202
624 125 00	624 991 25	25 ^{+0,07}	45	50,6	33	17,0	M6 x 16	16	9,6	240
624 130 00	624 991 30	30 ^{+0,12}	54	58,6	33	21,5	M6 x 18	16	9,6	342
624 140 00	624 991 40	40 ^{+0,12}	60	65,0	33	25,0	M6 x 18	16	9,6	344
624 150 00	624 991 50	50 ^{+0,12}	78	84,2	41	32,0	M8 x 25	17	13,6	772

Shaft Collars, Clamp Collars Double Wide, Double-Split

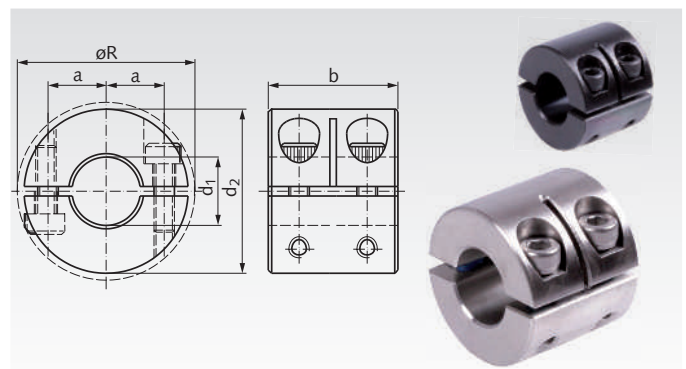
Material: Steel C45 burnished, screws steel 12.9.
Stainless steel 1.4301,
screws stainless steel A2-70.



Features: does not damage the shaft, stronger clamping force than with set collars, even distribution of clamping forces, easy readjustment, precision honed bores.
The threads of the screws DIN 912 are covered with a layer of nylon.

Tolerance b: +0.08 mm
-0.25 mm

Temperature range: -40°C to +175°C.



Ordering Details: e.g.: Product No. 624 406 00, Clamp Collar, 6mm

Product-No. Steel	Product-No. Stainless Steel	d ₁ mm	d ₂ mm	R mm	b mm	a mm	Screw DIN 912	Tightening Torque		Weight g
								Steel Nm	Stainless steel Nm	
624 406 00	624 994 06	6 ^{+0,05}	16	20,1	20	5,2	M3 x 8	2,1	1,1	20
624 408 00	624 994 08	8 ^{+0,07}	18	21,3	20	6,0	M3 x 8	2,1	1,1	24
624 410 00	624 994 10	10 ^{+0,07}	24	25,6	20	8,5	M3 x 8	2,1	1,1	44
624 412 00	624 994 12	12 ^{+0,07}	28	31,7	24	10,0	M4 x 12	4,6	2,5	76
624 416 00	624 994 16	16 ^{+0,07}	34	38,5	29	12,0	M5 x 14	9,5	5,4	126
624 420 00	624 994 20	20 ^{+0,07}	40	46,3	33	14,5	M6 x 16	16	9,6	194
624 425 00	624 994 25	25 ^{+0,07}	45	50,6	33	17,0	M6 x 16	16	9,6	228
624 430 00	624 994 30	30 ^{+0,12}	54	58,6	33	21,5	M6 x 18	16	9,6	326
624 440 00	624 994 40	40 ^{+0,12}	60	65,0	33	25,0	M6 x 18	16	9,6	326
624 450 00	624 994 50	50 ^{+0,12}	78	84,2	41	32,0	M8 x 25	17	13,6	740

Remarks to collars from steel

The black oxide on the clamping collars is formulated as part of the total performance of the product. It enhances the holding ability of the collar, it efficiently reduces slipping on the shaft,

has anti-stick-slip characteristics and helps to keep the torque rating of the screw within its designed parameters. The oxide layer also provides corrosion protection.

Shaft Collars, Clamp Collars with Thread

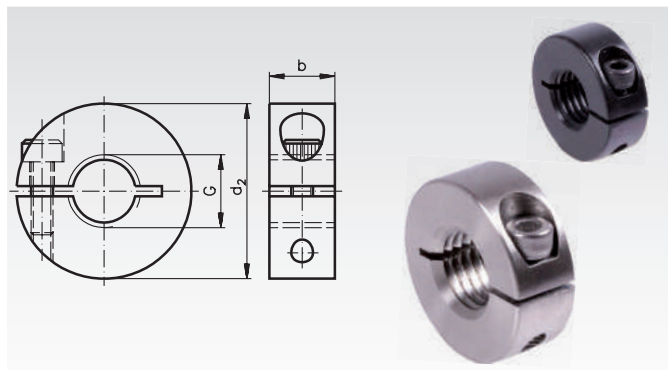
Material: Steel C45 burnished, screws steel 12.9.
Stainless steel 1.4301,
screws stainless steel A2-70.



The threads of the screws DIN 912 are covered with a layer of nylon.

Max. speed: 4,000 min⁻¹.

Temperature range: -40°C to +175°C.



Ordering Details: e.g.: Product No. 623 604 00, Clamp Collar, M4 Thread

Product No. Steel	Product No. Stainless Steel	Thread G	pitch	d ₂ mm	b mm	Screw DIN 912	Weight g
623 604 00	623 996 04	M4	0,7	16	9	M3 x 8	10
623 605 00	623 996 05	M5	0,8	16	9	M3 x 8	11
623 606 00	623 996 06	M6	1,0	16	9	M3 x 8	11
623 608 00	623 996 08	M8	1,25	18	9	M3 x 8	12
623 610 00	623 996 10	M10	1,5	24	9	M3 x 8	22
623 612 00	623 996 12	M12	1,75	28	11	M4 x 12	39
623 616 00	623 996 16	M16	2,0	34	13	M5 x 14	63
623 620 00	623 996 20	M20	2,5	40	15	M6 x 16	97
623 624 00	623 996 24	M24	3,0	45	15	M6 x 16	117
623 630 00	623 996 30	M30	3,5	54	15	M6 x 18	163

* Metric ISO-standard thread (column 1).



Rod ends, series K (wide version), internal and external thread

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		Lubricateable (GS), steel Ø 2-40mm.....	462
		Maintenance free (GT), steel Ø 4-40mm.....	463
		Maintenance free (GT-R), stainless steel Ø 5-40mm.....	464
		With ball bearing (BR), steel Ø 6-30mm.....	466
		With ball bearing (BR-R), stainless steel Ø 6-20mm.....	467

Rod ends, series E (slim version), internal and external thread

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	Maintenance free (GEW, GAW), steel Ø 6-80mm.....	465
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Rod Ends, special sizes (medium wide version), internal thread

Page

	With ball bearing, steel, internal thread (PF), Ø 10-20mm....	468
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Spherical bearings, series K (wide version)

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		Lubricateable, steel and stainless steel Ø 5-40mm.....	469
		Lubricateable, with outer ring, steel Ø 5-40mm.....	469
		Lubricateable, with outer ring, stainless steel Ø 5-40mm.....	469
		Maintenance free, steel and stainless steel Ø 5-40mm.....	470
		Maintenance free, with outer ring, steel Ø 5-40mm.....	470
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Spherical bearings, series E (slim version)

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		Lubricateable, steel Ø 6-80mm.....	471
		Maintenance free, steel Ø 6-80mm.....	471
		Maintenance free, stainless steel Ø 6-80mm.....	471

Load Capacity of Rod Ends and Spherical Bearings made from steel

Radial load: The load rating depends on the load case:

Load case I (stationary or static load):

Load rating like table 1.

Load case II (fluctuating or simple dynamic load):

Load rating like table 2. Attention for types GT and GT-R:

Load ratings from table 1 may not be exceeded.

Load case III (alternating or shock load):

The load rating depends highly on the real kind of application and use. We recommend 50% of the load rating from table 2.

Axial load: The axial force may not exceed 20 % of the radial load.

Table 1: Static Load Rating C₀ in kN for Load Case I

Bore Diameter of Rod End mm	Rod Ends with Internal Thread				Rod Ends with External Thread				Spherical bearings					
	GS	GT	GT-R	GEW	GS	GT	GT-R	GAW	S	S...D	G	G...D	GE...DO	GE...UK
2	3	-	-	-	0,6	-	-	-	-	-	-	-	-	-
3	4,1	-	-	-	1,5	-	-	-	-	-	-	-	-	-
4	-	5,2	-	-	-	2,6	-	-	-	-	-	-	-	-
5	9,9	8	11,8	-	4,3	4,3	6,2	-	10	12,5	19,8	12,5	-	-
6	11,9	8,9	13,1	10,3	6	6	8,8	6,9	12,8	15,5	25,8	15,5	17	9
8	17,1	14,1	20,7	15,8	11	11	16,1	12,7	21,6	27,8	42,6	27,8	27,5	14,6
10	21,4	19,3	28,3	23,4	17,4	17,4	25,5	19,9	30	39	60	39	40,5	21,6
12	27	23,5	34,5	31	25,5	23,5	34,5	29	40	53,5	80	53,5	54	28,5
14	24,5	21	39,5	-	24,5	20,8	39,5	-	51,5	70	102,5	70	-	-
15	-	-	-	42,5	-	-	-	39,5	-	-	-	-	85	44
16	37	32	60,5	54,5	36,5	32	60,5	54	64,5	88	128,5	88	106	56
17	-	-	-	54,5	-	-	-	54	-	-	-	-	106	56
18	43	38,6	73	-	43	38,6	73	-	78,5	106,5	157	106,5	-	-
20	49,5	44	83	62,5	49,5	43,8	83	62,5	94,5	130	188,5	130	146	78
22	57	53	100	-	57	52,6	100	-	114	162	229	162	-	-
25	68	62	118	92	68	61,4	118	92	142	204	293	204	240	127
30	82	82	155	124	82	81,6	155	124	416	281	416	281	310	166
35	101	101	191	144	101	101	191	144	480	343	480	343	400	338
40	124	124	235	178	124	124	235	178	693	495	693	495	500	419
45	-	-	-	263	-	-	-	263	-	-	-	-	640	540
50	-	-	-	320	-	-	-	320	-	-	-	-	780	665
60	-	-	-	497	-	-	-	497	-	-	-	-	1220	1030
70	-	-	-	606	-	-	-	566	-	-	-	-	1560	1320
80	-	-	-	752	-	-	-	752	-	-	-	-	2000	1700

Table 2: Dynamic Load Rating C in kN for Load Case II

Bore Diameter of Rod End mm	Rod Ends with Internal Thread				Rod Ends with External Thread				Spherical bearings					
	GS	GT	GT-R	GEW	GS	GT	GT-R	GAW	S	S...D	G	G...D	GE...DO	GE...UK
2	1,1	-	-	-	1,1	-	-	-	-	-	-	-	-	-
3	1,8	-	-	-	1,8	-	-	-	-	-	-	-	-	-
4	-	0,8	-	-	-	0,8	-	-	-	-	-	-	-	-
5	2,5	7,5	7,5	-	2,5	7,5*	7,5*	-	2,5	7,5	3,3	7,5	-	-
6	3,2	9,3*	9,3	3,6	3,2	9,3*	9,3*	3,6	3,2	9,3	4,3	9,3	3,4	3,6
8	5,4	16,7*	16,7	5,8	5,4	16,7*	16,7*	5,8	5,4	16,7	7,1	16,7	5,5	5,8
10	7,5	23,4*	23,4	8,6	7,5	23,4*	23,4	8,6	7,5	23,4	10	23,4	8,1	8,6
12	10	32*	32	11,5	10	32*	32	11,5	10	32	13,5	32	10,8	11,5
14	13	42*	42*	-	13	42*	42*	-	13	42	17	42	-	-
15	-	-	-	17,5	-	-	-	17,5	-	-	-	-	17	17,5
16	16	52,5*	52,5	22,5	16	52,5*	52,5	22,5	16	62,5	21,5	62,5	21,2	22
17	-	-	-	22,5	-	-	-	22,5	-	-	-	-	21,2	22
18	19,5	64*	64	-	19,5	64*	64*	-	19,5	64	26	64	-	-
20	23,5	78*	78	31,5	23,5	78*	78	31,5	23,5	78	31,5	78	30	31
22	29	97*	97	-	29	97*	97	-	29	97	38	97	-	-
25	35	122*	122*	51	35	122*	122*	51	35	122	47	122	48	51
30	64	168*	168*	66	64	168*	168*	66	64	168	64	168	62	65
35	80	206*	206*	140	80	206*	206*	140	80	206	80	206	80	140
40	116	286*	286*	185	116	286*	286*	185	116	286	116	286	100	185
45	-	-	-	240	-	-	-	240	-	-	-	-	127	240
50	-	-	-	295	-	-	-	295	-	-	-	-	156	295
60	-	-	-	460	-	-	-	460	-	-	-	-	245	460
70	-	-	-	590	-	-	-	590	-	-	-	-	315	590
80	-	-	-	750	-	-	-	750	-	-	-	-	400	750

* Attention: The static load rating is lower. The dynamic load ratings are calculated for the bearing, to be used for further calculations. The static load ratings from table 1 may not be exceeded.

Rod Ends and Spherical Bearings, Basic Informations

Permissible Speed of the Inner Ring for Rod Ends and Spherical Bearings made from steel

The effective determination of the maximum rotational speed depends on various factors and variables which cannot all be predefined by the manufacturer.

- Load.
- Loading case (I,II and III).
- Type of lubrication (central lubrication system etc.).
- Ambient temperature.
- Environmental influences (dust etc.).

For the aforementioned reasons the manufacturer cannot determine any explicit, general values for the maximum speed of the inner ring. The values in the table were calculated assuming favourable conditions. Rod ends DIN series E (GEW and GAW) and spherical bearings DIN series E (GE...DO and GE...UK) are not suitable for higher speeds (only for alternating load).

Rod End-Bores	Rod Ends			Spherical Bearings			
	GS min ⁻¹	GT** min ⁻¹	GT-R** min ⁻¹	S min ⁻¹	S...D** min ⁻¹	G min ⁻¹	G...D** min ⁻¹
5	1200	600	600	900	600	-	600
6	1500	530	530	760	530	1500	530
8	1200	420	420	620	420	1200	420
10	1000	350	350	500	350	1000	350
12	860	300	300	450	300	860	300
14	750	260	260	360	260	750	260
16	660	230	230	350	230	660	230
18	600	210	210	320	210	600	210
20	540	190	190	280	190	540	190
22	500	170	170	250	170	500	170
25	440	150	150	230	150	440	150
30	370	130	130	370	130	370	130
35	330	110	110	330	110	330	110
40	290	100	100	290	150	290	100

* Sizes 2, 3 and 4 mm and GS external thread 5 mm are not suitable for higher speeds.

** Speeds stated are for short-term rotary operation (not suitable for permanent rotary operation).

Tolerances for Rod Ends and Spherical Bearings

Ball Bores

Series K:

Bore tolerance H7.

Matching shaft: g6 recommended.

Series E:

Bore tolerance 0/-8μ.

Matching shaft: g7 recommended.

Outer diameter of the spherical bearing

Series K: Tolerance h6.

Housing tolerance J7 recommended.

Series E: Tolerance h5.

Housing tolerance JS7 recommended.

Thread Metric thread according to DIN 13. All external thread are rolled for high strength.

Lubrication

All rod ends and spherical bearings, which are not declared as maintenance-free, must be lubricated. An initial lubrication before use is required. But maintenance-free parts must not be lubricated.

We recommend the following lubrication intervals:

- If the system runs at full speed during the phase of start-up wear, i.e., during the first 5 operating days, running 8 hours per day, and in a dirty operating environment, i.e., under unfavourable ambient conditions, the unit should be lubricated twice a day.

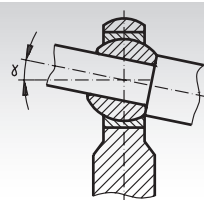
- With oscillating motion once to twice a week.

- With higher temperatures possibly once or twice a day.

We recommend high quality grease with Molykote or graphite ingredient.

Tilting Angle

Max. tilting angle: the tilting angles stated in the table relate to the maximum permissible misalignment of the shaft axis towards the bearing



Thermoplastic Rod Ends igubal® KCRM and KCLM similar to DIN 12240-4 (DIN 648) series K, Internal Thread

Material spherical ball: iglidur® W300, yellowish.

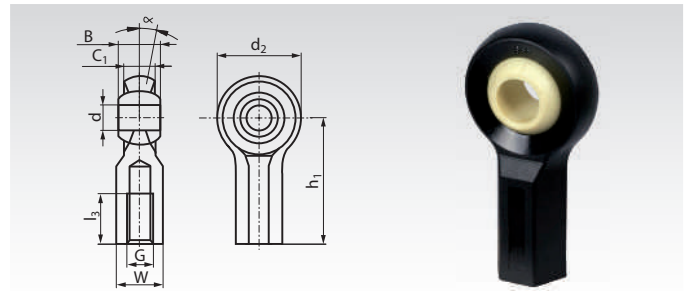
Material housing: igumid G, black.



- Maintenance-free, silent running and anti-vibrating.
 - High strength at very low weight.
 - Resistant against corrosion and many chemicals.
 - Electrical and thermal isolating.
 - The counter part must rotate inside the bore of the spherical ball.
- With a metal bolt, a sliding speed up to 30 m/min. may be possible.
The spherical ball may only compensate shaft misalignment.

Temperature range: -30° to +80°C.

IR = Internal Right-hand thread. **IL** = Internal Left-hand thread.



Ordering Details: e.g.: Product No. 632 556 05, Rod End igubal KCRM, 5mm

Product No. KCRM IR	Product No. KCLM IL	dE10 mm	B mm	C1 mm	d2 mm	h1 mm	l3 mm	Thread		Tilting angle α °	Load Rating*		Weight g
								G mm	W mm		radial static N	axial static N	
632 556 05	632 557 05	5	8	6	18	27	12	M5	SW9	43	600	90	4,0
632 556 06	632 557 06	6	9	7	20	30	13,5	M6	SW10	40	700	150	4,2
632 556 08	632 557 08	8	12	9	24	36	17	M8	SW13	35	1050	250	7,6
632 556 10	632 557 10	10	14	10,5	30	43	22	M10	SW15	35	1500	400	12,8
632 556 10F	632 557 10F	10	14	10,5	30	43	21	M10x1,25	SW15	35	1500	400	12,8
632 556 12	632 557 12	12	16	12	34	50	25	M12	SW17	35	1780	375	19
632 556 12F	632 557 12F	12	16	12	34	50	25	M12x1,25	SW17	35	1780	375	19
632 556 16	632 557 16	16	21	15	42	64	30	M16	SW20	35	1900	400	34
632 556 16F	632 557 16F	16	21	15	42	64	30	M16x1,5	SW20	35	1900	400	34
632 556 20	632 557 20	20	25	18	50	77	35	M20	SW24	35	2275	200	55
632 556 20F	632 557 20F	20	25	18	50	77	35	M20x1,5	SW24	35	2275	200	55

* At short term, the radial load may be twice as high.

Other versions or sizes on request.

Heavy-Duty Rod Ends GS DIN 12240-4 (DIN 648) Series K, Internal Thread

Material internal ring: Roller bearing steel 100Cr6, hardened

HRC 62 ±1, ground and polished.

Material outer part: Bores 6-12 mm, free cutting steel, turned, bores 14-30 mm C22 forged, zinc-plated.

Material bearing race: Special brass CuZn40Al1.

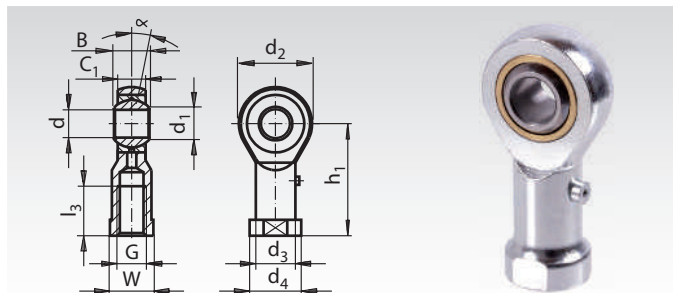
Normal bearing clearance: 15 - 45 µ at a measuring load of 100 N.

Sliding speeds up to 60 m/min. Steel on high-duty bronze, thus high radial and axial alternating loads.

Load tables pages 459 - 460.

Initial lubrication before use is required!

IR = Internal-Right hand thread. IL = Internal Left-hand thread.



Ordering Details: e.g.: Product No. 632 002 00, Rod End GS, IR

Product No. IR	Product No. IL	dH7 mm	B-0.1 mm	C1±0.2 mm	d1 mm	d2 mm	d3 mm	d4 mm	h1 mm	l3-1.0 mm	Thread ISO DIN 13 6H G mm	W mm	Tilting angle α °	Weight g
632 002 00*	632 102 00*	2	4,5	3,6	2,6	9	3,8	4,5	16	7	M2	4	16	3
632 003 00*	632 103 00*	3	6	4,5	5,1	14	5	6,5	21	10	M3	5,5	14	6
632 005 00	632 105 00	5	8	6	7,7	18	9	11	27	10	M5	9	13	86
632 006 00	632 106 00	6	9	6,75	8,9	20	10	13	30	12	M6	11	13	27
632 008 00	632 108 00	8	12	9	10,4	24	12,5	16	36	16	M8	13	14	46
632 010 00	632 110 00	10	14	10,5	12,9	28	15	19	43	20	M10	17	13	76
632 012 00	632 112 00	12	16	12	15,4	32	17,5	22	50	22	M12	19	13	115
632 014 00	632 114 00	14	19	13,5	16,8	36	20	25	57	25	M14	22	16	170
632 016 00	632 116 00	16	21	15	19,3	42	22	27	64	28	M16	22	15	230
632 018 00	632 118 00	18	23	16,5	21,8	46	25	31	71	32	M18x1,5	27	15	320
632 020 00	632 120 00	20	25	18	24,3	50	27,5	34	77	33	M20x1,5	32	14	415
632 022 00	632 122 00	22	28	20	25,8	54	30	37	84	37	M22x1,5	32	15	540
632 025 00	632 125 00	25	31	22	29,6	60	33,5	42	94	42	M24x2	36	15	750
632 030 00	632 130 00	30	37	25	34,8	70	40	51	110	51	M30x2	41	17	1130
632 035 00	632 135 00	35	43	28	37,7	80	46	58	125	56	M36x2	50	19	1600
632 040 00	632 140 00	40	49	35	44,2	90	57	69	142	60	M42x2	60	16	2770

* Up to size 3 without grease nipple.

Heavy-Duty Rod Ends GS DIN 12240-4 (DIN 648) Series K, External Thread

Material internal ring: Roller bearing steel 100Cr6, hardened

HRC 62 ±1, ground and polished.

Material outer part: Bores 6-12 mm, free cutting steel, turned, bores 14-30 mm C22 forged, zinc-plated.

Material bearing race: Special brass CuZn40Al1.

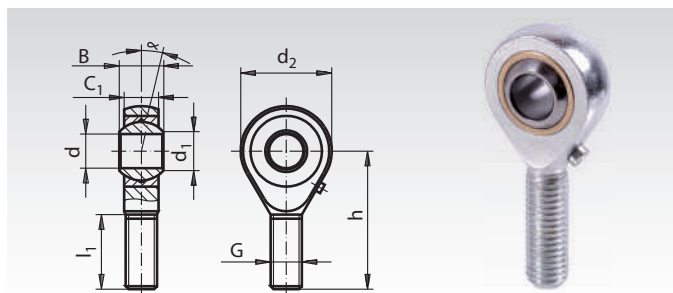
Normal bearing clearance: 15 - 45 µ at a measuring load of 100 N.

Sliding speeds up to 60 m/min. Steel on high-duty bronze, thus high radial and axial alternating loads.

Load tables pages 459 - 460.

Initial lubrication before use is required!

AR = External Right-hand thread. AL = External Left-hand thread.



Ordering Details: e.g.: Product No. 632 202 00, Rod End GS, AR

Product No. AR	Product No. AL	dH7 mm	B-0.1 mm	C1±0.2 mm	d1 mm	d2 mm	h mm	l1-1.0 mm	Thread ISO DIN 13 6H G mm	Tilting angle α °	Weight g
632 202 00*	632 302 00*	2	4,5	3,6	2,6	9	20	12	M2	16	3
632 203 00*	632 303 00*	3	6	4,5	5,1	14	26	15	M3	14	6
632 205 00*	632 305 00*	5	8	6	7,7	18	33	20	M5	13	13
632 206 00	632 306 00	6	9	6,75	8,9	20	36	22	M6	13	20
632 208 00	632 308 00	8	12	9	10,4	24	42	25	M8	14	33
632 210 00	632 310 00	10	14	10,5	12,9	28	48	29	M10	13	56
632 212 00	632 312 00	12	16	12	15,4	32	54	33	M12	13	87
632 214 00	632 314 00	14	19	13,5	16,8	36	60	36	M14	16	129
632 216 00	632 316 00	16	21	15	19,3	42	66	40	M16	15	189
632 218 00	632 318 00	18	23	16,5	21,8	46	72	44	M18x1,5	15	267
632 220 00	632 320 00	20	25	18	24,3	50	78	47	M20x1,5	14	348
632 222 00	632 322 00	22	28	20	25,8	54	84	51	M22x1,5	15	443
632 225 00	632 325 00	25	31	22	29,6	60	94	57	M24x2	15	600
632 230 00	632 330 00	30	37	25	34,8	70	110	71	M30x2	17	1030
632 235 00	632 335 00	35	43	28	37,7	80	125	73	M36x2	19	1600
632 240 00	632 340 00	40	49	35	44,2	90	142	78	M42x2	16	2550

* Up to size 5 without grease nipple.

Heavy-Duty Rod Ends GT DIN 12240-4 (DIN 648) Series K, Maintenance Free, Internal Thread

Material internal ring: Roller bearing steel 100Cr6, hardened HRC 62 ±1, ground and polished.

Material outer part: Bores 6-12 mm, free cutting steel, turned, bores 14-30 mm C22 forged, zinc-plated.

Material bearing race: Free cutting steel with PTFE-lining.

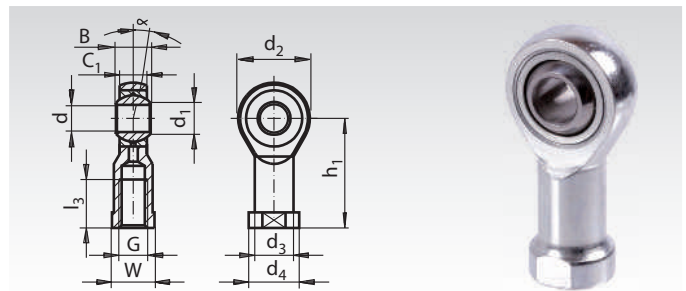
For high, radial and axial alternating loads.

Sliding speeds up to 10 m/min.

Load tables pages 459 - 460.

IR = Internal Right-hand thread. IL = Internal Left-hand thread.

Ordering Details: e.g.: Product No. 632 604 00, Rod End GT, IR



Product No. IR	Product No. IL	dH7 mm	B-0.1 mm	C1±0.2 mm	d1 mm	d2 mm	d3 mm	d4 mm	h1 mm	l3-1.0 mm	Thread ISO DIN 13 6H G mm	W mm	Tilting angle α °	Weight g
632 604 00	632 704 00	4	7	5,25	6,5	14	7,8	9,5	24	12	M4	8	14	11
632 605 00	632 705 00	5	8	6	7,7	18	9	11	27	10	M5	9	13	18
632 606 00	632 706 00	6	9	6,75	8,9	20	10	13	30	12	M6	11	13	27
632 608 00	632 708 00	8	12	9	10,4	24	12,5	16	36	16	M8	13	14	46
632 610 00	632 710 00	10	14	10,5	12,9	28	15	19	43	20	M10	17	13	76
632 612 00	632 712 00	12	16	12	15,4	32	17,5	22	50	22	M12	19	13	115
632 614 00	632 714 00	14	19	13,5	16,8	36	20	25	57	25	M14	22	16	170
632 616 00	632 716 00	16	21	15	19,3	42	22	27	64	28	M16	22	15	230
632 618 00	632 718 00	18	23	16,5	21,8	46	25	31	71	32	M18x1,5	27	15	320
632 620 00	632 720 00	20	25	18	24,3	50	27,5	34	77	33	M20x1,5	32	14	415
632 622 00	632 722 00	22	28	20	25,8	54	30	37	84	37	M22x1,5	32	15	540
632 625 00	632 725 00	25	31	22	29,6	60	33,5	42	94	42	M24x2	36	15	750
632 630 00	632 730 00	30	37	25	34,8	70	40	51	110	51	M30x2	41	17	1130
632 635 00	632 735 00	35	43	28	37,7	80	46	58	125	56	M36x2	50	19	1600
632 640 00	632 740 00	40	49	35	44,2	90	57	69	142	60	M42x2	60	16	2770

Heavy-Duty Rod Ends GT DIN 12240-4 (DIN 648) Series K, Maintenance Free, External Thread

Material internal ring: Roller bearing steel 100Cr6, hardened HRC 62 ±1, ground and polished.

Material outer part: Bores 6-12 mm, free cutting steel, turned, bores 14-30 mm C22 forged, zinc-plated.

Material bearing race: Free cutting steel with PTFE-lining.

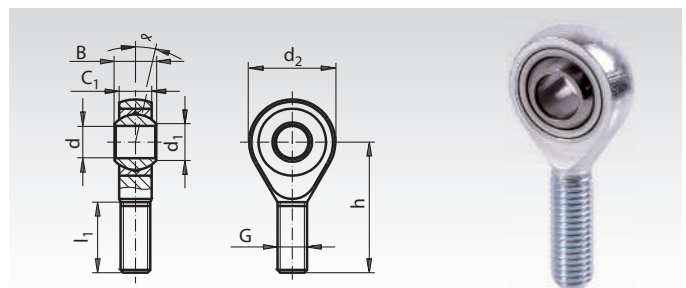
For high, radial and axial alternating loads.

Sliding speeds up to 10 m/min.

Load tables pages 459 - 460.

AR = External Right-hand thread. AL = External Left-hand thread.

Ordering Details: e.g.: Product No. 632 804 00, Rod End GT, AR



Product No. AR	Product No. AL	dH7 mm	B-0.1 mm	C1±0.2 mm	d1 mm	d2 mm	h mm	l1-1.0 mm	Thread ISO DIN 13 6H G mm	Tilting angle α °	Weight g
632 804 00	632 904 00	4	7	5,25	6,5	14	30	19	M4	14	9
632 805 00	632 905 00	5	8	6	7,7	18	33	20	M5	13	13
632 806 00	632 906 00	6	9	6,75	8,9	20	36	22	M6	13	20
632 808 00	632 908 00	8	12	9	10,4	24	42	25	M8	14	33
632 810 00	632 910 00	10	14	10,5	12,9	28	48	29	M10	13	56
632 812 00	632 912 00	12	16	12	15,4	32	54	33	M12	13	87
632 814 00	632 914 00	14	19	13,5	16,8	36	60	38	M14	16	129
632 816 00	632 916 00	16	21	15	19,3	42	66	40	M16	15	189
632 818 00	632 918 00	18	23	16,5	21,8	46	72	44	M18x1,5	15	267
632 820 00	632 920 00	20	25	18	24,3	50	78	47	M20x1,5	14	348
632 822 00	632 922 00	22	28	20	25,8	54	84	51	M22x1,5	15	443
632 825 00	632 925 00	25	31	22	29,6	60	94	57	M24x2	15	600
632 830 00	632 930 00	30	37	25	34,8	70	110	71	M30x2	17	1030
632 835 00	632 935 00	35	43	28	37,7	80	125	73	M36x2	19	1600
632 840 00	632 940 00	40	49	35	44,2	90	142	78	M42x2	16	2570

Heavy-Duty Rod Ends GT-R DIN 12240-4 (DIN 648) Series K, Maintenance Free, Stainless Steel, Internal Thread

Material:

Rod End: Stainless steel 1.4057.
(forged piece)



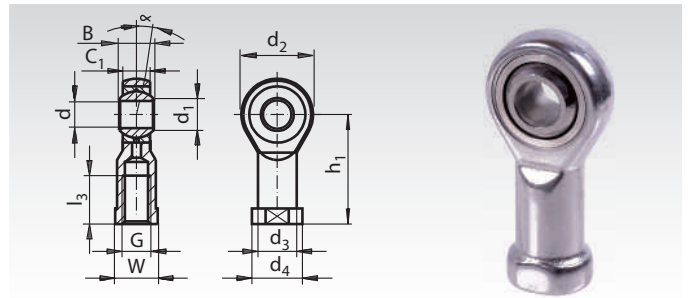
Thread rolled, surface clear stained.

Ball: Stainless steel 1.4034, hardened, all sides ground, bearing surface super finish.

Bearing Shell: Stainless steel 1.4571 with PTFE-lining.

Tolerances and load tables page 459 - 460.

IR = Internal Right-hand thread. IL = Internal Left-hand thread.



Ordering Details: e.g.: Product No. 632 996 05, Rod End GT-R, IR Stainless

Product No. IR	Product No. IL	d ^{H7} mm	B-0.1 mm	C ₁ ±0.2 mm	d ₁ mm	d ₂ mm	d ₃ mm	d ₄ mm	h ₁ mm	l ₃ -1.0 mm	Thread ISO DIN 13 6H G mm	W mm	Tilting angle α °	Weight g
632 996 05	632 997 05	5	8	6	7,7	18	9	11	27	10	M5	9	13	18
632 996 06	632 997 06	6	9	6,75	8,9	20	10	13	30	12	M6	11	13	27
632 996 08	632 997 08	8	12	9	10,4	24	12,5	16	36	16	M8	13	14	46
632 996 10	632 997 10	10	14	10,5	12,9	28	15	19	43	20	M10	17	13	76
632 996 12	632 997 12	12	16	12	15,4	32	17,5	22	50	22	M12	19	13	115
632 996 14	632 997 14	14	19	13,5	16,8	36	20	25	57	25	M14	22	16	170
632 996 16	632 997 16	16	21	15	19,3	42	22	27	64	28	M16	22	15	230
632 996 18	632 997 18	18	23	16,5	21,8	46	25	31	71	32	M18x1,5	27	15	320
632 996 20	632 997 20	20	25	18	24,3	50	27,5	34	77	33	M20x1,5	32	14	415
632 996 22	632 997 22	22	28	20	25,8	54	30	37	84	37	M22x1,5	32	15	540
632 996 25	632 997 25	25	31	22	29,6	60	33,5	42	94	42	M24x2	36	15	750
632 996 30	632 997 30	30	37	25	34,8	70	40	50	110	51	M30x2	41	17	1130
632 996 35	632 997 35	35	43	28	37,7	80	46	58	125	56	M36x2	50	19	1600
632 996 40	632 997 40	40	49	35	44,2	90	57	69	142	60	M42x2	60	16	2770

Heavy-Duty Rod Ends GT-R DIN 12240-4 (DIN 648) Series K, Maintenance Free, Stainless Steel, External Thread

Material:

Rod End: Stainless steel 1.4057.
(forged piece)



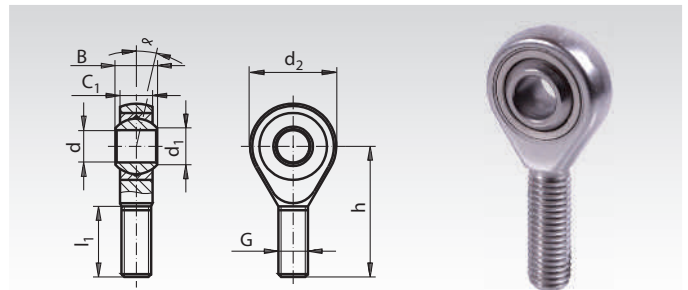
Thread rolled, surface clear stained.

Ball: Stainless steel 1.4034, hardened, all sides ground, bearing surface super finish.

Bearing Shell: Stainless steel 1.4571 with PTFE-lining.

Tolerances and load tables page 459 - 460.

AR = External Right-hand thread. AL = External Left-hand thread.



Ordering Details: e.g.: Product No. 632 998 05, Rod End GT-R, AR Stainless

Product No. AR	Product No. AL	d ^{H7} mm	B-0.1 mm	C ₁ ±0.2 mm	d ₁ mm	d ₂ mm	h mm	l ₁ -1.0 mm	Thread ISO DIN 13 6H G mm	Tilting angle α °	Weight g
632 998 05	632 999 05	5	8	6	7,7	18	33	20	M5	13	13
632 998 06	632 999 06	6	9	6,75	8,9	20	36	22	M6	13	20
632 998 08	632 999 08	8	12	9	10,4	24	42	25	M8	14	33
632 998 10	632 999 10	10	14	10,5	12,9	28	48	29	M10	13	56
632 998 12	632 999 12	12	16	12	15,4	32	54	33	M12	13	87
632 998 14	632 999 14	14	19	13,5	16,8	36	60	38	M14	16	129
632 998 16	632 999 16	16	21	15	19,3	42	66	40	M16	15	189
632 998 18	632 999 18	18	23	16,5	21,8	46	72	44	M18x1,5	15	267
632 998 20	632 999 20	20	25	18	24,3	50	78	47	M20x1,5	14	348
632 998 22	632 999 22	22	28	20	25,8	54	84	51	M22x1,5	15	443
632 998 25	632 999 25	25	31	22	29,6	60	94	57	M24x2	15	600
632 998 30	632 999 30	30	37	25	34,8	70	110	71	M30x2	17	1030
632 998 35	632 999 35	35	43	28	37,7	80	125	73	M36x2	19	1600
632 998 40	632 999 40	40	49	35	44,2	90	142	78	M42x2	16	2570

Threaded bars with metric thread and fine thread page 510.

Loctite thread locking and bonding products page 811.

Rod Ends GEW DIN 12240-4 (DIN 648) Series E, Maintenance Free, Internal Thread

Material:

Housing: up to size 10 free cutting steel 9SMnPb28K, turned,
from size 12 heat-treated steel C45, forged.

Bearing: maintenance-free steel/PTFE bearing.

Tribological pairing: hard chrome - steel/PTFE

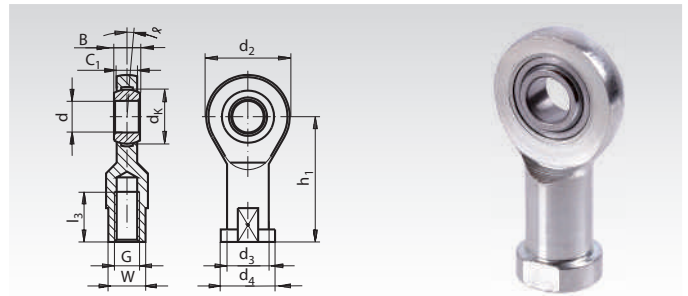
Tolerances and load tables page 459 - 460.

Application: For pivoting motions (alternating load).

Not for higher speeds.

IR = Internal Right-hand thread. IL = Internal Left-hand thread.

Ordering Details: e.g.: Product No. 634 106 00, Rod End GEW, IR



Product No. IR	Product No. IL	d mm	B mm	C ₁ mm	d ₂ mm	d ₃ mm	d ₄ mm	d _K mm	h ₁ mm	l ₃ mm	Thread ISO DIN 13 6H G mm	W mm	Tilting angle α °	Weight g
634 106 00	634 306 00	6	6	4,4	20	10	13	10	30	12	M6	11	13	21
634 108 00	634 308 00	8	8	6	24	12,5	16	13	36	16	M8	14	15	38
634 110 00	634 310 00	10	9	7	28	15	19	16	43	20	M10	17	12	60
634 112 00	634 312 00	12	10	8	34	17,5	22	18	50	22	M12	19	11	96
634 115 00	634 315 00	15	12	10	40	21	26	22	61	29	M14	22	8	180
634 116 00	634 316 00	16	14	11	46	24	30	25	67	33	M16	27	10	220
634 117 00	634 317 00	17	14	11	46	24	30	25	67	33	M16	27	10	220
634 120 00	634 320 00	20	16	13	53	27,5	35	29	77	38	M20x1,5	32	9	350
634 125 00	634 325 00	25	20	17	64	33,5	42	35,5	94	48	M24x2	36	7	640
634 130 00	634 330 00	30	22	19	73	40	50	40,7	110	56	M30x2	41	6	930
634 135 00	634 335 00	35	25	21	82	47	58	47	125	60	M36x3	50	6	1300
634 140 00	634 340 00	40	28	23	92	52	65	53	142	65	M39x3	55	7	2000
634 145 00	634 345 00	45	32	27	102	58	70	60	145	65	M42x3	60	7	2500
634 150 00	634 350 00	50	35	30	112	62	75	66	160	68	M45x3	65	6	3500
634 160 00	634 360 00	60	44	38	135	70	88	80	175	70	M52x3	75	6	5550
634 170 00	634 370 00	70	49	42	160	80	98	92	200	80	M56x4	85	6	8600
634 180 00	634 380 00	80	55	47	180	95	110	105	235	85	M64x4	100	6	12000

Rod Ends GAW DIN 12240-4 (DIN 648) Series E, Maintenance Free, External Thread

Material:

Housing: up to size 10 Free cutting steel 9SMnPb28K, turned,
from size 12 heat-treated steel C45, forged.

Bearing: maintenance-free steel/PTFE bearing.

Tribological pairing: hard chrome - steel/PTFE.

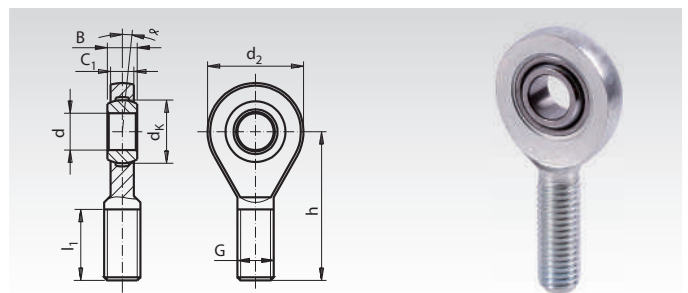
Tolerances and load tables page 459 - 460.

Application: For pivoting motions (alternating load).

Not for higher speeds.

AR = External Right-hand thread. AL = External Left-hand thread.

Ordering Details: e.g.: Product No. 634 606 00, Rod End GAW, ER



Product No. AR	Product No. AL	d mm	B mm	C ₁ mm	d ₂ mm	d _K mm	h mm	l ₁ mm	Thread ISO DIN 13 6H G mm	Tilting angle α °	Weight g
634 606 00	634 806 00	6	6	4,4	20	10	36	18	M6	13	16
634 608 00	634 808 00	8	8	6	24	13	42	22	M8	15	28
634 610 00	634 810 00	10	9	7	28	16	48	26	M10	12	50
634 612 00	634 812 00	12	10	8	34	18	54	28	M12	11	86
634 615 00	634 815 00	15	12	10	40	22	63	34	M14	8	140
634 616 00	634 816 00	16	14	11	46	25	69	36	M16	10	190
634 617 00	634 817 00	17	14	11	46	25	69	36	M16	10	190
634 620 00	634 820 00	20	16	13	53	29	78	43	M20x1,5	9	320
634 625 00	634 825 00	25	20	17	64	35,5	94	53	M24x2	7	560
634 630 00	634 830 00	30	22	19	73	40,7	110	65	M30x2	6	890
634 635 00	634 835 00	35	25	21	82	47	140	82	M36x3	6	1400
634 640 00	634 840 00	40	28	23	92	53	150	86	M39x3	7	1800
634 645 00	634 845 00	45	32	27	102	60	163	94	M42x3	7	2610
634 650 00	634 850 00	50	35	30	112	66	185	107	M45x3	6	3450
634 660 00	634 860 00	60	44	38	135	80	210	115	M52x3	6	5900
634 670 00	634 870 00	70	49	42	160	92	235	125	M56x4	6	8200
634 680 00	634 880 00	80	55	47	180	105	270	140	M64x4	6	12000

Threaded bars with metric thread and fine thread page 510.

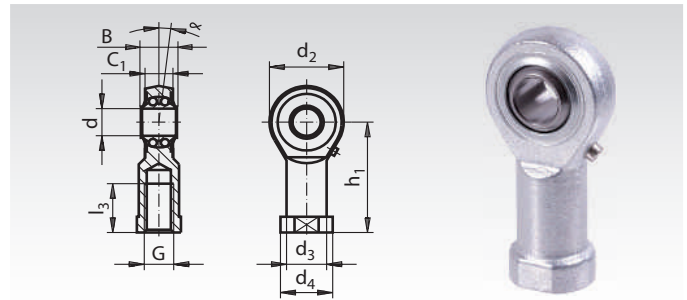
Loctite thread locking and bonding products page 811.

Heavy-Duty Rod Ends BR with Spherical Bearing DIN 12240-4 (DIN 648) Series K, Internal Thread

Material rod end: Alloyed, case-hardened steel (forged piece) quenched and tempered, bearing race hardened, ground and lapped. Thread rolled/cut, surface zinc-plated and chromatised.
Material inner ring: Bearing steel hardened, precisely honed.
Lubricant: Calcium-complex grease (-20°C to +120°C).
 If required special lubricants.

Rod end with low friction ball bearing, long-term lubricated, sealed with cover plates, with high load rating.

IR = Internal Right-hand thread. IL = Internal Left-hand thread.



Ordering Details: e.g.: Product No. 632 406 00, Rod End BR, IR

Product No. IR	Product No. IL	dH7 mm	B-0,1 mm	C1 mm	d2 mm	d3 mm	d4 mm	h1 mm	l3 mm	G mm	α °	Load Rating [kN]		Calculation Factors*		Speed n _{max} min ⁻¹	Weight g
												dynam. C	static C ₀	Y	Y ₀		
632 406 00	632 456 00	6	9	6,75	20	10	13	30	12	M6	8	2,8	0,65	2,09	2,19	1350	23
632 408 00	632 458 00	8	12	9	24	12,5	16	36	16	M8	8,5	4,0	1,0	1,8	1,89	1300	41
632 410 00	632 460 00	10	14	10,5	28	15	19	43	20	M10	8	4,5	1,5	1,9	1,81	1225	66
632 412 00	632 462 00	12	16	12	32	17,5	22	50	22	M12	7,5	5,0	1,8	1,74	1,82	1125	100
632 414 00	632 464 00	14	19	13,5	36	20	25	57	25	M14	6	5,6	2,0	2,36	2,48	1025	150
632 416 00	632 466 00	16	21	15	42	22	27	64	28	M16	8	6,3	2,4	2,24	2,35	975	199
632 418 00	632 468 00	18	23	16,5	46	25	31	71	32	M18x1,5	8,5	7,1	2,9	2,21	2,31	900	278
632 420 00	632 470 00	20	25	18	50	27,5	34	77	33	M20x1,5	7	7,9	3,5	2,46	2,58	825	352
632 422 00	632 472 00	22	28	20	54	30	38	84	37	M22x1,5	8	9,3	4,0	2,35	2,24	725	470
632 425 00	632 475 00	25	31	22	64	30	35	94	42	M24x2	5	11,0	5,7	2,02	2,12	600	583
632 430 00	632 480 00	30	37	25	70	40	50	110	51	M30x2	7,5	14,2	7,5	2,24	2,35	450	925

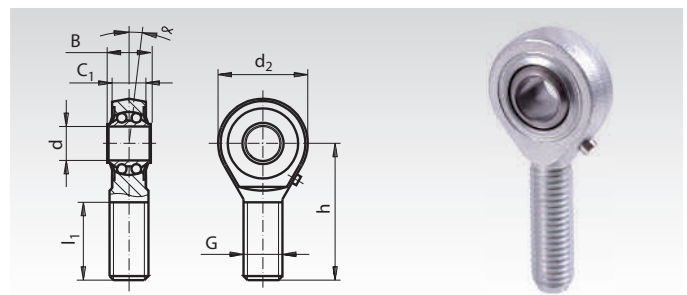
* Calculation see page 468.

Heavy-Duty Rod Ends BR with Spherical Bearing DIN 12240-4 (DIN 648) Series K, External Thread

Material rod end: Alloyed, case-hardened steel (forged piece) quenched and tempered, bearing race hardened, ground and lapped. Thread rolled/cut, surface zinc-plated and chromatised.
Material inner ring: Bearing steel hardened, precisely honed.
Lubricant: Calcium-complex grease (-20°C to +120°C).
 Special grease if required.

Basically without friction, long-term lubrication, sealed with cover plates, offer small dimensions, large pivoting angle and high load rating.

AR = External Right-hand thread. AL = External Left-hand thread.



Ordering Details: e.g.: Product No. 632 506 00, Rod End BR, AR

Product No. AR	Product No. AL	dH7 mm	B-0,1 mm	C ₁ mm	d ₂ mm	h mm	l ₁ mm	G mm	α °	Load Rating [kN] dynam. C	Load Rating [kN] static C ₀	Calculation Factors* Y Y ₀	Speed n _{max} min ⁻¹	Weight g	
632 506 00	632 556 00	6	9	6,75	20	36	22	M6	8	2,8	0,65	2,09	2,19	1350	18
632 508 00	632 558 00	8	12	9	24	42	25	M8	8,5	4,0	1,0	1,8	1,89	1300	33
632 510 00	632 560 00	10	14	10,5	28	48	29	M10	8	4,5	1,5	1,9	1,81	1225	57
632 512 00	632 562 00	12	16	12	32	54	33	M12	7,5	5,0	1,8	1,74	1,82	1125	81
632 514 00	632 564 00	14	19	13,5	36	60	36	M14	6	5,6	2,0	2,36	2,48	1025	122
632 516 00	632 566 00	16	21	15	42	66	40	M16	8	6,3	2,4	2,24	2,35	975	166
632 518 00	632 568 00	18	23	16,5	46	72	44	M18x1,5	8,5	7,1	2,9	2,21	2,31	900	241
632 520 00	632 570 00	20	25	18	50	78	47	M20x1,5	7	7,9	3,5	2,46	2,58	825	303
632 522 00	632 572 00	22	28	20	54	84	51	M22x1,5	8	9,3	4,0	2,35	2,24	725	391
632 525 00	632 575 00	25	31	22	64	94	57	M24x2	5	11,0	5,7	2,02	2,12	600	598
632 530 00	632 580 00	30	37	25	70	110	66	M30x2	7,5	14,2	7,5	2,24	2,35	450	825

* Calculation see page 468.

Threaded bars with metric thread and fine thread page 510.
 Loctite thread locking and bonding products page 811.

Heavy-Duty Rod Ends BR-R with Spherical Bearing DIN 12240-4 Series K, Stainless Steel, Internal Thread

Material rod end: Stainless steel, forged, hardened.
Bearing race superfinished.

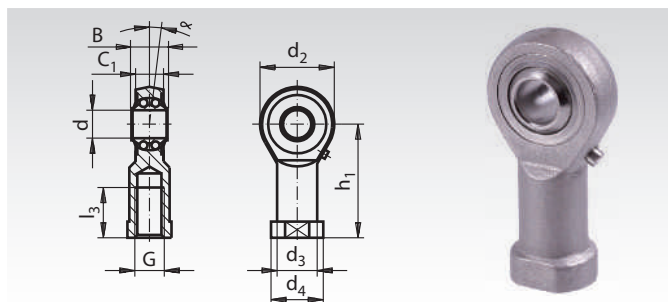


Material inner ring and rollers: Stainless steel, hardened, superfinished.

Lubricant: Aluminium-complex-soap-grease, approval according to USDA H1, -45°C to +120°C. If required special lubricants.

Basically without friction, long-term lubrication, sealed with cover plates, offer small dimensions, large pivoting angle and high load rating.

IR = Internal Right-hand thread. **IL** = Internal Left-hand thread.



Ordering Details: e.g.: Product No. 632 994 06, Rod End BR-R, IR

Product No. IR	Product No. IL	d ^{H7} mm	B-0,1 mm	C ₁ mm	d ₂ mm	d ₃ mm	d ₄ mm	h ₁ mm	l ₃ mm	G mm	α °	Load Rating [kN] dynam. C	Load Rating [kN] static C ₀	Calculation Factors* Y Y ₀	Speed n _{max} min ⁻¹	Weight g
632 994 06	632 994 56	6	9	6,75	20	10	13	30	12	M6	8	1,9	0,5	2,09 2,19	1350	24
632 994 08	632 994 58	8	12	9	24	12,5	16	36	16	M8	8,5	2,8	0,7	1,8 1,89	1300	44
632 994 10	632 994 60	10	14	10,5	28	15	19	43	20	M10	8	3,1	1,0	1,9 1,81	1225	72
632 994 12	632 994 62	12	16	12	32	17,5	22	50	22	M12	7,5	3,5	1,3	1,74 1,82	1125	107
632 994 16	632 994 66	16	21	15	42	22	27	64	28	M16	8	4,3	1,6	2,24 2,35	975	224
632 994 20	632 994 70	20	25	18	50	27,5	34	77	33	M20x1,5	7	5,4	2,3	2,46 2,58	825	367

* Calculation see page 468.

Heavy-Duty Rod Ends BR with Spherical Bearing DIN 12240-4 Series K, Stainless Steel, External Thread

Material rod end: Stainless steel, forged, hardened.
Bearing race superfinished, thread rolled.

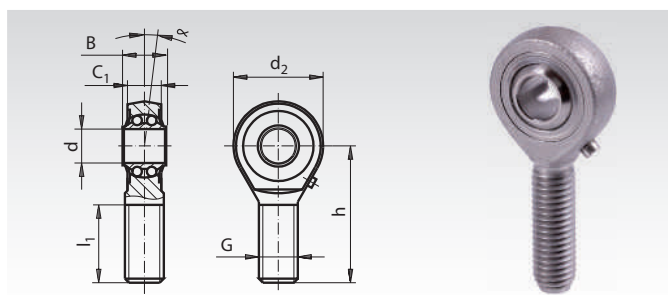


Material inner ring and rollers: Stainless steel, hardened, superfinished

Lubricant: Aluminium-complex-soap-grease, approval according to USDA H1, -45°C to +120°C. If required special lubricants.

Basically without friction, long-term lubrication, sealed with cover plates, offer small dimensions, large pivoting angle and high load rating.

AR = External Right-hand thread. **AL** = External Left-hand thread.



Ordering Details: e.g.: Product No. 632 995 06, Rod End BR-R, AR

Product No. AR	Product No. AL	d ^{H7} mm	B ^{-0,1} mm	C ₁ mm	d ₂ mm	h mm	l ₁ mm	G mm	α °	Load Rating [kN] dynam. C	Load Rating [kN] static C ₀	Calculation Factors* Y Y ₀	Speed n _{max} min ⁻¹	Weight g	
632 995 06	632 995 56	6	9	6,75	20	36	22	M6	8	1,9	0,5	2,09	2,19	1350	19
632 995 08	632 995 58	8	12	9	24	42	25	M8	8,5	2,8	0,7	1,8	1,89	1300	36
632 995 10	632 995 60	10	14	10,5	28	48	29	M10	8	3,1	1,0	1,9	1,81	1225	60
632 995 12	632 995 62	12	16	12	32	54	33	M12	7,5	3,5	1,3	1,74	1,82	1125	87
632 995 16	632 995 66	16	21	15	42	66	40	M16	8	4,3	1,6	2,24	2,35	975	190
632 995 20	632 995 70	20	25	18	50	78	47	M20x1,5	7	5,4	2,3	2,46	2,58	825	338

* Calculation see page 468.

Threaded bars with metric thread and Fine thread page 510.
Loctite thread locking and bonding products page 811.

Heavy-Duty Rod Ends PF with Integral Spherical Bearing

Material rod end: Alloyed, case-hardened steel (forged) quenched and tempered, bearing race hardened, ground and lapped. Thread rolled/cut, surface zinc-plated and chromatised.

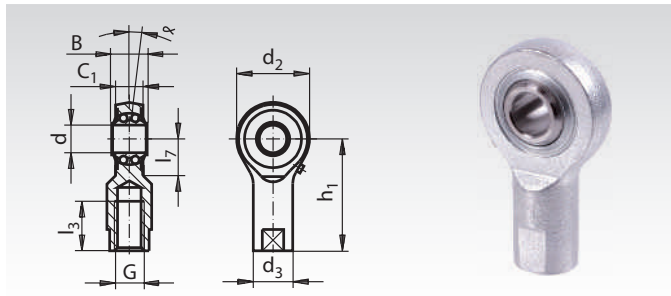
Material inner ring: Bearing steel hardened, precisely turned.

Lubricant: Calcium-complex grease (-20°C to +120°C).
Special grease if required.

Short design with internal thread.

Threaded bars with metric ISO thread and ISO fine thread page 510.

IR = Internal Right-hand thread. IL = Internal Left-hand thread.



Ordering Details: e.g.: Product No. 634 410 00, Rod End PF

Product No. IR	Product No. IL	d ₁ ¹⁾ mm	Bh ¹² mm	C ₁ mm	d ₂ mm	d ₃ mm	h ₁ mm	l ₃ mm	l ₇ mm	G mm	α °	Bearing loads [kN] dynam. C	static C ₀	Calculation-Factors Y	Y ₀	Speed n _{max.}	Weight g
634 410 00	634 460 00	10	13	9	30	15	38	17	14,5	M8	7	2,6	1,0	1,90	1,81	1225	63
634 415 00	634 465 00	15	16,5	12	40	19	51	24	20	M12	7	5,0	1,9	2,30	2,41	1025	143
634 420 00	634 470 00	20	20,5	15	48	22	65	32	22	M16	6,5	6,1	3,0	2,34	2,45	850	223

¹⁾ Tolerance DIN 620.

* in min⁻¹

Inner Rings - Tolerances DIN 620

Nominal dimension range of the bore d ₁ mm		Tolerance in μm	
above	up to	min.	max.
0,6	2,5	-8	+1
2,5	10	-8	+1
10	18	-8	+1
18	30	-9	+1
30	50	-11	+1

Rough Calculation for Rod Ends/Ball Bearing Type

β = half the pivoting angle in °
C = dynamic load rating in N
C₀ = static load rating in N
F_a = axial load in N (F_a ≤ 0.2 F_r)
F_r = radial load in N
n = speed or pivoting frequency in min⁻¹
P = dynamic equivalent radial load in N
(for self-aligning ball bearing P = F_r + Y · F_a)
(for self-aligning roller bearing P = F_r + 9.5 · F_a)
P₀ = Static equivalent radial load in N
(for self-aligning ball bearing P₀ = F_r + Y₀ · F_a)
(for self-aligning roller bearing P₀ = F_r + 5 · F_a)
Y = axial factor, dynamic
Y₀ = axial factor, static

Nominal Service Life L_n (n)

Rotating:

$$L_{hrot} = 10^6 \frac{\left(\frac{C}{P}\right)^z}{60 \cdot n} [h]$$

Oscillating:

$$L_{hosz.} = 10^6 \frac{\left(\frac{C}{P \sqrt[3]{\frac{\beta}{90}}}\right)^z}{60 \cdot n} [h]$$

z = 3 for self-aligning ball bearing
z = 3.33 for self-aligning roller bearing

Conditions:

Pivoting angle β ≥ 3°

For pivoting angle β < 3° we recommend the use of rod ends with slide bearings.

Static load

stationary:

$$P_0 \leq C_0 [N]$$

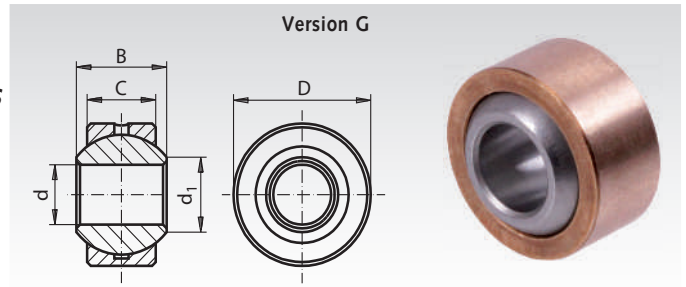
Spherical Bearings Series K, Steel or Stainless Steel, re-lubricateable

Material standard: Inner ring bearing steel 100Cr6, hardened, ground and polished. Bearing shell special bronze CuSn8.

Material stainless: Inner ring stainless steel 1.4034, hardened, ground and polished. Bearing shell special bronze CuSn8.



- DIN 12240-1 (DIN 648), series K (wide shape).
- Re-lubricateable (from size 6 with lubrication hole).
- Initial lubrication before use is required.
- Suitable for higher speeds.
- Without additional outer ring.



Ordering Details: e.g.: Product No. 633 205 00, Spherical Bearing, Series K, Steel, re-lubricateable, 5mm

Product No. Standard	Product No. Stainless	d ^{H7} mm	B-0,1 mm	C-0,1 mm	D-0,012 mm	d ₁ mm	α °	Load Rating [kN] dynam. C	static C ₀	Speed n _{max} min ⁻¹	Weight g
633 205 00*	633 992 05	5	8	6	13	7,7	13	3,3	19,8	-	5
633 206 00	633 992 06	6	9	6,75	16	8,9	13	4,3	25,8	1500	9
633 208 00	633 992 08	8	12	9	19	10,4	14	7,1	42,6	1200	16
633 210 00	633 992 10	10	14	10,5	22	12,9	13	10	60	1000	25
633 212 00	633 992 12	12	16	12	26	15,4	13	13,5	80	860	40
633 214 00	633 992 14	14	19	13,5	28	16,8	16	17	103	750	51
633 216 00	633 992 16	16	21	15	32	19,3	15	21,5	129	660	76
633 218 00	633 992 18	18	23	16,5	35	21,8	15	26	157	600	97
633 220 00	633 992 20	20	25	18	40	24,3	14	31,5	189	540	141
633 222 00	633 992 22	22	28	20	42	25,8	15	38	229	500	168
633 225 00	633 992 25	25	31	22	47	29,6	15	47	293	440	231
633 230 00	633 992 30	30	37	25	55	34,8	17	64	416	370	362
633 235 00	633 992 35	35	43	28	62	37,7	19	80	480	330	502
633 240 00	633 992 40	40	49	35	72	44,2	16	116	693	290	832

* Without lubrication bore.

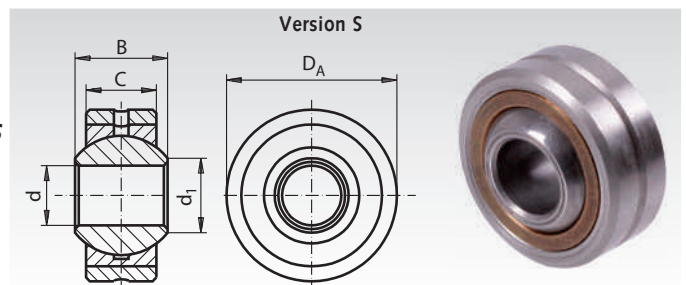
Spherical Bearings Series K, Steel or Stainless Steel, re-lubricateable, with Outer Ring

Material standard: Inner ring bearing steel 100Cr6, hardened, ground and polished. Bearing shell special bronze CuSn8. Outer ring steel 9SMnPb28K, zinc plated.

Material stainless: Inner ring stainless steel 1.4034, hardened, ground and polished. Bearing shell special bronze CuSn8. Outer ring stainless steel 1.4305.



- DIN 12240-1 (DIN 648), series K (wide shape).
- Re-lubricateable, initial lubrication before use is required.
- Suitable for higher speeds.
- With additional outer ring.



Ordering Details: e.g.: Product No. 633 005 00, Spherical Bearing, Series K, Steel, re-lubricateable, with Outer Ring, 5mm

Product No. Standard	Product No. Stainless	d ^{H7} mm	B-0,1 mm	C-0,1 mm	D _A -0,012 mm	d ₁ mm	α °	Load Rating [kN] dynam. C	static C ₀	Speed n _{max} min ⁻¹	Weight g
633 005 00	633 990 05	5	8	6	16	7,7	13	3,3	19,8	1200	8
633 006 00	633 990 06	6	9	6,75	18	8,9	13	4,3	25,8	1500	12
633 008 00	633 990 08	8	12	9	22	10,4	14	7,1	42,6	1200	23
633 010 00	633 990 10	10	14	10,5	26	12,9	13	10	60	1000	38
633 012 00	633 990 12	12	16	12	30	15,4	13	13,5	80	860	58
633 014 00	633 990 14	14	19	13,5	34	16,8	16	17	103	750	83
633 016 00	633 990 16	16	21	15	38	19,3	15	21,5	129	660	115
633 018 00	633 990 18	18	23	16,5	42	21,8	15	26	157	600	150
633 020 00	633 990 20	20	25	18	46	24,3	14	31,5	189	540	200
633 022 00	633 990 22	22	28	20	50	25,8	15	38	229	500	270
633 025 00	633 990 25	25	31	22	56	29,6	15	47	293	440	375
633 030 00	633 990 30	30	37	25	66	34,8	17	64	416	370	540
633 035 00	633 990 35	35	43	28	78	37,7	19	80	480	330	850
633 040 00	633 990 40	40	49	35	87	44,2	16	116	693	290	1400

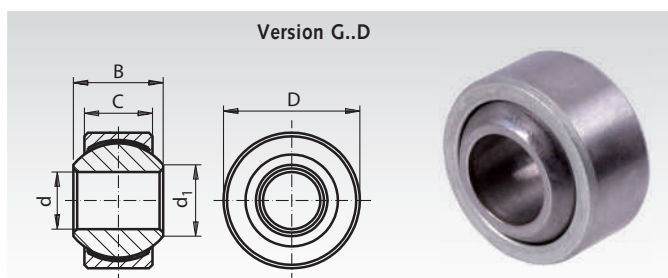
Spherical Bearings Series K, Steel or Stainless Steel, maintenance-free

Material standard: Inner ring bearing steel 100Cr6, hardened, ground and polished. Bearing shell steel 9SMnPb28K, zinc plated, with PTFE-lining.

Material stainless: Inner ring stainless steel 1.4034, hardened, ground and polished. Bearing shell stainless steel 1.4571, with PTFE-lining.



- DIN 12240-1 (DIN 648), series K (wide shape).
- Maintenance-free.
- Suitable for high dynamic loads.
- Without additional outer ring.



Ordering Details: e.g.: Product No. 633 305 00, Spherical Bearing, Series K, Steel, maintenance-free, 5mm

Product No. Standard	Product No. Stainless	d ^{H7} mm	B ^{-0,1} mm	C ^{-0,1} mm	D ^{-0,012} mm	d ₁ mm	α °	Load Rating [kN]		Speed n _{max} min ⁻¹	Weight g
								dynam. C	static C ₀		
633 305 00	633 993 05	5	8	6	13	7,7	13	7,5	12,5	600	6
633 306 00	633 993 06	6	9	6,75	16	8,9	13	9,3	15,5	530	9
633 308 00	633 993 08	8	12	9	19	10,4	14	16,7	27,8	420	17
633 310 00	633 993 10	10	14	10,5	22	12,9	13	23,4	39	350	26
633 312 00	633 993 12	12	16	12	26	15,4	13	32	53,5	300	41
633 314 00	633 993 14	14	19	13,5	28	16,8	16	42	70	260	56
633 316 00	633 993 16	16	21	15	32	19,3	15	52,5	88	230	75
633 318 00	633 993 18	18	23	16,5	35	21,8	15	64	107	210	97
633 320 00	633 993 20	20	25	18	40	24,3	14	78	130	190	142
633 322 00	633 993 22	22	28	20	42	25,8	15	97	162	170	169
633 325 00	633 993 25	25	31	22	47	29,6	15	122	204	150	230
633 330 00	633 993 30	30	37	25	55	34,8	17	168	281	130	369
633 335 00	633 993 35	35	43	28	62	37,7	19	206	343	110	505
633 340 00	633 993 40	40	49	35	72	44,2	16	286	495	100	832

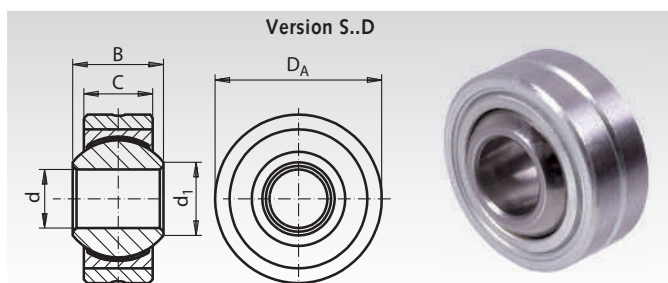
Spherical Bearings Series K, Steel or Stainless Steel, maintenance-free, with Outer Ring

Material standard: Inner ring bearing steel 100Cr6, hardened, ground and polished. Outer ring and bearing shell steel, zinc plated. With PTFE-lining.

Material stainless: Inner ring stainless steel 1.4034, hardened, ground and polished. Bearing shell stainless steel 1.4571 with PTFE-lining. Outer ring stainless steel 1.4305.



- DIN 12240-1 (DIN 648), series K (wide shape).
- Maintenance-free.
- Suitable for high dynamic loads.
- With additional outer ring.



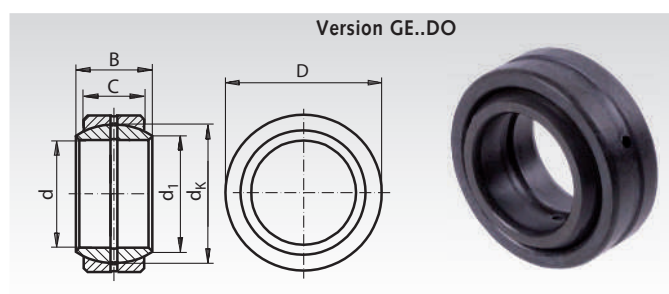
Ordering Details: e.g.: Product No. 633 105 00, Spherical Bearing, Series K, Steel, maintenance-free, with Outer Ring 5mm

Product No. Standard	Product No. Stainless	d ^{H7} mm	B ^{-0,1} mm	C ^{-0,1} mm	D _A ^{-0,012} mm	d ₁ mm	α °	Load Rating [kN]		Speed n _{max} min ⁻¹	Weight g
								dynam. C	static C ₀		
633 105 00	633 991 05	5	8	6	16	7,7	13	7,5	12,5	600	8
633 106 00	633 991 06	6	9	6,75	18	8,9	13	9,3	15,5	530	12
633 108 00	633 991 08	8	12	9	22	10,4	14	16,7	27,8	420	23
633 110 00	633 991 10	10	14	10,5	26	12,9	13	23,4	39	350	38
633 112 00	633 991 12	12	16	12	30	15,4	13	32	53,5	300	58
633 114 00	633 991 14	14	19	13,5	34	16,8	16	42	70	260	83
633 116 00	633 991 16	16	21	15	38	19,3	15	52,5	88	230	115
633 118 00	633 991 18	18	23	16,5	42	21,8	15	64	107	210	150
633 120 00	633 991 20	20	25	18	46	24,3	14	78	130	190	200
633 122 00	633 991 22	22	28	20	50	25,8	15	97	162	170	270
633 125 00	633 991 25	25	31	22	56	29,6	15	122	204	150	375
633 130 00	633 991 30	30	37	25	66	34,8	17	168	281	130	540
633 135 00	633 991 35	35	43	28	78	37,7	19	206	343	110	850
633 140 00	633 991 40	40	49	35	87	44,2	16	286	495	100	1400

Spherical Bearings Series E, Steel, re-lubricateable

Material: Inner ring and bearing shell from bearing steel 100Cr6, hardened, ground and phosphated. Treated with molybdenum disulfide. Bearing shell (outer ring) cut.

- DIN 12240-1 (DIN 648), series E (slim shape).
- Re-lubricateable (from size 15 with lubrication hole).
- Initial lubrication before use is required.
- Suitable for high, alternating loads.
- Sliding speed up to 60 m/min.



Ordering Details: e.g.: Product No. 633 606 00, Spherical Bearing, Series E, re-lubricateable, 6mm

Product No. Standard	d mm	B* mm	C mm	D mm	d ₁ mm	d _k mm	Tilting Angel α °	Weight g
633 606 00**	6 ^{-0,008}	6	4	14 ^{-0,008}	8,0	10	13	4
633 608 00**	8 ^{-0,008}	8	5	16 ^{-0,008}	10,2	13	15	7
633 610 00**	10 ^{-0,008}	9	6	19 ^{-0,009}	13,2	16	12	11
633 612 00**	12 ^{-0,008}	10	7	22 ^{-0,009}	14,9	18	11	17
633 615 00	15 ^{-0,008}	12	9	26 ^{-0,009}	18,4	22	8	26
633 616 00	16 ^{-0,008}	14	10	30 ^{-0,009}	20,7	25	10	40
633 617 00	17 ^{-0,008}	14	10	30 ^{-0,009}	20,7	25	10	40
633 620 00	20 ^{-0,010}	16	12	35 ^{-0,011}	24,1	29	9	64
633 625 00	25 ^{-0,010}	20	16	42 ^{-0,011}	29,3	35,5	7	115
633 630 00	30 ^{-0,010}	22	18	47 ^{-0,011}	34,2	40,7	6	149
633 635 00	35 ^{-0,012}	25	20	5 ^{-0,013}	39,7	47	6	228
633 640 00	40 ^{-0,012}	28	22	62 ^{-0,013}	45,0	53	7	318
633 645 00	45 ^{-0,012}	32	25	68 ^{-0,013}	50,7	60	7	421
633 650 00	50 ^{-0,012}	35	28	75 ^{-0,013}	55,9	66	6	562
633 660 00	60 ^{-0,015}	44	36	90 ^{-0,015}	66,8	80	6	1030
633 670 00	70 ^{-0,015}	49	40	105 ^{-0,015}	77,8	92	6	1570
633 680 00	80 ^{-0,015}	55	45	120 ^{-0,015}	89,4	105	6	2320

* Outer ring tolerance before cutting. ** Up to size 12 without lubrication bore. Technical tables page 459 - 460.

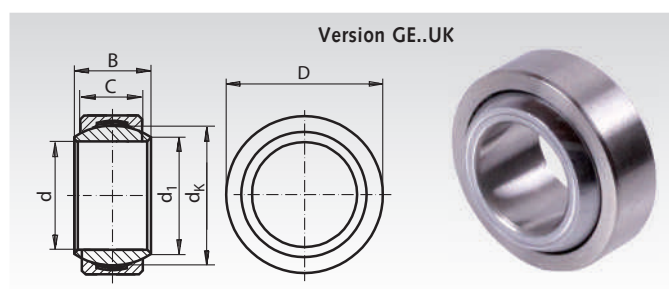
Spherical Bearings Series E, Steel or Stainless Steel, maintenance-free

Material standard: Inner ring bearing steel 100Cr6, hardened, ground, polished and hard chromed. Bearing shell from bearing steel, 100Cr6 with PTFE-lining. From size 35 in 2RS-version (sealed on both sides).

Material stainless: Inner ring stainless steel 1.4125 (from size 45 stainless steel 1.4112), hardened, ground and polished. Bearing shell stainless steel 1.4571, with PTFE-lining.



- DIN 12240-1 (DIN 648), series E (slim shape).
- Maintenance-free.
- Suitable for high unidirectional load.
- Sliding speed up to 10 m/min.



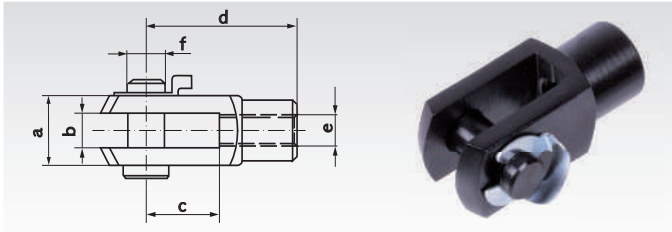
Ordering Details: e.g.: Product No. 633 706 00, Spherical Bearing, Series E, maintenance-free, 6mm

Product No. Standard	Product No. Stainless	d mm	B mm	C mm	D mm	d ₁ mm	d _k mm	Tilting Angel α °	Weight g
633 706 00	633 997 06	6 ^{-0,008}	6	4	14 ^{-0,008}	8,0	10	13	4
633 708 00	633 997 08	8 ^{-0,008}	8	5	16 ^{-0,008}	10,2	13	15	7
633 710 00	633 997 10	10 ^{-0,008}	9	6	19 ^{-0,009}	13,2	16	12	11
633 712 00	633 997 12	12 ^{-0,008}	10	7	22 ^{-0,009}	14,9	18	11	17
633 715 00	633 997 15	15 ^{-0,008}	12	9	26 ^{-0,009}	18,4	22	8	26
633 716 00	633 997 16	16 ^{-0,008}	14	10	30 ^{-0,009}	20,7	25	10	40
633 717 00	633 997 17	17 ^{-0,008}	14	10	30 ^{-0,009}	20,7	25	10	40
633 720 00	633 997 20	20 ^{-0,010}	16	12	35 ^{-0,011}	24,1	29	9	64
633 725 00	633 997 25	25 ^{-0,010}	20	16	42 ^{-0,011}	29,3	35,5	7	115
633 730 00	633 997 30	30 ^{-0,010}	22	18	47 ^{-0,011}	34,2	40,7	6	149
633 735 00*	633 997 35	35 ^{-0,012}	25	20	55 ^{-0,013}	39,8	47	6	228
633 740 00*	633 997 40	40 ^{-0,012}	28	22	62 ^{-0,013}	45,0	53	7	318
633 745 00*	633 997 45	45 ^{-0,012}	32	25	68 ^{-0,013}	50,8	60	7	421
633 750 00*	633 997 50	50 ^{-0,015}	35	28	75 ^{-0,013}	56,0	66	6	532
633 760 00*	633 997 60	60 ^{-0,015}	44	36	90 ^{-0,015}	66,8	80	6	1030
633 770 00*	633 997 70	70 ^{-0,015}	49	40	105 ^{-0,015}	77,9	92	6	1570
633 780 00*	633 997 80	80 ^{-0,015}	55	45	120 ^{-0,015}	89,4	105	6	2320

* From size 35 in 2RS-version (sealed on both sides).

Technical tables page 459 - 460.

Clevis Joints similar DIN 71752, Aluminium, KL

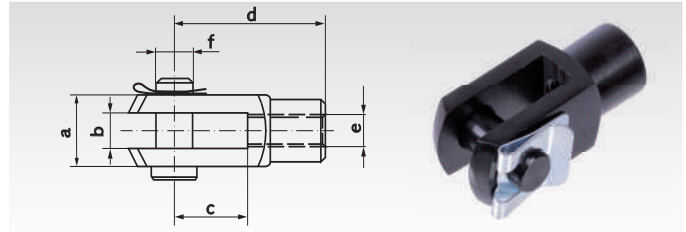


Material: Clevis and bolt aluminium, anodized black.
With KL-Retainer from steel, bright zinc plated.

Ordering Details: e.g.: Product No. 637 660 01, Clevis joint 4 x 8, Aluminium, KL

Product No. KL right	Product No. SL right	Size mm	a mm	b mm	c mm	d mm	e mm	f mm	Weight g
637 660 01	637 664 01	4 x 8	8	4	8	16	M4	4	2,2
637 660 02	637 664 02	4 x 16	8	4	16	24	M4	4	2,9
637 660 03	637 664 03	5 x 10	10	5	10	20	M5	5	4,2
637 660 05	637 664 05	6 x 12	12	6	12	24	M6	6	7,2
637 660 07	637 664 07	8 x 16	16	8	16	32	M8	8	16,8
637 660 09	637 664 09	10 x 20	20	10	20	40	M10	10	33,3
637 660 11	637 664 11	12 x 24	24	12	24	48	M12	12	54,4
637 660 13	637 664 13	14 x 28	27	14	28	56	M14	14	78,1
637 660 15	637 664 15	16 x 32	32	16	32	64	M16	16	121,2

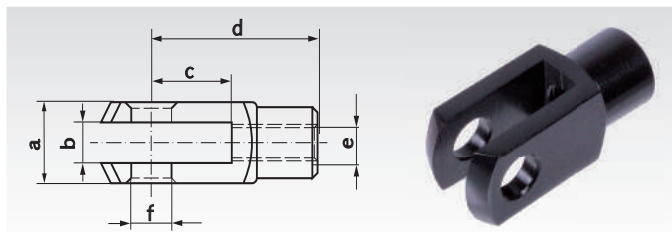
Clevis Joints similar DIN 71752, Aluminium, SL



Material: Clevis and bolt aluminium, anodized black.
With SL-Retainer from steel, bright zinc plated.

Ordering Details: e.g.: Product No. 637 664 01, Clevis joint 4 x 8, Aluminium, SL

Clevises similar DIN 71752, Aluminium

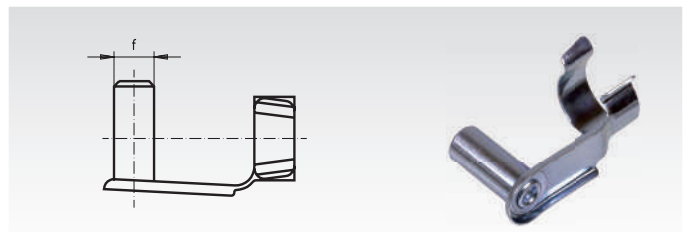


Material: Aluminium, anodized black.
To be used with ES bolt or customer's bolt.

Ordering Details: e.g.: Product No. 637 662 01, Clevis 4 x 8, Aluminium

Product No. Clevis	Product No. ES Bolt	Size mm	a mm	b mm	c mm	d mm	e mm	f mm	Weight Clevis g	Weight Bolt g
637 662 01	637 401 00	4 x 8	8	4	8	16	M4	4	1,7	1,5
637 662 02	637 402 00	4 x 16	8	4	16	24	M4	4	2,4	2,6
637 662 03	637 403 00	5 x 10	10	5	10	20	M5	5	3,1	2,7
637 662 05	637 405 00	6 x 12	12	6	12	24	M6	6	5,2	4,6
637 662 07	637 407 00	8 x 16	16	8	16	32	M8	8	12,7	10,4
637 662 09	637 409 00	10 x 20	20	10	20	40	M10	10	25,4	19
637 662 11	637 411 00	12 x 24	24	12	24	48	M12	12	41,6	33,5
637 662 13	637 413 00	14 x 28	27	14	28	56	M14	14	61,2	45
637 662 15	637 415 00	16 x 32	32	16	32	64	M16	16	96,9	70

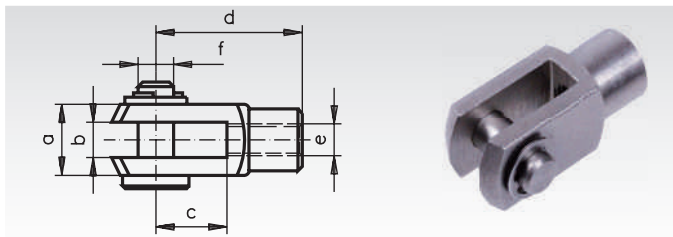
Snap-On-Bolts type ES



Material: Steel, bright zinc plated.
ES bolt and clevis can be used as fork joint.

Ordering Details: e.g.: Product No. 637 401 00, ES Bolt for Clevis 4 x 8

Clevis Joints similar DIN 71752, Stainless

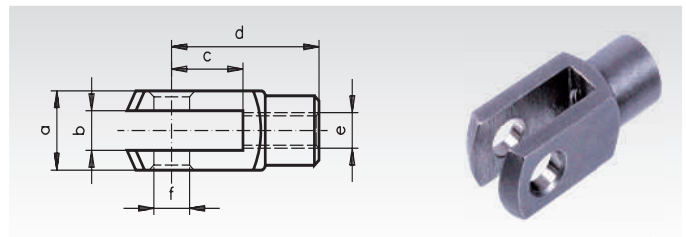


Material: Stainless Steel 1.4305.
Design A: With bolt and circlip.



Ordering Details: e.g.: Product No. 637 990 01, Clevis DIN 71752, A 4 x 8, Right Hand, Stainless

Clevises similar DIN 71752, Stainless



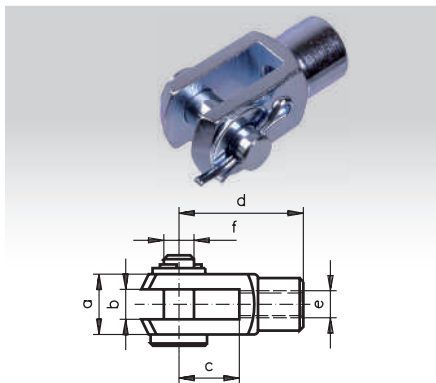
Material: Stainless steel 1.4305.
Design G: Without bolt.



Ordering Details: e.g.: Product No. 637 992 01, Clevis DIN 71752, G 4 x 8, Right Hand, Stainless

Product No. A Right	Product No. G Right	Size mm	a mm	b mm	c mm	d mm	e mm	f mm	Weights	
									A g	G g
637 990 01	637 992 01	4 x 8	8	4	8	16	M4	4	6	5
637 990 02	637 992 02	4 x 16	8	4	16	24	M4	4	8	7
637 990 03	637 992 03	5 x 10	10	5	10	20	M5	5	10	9
637 990 04	637 992 04	5 x 20	10	5	20	30	M5	5	14	13
637 990 05	637 992 05	6 x 12	12	6	12	24	M6	6	16	15
637 990 06	637 992 06	6 x 24	12	6	24	36	M6	6	23	22
637 990 07	637 992 07	8 x 16	16	8	16	32	M8	8	38	37
637 990 08	637 992 08	8 x 32	16	8	32	48	M8	8	55	54
637 990 09	637 992 09	10 x 20	20	10	20	40	M10	10	80	74
637 990 10	637 992 10	10 x 40	20	10	40	60	M10	10	120	116
637 990 11	637 992 11	12 x 24	24	12	24	48	M12	12	125	121
637 990 12	637 992 12	12 x 48	24	12	48	72	M12	12	180	175
637 990 13	637 992 13	14 x 28	27	14	28	56	M14	14	190	178
637 990 14	637 992 14	14 x 56	27	14	56	85	M14	14	265	258
637 990 15	637 992 15	16 x 32	32	16	32	64	M16	16	300	282
637 990 16	637 992 16	16 x 64	32	16	64	96	M16	16	430	410

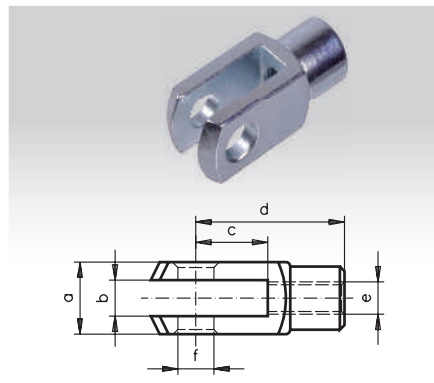
Clevis Joints DIN 71752, Steel



Material: Steel zinc-plated.
Design A: with split pin.

Ordering Details: e.g.: Product No. 637 001 00, Clevis DIN 71752, A 4 x 8 Right Hand

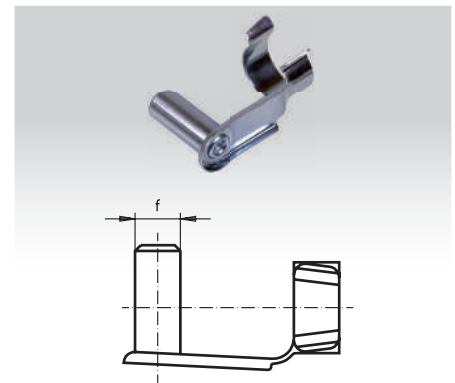
Clevises DIN 71752, Steel



Material: Steel zinc-plated.
Design G: without bolt.

Ordering Details: e.g.: Product No. 637 201 00, Clevis DIN 71752, G 4 x 8 Right Hand

Snap-On-Bolts type ES, Steel



Material: Steel zinc-plated.
ES-Standard 01

Ordering Details: e.g.: Product No. 637 401 00, ES Pin, for G 4 x 8

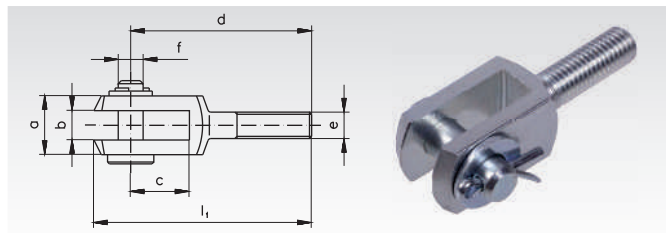
Product No. A Right	Product No. A Left	Product No. G Right	Product No. G Left	Product No. ES Bolt	Size mm	a mm	b mm	c mm	d mm	e mm	f mm	Weights		
												A g	G g	ES g
637 001 00	637 101 00	637 201 00	637 301 00	637 401 00	4 x 8	8	4	8	16	M4	4	6	5	1,5
637 002 00	637 102 00	637 202 00	637 302 00	637 402 00	4 x 16	8	4	16	24	M4	4	8	7	2,6
637 003 00	637 103 00	637 203 00	637 303 00	637 403 00	5 x 10	10	5	10	20	M5	5	10	9	2,7
637 004 00	637 104 00	637 204 00	637 304 00	637 404 00	5 x 20	10	5	20	30	M5	5	14	13	2,9
637 005 00	637 105 00	637 205 00	637 305 00	637 405 00	6 x 12	12	6	12	24	M6	6	16	15	4,6
637 006 00	637 106 00	637 206 00	637 306 00	637 406 00	6 x 24	12	6	24	36	M6	6	23	22	5
637 007 00	637 107 00	637 207 00	637 307 00	637 407 00	8 x 16	16	8	16	32	M8	8	38	37	10,4
637 008 00	637 108 00	637 208 00	637 308 00	637 408 00	8 x 32	16	8	32	48	M8	8	55	54	11,5
637 009 00	637 109 00	637 209 00	637 309 00	637 409 00	10 x 20	20	10	20	40	M10	10	80	74	19
637 010 00	637 110 00	637 210 00	637 310 00	637 410 00	10 x 40	20	10	40	60	M10	10	120	116	20,3
637 011 00	637 111 00	637 211 00	637 311 00	637 411 00	12 x 24	24	12	24	48	M12	12	125	121	33,5
637 012 00	637 112 00	637 212 00	637 312 00	637 412 00	12 x 48	24	12	48	72	M12	12	180	175	34,5
637 013 00	637 113 00	637 213 00	637 313 00	637 413 00	14 x 28	27	14	28	56	M14	14	190	178	45
637 014 00	637 114 00	637 214 00	637 314 00	637 414 00	14 x 56	27	14	56	85	M14	14	265	258	50
637 015 00	637 115 00	637 215 00	637 315 00	637 415 00	16 x 32	32	16	32	64	M16	16	300	282	70
637 016 00	637 116 00	637 216 00	637 316 00	637 416 00	16 x 64	32	16	64	96	M16	16	430	410	80

Clevis with ES-bolt can be used as fork joint.

Clevis Joints DIN 71752, External Thread, Zinc-Plated

Material: 11SMnPb30 zinc-plated.

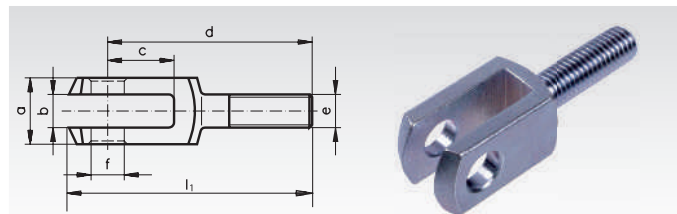
Design A: Right-handed thread, with bolt and split pin.



Ordering Details: e.g.: Product No. 637 705 00, Clevis Joint DIN 71752, A, External Thread

Product No. A Right	Size mm	a mm	b mm	c mm	d mm	e mm	f mm	$l_1 \pm 0,5$ mm	Weight g
637 705 00	6 x 12	12	6	12	37	M6	6	44	16
637 707 00	8 x 16	16	8	16	47	M8	8	57	38
637 709 00	10 x 20	20	10	20	57	M10	10	69	74
637 711 00	12 x 24	24	12	24	68	M12	12	82	126
637 713 00	14 x 28	27	14	28	78	M14	14	94	183
637 715 00	16 x 32	32	16	32	89	M16	16	108	306

Clevises DIN 71752, External Thread, Zinc Plated



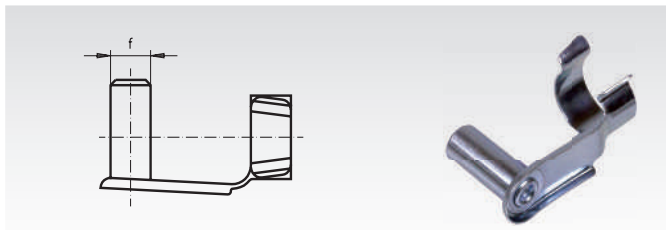
Material: 11SMnPb30 zinc-plated.

Design G: Right-handed thread, without bolt.

Ordering Details: e.g.: Product No. 637 505 00, Clevis DIN 71752, G, External Thread

Product No. Clevis	Product No. ES Bolt	Size mm	a mm	b mm	c mm	d mm	e mm	f mm	$l_1 \pm 0,5$ mm	Weight Clevis g	Weight ES Bolt g
637 505 00	637 405 00	6 x 12	12	6	12	37	M6	6	44	15	14,6
637 507 00	637 407 00	8 x 16	16	8	16	47	M8	8	57	36	10,4
637 509 00	637 409 00	10 x 20	20	10	20	57	M10	10	69	68	19,0
637 511 00	637 411 00	12 x 24	24	12	24	68	M12	12	82	122	33,5
637 513 00	637 413 00	14 x 28	27	14	28	78	M14	14	94	171	45,0
637 515 00	637 415 00	16 x 32	32	16	32	89	M16	16	108	288	70,0

Snap-On-Bolts type ES



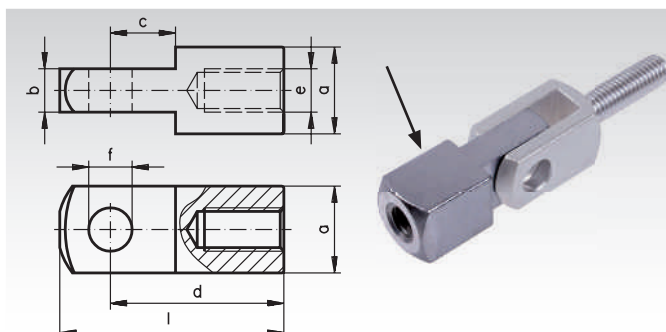
Material: Steel, zinc-plated.

ES bolt and clevis can be used as fork joint.

Ordering Details: e.g.: Product No. 637 405 00, ES Bolt for Clevis 6 x 12

Mating Pieces with Internal Thread for Clevis Joints DIN 71752, Zinc Plated

Material: 11SMnPb30 zinc-plated.



Ordering Details: e.g.: Product No. 637 605 00, Mating piece with Internal Thread, Right-Hand

Product No.	Size mm	a mm	b mm	c mm	d mm	e mm	f mm	$l_1 \pm 0,5$ mm	Weight g
637 605 00	6 x 12	12	6	9	24	M6	6	31	21
637 607 00	8 x 16	16	8	12	32	M8	8	42	51
637 609 00	10 x 20	20	10	15	40	M10	10	52	98
637 611 00	12 x 24	24	12	18	48	M12	12	62	168
637 613 00	14 x 28	27	14	21	56	M14	14	72	247
637 615 00	16 x 32	32	16	24	64	M16	16	83	397

Angle Joints DIN 71802, zinc-plated

Material: Steel zinc-plated.

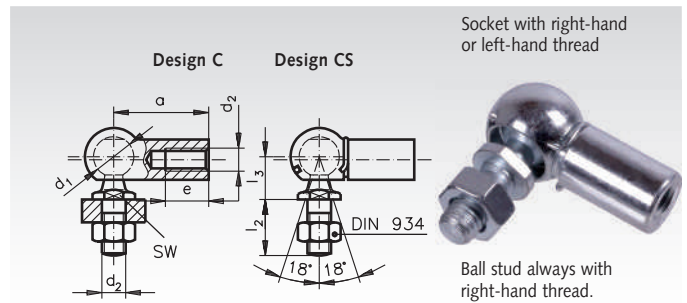
Form C: With threaded bolt and hexagon nut, ball stud hardened.

Form CS: With threaded bolt, hexagon nut and circlip. Ball stud hardened.

Right = Right-hand thread in the socket.

Left = Left-hand thread in the socket.

Ordering Details: e.g.: Product No. 636 405 00, Angle Joint DIN 71802, C 8, Right Hand



Product-No. C Righth	Product-No. CS Right	Product-No. C Left	Product-No. CS Left	d ₁ H ₉ /h ₉ mm	d ₂ mm	SW ^{h14} mm	a ^{+0,3} mm	e mm	l ₃ ±3 mm	l ₂ ±0,3 mm	Pivoting Angle C Degrees	Pivoting Angle CS* Degrees	Weight g
636 405 00	636 605 00	636 505 00	636 705 00	8	M5	7	22	10,2	9	10,2	18°	18°/10°	15,2
636 406 00	636 606 00	636 506 00	636 706 00	10	M6	8	25	11,5	11	12,5	18°	18°/15°	25,2
636 408 00	636 608 00	636 508 00	636 708 00	13	M8	11	30	14	13	16,5	18°	18°/15°	53,1
636 410 00	636 610 00	636 510 00	636 710 00	16	M10	13	35	15,5	16	20	18°	18°/15°	103,8
636 414 00	636 614 00	636 514 00	636 714 00	19	M14x1,5	16	45	21,5	20	28	18°	18°/15°	220,9

* Pivoting angle reduced by circlip.

Angle Joints DIN 71802, Stainless

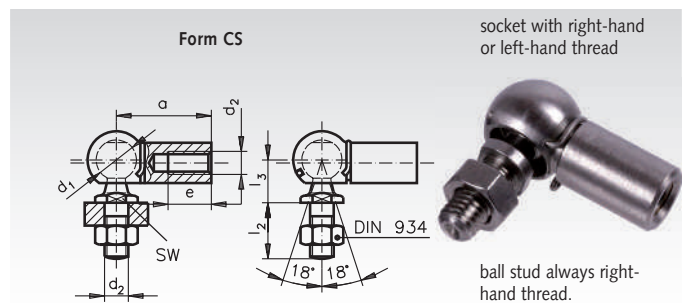
Material: Stainless steel 1.4305.

Design CS: With threaded bolt, hexagon nut and circlip.

Right = Right-hand thread in the socket.

Left = Left-hand thread in the socket.

Ordering Details: e.g.: Product No. 636 996 05, Angle Joint DIN 71802, CS 8, Right Hand, Stainless



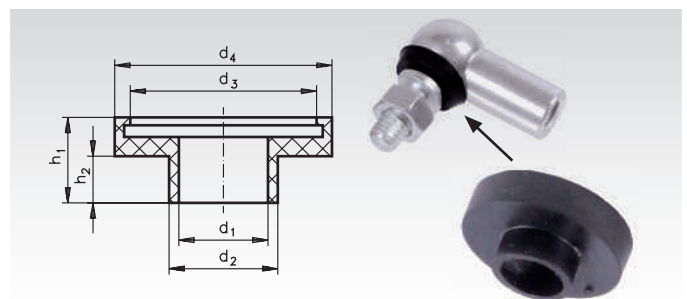
Product-No. CS Righth	Product-No. CS Left	d ₁ H ₉ /h ₉ mm	d ₂ mm	SW ^{h14} mm	a ^{+0,3} mm	e mm	l ₃ ±3 mm	l ₂ ±0,3 mm	Pivoting Angle* Degrees	Weight g
636 996 05	636 997 05	8	M5	7	22	10,2	9	10,2	18°/10°	15,2
636 996 06	636 997 06	10	M6	8	25	11,5	11	12,5	18°/15°	25,2
636 996 08	636 997 08	13	M8	11	30	14	13	16,5	18°/15°	53,1
636 996 10	636 997 10	16	M10	13	35	15,5	16	20	18°/15°	103,8
636 996 14	636 997 14	19	M14x1,5	16	45	21,5	20	28	18°/15°	220,9

* Pivoting angle reduced by circlip.

Sealing Cap for Angle Joints DIN 71802

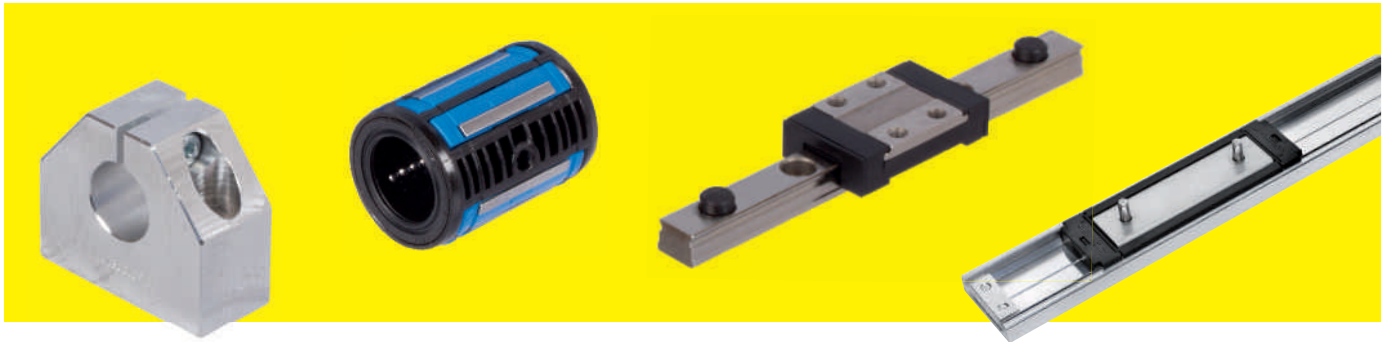
Material: Neoprene.

The sealing caps have delivered an optimal performance used with joints in very dirty or dusty environment. They also offer good protection against spray water and steam. Temperature range: -30°C to +110°C (short term 140°C).

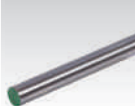
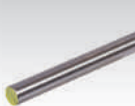


Ordering Details: e.g.: Product No. 636 775 00, Sealing Cap for 8 mm d₁

Product No.	for d ₁ DIN 71802 mm	d ₁ mm	d ₂ mm	d ₃ mm	d ₄ mm	h ₁ mm	h ₂ mm	Weight p.% Pcs. g
636 775 00	8	4	5,4	9	11,5	4,5	1,5	32
636 776 00	10	5,5	6,9	10,5	13	6,5	3,5	44
636 778 00	13	7	8,6	14	17	7,5	3,5	86
636 780 00	16	9	10,5	17,5	21	8,5	4,5	116
636 782 00	19	11	12,6	21	24,5	12	7	215



Shaft Steel

	Silver Steel Material No. 1.2210 (115CrV3) according to DIN 175 (h9) ground and polished		Shaft Steel Hardened and Ground, Material CF53 and CF 53 chromated		Shaft Steel Hardened and Ground, Material Stainless Steel X46 and X90		Shaft Steel with Shaft Support
	Page 477		Page 478		Page 478		Page 479

Universal Shaft Blocks

	Flange Shaft Blocks GWFL, universal use		Flange Shaft Blocks GWF, universal use		Shaft Blocks GWL / GWLE, universal use
	Page 480		Page 480		Page 481

Precision Shaft Blocks and Linear Bearing Units ISO-Series 1

	Shaft Blocks GW-1		Double Shaft Blocks GWD-1		Linear Bearings KB-1
	Page 482		Page 482		Page 483
	Linear Bearing Units KG-1		Tandem Linear Bearing Units KGT-1		Quadro Linear Bearing Units KGQ-1
	Page 483		Page 486		Page 486

Precision Shaft Blocks, Shaft Supports and Linear Bearing Units ISO-Series 3

	Shaft Blocks GW		Shaft Blocks GW-3		Double Shaft Blocks GWD-3		Precision Housing Open and Closed
	Page 487		Page 487		Page 488		Page 493
	Linear Bearings Open and Closed		Linear Bearings Open and Closed Economy-Line		Linear Slide Bearings Open and Closed		
	Page 489		Page 491		Page 492		
	Linear Bearing Units KG-3-K Closed		Linear Bearing Units KG-3-KO Open		Linear Bearing Units KG-3-F Closed, Flange Version		
	Page 494		Page 494		Page 495		
	Linear Bearing Units Open and Closed		Tandem Linear Bearing Units Open and Closed		Quadro Linear Bearing Units Open and Closed		
	Page 496		Page 498		Page 500		

Profiled Track Rollers



Profiled Track Rollers
LFR

Page 502



Bolts for Profil Track
Rollers

Page 503

Rail-Guide Sets



Precision Rail-Guide
Sets RE and RE-ACS

Page 504

Miniature Profile-Rail Guide



Miniature Profile-Rail
Guides

Page 505

Miniature Slide Units



Miniature Slide Units

Page 506

Linear motion guide



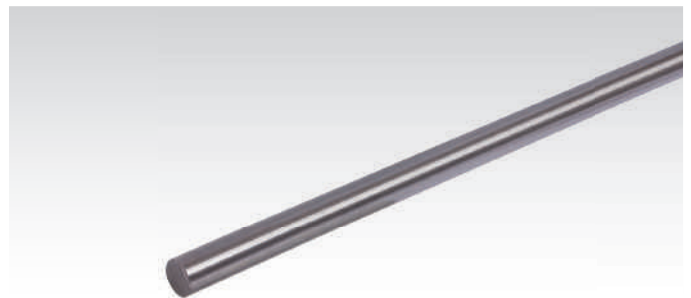
Linear motion guide
with ball carriage

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Silver Steel Material Nr. 1.2210 (115CrV3) According to DIN 175 (h9) Ground and Polished

Unhardened, strength 700 - 800 N/mm².
Subsequent hardening of short silver steel workpieces up to 64 HRC is well possible.

Fixed lengths can be delivered on request.



Ordering Details: e.g.: Product No. 647 002 00, Silver Steel 2 mm, 500 mm long

Product No. 0.5 m	Product No. 1 m	Product No. 2 m	Diameter mm	Weight per m kg
647 002 00	647 102 00	647 202 00	2	0,02
647 003 00	647 103 00	647 203 00	3	0,06
647 004 00	647 104 00	647 204 00	4	0,11
647 005 00	647 105 00	647 205 00	5	0,15
647 006 00	647 106 00	647 206 00	6	0,22
647 008 00	647 108 00	647 208 00	8	0,39
-	647 110 00	647 210 00	10	0,62
-	647 112 00	647 212 00	12	0,89
-	647 114 00	647 214 00	14	1,21
-	647 115 00	647 215 00	15	1,38
-	647 116 00	647 216 00	16	1,57
-	647 117 00	647 217 00	17	1,78
-	647 118 00	647 218 00	18	2,00
-	647 119 00	647 219 00	19	2,22
-	647 120 00	647 220 00	20	2,45
-	647 125 00	647 225 00	25	3,83

Precision Shaft Steel, Hardened and Ground, on choice chromed

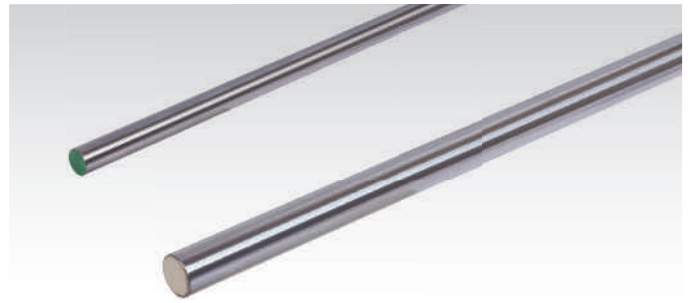
Material CF53: Steel 1.1213 (CF53), hardness min. 59 HRC.
Diameter tolerance: ISO h6.

Material CF53 CR: Steel 1.1213 (CF53), hardness min. 59 HRC,
chrome plated 10 µm, chrome-hardness min. 800 HV,
without CR(VI), suitable for food and medical industry.
Diameter tolerance: ISO h7.

Dimension-stable up to +120°C.

In lengths of 1 m and 2 m available ex stock.

Fixed lengths can be delivered on request.



Ordering Details: e.g.: Product No. 647 405 00, Shaft Steel CF53, 5 mm, length 1 m

Product No. CF53 1 m	Product No. CF53 2 m	Product No. CF53 CR 1 m	Product No. CF 53 CR 2 m	Shaft- Diameter mm	Hardness Depth DIN 13012 mm min.	Weight Length 1m kg	Weight Length 2m kg
647 403 01*	-	-	-	3	0,4	0,059	-
647 404 01	-	-	-	4	0,4	0,098	-
647 405 00	-	647 605 00	-	5	0,4	0,154	-
647 406 00	-	647 606 00	-	6	0,4	0,222	-
647 408 00	647 508 00	647 608 00	647 708 00	8	0,4	0,394	0,788
647 410 00	647 510 00	647 610 00	647 710 00	10	0,4	0,616	1,232
647 412 00	647 512 00	647 612 00	647 712 00	12	0,6	0,888	1,776
647 414 00	647 514 00	647 614 00	647 714 00	14	0,6	1,208	2,416
647 416 00	647 516 00	647 616 00	647 716 00	16	0,6	1,578	3,156
647 420 00	647 520 00	647 620 00	647 720 00	20	0,9	2,466	4,932
647 425 00	647 525 00	647 625 00	647 725 00	25	0,9	3,853	7,706
647 430 00	647 530 00	647 630 00	647 730 00	30	0,9	5,549	11,098
647 440 00	647 540 00	647 640 00	647 740 00	40	1,5	9,864	19,728
647 450 00	647 550 00	647 650 00	647 750 00	50	1,5	15,413	30,826

* Ø 3mm made from material 100CR6.

Precision Shaft Steel, Stainless, Hardened and Ground

Material X46: Stainless Steel 1.4043 (X46Cr13), min. 52 HRC.

Material X90: Stainless Steel 1.4112 (X90CrMoV18), min. 54 HRC.

Diameter tolerance: ISO h6.

Dimension-stable up to +120°C.

In lengths of 1 m and 2 m available ex stock.

Fixed lengths can be delivered on request.



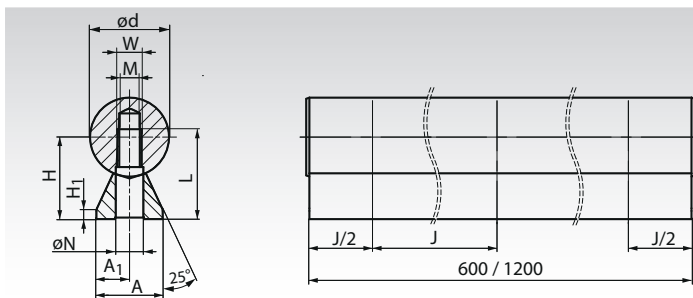
Ordering Details: e.g.: Product No. 647 992 06, Shaft Steel X46, 6 mm, length 1 m

Product No. X46 1 m	Product No. X46 2 m	Product No. X90 1 m	Product No. X90 2 m	Shaft- Diameter mm	Hardness Depth DIN 13012 mm min.	Weight Length 1m kg	Weight Length 2m kg
-	-	647 994 04	-	4	0,4	0,098	-
-	-	647 994 05	-	5	0,4	0,154	-
647 992 06	-	647 994 06	-	6	0,4	0,222	-
647 992 08	647 993 08	647 994 08	647 995 08	8	0,4	0,394	0,788
647 992 10	647 993 10	647 994 10	647 995 10	10	0,4	0,616	1,232
647 992 12	647 993 12	647 994 12	647 995 12	12	0,6	0,888	1,776
647 992 14	647 993 14	647 994 14	647 995 14	14	0,6	1,208	2,416
647 992 16	647 993 16	647 994 16	647 995 16	16	0,6	1,578	3,156
647 992 20	647 993 20	647 994 20	647 995 20	20	0,9	2,466	4,932
647 992 25	647 993 25	647 994 25	647 995 25	25	0,9	3,853	7,706
647 992 30	647 993 30	647 994 30	647 995 30	30	0,9	5,549	11,098
647 992 40	647 993 40	647 994 40	647 995 40	40	1,5	9,864	19,728
647 992 50	647 993 50	647 994 50	647 995 50	50	1,5	15,413	30,826

Dimension Tolerances for shafts with Ø-tolerance h6

		Shaft Diameter													
		3 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	14 mm	16 mm	20 mm	25 mm	30 mm	40 mm	50 mm
Diameter	[µm]	0,6	-8	-8	-8	-9	-9	-11	-11	-11	-13	-13	-13	-16	-16
Straightness	[mm/m]	0,3	0,3	0,2	0,2	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
Roundness	[µm]	3	4	4	4	4	4	5	5	5	6	6	6	7	7
Parallelity	[µm]	4	5	5	5	6	6	8	8	8	9	9	9	11	11

Precision Shaft Steel with Shaft Support, Low Version



Material shaft: Steel 1.1213 (Cf53), hardened and ground, hardness 62 ± 2 HRC, diameter tolerance ISO h6.

Material support: Extruded aluminium.

Length: Either 600 mm or 1200 mm.
Delivery without mounting screws.

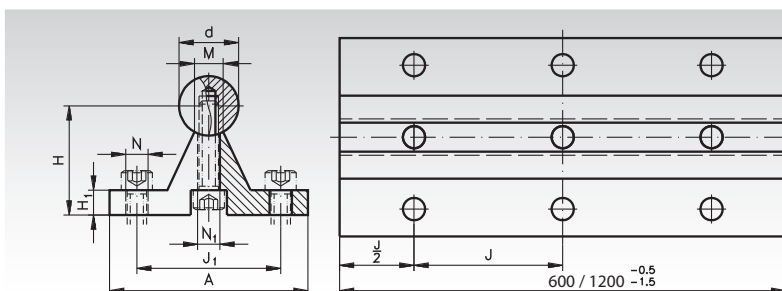
Ordering Details: e.g.: Product No. 647 412 05, Shaft with Support, Low Version, $\varnothing$ 12 mm, Length 600 mm

Product No. Length 600 mm	Product No. Length 1200 mm	d mm	A mm	A ₁ mm	H $\pm 0,15$ mm	H ₁ mm	J mm	M mm	N mm	L mm	W mm	Weight 600 mm g	Weight 1200 mm g
647 412 05	647 412 06	12	11	6	14,5	3	75	M4	4,5	15,5	5,4	660	1320
647 416 05	647 416 06	16	14	7	18	3	75	M5	5,5	16	7	1200	2400
647 420 05	647 420 06	20	17	8,5	22	3	75	M6	6,6	20	8,1	1790	3580
647 425 05	647 425 06	25	21	10,5	26	3	75	M8	9	25	10,3	2670	5340
647 430 05	647 430 06	30	23	11,5	30	3	100	M10	11	30	11	3760	7520
647 440 05	647 440 06	40	30	15	39	4	100	M12	13,5	38	15	6440	12880

Ready-to-install, supported linear shafts to be used with open linear bearings or open linear bearing units. The shafts are supported over the entire length. Unit can be shortened by the customer using an angle grinder. The shaft supports have internal threads to get mounted from the downside of the customer's base plate. The required screw length depends also on the thickness of the base plate. Longer versions on request.



Precision Shaft Steel with Shaft Support



Material shaft: Steel 1.1213 (Cf53), hardened and ground, hardness 62 ± 2 HRC, diameter tolerance ISO h6.

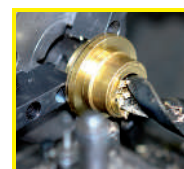
Material support: Extruded aluminium.

Length: Either 600 mm or 1200 mm.

Ordering Details: e.g.: Product No. 647 412 03, Shaft with Support, $\varnothing$ 12 mm, Length 600 mm

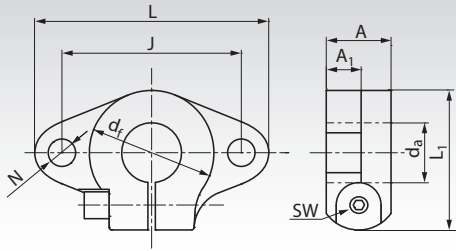
Product No. Length 600 mm	Product No. Length 1200 mm	d mm	A mm	H $\pm 0,02$ mm	H ₁ mm	J mm	J ₁ mm	M mm	N mm	N ₁ mm	β Degrees	Mounting Screw DIN 912	Weight 600 mm g	Weight 1200 mm g
647 412 03	647 412 04	12	40	22	5	75	29	5,8	4,5	4,5	50	M4x16	1080	2160
647 416 03	647 416 04	16	45	26	5	100	33	7	5,5	5,5	50	M5x20	1610	3220
647 420 03	647 420 04	20	52	32	6	100	37	8,3	6,6	6,6	50	M6x25	2444	4888
647 425 03	647 425 04	25	57	36	6	120	42	10,8	6,6	9	50	M8x25	3460	6920
647 430 03	647 430 04	30	69	42	7	150	51	11	9	11	50	M10x30	4840	9680
647 440 03	647 440 04	40	73	50	8	200	55	15	9	11	50	M10x35	7820	15640
647 450 03	647 450 04	50	84	60	9	200	63	19	11	13,5	46	M12x40	11780	23560

Ready-to-use, mounted, supported linear shafts to be used with open linear bearings or open linear bearing units. The shafts are supported over the entire length. The shaft supports have mounting holes for mounting them on a base plate. Unit can be shortened by the customer using an angle grinder. Longer versions on request.



**Reworking within
24h-service possible.
Custom made parts
on request.**

Flange Shaft Block GWFL universal use, low-cost type



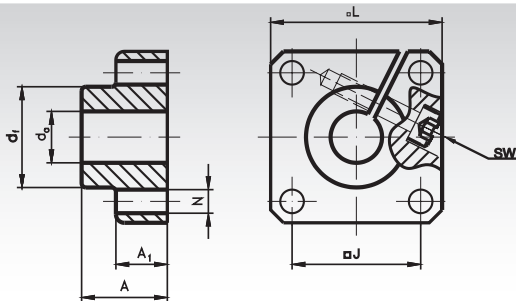
Material: Extruded Aluminium.
Clamp screw strength 8.8, Steel zinc-plated.

Universal use shaft blocks,
e.g. for flange fastening of guide shafts.

Ordering Details: e.g.: Product No. 646 405 10, Flange Shaft Block GWFL, for Shaft-Ø 10 mm

Product No.	d _a mm	L mm	A mm	A ₁ mm	d _f mm	J mm	L ₁ mm	N mm	Clamp- screw DIN 912	sw mm	Weight g
646 405 10	10	43	10	5	20	32	24	5,5	M4	3	13
646 405 12	12	47	13	7	25	36	28	5,5	M4	3	20
646 405 14	14	47	13	7	25	36	28	5,5	M4	3	18
646 405 16	16	50	16	8	28	40	31	5,5	M4	3	27
646 405 20	20	60	20	8	34	48	37	7	M5	4	40
646 405 25	25	70	25	10	40	56	42	7	M5	4	60
646 405 30	30	80	30	12	46	64	50	9	M6	5	110
646 405 40	40	105	40	16	56	80	67	12	M10	8	510
646 405 50	50	122	50	19	70	96	83	14	M12	10	890

Flange Shaft Blocks GWF universal use



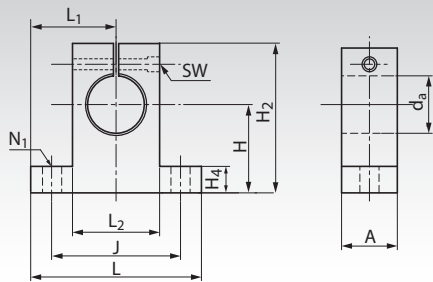
Material: Extruded aluminium.
Clamp screw strength 8.8, steel zinc-plated.

Universal use shaft blocks,
e.g. for flange connection of guide shafts.

Ordering Details: e.g.: Product No. 646 401 12, Flange Blocks for Shaft-Ø 12 mm

Product No.	d _a mm	L mm	A mm	A ₁ mm	d _f mm	J mm	NH13 mm	Clamp- screw DIN 912	sw mm	Weight g
646 401 12	12	40	20	12	23,5	30±0,12	5,5	M4	3	60
646 401 16	16	50	20	12	27,5	35±0,12	5,5	M4	3	80
646 401 20	20	50	23	14	33,5	38±0,15	6,6	M5	4	100
646 401 25	25	60	25	16	42,0	42±0,15	6,6	M6	5	150
646 401 30	30	70	30	19	49,5	54±0,25	9,0	M8	6	300
646 401 40	40	100	40	26	65,0	68±0,25	11,0	M10	8	700
646 401 50	50	100	50	36	75,0	75±0,25	11,0	M10	8	1200

Shaft Block GWL universal use, low-cost type



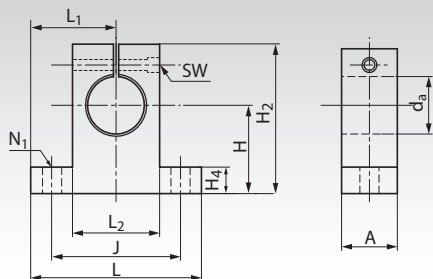
Material: Extruded Aluminium.
Clamp screw strength 8.8, Steel zinc-plated.

Universel use shaft blocks,
e.g. for fastening of guide shafts.

Ordering Details: e.g.: Product No. 646 406 08, Shaft Block GWL, for Shaft-Ø 8 mm

Product No.	d _a mm	A mm	H _{±0,02} mm	H ₂ mm	H ₄ mm	J mm	L mm	L _{1±0,05} mm	L ₂ mm	N ₁ mm	Clamp- screw DIN 912	sw mm	Weight g
646 406 08	8	14	20	32,8	6	32	42	21	18	5,5	M4	3	24
646 406 10	10	14	20	32,8	6	32	42	21	18	5,5	M4	3	24
646 406 12	12	14	23	37,5	6	32	42	21	20	5,5	M4	3	30
646 406 14	14	14	23	37,5	6	32	42	21	20	5,5	M4	3	28
646 406 16	16	16	27	44	8	38	48	24	25	5,5	M4	3	40
646 406 20	20	20	31	51	10	45	60	30	30	6,6	M5	4	70
646 406 25	25	24	35	60	12	56	70	35	38	6,6	M6	5	130
646 406 30	30	28	42	70	12	64	84	42	44	9	M6	5	180
646 406 40	40	36	60	96	15	90	114	57	60	11	M8	6	420
646 406 50	50	40	70	120	18	100	126	63	74	14	M12	10	750

Shaft Block GWLE universal use, European Dimensions

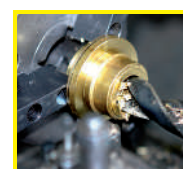


Material: Extruded Aluminium.
Clamp screw strength 8.8, Steel zinc-plated.

Universel use shaft blocks,
e.g. for fastening of guide shafts.

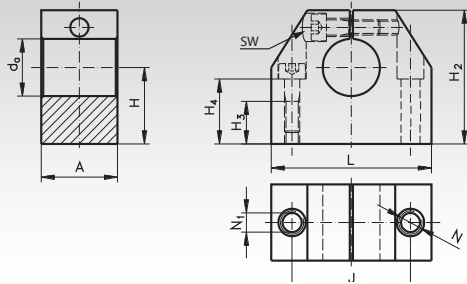
Ordering Details: e.g.: Product No. 646 407 08, Shaft Block GWLE, for Shaft-Ø 8 mm

Product No.	d _a mm	A mm	H _{±0,02} mm	H ₂ mm	H ₄ mm	J mm	L mm	L _{1±0,05} mm	L ₂ mm	N ₁ mm	Clamp- screw DIN 912	sw mm	Weight g
646 407 08	8	10	15	27	5	25	32	16	16	4,5	M3	2,5	24
646 407 12	12	12	20	35	5,5	32	42	21	20	5,5	M4	3	30
646 407 16	16	16	25	42	6,5	40	50	25	26	5,5	M4	3	40
646 407 20	20	20	30	50	8	45	60	30	32	5,5	M4	3	70
646 407 25	25	25	35	58	9	60	74	37	38	6,6	M5	4	130
646 407 30	30	28	40	68	10	68	84	42	45	9	M6	5	180
646 407 40	40	32	50	86	12	86	108	54	56	11	M8	6	420
646 407 50	50	40	60	100	14	108	130	65	80	11	M8	6	750



**Reworking within
24h-service possible.
Custom made parts
on request.**

Precision Shaft Blocks GW-1 ISO Series 1



Material: Extruded aluminium.

Matching linear-bearing units of ISO Series 1.

Robust machine elements to attach the guiding shaft of the linear bearings. They allow true to size and cost efficient constructions.

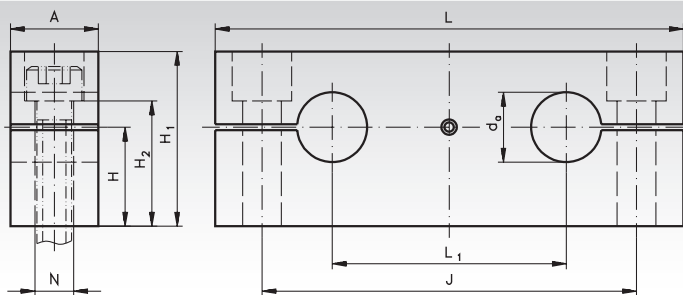
Ordering Details: e.g.: Product No. 646 406 06, Precision Shaft Block GW-1, for Shaft-Ø 6 mm

Product No.	d _a mm	A mm	H±0,02 mm	H ₂ mm	H ₃ mm	H ₄ mm	J±0,12 mm	L mm	N ₁ mm	N* mm	sw mm	Weight g
646 406 06	6	16	15	27	11	13	22	32	4,2	M5	2,5	30
646 408 08	8	16	16	27	11	13	22	32	4,2	M5	2,5	30
646 410 10	10	18	18	33	13	16	27	40	5,2	M6	3	50
646 412 12	12	18	19	33	13	16	27	40	5,2	M6	3	50
646 414 14	14	20	20	38	13	18	32	45	5,2	M6	3	70
646 416 16	16	20	22	38	13	18	32	45	5,2	M6	3	70
646 420 20	20	24	25	45	18	22	39	53	6,8	M8	4	120
646 425 25	25	28	31	54	22	26	44	62	8,6	M10	5	170
646 430 30	30	30	34	60	22	29	49	67	8,6	M10	5	220
646 440 40	40	40	42	76	26	38	66	87	10,3	M12	6	480
646 450 50	50	50	50	92	34	46	80	103	14,25	M16	8	820

* When mounting from above choose the next smaller screw size.

Shaft steel page 478.

Precision Double Shaft Blocks GWD-1 ISO Series 1



Material: Extruded aluminium.

Matching quadro linear-bearing units KGQ-1 of the ISO Series 1, page 486.

Robust machine elements to attach the guiding shafts of the linear bearings. They allow true to size and cost efficient constructions.

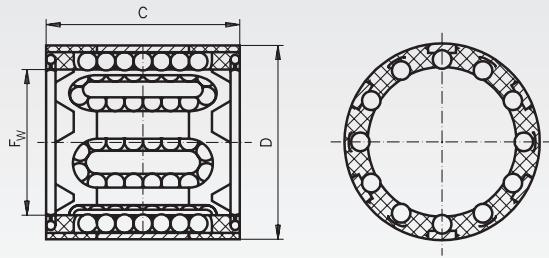
Ordering Details: e.g.: Product No. 646 402 12, Precision Shaft Block GWD-1 for Shaft-Ø 12 mm

Product No.	d _a mm	A mm	H mm	H ₁ mm	H ₂ mm	J mm	L mm	L ₁ mm	N* mm	Weight g
646 402 12	12	15	17	30	21,5	64	80	40	6,6	80
646 402 16	16	15	19,5	35	26,5	80	96	52	6,6	110
646 402 20	20	18	22	40	29	97	115	63	9	170
646 402 25	25	20	27	50	36,5	115	136	75	11	280
646 402 30	30	20	31	56	42,5	125	146	80	11	320
646 402 40	40	25	38	70	54	160	184	97	13,5	630
646 402 50	50	30	43	80	59	180	210	107	17,5	900

* For cylindrical screws with Allen screw according to DIN 912 or ISO 4762.

Shaft steel page 478.

Linear Bearings KB-1 ISO Series 1



Linear bearings Series 1 of ISO standard 10285 from premium brand in top quality.

Especially compact dimensions enable a space-saving and cost efficient linear support. Easy to mount and provide automatic retention in the mounting bore. I.e., if the boring in the housing

is exact, the bearing does not to be secured axially. Either with integral double-lip seal or with shields. Bearings up to FW 5mm must be lubricated before use.

All other bearings are lubricated ready-to-install.

Recommended shaft tolerance h6, housing tolerance H6 or JS6.

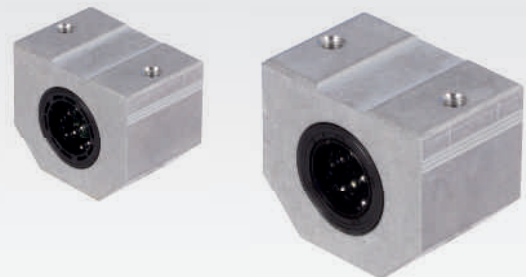
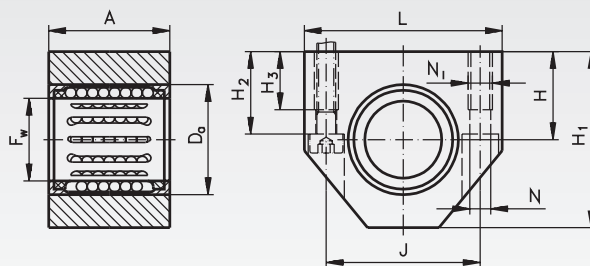
Ordering Details: e.g.: Product No. 646 003 03, Linear Bearing KB-1, Internal Ø 3 mm, with Shields

Product No. with Shields	Product No. with Seals	F _w mm	D mm	C mm	Number of Rows of Balls	Load Rating* dyn. C N	stat. C ₀ N	Weight g
646 003 03	646 103 03	3	7	10	4	60	44	0,7
646 004 04	646 104 04	4	8	12	4	75	60	1
646 005 05	646 105 05	5	10	15	4	170	129	2
646 006 06	646 106 06	6	12	22	4	335	270	6
646 008 08	646 108 08	8	15	24	4	490	355	7
646 010 10	646 110 10	10	17	26	5	585	415	11
646 012 12	646 112 12	12	19	28	5	695	510	12
646 014 14	646 114 14	14	21	28	5	710	530	14
646 016 16	646 116 16	16	24	30	5	930	630	18
646 020 20	646 120 20	20	28	30	6	1160	800	21
646 025 25	646 125 25	25	35	40	7	2120	1560	47
646 030 30	646 130 30	30	40	50	8	3150	2700	70
646 040 40	646 140 40	40	52	60	8	5500	4500	130
646 050 50	646 150 50	50	62	70	9	6950	6300	180

* On stainless shafts, the dynamic load rating has to be reduced by 18%, the static load rating by 8%.

Shaft steel page 478.
Shaft blocks page 480

Linear Bearings Units KG-1 ISO Series 1, with a Linear Bearing



Material: Housing made from extruded aluminium with a compact linear bearing of the ISO Series 1 from premium brand in top quality.

With integral double-lip seal or with shields.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6.

Ordering Details: e.g.: Product No. 646 506 06, Linear Bearings Unit KG-1, Internal Ø 6 mm, with Shields

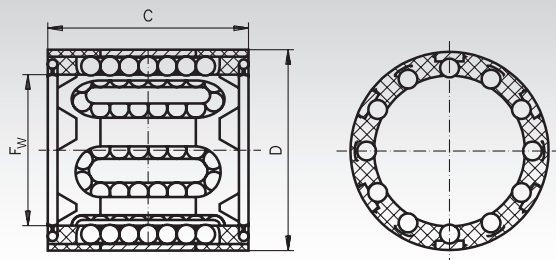
Product No. with Shields	Product No. with Seals	F _w mm	A mm	D _a mm	H±0,02 mm	H ₁ mm	H ₂ mm	H ₃ mm	L mm	J mm	N mm	N ₁ * mm	Load Rating C _{dyn.} N	stat. C ₀ N	Weight g	Spare Linear Bearings with Shields	with Seals
646 506 06	646 606 06	6	22**	12	13**	27**	13	9	32	23**	3,4	M4	335	270	50	646 006 06	646 106 06
646 508 08	646 608 08	8	24	15	14**	27	13	9	32	23**	3,4	M4	490	355	50	646 008 08	646 108 08
646 510 10	646 610 10	10	26	17	16	33**	16	11	40**	29**	4,3	M5	585	415	80	646 010 10	646 110 10
646 512 12	646 612 12	12	28	19	17	33	16	11	40	29	4,3	M5	695	510	90	646 012 12	646 112 12
646 514 14	646 614 14	14	28	21	18	36,5	18	11	43	34	4,3	M5	710	530	100	646 014 14	646 114 14
646 516 16	646 616 16	16	30	24	19	38	18	11	45	34	4,3	M5	930	630	100	646 016 16	646 116 16
646 520 20	646 620 20	20	30	28	23	45	22	13	53	40	5,3	M6	1160	800	140	646 020 20	646 120 20
646 525 25	646 625 25	25	40	35	27	54	26	18	62	48	6,6	M8	2120	1560	250	646 025 25	646 125 25
646 530 30	646 630 30	30	50	40	30	60	29	18	67	53	6,6	M8	3150	2700	370	646 030 30	646 130 30
646 540 40	646 640 40	40	60	52	39	76	38	22	87	69	8,4	M10	5500	4500	740	646 040 40	646 140 40
646 550 50	646 650 50	50	70	62	47	92	46	26	103	82	10,5	M12	6950	6300	1190	646 050 50	646 150 50

* When mounting from the bottom side choose the next smaller screw size.

** Dimension not in accordance with DIN ISO 13012-1.

Shaft steel page 478. Shaft blocks page 480.

Linear Bearings KB-1 ISO Series 1, Economy-Line



Linear bearings from reliable brand in good quality at low price.
These linear bearings can be fitted inside a customer's housing or as spare parts for our closed Economy-Line units.

These bearings are self-aligning up to $\pm 0,5^\circ$.
All bearings must be lubricated before use.
Recommended shaft tolerance h6, housing tolerance H6 or JS6.

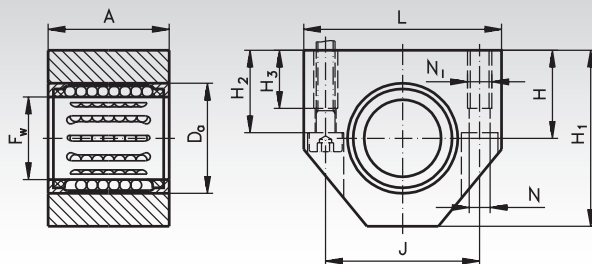
With wiping double-lip seals.

Ordering Details: e.g.: Product No. 646 306 06, Linear Bearing KB-1 Economy-Line, Internal $\varnothing$ 6mm

Product No. with seals	F _w mm	D mm	C mm	Load Rating*		Weight g
				dyn. C N	stat. C ₀ N	
646 306 06	6	12	22	400	239	7
646 308 08	8	15	24	441	280	12
646 310 10	10	17	26	500	370	14,5
646 312 12	12	19	28	620	510	18,5
646 314 14	14	21	28	620	520	20,5
646 316 16	16	24	30	800	620	27,5
646 320 20	20	28	30	950	790	32,5
646 325 25	25	35	40	1990	1670	66
646 330 30	30	40	50	2800	2700	95
646 340 40	40	52	60	4400	4450	182
646 350 50	50	62	70	5500	6300	252

Shaft steel with shaft support page 478.
Shaft blocks page 480.

Linear Bearings Units KG-1 ISO Series 1, Economy-Line, with a Linear Bearing



Material: Housing made from extruded aluminium with a compact bearing of the ISO Series 1. From reliable brand in good quality at low price. With integral double-lip seal.

All bearings are lubricated ready-to-install.
Recommended shaft tolerance h6.

Ordering Details: e.g.: Product No. 646 806 06, Linear Bearings Unit KG-1 Economy-Line, Internal $\varnothing$ 6 mm

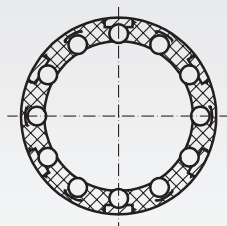
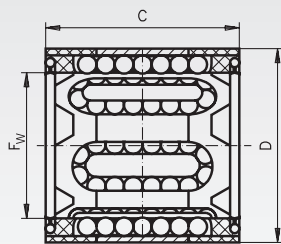
Product No. with seals	F _w mm	A mm	D _a mm	H $\pm 0,02$ mm	H ₁ mm	H ₂ mm	H ₃ mm	L mm	J mm	N mm	N ₁ * mm	Load Rating		Weight g	Product No. Spare Linear Bearings
												dyn. C N	stat. C ₀ N		
646 806 06	6	22**	12	13**	27**	13	9	32	23**	3,4	M4	400	239	50	646 306 06
646 808 08	8	24	15	14**	27	13	9	32	23**	3,4	M4	435	280	50	646 308 08
646 810 10	10	26	17	16	33**	16	11	40**	29**	4,3	M5	500	370	80	646 310 10
646 812 12	12	28	19	17	33	16	11	40	29	4,3	M5	620	510	90	646 312 12
646 814 14	14	28	21	18	36,5	18	11	43	34	4,3	M5	620	520	100	646 314 14
646 816 16	16	30	24	19	38	18	11	45	34	4,3	M5	800	620	110	646 316 16
646 820 20	20	30	28	23	45	22	13	53	40	5,3	M6	950	790	150	646 320 20
646 825 25	25	40	35	27	54	26	18	62	48	6,6	M8	1990	1670	290	646 325 25
646 830 30	30	50	40	30	60	29	18	67	53	6,6	M8	2800	2700	420	646 330 30
646 840 40	40	60	52	39	76	38	22	87	69	8,4	M10	4400	4450	790	646 340 40
646 850 50	50	70	62	47	92	46	26	103	82	10,5	M12	5500	6300	1290	646 350 50

* When mounting from the bottom side choose the next smaller screw size.

** Dimension not in accordance with DIN ISO 13012-1.

Shaft steel page 478. Shaft blocks page 480.

Linear Bearings KB-1 ISO Series 1, Stainless



Stainless linear bearings Series 1 of ISO standard 10285 from premium brand in top quality.

Especially compact dimensions enable a space-saving and cost efficient linear support. Easy to mount and provide automatic retention in the mounting bore. I.e., if the boring in the housing

is exact, the bearing does not to be secured axially. Either with integral double-lip seal or with shields. Bearings up to FW 5mm must be lubricated before use.

All other bearings are lubricated ready-to-install.

Recommended shaft tolerance h6, housing tolerance H6 or JS6.

Ordering Details: e.g.: Product No. 646 998 03, Linear Bearing KB-1, Internal Ø 3 mm, with Shields, stainless

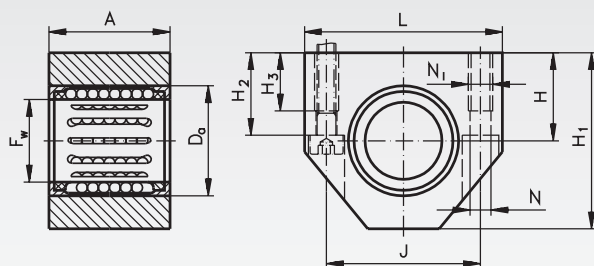
Product No. with Shields	Product No. with Seals	F _w mm	D mm	C mm	Number of Rows of Balls	Load Rating* dyn. C N	stat. C ₀ N	Weight g
646 998 03	646 999 03	3	7	10	4	49	40	0,7
646 998 04	646 999 04	4	8	12	4	62	55	1
646 998 05	646 999 05	5	10	15	4	139	119	2
646 998 06	646 999 06	6	12	22	4	275	248	6
646 998 08	646 999 08	8	15	24	4	402	327	7
646 998 10	646 999 10	10	17	26	5	480	382	11
646 998 12	646 999 12	12	19	28	5	570	469	12
646 998 14	646 999 14	14	21	28	5	582	488	14
646 998 16	646 999 16	16	24	30	5	763	580	18
646 998 20	646 999 20	20	28	30	6	951	736	21
646 998 25	646 999 25	25	35	40	7	1738	1435	47
646 998 30	646 999 30	30	40	50	8	2583	2484	70
646 998 40	646 999 40	40	52	60	8	4510	4140	130
646 998 50	646 999 50	50	62	70	9	5699	5796	180

* On stainless shafts X90.

Shaft steel page 478.
Shaft blocks page 480.



Linear Bearings Units KG-1 ISO Series 1, with a Linear Bearing, Stainless



Material: Housing made from extruded aluminium with a stainless linear bearing of the ISO Series 1 from premium brand in top quality.

With integral double-lip seal or with shields.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6.

Ordering Details: e.g.: Product No. 646 995 06, Linear Bearings Unit KG-1, Internal Ø 6 mm, with Shields, stainless

Product No. with Shields	Product No. with Seals	F _w mm	A mm	D _a mm	H±0.01 mm	H ₁ mm	H ₂ mm	H ₃ mm	L mm	J mm	N mm	N ₁ * mm	Load Rating* dyn.C N	stat.C ₀ N	Weight g	Spare Linear Bearings with Shields	with Seal
646 995 06	646 996 06	6	22**	12	13**	27**	13	9	32	23**	3,4	M4	275	248	50	646 998 06	646 999 06
646 995 08	646 996 08	8	24	15	14**	27	13	9	32	23**	3,4	M4	402	327	50	646 998 08	646 999 08
646 995 10	646 996 10	10	26	17	16	33**	16	11	40**	29**	4,3	M5	480	382	80	646 998 10	646 999 10
646 995 12	646 996 12	12	28	19	17	33	16	11	40	29	4,3	M5	570	469	90	646 998 12	646 999 12
646 995 14	646 996 14	14	28	21	18	36,5	18	11	43	34	4,3	M5	582	488	100	646 998 14	646 999 14
646 995 16	646 996 16	16	30	24	19	38	18	11	45	34	4,3	M5	763	580	100	646 998 16	646 999 16
646 995 20	646 996 20	20	30	28	23	45	22	13	53	40	5,3	M6	951	736	140	646 998 20	646 999 20
646 995 25	646 996 25	25	40	35	27	54	26	18	62	48	6,6	M8	1738	1435	250	646 998 25	646 999 25
646 995 30	646 996 30	30	50	40	30	60	29	18	67	53	6,6	M8	2583	2484	370	646 998 30	646 999 30
646 995 40	646 996 40	40	60	52	39	76	38	22	87	69	8,4	M10	4510	4140	740	646 998 40	646 999 40
646 995 50	646 996 50	50	70	62	47	92	46	26	103	82	10,5	M12	5699	5796	1190	646 998 50	646 999 50

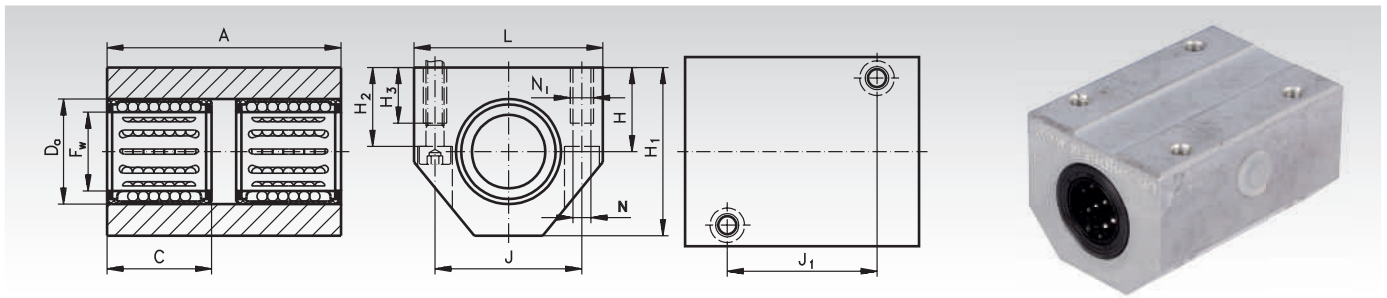
* When mounting from the bottom side choose the next smaller screw size.

** Dimension not in accordance with DIN ISO 13012-1.

Shaft steel page 478. Shaft blocks page 480.



Tandem Linear-Bearing Units KGT-1 ISO Series 1, with Two Linear Bearings



Material: Housing made from extruded aluminium with two compact linear bearings of the ISO Series 1 from premium brand in top quality. With integral double-lip seal.

All bearing are lubricated ready-to-install.
Recommended shaft tolerance h6.

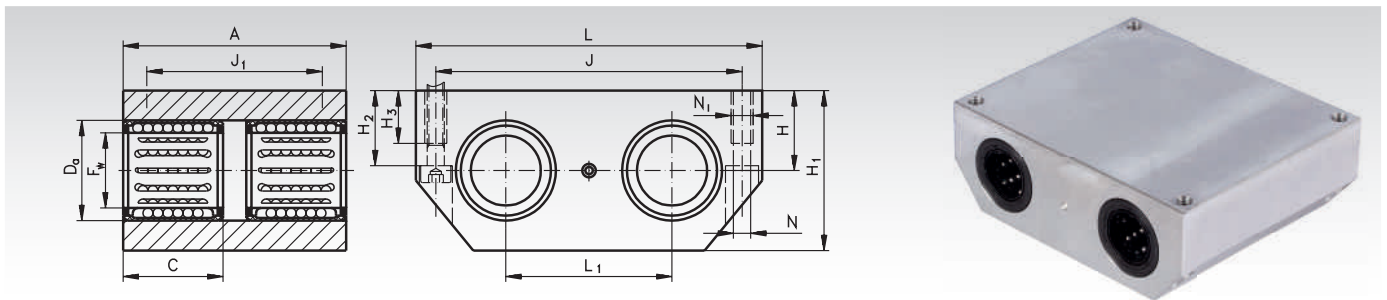
Ordering Details: e.g.: Product No. 646 403 12, Linear Bearings Unit KGT-1, Internal Ø 12 mm

Product No.	F _W mm	A mm	C mm	D _a mm	H _{±0.02} mm	H ₁ mm	H ₂ mm	H ₃ mm	J mm	J ₁ mm	L mm	N mm	N ₁ * mm	Load Rating dyn. C N	stat. C ₀ N	Weight g	Spare Linear Bearing with Seal
646 403 12	12	60	28	19	17	33	16	11	29	35	40	4,3	M5	1140	1020	170	646 112 12
646 403 16	16	65	30	24	19	38	18	11	34	40	45	4,3	M5	1530	1270	220	646 116 16
646 403 20	20	65	30	28	23	45	22	13	40	45	53	5,3	M6	1900	1600	310	646 120 20
646 403 25	25	85	40	35	27	54	26	18	48	55	62	6,6	M8	3450	3150	540	646 125 25
646 403 30	30	105	50	40	30	60	29	18	53	70	67	6,6	M8	5200	5400	800	646 130 30
646 403 40	40	125	60	52	39	76	38	22	69	85	87	8,4	M10	9000	9000	1570	646 140 40
646 403 50	50	145	70	62	47	92	46	26	82	100	103	10,5	M12	11400	12700	2510	646 150 50

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel page 478.
Shaft blocks page 480.

Quadro Linear-Bearing Units KGQ-1 ISO Series 1, with Four Linear Bearings



Material: Housing made from extruded aluminium with four compact linear bearings of the ISO Series 1 from premium brand in top quality. With integral double-lip seal.

All bearing are lubricated ready-to-install.
Recommended shaft tolerance h6.

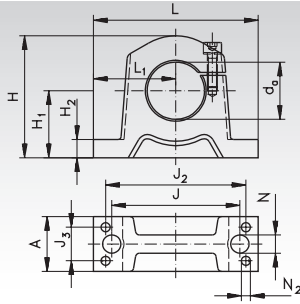
Ordering Details: e.g.: Product No. 646 404 12, Linear Bearings Unit KGQ-1, Internal Ø 12 mm

Product No.	F _W mm	A mm	C mm	D _a mm	H _{±0.02} mm	H ₁ mm	H ₂ mm	H ₃ mm	J mm	J ₁ mm	L mm	L ₁ mm	N mm	N ₁ * mm	Load Rating dyn. C N	stat. C ₀ N	Weight g	Spare Linear Bearing with Seal
646 404 12	12	70	28	19	15	30	14	11	69	59	80	40	4,3	M5	1860	2040	380	646 112 12
646 404 16	16	80	30	24	17,5	35	16,5	11	86	70	96	52	4,3	M5	2500	2550	570	646 116 16
646 404 20	20	85	30	28	20	40	19	13	103	73	115	63	5,3	M6	3100	3200	820	646 120 20
646 404 25	25	100	40	35	25	50	24	18	123	87	136	75	6,6	M8	5600	6300	1430	646 125 25
646 404 30	30	130	50	40	28	56	27	18	133	117	146	80	6,6	M8	8500	10800	2150	646 130 30
646 404 40	40	150	60	52	35	70	34	22	166	132	184	97	8,4	M10	14600	18000	3830	646 140 40
646 404 50	50	175	70	62	40	80	39	26	189	154	210	107	10,5	M12	18600	25500	5400	646 150 50

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel page 478.
Shaft blocks page 480.

Precision Shaft Blocks GW ISO Series 3



Material: Extruded aluminium.
Light Design, matching linear-bearing units of ISO Series 3.

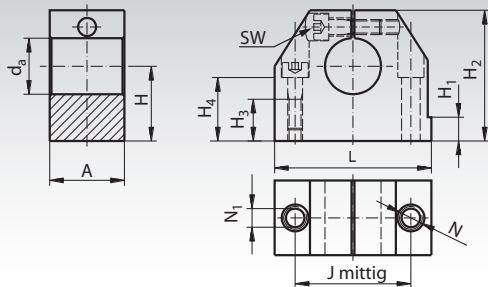
Robust machine elements to attach the guiding shafts of the linear bearings. They allow true to size and cost efficient constructions.

Ordering Details: e.g.: Product No. 646 408 00, Precision Shaft Block GW, for Shaft-Ø 8 mm

Product No.	d _a mm	A mm	H ₁ ±0.01 mm	H ₂ mm	H mm	J mm	J ₂ mm	J ₃ mm	L mm	L ₁ mm	N mm	N ₂ mm	Weight g
646 408 00	8	10	15	5,5	25	25	35	5	45	22,5	4,3	2,7	12
646 412 00	12	12	20	6	32,5	32	42	6	52	26	5,3	3,2	23
646 416 00	16	15	20	7	35,5	40	46	7,5	56	28	5,3	4,3	34
646 420 00	20	20	25	8	43,5	45	58	10	70	35	5,3	5,3	65
646 425 00	25	28	30	10	53	60	68	16	80	40	6,4	6,4	140
646 430 00	30	30	35	10	63	68	76	18	88	44	8,4	6,4	200
646 440 00	40	36	45	12	81	86	94	22	108	54	10,5	8,4	470
646 450 00	50	49	50	14	92,5	108	116	30	135	67,5	10,5	10,5	680

Shaft steel page 478.

Precision Shaft Blocks GW-3 ISO Series 3



Material: Extruded aluminium.
Matching linear-bearing units of ISO Series 3.

Robust machine elements to attach the guiding shafts of the linear bearings. They allow true to size and cost efficient constructions.

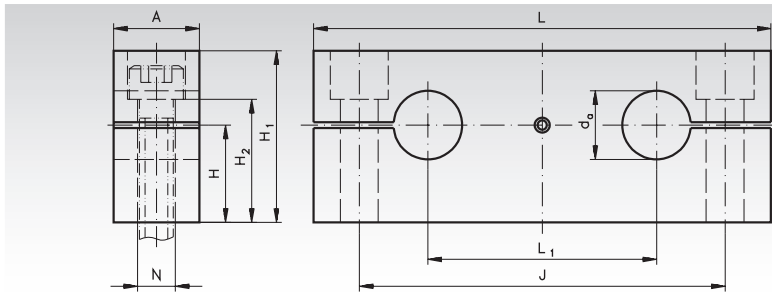
Ordering Details: e.g.: Product No. 646 412 01, Precision Shaft Block GW-3, for Shaft-Ø 12 mm

Product No.	d _a mm	A mm	H±0.02 mm	H ₁ mm	H ₂ mm	H ₃ mm	H ₄ mm	J±0,12 mm	L mm	N ₁ mm	N* mm	sw mm	Weight g
646 412 01	12	20	20	6	35	13	16,5	30	43	5,2	M6	3	60
646 416 01	16	24	25	7	42	18	21	38	53	6,8	M8	4	110
646 420 01	20	30	30	7,5	50	22	25	42	60	8,6	M10	5	170
646 425 01	25	38	35	8,5	61	26	30	56	78	10,3	M12	6	340
646 430 01	30	40	40	9,5	70	26	34	64	87	10,3	M12	6	460
646 440 01	40	48	50	11	90	34	44	82	108	14,25	M16	8	900
646 450 01	50	58	60	11	105	43	49	100	132	17,5	M20	10	1450

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel page 478.

Precision Double Shaft Blocks GWD-3 ISO Series 3



Material: Extruded aluminium.

Matching quadro linear-bearing units KGQ-3 of the ISO Series 3, page 500.

Robust machine elements to attach the guiding shafts of the linear bearings. They allow true to size and cost efficient constructions.

Ordering Details: e.g.: Product No. 646 412 02, Precision Shaft Block GWD-3 for Shaft-Ø 12 mm

Product No.	d _a mm	A mm	H mm	H ₁ mm	H ₂ mm	J mm	L mm	L ₁ mm	N* mm	Weight g
646 412 02	12	14	18	32	23,5	70	85	42	6,6	90
646 416 02	16	18	20	37	26,5	82	100	54	9	140
646 420 02	20	20	25	46	32,5	108	130	72	11	250
646 425 02	25	25	30	56	40	132	160	88	13,5	470
646 430 02	30	25	35	64	48	150	180	96	13,5	620
646 440 02	40	30	44	80	59	190	230	122	17,5	1150
646 450 02	50	30	52	96	75	240	280	152	17,5	1700

* For cylindrical screws with Allen screw according to DIN 912 or ISO 4762.

Shaft steel page 478.

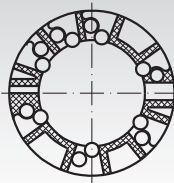
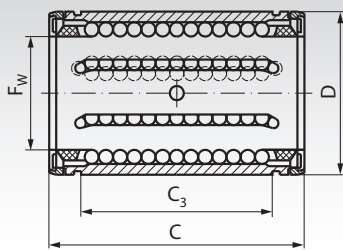
Collars
page 452



Retaining Rings
DIN 471 / DIN 472
page 514



Linear Bearings KB-3 ISO Series 3, Closed Design



Linear bearings series 3 of ISO standard 10285 from premium brand in top quality.

High load-bearing capacity, due to the asymmetric position of the rows of balls and the specially shaped raceway segments. These linear bearings can be fitted inside a closed or open housing and are thus adjustable.

With shields or wiping double-lip seals.

Bearings with FW 5mm must be lubricated before use.

All other bearings are lubricated ready-to-install.

Recommended shaft tolerance h6, housing tolerance H6 or JS6.

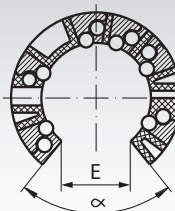
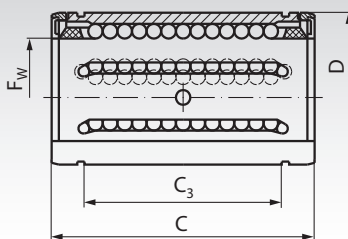
Stainless version on request.

Ordering Details: e.g.: Product No. 646 005 00, Linear Bearing KB-3, Internal Ø 5 mm, with Shields

Product No. with Shields	Product No. with Seals	F _w mm	D mm	C mm	C ₃ mm	Number of Rows of Balls	Load Rating dyn. C N	Load Rating stat. C ₀ N	Weight g	Product No. Retaining Ring DIN 471 Page 514	Weight g
646 005 00	646 105 00	5	12	22	12	4	280	210	5	617 412 00	0,5
646 008 00	646 108 00	8	16	25	14	4	490	355	9	617 416 00	0,8
646 012 00	646 112 00	12	22	32	20	6	1160	980	16	617 422 00	1,7
646 016 00	646 116 00	16	26	36	22	6	1500	1290	21	617 426 00	2,1
646 020 00	646 120 00	20	32	45	28	7	2240	2040	43	617 432 00	3,6
646 025 00	646 125 00	25	40	58	40	7	3350	3350	85	617 440 00	6,3
646 030 00	646 130 00	30	47	68	48	7	5600	5700	130	617 447 00	7,8
646 040 00	646 140 00	40	62	80	56	7	9000	8150	260	617 462 00	14,4
646 050 00	646 150 00	50	75	100	72	7	13400	12200	460	617 475 00	21,0

Shaft steel page 478. Shaft blocks
page 487. Precision housings page 493.

Linear Bearings KB-3-0 ISO Series 3, Open Design



Linear bearings series 3 of ISO standard 10285 from premium brand in top quality.

High load-bearing capacity, due to the asymmetric position of the rows of balls and the specially shaped raceway segments.

With shields or wiping double-lip seals.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6, housing tolerance H6 or JS6.

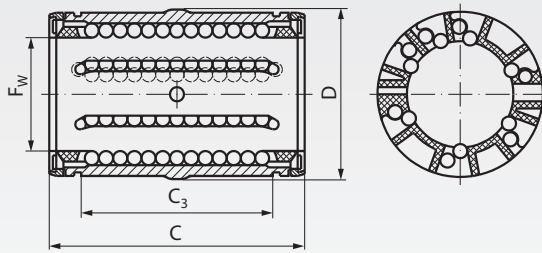
Stainless version on request.

Ordering Details: e.g.: Product No. 646 012 01, Linear Bearing KB-3-0, Internal Ø 12 mm, with Shields

Product No. with Shields	Product No. with Seals	F _w mm	D mm	C mm	C ₃ mm	E mm	α Degrees	Load Rating in N dyn. C stat. C ₀	Weight g
646 012 01	646 112 01	12	22	32	20	7,6	78	1160 980	13
646 016 01	646 116 01	16	26	36	22	10,4	78	1500 1290	17
646 020 01	646 120 01	20	32	45	28	10,8	60	2240 2040	36
646 025 01	646 125 01	25	40	58	40	13,2	60	3350 3350	71
646 030 01	646 130 01	30	47	68	48	14,2	50	5600 5700	114
646 040 01	646 140 01	40	62	80	56	18,7	50	9000 8150	230
646 050 01	646 150 01	50	75	100	72	23,6	50	13400 12200	390

Shaft steel with shaft support page 479.
Precision housings page 493.

Linear Bearings KB-3-A ISO Series 3, Self-Aligning, Closed Design



Self-aligning linear bearings series 3 of ISO standard 10285 from premium brand in top quality.

High load-bearing capacity, due to the asymmetric position of the rows of balls and the specially shaped raceway segments. These linear bearings can be fitted inside a closed or slotted housing and are thus adjustable.

With wiping double-lip seals.

These bearings are self-aligning up to $\pm 0,5^\circ$. All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6, housing tolerance H6 or JS6.

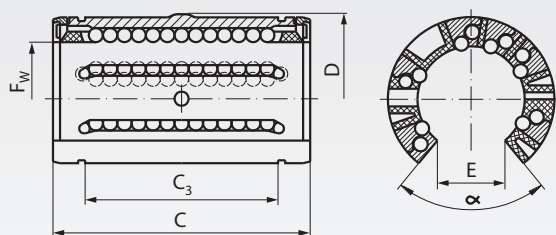
Stainless version on request.

Ordering Details: e.g.: Product No. 646 112 06, Linear Bearing KB-3-A, Internal $\varnothing$ 12 mm

Product No. with Seals	F _w mm	D mm	C ^{-0,02} mm	C ₃ ^{-0,02} mm	Load rating dyn. C N	Load rating stat. C ₀ N	Weight g	Product No.	Weight g
								Retaining Ring DIN 471 Page 514	
646 112 06	12	22	32	20,3	1080	815	15	617 422 00	1,7
646 116 06	16	26	36	22,3	1320	865	20	617 426 00	2,1
646 120 06	20	32	45	28,3	2000	1370	42	617 432 00	3,6
646 125 06	25	40	58	40,4	2900	2040	83	617 440 00	6,3
646 130 06	30	47	68	48,4	4650	3250	130	617 447 00	7,8
646 140 06	40	62	80	56,3	7800	5200	260	617 462 00	14,4
646 150 06	50	75	100	72,3	11200	6950	440	617 475 00	21,0

Shaft steel page 478. Shaft blocks page 487.
Precision housings page 493.

Linear Bearings KB-3-A-0 ISO Series 3, Self-Aligning, Open Design



Self-aligning linear bearings series 3 of ISO standard 10285 from premium brand in top quality.

High load-bearing capacity, due to the asymmetric position of the rows of balls and the specially shaped raceway segments.

With wiping double-lip seals.

These bearings are self-aligning up to $\pm 0,5^\circ$. All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6, housing tolerance H6 or JS6.

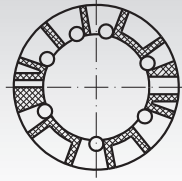
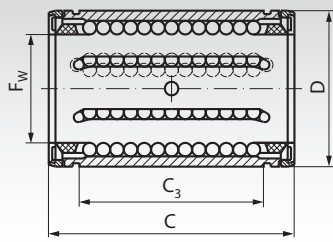
Stainless version on request.

Ordering Details: e.g.: Product No. 646 112 07, Linear Bearing KB-3-A-0, Internal $\varnothing$ 12 mm

Product No. with Seals	F _w mm	D mm	C ^{-0,02} mm	C ₃ ^{-0,02} mm	E mm	α °	Load rating		Weight g
							dyn. C N	stat. C ₀ N	
646 112 07	12	22	32	20,3	7,6	78	1080	815	12
646 116 07	16	26	36	22,3	10,4	78	1320	865	16
646 120 07	20	32	45	28,3	10,8	60	2000	1370	35
646 125 07	25	40	58	40,4	13,2	60	2900	2040	70
646 130 07	30	47	68	48,4	14,2	50	4650	3250	110
646 140 07	40	62	80	56,3	18,7	50	7800	5200	220
646 150 07	50	75	100	72,3	23,6	50	11200	6950	370

Shaft steel with shaft support page 479.
Precision housings page 493.

Linear Bearings KB-3 ISO Series 3, Economy-Line, Closed Design



Linear bearings from reliable brand in good quality at low price.
These linear bearings can be fitted inside a customer's housing or as spare parts for our closed Economy-Line units.

These bearings are self-aligning up to $\pm 0,5^\circ$.
All bearings must be lubricated before use.
Recommended shaft tolerance h6, housing tolerance H6 or JS6.

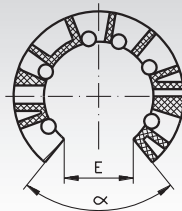
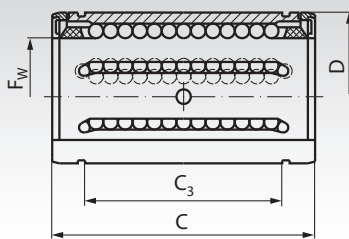
With wiping double-lip seals.

Ordering Details: e.g.: Product No. 646 112 02, Linear Bearing KB-3, Economy-Line, Internal $\varnothing$ 12 mm

Product No. with Seals	F_w mm	D mm	$C_{-0,02}$ mm	$C_3^{-0,02}$ mm	Load rating dyn. C N	Load rating stat. C_0 N	Weight g	Product No.	Weight g
								Retaining Ring DIN 471 Page 514	
646 112 02	12	22	32	20,3	1020	1290	16	617 422 00	1,7
646 116 02	16	26	36	22,3	1250	1550	21	617 426 00	2,1
646 120 02	20	32	45	28,3	2090	2630	43	617 432 00	3,6
646 125 02	25	40	58	40,4	3780	4720	85	617 440 00	6,3
646 130 02	30	47	68	48,4	5470	6810	130	617 447 00	7,8
646 140 02	40	62	80	56,3	6590	8230	260	617 462 00	14,4
646 150 02	50	75	100	72,3	10800	13500	460	617 475 00	21,0

Shaft steel page 478. Shaft blocks page 487.
Precision housings page 493.

Linear Bearings KB-3-0 ISO Series 3, Economy-Line, Open Design



Linear bearings from reliable brand in good quality at low price.
These linear bearings can be fitted inside a customer's housing or as spare parts for our open Economy-Line units.

These bearings are self-aligning up to $\pm 0,5^\circ$.
All bearings must be lubricated before use.
Recommended shaft tolerance h6, housing tolerance H6 or JS6.

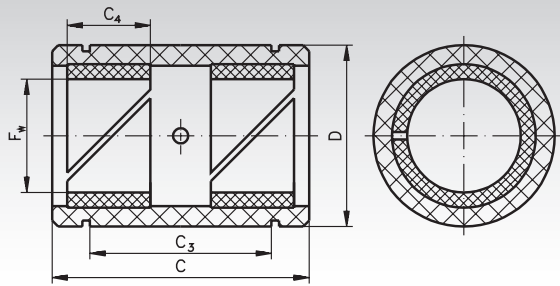
With wiping double-lip seals.

Ordering Details: e.g.: Product No. 646 112 03, Linear Bearing KB-3, Economy-Line, Open Design, Internal $\varnothing$ 12 mm

Product No. with Seals	F_w mm	D mm	$C_{-0,02}$ mm	$C_3^{-0,02}$ mm	E mm	α °	Load rating		Weight g
							dyn. C N	stat. C_0 N	
646 112 03	12	22	32	20,3	6,5	66	1020	1290	13
646 116 03	16	26	36	22,3	9,0	68	1250	1550	17
646 120 03	20	32	45	28,3	9,0	55	2090	2630	36
646 125 03	25	40	58	40,4	11,5	57	3780	4720	71
646 130 03	30	47	68	48,4	14,0	57	5470	6810	114
646 140 03	40	62	80	56,3	19,5	56	6590	8230	230
646 150 03	50	75	100	72,3	22,5	54	10800	13500	390

Shaft steel with shaft support page 479.
Precision housings page 493.

Linear Slide Bearings PO-3 Made from Plastic, ISO Series 3, Closed Design



External dimensions like ISO Series 3 from premium brand in top quality. The sliding material is polyacetal with a specific polyethylene. The linear slide bearings should be specifically chosen if, due to unusual operating conditions, linear bearings cannot be used.

Linear slide bearings feature the same mounting and securing options as the linear bearings of the ISO Series 3 and can be fitted in the same housings.

Tolerances: Mounting hole H6, shaft h6.

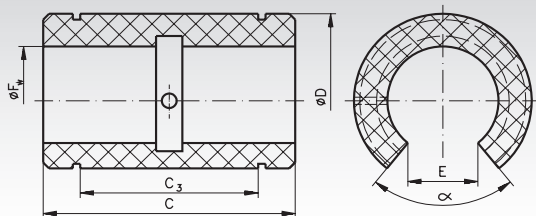
Temperature range: -40°C to +80°C.

Ordering Details: e.g.: Product No. 646 205 00, Linear Slide Bearings PO-3, Internal Ø 5 mm

Product No. Closed	F _w mm	D mm	C mm	C ₃ mm	C ₄ mm	Load Rating dyn. C		Load Rating static C ₀ N	Weight g	Product No. Retaining Ring DIN 471 Page 514	Weight g
						at 0.1m/s N	at 4m/s N				
646 205 00	5	12	22	12	7	280	7	980	3	617 412 00	0,5
646 208 00	8	16	25	14	8	510	13	1800	5	617 416 00	0,8
646 212 00	12	22	32	20	10	965	24	3350	12	617 422 00	1,7
646 216 00	16	26	36	22	12	1530	38	5400	16	617 426 00	2,1
646 220 00	20	32	45	28	15	2400	60	8300	30	617 432 00	3,6
646 225 00	25	40	58	40	20	4000	100	14000	60	617 440 00	6,3
646 230 00	30	47	68	48	23	5500	137	19300	90	617 447 00	7,8
646 240 00	40	62	80	56	25	8000	200	28000	200	617 462 00	14,4
646 250 00	50	75	100	72	30	12000	300	41500	340	617 475 00	21,0

Shaft steel page 478. Shaft blocks page 487.
Precision housings page 493.

Linear Slide Bearings PO-3-0 Made from Plastic, ISO Series 3, Open Design



External dimensions like ISO Series 3 from premium brand in top quality. The sliding material is polyacetal with a specific polyethylene. The linear slide bearings should be specifically chosen if, due to unusual operating conditions, linear bearings cannot be used.

Linear slide bearings feature the same mounting and securing options as the linear bearings of the ISO Series 3 and can be fitted in the same housings.

Tolerances: Mounting hole H6, shaft h6.

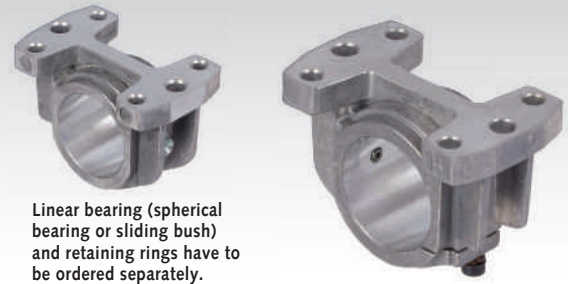
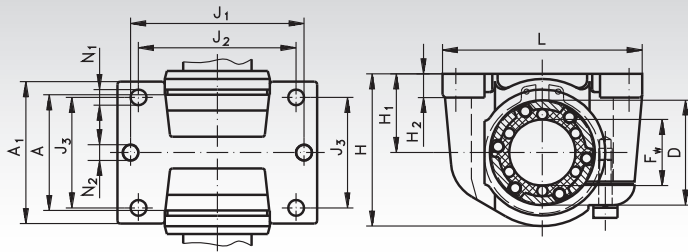
Temperature range: -40°C to +80°C.

Ordering Details: e.g.: Product No. 646 212 01, Linear Slide Bearings PO-3-0, Internal Ø 12 mm

Product No. Open	F _w mm	D mm	C mm	C ₃ mm	E mm	α Degrees	Load Rating dyn. C		Load Rating static C ₀ N	Weight g
							at 0.1m/s N	at 4m/s N		
646 212 01	12	22	32	20	7,6	78	965	24	3350	8
646 216 01	16	26	36	22	10,4	78	1530	38	5400	12
646 220 01	20	32	45	28	10,8	60	2400	60	8300	23
646 225 01	25	40	58	40	13,2	60	4000	100	14000	45
646 230 01	30	47	68	48	14,2	50	5500	137	19300	70
646 240 01	40	62	80	56	18,7	50	8000	200	28000	150
646 250 01	50	75	100	72	23,6	50	12000	300	41500	260

Shaft steel with shaft support page 479.
Precision housings page 493.

Precision Housings KG for Linear Bearings of Closed Design, ISO Series 3



Linear bearing (spherical bearing or sliding bush) and retaining rings have to be ordered separately.

Material: Aluminium die-cast.

Light housing for linear bearings of closed design, ISO Series 3 (linear bearing has to be ordered separately).

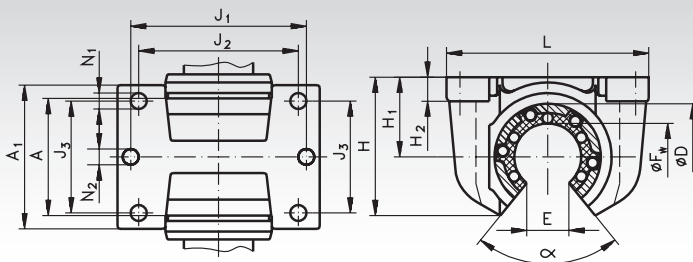
The housings can be mounted standing, upside-down or horizontally. The bearing is secured in the housing against axial and radial movement with a grease nipple. At the slotted housing, the desired radial clearance can be set with an adjusting screw during the mounting.

Ordering Details: e.g.: Product No. 646 508 00, Precision Housing KG, D = 16 mm, Closed

Product No. Closed	Product No. Slotted	F _w	D	A	A ₁	H	H ₁ ±0,01	H ₂	J ₁	J ₂	J ₃	L	N ₁	N ₂	Weight g	Product No. Matching Spherical Bearing or Slide Bearing			Product No. Retaining Ring	Weight
																Spher. Bear. /	Spher. Bear. /	Slide Bear.	DIN 471 Page 514	g
646 508 00	646 608 00	8	16	14	27	28	15	5,5	35	25	20	45	3,2	5,3	18	646 008 00/ 646 108 00/ 646 208 00	617 416 00	0,8		
646 512 00	646 612 00	12	22	20	31	34,5	18	6	42	32	23	52	4,3	5,3	38	646 012 00/ 646 112 00/ 646 212 00	617 422 00	1,7		
646 516 00	646 616 00	16	26	22	34,5	40,5	22	7	46	40	26	56	4,3	5,3	54	646 016 00/ 646 116 00/ 646 216 00	617 426 00	2,1		
646 520 00	646 620 00	20	32	28	41	48	25	8	58	45	32	70	4,3	6,4	100	646 020 00/ 646 120 00/ 646 220 00	617 432 00	3,6		
646 525 00	646 625 00	25	40	40	52	58	30	10	68	60	40	80	5,3	6,4	200	646 025 00/ 646 125 00/ 646 225 00	617 440 00	6,3		
646 530 00	646 630 00	30	47	48	59	67	35	10	76	68	45	88	6,4	6,4	300	646 030 00/ 646 130 00/ 646 230 00	617 447 00	7,8		
646 540 00	646 640 00	40	62	56	74	85	45	12	94	86	58	108	8,4	8,4	460	646 040 00/ 646 140 00/ 646 240 00	617 462 00	14,4		
646 550 00	646 650 00	50	75	72	66	99	50	14	116	108	50	135	8,4	10,5	750	646 050 00/ 646 150 00/ 646 250 00	617 475 00	21,0		

Shaft steel page 478. Shaft blocks page 487.

Precision Housings KG-0 for Linear Bearings of Open Design, ISO Series 3



Linear bearing (spherical bearing or sliding bush) have to be ordered separately.



Material: Aluminium die-cast.

Light housing for linear bearings of open design, ISO Series 3 (linear bearing has to be ordered separately).

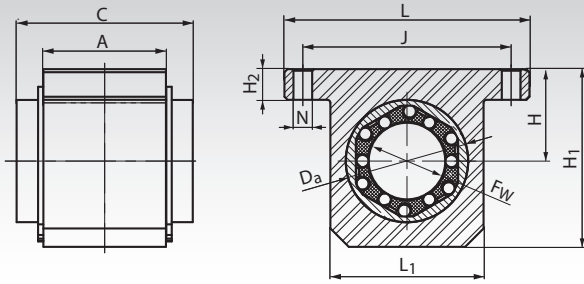
The housings can be mounted standing, upside-down or horizontally. The bearing is secured in the housing against axial and radial movement with a grease nipple.

Ordering Details: e.g.: Product No. 646 512 01, Precision Housing KG-O, D = 22 mm, Open

Product-No. Open	F _w mm	D mm	A mm	A ₁ mm	H±0,01 mm	H ₁ mm	H ₂ mm	J ₁ mm	J ₂ mm	J ₃ mm	L mm	N ₁ mm	N ₂ mm	E mm	α Grad	Gewicht g	Product-No. Matching Bearing		
																	Spher. Bear./	Spher. Bear. /	Slide Bear
646 512 01	12	22	20	31	28	18	6	42	32	23	52	4,3	5,3	7,6	78	33	646 012 01	646 112 01	646 212 01
646 516 01	16	26	22	34,5	35	22	7	46	40	26	56	4,3	5,3	10,4	78	44	646 016 01	646 116 01	646 216 01
646 520 01	20	32	28	41	42	25	8	58	45	32	70	4,3	6,4	10,8	60	88	646 020 01	646 120 01	646 220 01
646 525 01	25	40	40	52	51	30	10	68	60	40	80	5,3	6,4	13,2	60	180	646 025 01	646 125 01	646 225 01
646 530 01	30	47	48	59	60	35	10	76	68	45	88	6,4	6,4	14,2	50	260	646 030 01	646 130 01	646 230 01
646 540 01	40	62	56	74	77	45	12	94	86	58	108	8,4	8,4	18,7	50	400	646 040 01	646 140 01	646 240 01
646 550 01	50	75	72	66	88	50	14	116	108	50	135	8,4	10,5	23,6	50	650	646 050 01	646 150 01	646 250 01

Shaft steel with shaft support page 479.

Linear Bearings Units KG-3-K ISO Series 3, Short Version, with Linear Bearing of Closed Design



Material: Housing made from extruded aluminium with a closed linear bearing of the ISO Series 3 from reliable brand in good quality. Self-aligning capability that accommodates tilting.

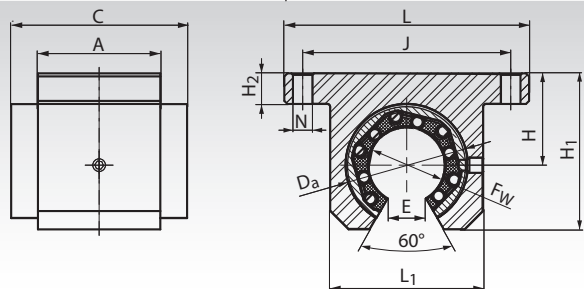
All bearings are lubricated ready-to-install.
Recommended shaft tolerance h6.
Spare linear bearing page 491.

Ordering Details: e.g.: Product No. 646 712 04, Linear Bearings Unit KG-3-K, Short Version, Internal Ø 12 mm

Product No. Closed	F _w mm	A mm	C mm	D _a mm	H±0,015 mm	H ₁ mm	H ₂ mm	J mm	L mm	L ₁ mm	N mm	Load dyn. C N	Rating stat. C ₀ N	Weight g
646 712 04	12	20	32	22	18	35	6	42	52	30	5,3	1020	1290	90
646 716 04	16	22	36	26	22	40,5	7	46	56	34	5,3	1250	1550	120
646 720 04	20	28	45	32	25	48	8	58	70	40	6,4	2090	2630	250
646 725 04	25	40	58	40	30	58	10	68	80	50	6,4	3780	4720	490
646 730 04	30	48	68	47	35	67	10	76	88	58	6,4	5470	6810	780
646 740 04	40	56	80	62	45	85	12	94	108	74	8,4	6590	8230	1280
646 750 04	50	72	100	75	50	100	12	116	135	96	10,5	10800	13500	1700

Shaft steel page 478. Shaft blocks page 487.

Linear Bearings Units KG-3-KO ISO Series 3, Short Version, with Linear Bearing of Open Design



Material: Housing made from extruded aluminium with an open linear bearing of the ISO Series 3 from reliable brand in good quality. Self-aligning capability that accommodates tilting.

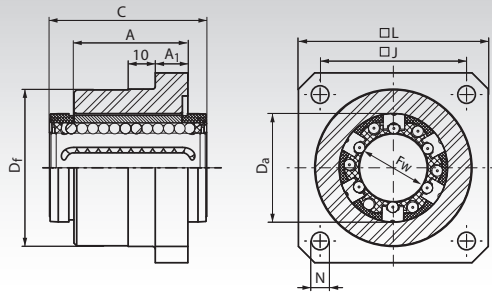
All bearings are lubricated ready-to-install.
Recommended shaft tolerance h6.
Spare linear bearing page 491.

Ordering Details: e.g.: Product No. 646 712 05, Linear Bearings Unit KG-3-KO, Short Version, Internal Ø 12 mm

Product No. Open	F _w mm	A mm	C mm	D _a mm	H±0,015 mm	H ₁ mm	H ₂ mm	J mm	L mm	L ₁ mm	E mm	N mm	Load Rating dyn. C N	stat. C ₀ N	Weight g
646 712 05	12	20	32	22	18	28	6	42	52	30	7,5	5,3	1020	1290	90
646 716 05	16	22	36	26	22	33,5	7	46	56	34	10	5,3	1250	1550	120
646 720 05	20	28	45	32	25	42	8	58	70	40	10	6,4	2090	2630	250
646 725 05	25	40	58	40	30	51	10	68	80	50	12,5	6,4	3780	4720	490
646 730 05	30	48	68	47	35	60	10	76	88	58	12,5	6,4	5470	6810	780
646 740 05	40	56	80	62	45	77	12	94	108	74	16,8	8,4	6590	8230	1280
646 750 05	50	72	100	75	50	93	12	116	135	96	21	10,5	10800	13500	1700

Shaft steel with shaft support page 479.

Linear Bearings Units KG-3-F ISO Series 3, Flange Version, with Linear Bearing of Closed Design



Material: Housing made from extruded aluminium with a closed linear bearing of the ISO Series 3 from reliable brand in good quality. Self-aligning capability that accommodates tilting.

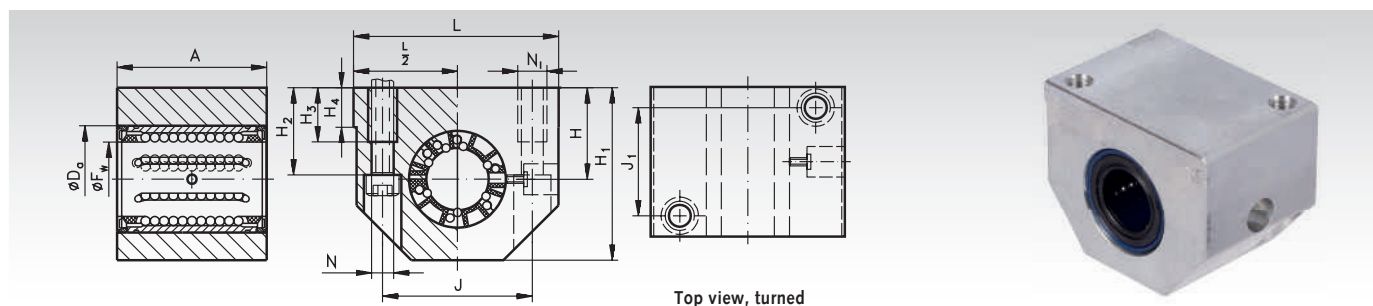
All bearings are lubricated ready-to-install.
Recommended shaft tolerance h6.
Spare linear bearing page 491.

Ordering Details: e.g.: Product No. 646 712 06, Linear Bearings Unit KG-3-F, Flange Version, Internal Ø 12 mm

Product No.	F _w mm	A mm	A ₁ mm	C mm	D _a mm	D _f ^{g7} mm	J mm	L mm	N mm	Load Rating		Weight g
										dyn. C N	stat. C ₀ N	
646 712 06	12	22	6	32	22	32	30	40	5,5	1020	1290	90
646 716 06	16	24	8	36	26	38	35	50	5,5	1250	1550	120
646 720 06	20	30	10	45	32	46	42	60	6,6	2090	2630	250
646 725 06	25	42	12	58	40	58	54	70	6,6	3780	4720	490
646 730 06	30	50	14	68	47	66	60	80	9	5470	6810	780
646 740 06	40	59	16	80	62	90	78	100	11	6590	8230	1280

Shaft steel page 478. Shaft blocks page 487.

Linear Bearings Units KG-3 ISO Series 3, with Linear Bearing of Closed Design



Top view, turned

Material: Housing made from extruded aluminium with a closed linear bearing of the ISO Series 3 from premium brand in top quality. With self-aligning capability that accommodates tilting.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6.

Spare linear bearing page 490.

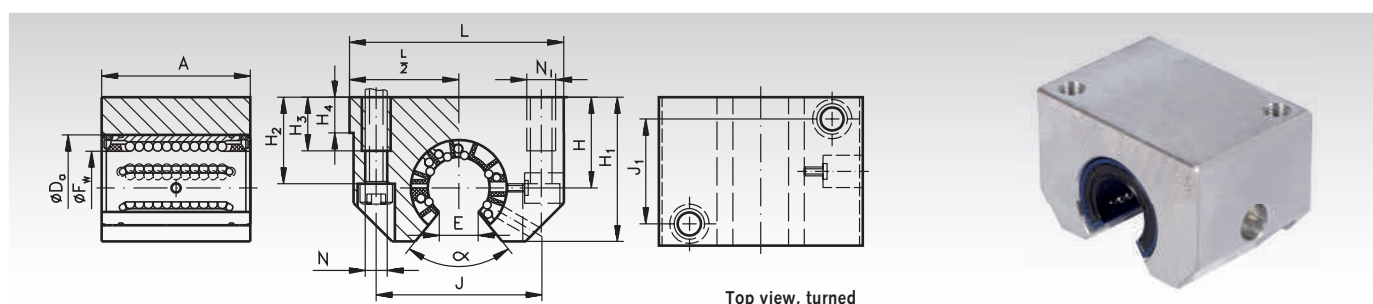
Ordering Details: e.g.: Product No. 646 712 00, Linear Bearings Unit KG-3, Internal Ø 12 mm

Product No. Closed	F _w mm	A mm	D _a mm	H _{±0.02} mm	H ₁ mm	H ₂ mm	H ₃ mm	H ₄ mm	J mm	J ₁ mm	L mm	N mm	N ₁ * mm	Load Rating		Weight g
														dyn. C N	stat. C ₀ N	
646 712 00	12	32	22	18	35	16,5	11	6	32	23	43	4,3	M5	1080	815	93
646 716 00	16	37	26	22	42	21	13	7	40	26	53	5,3	M6	1320	865	161
646 720 00	20	45	32	25	50	24	18	7,5	45	32	60	6,6	M8	2000	1370	225
646 725 00	25	58	40	30	61	29	22	8,5	60	40	78	8,4	M10	2900	2040	533
646 730 00	30	68	47	35	70	34	22	9,5	68	45	87	8,4	M10	4650	3250	790
646 740 00	40	80	62	45	90	44	26	11	86	58	108	10,5	M12	7800	5200	1440
646 750 00	50	100	75	50	105	49	35	11	108	50	132	13,5	M16	11200	6950	2470

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel page 478. Shaft blocks page 487.

Linear Bearings Units KG-3-O ISO Series 3, with Linear Bearing of Open Design



Top view, turned

Material: Housing made from extruded aluminium with an open linear bearing of the ISO Series 3 from premium brand in top quality. With self-aligning capability that accommodates tilting, adjustable clearance and double-lip seals.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6.

Spare linear bearing page 490.

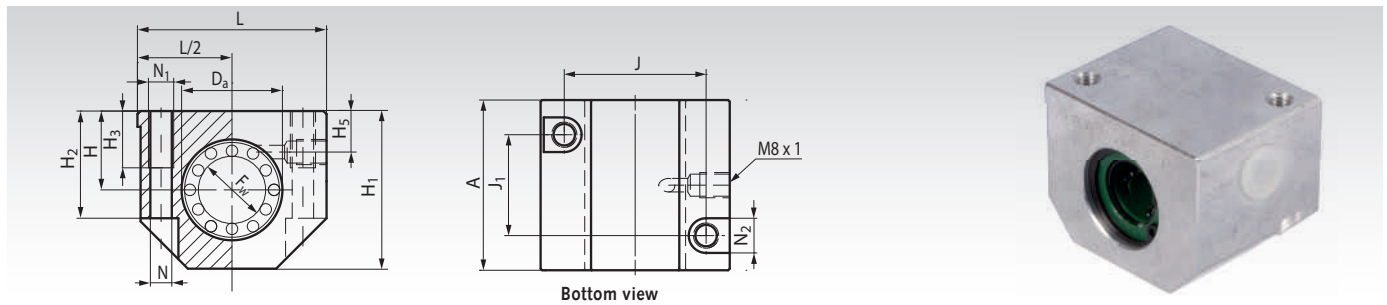
Ordering Details: e.g.: Product No. 646 712 01, Linear Bearings Unit KG-3-O, Internal Ø 12 mm

Product No. Open	F _w mm	A mm	D _a mm	H _{±0.02} mm	H ₁ mm	H ₂ mm	H ₃ mm	H ₄ mm	J mm	J ₁ mm	L mm	N mm	N ₁ * mm	E mm	α Degrees	Load Rating		Weight g
																dyn. C N	stat. C ₀ N	
646 712 01	12	32	22	18	28	16,5	11	6	32	23	43	4,3	M5	7,6	78	1080	815	74
646 716 01	16	37	26	22	35	21	13	7	40	26	53	5,3	M6	10,4	78	1320	865	132
646 720 01	20	45	32	25	42	24	18	7,5	45	32	60	6,6	M8	10,8	60	2000	1370	215
646 725 01	25	58	40	30	51	29	22	8,5	60	40	78	8,4	M10	13,2	60	2900	2040	443
646 730 01	30	68	47	35	60	34	22	9,5	68	45	87	8,4	M10	14,2	50	4650	3250	670
646 740 01	40	80	62	45	77	44	26	11	86	58	108	10,5	M12	18,7	50	7800	5200	1210
646 750 01	50	100	75	50	88	49	35	11	108	50	132	13,5	M16	23,6	50	11200	6950	2020

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel with shaft support page 479.

Linear Bearings Units KG-3 ISO Series 3, Economy-Line, with Linear Bearing of Closed Design



Material: Housing made from extruded aluminium with a closed linear bearing of the ISO Series 3 from reliable brand in good quality at low price. Self-aligning capability that accommodates tilting.

All bearings are lubricated ready-to-install.
Recommended shaft tolerance h6.
Spare linear bearing page 491.

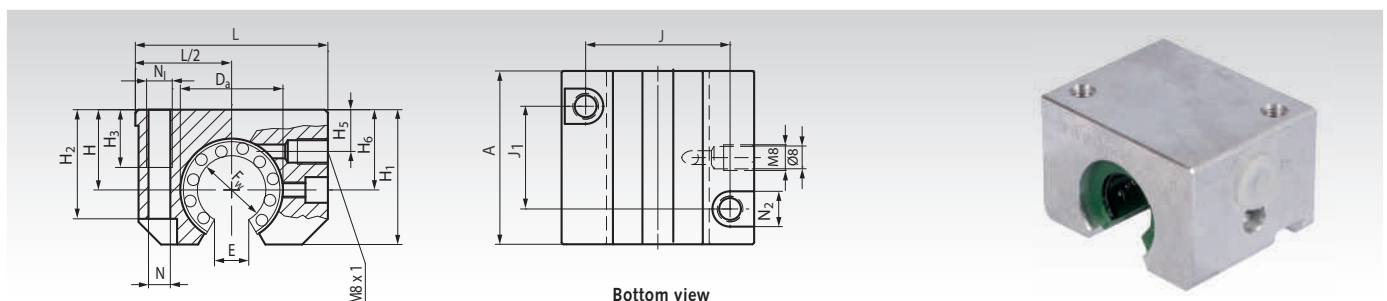
Ordering Details: e.g.: Product No. 646 712 02, Linear Bearings Unit KG-3, Economy-Line, Internal Ø 12 mm

Product No. closed	F _w mm	A mm	D _a mm	H _{±0,02} mm	H ₁ mm	H ₂ mm	H ₃ mm	H ₅ mm	J mm	J ₁ mm	L mm	N mm	N ₁ * mm	N ₂ mm	Load Rating dyn. C N	Rating stat. C ₀ N	Weight g
646 712 02	12	39	22	18	35	25	13	10	32	23	43	4,2	M5	8	1020	1290	130
646 716 02	16	43	26	22	42	30	13	12	40	26	53	5,2	M6	10	1250	1550	200
646 720 02	20	54	32	25	50	34	18	13	45	32	60	6,8	M8	11	2090	2630	330
646 725 02	25	67	40	30	60	40	22	15	60	40	78	8,6	M10	15	3780	4720	670
646 730 02	30	79	47	35	70	48	22	16	68	45	87	8,6	M10	15	5470	6810	1010
646 740 02	40	91	62	45	90	60	26	20	86	58	108	10,3	M12	18	6590	8230	1810
646 750 02	50	113	75	50	105	49	34	20	108	50	132	14,25	M16	20	10800	13500	2930

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel page 478. Shaft blocks page 487.

Linear Bearings Units KG-3-O ISO Series 3, Economy-Line, with Linear Bearing of Open Design



Material: Housing made from extruded aluminium with an open linear bearing of the ISO Series 3 from reliable brand in good quality at low price. Self-aligning capability that accommodates tilting.

All bearings are lubricated ready-to-install.
Recommended shaft tolerance h6.
Spare linear bearing page 491.

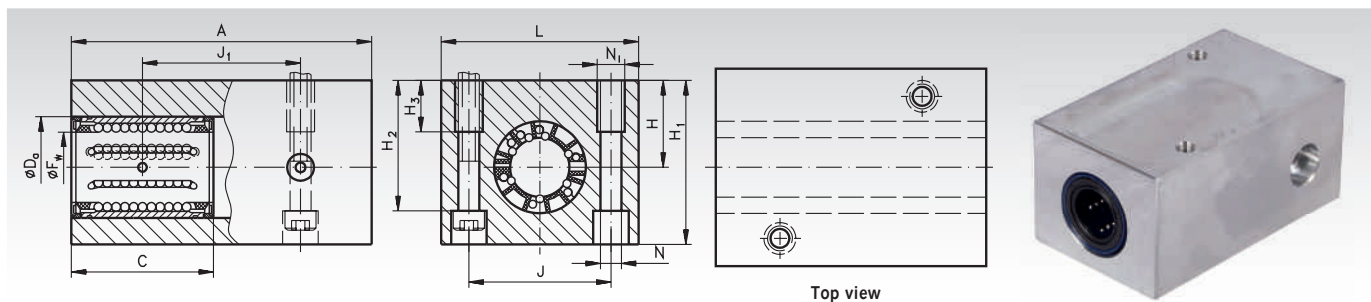
Ordering Details: e.g.: Product No. 646 712 03, Linear Bearings Unit KG-3-O, Economy-Line, Internal Ø 12 mm

Product No. open	F _w mm	A mm	D _a mm	H _{±0,02} mm	H ₁ mm	H ₂ mm	H ₃ mm	H ₅ mm	H ₆ mm	J mm	J ₁ mm	L mm	N mm	N ₁ * mm	N ₂ mm	E mm	Load Rating dyn. C N	Rating stat. C ₀ N	Weight g
646 712 03	12	39	22	18	28	23,5	11	8	16,7	32	23	43	4,2	M5	8	6,5	1020	1290	100
646 716 03	16	43	26	22	35	30	13	12	22,0	40	26	53	5,2	M6	10	9,0	1250	1550	170
646 720 03	20	54	32	25	42	34	18	13	25,0	45	32	60	6,8	M8	11	9,0	2090	2630	280
646 725 03	25	67	40	30	51	40	22	15	31,5	60	40	78	8,6	M10	15	11,5	3780	4720	570
646 730 03	30	79	47	35	60	48	22	16	33,0	68	45	87	8,6	M10	15	14,0	5470	6810	870
646 740 03	40	91	62	45	77	60	26	20	45,5	86	58	108	10,3	M12	28	19,5	6590	8230	1560
646 750 03	50	113	75	50	88	49	34	20	47,5	108	50	132	14,25	M16	20	22,5	10800	13500	2480

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel with shaft support page 479.

Tandem Linear-Bearing Units KGT-3 ISO Series 3, with Linear Bearings of Closed Design



Material: Housing made from extruded aluminium with two closed linear bearings of the ISO Series 3 from premium brand in top quality. With self-aligning capability that accommodates tilting and double-lip seals.

All bearings are lubricated ready-to-install.
Recommended shaft tolerance h6.
Spare linear bearing page 490.

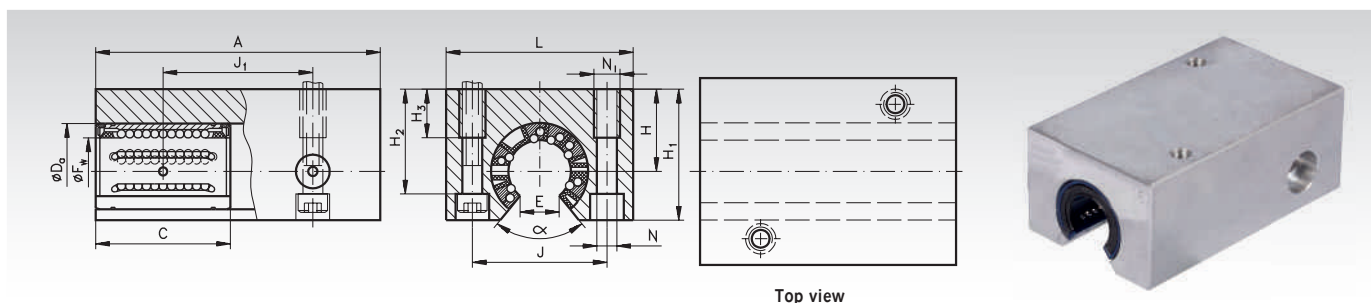
Ordering Details: e.g.: Product No. 646 812 00, Linear Bearings Unit KGT-3, Internal Ø 12 mm

Product No. Closed	F _w mm	A mm	C mm	D _a mm	H ₂ ±0.01 mm	H ₁ mm	H ₂ mm	H ₃ mm	J mm	J ₁ mm	L mm	N mm	N ₁ * mm	Load Rating dyn. C N	stat. C ₀ N	Weight g
646 812 00	12	76	32	22	18	35	27	13	30	40	42	5,3	M6	1760	1630	236
646 816 00	16	84	36	26	22	41,5	33	13	36	45	50	5,3	M6	2160	1730	372
646 820 00	20	104	45	32	25	49,5	39,5	18	45	55	60	6,4	M8	3200	2750	670
646 825 00	25	130	58	40	30	59,5	47	22	54	70	74	8,4	M10	4750	4150	1236
646 830 00	30	152	68	47	35	69,5	55	26	62	85	84	10,5	M12	7500	6550	1870
646 840 00	40	176	80	62	45	89,5	71	34	80	100	108	13	M16	12700	10400	3550
646 850 00	50	224	100	75	50	99,5	81	34	100	125	130	13	M16	18300	14000	5920

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel page 478. Shaft blocks page 487.

Tandem Linear-Bearing Units KGT-3-0 ISO Series 3, with Linear Bearings of Open Design



Material: Housing made from extruded aluminium with two open linear bearings of the ISO Series 3 from premium brand in top quality. With self-aligning capability that accommodates tilting and double-lip seals.

All bearings are lubricated ready-to-install.
Recommended shaft tolerance h6.
Spare linear bearing page 490.

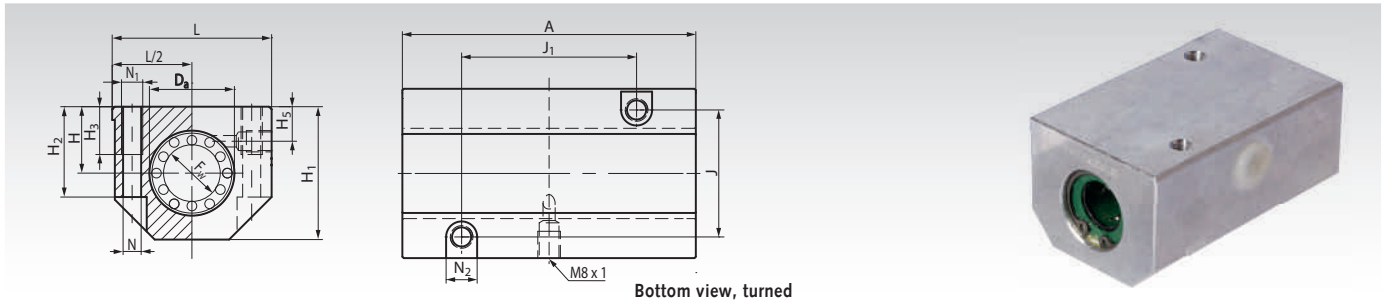
Ordering Details: e.g.: Product No. 646 812 01, Linear Bearings Unit KGT-3-0, Internal Ø 12 mm

Product No. Open	F _w mm	A mm	C mm	D _a mm	H ₂ ±0.02 mm	H ₁ mm	H ₂ mm	H ₃ mm	J mm	J ₁ mm	L mm	N mm	N ₁ * mm	E mm	α Degrees	Load Rating dyn. C N	stat. C ₀ N	Weight g
646 812 01	12	76	32	22	18	29	23,5	13	30	40	42	5,3	M6	7,6	78	1760	1630	178
646 816 01	16	84	36	26	22	35	28	13	36	45	50	5,3	M6	10,4	78	2160	1730	284
646 820 01	20	104	45	32	25	42	33,5	18	45	55	60	6,4	M8	10,8	60	3200	2750	620
646 825 01	25	130	58	40	30	51	40	22	54	70	74	8,4	M10	13,2	60	4750	4150	966
646 830 01	30	152	68	47	35	60	46,5	26	62	85	84	10,5	M12	14,2	50	7500	6550	1490
646 840 01	40	176	80	62	45	77	61	34	80	100	108	13	M16	18,7	50	12700	10400	2810
646 850 01	50	224	100	75	50	88	72	34	100	125	130	13	M16	23,6	50	18300	14000	4830

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel with shaft support page 479.

Tandem Linear-Bearing Units KGT-3 ISO Series 3, Economy-Line, with Linear Bearings of Closed Design



Material: Housing made from extruded aluminium with two closed linear bearings of the ISO Series 3 from reliable brand in good quality at low price. Self-aligning capability that accommodates tilting.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6.

Spare linear bearing page 491.

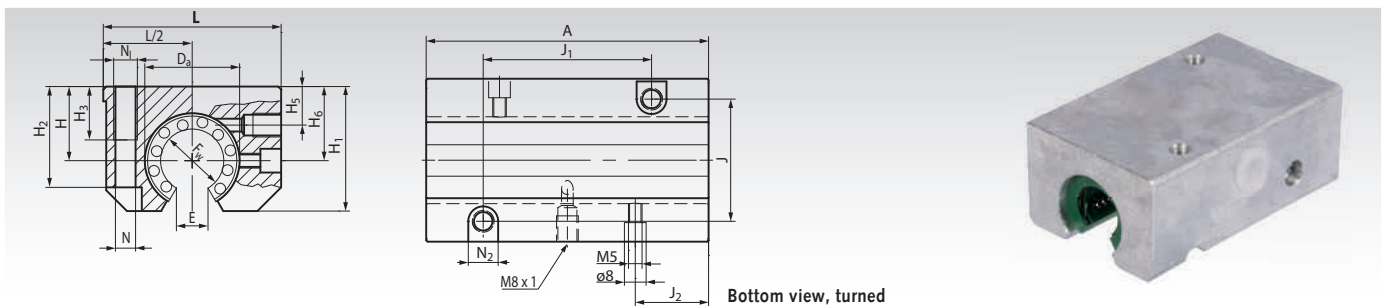
Ordering Details: e.g.: Product No. 646 812 02, Linear Bearings Unit KGT-3, Economy-Line, Internal Ø 12 mm

Product No. closed	F _w mm	A mm	D _a mm	H±0.02 mm	H ₁ mm	H ₂ mm	H ₃ mm	J mm	J ₁ mm	L mm	N mm	N ₁ * mm	N ₂ mm	Load Rating		Weight g
														dyn. C N	stat. C ₀ N	
646 812 02	12	76	22	18	35	25	13	30	40	43	5,2	M6	10	1660	2580	250
646 816 02	16	84	26	22	42	30	13	36	45	53	5,2	M6	10	2030	3100	410
646 820 02	20	104	32	25	50	34	18	45	55	60	6,8	M8	11	3400	5260	640
646 825 02	25	130	40	30	60	40	22	54	70	78	8,6	M10	15	6160	9440	1290
646 830 02	30	152	47	35	70	48	26	62	85	87	10,3	M12	18	8610	13620	1970
646 840 02	40	176	62	45	90	60	34	80	100	108	14,25	M16	20	10740	16460	3520
646 850 02	50	224	75	50	105	49	34	100	125	132	14,25	M16	20	17600	27000	5860

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel page 478. Shaft blocks page 487.

Tandem Linear-Bearing Units KGT-3-0 ISO Series 3, Economy-Line, with Linear Bearings of Open Design



Material: Housing made from extruded aluminium with two open linear bearings of the ISO Series 3 from reliable brand in good quality at low price. Self-aligning capability that accommodates tilting.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6.

Spare linear bearing page 491.

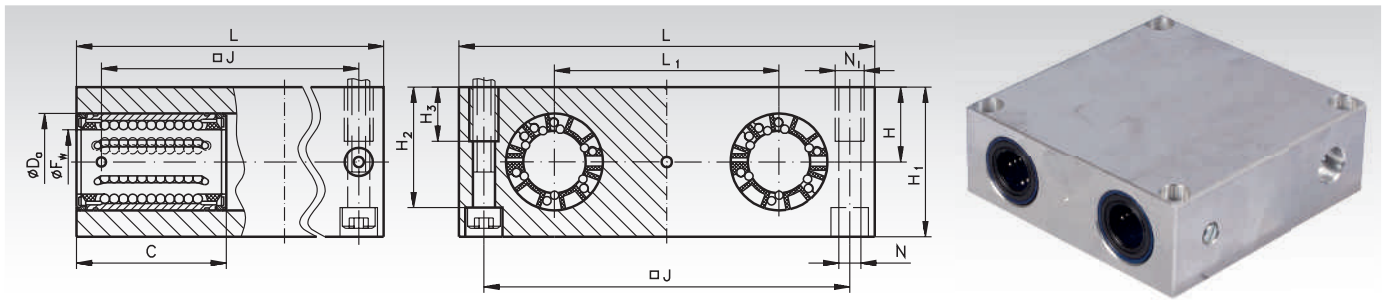
Ordering Details: e.g.: Product No. 646 812 03, Linear Bearings Unit KGT-3-0, Economy-Line, Internal Ø 12 mm

Product No. open	F _w mm	A mm	D _a mm	H±0.02 mm	H ₁ mm	H ₂ mm	H ₃ mm	H ₆ mm	J mm	J ₁ mm	J ₂ mm	L mm	N mm	N ₁ * mm	N ₂ mm	E mm	Load Rating		Weight g
																	dyn. C N	stat. C ₀ N	
646 812 03	12	76	22	18	30	25	13	16,7	30	40	19,5	43	5,2	M6	10	6,5	1660	2580	210
646 816 03	16	84	26	22	35	30	13	22,0	36	45	21,5	53	5,2	M6	10	9,0	2030	3100	340
646 820 03	20	104	32	25	42	34	18	25,0	45	55	27,0	60	6,8	M8	11	9,0	3400	5260	560
646 825 03	25	130	40	30	51	40	22	31,5	54	70	33,5	78	8,6	M10	15	11,5	6160	9440	1140
646 830 03	30	152	47	35	60	48	26	33,0	62	85	39,5	87	10,3	M12	18	14,0	8910	13620	1670
646 840 03	40	176	62	45	77	60	34	43,5	80	100	45,0	108	14,25	M16	20	19,5	10740	16460	3020
646 850 03	50	224	75	50	88	49	34	47,5	100	125	56,5	132	14,25	M16	20	22,5	17600	27000	5010

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel with shaft support page 479.

Quadro Linear-Bearing Units KGQ-3 ISO Series 3, with Linear Bearings of Closed Design



Material: Housing made from extruded aluminium with four closed linear bearings of the ISO Series 3 from premium brand in top quality. With self-aligning capability that accommodates tilting and double-lip seals.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6.

Spare linear bearing page 490.

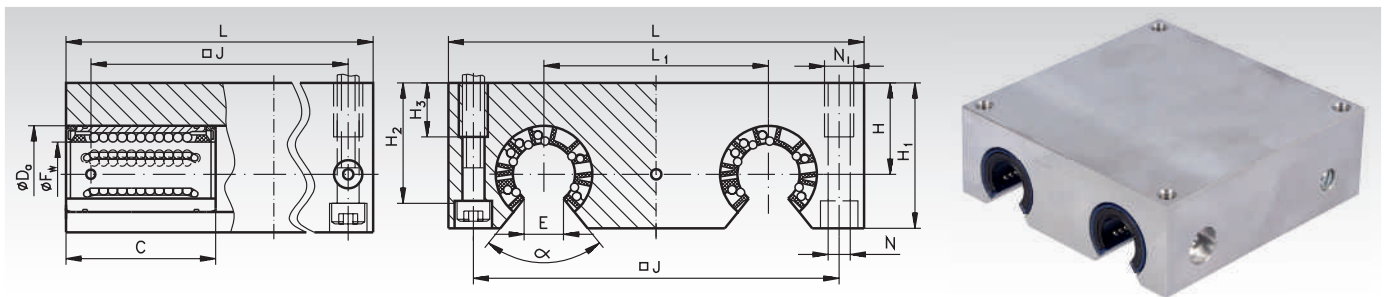
Ordering Details: e.g.: Product No. 646 912 00, Linear Bearings Unit KGQ-3, Internal Ø 12 mm

Product No. Closed	F _w mm	C mm	D _a mm	H±0.02 mm	H ₁ mm	H ₂ mm	H ₃ mm	J mm	L mm	L ₁ mm	N mm	N ₁ * mm	Load Rating		Weight g
													dyn. C N	stat. C ₀ N	
646 912 00	12	32	22	16	32	25	13	73	85	42	5,3	M6	2850	3250	492
646 916 00	16	36	26	18	36	29	13	88	100	54	5,3	M6	3450	3450	744
646 920 00	20	45	32	23	46	37,5	18	115	130	72	6,6	M8	5200	5500	1680
646 925 00	25	58	40	28	56	45	22	140	160	88	8,4	M10	7650	8150	3022
646 930 00	30	68	47	32	64	50,5	26	158	180	96	10,5	M12	12200	12900	4270
646 940 00	40	80	62	40	80	64	34	202	230	122	13,5	M16	20800	20800	8380
646 950 00	50	100	75	48	96	80	34	250	280	152	13,5	M16	30000	28000	14990

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel page 478. Shaft blocks page 487.

Quadro Linear-Bearing Units KGQ-3-0 ISO Series 3, with Linear Bearings of Open Design



Material: Housing made from extruded aluminium with four open linear bearings of the ISO Series 3 from premium brand in top quality. With self-aligning capability that accommodates tilting and double-lip seals.

All bearings are lubricated ready to install.

Recommended shaft tolerance h6.

Spare linear bearing page 490.

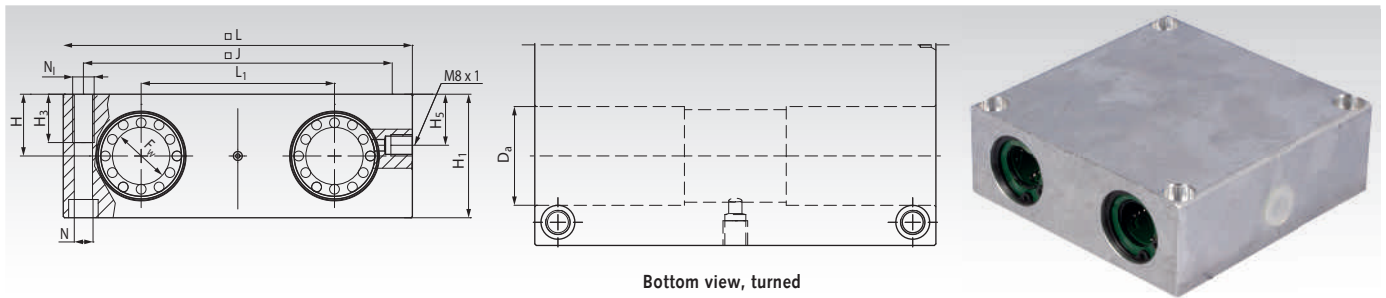
Ordering Details: e.g.: Product No. 646 912 01, Linear Bearings Unit KGQ-3-0, Internal Ø 12 mm

Product No. Open	F _w mm	C mm	D _a mm	H±0.02 mm	H ₁ mm	H ₂ mm	H ₃ mm	J mm	L mm	L ₁ mm	N mm	N ₁ * mm	E mm	α Degrees	Load Rating		Weight g
															dyn. C N	stat. C ₀ N	
646 912 01	12	32	22	18	30	23,4	13	73	85	42	5,3	M6	7,6	78	2850	3250	426
646 916 01	16	36	26	22	35	28,4	13	88	100	54	5,3	M6	10,4	78	3450	3450	698
646 920 01	20	45	32	25	42	33,5	18	115	130	72	6,6	M8	10,8	60	5200	5500	1420
646 925 01	25	58	40	30	51	40	22	140	160	88	8,4	M10	13,2	60	7650	8150	2572
646 930 01	30	68	47	35	60	46,5	26	158	180	96	10,5	M12	14,2	50	12200	12900	3790
646 940 01	40	80	62	45	77	61	34	202	230	122	13,5	M16	18,7	50	20800	20800	7800
646 950 01	50	100	75	55	93	77	34	250	280	152	13,5	M16	23,6	50	30000	28000	13960

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel with shaft support and shaft blocks page 479.

Quadro Linear-Bearing Units KGQ-3 ISO Series 3, Economy-Line, with Linear Bearings of Closed Design



Bottom view, turned

Material: Housing made from extruded aluminium with four closed linear bearings of the ISO Series 3 from reliable brand in good quality at low price. Self-aligning capability that accommodates tilting.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6.

Spare linear bearing page 491.

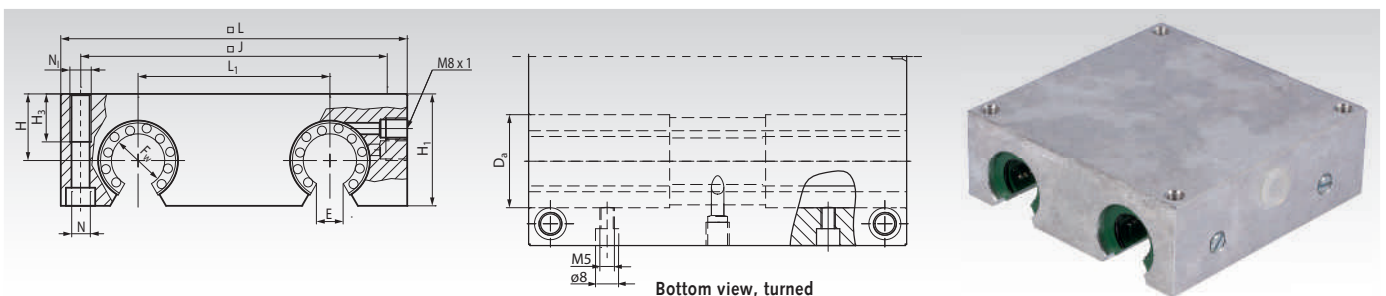
Ordering Details: e.g.: Product No. 646 912 02, Linear Bearings Unit KGQ-3, Economy-Line, Internal Ø 12 mm

Product No. closed	F _w mm	D _a mm	H±0.02 mm	H ₁ mm	H ₃ mm	H ₅ mm	J mm	L mm	L ₁ mm	N mm	N _l * mm	Load Rating		Weight g
												dyn. C N	stat. C ₀ N	
646 912 02	12	22	16	32	13	13	73	85	42	5,3	M6	2690	5160	520
646 916 02	16	26	18	36	13	15	88	100	54	5,3	M6	3300	6200	800
646 920 02	20	32	23	46	18	19	115	130	72	6,8	M8	5510	10520	1740
646 925 02	25	40	28	56	22	24	140	160	88	9,0	M10	9980	18880	3190
646 930 02	30	47	32	64	26	27	158	180	96	10,5	M12	14440	27240	4540
646 940 02	40	62	40	80	34	35	202	230	122	13,5	M16	17390	32920	8790
646 950 02	50	75	48	96	34	40	250	280	152	13,5	M16	28510	54000	15520

* When mounting from the bottom side choose the next smaller screw size.

Shaft steel page 478. Shaft blocks page 487.

Quadro Linear-Bearing Units KGQ-3-0 ISO Series 3, Economy-Line, with Linear Bearings of Open Design



Bottom view, turned

Material: Housing made from extruded aluminium with four open linear bearings of the ISO Series 3 from reliable brand in good quality at low price. Self-aligning capability that accommodates tilting.

All bearings are lubricated ready-to-install.

Recommended shaft tolerance h6.

Spare linear bearing page 491.

Ordering Details: e.g.: Product No. 646 912 03, Linear Bearings Unit KGQ-3-0, Economy-Line, Internal Ø 12 mm

Product No. open	F _w mm	D _a mm	H±0.02 mm	H ₁ mm	H ₃ mm	J mm	L mm	L ₁ mm	N mm	N _l * mm	E mm	Load Rating		Weight g
												C _{dyn.} N	stat. C ₀ N	
646 912 03	12	22	18	30	13	73	85	42	5,3	M6	6,5	2690	5160	470
646 916 03	16	26	22	35	13	88	100	54	5,3	M6	9,0	3300	6200	740
646 920 03	20	32	25	42	18	115	130	72	6,8	M8	9,0	5510	10520	1540
646 925 03	25	40	30	51	22	140	160	88	9,0	M10	11,5	9980	18880	2790
646 930 03	30	47	35	60	26	158	180	96	10,5	M12	14,0	14440	27240	4140
646 940 03	40	62	45	77	34	202	230	122	13,5	M16	19,5	17690	32920	8290
646 950 03	50	75	55	93	34	250	280	152	13,5	M16	22,5	28510	54000	14870

* When mounting from the bottom side choose the next smaller screw size.

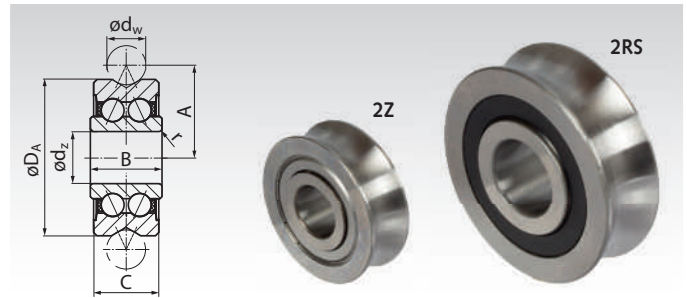
Shaft steel with shaft support and shaft blocks page 479.

Profiled Track Rollers LFR

Material: Roller bearing steel 100CR6.

- Standard rollers in high quality with very strong outer ring and special groove design for 2-point contact. Pressure angle 30°.
- Integrated double-row angular contact ball bearings for common axial and high radial load.
- Usable on hardened and ground linear shaft steel with shaft support or on special linear guides.
- On choice: With friction-free metal shields 2Z or with contacting rubber seals 2RS.

Accuracy class PN DIN 620. Radial clearance approaching class CN. Temperature range: -30°C to +90°C (for short time up to +110°C).



Ordering Details: e.g.: Product No. 647 801 01, Profiled Track Roller LFR50/5-4-2Z

Profiled Track Rollers LFR...-2Z with Shields

Product No.	Type	d _w mm	d _z mm	D _A mm	A mm	B mm	C mm	r mm	C _w kN	C _{w0} kN	F _{rz} kN	F _{0rz} kN	Weight g
647 801 01	LFR50/5-4-2Z	4	5	16	9	8	7	0,2	1,2	0,86	1,3	1,78	9
647 801 02	LFR50/5-6-2Z	6	5	17	10,5	8	7	0,2	1,27	0,82	1,3	1,78	10
647 801 03	LFR50/8-6-2Z	6	8	24	14	11	11	0,3	3,67	2,28	1,3	4,56	20
647 801 04	LFR5201-10-2Z	10	12	35	20,65	15,9	15,9	0,3	8,5	5,1	5,1	10,2	66
647 801 05	LFR5301-10-2Z	10	12	42	24	19	19	0,6	13	7,7	7,5	14,2	135
647 801 06	LFR5302-10-2Z	10	15	47	26,65	19	19	1,0	16,2	9,2	6,2	18,4	170
647 801 07	LFR5201-12-2Z	12	12	35	21,75	15,9	15,9	0,3	8,4	5	5,1	10	66
647 801 08	LFR5204-16-2Z	16	20	52	31,5	22,6	20,6	0,6	16,8	9,5	12,1	16,6	195
647 801 09	LFR5206-20-2Z	20	25	72	41	25,8	23,8	0,6	29,5	16,6	20,7	33,2	435
647 801 10	LFR5206-25-2Z	25	25	72	43,5	25,8	23,8	0,6	29,2	16,4	23,1	32,8	425
647 801 11	LFR5207-30-2Z	30	30	80	51	29	27	1,0	38	20,8	21,4	36,2	600
647 801 12	LFR5208-40-2Z	40	40	98	62,5	38	36	1,0	54,8	29	55	58	1100

Profiled Track Rollers LFR...-2RS with contacting Seals

Product No.	Type	d _w mm	d _z mm	D _A mm	A mm	B mm	C mm	r mm	C _w kN	C _{w0} kN	F _{rz} kN	F _{0rz} kN	Weight g
647 802 01	LFR50/5-4-2RS	4	5	16	9	8	7	0,2	1,2	0,86	1,3	1,78	9
647 802 02	LFR50/5-6-2RS	6	5	17	10,5	8	7	0,2	1,27	0,82	1,3	1,78	10
647 802 03	LFR50/8-6-2RS	6	8	24	14	11	11	0,3	3,67	2,28	1,3	4,56	20
647 802 04	LFR5201-10-2RS	10	12	35	20,65	15,9	15,9	0,3	8,5	5,1	5,1	10,2	66
647 802 05	LFR5301-10-2RS	10	12	42	24	19	19	0,6	13	7,7	7,5	14,2	135
647 802 06	LFR5302-10-2RS	10	15	47	26,65	19	19	1,0	16,2	9,2	6,2	18,4	170
647 802 07	LFR5201-12-2RS	12	12	35	21,75	15,9	15,9	0,3	8,4	5	5,1	10	66
647 802 08	LFR5204-16-2RS	16	20	52	31,5	22,6	20,6	0,6	16,8	9,5	12,1	16,6	195
647 802 09	LFR5206-20-2RS	20	25	72	41	25,8	23,8	0,6	29,5	16,6	20,7	33,2	435
647 802 10	LFR5206-25-2RS	25	25	72	43,5	25,8	23,8	0,6	29,2	16,4	23,1	32,8	425
647 802 11	LFR5207-30-2RS	30	30	80	51	29	27	1,0	38	20,8	21,4	36,2	600
647 802 12	LFR5208-40-2RS	40	40	98	62,5	38	36	1,0	54,8	29	55	58	1100

C_w = effective dynamical bearing load rate, taking account of the deformation of the outer ring.

C_{w0} = effective statical bearing load rate, taking account of the deformation of the outer ring.

F_{rz} = max. dynamical radial load, regarding the breaking strength of the outer ring.

F_{0rz} = max. statical radial load, regarding the breaking strength of the outer ring.

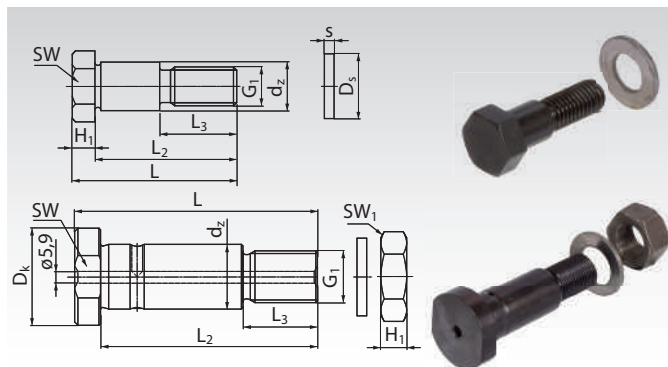
Assignment of Profiled Track Rollers and Bolts, related to Linear Shaft Diameter d_w and Bolt Diameter d_z

d _w mm	d _z mm	D _A mm	Track Roller with Shields		Track Roller with Seals		Zentric Bolt		Eccentric Bolt	
			Product No.	Type	Product No.	Type	Product No.	Type	Artikel-Nr.	Type
4	5	16	647 801 01	LFR50/5-4-2Z	647 802 01	LFR50/5-4-2RS	647 803 01	LFZ5	647 804 01	LFE5
6	5	17	647 801 02	LFR50/5-6-2Z	647 802 02	LFR50/5-6-2RS	647 803 01	LFZ5	647 804 01	LFE5
6	8	24	647 801 03	LFR50/8-6-2Z	647 802 03	LFR50/8-6-2RS	647 803 03	LFZ8	647 804 03	LFE8
10	12	35	647 801 04	LFR5201-10-2Z	647 802 04	LFR5201-10-2RS	647 803 04	LFZ12	647 804 04	LFE12
10	12	42	647 801 05	LFR5301-10-2Z	647 802 05	LFR5301-10-2RS	647 803 05	LFZ12/M12	647 804 05	LFE12/M12
10	15	47	647 801 06	LFR5302-10-2Z	647 802 06	LFR5302-10-2RS	647 803 06	LFZ15	647 804 06	LFE15
12	12	35	647 801 07	LFR5201-12-2Z	647 802 07	LFR5201-12-2RS	647 803 07	LFZ12x45A1	647 804 07	LFE12x45A1
16	20	52	647 801 08	LFR5204-16-2Z	647 802 08	LFR5204-16-2RS	647 803 08	LFZ20x67A1	647 804 08	LFE20x67A1
20	25	72	647 801 09	LFR5206-20-2Z	647 802 09	LFR5206-20-2RS	647 803 09	LFZ25x82A1	647 804 09	LFE25x82A1
25	25	72	647 801 10	LFR5206-25-2Z	647 802 10	LFR5206-25-2RS	647 803 09	LFZ25x82A1	647 804 09	LFE25x82A1
30	30	80	647 801 11	LFR5207-30-2Z	647 802 11	LFR5207-30-2RS	647 803 11	LFZ30x95A1	647 804 11	LFE30x95A1
40	40	98	647 801 12	LFR5208-40-2Z	647 802 12	LFR5208-40-2RS	647 803 12	LFZ40x107A1	647 804 12	LFE40x107A1

Centric Bolts LFZ for Profil Track Rollers

Material: Heat-treated steel, burnished.

- Centric bolt for mounting profil track rollers on fixed position.
- Normally, a carriage has four rollers: On one side two rollers with centric bolts on fixed position. On the other side two rollers on eccentric bolts, so that they can get adjusted clearance-free.
- The assignment of the bolt to the profil track roller is made by the linear shaft diameter d_w and the bolt diameter d_z .
- Included in scope of delivery, there is a distance washer for release mount of the track roller, for turn without binding (from LFZ8).



Ordering Details: e.g.: Product No. 647 803 01, Centric Bolt LFZ5

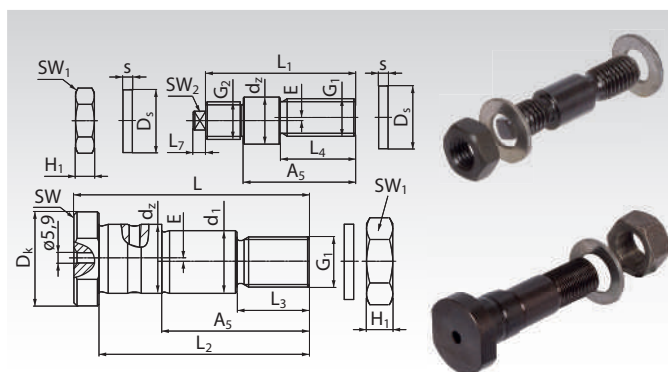
Product No.	Type	d _w mm	d _z mm	L mm	L ₂ mm	L ₃ mm	D _K mm	G ₁ mm	H ₁ mm	S mm	D _S mm	SW mm	SW ₁ mm	Weight g
647 803 01	LFZ5	4/6	5	19,5	16	9,5	10	M4	2,9	-	-	3*	-	6
647 803 03	LFZ8	6	8	28,3	24,3	15	-	M8	4	1	14	12	-	14
647 803 04	LFZ12	10	12	43	36	22	-	M10	8,4	1,8	21	17	-	34
647 803 05	LFZ12/M12	10	12	50,8	43,8	24	-	M12	6,5	1,8	19	17	-	50
647 803 06	LFZ15	10	15	50,8	43,8	26	-	M12	6,5	1,8	21	19	-	60
647 803 07	LFZ12x45A1	12	12	50	45	16	20	M10x1,5	8	2	21	17	17	40
647 803 08	LFZ20x67A1	16	20	75	67	23	30	M16x1,5	13	3	30	27	24	200
647 803 09	LFZ25x82A1	20/25	25	92	82	30	40	M20x1,5	16	3	37	36	30	400
647 803 11	LFZ30x95A1	30	30	107	95	32	45	M24x1,5	19	4	44	41	36	620
647 803 12	LFZ40x107A1	40	40	117	107	42	55	M30x1,5	24	4	56	46	46	1100

* Allen screw.

Eccentric Bolts LFE for Profil Track Rollers

Material: Heat-treated steel, burnished.

- Eccentric bolt for mounting profil track rollers on adjustable position, to install the rollers clearance-free.
- Normally, a carriage has four rollers: On one side two rollers with centric bolts on fixed position. On the other side two rollers on eccentric bolts, so that they can get adjusted clearance-free.
- The assignment of the bolt to the profil track roller is made by the linear shaft diameter d_w and the bolt diameter d_z .
- Included in scope of delivery, there is a distance washer for release mount of the track roller, for turn without binding (from LFZ8).



Ordering Details: e.g.: Product No. 647 804 01, Eccentric Bolt LFE5

Product No.	Type	d _w mm	d _z mm	L mm	L ₁ mm	L ₂ mm	L ₃ mm	L ₄ mm	L ₇ mm	A ₅ mm	d ₁ mm	D _K mm	G ₁ mm	G ₂ mm	H ₁ mm	S mm	D _S mm	E mm	SW mm	SW ₁ mm	SW ₂ mm	Weight g
647 804 01	LFE5	4/6	5	-	20,5	-	-	9	-	15	-	-	M4	M4	2,9	-	-	0,5	-	7	2	6
647 804 03	LFE8	6	8	-	33,2	-	-	13,7	3,5	22	-	-	M8	M8x0,75	4	1	14	1	-	13	5	14
647 804 04	LFE12	10	12	-	50	-	-	19,5	5	33,5	-	-	M10	M10	8,4	1,8	21	1	-	17	6	34
647 804 05	LFE12/M12	10	12	-	57	-	-	24	5	41	-	-	M12	M12	6,5	1,8	19	1	-	17	6	50
647 804 06	LFE15	10	15	-	57	-	-	24	5	41	-	-	M12	M12	6,5	1,8	21	1	-	19	6	60
647 804 07	LFE12x45A1	12	12	50	-	45	16	-	-	30	10	20	M10x1,5	-	8	2	21	0,75	17	17	-	40
647 804 08	LFE20x67A1	16	20	75	-	67	23	-	-	45	17	30	M16x1,5	-	13	3	30	1	27	24	-	200
647 804 09	LFE25x82A1	20/25	25	92	-	82	30	-	-	57	22	40	M20x1,5	-	16	3	37	1	36	30	-	400
647 804 11	LFE30x95A1	30	30	107	-	95	32	-	-	67	27	45	M24x1,5	-	19	4	44	1	41	36	-	620
647 804 12	LFE40x107A1	40	40	117	-	107	42	-	-	72	36	55	M30x1,5	-	24	4	56	1	46	46	-	1100

Precision Rail-Guide Sets RE and RE-ACS

Material:

Rails: Tool steel 1.2842 (90MnCrV8), hardness 61±3 HRC.

Rollers: Bearing steel 100Cr6, hardness 62±4 HRC.

Cages and end pieces: Plastic.

Technical data:

- Speed: Up to 3 m/s.
- Acceleration: Up to 80 m/s².
- Accuracy class: P10 (max. 10µm/1000 mm).
Higher accuracy classes P5 and P2 on request.
- Temperature range: -20°C to +80°C.

Lubrication: The rails have to be lubricated before mounting (z.B. lithium soap grease on mineral oil basis). Relubrication intervals depend on the type of application.

Contents of Delivery: A set consists of 4 half-rails, 2 plastic cages with rollers and 8 end pieces (delivered unassembled).

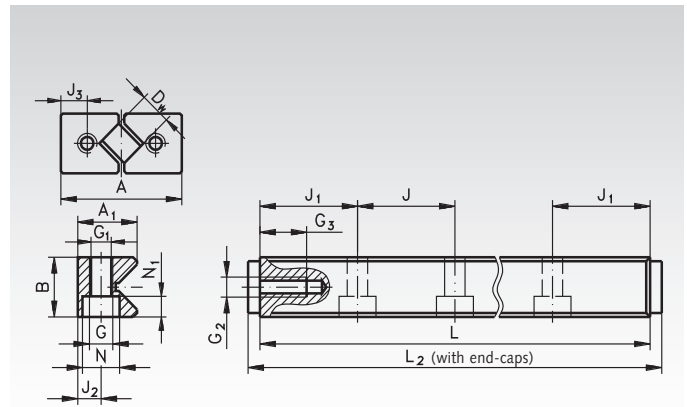
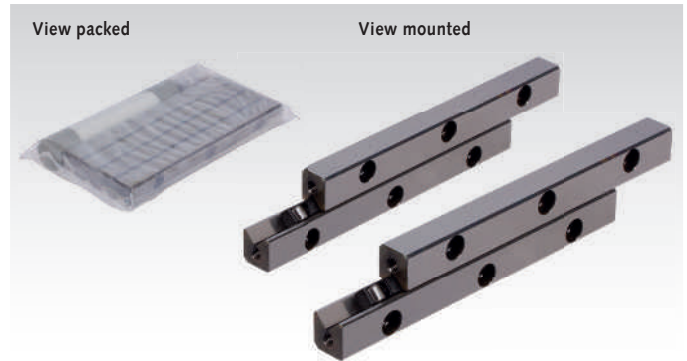
From these components a complete rail-pair unit can be assembled

Sizes: Two sizes with different lengths. Other sizes on request.

Design RE: For applications with limited travel, if high stiffness or load bearing capacity and positioning accuracy is required in very confined spaces. The rails are usually supplied in pairs, see contents of delivery.

Design RE-ACS: As version RE, but with an additional Anti-Creeper-System (ACS) that prevents the cage from creeping. This means the cage is guided by a plastic gear and teeth at the profile base. Hub and Load Rating are lower than for version RE (see table).

Applications: machine tools, handling systems, special machinery, measuring and testing equipment.

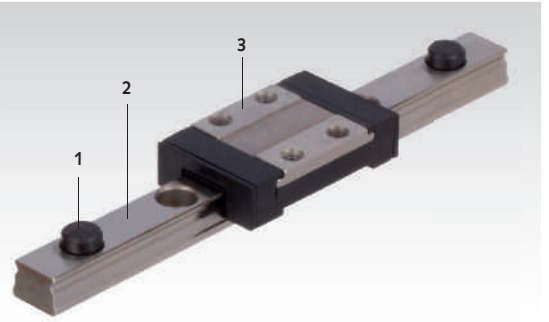
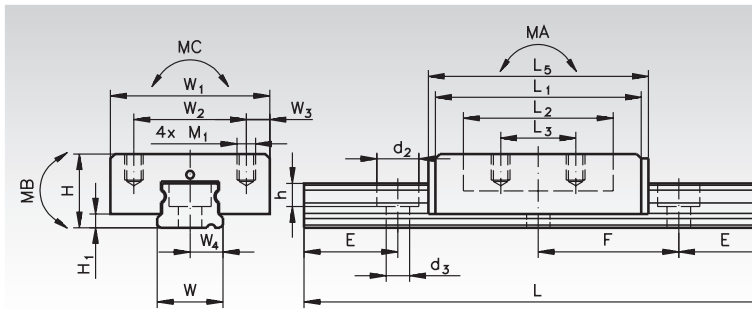


Ordering Details: e.g.: Product No. 649 703 01, Rail-Guide Sets RE Size 3, Length 50 mm

Product No. RE	Size	A-0.3 mm	B-0.2 mm	L mm	L ₂ mm	Stroke mm	A ₁ mm	D _w mm	J mm	J ₁ mm	J ₂ mm	G mm	G ₁ mm	N mm	N ₁ mm	J ₃ mm	G ₂ mm	G ₃ mm	Load Rating		Weight g
																			dyn. C N	stat. C ₀ N	
649 703 01	3	18	8	50	54	25	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	4230	5100	103
649 703 02	3	18	8	75	79	38	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	5803	7650	148
649 703 03	3	18	8	100	104	50	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	7263	10200	195
649 703 04	3	18	8	125	129	63	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	8644	12750	242
649 703 05	3	18	8	150	154	75	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	9964	15300	288
649 703 06	3	18	8	175	179	88	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	11238	17850	335
649 703 07	3	18	8	200	204	100	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	12471	20400	382
649 703 15	6	31	15	100	106	46	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	25743	27300	665
649 703 16	6	31	15	150	156	80	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	34000	39000	981
649 703 17	6	31	15	200	206	92	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	44204	54600	1302
649 703 18	6	31	15	250	256	126	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	51431	66300	1617
649 703 19	6	31	15	300	306	160	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	58382	78000	1933
649 703 20	6	31	15	350	356	172	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	67304	93600	2254
649 703 21	6	31	15	400	406	206	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	73781	105300	2569

Product No. RE-ACS	Size	A-0.3 mm	B-0.2 mm	L mm	L ₂ mm	Stroke mm	A ₁ mm	D _w mm	J mm	J ₁ mm	J ₂ mm	G mm	G ₁ mm	N mm	N ₁ mm	J ₃ mm	G ₂ mm	G ₃ mm	Load Rating		Weight g
																			dyn. C N	stat. C ₀ N	
649 703 29	3	18	8	50	54	20	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	3465	4250	102
649 703 30	3	18	8	75	79	30	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	5294	6800	103
649 703 31	3	18	8	100	104	45	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	6300	8500	193
649 703 32	3	18	8	125	129	62	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	7731	11050	240
649 703 33	3	18	8	150	154	79	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	9090	13600	286
649 703 34	3	18	8	175	179	94	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	9964	15300	333
649 703 35	3	18	8	200	204	100	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	11653	18700	381
649 703 43	6	31	15	100	106	37	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	22826	23400	660
649 703 44	6	31	15	150	156	71	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	31318	35100	976
649 703 45	6	31	15	200	206	105	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	39196	46800	1291
649 703 46	6	31	15	250	256	117	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	49056	62400	1612
649 703 47	6	31	15	300	306	151	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	56093	74100	1928
649 703 48	6	31	15	350	356	163	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	65107	89700	2249
649 703 49	6	31	15	400	406	197	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9	71640	101400	2564

Miniature Profile Rail Guides



Material: Rails: Stainless steel 1.4037. Guide Carriage: Stainless steel 1.4037 with return zones of POM. Balls: Stainless steel 1.4037. Seals: Polyurethane.



Technical Data:

- Structure: 4-point contact ball recirculation system with identical load angles and 2 ball recirculation paths per carriage for unlimited stroke.
- Product range: four different rail widths: 7, 9, 12, 15 mm with one or two carriages.
- Temperature range: from -20°C to +80°C.
- Speed: Up to max. 3 m/s.
- Acceleration: Up to 80 m/s².

Use: e.g. for applications in the fields of precision engineering, medical engineering, electronics production and the optical industry. High load bearing capacity at a minimum of mounting space.

Compact: Simple design, compact and cost efficient.

Fast: Ideal for linear movements up to 3 m/s.

Durability: Due to the pointed-arch shaped raceways, the carriages can take up loads and torques acting in any direction. High load bearing capacity and long service life.

Rust-resistant: All components are made from rust-resistant steel or of plastic.

Easy maintenance: Easily relubricatable through lubrications holes located in the end pieces of the carriage.

Lubrication and Sealing

Delivery prelubricated and ready for mounting. The individual carriages can be relubricated through lubrication holes located at the face side. The lubrication intervals depend on the distance travelled, the cycles and ambient conditions.

Demounting and Mounting of the Carriages

The system is premounted when delivered. To demount the system please regard the following instructions:

- Remove the end stop (1) from the rail.
- Position the mounting rail at the end of the rail (2), make sure there is no misalignment or gap.
- Move the carriage (3) from the rail onto the mounting rail while keeping both rails firm in position. For mounting the carriage on the rail, please proceed in reverse order.

Attention: please always use the enclosed mounting rail, as otherwise the ball retention inside the carriage is not guaranteed.

Ordering Details: e.g.: Product No. 649 010 71, Miniature Profile Guide Rails, 100 mm long, 1 Carriage

Product No.	No. of Carriages Pcs.	Rail Length mm	Rail Width W mm	E mm	Weight g	Product No.	No. of Carriages Pcs.	Rail Length mm	Rail Width W mm	E mm	Weight g
649 010 71	1	100	7	5,0	29	649 020 73	2	300	7	7,5	77
649 010 73	1	300	7	7,5	67	649 020 75	2	500	7	2,5	115
649 010 75	1	500	7	2,5	105	649 020 93	2	300	9	10,0	133
649 010 91	1	100	9	10,0	51	649 020 95	2	500	9	10,0	195
649 010 93	1	300	9	10,0	113	649 021 23	2	300	12	12,5	246
649 010 95	1	500	9	10,0	175	649 021 24	2	400	12	12,5	308
649 011 23	1	300	12	12,5	216	649 021 25	2	500	12	12,5	370
649 011 24	1	400	12	12,5	278	649 021 53	2	300	15	10,0	426
649 011 25	1	500	12	12,5	340	649 021 54	2	400	15	20,0	530
649 011 53	1	300	15	10,0	366	649 021 55	2	600	15	20,0	732
649 011 54	1	400	15	20,0	470						
649 011 56	1	600	15	20,0	672						

Dimensions of Carriages

Rail Width W mm	H mm	W ₁ mm	W ₃ mm	W ₂ mm	L ₁ mm	L ₂ mm	L ₃ mm	L ₅ mm	M ₁ mm	Fastening Torque Nm	H ₁ mm	Weight kg
7	8	17	2,5	12	22,0	16,0	8	23,5	M2 x 2,5	0,32	1,5	0,01
9	10	20	2,5	15	30,0	21,5	10	32,0	M3 x 3,0	1,10	2,0	0,02
12	13	27	3,5	20	33,0	23,0	15	36,0	M3 x 3,5	1,10	3,0	0,03
15	16	32	3,5	25	41,5	29,5	20	44,5	M3 x 4,0	1,10	4,0	0,06

Dimensions of Rail

Rail Width W mm	H ₄ mm	W ₄ mm	d ₃ x d ₂ x h mm	F mm	Dyn. Load C N	Stat. Load C ₀ N	Stat. Torque M _A Nm	Stat. Torque M _B Nm	Stat. Torque M _C Nm	Weight kg/m
7	4,8	3,5	2,5 x 4,5 x 2,5	15	860	1670	4,9	4,9	5,2	0,19
9	6,5	4,5	3,5 x 6,0 x 3,5	20	1850	3130	11,2	11,2	13,2	0,31
12	8,8	6,0	3,5 x 6,0 x 4,5	25	2550	4000	15,0	15,0	21,7	0,62
15	10,8	7,5	3,5 x 6,0 x 4,5	40	2880	5390	21,0	21,0	40,2	1,02

Miniature Slide Units

Material: Slides, rail and balls: Stainless steel 1.4034.
Cage and end pieces: Plastic.

Technical data:

- Speed: Up to 3 m/s.
- Acceleration: Up to 80 m/s².
- Accuracy class: P5 (standard, for most applications).
- Preload class: TO (standard, slight clearance).
Other accuracy classes and preload classes on request.
- Temperature range: -20°C to +80°C.
- Four rail widths to choose from (7, 9, 12 and 15 mm).

Lubrication: Prelubricated with „Paraliq P460“.

Relubrication intervals depend on the type of application.

Ready-to-mount, pre-assembled. for limited stroke. Especially compact construction. High running accuracy (5 µm/100 mm stroke). Extremely smooth motion. All technical parameters were set to ensure high system stiffness and precision guidance.

Contents of Delivery: One slide mounted on a rail.

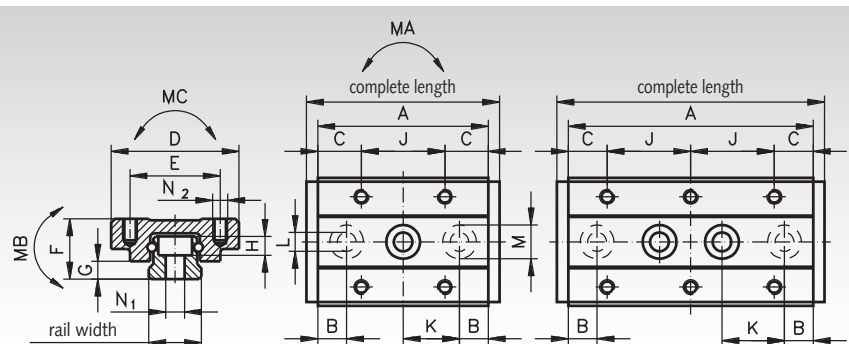
Application:

- Pneumatics.
- Semi Conductors manufacturing.
- Medical.
- electronics and micro assembly.
- Precision engineering.
- Measuring applications.

Advantages:

- Compact design.
- High load bearing capacity.
- Excellent running accuracy.
- Smooth running.
- High stiffness.
- Easy mounting.

Ordering Details: e.g.: Product No. 649 701 01, Miniature Slide Overall Length 29 mm



Product No.	Rail Width mm	Overall Length mm	Max. Stroke* mm	A mm	B mm	C mm	Number of Bores Slide pcs.	Rail pcs.	Load Rating dyn. C N	stat. Co N	Torques M _a M _b Nm	M _C Nm	Weight g
649 701 01	7	29	24	26	5,5	5	6	2	700	1100	3,5	6	18,4
649 701 02	7	37	34	34	9,5	5	8	2	900	1400	5,5	7	24,2
649 701 03	7	53	50	50	10	5	12	3	1100	2000	12	10	60,5
649 701 04	7	69	66	66	10,5	5	16	4	1400	2700	21	14	79,8
649 701 05	9	35	28	32	8	9,5	4	2	1200	1800	7	12	30,5
649 701 06	9	45	40	42	11	8	6	2	1400	2100	11	15	40,3
649 701 07	9	58	54	55	7,5	8	8	3	1900	3400	18	19	52,3
649 701 08	9	84	78	81	10,5	8	12	4	2500	4900	43	29	76,9
649 701 09	9	97	92	94	7	8	14	5	2700	5500	57	33	87,8
649 701 10	12	40	32	37	6	11	4	2	2200	3300	11	21	64,1
649 701 11	12	54	47	51	13	10,5	6	2	2600	4300	22	28	89,3
649 701 12	12	69	62	66	8	10,5	8	3	3000	5300	36	36	112,9
649 701 13	12	99	95	96	10,5	10,5	12	4	3800	7200	76	52	167,0
649 701 14	12	129	122	126	13	10,5	16	6	4700	9700	131	68	217,4
649 701 15	15	56	50	52	6	16,0	4	2	2800	3900	25	42	134,4
649 701 16	15	89	80	85	22,5	12,5	8	2	4600	7800	73	70	219,7
649 701 17	15	109	102	105	12,5	12,5	10	3	5100	9100	106	84	273,0
649 701 18	15	169	162	165	22,5	12,5	16	4	7300	15000	264	131	426,4

* Overall stroke from one mechanical end stop to the other.

Further Dimensions

Rail Width	D mm	E mm	F mm	G mm	H mm	J mm	K mm	L mm	M mm	N ₁ mm	N ₂ mm
7	17	12	8	2,35	2,5	8	15	2,5	4,5	M3	M2 x 2,5
9	20	15	10	3,55	3,5	13	20	3,5	6	M4	M3 x3
12	27	20	13	4,7	4,5	15	25	3,5	6	M4	M3 x 3,5
15	32	25	16	6	4,5	20	40	3,5	6	M4	M3 x 4

Linear Motion Guide DA 0115 RC with Ball Carriage

Material: Track made from aluminium.

Carriage: Stainless steel housing with plastic sealings.

On choice: With stainless steel balls (greased) or polymer balls (grease free).

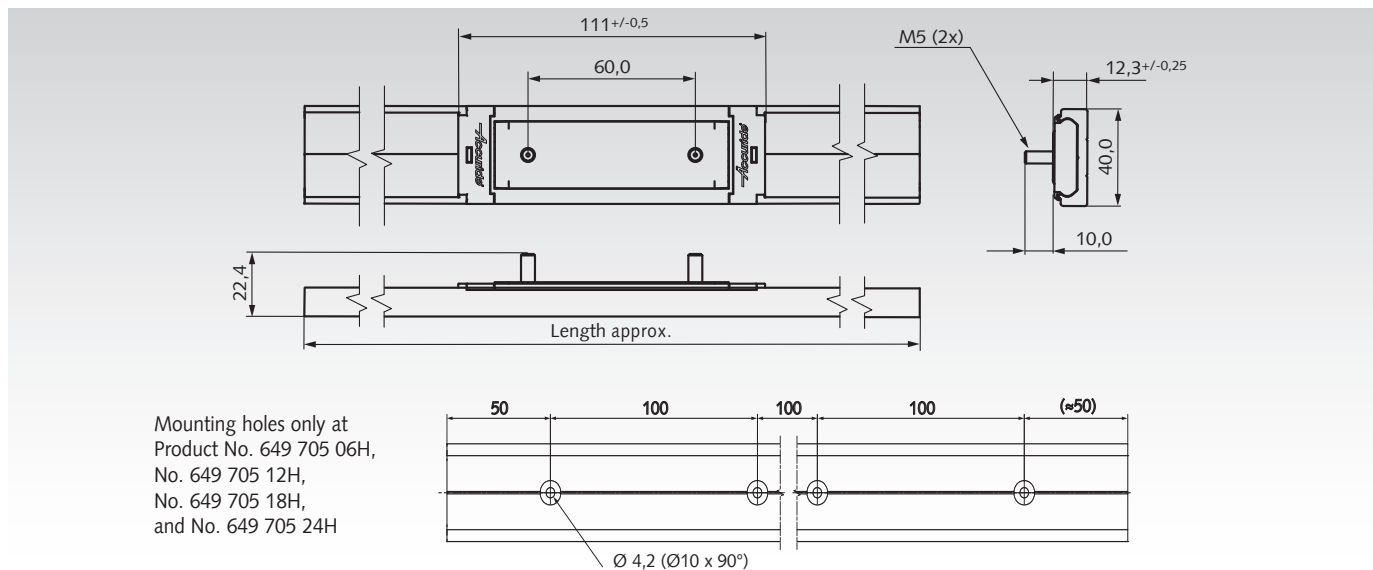
Linear guide for universal use.

- Four track lengths on choice (for to cut by the customer).
- Without boreholes, or with mounting holes.
- Several carriages can be used on one track.
- Resistant against corrosion and dirt.
- All parts have to be ordered seperately.
- Long service life, tested to 80,000 meters of travel distance.

Ordering details: e.g.: 1x Prod. No. 649 705 01, Carriage,
1x Prod. No. 649 705 06H, Track 600mm with Mounting Holes,
2x Prod. No. 649 705 03, End Stop



Accuride



Product No.	Product	Load ratings in kg depending on mounting position and number of carriages									Weight g
		vertically mounted			horizontally mounted, lying			horizontally mounted, hanging			
		1 Carriage	2 Carri.	3 Carri.	1 Carriage	2 Carri.	3 Carri.	1 Carriage	2 Carri.	3 Carri.	
649 705 01	Carriage with stainless steel balls	50	90	130	30	55	70	40	70	90	120
649 705 02	Carriage with polymer balls	30	54	75	18	32	42	24	42	54	85
649 705 06	Track, length 600mm										320
649 705 06H	Track, length 600mm with holes										320
649 705 12	Track, length 1200mm										635
649 705 12H	Track, length 1200mm with holes										635
649 705 18	Track, length 1800mm										950
649 705 18H	Track, length 1800mm with holes										950
649 705 24	Track, length 2400mm										1270
649 705 24H	Track, length 2400mm with holes										1270
649 705 03*	End Stop (1 piece)*										15

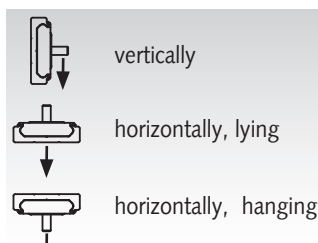
* Depending on the application, 2 pieces may be required. 2 screws included.



Carriage (with mounting aid) and End Stops have to be ordered seperately.



Tracks on choice without bores or with mounting holes.



The load ratings depend on the mounting position (see table).



Drilling jig: to drill pinholes for permanent pinned connection of tracks.

Note

Not recommended for high torque applicatins.

Fix track on a rigid and levelm surface. Fixing recommendation:

M4 countersunk screw or 4mm countersunk wood screw.

Drill countersunk holes in the middle of track, hole distance from 100mm up to 200mm, depending on mounting position and load.

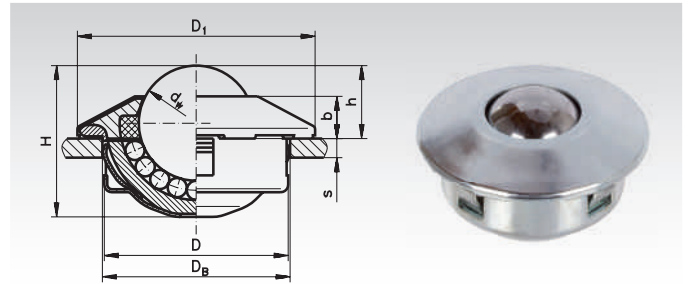
Push the carriages with the mounting aid carefully onto the track. Distribute weight evenly across carriages. Infinte track lengths possible. Butt tracks end to end and align the centre lines. For permanent pinned connection, use drilling jig (on request) for 3mm pins

Cup Rollers with Fastening Element

Material Version A:	Housing:	Steel, zinc plated.
	Ball cup:	Steel, case hardened.
	Ball:	Steel, hardened.
Material Version B:	Housing:	Steel, zinc plated.
	Ball cup:	Steel, case hardened.
	Ball:	Stainless steel, hardened, Material No. 1.3541.

Due to the special shape of the top part, an assembly plug should be used. Assembly plug see below.

Max. speed 2m/sec.



Ordering Details: e.g.: Product No. 654 310 15, Cup Roller with Fastening Element, Version A, 15 mm

Product No. Version A	d _w mm	D mm	D ₁ mm	h mm	H mm	b mm	Seating-Ø D _B mm	s min	Load Rating C* N	Weight kg
654 310 15	15	24 ^{-0,13}	31	9,5 ^{±0,2}	20,5	5,5	24 ^{+0,5}	1,5	500	0,044
654 310 22	22	36 ^{-0,16}	45	9,8 ^{±0,2}	28,6	6,0	36 ^{+0,8}	2,0	1300	0,146
654 310 30	30	45 ^{-0,16}	55	13,8 ^{±0,3}	37,5	8,0	45 ^{+1,0}	2,5	2500	0,290

Product No. Version B	d _w mm	D mm	D ₁ mm	h mm	H mm	b mm	Seating-Ø D _B mm	s min	Load Rating C* N	Weight kg
654 320 15	15	24 ^{-0,13}	31	9,5 ^{±0,2}	20,5	5,5	24 ^{+0,5}	1,5	370	0,044
654 320 22	22	36 ^{-0,16}	45	9,8 ^{±0,2}	28,6	6,0	36 ^{+0,8}	2,0	970	0,146
654 320 30	30	45 ^{-0,16}	55	13,8 ^{±0,3}	37,5	8,0	45 ^{+1,0}	2,5	1900	0,290

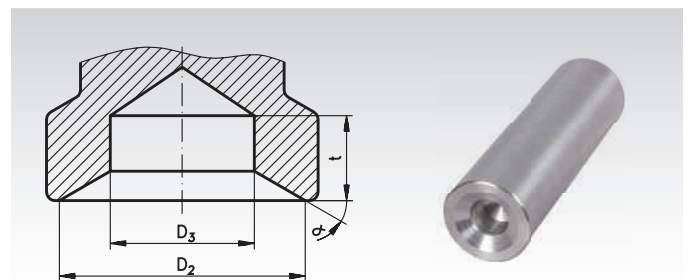
* Due to unevenness of the running surface, there are often only three rollers carrying the weight.
Therefore the chosen load rating should equal at least one third of the load.

Assembly Plugs for cup rollers with Fastening Element

Material: Aluminium.

For ball cups with fastening element.

Avoids damage to the upper, conical part of the housing.

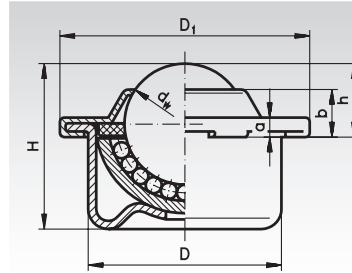


Ordering Details: e.g.: Product No. 654 300 15, Assembly Plug for Ball Cups 15 mm

Product No.	Ball Cup-Ø d _w mm	D ₂ mm	D ₃ mm	t _{min} mm	α °	Weight kg
654 300 15	15	29	17	10	30	0,34
654 300 22	22	43	24	10	20	0,46
654 300 30	30	53	30	10	24	0,63

Cup Rollers with Steel-Sheet Housing

Material Version A:	Housing:	Steel, zinc plated.
	Ball cup:	Steel, case hardened.
	Ball:	Steel, hardened.
Material Version B:	Housing:	Steel, zinc plated.
	Ball cup:	Steel, case hardened.
	Ball:	Stainless steel, hardened, Material No. 1.3541.
Material Version C:	Housing and other parts:	Stainless steel, Material No. 1.4301.
	Ball cup:	Stainless steel, Material No. 1.4301, hardened.
	Ball:	Stainless steel, hardened, Material No. 1.3541.



Max. speed 2m/sec.

Ordering Details: e.g.: Product No. 654 330 08, Ball Cup, Version A, 8 mm

Product No. Version A	d _w mm	D mm	D ₁ mm	h mm	H mm	a mm	b mm	Load Rating C* N	Weight kg
654 330 08	8	12,6 ^{+0,055}	17	4,8 ^{+0,15}	11,2	1,8	3,2	100	0,007
654 330 12	12	18 ^{+0,055}	23	7,4 ^{+0,15}	15,5	2,0	4,3	250	0,018
654 330 15	15	24 ^{+0,065}	31	9,5 ^{+0,2}	21,5	2,5	6,1	500	0,038
654 330 22	22	36 ^{+0,080}	45	9,8 ^{+0,2}	29,5	2,9	5,7	1300	0,132
654 330 30	30	45 ^{+0,080}	55	13,8 ^{+0,3}	37,5	3,7	7,9	2500	0,265
654 330 45	45	62 ^{+0,095}	75	19,0 ^{+0,4}	53,7	4,2	10,3	6000	0,720

Product No. Version B	d _w mm	D mm	D ₁ mm	h mm	H mm	a mm	b mm	Load Rating C* N	Weight kg
654 340 08	8	12,6 ^{+0,055}	17	4,8 ^{+0,15}	11,2	1,8	3,2	70	0,007
654 340 12	12	18 ^{+0,055}	23	7,4 ^{+0,15}	15,5	2,0	4,3	180	0,018
654 340 15	15	24 ^{+0,065}	31	9,5 ^{+0,2}	21,5	2,5	6,1	370	0,038
654 340 22	22	36 ^{+0,080}	45	9,8 ^{+0,2}	29,5	2,9	5,7	970	0,132
654 340 30	30	45 ^{+0,080}	55	13,8 ^{+0,3}	37,5	3,7	7,9	1900	0,265
654 340 45	45	62 ^{+0,095}	75	19,0 ^{+0,4}	53,7	4,2	10,3	4500	0,720

Product No. Version C	d _w mm	D mm	D ₁ mm	h mm	H mm	a mm	b mm	Load Rating C* N	Weight kg
654 350 08	8	12,6 ^{+0,055}	17	4,8 ^{+0,15}	11,2	1,8	3,2	70	0,007
654 350 12	12	18 ^{+0,055}	23	7,4 ^{+0,15}	15,5	2,0	4,3	180	0,018
654 350 15	15	24 ^{+0,065}	31	9,5 ^{+0,2}	21,5	2,5	6,1	370	0,038
654 350 22	22	36 ^{+0,080}	45	9,8 ^{+0,2}	29,5	2,9	5,7	970	0,132
654 350 30	30	45 ^{+0,080}	55	13,8 ^{+0,3}	37,5	3,7	7,9	1900	0,265

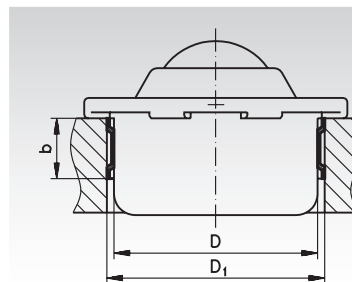
* Due to unevenness of the running surface, there are often only three rollers carrying the weight.
Therefore the chosen load rating should equal at least one third of the load.

Tolerance Rings for cup rollers with Steel-Sheet Housing

Material: Spring band steel.

Matching ball cups with steel-sheet housing.

The use of tolerance rings permits more generous tolerances in the mounting hole (dimension D₁).



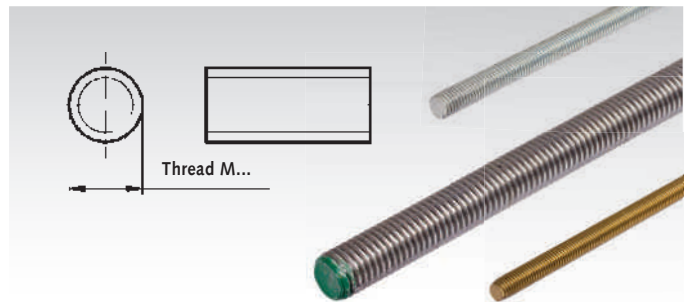
Ordering Details: e.g.: Product No. 654 390 08, Tolerance Ring D 12,6mm

Product No.	Tolerance Ring Matching Ball Cups with Ø d _w mm	D mm	Mounting Dim. D ₁ mm	b mm	Weight g
654 390 08	8	12,6	13,87 ^{+0,15}	6,1 ^{+0,2}	0,4
654 390 12	12	18	19,70 ^{+0,2}	6,1 ^{+0,2}	0,9
654 390 15	15	24	25,7 ^{+0,2}	7,1 ^{+0,2}	1,5
654 390 22	22	36	37,7 ^{+0,2}	12,1 ^{+0,2}	5,7
654 390 30	30	45	46,7 ^{+0,2}	12,1 ^{+0,2}	7,5
654 390 45	45	62	64,1 ^{+0,3}	15,1 ^{+0,2}	12,5

Metric Threaded Bars according to the Old Standard DIN 975, Similar to DIN 976

Threaded bars with metric ISO thread or fine thread, rolled, in different materials.

Other sizes and designs on request.



Steel, 8.8, with Metric Thread, Right-Hand

Material: 8.8, zinc plated. Length either 1000 mm or 2000 mm.

Ordering Details: e.g.: Product No. 651 004 00, Threaded Bars DIN 975, 8.8, M4 x 1000 right

Product No. 1m	Product No. 2m	Thread mm	Lead mm	Weight kg / 1m	Weight kg / 2m
651 004 00	--	M4	0,7	0,08	--
651 005 00	--	M5	0,8	0,12	--
651 006 00	--	M6	1	0,18	--
651 008 00	651 208 00	M8	1,25	0,32	0,64
651 010 00	651 210 00	M10	1,5	0,50	1,0
651 012 00	651 212 00	M12	1,75	0,73	1,5
651 016 00	651 216 00	M16	2	1,3	2,7
651 020 00	651 220 00	M20	2,5	2,1	4,2
651 024 00	651 224 00	M24	3	3,0	6,0
651 030 00	651 230 00	M30	3,5	4,8	9,5
651 036 00	651 236 00	M36	4	6,9	13,8

Steel, 4.6, with Metric Thread, Right / Left

Material: 4.6, zinc plated. Length 1000 mm.

Ordering Details: e.g.: Product No. 650 003 00, Threaded Bar DIN 975, M3, right

Product No. right	Product No. left	Thread mm	Lead mm	Weight per % kg
650 003 00	-	M3	0,5	4,4
650 004 00	-	M4	0,7	7,8
650 005 00	650 305 00	M5	0,8	12,4
650 006 00	650 306 00	M6	1	17,7
650 008 00	650 308 00	M8	1,25	31,9
650 010 00	650 310 00	M10	1,5	50,0
650 012 00	650 312 00	M12	1,75	72,5
650 016 00	650 316 00	M16	2	133
650 020 00	650 320 00	M20	2,5	208
650 024 00	650 324 00	M24	3	300
650 030 00	650 330 00	M30	3,5	475
650 036 00	-	M36	4	690

Steel, 4.6, with Fine Metric Thread, Right-Hand

Material: 4.6, zinc plated. Length 1000 mm.

Ordering Details: e.g.: Product No. 650 708 00, Threaded Bar DIN 975, M8x1 right, fine metric

Product No.	Thread mm	Lead mm	Weight per % kg
650 708 00	M8x1	1	31,9
650 710 00	M10x1	1	50
650 712 00	M12x1,5	1,5	72,5
650 716 00	M16x1,5	1,5	133
650 720 00	M20x1,5	1,5	208
650 724 00	M24x1,5	1,5	300
650 730 00	M30x2	2	475

Stainless Steel, with Metric Thread, Right-Hand

Material: V2A (A2). Length 1000 mm. 

Ordering Details: e.g.: Product No. 650 990 03, Threaded Bar DIN 975, M3, right, stainless

Product No.	Thread mm	Lead mm	Weight per % kg
650 990 03	M3	0,5	4,4
650 990 04	M4	0,7	7,8
650 990 05	M5	0,8	12,4
650 990 06	M6	1	17,7
650 990 08	M8	1,25	31,9
650 990 10	M10	1,5	50
650 990 12	M12	1,75	72,5
650 990 16	M16	2	133
650 990 20	M20	2,5	208
650 990 24	M24	3	300
650 990 30	M30	3,5	475

Brass, with Metric Thread, Right-Hand

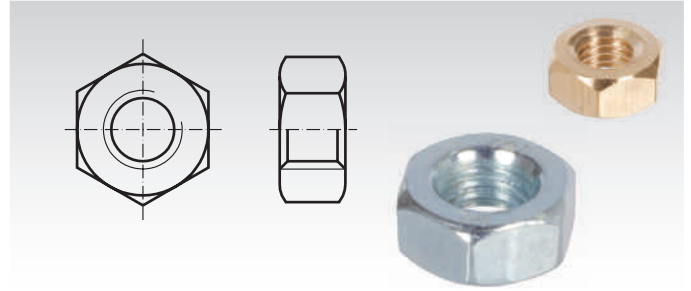
Material: Ms60 (CuZn40). Length 1000 mm.

Ordering Details: e.g.: Product No. 650 403 00, Threaded Bar DIN 975, M3, right, brass

Product No.	Thread mm	Lead mm	Weight per % kg
650 403 00	M3	0,5	4,8
650 404 00	M4	0,7	8,5
650 405 00	M5	0,8	13,4
650 406 00	M6	1	19,2
650 408 00	M8	1,25	34,5
650 410 00	M10	1,5	54,2
650 412 00	M12	1,75	78,5
650 416 00	M16	2	144
650 420 00	M20	2,5	226

Hexagon Nuts DIN 934

Hexagon nuts DIN 934 with metric ISO thread or fine thread made from various materials.



...with metric thread, right hand

Material: Steel, tensile strength 8, zinc-plated.

Ordering Details: e.g.: Product No. 652 003 00, Hexagon Nut DIN 934, M3, Right

Product No.	Thread mm	Width Across Flats mm	Weight p.% Pcs. kg
652 003 00	M3	5,5	0,04
652 004 00	M4	7	0,08
652 005 00	M5	8	0,12
652 006 00	M6	10	0,25
652 008 00	M8	13	0,52
652 010 00	M10	17	1,16
652 012 00	M12	19	1,73
652 016 00	M16	24	3,33
652 020 00	M20	30	6,40
652 024 00	M24	36	11,00
652 030 00	M30	46	22,30
652 036 00	M36	55	39,30

...with metric thread, left hand

Material: Steel, tensile strength 8, zinc-plated.

Ordering Details: e.g.: Product No. 652 305 00, Hexagon Nut DIN 934, M5, Left

Product No.	Thread mm	Width Across Flats mm	Weight p.% Pcs. kg
652 305 00	M5	8	0,12
652 306 00	M6	10	0,25
652 308 00	M8	13	0,52
652 310 00	M10	17	1,16
652 312 00	M12	19	1,73
652 316 00	M16	24	3,33
652 320 00	M20	30	6,40
652 324 00	M24	36	11,00
652 330 00	M30	46	22,30

...with metric, fine thread, right hand

Material: Steel, tensile strength 8, zinc-plated.

Ordering Details: e.g.: Product No. 652 508 00, Hexagon Nut DIN 934, M8, metr. fine

Product No.	Thread mm	Width Across Flats mm	Weight p.% Pcs. kg
652 508 00	M8x1	13	0,52
652 510 00	M10x1	17	1,16
652 512 00	M12x1,5	19	1,73
652 516 00	M16x1,5	24	3,33
652 520 00	M20x1,5	30	6,40
652 524 00	M24x1,5	36	11,00
652 530 00	M30x2	46	22,30

...with metric thread, right hand

Material: Brass Ms60 (CuZn40)

Ordering Details: e.g.: Product No. 652 703 00, Hexagon Nut DIN 934, Brass, M3, Right

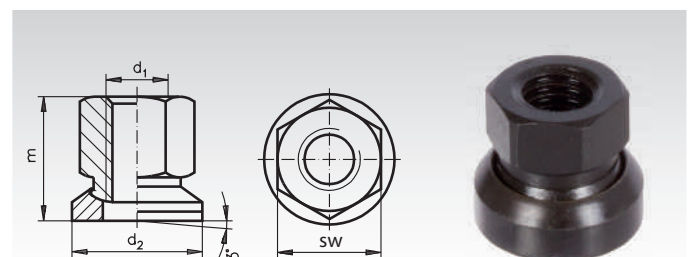
Product No.	Thread mm	Width Across Flats mm	Weight p.% Pcs. kg
652 703 00	M3	5,5	0,04
652 704 00	M4	7	0,09
652 705 00	M5	8	0,13
652 706 00	M6	10	0,27
652 708 00	M8	13	0,56
652 710 00	M10	17	1,26
652 712 00	M12	19	1,87
652 716 00	M16	24	3,61
652 720 00	M20	30	7,00
652 724 00	M24	36	11,90
652 730 00	M30	46	24,00

Hexagon Nuts 2308 with Ball Cup (Swivel Nuts)

Material: Heat-treated steel, tensile strength 10, burnished.

Ordering Details: e.g.: Product No. 653 358 00, Hexagon Nut 2308 with Ball Cup, M8

Product No.	d ₁ mm	d ₂ mm	m mm	sw mm	Weight g
653 358 00	M8	17	14	13	12
653 360 00	M10	21	17,5	16	27
653 362 00	M12	24	21,5	18	38
653 366 00	M16	30	28	24	68
653 370 00	M20	36	35	30	140
653 374 00	M24	44	42,5	36	255
653 380 00	M30	55	56	46	530



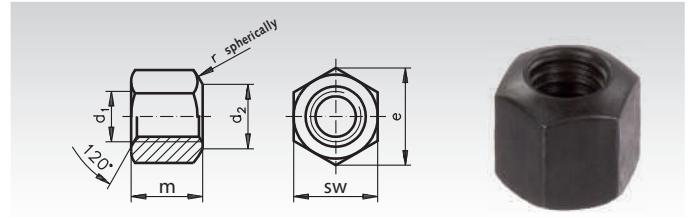
Hexagon Nuts DIN 6330 (Height 1.5 x d)

Material: Heat-treated steel, tensile strength 10.

Shape B, with round contact surface at one end.

The round end matches the spherical washers DIN 6319 page 468.

This combination can be used to compensate bearing displacement.



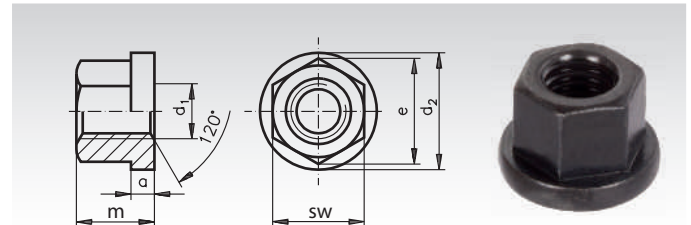
Ordering Details: e.g.: Product No. 653 206 00, Hexagon Nut DIN 6330, M6

Product No.	d ₁ mm	d ₂ mm	e mm	m mm	r mm	sw mm	Weight g
653 206 00	M6	7	11,5	9	9	10	5
653 208 00	M8	9	15	12	11	13	9
653 210 00	M10	11,5	18,5	15	15	16	20
653 212 00	M12	14	20,8	18	17	18	28
653 214 00	M14	16	24,2	21	20	21	45
653 216 00	M16	18	27,7	24	22	24	58
653 220 00	M20	22	34,6	30	27	30	110
653 224 00	M24	26	41,6	36	32	36	195
653 230 00	M30	32	53,1	45	41	46	405
653 236 00	M36	38	63,5	54	50	55	715

Hexagon Nuts DIN 6331 with Collar (Height 1.5 x d)

Material: Heat-treated steel, tensile strength 10.

The collar on the nut means no separate washer is required.

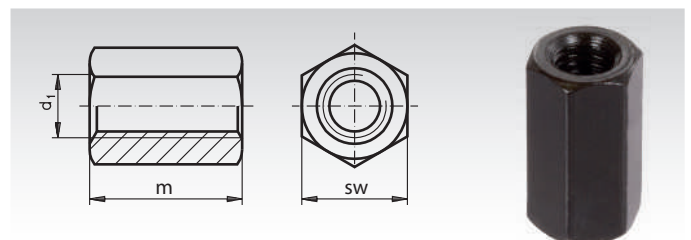


Ordering Details: e.g.: Product No. 653 308 00, Hexagon Nut DIN 6331, M8

Product No.	d ₁ mm	d ₂ mm	e mm	m mm	a mm	sw mm	Weight g
653 308 00	M8	18	15	12	3,5	13	12
653 310 00	M10	22	18,5	15	4	16	25
653 312 00	M12	25	20,8	18	4	18	35
653 314 00	M14	28	24,2	21	4	21	51
653 316 00	M16	31	27,7	24	5	24	68
653 320 00	M20	37	34,6	30	6	30	130
653 324 00	M24	45	41,6	36	6	36	230
653 330 00	M30	58	53,1	45	8	46	470
653 336 00	M36	68	63,5	54	10	55	810

Extension Nuts 6334 (Height 3 x d)

Material: Heat-treated steel. Strength class 10.



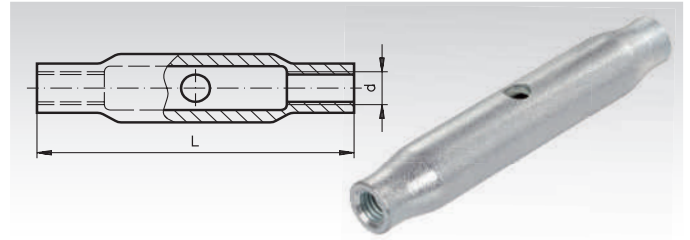
Ordering Details: e.g.: Product No. 653 006 00, Extension Nuts 6334, M6

Product No.	d ₁ mm	Lead mm	sw mm	m mm	Weight g
653 006 00	M6	1	10	18	8
653 008 00	M8	1,25	13	24	19
653 010 00	M10	1,5	16	30	42
653 012 00	M12	1,75	18	36	63
653 014 00	M14	2	21	42	95
653 016 00	M16	2	24	48	120
653 020 00	M20	2,5	30	60	235
653 024 00	M24	3	36	72	410
653 030 00	M30	3,5	46	90	850

Turnbuckles Similar to DIN 1478, Zinc-Plated, Made From Seamless Steel Tube

Material: St37 DIN 1629, zinc-plated.

Some turnbuckle nuts are supplied with cross-holes, according to DIN 1478 as at 09/2005, which serve to check the minimum thread engagement.



Ordering Details: e.g.: Product No. 653 906 00, Turnbuckle DIN 1478, zinc-plated M6

Product No. zinc-plated	d* mm	L mm	min. thread engagement mm	Adjustability mm	Weight g
653 906 00	M6	110	9,5	90	120
653 908 00	M8	110	12	85	140
653 910 00	M10	125	14	95	190
653 912 00	M12	125	17	90	250
653 916 00	M16	170	22	120	430
653 920 00	M20	200	26	140	650
653 924 00	M24	255	31	180	1100
653 930 00	M30	255	38	160	1300

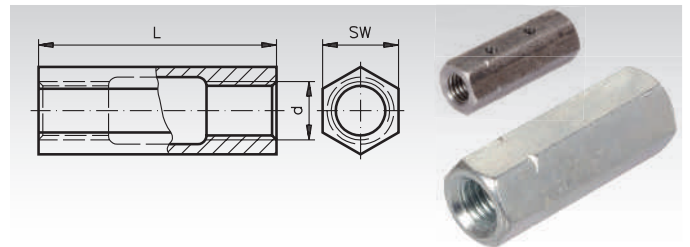
* One side right-hand thread, other side left-hand thread.

Turnbuckle Nuts Similar to DIN 1479

Material: St37 DIN 1629, either untreated or zinc-plated.

M6 to M16 with overlapping thread,
from M20 middle part relieved.

Some turnbuckle nuts are supplied with cross-holes, according to DIN 1479 as at 09/2005, which serve to check the minimum thread engagement.



Ordering Details: e.g.: Product No. 653 806 00, Turnbuckle Nut DIN 1479, M6

Product No. untreated	Product No. zinc-plated	d* mm	L mm	SW mm	Min. thread engagement mm	Adjustability mm	Weight g
653 806 00	653 856 00	M6	30	10	9,5	15	14
653 808 00	653 858 00	M8	35	13	12	15	26
653 810 00	653 860 00	M10	45	16	14	21	62
653 812 00	653 862 00	M12	55	18	17	25	90
653 816 00	653 866 00	M16	75	24	22	35	180
653 820 00	653 870 00	M20	95	30	26	47	320
653 824 00	653 874 00	M24	115	36	31	57	530
653 830 00	653 880 00	M30	125	46	38	53	1080

* One side right-hand thread, other side left-hand thread.

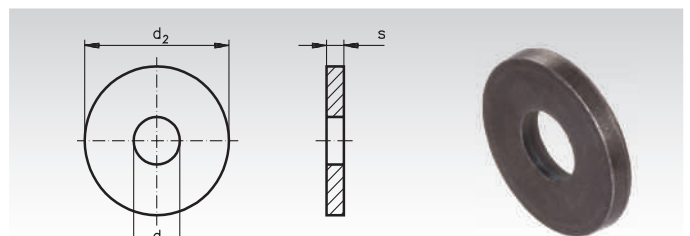
Washers DIN 6340 (extra thick)

Material: Quenched and tempered steel, stamped out, pressed flat or machine straightened, hardened.

Ordering Details: e.g.: Product No. 653 106 00, Washer DIN 6340 for M6

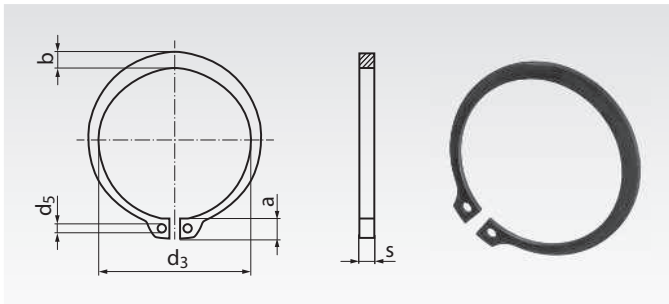
Product No.	d ₁ mm	d ₂ mm	s mm	for Bolt Size	Weight g
653 106 00	6,4	17	3	M6	5
653 108 00	8,4	23	4	M8	11
653 110 00	10,5	28	4	M10	16
653 112 00	13	35	5	M12	30
653 114 00*	15*	40	5	M14	42
653 116 00	17	45	6	M16	60
653 120 00	21	50	6	M20	75
653 124 00	25	60	8	M24	135
653 130 00	31	68	10	M30	230

* This size is not part of the DIN.



Loctite thread locking and bonding products
page 811.

Retaining Rings DIN 471 for shafts



Material: Feather steel, phosphated, oiled.

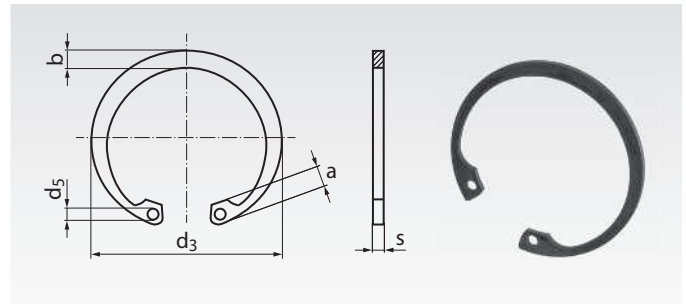
External rings for axial fixing a machine part on a shaft.

Ordering Details: e.g.: Product No. 617 403 00, Retaining Ring DIN 471, 3mm

Product No. DIN 471	Nominal Size* mm	s mm	d ₃ mm	a mm	b mm	d ₅ mm	Weight pro% kg
617 403 00	3	0,4	2,7	1,9	0,8	1,0	0,002
617 404 00	4	0,4	3,7	2,2	0,9	1,0	0,002
617 405 00	5	0,6	4,7	2,5	1,1	1,0	0,007
617 406 00	6	0,7	5,6	2,7	1,3	1,2	0,008
617 407 00	7	0,8	6,5	3,1	1,4	1,2	0,012
617 408 00	8	0,8	7,4	3,2	1,5	1,2	0,016
617 409 00	9	1,0	8,4	3,3	1,7	1,2	0,030
617 410 00	10	1,0	9,3	3,3	1,8	1,5	0,034
617 411 00	11	1,0	10,2	3,3	1,8	1,5	0,041
617 412 00	12	1,0	11,0	3,3	1,8	1,7	0,050
617 414 00	14	1,0	12,9	3,5	2,1	1,7	0,064
617 415 00	15	1,0	13,8	3,6	2,2	1,7	0,067
617 416 00	16	1,0	14,7	3,7	2,2	1,7	0,070
617 417 00	17	1,0	15,7	3,8	2,3	1,7	0,082
617 418 00	18	1,2	16,5	3,9	2,4	2,0	0,111
617 419 00	19	1,2	17,5	3,9	2,5	2,0	0,122
617 420 00	20	1,2	18,5	4,0	2,6	2,0	0,130
617 422 00	22	1,2	20,5	4,2	2,8	2,0	0,150
617 424 00	24	1,2	22,2	4,4	3,0	2,0	0,177
617 425 00	25	1,2	23,2	4,4	3,0	2,0	0,190
617 426 00	26	1,2	24,2	4,5	3,1	2,0	0,196
617 428 00	28	1,5	25,9	4,7	3,2	2,0	0,292
617 430 00	30	1,5	27,9	5,0	3,5	2,0	0,332
617 432 00	32	1,5	29,6	5,2	3,6	2,5	0,354
617 435 00	35	1,5	32,2	5,6	3,9	2,5	0,400
617 438 00	38	1,75	35,2	5,8	4,2	2,5	0,562
617 440 00	40	1,75	36,5	6,0	4,4	2,5	0,60
617 445 00	45	1,75	41,5	6,7	4,7	2,5	0,75
617 447 00	47	1,75	43,5	6,8	4,9	2,5	0,75
617 450 00	50	2,0	45,8	6,9	5,1	2,5	1,02
617 455 00	55	2,0	50,8	7,2	5,4	2,5	1,14
617 460 00	60	2,0	55,8	7,4	5,8	2,5	1,29
617 462 00	62	2,0	57,8	7,5	6,0	2,5	1,43
617 475 00	75	2,5	70,5	8,4	7,0	3,0	2,46

* Shaft diameter.

Retaining Rings DIN 472 for boreholes



Material: Feather steel, phosphated, oiled.

Internal rings for axial fixing a machine part inside a bore.

Ordering Details: e.g.: Product No. 617 608 00, Retaining Ring DIN 472, 8mm

Product No. DIN 472	Nominal Size* mm	s mm	d ₃ mm	a mm	b mm	d ₅ mm	Weight pro% kg
617 608 00	8	0,8	8,7	2,4	1,1	1,0	0,010
617 610 00	10	1,0	10,8	3,2	1,4	1,2	0,026
617 611 00	11	1,0	11,8	3,3	1,5	1,2	0,031
617 612 00	12	1,0	13,0	3,4	1,7	1,5	0,037
617 613 00	13	1,0	14,1	3,6	1,8	1,5	0,042
617 614 00	14	1,0	15,1	3,7	1,8	1,7	0,052
617 615 00	15	1,0	16,2	3,7	2,0	1,7	0,056
617 616 00	16	1,0	17,3	3,8	2,0	1,7	0,060
617 617 00	17	1,0	18,3	3,9	2,1	1,7	0,065
617 618 00	18	1,0	19,5	4,1	2,2	2,0	0,074
617 619 00	19	1,0	20,5	4,1	2,2	2,0	0,073
617 620 00	20	1,0	21,5	4,1	2,3	2,0	0,090
617 621 00	21	1,0	22,5	4,2	2,4	2,0	0,100
617 622 00	22	1,0	23,5	4,2	2,5	2,0	0,110
617 624 00	24	1,2	25,9	4,3	2,6	2,0	0,142
617 625 00	25	1,2	26,9	4,5	2,7	2,0	0,150
617 626 00	26	1,2	27,9	4,7	2,8	2,0	0,160
617 628 00	28	1,2	30,1	4,8	2,9	2,0	0,180
617 630 00	30	1,2	32,1	4,8	3,0	2,0	0,206
617 632 00	32	1,2	34,4	5,4	3,2	2,5	0,221
617 635 00	35	1,5	37,8	5,4	3,4	2,5	0,354
617 637 00	37	1,5	39,8	5,5	3,6	2,5	0,374
617 638 00	38	1,5	40,8	5,5	3,7	2,5	0,39
617 640 00	40	1,75	43,5	5,8	3,9	2,5	0,47
617 642 00	42	1,75	45,5	5,9	4,1	2,5	0,54
617 645 00	45	1,75	48,5	6,2	4,3	2,5	0,60
617 647 00	47	1,75	50,5	6,4	4,4	2,5	0,61
617 650 00	50	2,0	54,2	6,5	4,6	2,5	0,73
617 652 00	52	2,0	56,2	6,7	4,7	2,5	0,82
617 655 00	55	2,0	59,2	6,8	5,0	2,5	0,83
617 658 00	58	2,0	62,2	6,9	5,2	2,5	1,05
617 660 00	60	2,0	64,2	7,3	5,4	2,5	1,11
617 662 00	62	2,0	66,2	7,3	5,5	2,5	1,12
617 668 00	68	2,5	72,5	7,8	6,1	3,0	1,60
617 672 00	72	2,5	76,5	7,8	6,4	3,0	1,81
617 675 00	75	2,5	79,5	7,8	6,6	3,0	1,88
617 680 00	80	2,5	85,5	8,5	7,0	3,0	2,20
617 685 00	85	3,0	90,5	8,6	7,2	3,5	2,53
617 690 00	90	3,0	95,5	8,6	7,6	3,5	3,30
617 700 00	100	3,0	105,5	9,2	8,4	3,5	4,20
617 710 00	110	4,0	117,0	10,4	9,0	3,5	6,45

* Borehole diameter.

Locknuts DIN 981, Steel or Stainless Steel

Material:

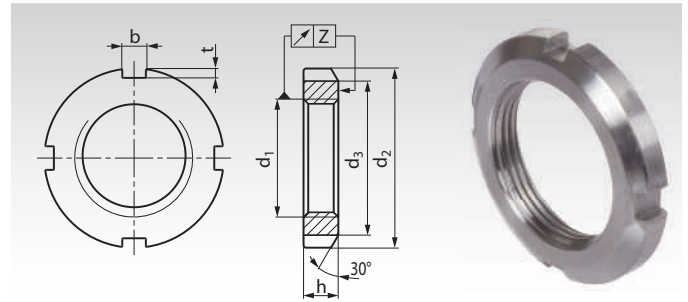
standard: Steel, min. strength 350 N/mm².

stainless: Stainless steel 1.4618 (AISI 201).



These nuts are used for unsafed, quickly to loosen applications, or for a safe connection with an additional lockwasher DIN 5406 (for these lockwashers, a keyway is required on the shaft thread).

Recommend tolerance for the shaft thread: 6g DIN ISO 965.



Ordering Details: e.g.: Product No. 653 630 00, Locknut DIN 981, Steel, KM 0

Product No. standard	Product No. stainless	Type	d ₁ mm	d ₂ mm	d ₃ min. mm	h mm	b mm	t mm	Z mm	Weight g
653 630 00	653 996 30	KM 0	M10 x 0,75	18	13,5	4	3	2	0,04	4
653 632 00	653 996 32	KM 1	M12 x 1	22	17	4	3	2	0,04	7
653 634 00	653 996 34	KM 2	M15 x 1	25	21	5	4	2	0,04	10
653 637 00	653 996 37	KM 3	M17 x 1	28	24	5	4	2	0,04	13
653 640 00	653 996 40	KM 4	M20 x 1	32	26	6	4	2	0,04	19
653 644 00	653 996 44	KM 5	M25 x 1,5	38	32	7	5	2	0,04	25
653 648 00	653 996 48	KM 6	M30 x 1,5	45	38	7	5	2	0,04	43
653 653 00	653 996 53	KM 7	M35 x 1,5	52	44	8	5	2	0,04	53
653 658 00	653 996 58	KM 8	M40 x 1,5	58	50	9	6	2,5	0,04	85
653 662 00	653 996 62	KM 9	M45 x 1,5	65	56	10	6	2,5	0,04	119
653 665 00	653 996 65	KM 10	M50 x 1,5	70	61	11	6	2,5	0,04	148
653 668 00	653 996 68	KM 11	M55 x 2	75	67	11	7	3	0,05	158
653 671 00	653 996 71	KM 12	M60 x 2	80	73	11	7	3	0,05	174
653 673 00	653 996 73	KM 13	M65 x 2	85	79	12	7	3	0,05	203
653 675 00	653 996 75	KM 14	M70 x 2	92	85	12	8	3,5	0,05	242
653 678 00	653 996 78	KM 15	M75 x 2	98	90	13	8	3,5	0,05	287
653 680 00	653 996 80	KM 16	M80 x 2	105	95	15	8	3,5	0,05	237
653 683 00	653 996 83	KM 17	M85 x 2	110	102	16	8	3,5	0,05	451
653 685 00	653 996 85	KM 18	M90 x 2	120	108	16	10	4	0,05	556
653 687 00	653 996 87	KM 19	M95 x 2	125	113	17	10	4	0,05	658
653 690 00	653 996 90	KM 20	M100 x 2	130	120	18	10	4	0,05	698

Lockwashers DIN 5406 for Locknuts DIN 981, Steel or Stainless Steel

Material:

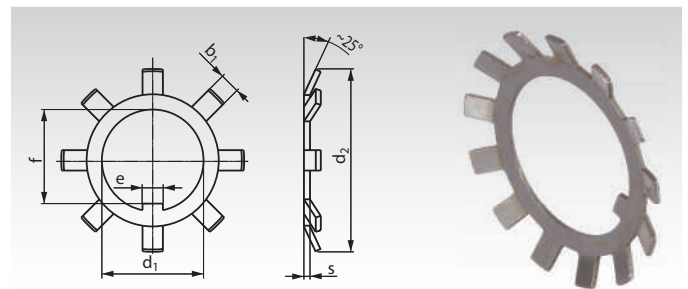
standard: Steel, min. strength 350 N/mm².

stainless: Stainless steel 1.4618 (AISI 201).



Safety plates for locknuts DIN 981.

A keyway is required on the shaft thread.



Ordering Details: e.g.: Product No. 653 630 01, Lockwasher DIN 5406 MB 0

Product No. standard	Product No. stainless	Type	matching nut type	d ₁ mm	d ₂ mm	d ₃ mm	e mm	f mm	b ₁ mm	s mm	Weight g
653 630 01	653 995 30	MB 0	KM 0	10	21	13,5	3	8,5	3	1,00	1
653 632 01	653 995 32	MB 1	KM 1	12	25	17	3	10,5	3	1,00	2
653 634 01	653 995 34	MB 2	KM 2	15	28	21	4	13,5	4	1,00	3
653 637 01	653 995 37	MB 3	KM 3	17	32	24	4	15,5	4	1,00	3
653 640 01	653 995 40	MB 4	KM 4	20	36	26	4	18,5	4	1,00	4
653 644 01	653 995 44	MB 5	KM 5	25	42	32	5	23,0	5	1,25	6
653 648 01	653 995 48	MB 6	KM 6	30	49	38	5	27,5	5	1,25	8
653 653 01	653 995 53	MB 7	KM 7	35	57	44	6	32,5	5	1,25	10
653 658 01	653 995 58	MB 8	KM 8	40	62	50	6	37,5	6	1,25	12
653 662 01	653 995 62	MB 9	KM 9	45	69	56	6	42,5	6	1,25	15
653 665 01	653 995 65	MB 10	KM 10	50	74	61	6	47,5	6	1,25	16
653 668 01	653 995 68	MB 11	KM 11	55	81	67	8	52,5	7	1,50	20
653 671 01	653 995 71	MB 12	KM 12	60	86	73	8	57,5	7	1,50	25
653 673 01	653 995 73	MB 13	KM 13	65	92	79	8	62,5	7	1,50	29
653 675 01	653 995 75	MB 14	KM 14	70	98	85	8	66,5	8	1,50	33
653 678 01	653 995 78	MB 15	KM 15	75	104	90	8	71,5	8	1,50	36
653 680 01	653 995 80	MB 16	KM 16	80	112	95	10	76,5	8	1,80	46
653 683 01	653 995 83	MB 17	KM 17	85	119	102	10	81,5	8	1,80	52
653 685 01	653 995 85	MB 18	KM 18	90	126	108	10	86,5	10	1,80	62
653 687 01	653 995 87	MB 19	KM 19	95	133	113	10	91,5	10	1,80	67
653 690 01	653 995 90	MB 20	KM 20	100	142	120	12	96,5	10	1,80	77

Locknuts UW with Locking Device, Steel and Stainless Steel

Material:

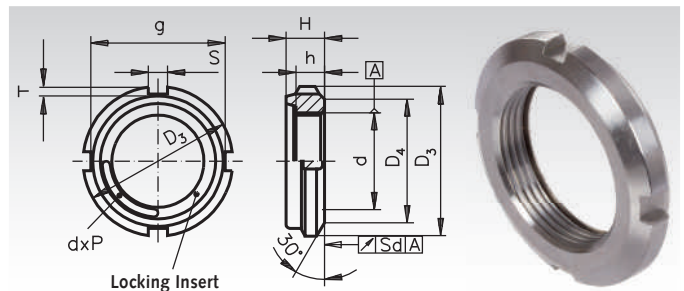
standard: Body of the nut: Low carbon steel (FUOOSS).

stainless: Body of the nut: Stainless steel 1.4301.

Locking insert: Stainless Steel.



With these slotted nuts no additional lock washers or keyways are required. No keyway or washer required for roller bearing. Designed for easy assembly. Maintenance-free construction. The bolt thread has to meet the medium quality of ISO 965.



Ordering Details: e.g.: Product No. 653 430 00, Slot Nut UW, M 10 x 0.75

Product No. standard	Product No. stainless	d x P mm	D ₃ -0,5 mm	D ₄ -0,5 mm	g ^{-0,5} mm	T mm	S±0,2 mm	h mm	H mm	Tol. H mm	Sd mm	Weight g
653 428 00	-	M8 x 0,75	16	12	13	1,5	3	4,3	5,3	±0,3	0,05	4
653 430 00	653 994 30	M10 x 0,75	18	13	14,4	1,8	3	4	5,2	±0,3	0,05	4,5
653 432 00	653 994 32	M12 x 1	22	17	18,4	1,8	3	4	5,4	±0,3	0,05	8
653 434 00	653 994 34	M15 x 1	25	21	21,4	1,8	4	5	6,5	±0,5	0,05	12
653 437 00	653 994 37	M17 x 1	28	24	24,2	1,9	4	5	6,4	±0,5	0,05	13
653 440 00	653 994 40	M20 x 1	32	26	28,4	1,8	4	6	7,7	±0,5	0,05	23
653 444 00	653 994 44	M25 x 1,5	38	32	34	2	5	7	9,1	±0,5	0,05	36
653 448 00	653 994 48	M30 x 1,5	45	38	41	2	5	7	9,1	±0,8	0,05	45
653 453 00	653 994 53	M35 x 1,5	52	44	48	2	5	8	10,2	±0,8	0,05	70
653 458 00	653 994 58	M40 x 1,5	58	50	53	2,5	6	9	11,2	±0,8	0,05	95
653 462 00	653 994 62	M45 x 1,5	65	56	60	2,5	6	10	12,5	±1,0	0,05	130
653 465 00	653 994 65	M50 x 1,5	70	61	65	2,5	6	11	13,5	±1,0	0,05	160
653 468 00	653 994 68	M55 x 2	75	67	69	3	7	11	13,5	±1,0	0,07	185
653 471 00	653 994 71	M60 x 2	80	73	74	3	7	11	13,5	±1,0	0,07	200

Please note:

Ensure that there are at least two or three full threads behind the locking insert.

This slot nut must not be used on shafts with keyway.

Lubricate the nut when screwing it onto the shaft.

Larger thread diameters can be supplied on request.

Function:

This system consists of a shaft nut and a special spring, acting as friction ring. This special spring is integrated into the upper part of the nut.

Due to the lead of the thread the special spring locks itself between shaft and nut. **The system is locked in any position!**

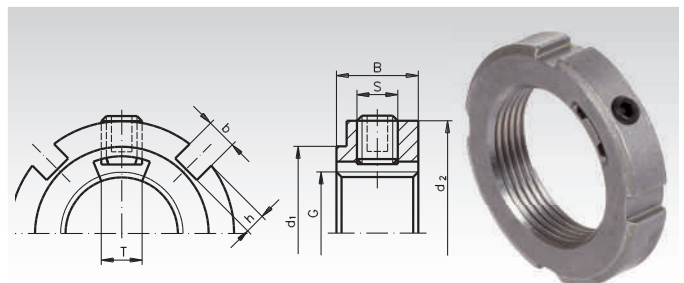
Locknuts KMK with Integral Locking Device

Material: Body of the nut steel, min. strength 350 N/mm².

Design: Metric ISO thread according to DIN 13 part 27.

Tolerance class: 5H or ISO 965/III-1980.

Reusable shaft nut with integrated locking device. Special feature of the shaft nut is the locking insert, integrated into the nut. This insert is threaded and thus does not cause any damage. The locking insert is pressed against the shaft thread with a locking screw and thus prevents the nut from turning.



Ordering Details: e.g.: Product No. 653 530 00, Shaft Nut KMK, M10 x 0.75

Product No.	Thread G mm	d ₁ mm	d ₂ mm	B mm	b mm	h mm	S mm	T mm	Fastening Torque of Locking Screw Nm	Permissible Axial Load N	Weight g
653 530 00	M10 x 0,75	16	20	9	3	2	M5	4	4	9800	16
653 532 00	M12 x 1	18	22	9	3	2	M5	4	4	11800	18
653 534 00	M15 x 1	21	25	9	4	2	M5	4	4	14600	21
653 537 00	M17 x 1	24	28	9	4	2	M5	4	4	19600	27
653 540 00	M20 x 1	28	32	9	4	2	M5	4	4	24000	30
653 544 00	M25 x 1,5	34	38	9	5	2	M5	10	4	31500	30
653 548 00	M30 x 1,5	41	45	9	5	2	M5	10	4	36500	60
653 553 00	M35 x 1,5	48	52	9	5	2	M5	10	4	50000	70
653 558 00	M40 x 1,5	53	58	11	6	2,5	M6	12	8	62000	110
653 562 00	M45 x 1,5	60	65	11	6	2,5	M6	12	8	78000	140
653 565 00	M50 x 1,5	65	70	15	6	2,5	M8	12	18	91500	180
653 568 00	M55 x 2	69	75	15	7	3	M8	12	18	91500	190
653 571 00	M60 x 2	74	80	15	7	3	M8	12	18	95000	200

Hook Wrenches DIN 1810 form A for Locknuts

Material: High grade tool steel, burnished.

Hook wrenches for locknuts DIN 981 and slotted nuts DIN 1804.

Please note: For some applications like mounting the precision levelling adjusters, there are two wrenches required.

Ordering Details: e.g.: Product No. 653 400 12, Hook Wrench 12-14mm



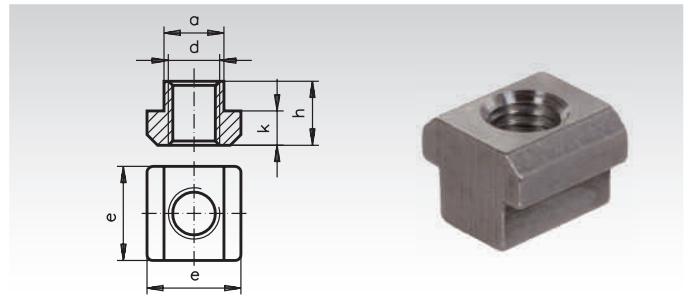
Product No.	D _m Range mm	Length mm	Thickness mm	Weight g
653 400 12	12 - 14	110	3	25
653 400 16	16 - 20	110	3	25
653 400 25	25 - 28	136	4	45
653 400 30	30 - 32	136	4	50
653 400 34	34 - 36	170	5	90
653 400 40	40 - 42	170	5	90
653 400 45	45 - 50	206	6	155
653 400 52	52 - 55	206	6	160
653 400 58	58 - 62	240	7	260
653 400 68	68 - 75	240	7	255
653 400 80	80 - 90	280	8	410
653 400 95	95 - 100	280	8	405
653 401 10	110 - 115	335	10	745
653 401 20	120 - 130	335	10	720

Collars
page 452



T-Nuts DIN 508

Material: Tempered steel, tensile strength 8, blank.
Suitable for T-slots DIN 650.



Ordering Details: e.g.: Product No. 655 105 00, Nut for T-Slots DIN 508, M5

Product No.	d mm	for T-Slots mm	a mm	e mm	h mm	k mm	Weight g
655 105 00	M5	6	5,6	10	8	4	3
655 106 00	M6	8	7,6	13	10	6	8
655 108 00	M8	10	9,6	15	12	6	14
655 110 00	M10	12	11,6	18	14	7	22
655 112 00	M12	14	13,6	22	16	8	34
655 114 00	M14*	16	15,6	25	18	9	50
655 116 00	M16	18	17,6	28	20	10	68
655 120 00	M20	22	21,6	35	28	14	155
655 124 00	M24	28	27,6	44	36	18	330

* These dimension is not part of the DIN.

Threaded bars page 510. Nuts with collar page 512. Washers page 513.

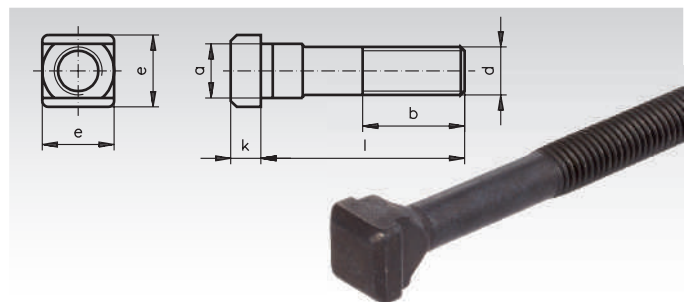
T-Slot Bolts DIN 787

Material: Tempered steel, forged, slot flats milled, burnished.

Tensile strength:

Up to M12: strength 10.9. Above M12: strength 8.8.

More sizes up to M36 x 600mm on request.



Ordering Details: z.B.: Product No. 655 001 00, Bolt for T-Slots DIN 787, M6 x 25 mm

Product No.	d mm	for T-Slots mm	l mm	a mm	b mm	e mm	k mm	Weight g
655 001 00	M6	6	25	5,6	15	10	4	10
655 002 00	M6	6	40	5,6	28	10	4	15
655 004 00	M8	8	50	7,6	35	13	6	26
655 005 00	M8	8	80	7,6	50	13	6	37
655 006 00	M10	10	40	9,6	30	15	6	33
655 007 00	M10	10	63	9,6	45	15	6	50
655 009 00	M10	10	100	9,6	60	15	6	67
655 011 00	M12	12	50	11,6	35	18	7	58
655 012 00	M12	12	80	11,6	55	18	7	87
655 014 00	M12	12	125	11,6	75	18	7	120
655 015 00	M12	14	50	13,6	35	22	8	76
655 016 00	M12	14	80	13,6	55	22	8	100
655 018 00	M12	14	125	13,6	75	22	8	135
655 019 00	M16	16	63*	15,6	45	25	9	136
655 020 00	M16	16	100*	15,6	65	25	9	200
655 022 00	M16	16	160*	15,6	100	25	9	290
655 023 00	M16	18	63	17,6	45	28	10	162
655 024 00	M16	18	100	17,6	65	28	10	220
655 026 00	M16	18	160	17,6	100	28	10	300
655 028 00	M20	20	160*	19,6	100	32	12	444
655 029 00	M20	22	80	21,6	55	35	14	332
655 030 00	M20	22	125	21,6	85	35	14	390
655 032 00	M20	22	160*	21,6	100	35	14	497

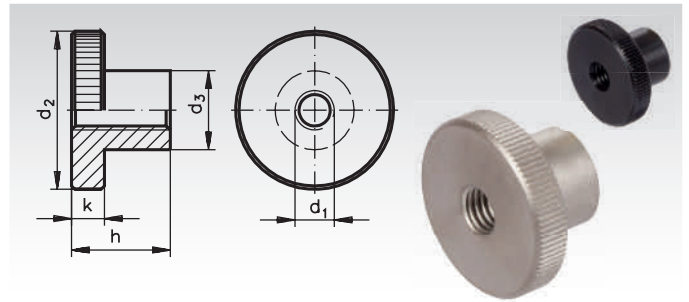
* These dimensions are not part of the DIN.

Threaded bars page 510. Nuts with collar page 512. Washers page 513.

Knurled Nuts DIN 466, Steel and Stainless Steel

Material: Steel, tensile strength 5,
visible face precision turned, burnished.

Material: Stainless steel 1.4305,
visible face precision turned,
sand blasted matt.



Ordering Details: e.g.: Product No. 653 723 00, Knurled Nut DIN 466, M3

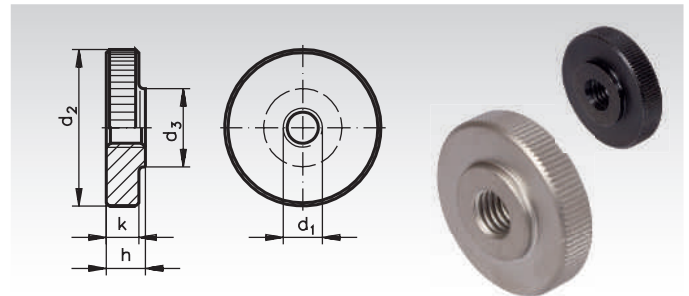
Product No. Steel	Product No. Stainless	d ₁ mm	d ₂ mm	d ₃ mm	h mm	k mm	Weight g
653 723 00	-	M3	12	6	7,5	2,5	3
653 724 00	653 997 24	M4	16	8	9,5	3,5	7
653 725 00	653 997 25	M5	20	10	11,5	4	13
653 726 00	653 997 26	M6	24	12	15	5	23
653 728 00	653 997 28	M8	30	16	18	6	44
653 730 00	653 997 30	M10	36	20	23	8	84
653 732 00	-	M12*	40	22	25	10	118

* Not part of the DIN.

Flat Knurled Nuts DIN 467, Steel and Stainless Steel

Material: Steel, tensile strength 5,
visible face precision turned, burnished.

Material: Stainless steel 1.4305,
visible face precision turned, sand blasted,
matt finish.



Ordering Details: e.g.: Product No. 653 743 00, Flat Knurled Nuts DIN 466, M3

Product No. Steel	Product No. Stainless	d ₁ mm	d ₂ mm	d ₃ mm	h mm	k mm	Weight g
653 743 00	-	M3	12	6	3	2,5	2
653 744 00	653 997 44	M4	16	8	4	3,5	5
653 745 00	653 997 45	M5	20	10	5	4	10
653 746 00	653 997 46	M6	24	12	6	5	18
653 748 00	653 997 48	M8	30	16	8	6	35
653 750 00	653 997 50	M10	36	20	10	8	61
653 752 00	-	M12*	40	22	12	10	92

* Not part of the DIN.

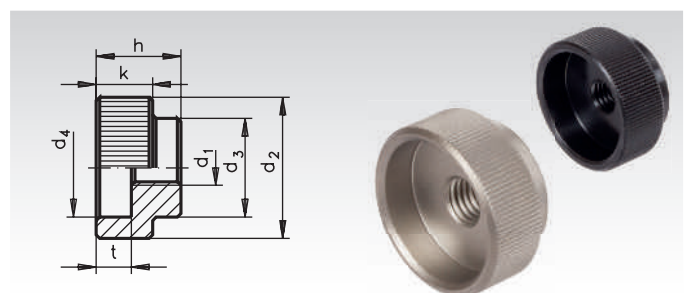
Knurled Nuts DIN 6303, Steel and Stainless Steel

Material: Steel, burnished.

Material: Stainless steel 1.4305



Without pin hole.



Ordering Details: e.g.: Product No. 653 705 00, Knurled Nut DIN 6303, M5

Product No. Steel	Product No. Stainless	d ₁ mm	d ₂ mm	d ₃ mm	d ₄ mm	h mm	k mm	t mm	Weight g
653 705 00	653 997 05	M5	20	14	15	12	8	5	15
653 706 00	653 997 06	M6	24	16	18	14	10	6	27
653 708 00	653 997 08	M8	30	20	24	17	12	7	40
653 710 00	653 997 10	M10	36	28	30	20	14	8	85
653 712 00	653 997 12	M12	40	32	34	24	16	10	132

Hollow Knurled Nuts 420

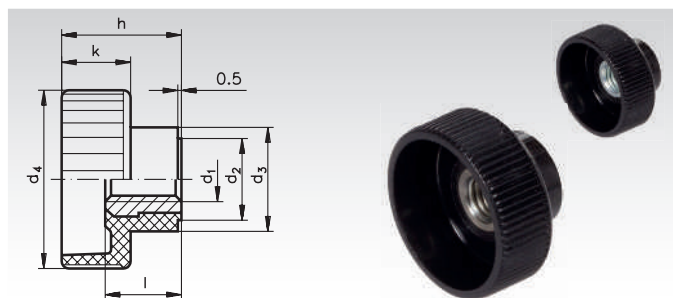
Material:

Type Steel:

Head: Plastic thermoplast (polyamide) black, glossy.
Bush: Steel, zinc plated, chromatised blue.

Type Stainless Steel:

Head: Plastic thermoplast (polyamide) black, glossy.
Bush: Stainless steel 1.4305.



Ordering Details: e.g.: Product No. 653 754 00, Knurled Nut M 4

Product No. steel	Product No. stainless	d ₁ mm	d ₂ mm	d ₃ mm	d ₄ mm	h mm	k mm	l mm	Weight g
653 754 00	-	M4	9	12	19	14	8	9	4
653 755 00	653 997 55	M5	9	12	19	14	8	9	4
653 756 00	653 997 56	M6	11	14	24	16,5	9,5	10,5	7
653 758 00	653 997 58	M8	13	16	30	19,5	11	11,5	10
653 760 00	-	M10	15	18	36	22,5	12,5	14	16

Knurled Thumb Screws 421

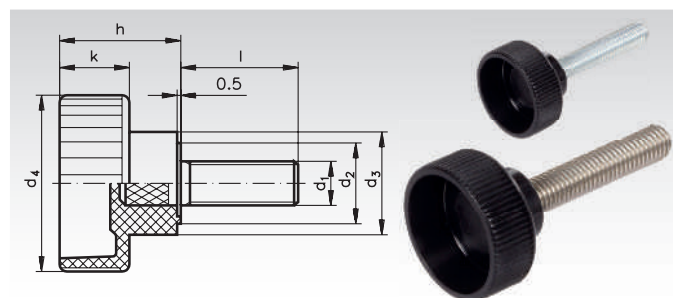
Material:

Type with threaded bolt of steel:

Head: Plastic thermoplast (polyamide) black, glossy.
Threaded bolt: Steel, zinc plated, chromatised blue.

Type with threaded bolt of stainless steel:

Head: Plastic thermoplast (polyamide) black, glossy.
Threaded bolt: Stainless steel 1.4567.



Ordering Details: e.g.: Product No. 653 770 00, Knurled Thumb Screw M4 x 10

Product No. steel	Product No. stainless	d ₁ mm	Length l mm	d ₂ mm	d ₃ mm	d ₄ mm	h mm	k mm	Weight g
653 770 00	-	M4	10	9	12	19	14	8	6
653 772 00	-	M4	15	9	12	19	14	8	6
653 774 00	-	M4	20	9	12	19	14	8	6
653 775 00	-	M4	30	9	12	19	14	8	7
653 776 00	653 997 76	M5	10	9	12	19	14	8	7
653 778 00	653 997 78	M5	15	9	12	19	14	8	7
653 780 00	653 997 80	M5	20	9	12	19	14	8	7
653 781 00	653 997 81	M5	25	9	12	19	14	8	8
653 782 00	653 997 82	M6	16	11	14	24	16,5	9,5	8
653 784 00	653 997 84	M6	20	11	14	24	16,5	9,5	12
653 786 00	653 997 86	M6	25	11	14	24	16,5	9,5	13
653 787 00	653 997 87	M6	30	11	14	24	16,5	9,5	10
653 788 00	-	M8	16	13	16	30	19,5	11	17
653 790 00	653 997 90	M8	20	13	16	30	19,5	11	18
653 792 00	653 997 92	M8	30	13	16	30	19,5	11	24
653 793 00	653 997 93	M8	40	13	16	30	19,5	11	20
653 794 00	653 997 94	M10	20	15	18	36	22,5	12,5	30
653 795 00	653 997 95	M10	25	15	18	36	22,5	12,5	33
653 796 00	653 997 96	M10	30	15	18	36	22,5	12,5	35
653 798 00	-	M10	40	15	18	36	22,5	12,5	40
-	653 997 99	M10	55	15	18	36	22,5	12,5	48

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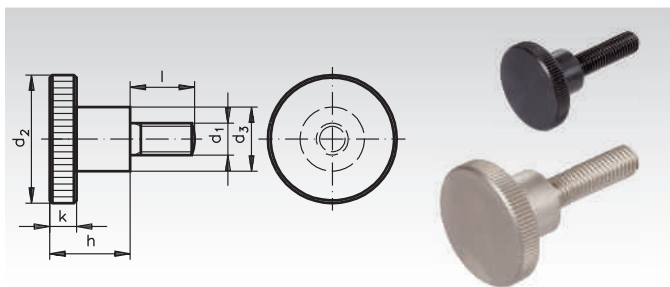
Knurled Thumb Screws DIN 464, Burnished Steel and Stainless Steel

Material: Steel burnished, tensile strength 5.8.

Material: Stainless steel 1.4305.

Visible face precision turned.

Contrary to the standards sheet, all knurled screws are produced from one piece and threaded over their full length.



Ordering Details: e.g.: Product No. 654 205 00, Knurled Screw DIN 464, M4 x 8

Product No. Steel 5.8	Product No. stainless	d ₁ mm	l mm	d ₂ mm	d ₃ mm	h mm	k mm	Weight g
654 205 00	654 992 05	M4	8	16	8	9,5	3,5	9
654 206 00	654 992 06	M4	10	16	8	9,5	3,5	9
654 207 00	654 992 07	M4	12	16	8	9,5	3,5	10
654 208 00	654 992 08	M4	16	16	8	9,5	3,5	10
654 212 00	654 992 12	M5	10	20	10	11,5	4	12
654 214 00	654 992 14	M5	16	20	10	11,5	4	16
654 216 00	654 992 16	M5	20	20	10	11,5	4	16
654 218 00	-	M6	10	24	12	15	5	28
654 220 00	654 992 20	M6	16	24	12	15	5	29
654 221 00	654 992 21	M6	20	24	12	15	5	30
654 222 00	654 992 22	M6	25	24	12	15	5	31
654 224 00	654 992 24	M8	16	30	16	18	6	56
654 225 00	654 992 25	M8	20	30	16	18	6	60
654 227 00	654 992 27	M8	30	30	16	18	6	61
654 229 00	-	M10	20	36	20	23	8	108
654 231 00	-	M10	30	36	20	23	8	113
654 232 00	-	M10	40	36	20	23	8	118

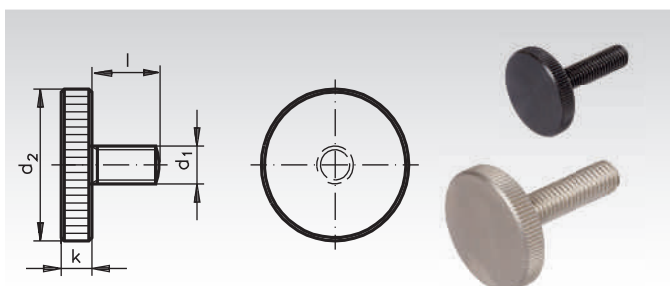
Knurled Thumb Screws DIN 653, Burnished Steel and Stainless Steel

Material: Steel burnished, tensile strength 5.8.

Material: Stainless steel 1.4305.

Visible face precision turned.

Produced from one piece and threaded over their full length (DIN designation A).



Ordering Details: e.g.: Product No. 654 233 05, Knurled Screw DIN 653, M3 x 6

Product No. Steel 5.8	Product No. Stainless	d ₁ mm	l mm	d ₂ mm	k mm	Weight g
654 233 05	-	M3	6	12	2,5	2,3
654 233 06	-	M3	8	12	2,5	2,4
654 233 07	-	M3	10	12	2,5	2,5
654 233 08	-	M3	16	12	2,5	2,7
654 233 10	654 234 10	M4	8	16	3,5	5,6
654 233 11	654 234 11	M4	10	16	3,5	5,7
654 233 12	654 234 12	M4	12	16	3,5	6,1
654 233 13	654 234 13	M4	16	16	3,5	6,2
654 233 14	-	M4	20	16	3,5	6,6
654 233 16	654 234 16	M5	10	20	4	10
654 233 17	654 234 17	M5	12	20	4	11
654 233 18	654 234 18	M5	16	20	4	12
654 233 19	654 234 19	M5	20	20	4	13
654 233 20	-	M5	25	20	4	14
654 233 22	654 234 22	M6	12	24	5	18
654 233 23	654 234 23	M6	16	24	5	20
654 233 24	654 234 24	M6	20	24	5	22
654 233 25	654 234 25	M6	25	24	5	24
654 233 26	-	M6	30	24	5	26
654 233 28	654 234 28	M8	16	30	6	33
654 233 29	654 234 29	M8	20	30	6	37
654 233 30	654 234 30	M8	25	30	6	39
654 233 31	654 234 31	M8	30	30	6	41
654 233 33	-	M8	40	30	6	44
654 233 34	654 234 34	M10	20	36	8	68
654 233 35	654 234 35	M10	25	36	8	72
654 233 36	654 234 36	M10	30	36	8	76
654 233 38	654 234 38	M10	40	36	8	80

Swing Bolts similar to DIN 444, Burnished Steel and Stainless Steel

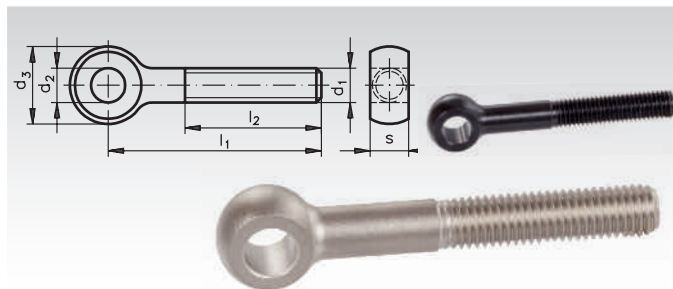
Material: Steel burnished, tensile strength 5.8.

Material: Stainless steel 1.4305.

Precision made, thread rolled.

Contrary to the standards sheet the burnished steel version has a higher tensile strength (5.8 instead of 4.6 / 5.6) and the thread length l_2 is larger at both version.

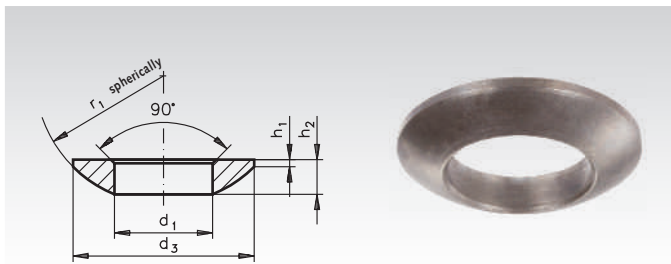
The stainless steel version is not part of the DIN.



Ordering Details: e.g.: Product No. 654 406 00, Swing Bolt DIN 444, M6

Product No. Steel 5.8	Product No. stainless	d ₁ mm	l ₁ mm	l ₂ mm	d ₂ ^{H7} mm	d ₃ mm	s-0,2 mm	Weight g
654 404 00	654 994 04	M5	50	32	5	12	6	9
654 405 00	654 994 05	M5	75	32	5	12	6	13
654 406 00	654 994 06	M6	50	32	6	14	7	14
654 407 00	654 994 07	M6	75	32	6	14	7	20
654 410 00	654 994 10	M8	50	32	8	18	9	26
654 411 00	654 994 11	M8	75	32	8	18	9	36
654 414 00	654 994 14	M10	50	40	10	20	12	38
654 415 00	654 994 15	M10	75	40	10	20	12	52
654 416 00	654 994 16	M10	100	40	10	20	12	68
654 418 00	654 994 18	M12	75	40	12	25	14	80
654 420 00	654 994 20	M12	100	40	12	25	14	98
654 421 00	654 994 21	M12	130	40	12	25	14	120
654 424 00	654 994 24	M16	75	50	16	32	17	146
654 425 00	654 994 25	M16	100	50	16	32	17	183
654 426 00	654 994 26	M16	130	50	16	32	17	220
654 428 00	654 994 28	M20	100	63	18	40	22	305
654 429 00	654 994 29	M20	130	63	18	40	22	366
654 430 00	654 994 30	M20	160	63	18	40	22	438

Spherical Washers DIN 6319



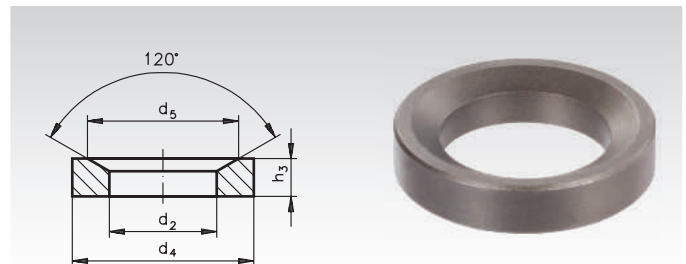
Material: Steel, blank, turned, case hardened, hardening depth min. 0.2 mm.

Ordering Details: e.g.: Product No. 655 406 00, Spherical Washer DIN 6319, 6.4 mm

Product No. Type C	d ₁ ^{H13} mm	d ₃ mm	h ₁ mm	h ₂ mm	r ₁ mm	for Bolt Ø	F* kN	Weight g
655 406 00	6,4	12	0,7	2,3	9	6	9	0,9
655 408 00	8,4	17	0,6	3,2	12	8	17	2,5
655 410 00	10,5	21	0,8	4,0	15	10	26	5
655 412 00	13	24	1,1	4,6	17	12	38	7,3
655 414 00	15	28	1,2	5,0	22	14	53	11,4
655 416 00	17	30	1,3	5,3	22	16	73	12,7
655 420 00	21	36	2,0	6,3	27	20	117	22
655 424 00	25	44	2,4	8,2	32	24	168	43
655 430 00	31	56	3,6	11,2	41	30	269	102
655 436 00	37	68	4,6	14,0	50	36	394	190
655 440 00	43	78	6,5	17,0	58	42	542	305
655 448 00	50	92	8,0	21,0	67	48	714	540

* Max. statical load.

Conical Seats DIN 6319



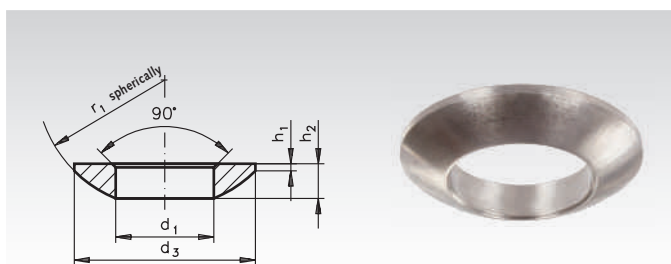
Material: Steel, blank, turned, case hardened, hardening depth min. 0.2 mm.

Ordering Details: e.g.: Product No. 655 506 00, Conical Seat DIN 6319, 7.1 mm

Product No. Type D	d ₂ ^{H13} mm	d ₄ mm	d ₅ mm	h ₃ mm	h ₄ ** mm	for Bolt Ø	F* kN	Weight g
655 506 00	7,1	12	11	2,8	4	6	9	1,3
655 508 00	9,6	17	14,5	3,5	5	8	17	3,5
655 510 00	12	21	18,5	4,2	6,3	10	26	6,7
655 512 00	14,2	24	20	5	8	12	38	10
655 514 00	16,5	28	24,8	5,6	8,6	14	53	14,4
655 516 00	19	30	26	6,2	9,3	16	73	18
655 520 00	23,2	36	31	7,5	11,5	20	117	31
655 524 00	28	44	37	9,5	15	24	168	61
655 530 00	35	56	49	12	19,7	30	269	130
655 536 00	42	68	60	15	23	36	394	230
655 540 00	49	78	70	18	29	42	542	360
655 548 00	56	92	82	22	36	48	714	640

** Total height, together with spherical washer.

Spherical Washers DIN 6319 of Stainless Steel



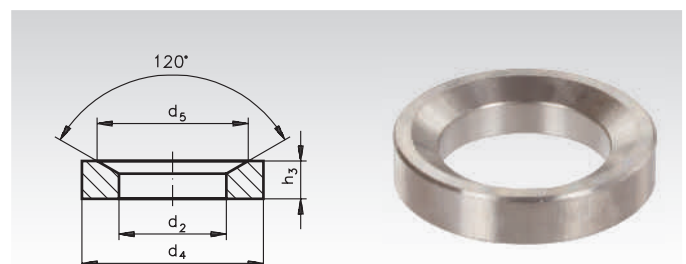
Material: 1.4301.



Ordering Details e.g.: Product No. 655 994 06, Spherical Washer DIN 6319, 6.4 mm, stainless

Product No. Type C	d ₁ ^{H13} mm	d ₃ mm	h ₁ mm	h ₂ mm	r ₁ mm	for Bolt Ø	Weight g
655 994 06	6,4	12	0,7	2,3	9	6	0,9
655 994 08	8,4	17	0,6	3,2	12	8	2,5
655 994 10	10,5	21	0,8	4	15	10	5
655 994 12	13	24	1,1	4,6	17	12	7,3
655 994 16	17	30	1,3	5,3	22	16	12,7
655 994 20	21	36	2	6,3	27	20	22
655 994 24	25	44	2,4	8,2	32	24	43
655 994 30	31	56	3,6	11,2	41	30	102

Conical Seats DIN 6319 of Stainless Steel



Material: 1.4301.



Ordering Details e.g.: Product No. 655 995 06, Conical Seat DIN 6319, 7.1 mm, stainless

Product No. Type D	d ₂ ^{H13} mm	d ₄ mm	d ₅ mm	h ₃ mm	for Bolt Ø	Weight g
655 995 06	7,1	12	11	2,8	6	1,3
655 995 08	9,6	17	14,5	3,5	8	3,5
655 995 10	12	21	18,5	4,2	10	6,7
655 995 12	14,2	24	20	5	12	10
655 995 16	19	30	26	6,2	16	18
655 995 20	23,2	36	31	7,5	20	31
655 995 24	28	44	37	9,5	24	61
655 995 30	35	56	49	12	30	130

Ball-Ended Thrust Screws

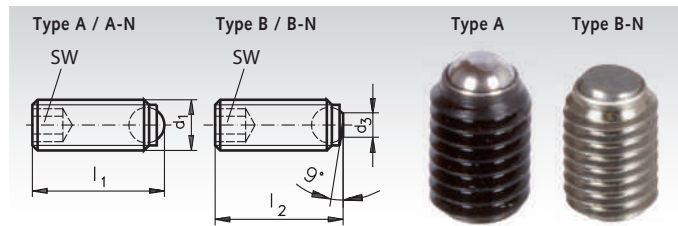
Material typ A and typ B: Screw: Steel tensile strength 12.9, burnished. Ball: Steel, hardened, blank.

Material typ A-N and typ B-N: Screw: Stainless steel 1.4305. Ball: Stainless steel, hardened.

Type A / A-N: with full ball.

Type B / B-N: with flat-faced ball, to clamp surfaces that are not exactly parallel.

Temperature range: -60°C to +350°C.



Ordering Details: e.g.: Product No. 654 503 05, Ball-Ended Thrust Screw M3 x 5mm

Product No. Type A	Product No. Type B	Product No. Type A-N	Product No. Type B-N	d ₁ mm	Nominal length mm	d ₃ mm	l ₁ mm	l ₂ mm	Ball Ø mm	SW mm	kN*	Weight g
654 503 05	-	654 903 05	-	M3	5	-	5	-	1,5	1,5	2,5	0,15
654 503 08	-	654 903 08	-	M3	8	-	7,5	-	1,5	1,5	2,5	0,22
654 503 10	-	654 903 10	-	M3	10	-	10	-	1,5	1,5	2,5	0,33
654 504 06	654 554 06	654 904 06	654 954 06	M4	6	1,8	6	5,6	2,5	2	3,5	0,4
654 504 10	654 554 10	654 904 10	654 954 10	M4	10	1,8	10	9,6	2,5	2	3,5	0,7
654 504 16	654 554 16	654 904 16	654 954 16	M4	16	1,8	16	15,6	2,5	2	3,5	1,1
654 505 08	654 555 08	654 905 08	654 955 08	M5	8	2,2	8	7,5	3	2,5	4,5	0,8
654 505 12	654 555 12	654 905 12	654 955 12	M5	12	2,2	12	11,5	3	2,5	4,5	1,3
654 505 20	654 555 20	654 905 20	654 955 20	M5	20	2,2	20	19,5	3	2,5	4,5	2,3
654 506 10	654 556 10	654 906 10	654 956 10	M6	10	3	10,8	10	4	3	9	1,5
654 506 16	654 556 16	654 906 16	654 956 16	M6	16	3	16,8	16	4	3	9	2,4
654 506 25	654 556 25	654 906 25	654 956 25	M6	25	3	25,8	25	4	3	9	3,9
654 508 10	654 558 10	654 908 10	654 958 10	M8	10	5	11,2	10	5,5	4	15	2,6
654 508 12	654 558 12	654 908 12	654 958 12	M8	12	5	13,2	12	5,5	4	15	3,2
654 508 20	654 558 20	654 908 20	654 958 20	M8	20	5	21,2	20	5,5	4	15	5,7
654 508 30	654 558 30	654 908 30	654 958 30	M8	30	5	31,2	30	5,5	4	15	8,9
654 510 12	654 560 12	654 910 12	654 960 12	M10	12	6	13,7	12	7	5	20	5
654 510 16	654 560 16	654 910 16	654 960 16	M10	16	6	17,7	16	7	5	20	6,8
654 510 25	654 560 25	654 910 25	654 960 25	M10	25	6	26,7	25	7	5	20	11,2
654 510 35	654 560 35	654 910 35	654 960 35	M10	35	6	36,7	35	7	5	20	16,2
654 512 16	654 562 16	654 912 16	654 962 16	M12	16	7	18	16	8,5	6	30	10
654 512 20	654 562 20	654 912 20	654 962 20	M12	20	7	22	20	8,5	6	30	12,4
654 512 30	654 562 30	654 912 30	654 962 30	M12	30	7	32	30	8,5	6	30	19,6
654 512 40	654 562 40	654 912 40	654 962 40	M12	40	7	42	40	8,5	6	30	28,5
654 516 20	654 566 20	654 916 20	654 966 20	M16	20	11	23,3	20	12	8	60	22
654 516 25	654 566 25	654 916 25	654 966 25	M16	25	11	28,3	25	12	8	60	28
654 516 35	654 566 35	654 916 35	654 966 35	M16	35	11	38,3	35	12	8	60	41
654 516 50	654 566 50	654 916 50	654 966 50	M16	50	11	53,3	50	12	8	60	48
654 520 30	654 570 30	-	-	M20	30	13,5	34,2	30	15	10	90	52
654 520 40	654 570 40	-	-	M20	40	13,5	44,2	40	15	10	90	72
654 520 50	654 570 50	-	-	M20	50	13,5	54,2	50	15	10	90	93
654 520 60	654 570 60	-	-	M20	60	13,5	64,2	60	15	10	90	115

* Max. Load Capacity kN, only with static load, only type A and type B.

Thrust Screws with Brass Bolt

Material:

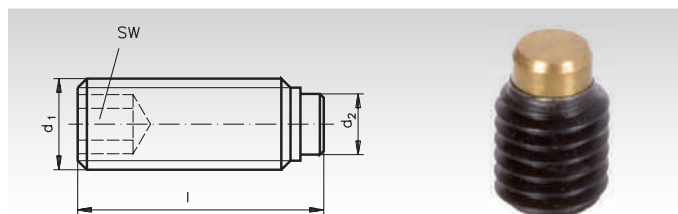
Screw: Steel, tensile strength 12.9, burnished.

Bolt: Brass.

Note: Brass bolt press-fitted. Used for gentle pressing-in or clamping of threaded spindles, axles, shafts and surface treated parts.

Temperature range: -60°C to +350°C.

Ordering Details: e.g.: Product No. 654 604 06, Thrust Screw with Brass Bolt, M4 x 6.5



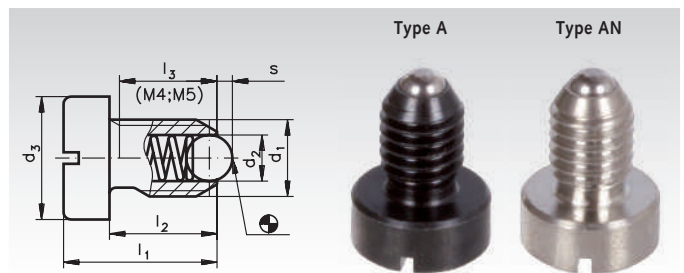
Product No.	d ₁ mm	l mm	d ₂ mm	SW mm	Weight g
654 604 06	M4	6,5	2,5	2	0,5
654 604 10	M4	10,5	2,5	2	0,8
654 605 08	M5	8,5	3	2,5	0,9
654 605 12	M5	12,5	3	2,5	1,4
654 606 11	M6	11,5	4	3	1,7
654 606 17	M6	17,5	4	3	2,5
654 608 12	M8	12	5,5	4	2,7
654 608 22	M8	22	5,5	4	6,1
654 610 14	M10	14	7	5	5,6
654 610 18	M10	18	7	5	7,2

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Spring Plungers with Ball and Head, Steel or Stainless Steel

Material: **Type A:** Body: Steel, burnished.
Ball: Ball bearing steel, hardened.
Spring: Stainless steel.

Type AN: Body: Stainless steel.
Ball: Stainless steel.
Spring: Stainless steel.



Used for fixation and to press something in or push it out.

Temperature: max. +250°C.

Ordering Details: e.g.: Product No. 654 634 00, Spring Plunger M4

Product No. Type A	Product No. Type AN	d ₁ mm	d ₂ mm	d ₃ mm	l ₁ mm	l ₂ mm	l ₃ mm	S mm	Spring Tension*		Weight g
									Initial N	End N	
654 634 00	654 996 34	M4	2,5	6	9,5	6,5	5,0	0,8	8	14	1,0
654 635 00	654 996 35	M5	3,0	8	12,5	8,5	6,7	0,9	8	14	2,0
654 636 00	654 996 36	M6	3,5	10	14,0	9,0	-	1,0	11	18	3,7
654 638 00	654 996 38	M8	4,5	13	16,5	11,0	-	1,5	18	31	7,0
654 640 00	654 996 40	M10	6,0	16	20,0	14,0	-	2,0	24	45	13,2
654 642 00	654 996 42	M12	8,0	18	22,0	15,0	-	2,5	26	49	19,5

* Statistical average.

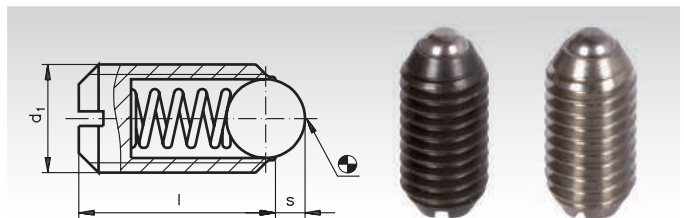
Spring Plungers with Ball and Slot, Burnished or Stainless Steel

Material:
Body: Steel, burnished. Ball: Hardened. Spring: Stainless steel.
Standard spring tension.

Material Type R:

Body: Stainless steel.
Ball: Stainless steel, hardened.
Spring: Stainless steel, standard spring tension.

Temperature range: -40°C to +250°C.



Ordering Details: e.g.: Product No. 654 996 02, Spring Plunger Type R, M2

Product No. burnished	Product No. Type R	d ₁ mm	l mm	s mm	Ball Ø mm	Spring Tension*		Weight g
						Initial N	End N	
-	654 996 02	M2	4	0,3	1,0	0,8	1,5	0,1
654 603 00	654 996 03	M3	7	0,4	1,5	3	4,5	0,3
654 604 00	654 996 04	M4	9	0,8	2,5	6	14,5	0,6
654 605 00	654 996 05	M5	12	0,9	3	8	14	0,9
654 606 00	654 996 06	M6	14	1,0	3,5	11	18	1,5
654 608 00	654 996 08	M8	16	1,5	4,5	18	31	3,5
654 610 00	654 996 10	M10	19	2,0	6	24	45	7
654 612 00	654 996 12	M12	22	2,5	8	26	49	10
654 616 00	654 996 16	M16	24	3,5	10	41	86	24
654 620 00	654 996 20	M20	30	4,5	12	56	111	43
654 624 00	654 996 24	M24	34	5,5	15	81	151	70

Note

These Spring Plungers are, e.g., used for fixation or as device to press something in or push it out.

* Statistical average.

Spring Plungers with Ball and Slot, Burnished or Stainless Steel, Strong Spring Tension

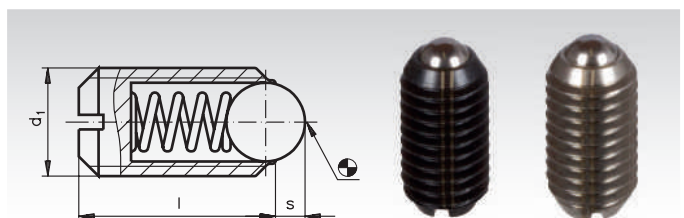
Material:
Body: Steel, burnished. Ball: Hardened. Spring: Stainless steel.
Strong spring tension.

Material Type R:

Body: Stainless steel.
Ball: Stainless steel, hardened.
Spring: Stainless steel, strong spring tension.

Temperature range: -40°C to +250°C.

Ordering Details: e.g.: Product No. 654 805 00, Spring Plunger, M5



Product No. burnished	Product No. Type R	d ₁ mm	l mm	s mm	Ball Ø mm	Spring Tension*		Weight g
						Initial N	End N	
654 805 00	654 998 05	M5	12	0,9	3	15	22	0,9
654 806 00	654 998 06	M6	14	1,0	3,5	19	28	1,5
654 808 00	654 998 08	M8	16	1,5	4,5	36	62	3,5
654 810 00	654 998 10	M10	19	2,0	6	57	104	7
654 812 00	654 998 12	M12	22	2,5	8	61	110	10
654 816 00	654 998 16	M16	24	3,5	10	68	142	24
654 820 00	654 998 20	M20	30	4,5	12	84	166	43
654 824 00	654 998 24	M24	34	5,5	15	127	237	70

Note

These Spring Plungers are, e.g., used for fixation or as device to press something in or push it out.

* Statistical average.

Spring Plungers, Plastic

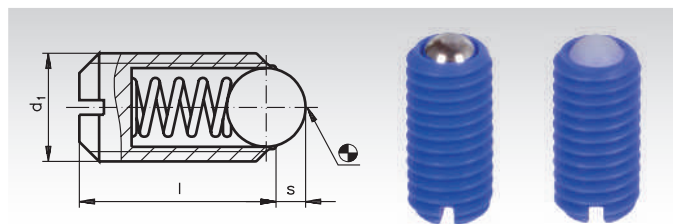
Material:

Body: POM, blue. Ball made from hardened stainless steel or of POM, white. Spring: Stainless steel.

Type N: Ball made from stainless steel.

Type P: Ball made from POM.

Temperature range -30°C to +50°C.



Ordering Details: e.g.: Product No. 654 726 00, Spring Plunger M6, Version P, Delrin

Product No. Version N	Product No. Version P	d ₁ mm	l mm	s mm	Ball Ø mm	Spring Tension* Initial N	End N	Weight g
654 706 00	654 726 00	M6	14	1	3,5	12	17	0,4
654 708 00	654 728 00	M8	16	1,5	5	20	35	1,1
654 710 00	654 730 00	M10	19	2	6	20	45	3,0

Note

These parts are used in applications where, e.g., electrical conductivity is not desired or in aggressive environments.

* Statistical average.

Spring Plungers with Ball and Internal Hexagon, Stainless

Material:

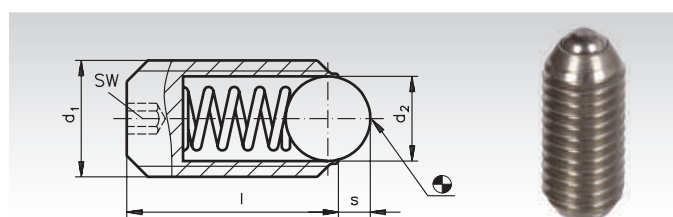
Body: Stainless Steel 1.4305.

Ball: Stainless steel, hardened.

Spring: Stainless steel.

Standard spring load.

Temperature range: -40°C to +250°C.



Ordering Details: e.g.: Product No. 654 999 06, Spring Plunger M6, Type KN Stainless

Product No.	d ₁ mm	d ₂ mm	l mm	s mm	WS mm	Spring Tension* Initial N	End N	Weight g
654 999 06	M6	3,5	15	1	3	11	18	2
654 999 08	M8	4,5	18	1,5	4	18	31	4
654 999 10	M10	6	23	2	5	24	45	8
654 999 12	M12	8	26	2,5	6	26	49	12
654 999 16	M16	10	33	3,5	8	41	86	31
654 999 20	M20	12	43	4,5	10	66	111	64
654 999 24	M24	15	48	5,5	12	81	151	100

Note

Used for fixation or as device to press something in or push it out.

* Statistical average.

Spring Plungers with Internal Hexagon, Burnished or Stainless Steel

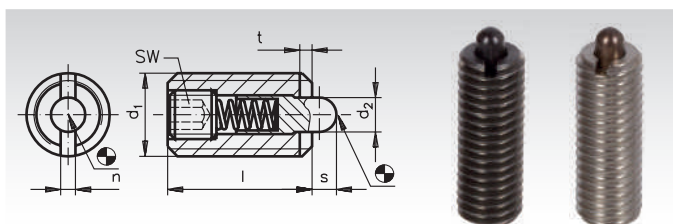
Material:

Body: Steel, burnished. Bolt: Steel, hardened. Spring: Stainless steel

Type "stainless": Stainless steel 1.4305.

Standard spring tension.

Temperature range: -40°C to +250°C.



Ordering Details: e.g.: Product No. 654 653 00, Spring Plunger M 3

Product No. burnished	Product No. stainless	d ₁ mm	d ₂ mm	l mm	n mm	s mm	t mm	SW mm	Spring Tension* Initial N	End N	Weight g
654 653 00	-	M3	1,0	12	0,4	1,0	0,5	0,7	2	4	0,4
654 654 00	654 996 54	M4	1,5	15	0,6	1,5	0,6	1,3	4,5	16	0,8
654 655 00	654 996 55	M5	2,4	18	1,2	2,3	0,8	1,5	6	19	1,3
654 656 00	654 996 56	M6	2,7	20	1,3	2,5	0,9	2	6	19	2,5
654 658 00	654 996 58	M8	3,5	22	1,5	3	1,4	2,5	10	39	6
654 660 00	654 996 60	M10	4	22	1,5	3	1,4	3	10	39	9
654 662 00	654 996 62	M12	6	28	2,7	4	2	4	12	53	16
654 666 00	654 996 66	M16	7,5	32	3,2	5	2,5	5	45	100	35
654 670 00	654 996 70	M20	10	40	3,7	7	3	6	52	125	65
654 674 00	-	M24	12	52	3,7	10	3	8	70	170	120

* Statistical average.

Note

Used for fixation or as device to press something in or push it out. The spring plungers can be mounted and demounted using the internal hexagon or the slot.

Spring Plungers, Smooth with Collar, Stainless

Material:

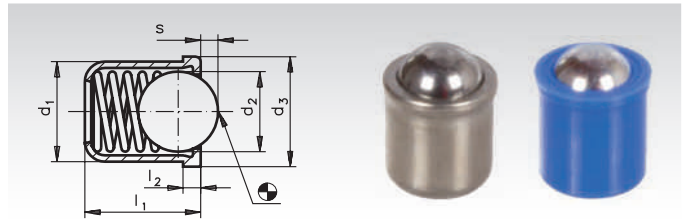
Type GN: Body, ball and spring stainless steel.

Type GP: Body: Plastic POM.

Ball and spring: Stainless steel.

Temperature range GN: -40°C to +250°C.

Temperature range GP: -30°C to +50°C.



Ordering Details: e.g.: Product No. 654 997 53, Spring Plunger, Type GN, Stainless, 3mm

Product No. Type GN	Product No. Type GP	d ₁ +0,08 mm	d ₂ mm	d ₃ mm	l ₁ mm	l ₂ GN / GP mm	s GN / GP mm	Spring Tension* GN		Spring Tension* GP		Weight	
								Initial N	F ₂ N	Initial N	End N	GN g	GP g
654 997 53	654 784 03	3	2,38	3,5	4	0,75/0,6	0,7/0,55	1,8	3,5	1,7	3,5	0,20	0,09
654 997 54	654 784 00	4	3	4,6	5	0,9/1,0	1,0/0,8	2,5	6	2,5	6,5	0,35	0,20
654 997 55	654 785 00	5	4	5,6	6	0,9/1,0	1,4/1,0	3	6,5	4,5	9	0,60	0,40
654 997 56	654 786 00	6	5	6,5	7	1,0/1,0	1,8/1,6	5,5	11,5	6,5	13	1,00	0,70
654 997 58	654 788 00	8	6,5	8,5	9	1,1/1,0	1,9/1,9	7	12,5	8	18	2,20	1,50
654 997 60	654 790 00	10	8,5	11	13,5	1,7/1,5	3,3/2,4	8,5	18,5	12	23	5,30	3,1
654 997 62	654 792 00	12	10	13	16	2,3/1,5	4,0/3,3	12	26,5	13	25	7,80	5,8

* Statistical average.

Note

Spring plungers are used for fixation or as device to press something in or push it out.

Double-Ended Spring Plunger

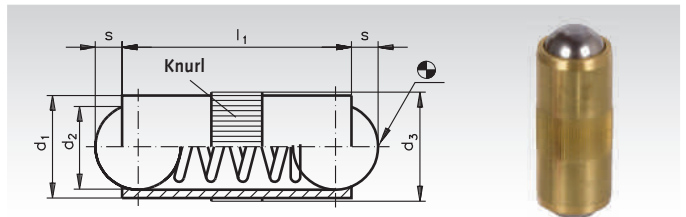
Material:

Body: Brass.

Ball: Stainless steel, hardened.

Spring: Stainless steel.

Temperature range: -40°C to +250°C.



Ordering Details: e.g.: Product No. 654 843 00, Spring Plunger, Double-Ended 3 mm

Product No.	d ₁ mm	d ₂ mm	d ₃ +0,5 mm	l ₁ mm	s mm	Spring Tension*		Weight g
						Initial N	End N	
654 843 00	3	2,5	3,02	7,3	0,8	2	4,5	0,4
654 844 00	4	3	4,03	9	0,9	2,5	7,5	0,6
654 845 00	5	4	5,03	10,8	1,2	3,5	8	1,2
654 847 00	7	6	7,03	14	2	4	12	3,0
654 848 00	8	6,5	8,03	18	2,1	6	15	5,1

* Statistical average.

Note

To fix or secure axles and bolts and as electronic contact.

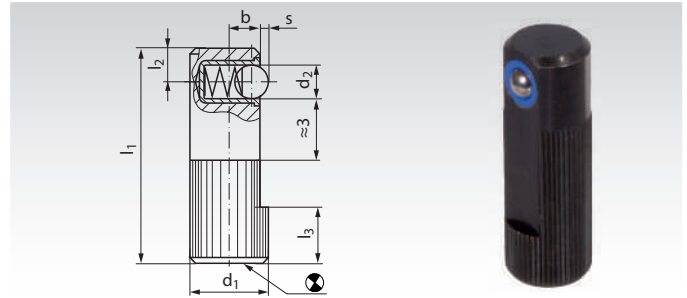
Spring-Action Side Thrust Pins 2214, Version A, Stainless Ball, Normal Spring Pressure, Single-Sided

Material:

Steel, burnished. Ball: Stainless steel, hardened.

Spring: Stainless steel.

Temperature range -30°C to +50°C.



Ordering Details: e.g.: Product No. 654 928 00, Spring-Action Side Thrust Pin, Vers. A, 8mm

Product No. Version A	d ₁ mm	d ₂ mm	l ₁ mm	l ₂ mm	l ₃ mm	b mm	s mm	Intake Bore mm ^{H8}	Spring Load *		Weight g
									Initial N	End N	
654 928 00	8	3	25	3,6	6	3,2	0,9	8	2,5	6,5	8,7
654 930 00	10	4	30	4,2	7	4	1	10	4,5	9	17
654 932 00	12	5	35	4,8	9	5	1,5	12	6,5	13	29
654 934 00	14	6,5	40	5,8	10	5,4	1,8	14	8	18	43

* Statistical average.

Note

The side thrust pin is pressed into the bore by at least as far as the measure l₃. It serves to position, hold or clamp small workpieces inside fixtures. If the workpiece is machined, additional clamping devices might be required for holding it safely in place.

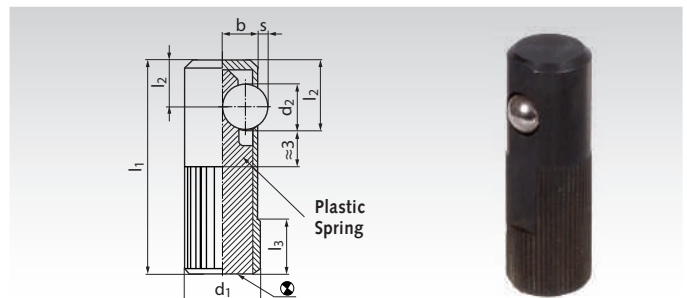
Spring-Action Side Thrust Pins 2214, Version B, Steel Ball, Strong Spring Pressure, Single-Sided

Material:

Free cutting steel, burnished. Ball: Steel, hardened.

Spring: Plastic.

Temperature range -40°C to +80°C.



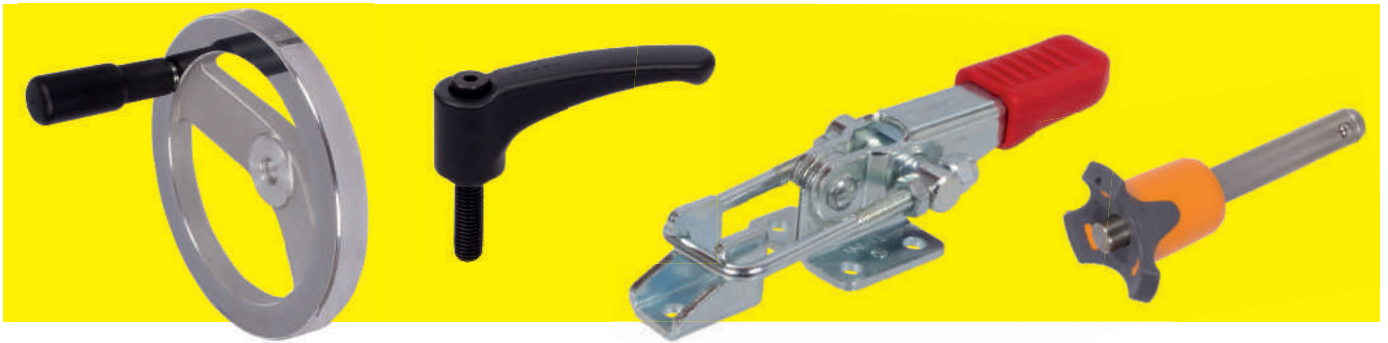
Ordering Details: e.g.: Product No. 654 950 00, Spring-Action Side Thrust Pin, Vers. B, 10mm

Product No. Version B	d ₁ mm	d ₂ mm	l ₁ mm	l ₂ mm	l ₃ mm	b mm	s mm	Intake Bore mm ^{H8}	Spring Load*		Weight g
									Initial N	End N	
654 950 00	10	5,5	30	7	8	4,5	1	10	50	160	8,6
654 952 00	12	6,5	35	8	9	5,5	1,5	12	60	270	13

* Statistical average.

Note

The side thrust pin is pressed into the bore by at least as far as the measure l₃. It serves to position, hold or clamp small workpieces inside fixtures. If the workpiece is machined, additional clamping devices might be required for holding it safely in place. If fixtures are stored please make sure that the plastic spring is not loaded.



Cam-Action Indexing Plungers / Indexing Plungers



Cam-Action Indexing Plunger 612, Made from Steel and Stainless Steel

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Indexing Plunger 417

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Indexing Plunger 717, Made from Steel and Stainless Steel

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Indexing Plunger 817, Made from Steel and Stainless Steel

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Knobs / Grips



Control Knobs 726.1

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Star Grips DIN 6335 GG

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Star Grips Similar to DIN 6335 Pr

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Star Grips with Axial Bearing

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Star Grip Screws with Axial Bearing

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Star Grips DIN 6336 GG

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Star Grips Similar to DIN 6336 Pr

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Star Grips Similar to DIN 6336 AL

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Star Grips 5335 Stainless Steel

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Star Grips 5334 Stainless Steel

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Star Grip Screws 5334 Stainless Steel

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Star Grips Similar to DIN 6336, Made From Thermoplastics

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Star Grip Screws Similar to DIN 6336

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Triangular Knobs, Made from Plastic

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Triangular Knob Screws, Made from Plastic

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Knurled Knobs, Made from Plastic

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Knurled Knob Screws, Made from Plastic

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Triangular Knobs, Made from Stainless Steel

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Wing Nuts, Plastic

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Wing screws, Plastic

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Wing Nuts, Stainless Steel

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Wing screws, Stainless Steel

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Ball Knobs DIN 319 Pr Plastic

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Ball Knobs Similar to DIN 319, Metal

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Revolving Ball Knobs 3192

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Gear Lever Handles 209 with Ball Knob DIN 319, Steel, Burnished or Zinc Plated or Stainless

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Knobs / Grips

	Revolving Cylindrical Grips 598		Retractable Handles NG		Cylindrical Knobs, Press-on Type		Gear Lever Handles 209 with Cylindrical Grip, Steel, Burnished or Zinc Plated or Stainless
Page 547		Page 547		Page 547		Page 546	
	Fixed Handles DIN 39 St and DIN 39 AL		Fixed Handles DIN 39 Pr		Revolving Handles DIN 98 St and DIN 98 AL		Revolving Handles DIN 98 Pr
Page 548		Page 548		Page 549		Page 549	

Clamping Levers

	Adjustable Clamping Levers 355 from Plastic		Adjustable Clamping Levers 355 from Plastic with Screw		Adjustable Clamping Levers 120		Adjustable Clamping Levers 120 with Screw
Page 550		Page 550		Page 551		Page 551	
	Adjustable Clamping Levers 300, Disengaged by Pulling		Adjustable Clamping Levers 300, with External Thread, Disengaged by Pulling		Adjustable Clamping Levers 300.5 Stainless		Adjustable Clamping Levers 300.5, with External Thread, Stainless
Page 552		Page 552		Page 553		Page 553	
	Eccentric Clamps Version A and B		Eccentric Clamps Version A and B, with External Thread				
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Clamp Nuts

	Clamp Nuts DIN 99 St Made From Steel or Stainless Steel		Adjustable Clamp Nuts 119 St		Control Levers 223 St		Control Levers with Long Hub 2120 St
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Clamp Nuts

	Clamp Nuts 202 Tg Cast Steel and Stainless Steel		Cylindrical Clamp Nuts, Steel or Stainless Steel		Clamp Nuts with Double Lever, Steel or Stainless Steel		
Page 555		Page 556		Page 556			

Cabinet "U" Handles / Arch Handles / Folding Handles

	Cabinet "U" Handles 525 and 725 made From Polyamide or Polypropylene		Cabinet "U" Handles 528 made From Polyamide or Polypropylene		Cabinet "U" Handles 565		Cabinet "U" Handles 565.1
Page 558		Page 558		Page 559		Page 559	
	Cabinet "U" Handles 565.2		Cabinet "U" Handles 426 / 426.1		Arch handles		Cabinet "U" Handles 425, Chrome plated or Stainless Steel
Page 559		Page 560		Page 560		Page 561	
	Folding Handles Made From Steel or Stainless Steel		Folding Handle with Recessed Tray 425.4		Tubular Handles with Inclined Feet, Aluminium		Tubular Handles with Straight Feet, Aluminium and Stainless Steel
Page 561		Page 561		Page 562		Page 562	

Cranks / Handwheels



Tri-Ball Handles 2140

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Hand Cranks
DIN 468 Tg

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Hand Cranks
DIN 469 Tg

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Hand Cranks 471

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Hand Cranks 569

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Turret Levers 2130 St

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Handwheels,
Stainless Steel

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Handwheels,
Stainless Steel,
solid version

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Handwheels,
Stainless Steel,
solid version
similar to DIN 950

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Handwheels 527.1
with Peripheral
Grooves, Plastic

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Spoked Handwheels
522, with Revolving
Cylindrical Handle,
Plastic

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Retractable-Handle
Handwheels 5223,
Plastic

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Spoked Handwheels
DIN 950,
Grey Cast

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Spoked Handwheels
DIN 950,
Grey Cast,
with Square Hole

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Spoked Handwheels
DIN 950,
Aluminium

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Solid-Disk
Handwheels, Similar to
DIN 950,
Aluminium

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Solid-Disk Handwheels
DIN 3670,
with Recessed Grips,
Aluminium

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Solid-Disk
Handwheels 323,
Aluminium

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Retractable-Handle
Handwheels 3223,
Aluminium

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Spoked Handwheels
320,
Aluminium

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Solid-Disk Handwheels
326,
Aluminium

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Safety Handwheels
SHR,
Aluminium

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Lifting Pins / Socket Pins with Spring Loaded Balls



Lifting Pins, Self-
Locking

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Socket Pins with
Spring-Loaded Balls,
Self-Locking

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Latch Clamps / Quick Clamps



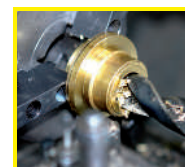
Latch Clamps
Zinc Plated Steel and
Stainless Steel

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Quick Clamps

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Reworking within
24h-service possible.
Custom made parts
on request.

Cam-Action Indexing Plungers 612 Made from Steel

Material: Steel, burnished, cam-action indexing plunger precision turned and nitrided. Cap: Plastic Thermoplast (polyamide) black, matt finish.

Note: cam-action indexing plungers are used if the plunger pin sometimes needs to be retracted, i.e. must not stick out. Turning the indexing plunger by 180° causes the plunger pin to retract. There is a notched catch to ensure the plunger can be locked in both positions.

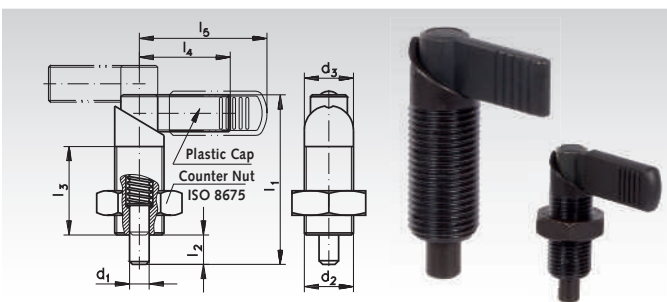
Version A: without counter nut, without plastic cap.

Version B: without counter nut, with plastic cap.

Version AK: with counter nut, without plastic cap.

Version BK: with counter nut, with plastic cap.

Ordering Details: e.g.: Product No. 666 773 00, Indexing Plunger 612, Version A, 5 mm



Product No. Version A	Product No. Version B	Product No. Version AK	Product No. Version BK	-0,02/-0,04 d ₁ mm	d ₂ mm	d ₃ mm	l ₁ mm	l ₂ mm	l ₃ +1,5 mm	l ₄ mm	l ₅ mm	Spring Load*		Weight g
												Initial N	End N	
666 773 00	666 783 00	666 873 00	666 883 00	5	M12 x 1,5	12	47	8	26	26	32	9	21	39
666 774 00	666 784 00	666 874 00	666 884 00	6	M12 x 1,5	12	47	8	26	26	32	9	21	39
666 775 00	666 785 00	666 875 00	666 885 00	6	M16 x 1,5	16	56	10	30	32	42	12	32	59
666 776 00	666 786 00	666 876 00	666 886 00	8	M12 x 1,5	12	47	8	26	26	32	9	21	39
666 777 00	666 787 00	666 877 00	666 887 00	8	M16 x 1,5	16	56	10	30	32	42	12	32	79
666 778 00	666 788 00	666 878 00	666 888 00	8	M20 x 1,5	20	69	12	36	37	52	21	57	115
666 779 00	666 789 00	666 879 00	666 889 00	10	M16 x 1,5	16	56	10	30	32	42	12	32	64
666 780 00	666 790 00	666 880 00	666 890 00	10	M20 x 1,5	20	69	12	36	37	52	21	57	119
666 782 00	666 792 00	666 882 00	666 892 00	12	M20 x 1,5	20	69	12	36	37	52	21	57	125

* Statistical average.

Cam-Action Indexing Plungers 612 Stainless Steel

Material: Stainless steel 1.4305/1.4404. Tension spring: 1.4310.

Plunger pin ground.

Cap: Plastic Thermoplast (polyamide) black, matt finish.

Note: cam-action indexing plungers are used if the plunger pin sometimes needs to be retracted, i.e. must not stick out. Turning the indexing plunger by 180° causes the plunger pin to retract. There is a notched catch to ensure the plunger can be locked in both positions.

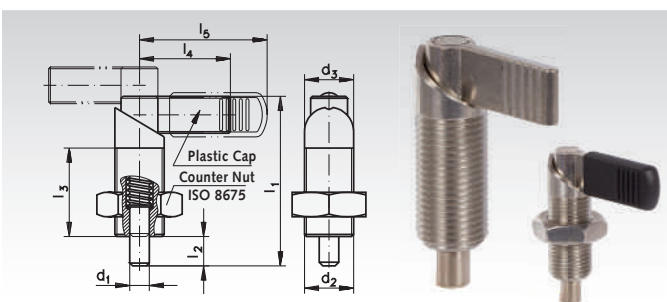
Version A-N: without counter nut, without plastic cap.

Version B-N: without counter nut, with plastic cap.

Version AK-N: with counter nut, without plastic cap.

Version BK-N: with counter nut, with plastic cap.

Ordering Details: e.g.: Product No. 666 997 73, Indexing Plunger 612, Version A-N, 5 mm



Product No. Version A-N	Product No. Version B-N	Product No. Version AK	Product No. Version BK-N	-0,02/-0,04 d ₁ mm	d ₂ mm	d ₃ mm	l ₁ mm	l ₂ mm	l ₃ mm	l ₄ mm	l ₅ mm	Spring Load*		Weight g
												Initial N	End N	
666 997 73	666 997 83	666 998 73	666 998 83	5	M12 x 1,5	12	47	8	26	26	32	9	21	39
666 997 74	666 997 84	666 998 74	666 998 84	6	M12 x 1,5	12	47	8	26	26	32	9	21	39
666 997 75	666 997 85	666 998 75	666 998 85	6	M16 x 1,5	16	56	10	30	32	42	12	32	59
666 997 76	666 997 86	666 998 76	666 998 86	8	M12 x 1,5	12	47	8	26	26	32	9	21	39
666 997 77	666 997 87	666 998 77	666 998 87	8	M16 x 1,5	16	56	10	30	32	42	12	32	79
666 997 78	666 997 88	666 998 78	666 998 88	8	M20 x 1,5	20	69	12	36	37	52	21	57	115
666 997 79	666 997 89	666 998 79	666 998 89	10	M16 x 1,5	16	56	10	30	32	42	12	32	64
666 997 80	666 997 90	666 998 80	666 998 90	10	M20 x 1,5	20	69	12	36	37	52	21	57	119
666 997 82	666 997 92	666 998 82	666 998 92	12	M20 x 1,5	20	69	12	36	37	52	21	57	125

* Statistical average.

Loctite thread locking and bonding products page 811.

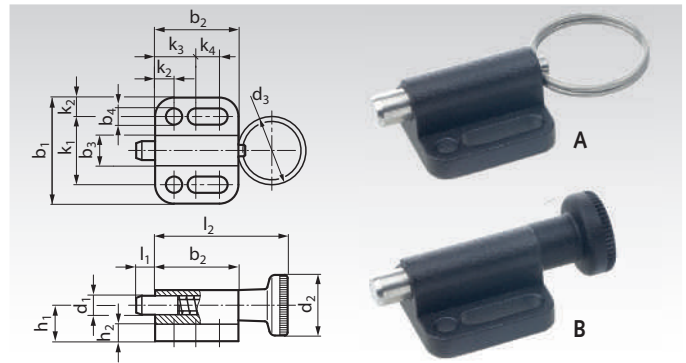
Indexing Plungers 417, without Rest Position

Material: Housing zinc die-cast, plastic coated black, textured finish. Plunger pin: Stainless steel 1.4305. Spring and lifting ring (type A): Stainless steel 1.4310. Knob (type B): Plastic (Polyamide PA) black, matt finish, not removable.

Indexing Plungers without rest position are used where, on releasing the knob or lifting ring, the plunger pin should be returned to its initial position by the spring force.

Type A: without rest position, with lifting ring.

Type B: without rest position, with knob.



Ordering Details: e.g.: Product No. 666 680 04, Indexing Plunger 417 type A, 4mm

Product No.	Type	d ₁ mm	d ₂ mm	d ₃ mm	b ₁ mm	b ₂ mm	b ₃ mm	b ₄ mm	h ₁ mm	h ₂ mm	k ₁ mm	k ₂ mm	k ₃ mm	k ₄ mm	l ₁ mm	l ₂ mm	Spring Load*		Weight g
																	Initial N	End N	
666 680 04	A	4	-	14	22	16,5	6	3,3	7,0	4	14	4	8	4,5	4	-	3	12	11
666 680 05	A	5	-	18	28	22	8	4,3	9,5	4,5	18	5	10	7	5	-	5	24	22
666 680 06	A	6	-	24	32	27,5	10	5,4	10,5	5	21	5,5	12	10	6	-	5	21	36
666 680 08	A	8	-	30	34	33	12	5,4	12,5	6	23	5,5	12	15,5	8	-	6	22	58
666 680 10	A	10	-	30	39	35	14,5	6,5	14,5	6	27	6	15	13,5	10	-	4	25	83
666 681 04	B	4	12	-	22	16,5	6	3,3	7,0	4	14	4	8	4,5	4	26,5	3	12	11
666 681 05	B	5	16	-	28	22	8	4,3	9,5	4,5	18	5	10	7	5	35	5	24	22
666 681 06	B	6	18	-	32	27,5	10	5,4	10,5	5	21	5,5	12	10	6	43	5	21	37
666 681 08	B	8	21	-	34	33	12	5,4	12,5	6	23	5,5	12	15,5	8	51	6	22	59
666 681 10	B	10	25	-	39	35	14,5	6,5	14,5	6	27	6	15	13,5	10	57,5	4	25	90

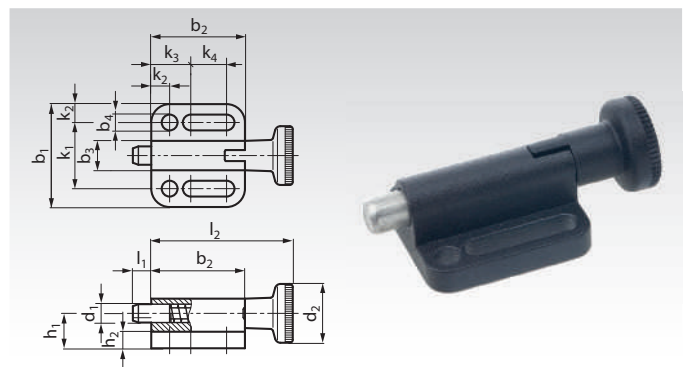
* Statistical average.

Indexing Plungers 417, with Rest Position

Material: Housing zinc die-cast, plastic coated black, textured finish. Plunger pin: Stainless steel 1.4305. Spring: Stainless steel 1.4310. Knob: Plastic (Polyamide PA) black, matt finish, not removable.

Indexing Plungers with rest position are used where the pin has to remain in retracted position. To achieve this, the knob is rotated by 90 degrees after being retracted. A notched catch stops the locked-in knob from returning to its initial position accidentally or due to vibration.

Type C: with rest position, with knob.



Ordering Details: e.g.: Product No. 666 682 04, Indexing Plunger 417 type C, 4mm

Product No.	Type	d ₁ mm	d ₂ mm	b ₁ mm	b ₂ mm	b ₃ mm	b ₄ mm	h ₁ mm	h ₂ mm	k ₁ mm	k ₂ mm	k ₃ mm	k ₄ mm	l ₁ mm	l ₂ mm	Spring Load*		Weight g
																Initial N	End N	
666 682 04	C	4	12	22	19	6	3,3	7	4	14	4	8	7	4	29	3	12	10
666 682 05	C	5	16	28	25,5	8	4,3	9,5	4,5	18	5	10	10,5	5	38,5	5	24	25
666 682 06	C	6	18	32	30,5	10	5,4	10,5	5	21	5,5	12	13	6	46	5	21	41
666 682 08	C	8	21	34	37,5	12	5,4	12,5	6	23	5,5	12	20	8	55,5	6	22	66
666 682 10	C	10	25	39	40	14,5	6,5	14,5	6	27	6	15	18,5	10	62,5	4	25	98

* Statistical average.

Indexing Plungers 717, Steel and Stainless Steel, without Rest Position

Material Standard Version: Body zinc plated, blue passivated.

Material Stainless Version: Body stainless steel 1.4305.

Both versions: Plunger pin stainless steel 1.4305. Spring and lifting ring (type A/K) stainless steel 1.4310. Knob (type B/BK) plastic (Polyamide PA) black, matt finish, not removable.



Indexing plungers 717 are reasonably priced, with small dimensions, for applications where high precision indexing is not required.

Indexing Plungers without rest position are used where, on releasing the knob or lifting ring, the plunger pin should be returned to its initial position by the spring force.

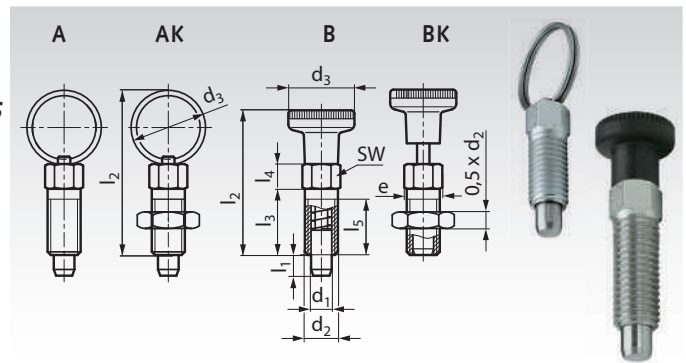
During assembly, do not exceed the fastening torque TA.

Type A: without rest position, with lifting ring, without counter nut.

Type AK: without rest position, with lifting ring, with counter nut.

Type B: without rest position, with knob, without counter nut.

Type BK: without rest position, with knob, with counter nut.



Type A: without rest position, with lifting ring, without counter nut.

Type AK: without rest position, with lifting ring, with counter nut.

Type B: without rest position, with knob, without counter nut.

Type BK: without rest position, with knob, with counter nut.

Ordering Details: e.g.: Product No. 666 717 01, Indexing Plunger 717 type A, 3mm

Product No. Standard	Product No. Stainless	Type	d ₁ mm	l ₁ min. mm	d ₂ mm	d ₃ mm	e mm	l ₂ max. mm	l ₃ mm	l ₄ mm	l ₅ mm	sw mm	T _A ** Nm	Spring Load*		Weight g
														Initial N	End N	
666 717 01	666 718 01	A	3	3,5	M6	14	6,9	30,5	12	4,5	10	6	2	3	12	3,5
666 717 02	666 718 02	A	3	3,5	M6 x 0,75	14	6,9	30,5	12	4,5	10	6	3	3	12	3,6
666 717 03	666 718 03	A	4	4	M6	14	6,9	30,5	12	4,5	10	6	2	3	12	4
666 717 04	666 718 04	A	4	4,5	M8 x 1	18	9,2	40	16	6	13,5	8	8	5	24	8,4
666 717 05	666 718 05	A	5	5	M8	18	9,2	40	16	6	13,5	8	7	5	24	8
666 717 06	666 718 06	A	5	5	M8 x 1	18	9,2	40	16	6	13,5	8	7	5	24	13
666 717 07	666 718 07	A	5	5	M10 x 1	18	11,5	40	16	6	13,5	10	22	5	24	12,8
666 717 08	666 718 08	A	6	6	M10	24	11,5	51,5	20	7,5	17	10	15	5	21	17
666 717 09	666 718 09	A	6	6	M12 x 1,5	24	13,8	51,5	20	7,5	16,5	12	38	5	21	23
666 717 10	666 718 10	A	8	8	M12	30	13,8	63	24	9	20,5	12	20	6	22	30
666 717 11	666 718 11	A	8	8	M12 x 1,5	30	13,8	63	24	9	20,5	12	20	6	22	30
666 717 12	666 718 12	A	8	8	M16 x 1,5	30	19,6	63	24	9	20,5	17	80	6	22	54
666 717 13	666 718 13	A	10	10	M16 x 1,5	30	19,6	65	26	9	22,5	17	80	4	27	55
666 717 14	666 718 14	AK	3	3,5	M6	14	6,9	30,5	12	4,5	10	6	2	3	12	3
666 717 15	666 718 15	AK	3	3,5	M6 x 0,75	14	6,9	30,5	12	4,5	10	6	3	3	12	3,4
666 717 16	666 718 16	AK	4	4	M6	14	6,9	30,5	12	4,5	10	6	2	3	12	5
666 717 17	666 718 17	AK	4	4,5	M8 x 1	18	9,2	40	16	6	13,5	8	8	5	24	10
666 717 18	666 718 18	AK	5	5	M8	18	9,2	40	16	6	13,5	8	7	5	24	11
666 717 19	666 718 19	AK	5	5	M8 x 1	18	9,2	40	16	6	13,5	8	7	5	24	13
666 717 20	666 718 20	AK	5	5	M10 x 1	18	11,5	40	16	6	13,5	10	22	5	24	18
666 717 21	666 718 21	AK	6	6	M10	24	11,5	51,5	20	7,5	17	10	15	5	21	22
666 717 22	666 718 22	AK	6	6	M12 x 1,5	24	13,8	51,5	20	7,5	16,5	12	38	5	21	30
666 717 23	666 718 23	AK	8	8	M12	30	13,8	63	24	9	20,5	12	20	6	22	39
666 717 24	666 718 24	AK	8	8	M12 x 1,5	30	13,8	63	24	9	20,5	12	20	6	22	39
666 717 25	666 718 25	AK	8	8	M16 x 1,5	30	19,6	63	24	9	20,5	17	80	6	22	70
666 717 26	666 718 26	AK	10	10	M16 x 1,5	30	19,6	65	26	9	22,5	17	80	4	27	80
666 717 27	666 718 27	B	3	3,5	M6	12	6,9	26,5	12	4,5	10	6	2	3	12	3
666 717 28	666 718 28	B	3	3,5	M6 x 0,75	12	6,9	26,5	12	4,5	10	6	3	3	12	3,8
666 717 29	666 718 29	B	4	4	M6	12	6,9	26,5	12	4,5	10	6	2	3	12	3,9
666 717 30	666 718 30	B	4	4,5	M8 x 1	16	9,2	35	16	6	13,5	8	8	5	24	9
666 717 31	666 718 31	B	5	5	M8	16	9,2	35	16	6	13,5	8	7	5	24	9
666 717 32	666 718 32	B	5	5	M8 x 1	16	9,2	35	16	6	13,5	8	7	5	24	9,3
666 717 33	666 718 33	B	5	5	M10 x 1	18	11,5	37,5	16	6	13,5	10	22	5	24	14
666 717 34	666 718 34	B	6	6	M10	18	11,5	43	20	7,5	17	10	15	5	21	18
666 717 35	666 718 35	B	6	6	M12 x 1,5	21	13,8	46	20	7,5	16,5	12	38	5	21	26
666 717 36	666 718 36	B	8	8	M12	21	13,8	51	24	9	20,5	12	20	6	22	31
666 717 37	666 718 37	B	8	8	M12 x 1,5	21	13,8	51	24	9	20,5	12	20	6	22	31
666 717 38	666 718 38	B	8	8	M16 x 1,5	25	19,6	55,5	24	9	20,5	17	80	6	22	54
666 717 39	666 718 39	B	10	10	M16 x 1,5	25	19,6	57,5	26	9	22,5	17	80	4	27	18
666 717 40	666 718 40	BK	3	3,5	M6	12	6,9	26,5	12	4,5	10	6	2	3	12	5
666 717 41	666 718 41	BK	3	3,5	M6 x 0,75	12	6,9	26,5	12	4,5	10	6	3	3	12	5,3
666 717 42	666 718 42	BK	4	4	M6	12	6,9	26,5	12	4,5	10	6	2	3	12	5
666 717 43	666 718 43	BK	4	4,5	M8 x 1	16	9,2	35	16	6	13,5	8	8	5	24	10
666 717 44	666 718 44	BK	5	5	M8	16	9,2	35	16	6	13,5	8	7	5	24	12
666 717 45	666 718 45	BK	5	5	M8 x 1	16	9,2	35	16	6	13,5	8	7	5	24	12
666 717 46	666 718 46	BK	5	5	M10 x 1	18	11,5	37,5	16	6	13,5	10	22	5	24	20
666 717 47	666 718 47	BK	6	6	M10	18	11,5	43	20	7,5	17	10	15	5	21	23
666 717 48	666 718 48	BK	6	6	M12 x 1,5	21	13,8	46	20	7,5	16,5	12	38	5	21	35
666 717 49	666 718 49	BK	8	8	M12	21	13,8	51	24	9	20,5	12	20	6	22	40
666 717 50	666 718 50	BK	8	8	M12 x 1,5	21	13,8	51	24	9	20,5	12	20	6	22	40
666 717 51	666 718 51	BK	8	8	M16 x 1,5	25	19,6	55,5	24	9	20,5	17	80	6	22	70
666 717 52	666 718 52	BK	10	10	M16 x 1,5	25	19,6	57,5	26	9	22,5	17	80	4	27	76

* Statistical average.

** Fastening torque during assembly.

Indexing Plungers 717, Steel and Stainless Steel, with Rest Position

Material Standard Version: Body zinc plated, blue passivated.

Material Stainless Version: Body stainless steel 1.4305.

Both versions: Plunger pin stainless steel 1.4305. Spring stainless steel 1.4310. Knob (type B/BK) plastic (Polyamide PA) black, matt finish, not removable.

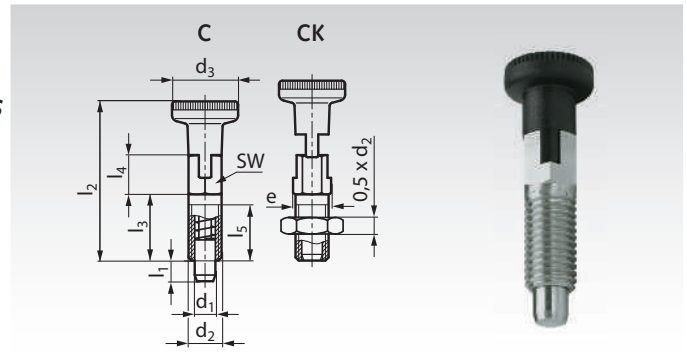


Indexing plungers 717 are reasonably priced, with small dimensions, for applications where high precision indexing is not required.

Indexing Plungers with rest position are used where the pin has to remain in retracted position. To achieve this, the knob is rotated by 90 degrees after being retracted. A notched catch stops the locked-in knob from returning to its initial position accidentally or due to vibration.

Type C: with rest position, with knob, without counter nut.

Type CK: with rest position, with knob ring, with counter nut.



Type C: with rest position, with knob, without counter nut.

Type CK: with rest position, with knob, with counter nut.

Ordering Details: e.g.: Product No. 666 717 53, Indexing Plunger 717 type C, 3mm

Product No. Standard	Product No. Stainless	Type	d ₁ mm	l ₁ min. mm	d ₂ mm	d ₃ mm	e mm	l ₂ max. mm	l ₃ mm	l ₄ mm	l ₅ mm	sw mm	T _A ** Nm	Spring Load* Initial N	Spring Load* End N	Weight g
666 717 53	666 718 53	C	3	3,5	M6	12	6,9	29	12	7	10	6	2	3	12	4
666 717 54	666 718 54	C	3	3,5	M6 x 0,75	12	6,9	29	12	7	10	6	3	3	12	4
666 717 55	666 718 55	C	4	4	M6	12	6,9	29	12	7	10	6	2	3	12	4
666 717 56	666 718 56	C	4	4,5	M8 x 1	16	9,2	38,5	16	9,5	13,5	8	8	5	24	10
666 717 57	666 718 57	C	5	5	M8	16	9,2	38,5	16	9,5	13,5	8	7	5	24	10
666 717 58	666 718 58	C	5	5	M8 x 1	16	9,2	38,5	16	9,5	13,5	8	7	5	24	10
666 717 59	666 718 59	C	5	5	M10 x 1	18	11,5	41	16	10	13,5	10	22	5	24	16
666 717 60	666 718 60	C	6	6	M10	18	11,5	46	20	10,5	17	10	15	5	21	19
666 717 61	666 718 61	C	6	6	M12 x 1,5	21	13,8	49	20	11	16,5	12	38	5	21	27
666 717 62	666 718 62	C	8	8	M12	21	13,8	55,5	24	13,5	20,5	12	20	6	22	34
666 717 63	666 718 63	C	8	8	M12 x 1,5	21	13,8	55,5	24	13,5	20,5	12	20	6	22	57
666 717 64	666 718 64	C	8	8	M16 x 1,5	25	19,6	60	24	13,5	20,5	17	80	6	22	60
666 717 65	666 718 65	C	10	10	M16 x 1,5	25	19,6	62,5	26	14	22,5	17	80	4	27	66
666 717 66	666 718 66	CK	3	3,5	M6	12	6,9	29	12	7	10	6	2	3	12	17
666 717 67	666 718 67	CK	3	3,5	M6 x 0,75	12	6,9	29	12	7	10	6	3	3	12	6
666 717 68	666 718 68	CK	4	4	M6	12	6,9	29	12	7	10	6	2	3	12	5
666 717 69	666 718 69	CK	4	4,5	M8 x 1	16	9,2	38,5	16	9,5	13,5	8	8	5	24	20
666 717 70	666 718 70	CK	5	5	M8	16	9,2	38,5	16	9,5	13,5	8	7	5	24	13
666 717 71	666 718 71	CK	5	5	M8 x 1	16	9,2	38,5	16	9,5	13,5	8	7	5	24	13
666 717 72	666 718 72	CK	5	5	M10 x 1	18	11,5	41	16	10	13,5	10	22	5	24	20
666 717 73	666 718 73	CK	6	6	M10	18	11,5	46	20	10,5	17	10	15	5	21	24
666 717 74	666 718 74	CK	6	6	M12 x 1,5	21	13,8	49	20	11	16,5	12	38	5	21	20
666 717 75	666 718 75	CK	8	8	M12	21	13,8	55,5	24	13,5	20,5	12	20	6	22	44
666 717 76	666 718 76	CK	8	8	M12 x 1,5	21	13,8	55,5	24	13,5	20,5	12	20	6	22	57
666 717 77	666 718 77	CK	8	8	M16 x 1,5	25	19,6	60	24	13,5	20,5	17	80	6	22	79
666 717 78	666 718 78	CK	10	10	M16 x 1,5	25	19,6	62,5	26	14	22,5	17	80	4	27	84

* Statistical average.

** Fastening torque during assembly.

Indexing Plungers 817, Steel and Stainless Steel

Material Steel Version: Steel burnished. Plunger pin: Hardened.

Material Stainless Steel Version: Stainless steel 1.4305. Plunger pin nickel plated. Knob: Plastic Thermoplast (polyamide) black, matt finish, cannot be disassembled.

Indexing plunger 817 offer the following advantages:

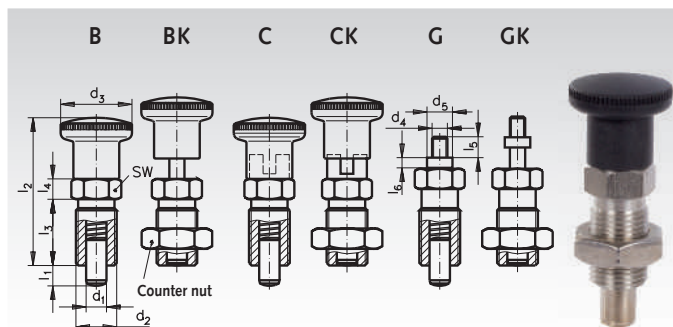
- small outer dimensions.
- most of the release mechanism (version C/CK) is covered.
- defined thread length by an undercut at the end of the thread (version G/GK).



Version B/BK with knob, without notched catch, this version is used where, on releasing the knob, the plunger pin should be returned to its initial position by the spring force.

Version C/CK with knob, is used if the plunger pin has to remain in retracted position. To achieve this, the knob is rotated by 90 degrees after being retracted. A notched catch stops the locked-in knob from returning to its initial position accidentally or due to vibration.

Version G/GK with threaded plunger end, for applications where a special knob to customer's request is required or where the plunger pin is not shifted manually.



Version B: with knob, without counter nut.

Version BK: with knob, with counter nut.

Version C: with indexing knob, without counter nut.

Version CK: with indexing knob, with counter nut.

Version G: with threaded bolt, without counter nut.

Version GK: with threaded bolt, with counter nut.

Product No. Steel	Product No. Stainless Steel	Version	mm	$-0,02/-0,04$ d ₁ mm	l ₁ min. mm	d ₂ mm	d ₃ mm	d ₄ mm	d ₅ mm	l ₂ mm	l ₃ mm	l ₄ mm	l ₅ mm	l ₆ mm	SW mm	Spring Load* Initial N	End N	Weight g
666 684 00	666 996 84	B	4	4	4	M8x1	16	-	-	35	16	5	-	-	10	4,0	12,0	11,0
666 685 00	666 996 85	B	5	5	5	M10x1	19	-	-	40	18	6	-	-	12	5,0	15,0	18,0
666 686 00	666 996 86	B	6	6	6	M12x1,5	23	-	-	48	22	6	-	-	14	6,0	19,0	29,0
666 687 00	666 996 87	B	8	8	8	M16x1,5	28	-	-	58	26	8	-	-	17	8,5	26,0	63,0
666 690 00	666 996 90	B	10	12	12	M16x1,5	28	-	-	58	26	8	-	-	17	9,5	38,0	64,0
666 694 00	666 996 94	BK	4	4	4	M8x1	16	-	-	35	16	5	-	-	10	4,0	12,0	13,8
666 695 00	666 996 95	BK	5	5	5	M10x1	19	-	-	40	18	6	-	-	12	5,0	15,0	25,0
666 696 00	666 996 96	BK	6	6	6	M12x1,5	23	-	-	48	22	6	-	-	14	6,0	19,0	39,0
666 698 00	666 996 98	BK	8	8	8	M16x1,5	28	-	-	58	26	8	-	-	17	8,5	26,0	83,0
666 700 00	666 997 00	BK	10	12	12	M16x1,5	28	-	-	58	26	8	-	-	17	9,5	38,0	79,8
666 704 00	666 997 04	C	4	4	4	M8x1	16	-	-	35	16	5	-	-	10	4,0	12,0	13,0
666 705 00	666 997 05	C	5	5	5	M10x1	19	-	-	40	18	6	-	-	12	5,0	15,0	21,0
666 706 00	666 997 06	C	6	6	6	M12x1,5	23	-	-	48	22	6	-	-	14	6,0	19,0	33,0
666 708 00	666 997 08	C	8	8	8	M16x1,5	28	-	-	58	26	8	-	-	17	8,5	26,0	66,5
666 710 00	666 997 10	C	10	12	12	M16x1,5	28	-	-	58	26	8	-	-	17	9,5	38,0	69,6
666 714 00	666 997 14	CK	4	4	4	M8x1	16	-	-	35	16	5	-	-	10	4,0	12,0	15,8
666 715 00	666 997 15	CK	5	5	5	M10x1	19	-	-	40	18	6	-	-	12	5,0	15,0	28,0
666 716 00	666 997 16	CK	6	6	6	M12x1,5	23	-	-	48	22	6	-	-	14	6,0	19,0	43,0
666 718 00	666 997 18	CK	8	8	8	M16x1,5	28	-	-	58	26	8	-	-	17	8,5	26,0	86,5
666 720 00	666 997 20	CK	10	12	12	M16x1,5	28	-	-	58	26	8	-	-	17	9,5	38,0	85,0
666 734 00	666 997 34	G	4	4	4	M8x1	-	M3	7	-	16	5	4,5	2,5	10	4,0	12,0	9,8
666 735 00	666 997 35	G	5	5	5	M10x1	-	M4	8	-	18	6	5,5	3,0	12	5,0	15,0	15,8
666 736 00	666 997 36	G	6	6	6	M12x1,5	-	M5	9	-	22	6	7,0	3,5	14	6,0	19,0	25,3
666 738 00	666 997 38	G	8	8	8	M16x1,5	-	M6	10	-	26	8	8,5	4,0	17	8,5	26,0	53,9
666 740 00	666 997 40	G	10	12	12	M16x1,5	-	M6	10	-	26	8	8,5	4,0	17	9,5	38,0	55,6
666 744 00	666 997 44	GK	4	4	4	M8x1	-	M3	7	-	16	5	4,5	2,5	10	4,0	12,0	12,7
666 745 00	666 997 45	GK	5	5	5	M10x1	-	M4	8	-	18	6	5,5	3,0	12	5,0	15,0	22,8
666 746 00	666 997 46	GK	6	6	6	M12x1,5	-	M5	9	-	22	6	7,0	3,5	14	6,0	19,0	35,3
666 748 00	666 997 48	GK	8	8	8	M16x1,5	-	M6	10	-	26	8	8,5	4,0	17	8,5	26,0	73,9
666 750 00	666 997 50	GK	10	12	12	M16x1,5	-	M6	10	-	26	8	8,5	4,0	17	9,5	38,0	75,6

* Statistical average.

Steel Versions:



Stainless Steel Versions:



Control Knobs 726.1

Material:

Aluminium, black anodised finish, scale (version S) and arrow (version A): white, engraved with laser precision. Knob cover disk: light- grey plastic. Collet/hexagon nut: brass. Stainless steel set screw: DIN 916 with Allen screw and serrated end.

Type A: with arrow.

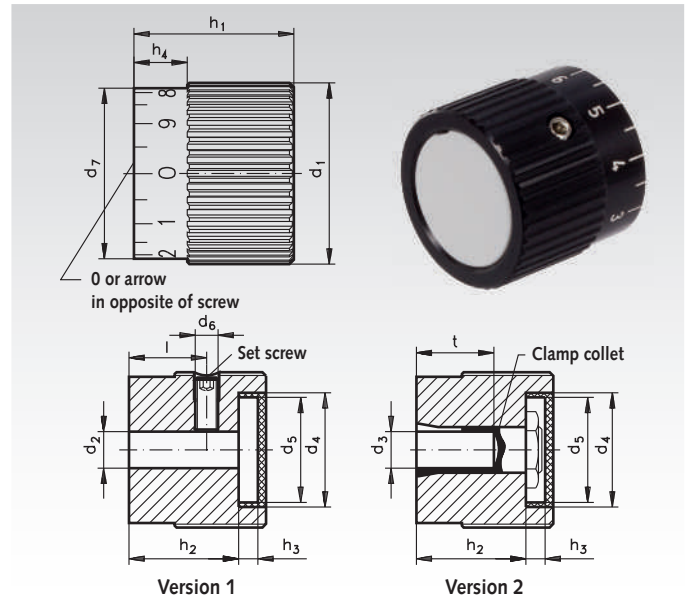
Type B: neutral, without arrow or grading.

Type S: with scale 0...9, 20 graduations.

Version 1: with set screw (bore d_2).

Version 2: with collet (bore d_3).

When mounting, the cover is pressed in by hand, for demounting it can be lifted up at the slot using a screwdriver. The collet version allows easy "adjustment" of the knobs and offers completely secure mounting on the shaft. Scale or arrow are fully abrasion proof and easy to read, as the engraving makes the aluminium coloured figures and numbers stand out against the black, anodised surface. Besides the standard scale (Version S) these knobs can be supplied with any scale desired (on request).



Ordering Details: e.g.: Product No. 660 701 22, Control Knob Vers. 1, Version A, 22 mm

Product No. Version 1	Product No. Version 2	Type	d_1 mm	d_2^{H8} mm	d_3 mm	d_4 mm	d_5 mm	d_6 mm	d_7 mm	h_1 mm	h_2 mm	h_3 mm	h_4 mm	l mm	t mm	Weight in g	
																Vers. 1	Vers. 2
660 701 22	-	A	22	5	-	16	14	M4	20	22	16	4,3	8	12,5	-	17	-
660 701 27	660 705 27	A	27	6	6	20	18	M4	25	26	20	4,3	9	14	14	32	37
660 701 34	660 705 34	A	34	8	8	25	23	M5	32	30	24	4,2	10	15	17	58	65
660 701 42	660 705 42	A	42	10	10	32	30	M5	40	34	28	4,0	11	16	20	103	112
660 702 22	-	B	22	5	-	16	14	M4	20	22	16	4,3	8	12,5	-	17	-
660 702 27	660 706 27	B	27	6	6	20	18	M4	25	26	20	4,3	9	14	14	32	37
660 702 34	660 706 34	B	34	8	8	25	23	M5	32	30	24	4,2	10	15	17	58	65
660 702 42	660 706 42	B	42	10	10	32	30	M5	40	34	28	4,0	11	16	20	103	112
660 703 22	-	S	22	5	-	16	14	M4	20	22	16	4,3	8	12,5	-	17	-
660 703 27	660 707 27	S	27	6	6	20	18	M4	25	26	20	4,3	9	14	14	32	37
660 703 34	660 707 34	S	34	8	8	25	23	M5	32	30	24	4,2	10	15	17	58	65
660 703 42	660 707 42	S	42	10	10	32	30	M5	40	34	28	4,0	11	16	20	103	112



Type A: with arrow.



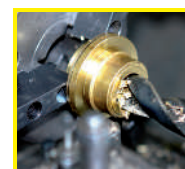
Type B: neutral, without arrow or grading.



Type S: with scale 0...9, 20 graduations.

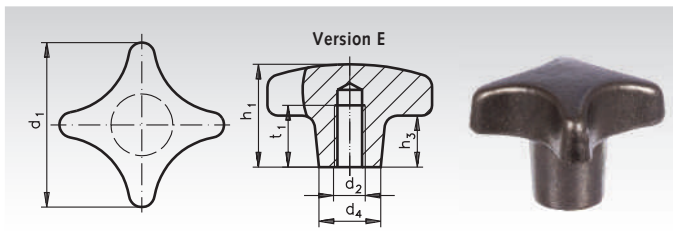


Version 1: with set screw (bore d_2).
Version 2: with collet (bore d_3).



**Reworking within
24h-service possible.
Custom made parts
on request.**

Star Knobs DIN 6335 GG

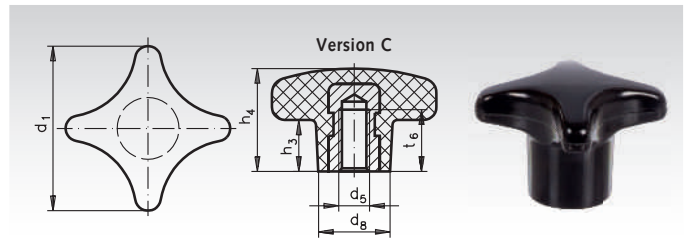


Material: Grey cast iron.
Type E = with tapped blind hole.

Ordering Details: e.g.: Product No. 660 232 00, Star Knobs DIN 6335 GG, Vers. E 32 mm

Product No. Type E	d ₁ mm	d ₂ mm	d ₄ mm	h ₁ mm	h ₃ mm	t ₁ mm	Weight g
660 232 00	32	M6	12	21	10	12	30
660 240 00	40	M8	14	26	14	15	49
660 250 00	50	M10	18	34	20	18	105
660 263 00	63	M12	20	42	25	22	170
660 280 00	80	M16	25	52	30	28	350
660 298 00	100	M20	32	65	38	36	715

Star Knobs Similar to DIN 6335 Pr



Material: Plastic PF31, black, glossy finish.
Type K = with press-fitted threaded bush made from brass.

Ordering Details: e.g.: Product No. 660 520 00, Star Knobs DIN 6335 Pr, Vers. K 20 mm

Product No. Type K	d ₁ mm	d ₅ mm	d ₈ mm	h ₃ mm	h ₄ mm	t ₆ min. mm	Weight g
660 520 00	20	M4	10	6	13	6,5	3
660 525 00	25	M5	13	8	17	9,5	7
660 532 00	32	M6	14	10	20	12	10
660 540 00	40	M8	18	14	26	14	19
660 550 00	50	M10	22	18	32	18	35
660 563 00*	63	M12	26	22	40	22	65
660 580 00*	80	M16	34	29	53	30	137

* With threaded bush made from steel.

Star Knobs with Axial Bearing

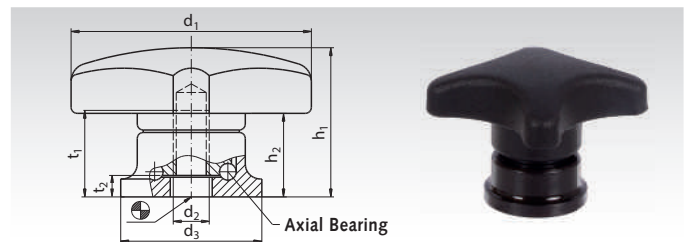
Material: Grip: Thermoplast (PA).
 Insert: Heat-treated steel nitrided, burnished.

The advantages of the axial bearing:

- double clamping force with same lever size, by reducing the surface friction.
- Less wear on the component due to fixed locating face.
- Little settling due to higher pre-tensioning force of the bolt or thread.

Ordering Details: e.g.: Product No. 660 640 00, Star Knob with Axial Bearing, Ø 40 mm

Product No.	d ₁ mm	d ₂ mm	d ₃ mm	h ₁ mm	h ₂ mm	t ₁ mm	t ₂ mm	Weight g
660 640 00	40	M6	24	27	15	12,5	5	45
660 650 00	50	M8	25	34	22,5	14	4,2	68
660 663 00	63	M10	30	41	26,5	18	5,4	111
660 680 00	80	M12	35	54	34	26,5	6,6	218



Star Knob Screws with Axial Bearing

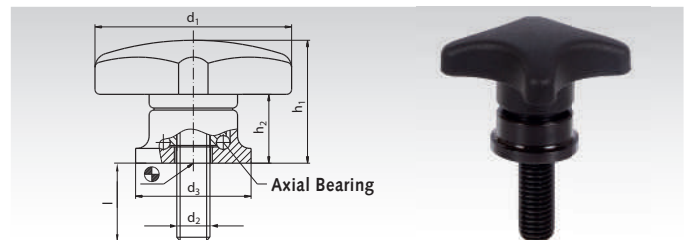
Material: Grip: Thermoplast (PA).
 Insert: Heat-treated steel nitrided, burnished.
 Screw: Steel tensile strength 8.8, burnished.

The advantages of the axial bearing:

- double clamping force with same lever size, by reducing the surface friction.
- Less wear on the component due to fixed locating face.
- Little settling due to higher pre-tensioning force.

Ordering Details: e.g.: Product No. 660 640 01, Star Knob Screw with Axial Bearing, Ø 40mm, M6 x 15mm

Product No.	d ₁ mm	d ₂ mm	l mm	d ₃ mm	h ₁ mm	h ₂ mm	Weight g
660 640 01	40	M6	15	24	27	15	50
660 640 02	40	M6	25	24	27	15	52
660 650 01	50	M8	20	25	34	22,5	81
660 650 02	50	M8	35	25	34	22,5	86
660 663 01	63	M10	30	30	41	26,5	137
660 663 02	63	M10	40	30	41	26,5	142
660 680 01	80	M12	30	35	54	34	258
660 680 02	80	M12	50	35	54	34	276

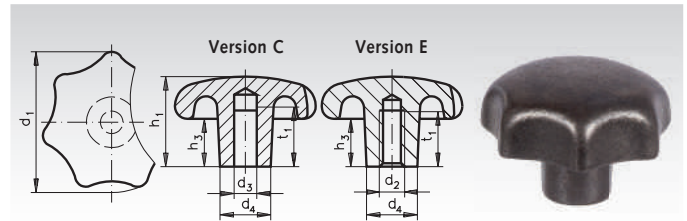


Star Knobs DIN 6336 GG

Material: Grey cast iron.

Version C = with blind hole d_3^{H7}

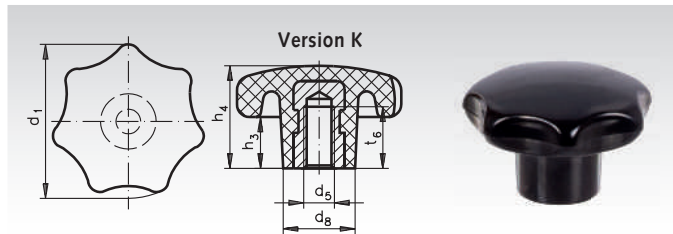
Version E = with tapped blind hole d_2



Ordering Details: e.g.: Product No. 661 132 00, Star Knob DIN 6336 GG, Vers. C 32 mm

Product No. Vers. C	Product No. Vers. E	d_1 mm	d_2 mm	d_3^{H7} mm	d_4 mm	h_1 mm	h_3 mm	t_1 mm	Weight Vers. C g	Weight Vers. E g
661 132 00	661 232 00	32	M6	6	12	20	10	12	47	49
661 140 00	661 240 00	40	M8	8	14	25	13	15	70	70
661 150 00	661 250 00	50	M10	10	18	32	17	18	145	148
661 163 00	661 263 00	63	M12	12	20	40	21	22	246	254
661 180 00	661 280 00	80	M16	16	25	50	25	28	542	542

Star Knobs Similar to DIN 6336 Pr



Material: Plastic PF31, black, glossy finish.

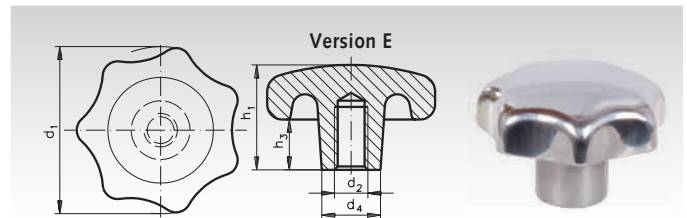
Version K = with threaded bush of zinc-plated steel.

Ordering Details: e.g.: Product No. 661 520 00, Star Knob DIN 6336 Pr, Vers. K 20 mm

Product No. Vers. K	d_1 mm	d_5 mm	d_8 mm	h_3 mm	h_4 mm	t_6 min mm	Weight g
661 520 00*	20	M4*	10	7	13	6,5	3
661 525 00	25	M5	12	8	16	9,5	7
661 532 00	32	M6	14	9	20	12	11
661 540 00	40	M8	18	13	26	14	26
661 550 00	50	M10	22	17	33	18	44
661 563 00	63	M10	25	21	42	18	83
661 564 00	63	M12	25	21	42	22	83
661 580 00	80	M12	35	22	50	22	158

* With threaded bush made from brass.

Star Knobs Similar to DIN 6336 AL



Material: GKAlSi7Cu3, polished.

Version E = with tapped blind hole.

Ordering Details: e.g.: Product No. 661 740 00, Star Knob DIN 6336 EL, Vers. E 40 mm

Product No. Vers. E	d_1 mm	d_2 mm	h_1 mm	h_3 mm	d_4 mm	Weight g
661 740 00	40	M8	26	13	14	35
661 750 00	50	M10	34	17	18	65
661 763 00	63	M12	42	21	20	100
661 780 00	80	M16	52	25	25	220

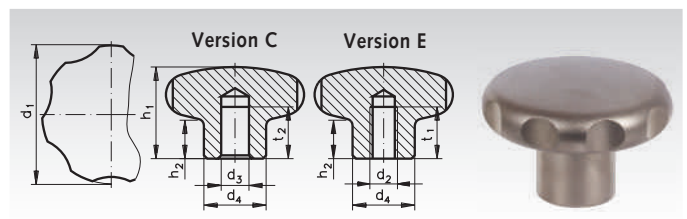
Star Knobs 5335 Stainless Steel

Material: Stainless steel 1.4305, blasted, matt finish.

Version C = with blind hole d_3^{H7}

Version E = with tapped blind hole d_2

Especially suited for the food-processing machinery industry, with smooth and enclosed areas.



Ordering Details: e.g.: Product No. 661 993 21, Star Knob Stainless Steel, Cast, 40 mm

Product No. Vers. C	Product No. Vers. E	d_1 mm	Thread d_2 mm	Bore d_3 mm	d_4 mm	h_1 mm	h_2 mm	$t_{2min.}(C)$ mm	$t_{1min.}(E)$ mm	Weight g
-	661 993 30	40	M6	-	18	30,5	15	-	12	150
661 993 21	661 993 31	40	M8	8	18	30,5	15	15	12	125
-	661 993 32	50	M8	-	21	34,0	17	-	15	240
661 993 23	661 993 33	50	M10	10	21	34,0	17	18	15	208
-	661 993 34	60	M10	-	25	39,0	18	-	18	370
661 993 25	661 993 35	60	M12	12	25	39,0	18	22	22	365

Star Knobs 5334 Stainless Steel

Material: Stainless steel 1.4301. Grip drawn from stainless-steel sheet. Hub butt-welded on, blasted, matt finish.

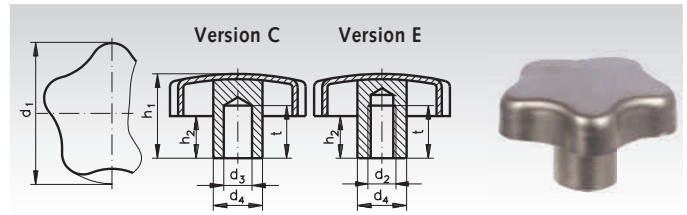


Version C = with blind hole d_3^{H7}

Version E = with tapped blind hole d_2

Refined and cost-saving manufacturing techniques led to this cost-efficient stainless steel-version.

Ordering Details: e.g.: Product No. 661 993 01, Star Knob Stainless Steel, Drawn, 40 mm



Product No. Vers. C	Product No. Vers. E	d_1 mm	Thread d_2 mm	Bore d_3^{H7} mm	d_4 mm	h_1 mm	h_2 mm	t min. mm	Weight g
661 993 01	661 993 11	40	M8	8	14	24	12	15	37
661 993 03	661 993 13	50	M10	10	18	31	17,5	18	65
661 993 05	661 993 15	60	M12	12	20	39	21	22	107

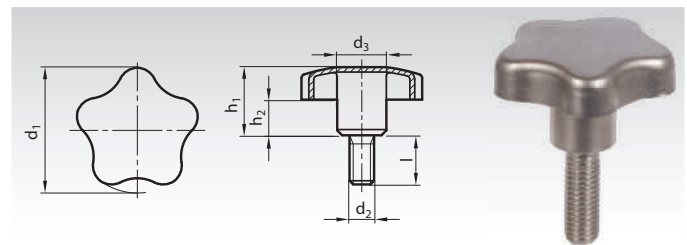
Star Knob Screws 5334 Stainless Steel

Material: Stainless steel 1.4301. Grip drawn from stainless-steel sheet. Hub butt-welded on, blasted, matt finish.

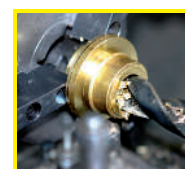


Refined and cost-saving manufacturing techniques led to this cost-efficient stainless steel-version.

Ordering Details: e.g.: Product No. 661 993 01, Star Knob Screw Stainless Steel, 40 mm



Product No.	d_1 mm	d_2 mm	l mm	d_3 mm	h_1 mm	h_2 mm	Weight g
661 993 41	40	M8	20	14	24	12	50
661 993 42	40	M8	30	14	24	12	55
661 993 43	40	M8	40	14	24	12	57
661 993 44	50	M10	20	18	30	16,5	91
661 993 45	50	M10	30	18	30	16,5	97
661 993 46	50	M10	40	18	30	16,5	101
661 993 47	60	M12	30	20	37,5	20	155
661 993 48	60	M12	40	20	37,5	20	162
661 993 49	60	M12	50	20	37,5	20	170



Reworking within
24h-service possible.
Custom made parts
on request.

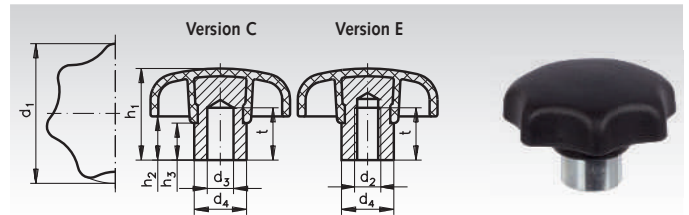
Star Knobs Similar to DIN 6336, Thermoplast

Material: Plastic Thermoplast (Polyamide), impact resistant, black, matt finish. Bush: Steel, zinc-plated, chromated blue.

Version C = with blind hole d_3^{H7}

Version E = with tapped blind hole d_2

The full diameter of the contact surface is made from Steel.
The protruding steel bush allows a perfect cross-pin connection.



Ordering Details: e.g.: Product No. 661 332 00, Star Knob Thermoplast, 32 mm

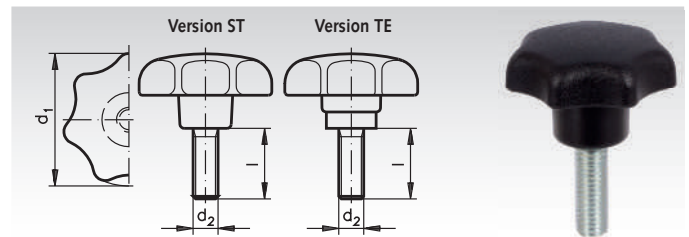
Product No. Vers. C	Product No. Vers. E	d ₁ mm	Vers. C d ₃ mm	Vers. E d ₂ mm	d ₄ mm	h ₁ mm	h ₂ mm	h ₃ mm	t min. mm	Weight g
661 332 00	661 332 01	32	6	M6	12	20	10	8,5	12	15
661 340 00	661 340 01	40	8	M8	14	26	13	10	14	25
661 350 00	661 350 01	50	10	M10	18	32	17	10	18	53
661 363 00	661 363 01	63	12	M12	20	40	21	14	22	85
661 380 00	661 380 01	80	16	M16	25	52	27	15	30	195

Star Knob Screws Similar to DIN 6336

Material: Plastic Thermoplast (Polyamide). Threaded bolt: steel, zinc-plated, chromated blue.

Version ST = grip part fully made from plastic with moulded-in threaded bolt.

Version TE = grip part with moulded-in protruding steel hub (steel hub and threaded bolt made from one part, turned).

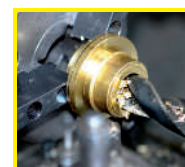


Ordering Details: e.g.: Product No. 661 825 10, Star Knob screw Thermoplast, 25 mm

Product No. Vers. ST	Product No. Vers. TE	d ₁ mm	d ₂ mm	l mm	Weight g
661 825 10	-	25	M5	10	5
661 825 15	-	25	M5	15	7
661 825 20	-	25	M5	20	8
661 832 10	-	32	M6	10	10
661 832 16	661 932 16	32	M6	16	11
661 832 20	661 932 20	32	M6	20	12
661 832 25	661 932 25	32	M6	25	13
661 840 16	661 940 16	40	M8	16	21
661 840 20	661 940 20	40	M8	20	22
661 840 25	661 940 25	40	M8	25	24
661 840 30	661 940 30	40	M8	30	26
661 850 20	-	50	M10	20	43
661 850 25	661 950 25	50	M10	25	45
661 850 30	661 950 30	50	M10	30	48
661 850 45	661 950 45	50	M10	45	58
661 863 20	-	63	M12	20	79
661 863 30	661 963 30	63	M12	30	91
661 863 40	661 963 40	63	M12	40	105
661 863 60	661 963 60	63	M12	60	115

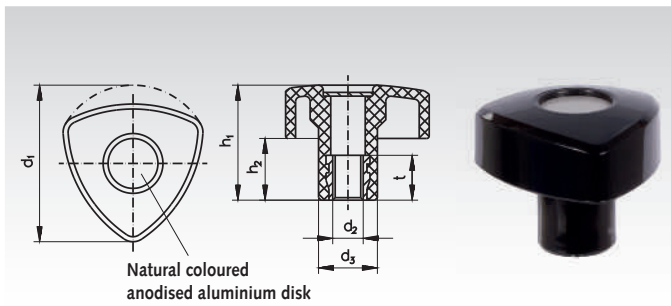
Version ST

Version TE



**Reworking within
24h-service possible.
Custom made parts
on request.**

Triangular Knobs, Made from Thermoplast



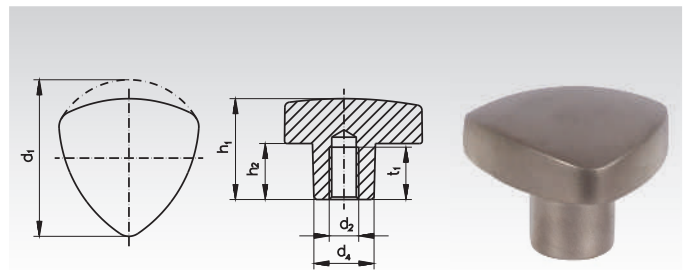
Material: Thermoplast (Polyamide PA),
black glossy finish, brass bush.

Very elegant and easy to grip.

Ordering Details: e.g.: Product No. 661 632 11, Triangular Knob, 32mm, M5

Product No.	d ₁ mm	d ₂ mm	d ₃ mm	h ₁ mm	h ₂ mm	t mm	Weight g
661 632 11	32	M5	14	26	16	10	7
661 632 12	32	M6	14	26	16	12	9
661 640 11	40	M6	16	30	17	12	11
661 640 12	40	M8	16	30	17	14	13
661 650 11	50	M8	19	35	19	14	18
661 650 12	50	M10	19	35	19	16	22
661 660 11	60	M10	22	41	22	16	30
661 660 12	60	M12	22	41	22	18	32

Triangular Knobs, Made from Stainless Steel



Material: Stainless steel 1.4308, matt blasted.



Elegant, easy to grip and clean.
For comparably high torque transmission.

Ordering Details: e.g.: Product No. 661 996 31, Triangular Knob stainless, 32mm, M5

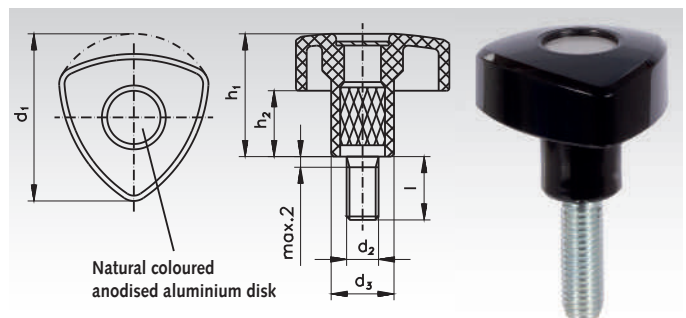
Product No.	d ₁ mm	d ₂ mm	d ₄ mm	h ₁ mm	h ₂ mm	t mm	Weight g
661 996 31	32	M5	12	21	12	10	62
661 996 32	32	M6	12	21	12	10	60
661 996 41	40	M6	14	26	14	12	103
661 996 42	40	M8	14	26	14	12	100
661 996 51	50	M8	18	33	19	15	160
661 996 52	50	M10	18	33	19	15	155
661 996 61	60	M10	20	41	23	18	295
661 996 62	60	M12	20	41	23	18	290

Triangular Knob screws, Made from Thermoplast

Material: Thermoplast (Polyamide PA),
black glossy finish.
Grub screw, zinc-plated steel, chromated.

Very elegant and easy to grip.

Ordering Details: e.g.: Product No. 661 632 13, Triangular Knob screw, 32mm, M5



Product No.	d ₁ mm	d ₂ mm	l mm	h ₁ mm	h ₂ mm	d ₃ mm	Weight g
661 632 13	32	M5	10	26	16	14	9
661 632 14	32	M5	20	26	16	14	10
661 632 15	32	M5	40	26	16	14	13
661 632 16	32	M6	10	26	16	14	10
661 632 17	32	M6	20	26	16	14	13
661 632 18	32	M6	40	26	16	14	15
661 640 13	40	M6	10	30	17	16	14
661 640 14	40	M6	20	30	17	16	15
661 640 15	40	M6	40	30	17	16	19
661 640 16	40	M8	16	30	17	16	19
661 640 17	40	M8	30	30	17	16	25
661 640 18	40	M8	50	30	17	16	30
661 650 13	50	M8	16	35	19	19	28
661 650 14	50	M8	30	35	19	19	32
661 650 15	50	M8	50	35	19	19	37
661 650 16	50	M10	20	35	19	19	35
661 650 17	50	M10	30	35	19	19	40
661 650 18	50	M10	50	35	19	19	50
661 660 13	60	M10	20	41	22	22	42
661 660 14	60	M10	30	41	22	22	48
661 660 15	60	M10	50	41	22	22	60
661 660 16	60	M12	20	41	22	22	57
661 660 17	60	M12	30	41	22	22	65
661 660 18	60	M12	50	41	22	22	80

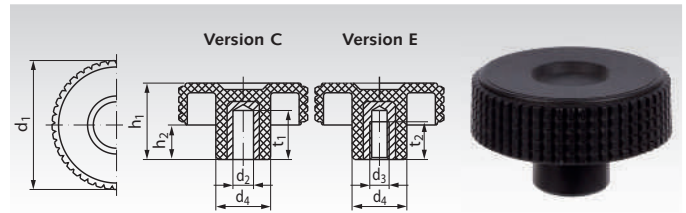
Knurled Knobs, Made from Thermoplast

Material: Thermoplast (Polypropylene PP) reinforced, impact resistant, black, matt, brass bush.

Version C = with blind hole d_2^{H9}

Version E = with threaded blind hole d_3

Special surface (contact points as a quadratic truncated pyramid) for maximum torque without uncomfortable stress on the skin.



Ordering Details: e.g.: Product No. 661 632 01, Knurled Knob, Thermoplast, 32 mm, M5

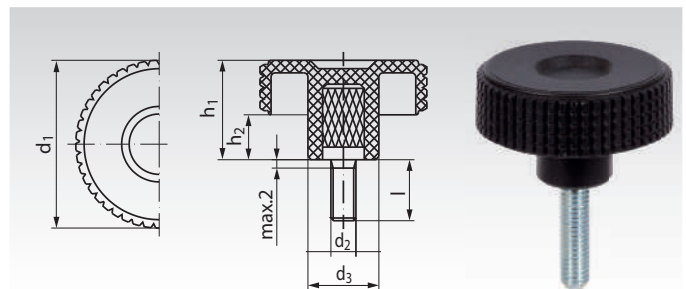
Product No. Version C	Product No. Version E	d_1 mm	Version C d_2^{H9} mm	Version E d_3 mm	d_4 mm	h_1 mm	h_2 mm	t_1 min. mm	t_2 mm	Weight g
—	661 632 01	32	—	M5	15	22	9	—	10	11
—	661 632 02	32	—	M6	15	22	9	—	12	16
661 640 00	661 640 01	40	6	M6	17	24	11	14	12	20
—	661 640 02	40	—	M8	17	24	11	—	13	21
661 650 00	661 650 01	50	8	M8	20	30	13,5	20	20	42
—	661 650 02	50	—	M10	20	30	13,5	—	18	32
661 660 00	661 660 01	60	10	M10	23	35	15	25	20	46
—	661 660 02	60	—	M12	23	35	15	—	20	54
—	661 670 01	70	—	M12	24	38	18,5	—	20	65
—	661 670 02	70	—	M14	24	38	18,5	—	20	73

Knurled Knob Screws, Made from Thermoplast

Material: Thermoplast (Polypropylene PP) reinforced, impact resistant, black, matt.

Grub screw, zinc-plated steel, chromated.

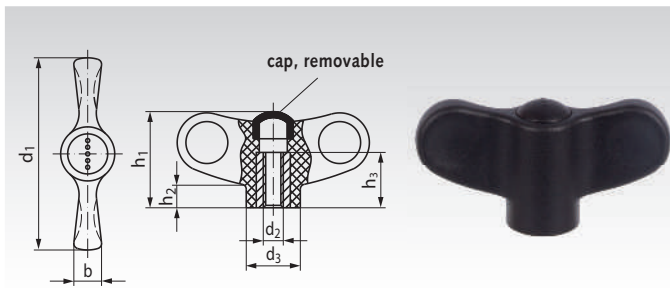
Special surface (contact points as a quadratic truncated pyramid) for maximum torque without uncomfortable stress on the skin.



Ordering Details: e.g.: Product No. 661 632 03, Knurled Knob, Thermoplast, 32 mm

Product No.	d_1 mm	d_2 mm	l mm	h_1 mm	h_2 mm	d_3 mm	Weight g
661 632 03	32	M5	10	22	9	15	12
661 632 04	32	M5	20	22	9	15	13
661 632 05	32	M5	40	22	9	15	15
661 632 06	32	M6	10	22	9	15	13
661 632 07	32	M6	20	22	9	15	15
661 632 08	32	M6	40	22	9	15	18
661 640 03	40	M6	10	24	11	17	16
661 640 04	40	M6	20	24	11	17	18
661 640 05	40	M6	40	24	11	17	22
661 640 06	40	M8	16	24	11	17	24
661 640 07	40	M8	30	24	11	17	28
661 640 08	40	M8	50	24	11	17	34
661 650 03	50	M8	16	30	13,5	20	34
661 650 04	50	M8	30	30	13,5	20	36
661 650 05	50	M8	50	30	13,5	20	42
661 650 06	50	M10	20	30	13,5	20	40
661 650 07	50	M10	30	30	13,5	20	45
661 650 08	50	M10	50	30	13,5	20	55
661 660 03	60	M10	20	35	15	23	54
661 660 04	60	M10	30	35	15	23	59
661 660 05	60	M10	50	35	15	23	69
661 660 06	60	M12	20	35	15	23	66
661 660 07	60	M12	30	35	15	23	74
661 660 08	60	M12	50	35	15	23	90
661 670 03	70	M12	30	38	18,5	24	85
661 670 04	70	M12	50	38	18,5	24	100

Wing nuts, Made from Thermoplast



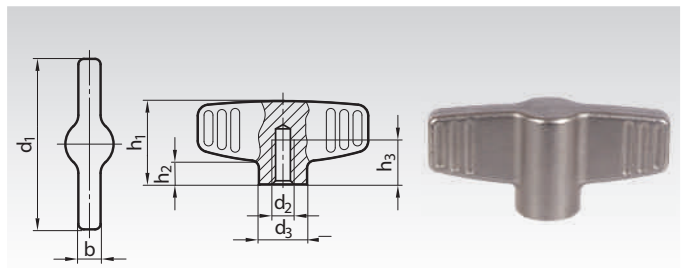
Material: Thermoplast (Polyamide PA),
glass-fibre reinforced, black matt, brass bush.

With indents for large, easy to grip contact surfaces.
For relatively high tightening torques.

Ordering Details: e.g.: Product No. 661 748 01, Wing Nut, Thermoplast, 48mm, M5

Product No.	d ₁ mm	d ₂ mm	h ₁ mm	h ₂ mm	h ₃ mm	b mm	d ₃ mm	Weight g
661 748 01	48	M5	24	5,5	12	7	13,5	10
661 748 02	48	M6	24	5,5	12	7	13,5	9
661 755 01	55	M6	28	6,5	18	8	16	20
661 755 02	55	M8	28	6,5	18	8	16	19
661 770 01	70	M8	36	8	20	10	20	32
661 770 02	70	M10	36	8	20	10	20	34

Wing Nuts, made from Stainless Steel



Material: Stainless steel 1.4308,
Precision cast, matt blasted.

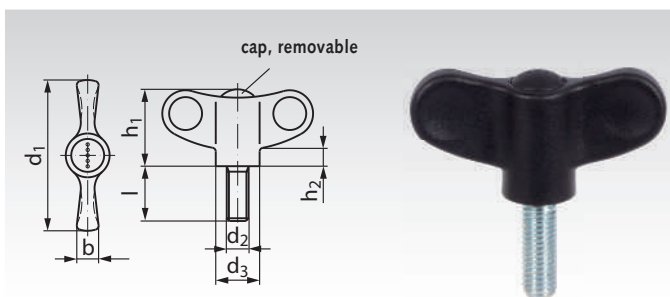
With indents for large, easy to grip contact surfaces.
For high tightening torques. Easy to clean.

Ordering Details: e.g.: Product No. 661 997 41, Wing Nut stainless, 46mm, M6

Product No.	d ₁ mm	d ₂ mm	h ₁ mm	h ₂ ca. mm	h ₃ min. mm	b mm	d ₃ mm	Weight g
661 997 41	46	M6	22,5	5,5	12	6	13	38
661 997 42	46	M8	22,5	5,5	15	6	13	36
661 997 51	58	M8	26,5	6,5	15	7	16	70
661 997 52	58	M10	26,5	6,5	18	7	16	65



Wing screws, Made from Thermoplast



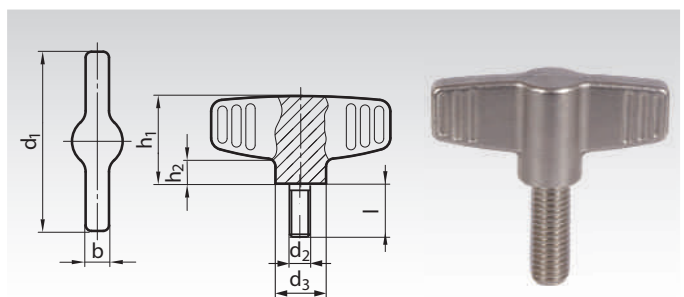
Material: Thermoplast (Polyamide PA),
glass-fibre reinforced, black matt.
Grub screw, zinc-plated steel, chromated.

With indents for large, easy to grip contact surfaces.
For relatively high tightening torques.

Ordering Details: e.g.: Product No. 661 748 03, Wing Screw, Thermoplast, 48mm, M5

Product No.	d ₁ mm	d ₂ mm	l mm	h ₁ mm	h ₂ mm	b mm	d ₃ mm	Weight g
661 748 03	48	M5	16	24	5,5	7	13,5	10
661 748 04	48	M5	20	24	5,5	7	13,5	12
661 748 05	48	M6	20	24	5,5	7	13,5	15
661 748 06	48	M6	30	24	5,5	7	13,5	15
661 748 07	48	M6	40	24	5,5	7	13,5	17
661 755 03	55	M8	20	28	6,5	8	16	22
661 755 04	55	M8	30	28	6,5	8	16	25
661 755 05	55	M8	40	28	6,5	8	16	29
661 755 06	55	M10	20	28	6,5	8	16	30
661 755 07	55	M10	30	28	6,5	8	16	34
661 755 08	55	M10	40	28	6,5	8	16	38
661 770 03	70	M8	20	36	8	10	20	35
661 770 04	70	M8	30	36	8	10	20	38
661 770 05	70	M10	20	36	8	10	20	41
661 770 06	70	M10	30	36	8	10	20	45
661 770 07	70	M10	40	36	8	10	20	49

Wing screws, Made from Stainless Steel



Material: Stainless steel 1.4308,
Precision cast, matt blasted.

With indents for large, easy to grip contact surfaces.
For high tightening torques. Easy to clean.

Ordering Details: e.g.: Product No. 661 997 61, Wing Screw stainless, 46mm, M6 x 16

Product No.	d ₁ mm	d ₂ mm	l mm	h ₁ mm	h ₂ mm	b mm	d ₃ mm	Weight g
661 997 61	46	M6	16	22,5	6	6	13	40
661 997 62	46	M6	20	22,5	6	6	13	41
661 997 63	46	M6	25	22,5	6	6	13	42
661 997 64	46	M8	16	22,5	6	6	13	60
661 997 65	46	M8	20	22,5	6	6	13	61
661 997 66	46	M8	25	22,5	6	6	13	62
661 997 67	58	M8	20	26,5	7	7	16	83
661 997 68	58	M8	25	26,5	7	7	16	84
661 997 69	58	M8	30	26,5	7	7	16	85
661 997 70	58	M10	20	26,5	7	7	16	80
661 997 71	58	M10	25	26,5	7	7	16	83
661 997 72	58	M10	30	26,5	7	7	16	85



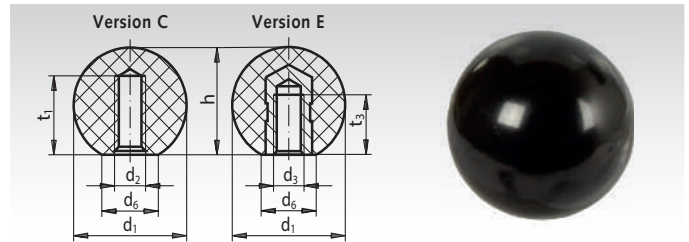
Ball Knobs DIN 319 PF

Material: Plastic PF31 (phenolic resin), black, high-gloss finish.

Version C: With compression-moulded thread.

Version E: With threaded bush of zinc-plated steel.

*M4 threaded bush made from brass.



Ordering Details: e.g.: Product No. 664 016 00, Ball Knob DIN 319 PF, Version C, 16 mm

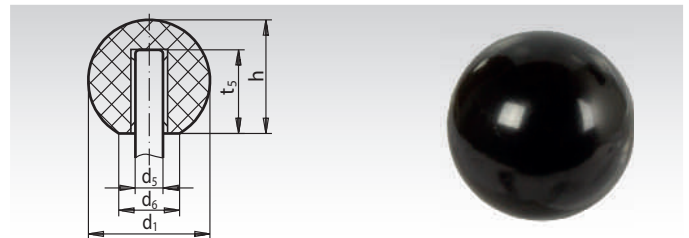
Product No. Version C	Product No. Version E	d ₁ mm	d ₂ mm	d ₃ mm	h mm	d ₆ mm	t ₁ min. mm	t ₃ min. mm	Weight in g	
									Version C	Version E
664 016 00	664 116 00*	16	M4	M4*	15	8	6	6	2,8	3,4
664 020 00	664 120 00	20	M5	M5	18	12	7,5	7,5	5,2	8,1
664 025 00	664 125 00	25	M6	M6	22,5	15	9	9	9,9	13,6
664 032 00	664 132 00	32	M8	M8	29	18	12	12	20,8	30,2
664 040 00	664 140 00	40	M10	M10	37	22	15	15	42,7	54,5
664 045 00	-	45**	M10	M10	44	17	15	18	62,0	-
664 050 00	664 150 00	50	M12	M12	46	28	18	18	85,4	106,4

** Size 45 is not part of the DIN.

Ball Knobs DIN 319 PF, Version L with Tolerance Ring

Material: Plastic PF31 (phenolic resin), black, high-gloss finish.

Shaft d₅ is not included in the delivery.



Ordering Details: e.g.: Product No. 664 216 00, Ball Knob DIN 319 PF Version L, 16 mm

Product No. Version L	d ₁ mm	d ₅ h ⁹ mm	d ₆ mm	h mm	t ₅ mm	Weight g
664 216 00	16	4	8	15	11	2,5
664 220 00	20	5	12	18	13	5
664 225 00	25	6	15	22,5	16	10,3
664 226 00	25	8	15	22,5	15	9,9
664 232 00	32	8	18	29	15	22,5
664 233 00	32	10	18	29	20	20
664 240 00	40	10	22	37	20	42
664 241 00	40	12	22	37	23	40
664 250 00	50	16	28	46	23	82

Ball Knobs DIN 319 Version C, Steel, Stainless Steel and Aluminium

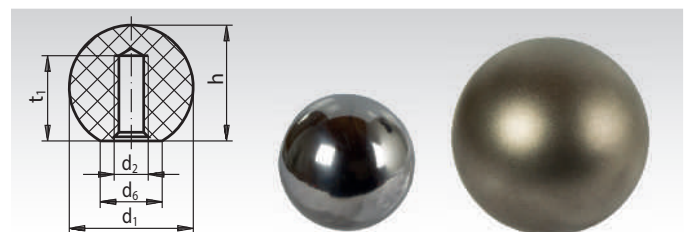
Material: Steel, polished.

Stainless steel 1.4305, matt blasted.

Aluminium, polished.



Ball knobs with dimensions according to DIN 319, made from metal.



Ordering Details: e.g.: Product No. 664 416 00, Ball Knob DIN 319 Version C, Steel, 16mm

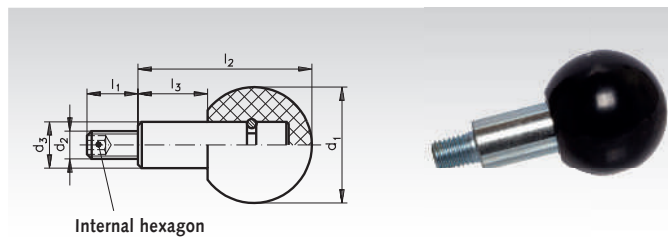
Product No. Steel	Product No. Stainless Steel	Product No. Aluminium	d ₁ mm	d ₂ mm	d ₆ mm	h mm	t ₁ min. mm	Weight in g		
								Steel	Stainless	Aluminium
664 416 00	664 994 16	664 664 16	16	M4	8	15	6	15	15	6
664 420 00	664 994 20	664 664 20	20	M5	12	18	7,5	26	26	11
664 425 00	664 994 25	664 664 25	25	M6	15	22,5	9	59	59	21
664 432 00	664 994 32	664 664 32	32	M8	18	29	12	116	116	43
664 440 00	664 994 40	664 664 40	40	M10	22	37	15	235	235	85
664 450 00	-	664 664 50	50	M12	28	46	18	475	475	169

Revolving Ball Knobs 3192 with Gear Lever Handle

Material: Duroplast PF31, black, glossy finish.

Bolt: Steel, zinc plated.

Use: Instead of revolving handles, e.g. for handwheels and hand cranks. Revolving ball knobs have the same connecting dimensions as handles DIN 39 and DIN 98 page 548.



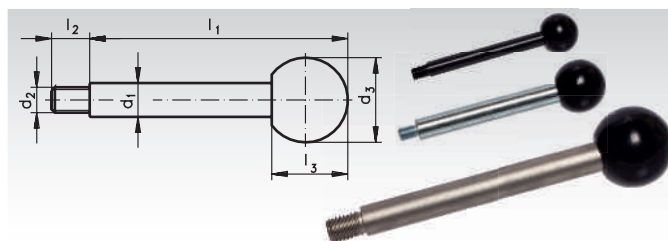
Ordering Details: e.g.: Product No. 664 525 00, Revolving Ball Knob 3192, 25 mm

Product No.	d ₁ mm	d ₂ mm	d ₃ mm	l ₁ mm	l ₂ mm	l ₃ mm	Weight g
664 525 00	25	M6	10	11	37,5	15	28
664 532 00	32	M8	13	13	48	19	62
664 540 00	40	M10	16	14	61	24	117
664 550 00	50	M12	20	21	78	31	237

Gear Lever Handles 209 with Ball Knob DIN 319, Steel Burnished or Zinc Plated or Stainless

Material: Lever: Steel burnished or steel zinc plated or stainless steel 1.4305 matt.
Ball knob: Plastic duroplast PF31, black, glossy finish.

The knob is screwed on.



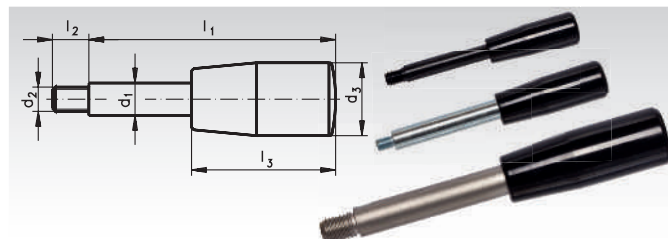
Ordering Details: e.g.: Product No. 666 006 00, Handle 209 with Ball Knob, burnished, 8 mm

Product No. Burnished	Product No. Zinc Plated	Product No. Stainless	d ₁ mm	d ₂ mm	d ₃ mm	l ₁ mm	l ₂ mm	l ₃ mm	Weight g
666 006 00	666 066 00	666 990 06	8	M6	20	80	9	18	36
666 007 00	666 067 00	666 990 07	8	M6	20	100	9	18	40
666 008 00	666 068 00	666 990 08	10	M8	25	100	11	22,5	63
666 009 00	666 069 00	666 990 09	10	M8	25	125	11	22,5	78
666 010 00	666 070 00	666 990 10	12	M10	32	125	14	29	123
666 011 00	666 071 00	666 990 11	12	M10	32	160	14	29	154
666 012 00	666 072 00	666 990 12	14	M12	35	160	16	32,5	202
666 013 00	666 073 00	666 990 13	14	M12	35	200	16	32,5	250
666 014 00	666 074 00	-	16	M14	40	200	18	37	331
666 015 00	666 075 00	-	16	M14	40	250	18	37	410

Gear Lever Handles 209 with Cylindrical Grip, Steel Burnished or Zinc Plated or Stainless

Material: Lever: Steel burnished or steel zinc plated or stainless steel 1.4305 matt.
Cylindrical grip: Plastic duroplast PF31, black, glossy finish.

The grip is screwed on.



Ordering Details: e.g.: Product No. 666 106 00, Handle 209 with Cylindrical Grip, burnished, 8mm

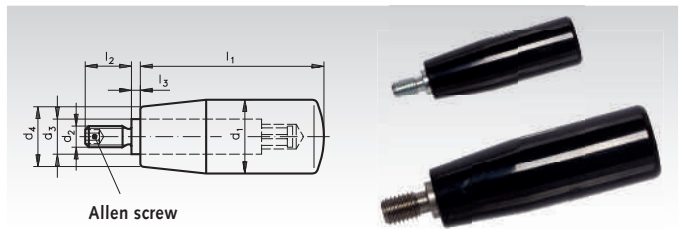
Product No. Burnished	Product No. Zinc Plated	Product No. Stainless	d ₁ mm	d ₂ mm	d ₃ mm	l ₁ mm	l ₂ mm	l ₃ mm	Weight g
666 106 00	666 166 00	666 991 06	8	M6	18	80	9	40	33
666 107 00	666 167 00	666 991 07	8	M6	18	100	9	40	44
666 108 00	666 168 00	666 991 08	10	M8	21	100	11	50	62
666 109 00	666 169 00	666 991 09	10	M8	21	125	11	50	78
666 110 00	666 170 00	666 991 10	12	M10	23	125	14	65	103
666 111 00	666 171 00	666 991 11	12	M10	23	160	14	65	133
666 112 00	666 172 00	666 991 12	14	M12	26	160	16	80	168
666 113 00	666 173 00	666 991 13	14	M12	26	200	16	80	216
666 114 00	666 174 00	-	16	M14	28	200	18	90	273
666 115 00	666 175 00	-	16	M14	28	250	18	90	352

Revolving Cylindrical Handles 598

Material:

Version K: Duroplast PF31, black, glossy finish.
Spindle: Steel, zinc-plated.
Version N: Duroplast PF31, black, glossy finish.
Spindle: Stainless steel 1.4305.

Modern design.



Ordering Details: e.g.: Product No. 663 418 00, Handle 598, Version K, 18 mm

Product No. Vers. K	Product No. Vers. N	d ₁ mm	d ₂ mm	d ₃ mm	d ₄ mm	l ₁ mm	l ₂ mm	l ₃ mm	Weight in g	
									Vers. K	Vers. N
663 418 00	663 518 00	18	M6	10	15	40	12	2,5	29	29
663 421 00	663 521 00	21	M6	10	17	50	13	2,5	42	42
663 422 00	-	22	M6	10	18	56	13	2,5	47	-
663 423 00	663 523 00	23	M8	13	19	65	14	2,5	79	79
663 426 00	663 526 00	26	M10	13	21	80	16	2,5	109	109
663 428 00	663 528 00	28	M10	13	22	90	16	2,5	125	125
663 431 00	663 531 00	31	M12	14	25	102	20	2,5	175	175

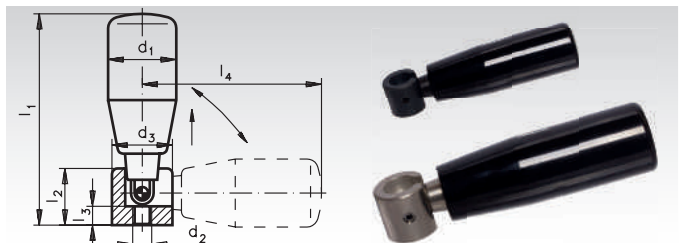
Retractable Handles NG

Material:

Version K: Duroplast PF31, black, glossy finish.
Folding mechanism: Steel, burnished.
Version N: Duroplast PF31, black, glossy finish.
Folding mechanism: Stainless steel 1.4305.



Use: When the handle must at times not stick out. The handle is pulled out of its taper seating and then tilted. A compression spring locks the handle in both end positions. All handles are revolving (type 598).



Ordering Details: e.g.: Product No. 663 200 00, Retractable Handle NG, Version K, 21 mm

Product No. Vers. K	Product No. Vers. N	d ₁ mm	d ₂ mm	d ₃ mm	l ₁ mm	l ₂ mm	l _{3-0,5} mm	l ₄ mm	Weight g
663 200 00	-	21	M5	16	67	15,0	5	62	58
663 201 00	663 992 01	26	M6	20	102	19,5	6	95	134
663 202 00	663 992 02	28	M8	26	118	26,0	10	106	214

Cylindrical Knobs, Press-On Type

Material: Thermoplast (Polypropylene PP), impact resistant, black, matt finish.

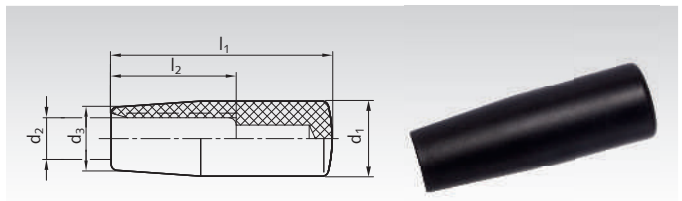
These knobs do not require a thread at the shaft.

During mounting, easy blows with a soft hammer are sufficient to drive the knob into place. The shaft end with tolerance h9 should be slightly rounded or chamfered (30°). The knob is quickly mounted and sits absolute vibration-tight.

Temperature resistant up to 80°C.

Ordering Details: e.g.: Product No. 662 201 18, Cylindrical Knob, 18 mm

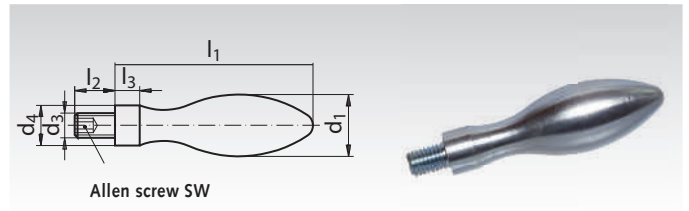
Product No.	d ₁ mm	d ₂ mm	d ₃ mm	l ₁ mm	l _{2 min.} mm	Weight g
662 202 18	18	8	15	40	28	7
662 202 21	21	10	17	50	35	10
662 202 23	23	10	19	65	45	17
662 202 26	26	12	21	80	50	25
662 202 28	28	15	22	90	60	33



Fixed Handles DIN 39 St

Material: Steel, zinc-plated.

Version E = with threaded bolt and Allen screw.



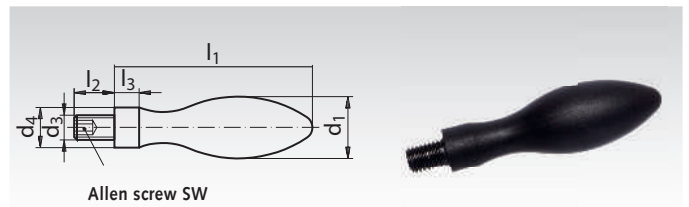
Ordering Details: e.g.: Product No. 662 110 00, Grip DIN 39 St, Vers. E 10 mm

Product No. Vers. E	d ₁ mm	d ₃ mm	d ₄ ^{H13} mm	l ₁ mm	l ₂ mm	l ₃ mm	SW mm	Weight g
662 110 00	10	M4	7	32	7	4	-	11
662 113 00	13	M5	8	40	9	5	-	24
662 116 00	16	M6	10	50	11	7	3	45
662 120 00	20	M8	13	64	13	8	4	91
662 125 00	25	M10	16	80	14	10	5	177
662 132 00	32	M12	20	100	21	13	6	360
662 136 00	36	M16	22	112	26	14	8	526

Fixed Handles DIN 39 Pr

Material: Plastic Thermoplast (Polyamide), black, matt finish.

Version E = with threaded bolt and Allen screw.



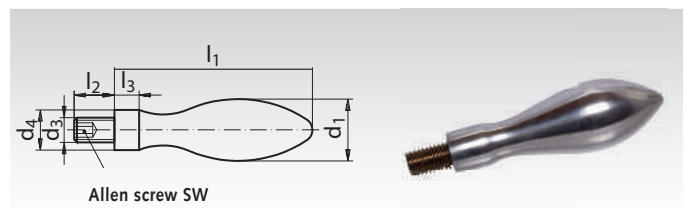
Ordering Details: e.g.: Product No. 662 220 00, Grip DIN 39 Pr, Version E 20 mm

Product No. Vers. E	d ₁ mm	d ₃ mm	d ₄ ^{H13} mm	l ₁ mm	l ₂ mm	l ₃ mm	SW mm	Weight g
662 220 00	20	M8	13	64	13	8	4	25
662 225 00	25	M10	16	80	14	10	5	50
662 232 00	32	M12	20	100	21	13	6	100

Fixed Handles DIN 39 AL

Material: Aluminium polished.

Version E = with moulded-in threaded bolt and Allen screw.



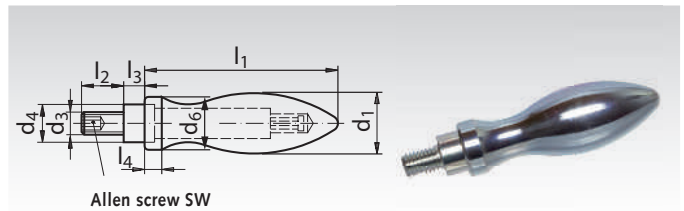
Ordering Details: e.g.: Product No. 662 316 00, Grip DIN 39 AL, Version E 16 mm

Product No. Vers. E	d ₁ mm	d ₃ mm	d ₄ ^{H13} mm	l ₁ mm	l ₂ mm	l ₃ mm	SW mm	Weight g
662 316 00	16	M6	10	50	10	7	3	20
662 320 00	20	M8	13	64	12	8	4	35
662 325 00	25	M10	16	80	16	12	5	85
662 332 00	32	M12	20	100	21	16	6	150
662 336 00	36	M16	22	112	25	16	8	210

Revolving Handles DIN 98 St

Material: Steel, zinc-plated.

Version E = with threaded spindle and Allen screw.



Ordering Details: z.B.: Product No.. 663 116 00, Grip DIN 98 St, Vers. E 16 mm

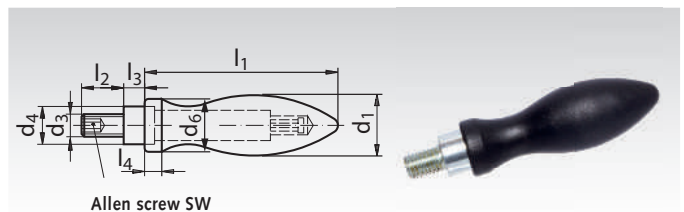
Product No. Vers. E	d ₁ mm	d ₃ mm	d ₄ ^{H13} mm	d ₆ mm	l ₁ mm	l ₂ mm	l ₃ mm	l ₄ mm	SW mm	Weight g
663 116 00	16	M6	10	14	49	11	5,5	5	3	55
663 120 00	20	M8	13	18	61	13	6	6	4	104
663 125 00	25	M10	16	21	75	14	8	6,5	5	187
663 132 00	32	M12	20	26	95	21	10,5	8	6	387
663 136 00	36	M16	22	29	106	26	11	9	8	541

Revolving Handles DIN 98 Pr

Material: Plastic Thermoplast (Polyamide), black, matt finish.

Version E = with threaded spindle and Allen screw.

Spindle: Steel, zinc-plated.



Ordering Details: e.g.: Product No. 663 216 00, Grip DIN 98 Pr, Vers. E 16 mm

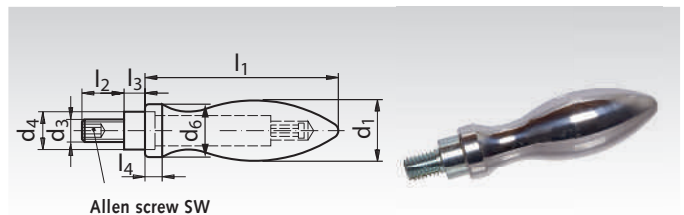
Product No. Vers. E	d ₁ mm	d ₃ mm	d ₄ ^{H13} mm	d ₆ mm	l ₁ mm	l ₂ mm	l ₃ mm	l ₄ mm	SW mm	Weight g
663 216 00	16	M6	10	14	49	11	5,5	5	3	21
663 220 00	20	M8	13	18	61	13	6	6	4	45
663 225 00	25	M10	16	21	75	14	8	6,5	5	71
663 232 00	32	M12	20	26	95	21	10,5	8	6	144

Revolving Handles DIN 98 AL

Material: Aluminium polished.

Version E = with threaded spindle and Allen screw.

Spindle Steel, zinc-plated.



Ordering Details: e.g.: Product No. 663 316 00, Grip DIN 98 AL, Vers. E 16 mm

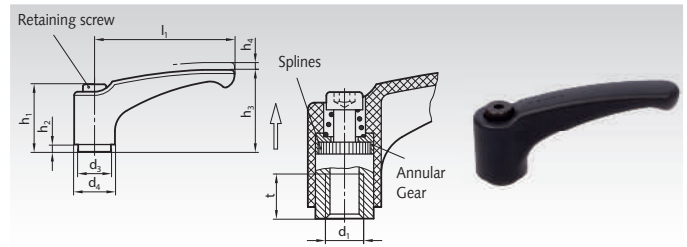
Product No. Vers. E	d ₁ mm	d ₃ mm	d ₄ ^{H13} mm	d ₆ mm	l ₁ mm	l ₂ mm	l ₃ mm	l ₄ mm	SW mm	Weight g
663 316 00	16	M6	10	14	49	11	5,5	5	3	20
663 320 00	20	M8	13	18	61	13	6	6	4	35
663 325 00	25	M10	16	21	75	14	8	6,5	5	85
663 332 00	32	M12	20	26	95	21	10,5	8	6	150
663 336 00	36	M16	22	29	106	26	11	9	8	210

Adjustable Clamping Levers 355, Version N with Internal Thread, Disengaged by Pulling, Plastic

Material: Threaded bush and retaining screw steel, burnished.
Grip body: technopolymer (Polyamide PA), glas fibre reinforced, black-grey RAL 7021. Serrated ring zinc die casting.

User-friendly design. To be used preferably when the clamping range is limited or if a specific clamping position is required. By lifting (pulling) the handle the splines work loose and the clamping lever can be turned to the most suitable clamping position. Letting go causes the handle to re-engage automatically.

Temperature resistant up to +130°C.



Ordering Details: e.g.: Product No. 665 557 01, Adjustable Clamping Lever 355, version I, 44 mm, M4

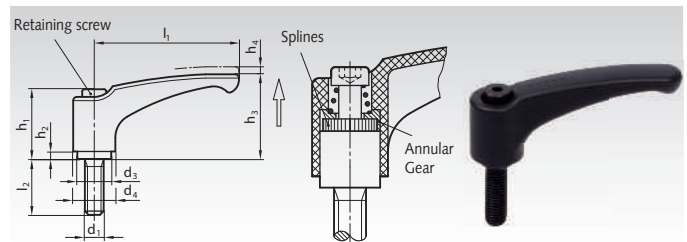
Product No.	l ₁ mm	d ₁ mm	d ₃ mm	d ₄ mm	h ₁ mm	h ₂ mm	h ₃ mm	h ₄ mm	t mm	Weight g
665 557 01	44	M4	10	15,5	24,5	3,5	30,5	3	8	17
665 557 02	44	M5	10	15,5	24,5	3,5	30,5	3	8	17
665 557 03	44	M6	10	15,5	24,5	3,5	30,5	3	8	16
665 557 04	63	M6	13,5	19	31	3,5	38,5	3	10	37
665 557 05	63	M8	13,5	19	31	3,5	38,5	3	10	35
665 557 06	78	M8	16	23	36	3,5	46,5	4	14	62
665 557 07	78	M10	16	23	36	3,5	46,5	4	14	60
665 557 08	95	M10	19	26,5	43	5	56,5	5	17	95
665 557 09	95	M12	19	26,5	43	5	56,5	5	17	90

Adjustable Clamping Levers 355, Version G with External Thread, Disengaged by Pulling, Plastic

Material: Threaded stud and retaining screw steel, burnished.
Grip body: technopolymer (Polyamide PA), glas fibre reinforced, black-grey RAL 7021. Serrated ring zinc die casting.

User-friendly design. To be used preferably when the clamping range is limited or if a specific clamping position is required. By lifting (pulling) the handle the splines work loose and the clamping lever can be turned to the most suitable clamping position. Letting go causes the handle to re-engage automatically.

Temperature resistant up to +130°C.



Ordering Details: e.g.: Product No. 665 557 11, Adjustable Clamping Lever 355, version A, 44 mm, M4x12mm

Product No.	l ₁ mm	l ₂ mm	d ₁ mm	d ₃ mm	d ₄ mm	h ₁ mm	h ₂ mm	h ₃ mm	h ₄ mm	Weight g
665 557 11	44	12	M4	10	15,5	24,5	3,5	30,5	3	18
665 557 12	44	16	M4	10	15,5	24,5	3,5	30,5	3	16
665 557 16	44	12	M5	10	15,5	24,5	3,5	30,5	3	19
665 557 18	44	20	M5	10	15,5	24,5	3,5	30,5	3	19
665 557 19	44	25	M5	10	15,5	24,5	3,5	30,5	3	20
665 557 32	63	20	M6	13,5	19	31	3,5	38,5	3	41
665 557 34	63	32	M6	13,5	19	31	3,5	38,5	3	45
665 557 40	63	20	M8	13,5	19	31	3,5	38,5	3	46
665 557 41	63	25	M8	13,5	19	31	3,5	38,5	3	47
665 557 42	63	32	M8	13,5	19	31	3,5	38,5	3	47
665 557 43	63	40	M8	13,5	19	31	3,5	38,5	3	52
665 557 54	78	20	M8	16	23	36	3,5	46,5	4	75
665 557 55	78	25	M8	16	23	36	3,5	46,5	4	70
665 557 56	78	32	M8	16	23	36	3,5	46,5	4	73
665 557 57	78	40	M8	16	23	36	3,5	46,5	4	78
665 557 62	78	20	M10	16	23	36	3,5	46,5	4	79
665 557 63	78	25	M10	16	23	36	3,5	46,5	4	76
665 557 64	78	32	M10	16	23	36	3,5	46,5	4	81
665 557 65	78	40	M10	16	23	36	3,5	46,5	4	86
665 557 66	78	50	M10	16	23	36	3,5	46,5	4	88
665 557 67	78	63	M10	16	23	36	3,5	46,5	4	94
665 557 78	95	32	M10	19	26,5	43	5	56,5	5	120
665 557 79	95	40	M10	19	26,5	43	5	56,5	5	121
665 557 80	95	50	M10	19	26,5	43	5	56,5	5	128
665 557 81	95	63	M10	19	26,5	43	5	56,5	5	133
665 557 86	95	32	M12	19	26,5	43	5	56,5	5	125
665 557 87	95	40	M12	19	26,5	43	5	56,5	5	131
665 557 88	95	50	M12	19	26,5	43	5	56,5	5	138
665 557 89	95	63	M12	19	26,5	43	5	56,5	5	148

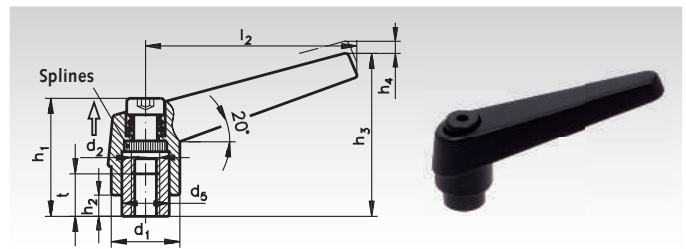
Adjustable Clamping Levers 120 Version N with Internal Thread, Disengaged by Pulling

Material: Handle: Zinc die-cast. Threaded bush and locking screw: Steel burnished. Handle: plastic coated, colour black RAL 9005.

Version N = Handle slanted, with metric-threaded bush.

As they are adjustable, they are very versatile in use.

The threaded insert is connected to the lever via the serration and can be released by pulling



Ordering Details: e.g.: Product No. 665 705 00, Adjustable Clamping Lever, Thread M5

Product No. Version N	d ₁ mm	d ₂ mm	d ₅ mm	h ₁ mm	h ₂ mm	Stroke h ₄ mm	h ₃ mm	l ₂ mm	t mm	Weight g
665 705 00	14	M5	10	25	4,5	3,5	35	45	9	33
665 706 00	14	M6	10	25	4,5	3,5	35	45	9	33
665 707 00	18	M6	13,5	31	6,5	4	45	62	12	70
665 708 00	18	M8	13,5	31	6,5	4	45	62	12	70
665 709 00	22	M8	16	36	8	4	52	74	15	116
665 710 00	22	M10	16	36	8	4	52	74	15	116
665 711 00	25	M10	19	43	11	4	63	89	18	173
665 712 00	25	M12	19	43	11	4	63	89	18	173
665 713 00	30	M12	23	50,5	12	5	76	108	24	285
665 716 00	30	M16	23	50,5	12	5	76	108	24	285

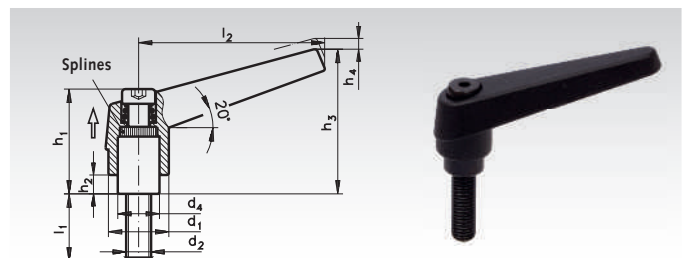
Adjustable Clamping Levers 120 Version G with External Thread, Disengaged by Pulling

Material: Handle: zinc die-cast. Threaded stud and locking screw: Steel burnished. Handle: Plastic coated, colour black RAL 9005.

Version G = Handle slanted, with metric-threaded stud.

As they are adjustable, they are very versatile in use.

The threaded insert is connected to the lever via the serration and can be released by pulling



Ordering Details: e.g.: Product No. 665 755 12, Adjustable Clamping Lever, Thread M5x12

Product No. Version G	d ₁ mm	d ₂ mm	l ₁ mm	d ₄ mm	h ₁ mm	h ₂ mm	h ₃ mm	Stroke h ₄ mm	l ₂ mm	Weight g
665 755 12	14	M5	12	10	25	4,5	35	3,5	45	37
665 755 16	14	M5	16	10	25	4,5	35	3,5	45	38
665 755 20	14	M5	20	10	25	4,5	35	3,5	45	39
665 755 25	14	M5	25	10	25	4,5	35	3,5	45	39
665 755 32	14	M5	32	10	25	4,5	35	3,5	45	40
665 756 16	18	M6	16	13,5	31	6,5	45	4	62	76
665 756 20	18	M6	20	13,5	31	6,5	45	4	62	77
665 756 25	18	M6	25	13,5	31	6,5	45	4	62	80
665 756 32	18	M6	32	13,5	31	6,5	45	4	62	81
665 756 40	18	M6	40	13,5	31	6,5	45	4	62	82
665 758 16	18	M8	16	13,5	31	6,5	45	4	62	78
665 758 20	18	M8	20	13,5	31	6,5	45	4	62	80
665 758 25	18	M8	25	13,5	31	6,5	45	4	62	81
665 758 32	18	M8	32	13,5	31	6,5	45	4	62	87
665 758 40	18	M8	40	13,5	31	6,5	45	4	62	89
665 760 20	22	M10	20	16	36	8	52	4	74	132
665 760 25	22	M10	25	16	36	8	52	4	74	136
665 760 32	22	M10	32	16	36	8	52	4	74	137
665 760 40	22	M10	40	16	36	8	52	4	74	143
665 760 50	22	M10	50	16	36	8	52	4	74	148
665 762 25	25	M12	25	19	43	11	63	4	89	203
665 762 32	25	M12	32	19	43	11	63	4	89	206
665 762 40	25	M12	40	19	43	11	63	4	89	214
665 762 50	25	M12	50	19	43	11	63	4	89	219
665 766 32	30	M16	32	23	50,5	12	76	5	108	362
665 766 40	30	M16	40	23	50,5	12	76	5	108	373
665 766 50	30	M16	50	23	50,5	12	76	5	108	386

Note

This clamping lever has proven ideal wherever the swivel range is limited or where a specific lever position is most convenient for the operator. The lever also features a modern design. By pulling the lever, the serrations are disengaged. Now the handle

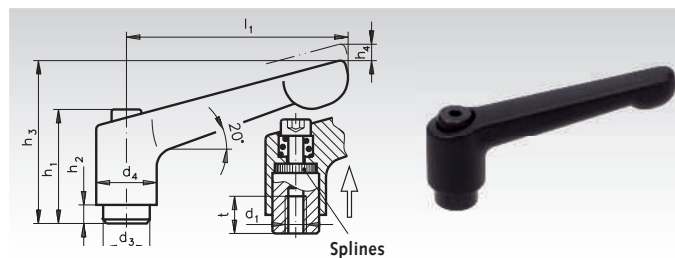
can be turned into any direction and the threaded insert can be screwed in or out by turning the locking screw. When the lever is released, the serration re-engages automatically because of the spring tension.

Adjustable Clamping Levers 300, Version N with Internal Thread, Disengaged by Pulling

Material: Threaded bush and locking screw: steel 5.8, burnished.
Handle: zinc die-cast.
Plastic coating: black.

Modern industrial design. Easy to operate. Ideal wherever parts have to be clamped in confined spaces or in a particular lever position.

Pulling the lever upwards disengages the serrations, allowing the lever to be turned to the ideal clamping position. When the lever is released, the serrations automatically re-engage.



Ordering Details: e.g.: Product No. 665 720 00, Adjustable Clamping Lever 300, 30 mm, M4

Product No.	l ₁ mm	d ₁ mm	d ₃ mm	d ₄ mm	h ₁ mm	h ₂ mm	h ₃ mm	h ₄ mm	t mm	Weight g
665 720 00	30	M4	10	13	24,5	4	31	3,5	7	27
665 722 00	30	M5	10	13	24,5	4	31	3,5	7	27
665 724 00	45	M4	10	13	24,5	4	35	3,5	8	34
665 726 00	45	M5	10	13	24,5	4	35	3,5	8	34
665 728 00	63	M6	13,5	17,5	31	6,5	45	4	10	76
665 730 00	63	M8	13,5	17,5	31	6,5	45	4	10	74
665 731 00	78	M8	16	21	36	8	55	4	14	123
665 733 00	78	M10	16	21	36	8	55	4	14	119
665 734 00	92	M10	19	24	43	11	65	4	17	194
665 736 00	92	M12	19	24	43	11	65	4	17	171
665 738 00	108	M16	23	30	50,5	12	76	5	23	289

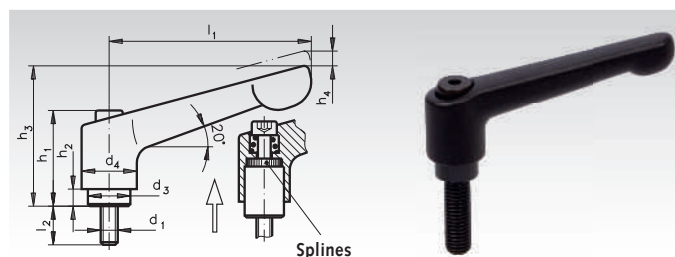
Adjustable Clamping Levers 300, Version G with external Thread, disengaged by pulling

Material: Screw insert and locking screw: Steel 5.8 burnished.
Handle: zinc diecast.
Plastic coating: black.

Modern industrial design. Easy to operate. Ideal wherever parts have to be clamped in confined spaces or in a particular lever position.

The insert is connected to the lever via serrations. Pulling the lever upwards disengages the serrations, allowing the lever to be turned to the ideal clamping position. When the lever is released, the serrations automatically re-engage.

Ordering Details: e.g.: Product No. 665 775 08, Adjustable Clamping Lever 300, 30 mm, M4



Product No.	l ₁ mm	l ₂ mm	d ₁ mm	d ₃ mm	d ₄ mm	h ₁ mm	h ₂ mm	h ₃ mm	h ₄ mm	Weight g
665 775 08	30	12	M4	10	13	24,5	4	31	3,5	28
665 775 09	30	20	M4	10	13	24,5	4	31	3,5	28
665 775 10	30	12	M5	10	13	24,5	4	31	3,5	29
665 775 11	30	20	M5	10	13	24,5	4	31	3,5	29
665 775 12	45	12	M5	10	13	24,5	4	35	3,5	36
665 775 16	45	16	M5	10	13	24,5	4	35	3,5	36
665 775 20	45	20	M5	10	13	24,5	4	35	3,5	36
665 775 25	45	25	M5	10	13	24,5	4	35	3,5	37
665 775 32	45	32	M5	10	13	24,5	4	35	3,5	38
665 776 16	45	16	M6	10	13	24,5	4	35	3,5	37
665 776 20	45	20	M6	10	13	24,5	4	35	3,5	37
665 776 25	45	25	M6	10	13	24,5	4	35	3,5	38
665 776 32	45	32	M6	10	13	24,5	4	35	3,5	40
665 776 40	45	40	M6	10	13	24,5	4	35	3,5	41
665 778 10	63	20	M6	13,5	17,5	31	6,5	45	4	81
665 778 16	63	32	M6	13,5	17,5	31	6,5	45	4	83
665 778 20	63	20	M8	13,5	17,5	31	6,5	45	4	84
665 778 25	63	25	M8	13,5	17,5	31	6,5	45	4	86
665 778 32	63	32	M8	13,5	17,5	31	6,5	45	4	88
665 778 40	63	40	M8	13,5	17,5	31	6,5	45	4	91
665 780 20	78	20	M10	16	21	36	8	55	4	139
665 780 25	78	25	M10	16	21	36	8	55	4	141
665 780 32	78	32	M10	16	21	36	8	55	4	142
665 780 40	78	40	M10	16	21	36	8	55	4	146
665 780 50	78	50	M10	16	21	36	8	55	4	152
665 780 63	78	63	M10	16	21	36	8	55	4	159
665 782 32	92	32	M12	19	24	43	11	65	4	217
665 782 40	92	40	M12	19	24	43	11	65	4	222
665 782 50	92	50	M12	19	24	43	11	65	4	229
665 782 63	92	63	M12	19	24	43	11	65	4	239

On request, the adjustable clamping levers 300 can also be supplied with stainless-steel insert 1.4305.

Adjustable Clamping Levers 300.5, Version IS-N with Internal Thread, Disengaged by Pulling, Stainless

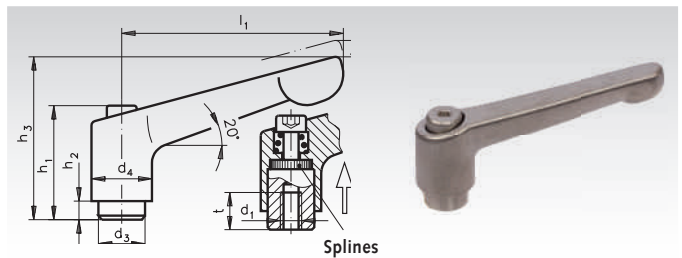
Material: Threaded bush and set screw, stainless steel 1.4305.
Grip body: Stainless steel 1.4308, matt blasted.



Version IS: With internal hexagon screw.

User-friendly design. To be used preferably when the clamping range is limited or if a specific clamping position is required. The thread insert is connected to the handle via splines and can be removed.

By lifting (pulling) the handle the splines work loose and the clamping lever can be turned to the most suitable clamping position. Letting go causes the handle to engage automatically.



Ordering Details: e.g.: Product No. 665 997 01, Adjustable Clamping Lever 300.5, version I, 45 mm.

Product No.	l_1 mm	d_1 mm	d_3 mm	d_4 mm	h_1 mm	h_2 mm	h_3 mm	h_4 mm	t mm	Weight g
665 997 01	45	M5	10	13	24,5	4	35	3,5	9	34
665 997 02	45	M6	10	13	24,5	4	35	3,5	9	34
665 997 03	63	M6	13,5	17,5	31	6,5	45	4	11	76
665 997 04	63	M8	13,5	17,5	31	6,5	45	4	11	74
665 997 05	78	M8	16	21	36	8	55	4	14	123
665 997 06	78	M10	16	21	36	8	55	4	14	119

Alternatively with outside-hexagon screw on request.

Adjustable Clamping Levers 300.5, Version IS-G with External Thread, Disengaged by Pulling, Stainless

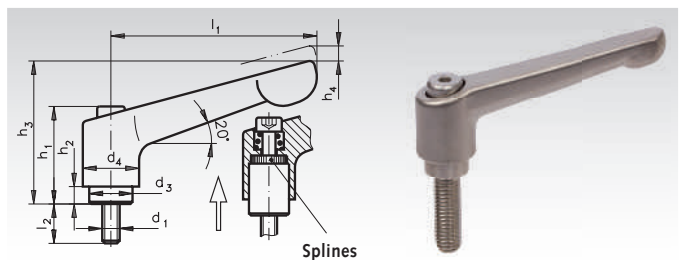
Material: Screwed insert and set screw, stainless steel 1.4305.
Grip body: Stainless steel 1.4308, matt blasted.



Version IS: With internal hexagon screw.

User-friendly design. To be used preferably when the clamping range is limited or if a specific clamping position is required. The thread insert is connected to the handle via splines and can be removed.

By lifting (pulling) the handle the splines work loose and the clamping lever can be turned to the most suitable clamping position. Letting go causes the handle to engage automatically.



Ordering Details: e.g.: Product No. 665 997 11, Adjustable Clamping Lever 300.5, version A, 45 mm.

Product No.	l_1 mm	l_2 mm	d_1 mm	d_3 mm	d_4 mm	h_1 mm	h_2 mm	h_3 mm	h_4 mm	Weight g
665 997 11	45	12	M5	10	13	24,5	4	35	3,5	36
665 997 12	45	16	M5	10	13	24,5	4	35	3,5	36
665 997 13	45	20	M5	10	13	24,5	4	35	3,5	36
665 997 14	45	25	M5	10	13	24,5	4	35	3,5	37
665 997 15	45	32	M5	10	13	24,5	4	35	3,5	38
665 997 19	45	16	M6	10	13	24,5	4	35	3,5	37
665 997 20	45	20	M6	10	13	24,5	4	35	3,5	37
665 997 21	45	25	M6	10	13	24,5	4	35	3,5	38
665 997 22	45	32	M6	10	13	24,5	4	35	3,5	40
665 997 23	45	40	M6	10	13	24,5	4	35	3,5	41
665 997 26	63	20	M6	13,5	17,5	31	6,5	45	4	81
665 997 27	63	25	M6	13,5	17,5	31	6,5	45	4	82
665 997 28	63	32	M6	13,5	17,5	31	6,5	45	4	83
665 997 29	63	40	M6	13,5	17,5	31	6,5	45	4	83
665 997 30	63	50	M6	13,5	17,5	31	6,5	45	4	84
665 997 33	63	20	M8	13,5	17,5	31	6,5	45	4	84
665 997 34	63	25	M8	13,5	17,5	31	6,5	45	4	86
665 997 35	63	32	M8	13,5	17,5	31	6,5	45	4	88
665 997 36	63	40	M8	13,5	17,5	31	6,5	45	4	91
665 997 37	63	50	M8	13,5	17,5	31	6,5	45	4	94
665 997 38	63	63	M8	13,5	17,5	31	6,5	45	4	98
665 997 39	78	20	M10	16	21	36	8	55	4	139
665 997 40	78	25	M10	16	21	36	8	55	4	141
665 997 41	78	32	M10	16	21	36	8	55	4	142
665 997 42	78	40	M10	16	21	36	8	55	4	146
665 997 43	78	50	M10	16	21	36	8	55	4	152
665 997 44	78	63	M10	16	21	36	8	55	4	159

Alternatively with outside-hexagon screw on request.

Eccentric clamps 927 with internal thread

Materials: Lever: Zinc die cast, with wear-resistant epoxy resin coating, black matt.
Knurled setting nut version A and threaded bush: Zinc-plated steel, chromated.
Contact plate version A: Polyacetal (POM), glass-fibre reinforced, black matt.
Contact plate version B: Polyamid (PA), glass-fibre reinforced, black matt.

Version A: With adjustable contact plate, with knurled setting nut with fine thread. Thus the clamping force and the lever position can be set exactly on the lever side.

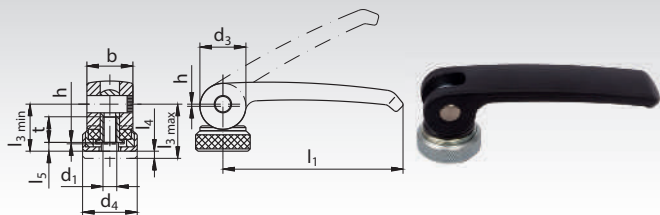
Version B: Non-adjustable contact plate. The clamping force, can either be set on the lever side by turning the lever, or on the backside by adjusting the nut/knurled nut if present.

- For rapid clamping and loosening by hand.
- Clamping is made without generating a torque.
- Clamping force is up to 8 kN.

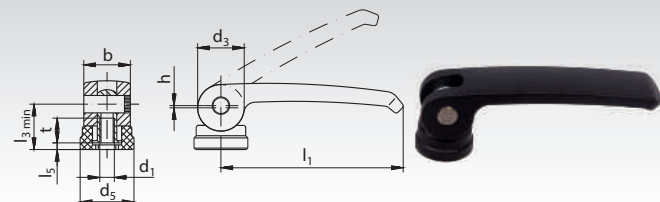
Ordering Details: e.g.: Product No. 661 763 10, Eccentric Clamp Version A, Length 63mm, M6

Product No. Version A	Product No. Version B	l_1 mm	d_1 mm	b mm	d_3 mm	d_4 mm	d_5 mm	h mm	l_3 min. mm	l_3 max. mm	l_4 mm	l_5 min. mm	t mm	Weight g
665 763 10	665 763 20	63	M6	16	16	19	18,5	0,75	16,3	18,8	2,5	3	10	56
665 782 10	665 782 20	82	M8	20	20	25	22,5	1	19,5	22,5	3	3,7	12	108

Version A



Version B



Eccentric clamps 927 with external thread

Materials: Lever: Zinc die cast, with wear-resistant epoxy resin coating, black matt.
Knurled setting nut version A and threaded bolt: Zinc-plated steel, chromated.
Contact plate version A: Polyacetal (POM), glass-fibre reinforced, black matt.
Contact plate version B: Polyamid (PA), glass-fibre reinforced, black matt

Version A: With adjustable contact plate, with knurled setting nut with fine thread. Thus the clamping force and the lever position can be set exactly on the lever side.

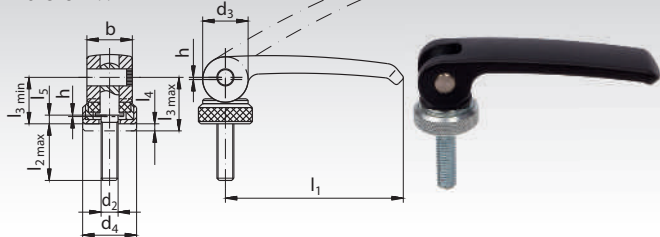
Version B: Non-adjustable support washer. The clamping force, can either be set on the lever side by turning the lever, or on the backside by adjusting the nut/knurled nut if present.

- For rapid clamping and loosening by hand.
- Clamping is made without generating a torque.
- Clamping force is up to 8 kN.

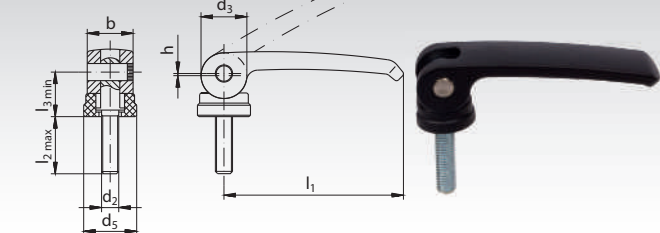
Ordering Details: e.g.: Product No. 665 763 11, Eccentric Clamp Version A, Length 63mm, M6x 20

Product No. Version A	Product No. Version B	l_1 mm	d_2 mm	l_2 mm	b mm	d_3 mm	d_4 mm	d_5 mm	h mm	l_3 min. mm	l_3 max. mm	l_4 mm	l_5 min. mm	Weight g
665 763 11	665 763 21	63	M6	20	16	16	19	18,5	0,75	16,3	18,8	2,5	3	62
665 763 12	665 763 22	63	M6	25	16	16	19	18,5	0,75	16,3	18,8	2,5	3	63
665 763 13	665 763 23	63	M6	30	16	16	19	18,5	0,75	16,3	18,8	2,5	3	64
665 763 14	665 763 24	63	M6	35	16	16	19	18,5	0,75	16,3	18,8	2,5	3	65
665 763 15	665 763 25	63	M6	40	16	16	19	18,5	0,75	16,3	18,8	2,5	3	66
665 763 16	665 763 26	63	M6	50	16	16	19	18,5	0,75	16,3	18,8	2,5	3	68
665 782 11	665 782 21	82	M8	25	20	20	25	22,5	1	19,5	22,5	3	3,7	122
665 782 12	665 782 22	82	M8	30	20	20	25	22,5	1	19,5	22,5	3	3,7	124
665 782 13	665 782 23	82	M8	35	20	20	25	22,5	1	19,5	22,5	3	3,7	126
665 782 14	665 782 24	82	M8	40	20	20	25	22,5	1	19,5	22,5	3	3,7	128
665 782 15	665 782 25	82	M8	50	20	20	25	22,5	1	19,5	22,5	3	3,7	132
665 782 16	665 782 26	82	M8	60	20	20	25	22,5	1	19,5	22,5	3	3,7	136

Version A



Version B

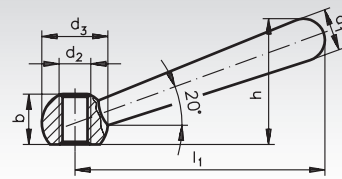


Clamp Nuts DIN 99 St Made from Steel or Stainless Steel

Material Version N: Steel burnished.

Material Stainless: Stainless steel 1.4305, matt finish blasted.

Handle slanted, with metric thread.



Ordering Details: e.g.: Product No. 665 106 00, Clamp Nut DIN 99, 8 mm

Product No. Version N	Product No. Stainless	d ₁ mm	Thread mm	d ₃ mm	l ₁ mm	h mm	b mm	Weight g
665 106 00	665 991 06	8	M6	12	48	24	9,5	17
665 108 00	665 991 08	10	M8	16	60	30,5	12	38
665 110 00	665 991 10	13	M10	20	76	38	14,5	76
665 112 00	665 991 12	16	M12	25	95	47	18,5	144
665 116 00	665 991 16	20	M16	32	119	59,5	24	283
665 120 00	-	25	M20	40	152	76	30	561
665 124 00	-	32	M24	50	190	97	40	1116

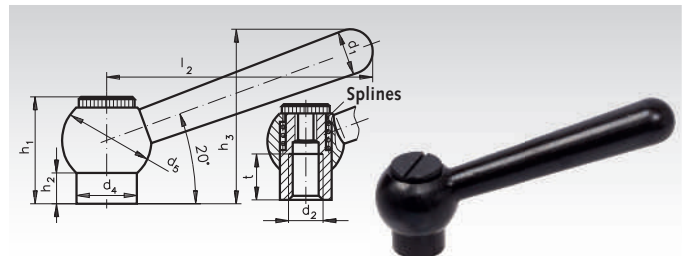
Adjustable Clamping Levers 119 St

Material: Steel burnished.

Version N = handle slanted, with metric thread.

Use: In applications where either the clamping range is limited or where a specific lever position is required. The serrated bore in the spherical hub is fitted with a threaded-bolt insert, which engages in the hub with its own serrations.

By depressing the clamping lever, the serrations are disengaged, freeing it for re-positioning in the most convenient position. When releasing the lever, the serrations re-engage automatically. Should a rotation of 360° not be possible, the insert can be slightly screwed in (after the lever has been disengaged) by means of the slotted knurled screw.



Ordering Details: e.g.: Product No. 665 508 00, Adjustable Clamping Lever 119 St, 10 mm

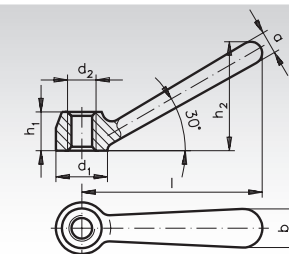
Product No. Version N	d ₁ mm	d ₂ mm	d ₄ mm	d ₅ mm	h ₁ mm	h ₂ mm	h ₃ mm	l ₂ mm	t mm	Weight g
665 508 00	10	M8	13,5	20	25	8	39,5	60	12	59
665 510 00	13	M10	16	25	29	8	49,5	76	15	118
665 512 00	16	M12	19	28	33,5	10,5	60,5	95	18	188

Clamp Nuts 202 Tg Made from Steel or Stainless Steel

Material Version N: Cast steel.

Material Stainless: Stainless steel 1.4308, matt finish blasted.

Deburred, contact surface machined. Simple and cost efficient clamping elements.



Ordering Details: e.g.: Product No. 665 308 00, Clamp Nut 202 Tg, version N, 16 mm

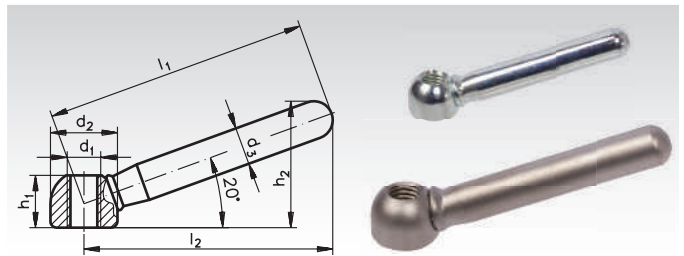
Product No. Version N	Product No. Stainless	d ₁ mm	d ₂ mm	a mm	b mm	h ₁ mm	h ₂ ca. mm	l ca. mm	Weight g
665 308 00	665 993 08	16	M8	7	12	12	34	56	30
665 310 00	665 993 10	20	M10	9	14	14	42,5	70	60
665 312 00	665 993 12	25	M12	11	18	18	53	87	125
665 316 00	665 993 16	32	M16	15	22	22	66,5	109	248
665 320 00	665 993 20	40	M20	18	28	28	84,5	140	419

Cylindrical Clamp Nuts, Steel or Stainless Steel

Material: Steel zinc plated (glossy),
or stainless steel 1.4305, blasted, matt finish finish.

Shaft butt-welded on.

These clamp nuts are a modified version of the common ball knobs DIN 99. Material-saving design. Cost-efficient clamping element by rationalised production process.



Ordering Details: e.g.: Product No. 665 408 00, Cylindrical Clamp Nuts, Steel. M8

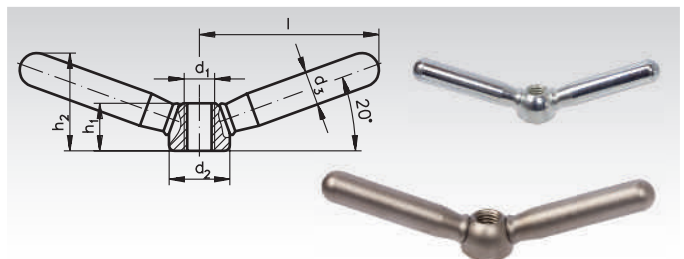
Product No. Steel	Product No. Stainless Steel	Length l_1 mm	d_1 mm	d_2 mm	d_3 mm	h_1 mm	h_2 mm	l_2 mm	Weight g
665 408 00	665 994 08	63	M8	16	9	12,5	30,5	60	39
665 410 00	665 994 10	80	M10	20	11	15	37	76	75
665 412 00	665 994 12	100	M12	25	14	19	46	95	147
665 416 00	665 994 16	125	M16	32	18	25	58,5	119	309
665 420 00	665 994 20	160	M20	40	20	31	73	152	526

Clamping Nuts with Double Lever, Steel or Stainless Steel

Material: Steel zinc plated (glossy),
or stainless steel 1.4305, blasted, matt finish finish.

Shaft butt-welded on.

Material-saving design. Cost-efficient clamping element by rationalised production process.

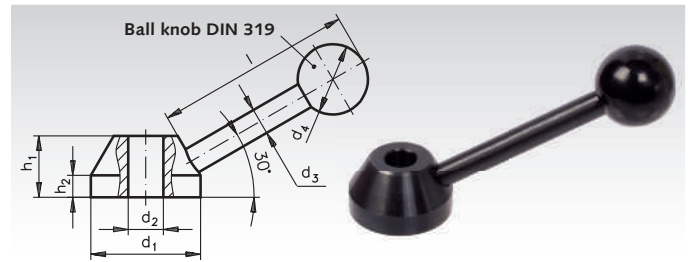


Ordering Details: e.g.: Product No. 665 458 00, Clamping Nut with Double lever, Steel. M8

Product No. Steel	Product No. Stainless Steel	l mm	d_1 mm	d_2 mm	d_3 mm	h_1 mm	h_2 mm	Weight g
665 458 00	665 994 58	47,5	M8	16	9	12,5	26	50
665 460 00	665 994 60	59,5	M10	20	11	15,0	32	100
665 462 00	665 994 62	75,5	M12	25	14	19,0	40	212
665 466 00	665 994 66	94,5	M16	32	18	25,0	52	435
665 470 00	665 994 70	118,0	M20	40	20	31,0	62	710

Control Levers 223 St

Material: Steel, precision turned and burnished.
Ball knob made from plastic.



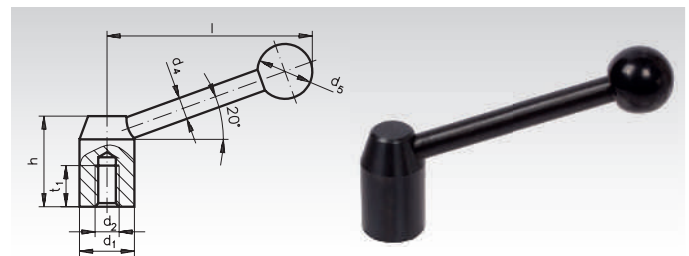
Ordering Details: e.g.: Product No. 666 132 00, Control Lever 223 St

Product No.	d ₁ mm	d ₂ ^{H7} mm	d ₃ mm	d ₄ mm	h ₁ mm	h ₂ mm	l mm	Weight g
666 132 00	32	10	8	20	18	6,5	62	103
666 140 00	40	12	10	30	22	8,5	95	214
666 152 00	52	16	14	40	28	11	136	503

Control Levers with Long Hub 2120 St

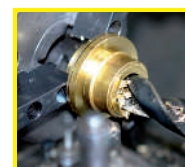
Material: Steel, precision turned and burnished.
Ball knob made from plastic.

Version E = lever slanted with thread.



Ordering Details: e.g.: Product No. 666 420 00, Control Lever 2120 St, Version E, 20 mm

Product No. Version E	d ₁ mm	d ₂ mm	d ₄ mm	d ₅ mm	h mm	l mm	t ₁ mm	Weight g
666 420 00	20	M8	8	20	33	70	15	94
666 422 00	22	M10	8	20	37	82	15	118
666 425 00	25	M12	10	25	42	96	18	182
666 428 00	28	M12	12	30	47	110	18	274
666 432 00	32	M16	12	32	52	124	23	352
666 436 00	36	M16	14	35	58	138	24	525
666 440 00	40	M20	16	40	64	152	27	709
666 445 00	45	M20	16	40	71	170	30	949



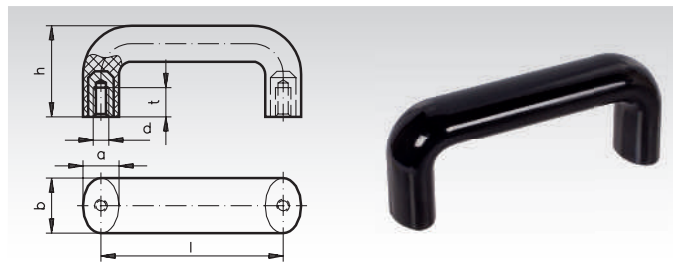
**Reworking within
24h-service possible.
Custom made parts
on request.**

Cabinet "U" Handles 525

Material: Plastic Duroplast PF31, black glossy finish, flash mark thoroughly polished.

A special feature is that the flash mark on this handle is not visible nor can it be felt. The large tube diameter and the brass threaded bush lead to an immense rigidity.

Temperature resistant up to 110°C.



Ordering Details: e.g.: Product No. 666 601 00, Cabinet "U" Handle 525, 86 mm

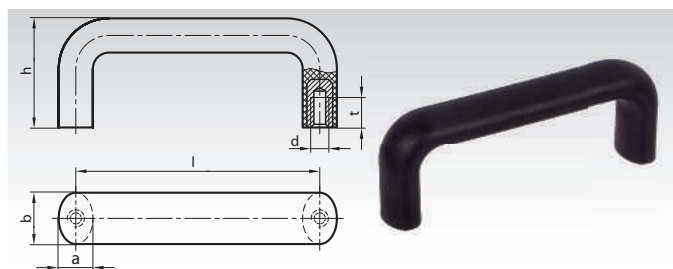
Product No.	Length l mm	a mm	b mm	d mm	h mm	t mm	Weight g
666 601 00	86 $\pm$ 0,5	17	26	M6	43	12	85
666 602 00	117 $\pm$ 0,5	20	30	M8	54	13	138
666 603 00	179 $\pm$ 1	20	30	M8	62	13	185

Cabinet "U" Handles 725 Made from Polypropylene or Polyamide

Material:

Version Plastic PP: Thermoplast Polypropylene, glass-fibre reinforced, black, matt.
Cost efficient. Temperature resistant up to 100°C.

Version Plastic PA HT: Thermoplast Polyamide, glass-fibre reinforced, black, matt.
Temperature resistant up to 200° C.



Ordering Details: e.g.: Product No. 666 601 01, Cabinet "U" Handle 725 PP, 86 mm

Product No. PP	Product No. PA HT	Length l mm	a mm	b mm	d mm	h mm	t mm	Weight g
666 601 01	666 602 01	86 $\pm$ 0,5	14	23	M6	44	12	46
666 601 02	666 602 02	117 $\pm$ 0,5	15	25	M6	49	12	69
666 601 03	666 602 03	117 $\pm$ 0,5	15	25	M8	49	13	69
666 601 04	-	120 $\pm$ 0,5	15	25	M8	49	13	74
666 601 05	-	132 $\pm$ 0,5	16	26	M8	54	13	83
666 601 06	-	150 $\pm$ 1	16	27	M8	56	13	95
666 601 07	666 602 07	179 $\pm$ 1	16	27	M8	57	13	108
666 601 08	-	300 $\pm$ 1	20	32	M10	64	17	205

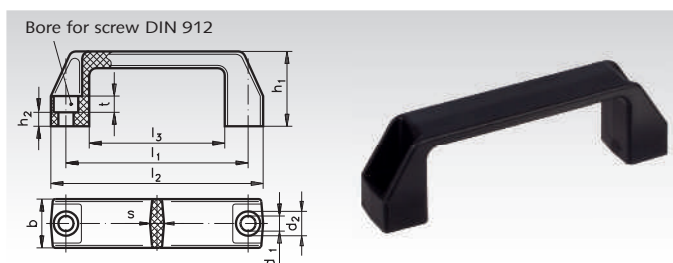
Cabinet "U" Handles 528 Made from Polypropylene or Polyamide

Material:

Version Plastic PP: Thermoplast Polypropylene, glass-fibre reinforced, black, matt.
Cost efficient. Temperature resistant up to 100°C.

Version Plastic PA: Thermoplast Polyamide, glass-fibre reinforced, black, matt.
Temperature resistant up to 150° C.

Cabinet handles 528 are mounted from the operating side with socket-head cap screws.

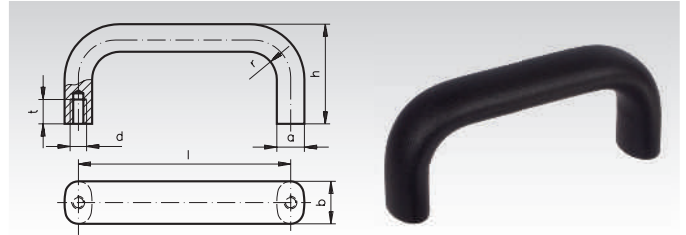


Ordering Details: e.g.: Product No. 666 540 00, Cabinet "U" Handle 528 PP, 94 mm

Product No. PP	Product No. PA	Length l ₁ mm	b mm	d ₁ mm	d ₂ mm	h ₁ mm	h ₂ mm	l ₂ mm	l ₃ mm	s mm	t mm	Weight g
666 540 00	666 530 00	94 $\pm$ 1	21	6,5	10,5	38	6	109	74	6	7,0	26
666 542 00	666 532 00	117 $\pm$ 1	26	8,5	13,5	41	6,5	137	93	7	8,5	44
666 544 00	666 534 00	132 $\pm$ 1	27	8,5	13,5	45	7,5	150	108	7	8,5	47
666 546 00	666 536 00	179 $\pm$ 1	28	8,5	13,5	50	8,5	196	151	7,5	8,5	70
666 548 00	666 538 00	235 $\pm$ 1	30	10,5	16,5	54	9,5	260	201	8,5	10,5	118

Cabinet "U" Handles 565

Material: Aluminium, plastic coated, matt finish black RAL 9011.
Made from drawn aluminium. Smooth surface and rigid design.

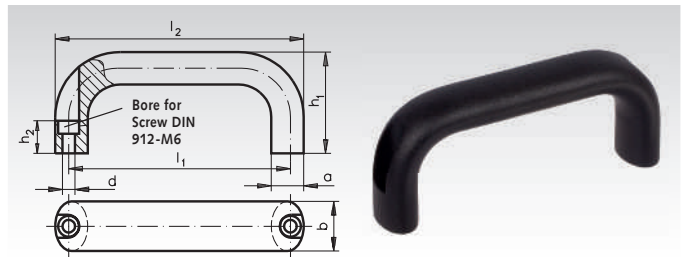


Ordering Details: e.g.: Product No. 666 633 00, Cabinet "U" Handle 565, 100 mm

Product No.	Length l mm	a mm	b mm	d mm	h mm	r mm	t mm	Weight g
666 633 00	100	13	20	M6	47	13	10	87
666 635 00	112	13	20	M6	49	13	10	97
666 637 00	128	13	20	M6	51	13	10	107
666 640 00	160	13	20	M6	51	13	10	127
666 645 00	112	17	26	M8	53	17	12	160
666 647 00	128	17	26	M8	55	17	12	183
666 649 00	160	17	26	M8	57	17	12	211
666 652 00	192	17	26	M8	57	17	12	245
666 656 00	300	17	26	M8	57	17	12	350
666 658 00	400	17	26	M8	57	17	12	445

Cabinet "U" Handles 565.1

Material: Aluminium plastic coated, matt finish, black RAL 9011.
Made from drawn aluminium. Smooth surface and rigid design.
To be mounted from the operating side.

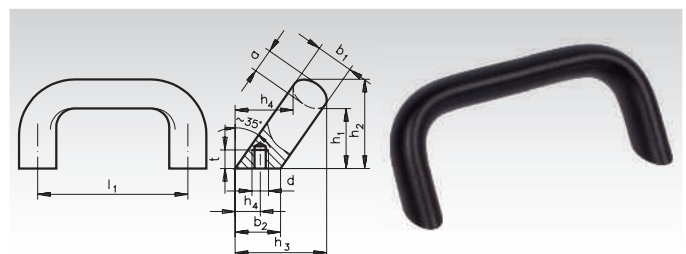


Ordering Details: e.g.: Product No. 666 660 00, Cabinet "U" Handle 565.1, 116 mm

Product No.	l ₁ mm	a mm	b mm	d mm	h ₁ mm	h ₂ mm	l ₂ mm	r mm	Weight g
666 660 00	116	17	26	6,4	55	17	130	17	147
666 662 00	132	17	26	6,4	55	17	146	17	163
666 664 00	164	17	26	6,4	57	17	178	17	197
666 666 00	196	17	26	6,4	57	17	210	17	229

Cabinet "U" Handles 565.2

Material: Aluminium, plastic coated, matt finish, black RAL 9011.
Made from drawn aluminium. Smooth surface and rigid design.
The angled contact surface allows improved access even in confined spaces such as corners. "tactile friendliness" by epoxy coating.



Ordering Details: e.g.: Product No. 666 860 00, Cabinet "U" Handle 565.2, 112 mm

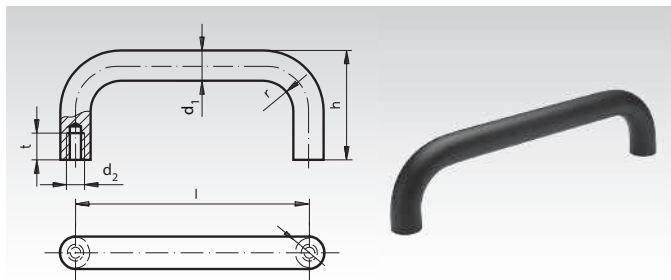
Product No.	l ₁ mm	a mm	b ₁ mm	b ₂ mm	d mm	h ₁ mm	h ₂ mm	h ₃ mm	h ₄ +1 mm	r mm	t mm	Weight g
666 860 00	112	13	20	24	M6	32	48	50	13,5	13	10	100
666 862 00	128	13	20	24	M6	32	48	50	13,5	13	10	112
666 864 00	128	17	26	32	M8	34	54	57	18	17	12	192
666 866 00	160	17	26	32	M8	34	54	57	18	17	12	225

Cabinet "U" Handles 426

Material: Aluminium plastic coated, matt finish black RAL 9005.

Handles $d_1 = 20$ mm are drawn from aluminium extrusions.

Handles $d_1 = 28$ mm are produced from aluminium tube with a wall thickness of 4 mm with threaded bush from aluminium.



Ordering Details: e.g.: Product No. 666 669 01, Cabinet "U" Handle 426, 200 mm

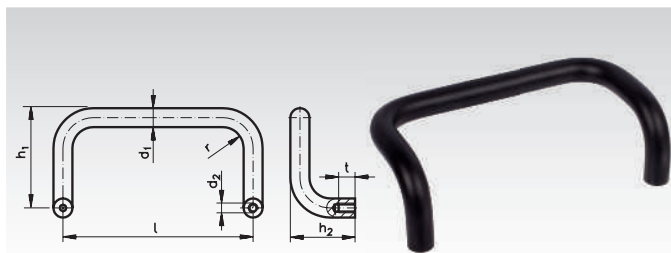
Product No.	Length l mm	d ₁ mm	d ₂ mm	h mm	r mm	t _{min.} mm	Weight g
666 669 01	200	20	M8	68	22	15	238
666 669 02	250	20	M8	68	22	15	280
666 669 03	300	20	M8	68	22	15	330
666 669 04	350	20	M8	68	22	15	375
666 669 05	250	28	M10	78	32	15	290
666 669 06	300	28	M10	78	32	15	330
666 669 07	350	28	M10	78	32	15	375
666 669 08	400	28	M10	78	32	15	415

Cabinet "U" Handles 426.1

Material: Aluminium plastic coated, matt finish black RAL 9005.

Handles $d_1 = 20$ mm are drawn from aluminium extrusions.

Handles $d_1 = 28$ mm are produced from aluminium tube with a wall thickness of 4 mm. Threaded bush aluminium.



Ordering Details: e.g.: Product No. 666 670 00, Cabinet "U" Handle 426.1, 200 mm

Product No.	Length l mm	d ₁ mm	d ₂ mm	h ₁ mm	h ₂ mm	r mm	t mm	Weight g
666 670 00	200	20	M8	105	68	22	15	380
666 672 00	300	20	M8	105	68	22	15	475
666 674 00	250	28	M10	120	78	32	15	430
666 676 00	350	28	M10	120	78	32	15	505
666 678 00	500	28	M10	120	78	32	15	628

Arch Handles

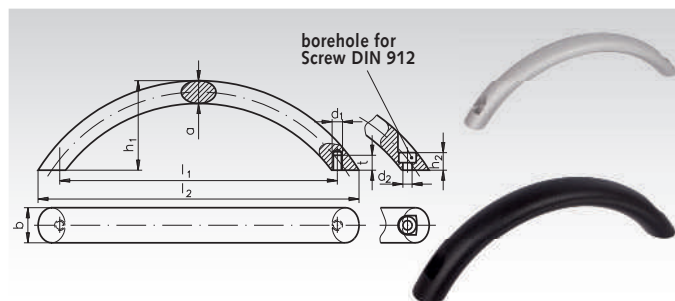
Material: Aluminium, natural colour, anodized or plastic coated, matt finish black RAL 9005.

These arched handles are noted for their elegant design.

The well-proven elliptical profile has been used again.

Type A: Mounting from the back.

Type B: Mounting from the operating side.



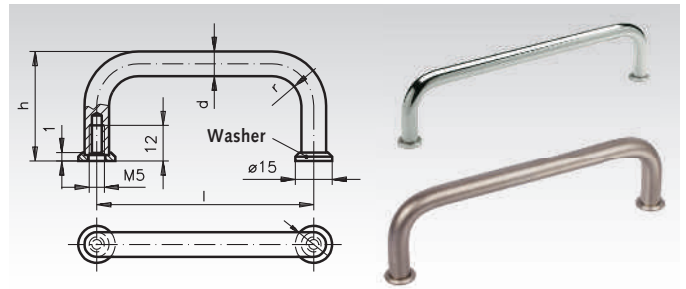
Ordering Details: e.g.: Product No. 666 844 00, Arch Handle Aluminium

Product No. alu colour	Product No. black	Type	b mm	l ₁ mm	l ₂ ca. mm	a mm	d ₁ mm	d ₂ mm	h ₁ mm	h ₂ mm	t _{min.} mm	Weight g
666 844 00	666 840 00	A	20	160	185	13	M6	-	51	-	8,5	106
666 845 00	666 841 00	A	20	192	221	13	M6	-	51	-	8,5	130
666 846 00	666 842 00	A	26	160	190	17	M8	-	57	-	12	116
666 847 00	666 843 00	A	26	192	227	17	M8	-	57	-	12	140
666 854 00	666 850 00	B	20	160	185	13	-	5,3	51	10	-	106
666 855 00	666 851 00	B	20	192	221	13	-	5,3	51	10	-	130
666 856 00	666 852 00	B	26	160	190	17	-	6,4	57	12	-	116
666 857 00	666 853 00	B	26	192	227	17	-	6,4	57	12	-	140

Cabinet "U" Handles 425 from Steel or Stainless Steel

Material: Version CR: Steel, chrome plated.
Washers zinc die-cast, nickel plated.
Version NI: Stainless steel 1.4305, blasted,
matt finish. Washers stainless steel 1.4305.

Supplied with two washers. These discs guarantee perfect positioning even with large bores in the cabinet. The washers are loosely packed.



Ordering Details: e.g.: Product No. 666 612 00, Cabinet "U" Handle 425, CR, 88 mm

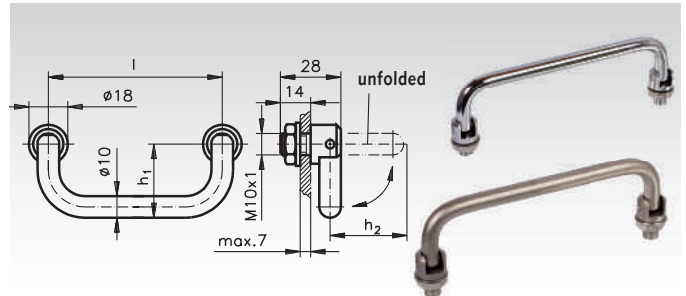
Product No. Version CR	Product No. Version NI	Length l mm	d mm	h mm	r mm	Weight g
666 612 00	666 996 12	88	10	42	12	89
666 614 00	666 996 14	100	10	42	12	96
666 616 00	666 996 16	120	10	42	12	108
666 619 00	666 996 19	180	10	42	12	148
666 621 00	666 996 21	200	10	42	12	160
666 623 00	666 996 23	235	10	42	12	181

Folding Handles Made from Steel or Stainless Steel

Material: Version CR: Steel, chrome plated.
Version NI: 1.4305, blasted, matt finish.



Mainly used in applications where the handle should not stick out, or where sticking out should be kept to a minimum. The handle is locked in both end positions by a spring-loaded pressure pin. Hexagon nuts and washers are included in the delivery.



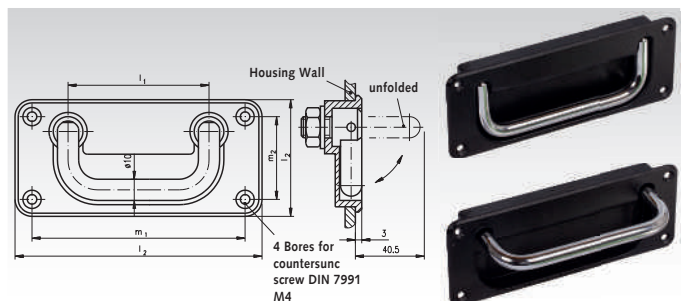
Ordering Details: e.g.: Product No. 666 680 00, Folding Handle, Steel, Chrome Plated

Product No. Version CR	Product No. Version NI	Length l mm	h ₁ mm	h ₂ mm	Weight g
666 680 00	666 996 80	100	34	44	150
666 682 00	666 996 82	120	34	44	161
666 688 00	666 996 88	180	34	44	195

Folding Handle with Recessed Tray 425.4

Material:
Folding handle made from steel, chrome plated. Tray: Zinc die-cast, plastic coated, black.

Used in applications where the folded handle must not stick out, or where the sticking out must be max. 3 mm. In addition, screws M4 are sufficient for mounting the handle on the housing. Handle and folding mechanism are made from chrome-plated steel and the tray is made from zinc die-cast. This gives the folding handle additional strength (supplied as complete assembly).



Ordering Details: e.g.: Product No. 666 550 00, Folding Handle with Recessed Tray

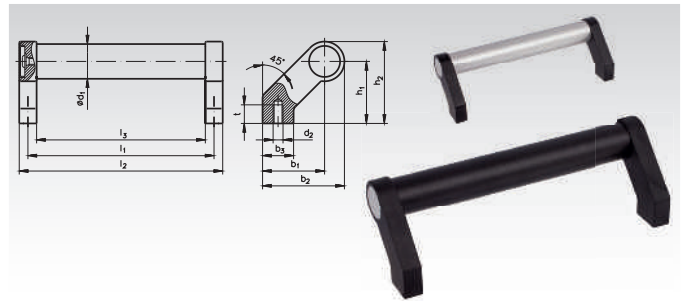
Product No.	Length l ₁ mm	l ₂ mm	l ₃ mm	m ₁ mm	m ₂ mm	Weight g
666 550 00	120	170	65	154	49	402

Tubular Handles 333, with Inclined Feet, Aluminium

Material: Grip tube Ø28mm x 1.5 mm made from Aluminium. Either natural coloured anodised or black plastic coated RAL 9005 matt.
Feet made from zinc die cast, black plastic coated RAL 9005 matt.

High stability for small sizes. Tube either aluminium silver or black. Grip tube fixed against turning with screws on the face ends (screws below bright grey removable plastic caps).

Other sizes on request.



Ordering Details: e.g.: Product No. 666 505 02, Tubular handle 333, aluminium colour, length 200mm

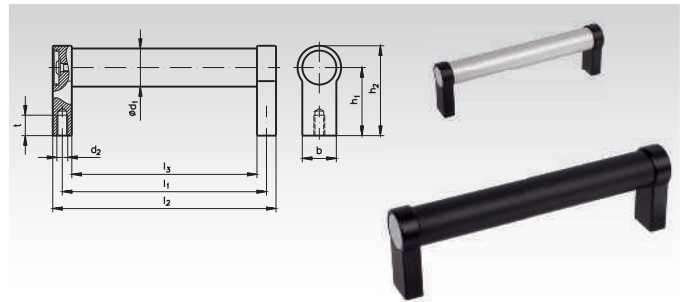
Product No. alu colour	Product No. black	$l_1^{+0,5}$ mm	d_1 mm	d_2 mm	b_1 mm	b_2 mm	b_3 mm	h_1 mm	h_2 mm	l_2 mm	l_3 mm	$t_{min.}$ mm	Weight g
666 505 02	666 505 22	200	28	M8	50	66	25	50	66	214	186	15	432
666 505 04	666 505 24	250	28	M8	50	66	25	50	66	264	236	15	455
666 505 06	666 505 26	300	28	M8	50	66	25	50	66	314	286	15	470
666 505 08	666 505 28	400	28	M8	50	66	25	50	66	414	386	15	530
666 505 10	666 505 30	500	28	M8	50	66	25	50	66	514	486	15	575
666 505 12	666 505 32	600	28	M8	50	66	25	50	66	614	586	15	620

Tubular Handles 333.1, with Straight Feet, Aluminium

Material: Grip tube Ø20mm / Ø28mm x 1.5mm made from Aluminium. Either natural coloured anodised or black plastic coated RAL 9005 matt.
Feet made from zinc die cast, black plastic coated RAL 9005 matt.

High stability for small sizes. Tube either aluminium silver or black. Grip tube fixed against turning with screws on the face ends (screws below bright grey removable plastic caps).

Other sizes on request.



Ordering Details: e.g.: Product No. 666 505 02, Tubular handle 333.1, aluminium colour, length 180mm

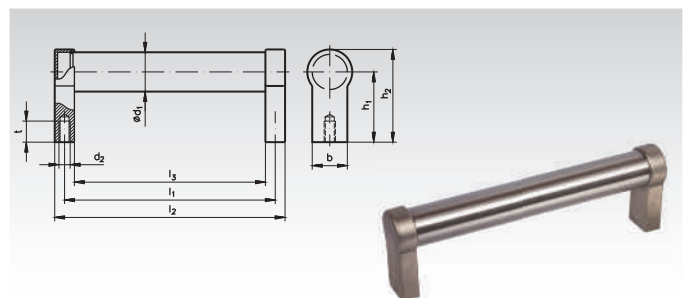
Product No. alu colour	Product No. black	$l_1^{+0,2}$ mm	d_1 mm	d_2 mm	b mm	h_1 mm	h_2 mm	l_2 mm	l_3 mm	$t_{min.}$ mm	Weight g
666 505 42	666 505 72	180	20	M6	24	42	54	192	168	12	190
666 505 44	666 505 74	200	20	M6	24	42	54	212	188	12	200
666 505 46	666 505 76	250	20	M6	24	42	54	262	238	12	225
666 505 48	666 505 78	300	20	M6	24	42	54	312	288	12	250
666 505 50	666 505 80	400	20	M6	24	42	54	412	388	12	300
666 505 52	666 505 82	200	28	M8	25	50	66	214	186	15	340
666 505 54	666 505 84	250	28	M8	25	50	66	264	236	15	360
666 505 56	666 505 86	300	28	M8	25	50	66	314	286	15	380
666 505 58	666 505 88	400	28	M8	25	50	66	414	386	15	440
666 505 60	666 505 90	500	28	M8	25	50	66	514	486	15	480
666 505 62	666 505 92	600	28	M8	25	50	66	614	586	15	520

Tubular Handles 335, with Straight Feet, Stainless Steel

Material: Grip tube Ø28mm x 2 mm made from Stainless Steel 1.4305, silk matt gloss, ground.
Feet made from stainless steel, precision cast 1.4308, matt blasted.

Very high stability for small sizes.
Connection between tube and foot is sealed against water spray.

Other sizes on request.

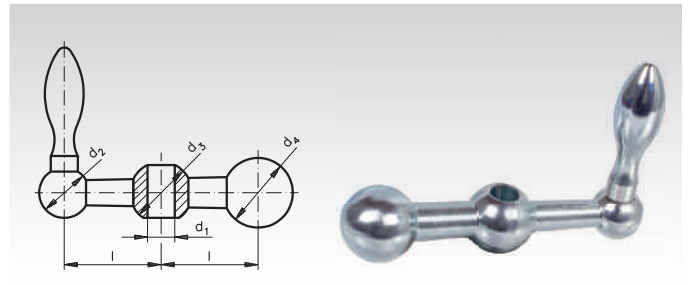


Ordering Details: e.g.: Product No. 666 995 52, Tubular handle 335, length 200 mm

Product No. stainless	l_1^{+1} mm	d_1 mm	d_2 mm	b mm	h_1 mm	h_2 mm	l_2 mm	l_3 mm	$t_{min.}$ mm	Weight g
666 995 52	200	28	M8	25	50	66	214	186	15	500
666 995 54	250	28	M8	25	50	66	264	236	15	565
666 995 56	300	28	M8	25	50	66	314	286	15	630
666 995 58	400	28	M8	25	50	66	414	386	15	760
666 995 60	500	28	M8	25	50	66	514	486	15	890
666 995 62	600	28	M8	25	50	66	614	586	15	1020

Tri-Ball Handles 2140

Material: Steel, zinc plated, with handle DIN 39.
With through hole d_1^{H7}

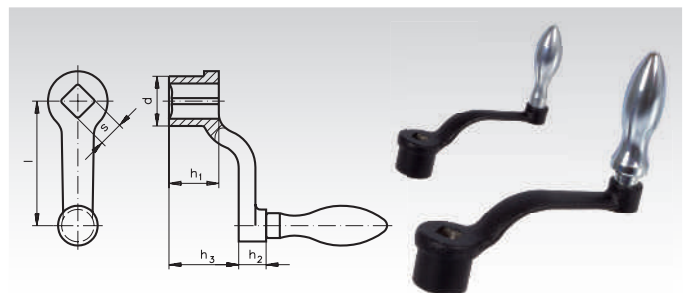


Ordering Details: e.g.: Product No. 667 425 00, Tri-Ball Handles 2140, Version A, 25 mm

Product No.	l mm	d_1^{H7} mm	d_2 mm	d_3 mm	d_4 mm	$t_{min.}$ mm	Handle-Ø mm	Weight g
667 425 00	25	7	13	16	18	11	10	60
667 434 00	34	8	16	20	22	15	14	136
667 441 00	41	10	18	23	25	17	16	194
667 450 00	50	12	20	26	28	19	18	283

Cranked Handles DIN 468 Tg

Material: Cast iron, plastic coated, black.
Handle made from Steel, zinc plated.
Hand cranks: Square hole reamed true to gauge.
Hub: Machined, cast iron burr precisely ground, sand blasted.
Version F = with fixed handle.
Version D = with revolving handle.

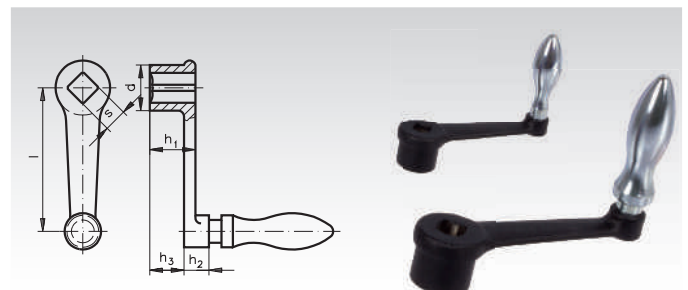


Ordering Details: e.g.: Product No. 668 008 00, Cranked Handle DIN 468 Tg, Version F, 80 mm

Product No.	Product No.	l mm	s^{H11} mm	d mm	h_1 mm	h_2 mm	h_3 mm	Grip- Ø mm	Weight Vers. F g	Weight Vers. D g
Version F	Version D									
668 008 00	668 208 00	80	10	24	24	13	38	18	183	195
668 010 00	668 210 00	100	12	28	28	13	48	20	281	295
668 012 00	668 212 00	125	14	34	34	14	55	22	434	448
668 016 00	668 216 00	160	17	38	38	14	65	25	650	664
668 020 00	668 220 00	200	19	44	44	21	78	28	999	1022
668 025 00	668 225 00	250	22	48	48	21	90	32	1427	1435
668 031 00	668 231 00	315	24	54	54	26	105	36	2123	2168

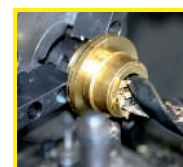
Cranked Handles DIN 469 Tg

Material: Cast iron, plastic coated, black.
Handle made from Steel, zinc plated.
Hand cranks: Square hole reamed true to gauge.
Hub: Machined, cast iron burr precisely ground, sand blasted.
Version F = with fixed handle.
Version D = with revolving handle.



Ordering Details: e.g.: Product No. 669 008 00, Cranked Handle DIN 469 Tg, Version F, 80 mm

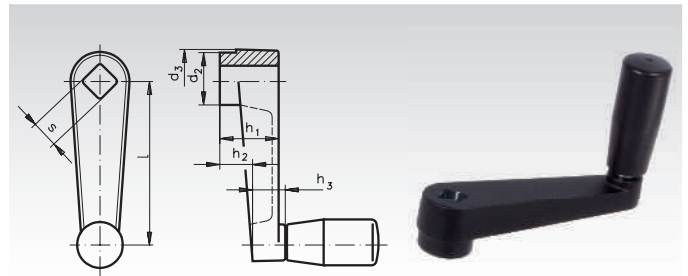
Product No.	Product No.	l mm	s^{H11} mm	d mm	h_1 mm	h_2 mm	h_3 mm	Grip- Ø mm	Weight Vers. F g	Weight Vers. D g
Version F	Version D									
669 008 00	669 208 00	80	10	24	24	13	18	18	179	191
669 010 00	669 210 00	100	12	28	28	13	21	20	271	285
669 012 00	669 212 00	125	14	34	34	14	26	22	434	448
669 016 00	669 216 00	160	17	38	38	14	29	25	642	652
669 020 00	669 220 00	200	19	44	44	21	34	28	998	1021
669 025 00	669 225 00	250	22	48	48	21	36	32	1332	1340



**Reworking within
24h-service possible.
Custom made parts
on request.**

Cranked Handles 471

Material: Crank body made from aluminium.
Revolving cylindrical handle: Plastic black.
Modern design.



Ordering Details: e.g.: Product No. 667 306 00, Hand Crank 471, 64 mm

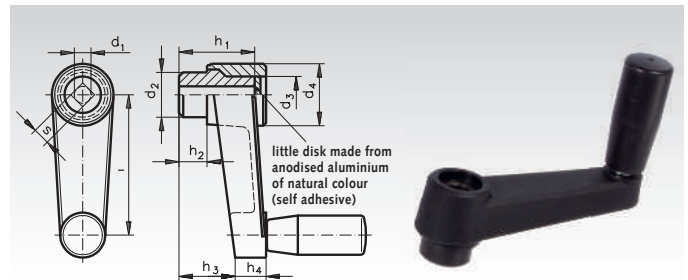
Product No.	l mm	s ^{H11} mm	d ₂ mm	d ₃ mm	h ₁ mm	h ₂ mm	h ₃ mm	Cyl.Grip-Ø mm	Weight g
667 306 00	64	10	19	22	20	11	12	18	97
667 308 00	80	10	23	26	24	14	14	21	166
667 310 00	100	12	27	30	28	17	15	23	251
667 312 00	125	14	32	35	34	22	18	26	270
667 316 00	160	17	35	39	38	26	18	26	313

Cranked Handles 569

Material: Plastic Thermoplast reinforced
Crank body made from plastic. Hub insert: steel, burnished, brass-threaded bush for screwing in the cylindrical handle.
Cylindrical handle made from black plastic and revolving. The protruding steel bush ensures an accurate bore and a flush fit of the bore face. It can be retained with a pin or a retaining screw.

Version B = with bore d₁^{H7}

Version V = with square bore s^{H11}

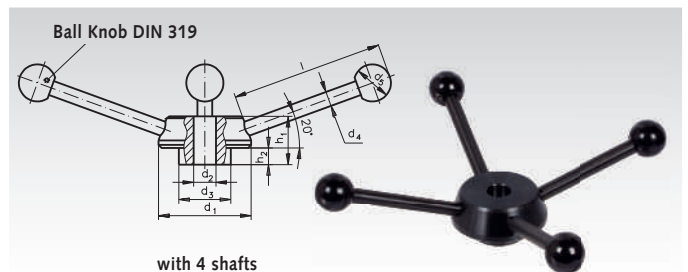


Ordering Details: e.g.: Product No. 667 106 00, Cranked Handles 569, Version B, 64 mm

Product No.	Product No.	l mm	d ₁ ^{H7} mm	s ^{H11} mm	d ₂ mm	d ₃ mm	d ₄ mm	h ₁ mm	h ₂ mm	h ₃ mm	h ₄ mm	Grip Ø mm	Grip length mm	Weight Version B g	Weight Version V g
667 106 00	667 206 00	64	10	10	18	16	27	29	10	20	13	18	42,5	88	63
667 108 00	667 208 00	80	10	10	22	17	30	32	10	23	13	21	52,5	132	103
667 110 00	667 210 00	100	12	12	24	21	34	37	10	25	16	23	67,5	220	185
667 113 00	667 213 00	130	14	14	28	24	40	44	14	34	16	26	82,5	320	260
667 116 00	-	160	16	17	34	27	45	49	15	38	18	28	92,5	442	370

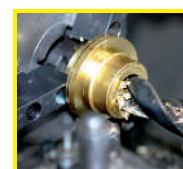
Turret Levers 2130 St

Material: Steel, precision turned and burnished.
Ball knobs made from plastic.



Ordering Details: e.g.: Product No. 666 512 00, Turret Lever 2130 St, 50 mm

Product No.	d ₁ mm	d ₂ ^{H7} mm	d ₃ mm	d ₄ mm	d ₅ mm	h ₁ mm	h ₂ mm	l mm	Weight g
666 512 00	50	12	28	8	20	26	9	82	382
666 514 00	55	14	30	10	25	28	10	96	544
666 515 00	60	15	32	10	25	30	11	96	633
666 516 00	65	16	35	12	30	32	12	110	848
666 518 00	72	18	40	12	32	36	14	124	1097
666 520 00	80	20	44	14	35	40	16	138	1531



**Reworking within
24h-service possible.
Custom made parts
on request.**

Handwheels Stainless Steel

Material: Wheel body: Stainless steel plate 1.4301.
Hub: Welded on, matt blasted.
At version B: Handle Duroplast PF31, black, glossy finish. Spindle: Stainless steel 1.4305.

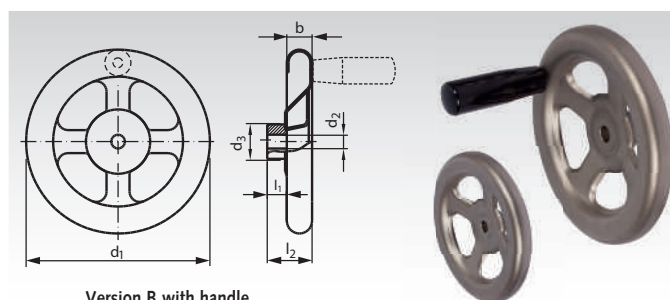


Hub lengths comply with DIN 950. High mechanical strength, insensitive to blows and impacts.

Version A: Without cylindrical handle.

Version B: With revolving cylindrical handle.

Keyway available at extra charge.



Version B with handle

Ordering Details: e.g.: Product No. 670 999 16, Handwheel, Diameter 160 mm

Product No. Version A	Product No. Version B	d ₁ mm	d ₂ ^{H9} mm	b mm	d ₃ mm	l ₁ mm	l ₂ mm	Cyl. Grip- Ø mm	Grip- length mm	No. of spokes pcs.	Sheet gauge mm	Weight Vers. A g	Weight Vers. B g
670 999 16	670 994 16	160	12	22	30	20	39	26	83	4	2	430	540
670 999 20	670 994 20	200	14	22	40	24	44	26	83	4	2,5	824	935
670 999 25	670 994 25	250	17	30	45	28	52	28	93	5	3	1477	1600
670 999 32	670 994 32	315	19	36	55	33	64	28	93	5	3	2330	2400
670 999 40	670 994 40	400	24	43	65	38	81	28	93	5	3	4210	4300

Handwheels Stainless Steel, Solid Version

Material: Wheel body: Cast stainless steel 1.4308.
Rim turned, matt blasted.
At version B: Handle Duroplast PF31, black, glossy finish. Spindle: Stainless steel 1.4305.

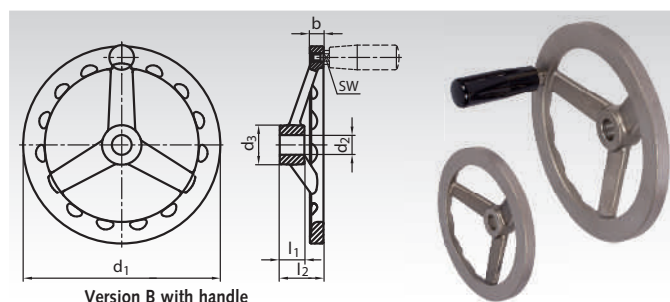


Version A: Without cylindrical handle.

Version B: With revolving cylindrical handle.

Easy to clean.

Keyway available at extra charge.



Version B with handle

Ordering Details: e.g.: Product No. 670 995 10, Handwheel, Diameter 100 mm

Product No. Version A	Product No. Version B	d ₁ mm	d ₂ ^{H8} mm	b mm	d ₃ mm	l ₁ mm	l ₂ mm	Cyl. Grip- Ø mm	Grip- length mm	No. of spokes pcs.	sw mm	Weight Vers. A g	Weight Vers. B g
670 995 10	670 996 10	100	10	7	20	15	27,5	18	45	3	9	222	255
670 995 12	670 996 12	125	12	9	24	16	28,5	21	55	3	9	425	460
670 995 14	670 996 14	140	14	10	28	18	30,5	23	71	3	11	640	800
670 995 16	670 996 16	160	16	11	31	20	35,5	23	71	3	11	805	900
670 995 20	670 996 20	200	18	14	36	23	39	23	71	3	11	1442	1524
670 995 22	670 996 22	200	20	14	36	23	39	23	71	3	11	1400	1482

Handwheels Stainless Steel, Solid Version, similar to DIN 950

Material: Wheel body: Cast stainless steel 1.4401.
Rim turned and polished.
At version B: Handle stainless steel 1.4404.

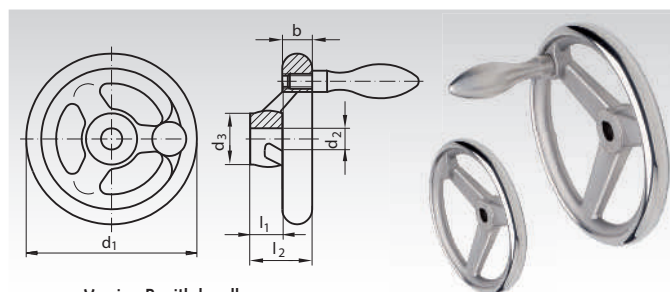


Version A: Without handle.

Version B: With fixed handle.

Acid-resistant A4-quality. Easy to clean.
Dimensions almost according to DIN 950.

Keyway available at extra charge.



Version B with handle

Ordering Details: e.g.: Product No. 670 997 10, Handwheel DIN 950, stainless steel, Version A, 100 mm

Product No. Version A	Product No. Version B	d ₁ mm	d ₂ ^{H9} mm	b mm	d ₃ mm	l ₁ mm	l ₂ mm	Cyl. Grip- Ø mm	Grip- length mm	No. of spokes pcs.	Weight Vers. A g	Weight Vers. B g
670 997 10	670 998 10	100	10	14,5	25,5	17	33	16	50	3	433	480
670 997 12	670 998 12	125	12	15,8	27	18	35,5	20	64	3	659	770
670 997 14	670 998 14	140	14	17	29	19	38,5	20	64	3	865	940
670 997 16	670 998 16	160	14	17,5	31	20	39,5	25	80	3	1156	1320
670 997 20	670 998 20	200	18	20	37	24	44,5	25	80	3	1938	2060

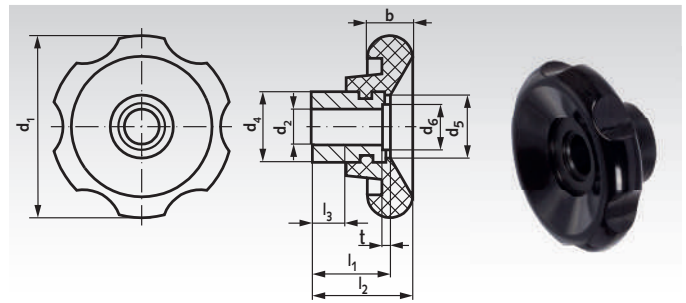
Handwheels 527.1 with Peripheral Grooves

Material: Plastic Thermoplast (PA) reinforced, black, gloss finish.
Hub: Steel, burnished.

With steel hubs of large dimension. For applications requiring a large contact surface or a large diameter bore.

Temperature resistant up to +120°C.

Keyway available at extra charge.



Ordering Details: e.g.: Product No. 675 052 01, Handwheel 527.1, 50mm

Product No.	d ₁ mm	d ₂ ^{H7} mm	d ₄ mm	d ₅ mm	d ₆ mm	t mm	b mm	l _{1-0.5} mm	l ₂ mm	l ₃ mm	Weight g
675 052 01	50	10	20	18	-	-	13	21	29	10	60
675 062 01	60	12	25	24	-	-	16	23	30	11	110
675 070 01	70	14	30	29	21,4	1,5	18	25	33	12	160
675 083 01	80	16	35	34	21,4	1,5	19	30	40	15	255

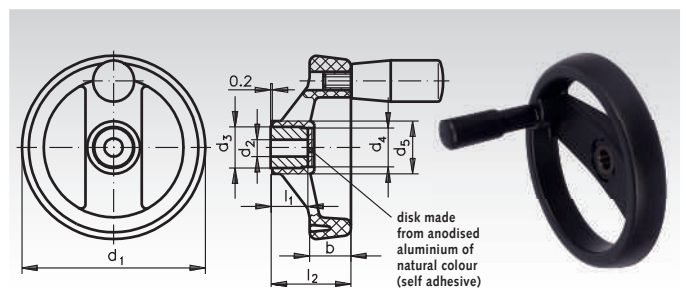
Spoked Handwheels 522 Made from Plastic with Revolving Cylindrical Handle

Material: Plastic Thermoplast reinforced, impact-proof, black, matt finish. Hub bush: Steel burnished.

Brass threaded bush for screwing in the cylindrical grip.
Revolving cylindrical handle: Plastic, black.

Perfect and flawless surface and excellent concentricity.

Keyway available at extra charge.



Ordering Details: e.g.: Product No. 675 708 00, Spoked Handwheel 522, 80 mm

Product No.	d ₁ mm	d ₂ ^{H7} mm	d ₃ mm	d ₄ mm	d ₅ mm	b mm	l ₁ mm	l ₂ mm	Cyl. Grip Ø mm	Weight g
675 708 00	80	8	18	17	23	18	17	35	18	106
675 710 00	100	10	18	17	25	20	17	37	22	150
675 712 00	125	12	22	21	31	22	22	44	23	248
675 716 00	160	14	26	25	40	25	27	51	23	379
675 720 00	200	20	30	31	50	28	34	61	26	561
675 725 00	250	20	35	34	59	32	38	70	28	880

Retractable-Handle Handwheels 5223

Material: Thermoplast reinforced, impact-proof, black, matt finish.

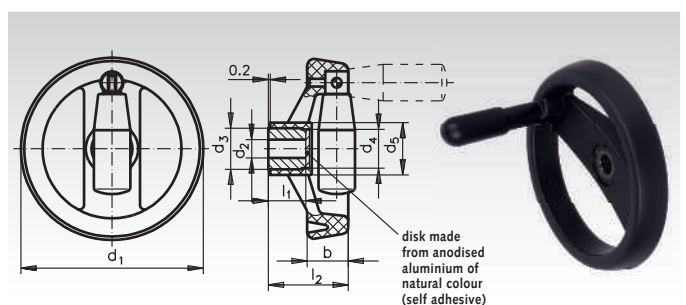
Hub bush: Steel burnished.

Folding system: Steel burnished.

Retractable handle: Plastic black.

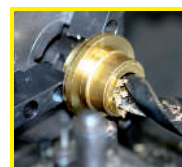
Use: When the handle must not stick out. The handle is firmly locked in a slim taper in the operating position. To retract the handle, it is pulled out of its taper seat and then tilted. A compression spring locks the handle in both end positions. When folding the handle away, it automatically locks in position.

Keyway available at extra charge.



Ordering Details: e.g.: Product No. 675 508 00, Retractable-Handle Handwheel 5223, 80 mm

Product No.	d ₁ mm	d ₂ ^{H7} mm	d ₃ mm	d ₄ mm	d ₅ mm	b mm	l ₁ mm	l ₂ mm	Retr. Handle Ø/mm	Weight g
675 508 00	80	10	18	17	23	18	17	35	21	70
675 510 00	100	12	18	17	25	20	17	37	22	165
675 512 00	125	12	22	21	31	22	22	44	23	240
675 516 00	160	14	26	25	40	25	27	51	23	400
675 520 00	200	20	30	31	50	28	34	61	26	585
675 525 00	250	20	35	34	59	32	38	70	28	950



**Reworking within
24h-service possible.
Custom made parts
on request.**

Spoked Handwheels DIN 950 with Smooth Rim and Slanted Spokes

Material: Grey cast iron.

Number of spokes:

3 spokes for sizes: up to Ø 200.

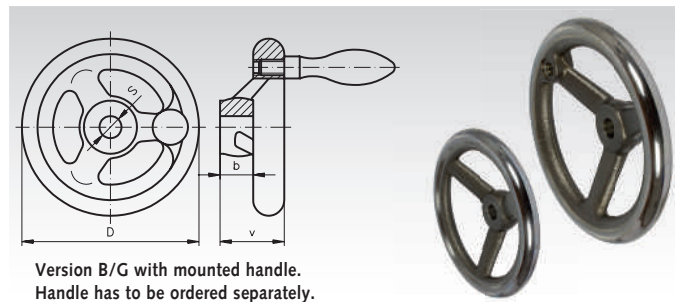
5 spokes for sizes: from Ø 225.

Version B/A = Rim turned and polished. Hub surfaces machined. Bores H7.

Version B/G = As vers. B/A, but with threaded lug for handle.

Keyway available at extra charge.

Ordering Details: e.g.: 672 408 00, Spoked Handwheel DIN 950, B/G, 80 mm
(Matching handle DIN 39, Product No. 662 116 00 or DIN 98, Product No. 663 116 00)



Version B/G with mounted handle.
Handle has to be ordered separately.

Product No. Vers. B/A	Product No. Vers. B/G	Rim Ø D mm	Bore SH7 mm	Hub- Ø mm	Hub- Length B mm	Overall Height V mm	Weight kg	Product No. Matching Handle Steel	
								Fixed DIN 39	Revolving DIN 98
672 208 00	672 408 00	80	10	24	16	29	0,45	662 116 00	663 116 00
672 210 00	672 410 00	100	10	26	17	33	0,56	662 116 00	663 116 00
672 212 00	672 412 00	125	12	28	18	36	0,85	662 120 00	663 120 00
672 214 00	672 414 00	140	14	30	19	39	1,10	662 120 00	663 120 00
672 216 00	672 416 00	160	14	32	20	40	1,35	662 125 00	663 125 00
672 218 00	672 418 00	180	16	35	22	43	1,80	662 125 00	663 125 00
672 220 00	672 420 00	200	18	38	24	45	2,30	662 125 00	663 125 00
672 222 00	672 422 00	225	20	42	26	48	3,30	662 125 00	663 125 00
672 225 00	672 425 00	250	22	45	28	50	4,20	662 132 00	663 132 00
672 228 00	672 428 00	280	24	50	30	53	5,20	662 132 00	663 132 00
672 231 00	672 431 00	315	26	53	33	56	6,50	662 132 00	663 132 00
672 236 00	672 436 00	360	28	60	35	59	8,90	662 136 00	663 136 00
672 240 00	672 440 00	400	30	65	38	63	11,20	662 136 00	663 136 00

Handles page 548.

Spoked Handwheels DIN 950 with Smooth Rim and Slanted Spokes, with Square Hole

Material: Grey cast iron.

Number of spokes:

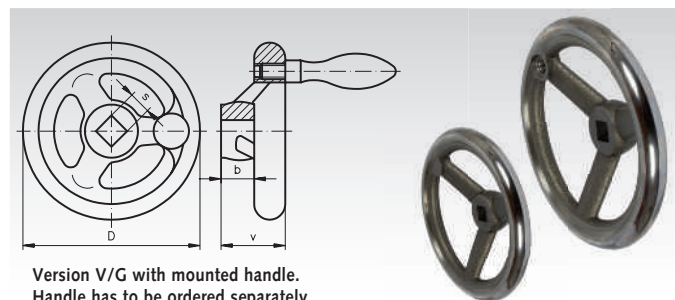
3 spokes for sizes: up to Ø 200.

5 spokes for sizes: from Ø 225.

Version V/A = Rim turned and polished. Hub surface machined, square hole reamed true to gauge

Version V/G = As version V/A, but with threaded lug for handle.

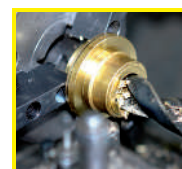
Ordering Details: e.g.: 673 408 00, Spoked Handwheel DIN 950, V/G, 80 mm
(Matching Handle DIN 39, Product No. 662 116 00 or DIN 98, Product No. 663 116 00)



Version V/G with mounted handle.
Handle has to be ordered separately.

Product No. Vers. V/A	Product No. Vers. V/G	Rim-Ø D mm	Square Hole mm	Hub Ø mm	Hub Length b mm	Overall Height V mm	Weight kg	Product No. Matching Handle Steel	
								Fixed DIN 39	Revolving DIN 98
673 208 00	673 408 00	80	9	24	16	29	0,45	662 116 00	663 116 00
673 210 00	673 410 00	100	10	26	17	33	0,56	662 116 00	663 116 00
673 212 00	673 412 00	125	11	28	18	36	0,85	662 120 00	663 120 00
673 214 00	673 414 00	140	12	30	19	39	1,10	662 120 00	663 120 00
673 216 00	673 416 00	160	14	32	20	40	1,35	662 125 00	663 125 00
673 218 00	673 418 00	180	14	35	22	43	1,80	662 125 00	663 125 00
673 220 00	673 420 00	200	17	38	24	45	2,30	662 125 00	663 125 00
673 222 00	673 422 00	225	19	42	26	48	3,30	662 125 00	663 125 00
673 225 00	673 425 00	250	22	45	28	50	4,20	662 132 00	663 132 00
673 231 00	673 431 00	315	27	53	33	56	6,50	662 132 00	663 132 00
673 240 00	673 440 00	400	32	65	38	63	11,20	662 136 00	663 136 00

Handles page 548.



**Reworking within
24h-service possible.
Custom made parts
on request.**

Spoked Handwheels DIN 950 AL with Smooth Rim and Slanted Spokes

Material: Aluminium.

Number of spokes:

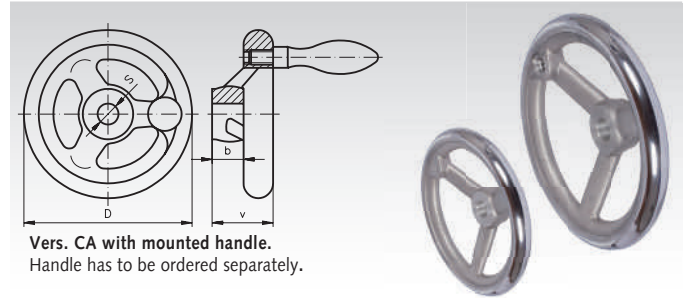
3 spokes for sizes up to Ø 200 mm.

5 spokes for sizes from Ø 225 mm.

Version C = wheel rim ground and high-gloss finish.

Version CA = as Version C, but with threaded lug for handle.

Keyway available at extra charge.



Ordering Details: e.g.: Product No. 670 008 00, Spoked Handwheel DIN 950 AL, Vers. C, 80 mm

Product No. Vers. C	Product No. Vers. CA	D mm	SH7 mm	Hub-Ø mm	b mm	v mm	Weight kg	Matching Handle AL	
								Fixed DIN 39	Revolving DIN 98
670 008 00	670 108 00	80	10	26	16	29	0,15	662 316 00	663 316 00
670 010 00	670 110 00	100	12	28	17	33	0,19	662 316 00	663 316 00
670 012 00	670 112 00	125	13	30	18	36	0,29	662 320 00	663 320 00
670 014 00	670 114 00	140	14	32	19	39	0,36	662 320 00	663 320 00
670 016 00	670 116 00	160	15	34	20	40	0,52	662 325 00	663 325 00
670 018 00	670 118 00	180	16	37	22	43	0,70	662 325 00	663 325 00
670 020 00	670 120 00	200	18	40	24	45	0,89	662 325 00	663 325 00
670 022 00	670 122 00	225	20	46	26	48	1,20	662 325 00	663 325 00
670 025 00	670 125 00	250	22	48	28	50	1,60	662 332 00	663 332 00
670 028 00	670 128 00	280	24	56	30	53	2,00	662 332 00	663 332 00
670 032 00	670 132 00	315	26	56	33	56	2,46	662 332 00	663 332 00

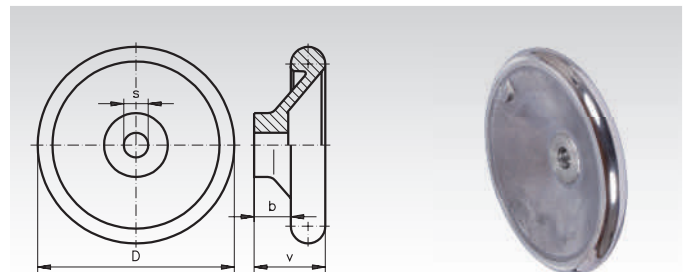
Handles page 548.

Solid-Disk Handwheels, Similar DIN 950 AL

Material: Aluminium.

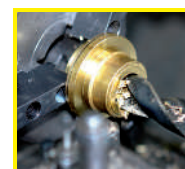
Version C = rim of wheel ground and with high-gloss finish.

Keyway available at extra charge.



Ordering Details: e.g.: Product No. 670 308 00, Solid-Disk Handwheel DIN 950 AL, Version C, 80 mm

Product No. Vers. C	D mm	SH7 mm	Hub-Ø mm	b mm	v mm	Weight kg
670 308 00	80	10	26	16	29	0,15
670 310 00	100	12	27	17	33	0,26
670 312 00	125	13	28	18	36	0,35
670 314 00	140	14	30	19	39	0,46
670 316 00	160	15	37	20	40	0,72
670 318 00	180	16	36	22	43	0,95
670 320 00	200	18	40	24	45	1,20
670 322 00	225	20	42	26	48	1,60
670 325 00	250	22	51	28	50	2,00
670 328 00	280	24	52	30	53	2,40
670 332 00	315	26	55	33	56	3,50



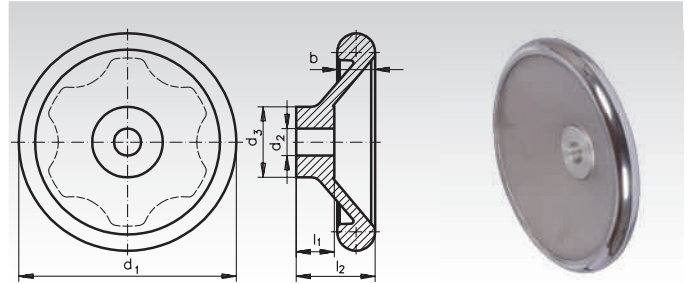
**Reworking within
24h-service possible.
Custom made parts
on request.**

Solid-Disk Handwheels DIN 3670 with Recessed Grips

Material: Aluminium, hub machined, rim turned and polished.
Without Handle.

Keyway available at extra charge.

Ordering Details: e.g.: Product No. 670 412 00, Solid-Disk Handwheel DIN 3670, 125 mm



Product No.	d ₁ mm	d ₂ ^{H7} mm	d ₃ mm	b mm	l ₁ mm	l ₂ mm	Weight g
670 412 00	125	12	31	16	18	36	306
670 416 00	160	14	36	18	20	40	514
670 420 00	200	18	42	22	24	45	943
670 425 00	250	22	48	26	28	50	1608

Solid-Disk Handwheels 323

Material: Aluminium gravity die-cast, plastic coated, black, textured finish.

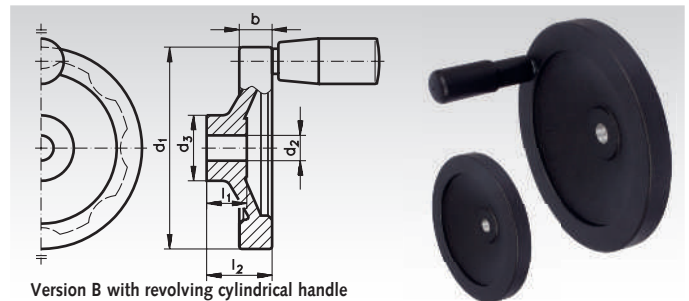
Hub machined. Rim turned on all sides. The rim is machined before coating, thus it is perfectly concentric.

Version A: Without cylindrical handle.

Version B: With revolving cylindrical handle.

Keyway available at extra charge.

Ordering Details: e.g.: Product No. 670 901 00, Solid-Disk Handwheel 323, 80 mm



Product No. Vers. A	Product No. Vers. B	d ₁ mm	d ₂ ^{H7} mm	d ₃ mm	b mm	l ₁ mm	l ₂ mm	Cylindrical Handle Ø mm	Weight Vers. A g	Weight Vers. B g
670 901 00	670 911 00	80	10	26	13	16	26	18	140	160
670 902 00	670 912 00	100	10	28	14	17	30	21	210	250
670 903 00	670 913 00	125	12	31	15	18	33	23	320	400
670 904 00	670 914 00	140	14	36	16,5	19	36	23	440	510
670 905 00	670 915 00	160	14	36	18	20	39	26	570	670
670 906 00	670 916 00	200	18	42	20,5	24	45	26	930	1030
670 907 00	670 917 00	250	22	48	23	28	51	28	1550	1670

Handwheels with Retractable Handle 3223

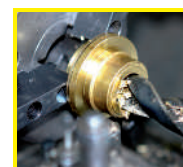
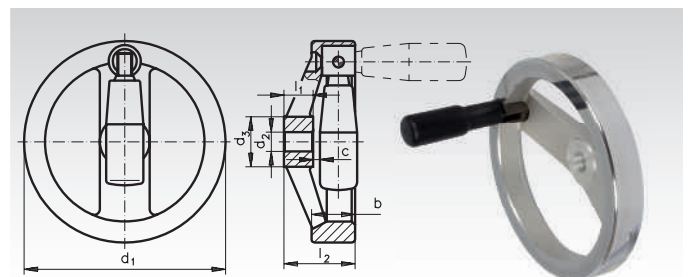
Material: Aluminium gravity die-cast, hub machined, rim turned and polished. Parts of the folding mechanism: Steel hardened and bur-nished.

These handwheels are used in applications where the handle must not stick out. Handle and folding mechanism are fully encased in the rim. The handle is locked in the operating position. To retract it, the handle is pulled out of its taper seat and then tilted. A compression spring locks the handle in both end positions.

Keyway available at extra charge.

Ordering Details: e.g.: Product No. 670 516 00, Handwheel with Retractable Handle 3223, 160 mm

Product No.	d ₁ mm	d ₂ ^{H7} mm	d ₃ mm	b mm	c min. mm	l ₁ mm	l ₂ mm	Handle Ø mm	Weight g
670 512 00	125	12	31	24,5	4,5	18	44	23	469
670 516 00	160	14	36	25	4	20	47	26	697
670 520 00	200	18	42	25	5,5	24	52,5	26	978



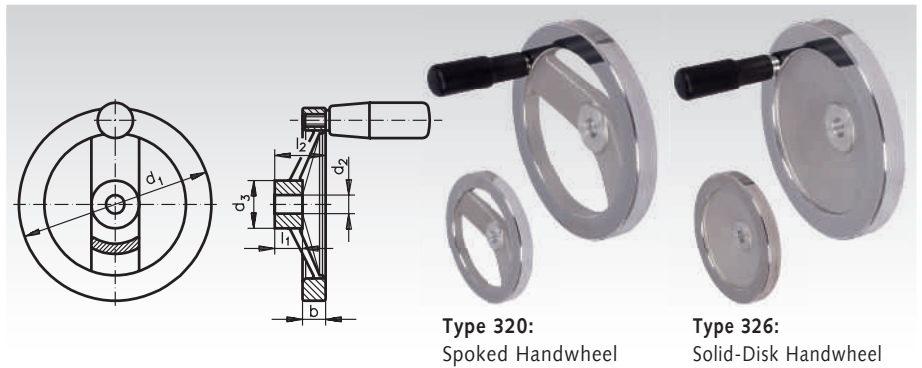
**Reworking within
24h-service possible.
Custom made parts
on request.**

Spoked Handwheels 320 and Solid-Disk Handwheels 326

Material: Aluminium, gravity die-cast.
Revolving cylindrical handle made from plastic with threaded steel stud and Allen screw. Hub machined, rim of wheel turned and polished all over.

Hub length and bore diameter according to DIN 950.

Keyway available at extra charge.



Ordering Details: e.g.: Product No. 670 712 00, Spoked Handwheel 320 with Handle, 125 mm

Product No. 320 with Handle	Product No. 320 without Handle	Product No. 326 with Handle	Product No. 326 without Handle	d ₁ mm	d ₂ ^{H7} mm	d ₃ mm	b mm	l ₁ mm	l ₂ mm	Cylindrical Handle Ø mm	320 with H.	Weight g 320 without H.	326 with H.	326 without H.
-	-	-	670 801 00	80	10	26	13	16	26	18	-	-	161	134
-	-	670 810 00	670 802 00	100	10	31	14	17	30	21	-	-	255	215
670 712 00	670 703 00	670 812 00	670 803 00	125	12	31	15	18	33	23	383	311	394	318
670 714 00	670 704 00	670 814 00	670 804 00	140	14	34	16,5	19	36	23	486	411	507	431
670 716 00	670 705 00	670 816 00	670 805 00	160	14	36	18	20	39	26	643	539	675	570
670 720 00	670 706 00	670 820 00	670 806 00	200	18	42	20,5	24	45	26	996	892	990	885
670 725 00	670 707 00	670 825 00	670 807 00	250	22	48	23	28	51	28	1598	1478	1626	1552

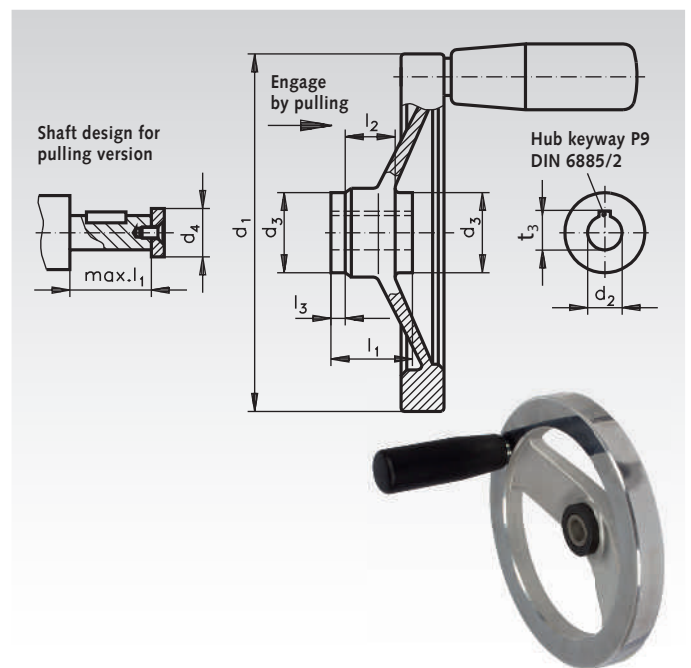
Safety Handwheels SHR

Material: Aluminium, polished.
Coupling attachment assembled.
Can only be supplied with revolving, cylindrical handle made from plastic with threaded steel bolt and with hub keyway.

According to safety regulations, handwheels must be mounted on the shaft in such a way that they do not rotate along with the machine drive. Safety handwheels comply with this regulation.

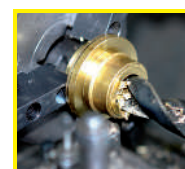
Procedure: Wheel disengaged if not used. By axial displacement of the wheel (pulling) the two serrated wheel rims are engaged. The wheel is now positively keyed to the shaft. When the wheel is released, it automatically disengages. The coupling elements are assembled together in an enclosed unit. Coupling attachment made from steel, nitrided, bearing surface ground and PTFE coated, for minimal friction between bearing surfaces and high wear resistance. An oil hole is provided, which serves to connected to a pressure oiler in the wheel hub. Frequent lubrication is an important precondition in guaranteeing the correct functioning of the plain-bearing coupling attachment. The range of application of these handwheels is limited to low shaft speeds, or to higher speeds of only short duration (e.g. feed screws for milling machine table with rapid feed).

The coupling attachments can also be supplied separately, to be mounted with existing handwheels. Prices on request.
We assume no liability for any consequential damage.



Ordering Details: e.g.: Product No. 670 612 00, Safety Handwheel SHR, 125 mm

Product No.	d ₁ mm	d ₂ ^{H7} mm	d ₃ mm	d ₄ max. mm	l ₁ mm	l ₂ mm	l ₃ mm	Weight g
670 612 00	125	12	28	17	28,5	18	5	552
670 614 00	140	12	28	17	28,5	18	5	660
670 616 00	160	14	32	21	32,5	20	6	907
670 620 00	200	18	38	26	36,5	24	6	1324
670 625 00	250	22	45	30	47,5	28	12	2122



**Reworking within
24h-service possible.
Custom made parts
on request.**

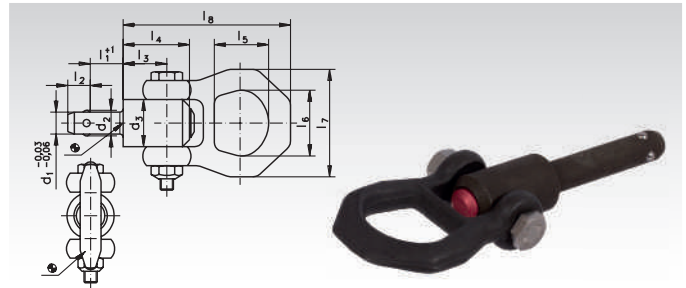
Lifting Pins, Self Locking

Material: Steel, manganese-phosphate treated. Press bolt made from AL.

Press = release.

Loosen = lock.

Fast and easy-to-use, robust lifting element with moveable shackle. Special lifting devices, i.e., threads are no longer required on the workpiece. Simple H11 bores are sufficient.



Ordering Details: e.g.: Product No. 666 910 15, Lifting Pin, Self Locking, 10 x 15

Product No.	d ₁ mm	l ₁ mm	d ₂ mm	d ₃ mm	d ₄ min. mm	l ₂ mm	l ₃ mm	l ₄ mm	l ₅ mm	l ₆ mm	l ₇ mm	l ₈ mm	x min. mm	x max. mm	Location Hole ^{H11} mm	F1* kN	F2* kN	F3* kN	Weight g
666 910 15	10	15	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1	139
666 910 25	10	25	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	15	10	2,7	2,4	2,1	145
666 910 35	10	35	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	25	10	2,7	2,4	2,1	152
666 910 50	10	50	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	35	10	2,7	2,4	2,1	161
666 912 15	12	15	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	10	12	3,5	3,2	2,8	147
666 912 25	12	25	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	20	12	3,5	3,2	2,8	156
666 912 35	12	35	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	25	12	3,5	3,2	2,8	162
666 912 50	12	50	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	45	12	3,5	3,2	2,8	278
666 916 25	16	25	18,6	26,0	19,2	15,1	31,0	44,5	27	30	49	92,8	1,5	20	16	4,8	4,5	4,1	272
666 916 50	16	50	18,6	26,0	19,2	15,1	31,0	44,5	27	30	49	92,8	1,5	40	16	4,8	4,5	4,1	311
666 916 75	16	75	18,6	26,0	19,2	15,1	31,0	44,5	27	30	49	92,8	1,5	55	16	4,8	4,5	4,1	351

* For a 5-fold safety.



Socket Pins with Spring-Loaded Balls, Self Locking (Ball Lock PINS)

Material: Pin part: stainless steel 1.4542 hardened.
Handle: Plastic (PA6).
Spring: stainless steel.

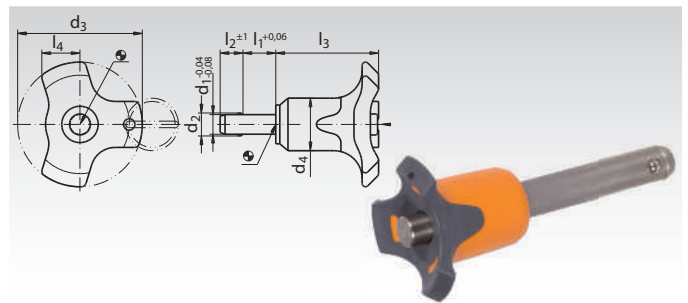


Press = release.

Loosen = lock.

For quick fastening and securing of parts and workpieces. Fast and easily released for frequently repeated actions, e.g., replaceable bearing pins.

Temperature range: -30° / +80° C.



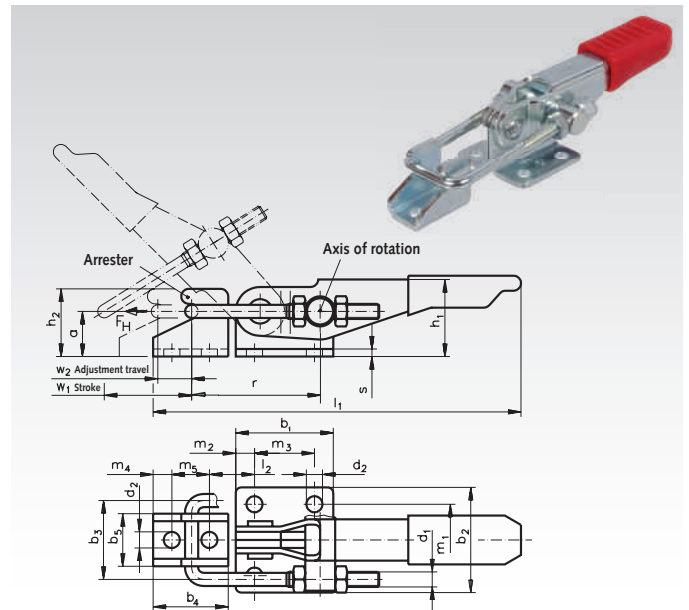
Product No.	d ₁ mm	l ₁ mm	d ₂ mm	d ₃ mm	d ₄ mm	l ₂ mm	l ₃ mm	l ₄ mm	Location Hole H11	Shearing Resistance* kN	Weight g
666 806 10	6	10	7,0	33,2	14,5	7,0	26,7	10,8	6	35	16
666 806 20	6	20	7,0	33,2	14,5	7,0	26,7	10,8	6	35	18
666 806 30	6	30	7,0	33,2	14,5	7,0	26,7	10,8	6	35	20
666 806 40	6	40	7,0	33,2	14,5	7,0	26,7	10,8	6	35	22
666 806 50	6	50	7,0	33,2	14,5	7,0	26,7	10,8	6	35	24
666 808 20	8	20	9,6	39,2	19,3	8,2	33,3	13,4	8	63	40
666 808 30	8	30	9,6	39,2	19,3	8,2	33,3	13,4	8	63	44
666 808 40	8	40	9,6	39,2	19,3	8,2	33,3	13,4	8	63	47
666 808 50	8	50	9,6	39,2	19,3	8,2	33,3	13,4	8	63	51
666 810 20	10	20	12,0	39,2	19,3	9,6	33,3	13,4	10	100	47
666 810 30	10	30	12,0	39,2	19,3	9,6	33,3	13,4	10	100	53
666 810 40	10	40	12,0	39,2	19,3	9,6	33,3	13,4	10	100	58
666 810 50	10	50	12,0	39,2	19,3	9,6	33,3	13,4	10	100	64
666 810 60	10	60	12,0	39,2	19,3	9,6	33,3	13,4	10	100	70
666 812 30	12	30	14,5	47,6	26,3	10,6	39,7	16,7	12	144	100
666 812 40	12	40	14,5	47,6	26,3	10,6	39,7	16,7	12	144	109
666 812 50	12	50	14,5	47,6	26,3	10,6	39,7	16,7	12	144	117
666 812 70	12	70	14,5	47,6	26,3	10,6	39,7	16,7	12	144	134
666 812 80	12	80	14,5	47,6	26,3	10,6	39,7	16,7	12	144	143
666 816 50	16	50	19,0	47,6	26,3	14,0	39,7	16,7	16	257	168
666 816 80	16	80	19,0	47,6	26,3	14,0	39,7	16,7	16	257	208

* Rupture limit.

Latch Clamps

Material: Sheet-metal parts: Case-hardened steel C10, zinc-plated, blue passivated.
Pulling latch: Steel St37, zinc-plated, blue passivated.
Handle with plastic sleeve, red, oil resistant.

Latch clamps allow a fast and secure locking of lids and covers.
The stroke of the pulling ledge can be adjusted within its range.
In the clamped position the pulling ledge with its clamping arm is parallel to the plane of the operating handle.
Latch bracket included in the delivery.



Ordering Details: e.g.: Product No. 676 204 00, Latch Clamp, Size 160

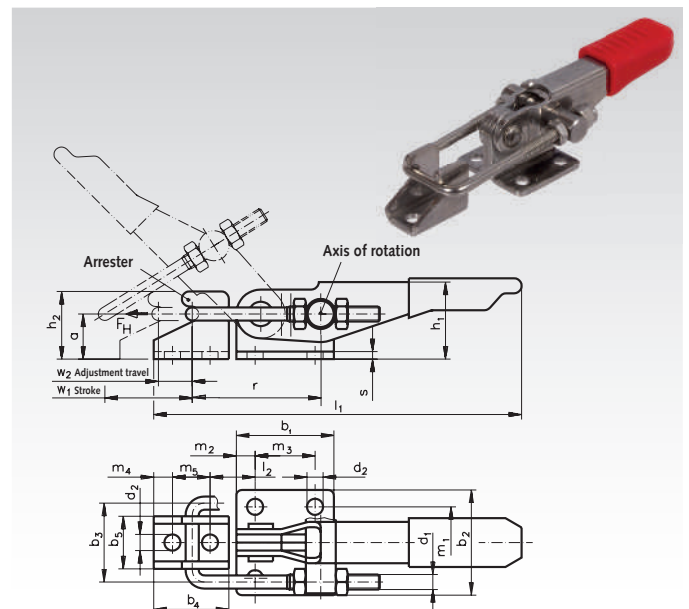
Product No.	Size	Holding Force F_H N	approx. Dimensions																				Weight	
			a	b ₁	b ₂	b ₃	b ₄	b ₅	d ₁	d ₂	h ₁	h ₂	l ₁	l ₂	m ₁	m ₂	m ₃	m ₄	m ₅	r	s	w ₁	w ₂	g
676 204 00	160	1600	12	26	28	21	20	14	M4	4,3	22	18	98	11	19	5,0	16,0	5,0	10	34	2,0	25	11	85
676 206 00	320	3200	16	40	44	32	28	22	M6	6,5	30	25	152	19	32	10,5	19,0	7,0	14	57	3,0	48	13	250
676 208 00	700	7000	24	60	54	39	38	26	M8	8,5	42	36	220	23	38	9,5	41,5	9,5	19	74	3,5	58	26	60

Latch Clamps, Stainless Steel

Material: Sheet-metal parts: 1.4301.
Pulling latch: 1.4305.
Handle: Plastic sleeve, red, oil resistant.



Latch clamps allow a fast and secure locking of lids and covers.
The stroke of the pulling ledge can be adjusted within its range.
In the clamped position the pulling ledge with its clamping arm is parallel to the plane of the operating handle.
Latch bracket included in the delivery.



Ordering Details: e.g.: Product No. 676 992 04, Latch Clamp, Stainless Steel, Size 160

Product No.	Size	Holding Force F_H N	approx. Dimensions																				Weight	
			a	b ₁	b ₂	b ₃	b ₄	b ₅	d ₁	d ₂	h ₁	h ₂	l ₁	l ₂	m ₁	m ₂	m ₃	m ₄	m ₅	r	s	w ₁	w ₂	g
676 992 04	160	1600	12	26	28	21	20	14	M4	4,3	22	18	98	11	19	5,0	16	5	10	37	2	25	11	85
676 992 06	320	3200	16	40	44	32	28	22	M6	6,5	30	25	152	19	32	10,5	19	7	14	57	3	48	13	250

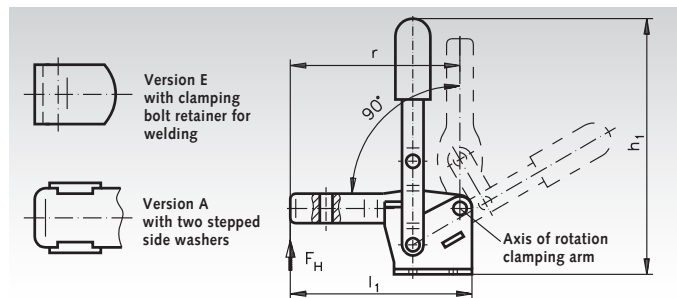
Quick Clamps (Vertical Clamp with Horizontal Base, without Clamping Bolts)

Material: Steel-sheet parts: Case-hardened steel C10, zinc-plated. Bearing pins: Hardened, from size 200 case hardened.

All moving parts lubricated with special grease.
Handle with plastic sleeve, red, oil resistant.

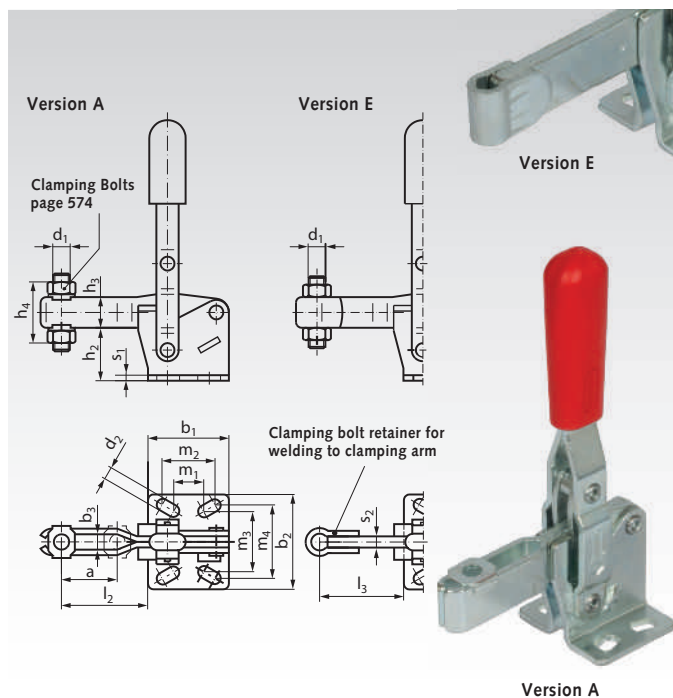
Operating handle and clamping lever move in the same direction.
In the clamping position the operating handle is vertical. Vertical clamps are available for holding forces F_H from 90 daN up to 460 daN.

Note: Worth pointing out is the clamping arm on all vertical clamps: It is blanked out from full and reinforced on the points of highest load. During the closing movement it is guided on both sides to prevent being affected by possible side thrusts.



Version A: forked clamping arm.

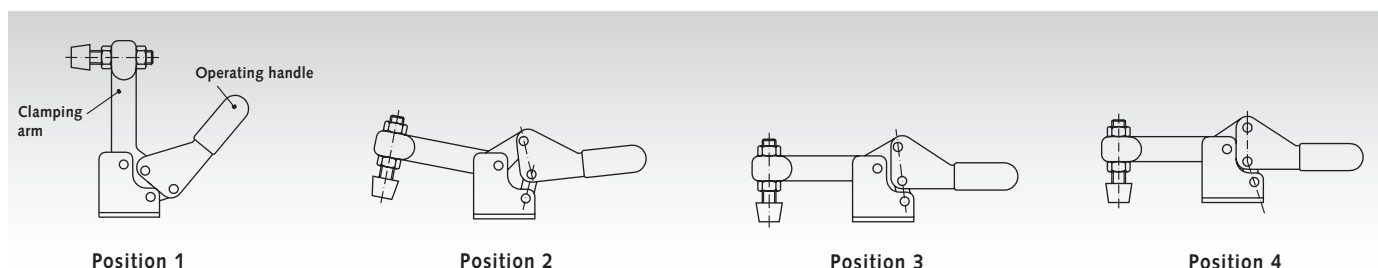
Version E: solid clamping arm.



Product No. Version A	Product No. Version E	Size	F_H N	$a \approx$ mm	b_1 mm	b_2 mm	b_3 mm	d_1^* mm	$d_2 \approx$ mm	$h_1 \approx$ mm	h_2 mm	h_3 mm	h_4 mm	$l_1 \max$ mm	$l_2 \approx$ mm	$l_3 \max$ mm	m_1 mm	m_2 mm	m_3 mm	m_4 mm	r mm	s_1 mm	s_2 mm	Weight g
676 003 00	676 043 00	70	900	20	29	34	5,2	M5	4,5	98	20	11	21	67	32	41	15	16	24	24	63	2	4	95
676 006 00	676 046 00	130	1600	28	35	42	6,2	M6	5,5	142	28	16	27	86	42	54	12,5	19	27	29	80	2,5	5	210
676 010 00	676 050 00	230	2200	40	43	45	8,5	M8	6,5	168	33	18	31	112	58	73	19	20	32	32	104	3	6	350
676 015 00	676 055 00	330	2700	43	50	65	10,5	M10	8,5	195	43	22	38	131	66	86	29	32	46	45	122	3,5	7	550
676 020 00	676 060 00	430	3000	64	58	65	12,5	M12	8,5	247	55	26	45	166	88	114	32	32	54	45	156	4	10	1000
676 025 00	676 065 00	530	4600	90	80	95	12,5	M12	12,5	303	84	32	51	225	125	152	50	51	70	70	212	7	10	1960

* Clamping bolt page 574 has to be ordered separately.

Operating Principle



Position 1: By using the toggle link principle, these quick clamps offer essential advantages:
The clamping arm retracts to such an extent, that the workpiece can be inserted and removed completely unobstructed.

Position 2: Even the slightest forward movement of the operating handle moves the clamping arm with the contact pad over the workpiece.
As can be seen from the sketch, the position of the toggle links leads to a multiple of the input force at the operating handle being applied to the clamping arm.

In this position the quick clamp is not yet fully locked, i.e., any counter force applied to the operating handle will open the clamp.

Position 3: In this position all three pivots are perfectly aligned yielding the maximum clamping force (dead centre point). The clamping force applied to the workpiece is mainly dependent on:

- the input force applied to the operating handle,
- the position of the clamping bolt on the clamping lever.

The clamping force can be altered by readjusting the position

of the clamping bolt: It increases if the entire contact area of the bolt touches the workpiece before the dead centre point is reached. This effect is clearly illustrated when using an elastic clamping pad.

Position 4: In this position the toggle link has arrived in the over-centre lock position, and the operating lever has reached a firm stop. This leads to a secure locking (self-blocking) of the quick clamp, preventing it from opening until it is released by the operator. The force which the clamping element is capable of withstanding in this over-centre lock position without suffering permanent deformation is known as holding force F_H . The holding force F_H is a characteristic value (co-efficient) for toggle clamps, and this value is mainly dependent on:

- the size (dimensions, geometry) of the quick clamp,
 - the position of the clamping bolt on the clamping arm.
- In the tables, the maximum holding force F_H is stated in relation to a particular position of the clamping arm.

Quick Clamps (Horizontal Clamp with Horizontal Base, without Clamping Bolts)

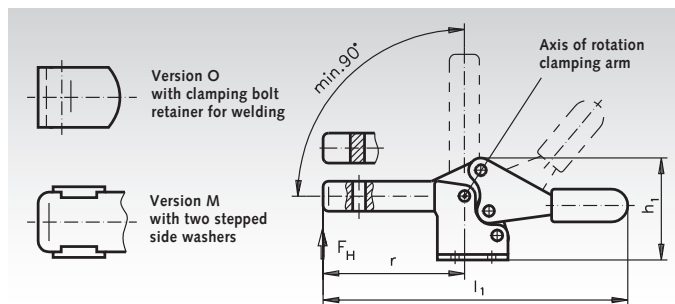
Material: Steel-sheet parts: Case-hardened steel C10, zinc-plated. Bearing pins: hardened, from size 350 case hardened.

All moving parts lubricated with special grease.

Handle with plastic sleeve, red, oil resistant.

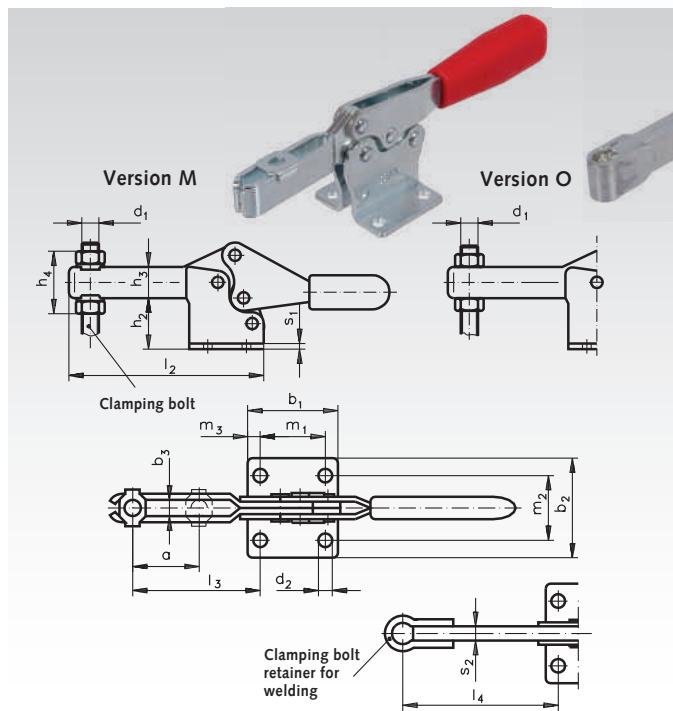
Low profile in the clamping position, designed to avoid the operator's fingers being caught between the retracting clamping arm and the operating handle (safety distance). During the closing movement it is guided on both sides to prevent it from being affected by possible side thrusts

Operating principle page 573.



Version M: forked clamping arm.

Version O: solid clamping arm.



Ordering Details: e.g.: Product No. 676 102 00, Horizontal Clamp, Version M, Size 25

Product No. Version M	Product No. Version O	Holding Force																				Weight g		
		Size	F _H N	a ² mm	b ₁ mm	b ₂ mm	b ₃ mm	d ₁ ** mm	d ₂ mm	h ₁ mm	h ₂ mm	h ₃ mm	h ₄ mm	l ₁ mm	l ₂ mm	l ₃ mm	l ₄ mm	m ₁ mm	m ₂ mm	m ₃ mm	r mm		s ₁ mm	s ₂ mm
676 102 00	-	25*	400	10	24	24,5	4,3	M4	4,3	23	12	7	15	68	43	20	-	15	16	4,5	24,5	1,2	-	25
676 103 00	676 143 00	75	900	20	28	26	5,5	M5	4,5	38	20	11	22,5	118	67	40	49,5	13,5	17	7,2	43	2	4	80
676 105 00	676 145 00	130	1000	32	36	40	6,5	M6	5,5	51	29	14	27	168	92	53	64	26	26	5	62	2,5	5	180
676 111 00	676 151 00	230	1700	37	44	42	8,5	M8	6,5	61,5	37	18	35	196	110	63,5	78	26	28,5	9	72	3	6	300
676 117 00	676 157 00	355	3200	58	60	56	10,4	M10	8,5	83	50	22	43	270	161	96	115	41	41	9,5	108,5	3,5	7	600
676 122 00	676 162 00	455	6200	65	70	65	12,4	M12	8,5	99	60	26	53	309	186	116	135	41,5	41,5	14,2	126	4	10	1400

* Size 25 only available in version M.

** Clamping bolts have to be ordered separately.

Clamping Bolts and Protective Caps for Quick Clamps

Material:

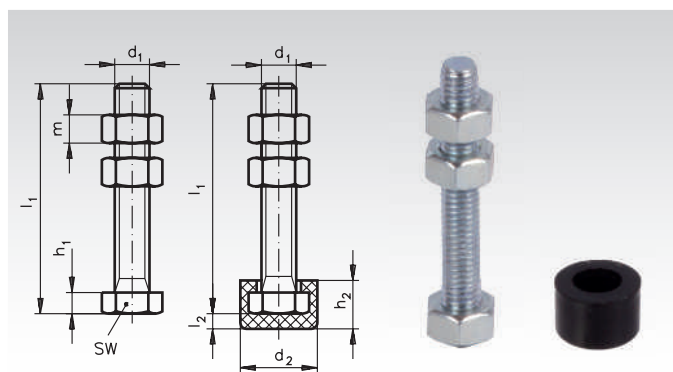
Hexagon Bolt: DIN 933, steel, strength class 8, zinc-plated.

Hexagon nuts: DIN 934/DIN 936, steel, zinc-plated.

Protective cap: Neoprene 85° Shore hardness, black.

Note: Protective cap has to be ordered separately.

The elastic protective cap can be easily slipped over the bolt head.



Ordering Details: e.g.: Product No. 676 000 04, Clamping Bolt M4

Product No. Screw	Product No. Protect. Cap	d_1 mm	Length l_1 mm	d_2 mm	h_1 mm	h_2 mm	l_2 mm	m mm	sw mm	Weight	
										Screw g	Cap g
676 000 04	676 000 44	M4	23	11	3	6,5	2,5	3,2	7	5	1
676 000 05	676 000 45	M5	38	12,5	3,5	8	2,5	4,7	8	9	1
676 000 06	676 000 46	M6	49	15	4	10	4	5,2	10	11	2
676 000 08	676 000 48	M8	56	19	5,5	13	5,5	6,8	13	24	4
676 000 10	676 000 50	M10	77	24	6,5	16	7	8,4	16	47	7
676 000 12	676 000 52	M12	88	26	7,5	19	8,5	10,8	18	75	10

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bearings



Spherical roller
bearings



Tapered roller
bearings

The rolling bearings are to find:

- ***in this catalog page 416***
- ***on the internet at www.maedler.de***

Assortment Box Retainers for shafts, type KL

Material: Steel, phosphatized and oiled.

The assortment box is made from impact-resistant plastic of premium quality and is filled with KL-Retainers matching BEKbolts with groove/clevises/clevis joints. Contains 880 pieces. Weight 1.8 kg.

Size	Amount
3	100
4	100
5	100
6	100
8	100
10	80
12	100
14	80
16	100
24	20

Product No. 618 000 01



Product No. 618 000 01

Assortment Box SL-Retainers Retainers for shafts, type SL

Material: Steel, phosphatized and oiled.

The assortment box is made from impact-resistant plastic of premium quality and is filled with SL-Retainers matching BEKbolts with groove/clevises/clevis joints. Contains 560 pieces. Weight 1.23 kg.

Size	Amount
4	100
5	100
6	100
8	100
10	40
12	40
14	40
16	40

Product No. 618 000 02



Product No. 618 000 02

Assortment Box Washers and Pins

Material: Steel, zinc-plated, white/blue.

The assortment box is made from impact-resistant plastic of premium quality and is filled with washers and pins according to DIN 125 and DIN 94, matching BEK-bolts with groove/clevises/clevis joints.

Contains 1480 pieces. Weight 4.9 kg.

Washer Size	Amount	Pin Size	Amount
A4.3	100	1 x 10	200
A5.3	100	1.6 x 16	100
A6.4	100	2 x 16	100
A8.4	100	3.2 x 20	100
A 10.5	100	4 x 32	100
A 13.0	100	5 x 45	100
A 15.0	100		
A 17.0	30		
A 19.0	25		
A 21.0	25		

Product No. 618 000 03

Product No. 618 000 03



Assortment Box Feather Keys According to DIN 6885 Version A and shaft Collars

Materials: Feather keys made from C45K, single split Shaft collars made from steel, burnished.

The assortment box is made from impact-resistant plastic of premium quality and is filled with Feather keys and clamp collars.

Contains 316 pieces. Weight 2.05 kg.

Product	Size	Amount
Parallel keys	3 x 3 x 12	40
Parallel keys	3 x 3 x 20	40
Parallel keys	4 x 4 x 15	30
Parallel keys	4 x 4 x 20	30
Parallel keys	5 x 5 x 15	20
Parallel keys	5 x 5 x 20	20
Parallel keys	5 x 5 x 25	20
Parallel keys	5 x 5 x 30	15
Parallel keys	6 x 6 x 25	15
Parallel keys	6 x 6 x 30	15
Parallel keys	6 x 6 x 40	15
Parallel keys	8 x 7 x 25	15
Parallel keys	8 x 7 x 40	10
Parallel keys	10 x 8 x 40	6
Clamp Collars	6 mm Bore	8
Clamp Collars	8 mm Bore	8
Clamp Collars	10 mm Bore	5
Clamp Collars	12 mm Bore	4

Product No. 618 000 00

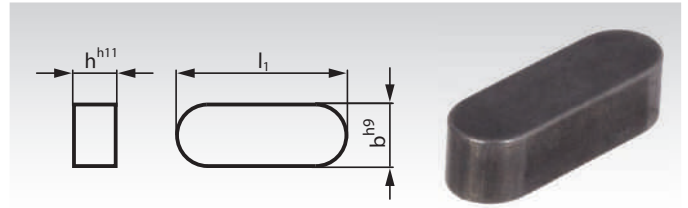
Product No. 618 000 00



Feather Keys According to DIN 6885

Material: C45K

Version A.



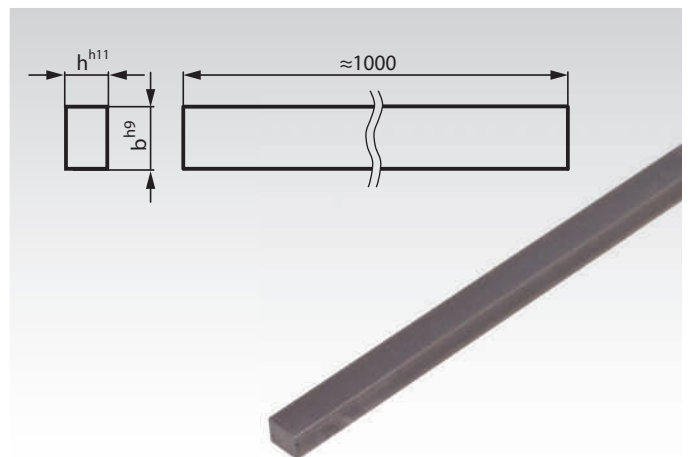
Ordering Details: e.g.: Product No. 618 002 00, Feather Keys, 2 x 2 x 6 mm

Product No.	b ^{h9} mm	h mm	l ₁ mm	Weight g	Product No.	b ^{h9} mm	h mm	l ₁ mm	Weight g	Product No.	b ^{h9} mm	h mm	l ₁ mm	Weight g	Product No.	b ^{h9} mm	h mm	l ₁ mm	Weight g
618 002 00	2	2	6	0,2	618 069 00	4	4	20	2,5	618 129 00	6	6	45	12,7	618 202 00	12	8	60	45
618 003 00	2	2	8	0,3	618 070 00	4	4	22	2,8	618 130 00	6	6	50	14,1	618 203 00	12	8	65	49
618 004 00	2	2	10	0,3	618 071 00	4	4	25	3,1	618 131 00	6	6	55	15,5	618 204 00	12	8	70	53
618 005 00	2	2	12	0,4	618 072 00	4	4	28	3,5	618 132 00	6	6	60	17,0	618 211 00	14	9	40	40
618 006 00	2	2	14	0,4	618 073 00	4	4	30	3,8	618 146 00	8	7	20	8,8	618 212 00	14	9	45	45
618 007 00	2	2	15	0,5	618 094 00	5	5	12	2,4	618 147 00	8	7	22	9,7	618 213 00	14	9	50	49
618 008 00	2	2	16	0,5	618 095 00	5	5	14	2,7	618 148 00	8	7	25	11,0	618 214 00	14	9	55	54
618 009 00	2	2	18	0,6	618 096 00	5	5	15	2,9	618 149 00	8	7	28	12,3	618 215 00	14	9	60	59
618 010 00	2	2	20	0,6	618 097 00	5	5	16	3,1	618 150 00	8	7	30	13,2	618 216 00	14	9	65	64
618 011 00	2	2	22	0,7	618 098 00	5	5	18	3,5	618 151 00	8	7	35	15,4	618 217 00	14	9	70	69
618 012 00	2	2	25	0,8	618 099 00	5	5	20	3,9	618 152 00	8	7	40	17,6	618 218 00	14	9	75	74
618 030 00	3	3	8	0,6	618 100 00	5	5	22	4,3	618 153 00	8	7	45	19,8	618 219 00	14	9	80	79
618 031 00	3	3	10	0,7	618 101 00	5	5	25	4,9	618 154 00	8	7	50	22,0	618 228 00	16	10	45	57
618 032 00	3	3	12	0,8	618 102 00	5	5	28	5,5	618 155 00	8	7	55	24,2	618 229 00	16	10	50	63
618 034 00	3	3	14	1,0	618 103 00	5	5	30	5,9	618 156 00	8	7	60	26,4	618 230 00	16	10	55	69
618 035 00	3	3	15	1,1	618 104 00	5	5	35	6,9	618 171 00	10	8	25	15,7	618 231 00	16	10	60	75
618 036 00	3	3	16	1,1	618 105 00	5	5	40	7,9	618 172 00	10	8	28	17,6	618 232 00	16	10	65	82
618 037 00	3	3	18	1,3	618 106 00	5	5	45	8,8	618 173 00	10	8	30	18,8	618 233 00	16	10	70	88
618 038 00	3	3	20	1,4	618 107 00	5	5	50	9,8	618 174 00	10	8	35	22,0	618 234 00	16	10	75	94
618 039 00	3	3	22	1,6	618 119 00	6	6	15	4,2	618 175 00	10	8	40	25,1	618 235 00	16	10	80	100
618 040 00	3	3	25	1,8	618 120 00	6	6	16	4,5	618 176 00	10	8	45	28,3	618 246 00	18	11	50	78
618 041 00	3	3	28	2,0	618 121 00	6	6	18	5,1	618 177 00	10	8	50	31,4	618 247 00	18	11	55	85
618 042 00	3	3	30	2,1	618 122 00	6	6	20	5,7	618 178 00	10	8	55	34,5	618 248 00	18	11	60	93
618 063 00	4	4	10	1,3	618 123 00	6	6	22	6,2	618 179 00	10	8	60	37,7	618 249 00	18	11	65	101
618 064 00	4	4	12	1,5	618 124 00	6	6	25	7,1	618 197 00	12	8	35	26,4	618 250 00	18	11	70	109
618 065 00	4	4	14	1,8	618 125 00	6	6	28	7,9	618 198 00	12	8	40	30,1	618 251 00	18	11	75	117
618 066 00	4	4	15	1,9	618 126 00	6	6	30	8,5	618 199 00	12	8	45	33,9	618 252 00	18	11	80	124
618 067 00	4	4	16	2,0	618 127 00	6	6	35	9,9	618 200 00	12	8	50	37,7					
618 068 00	4	4	18	2,3	618 128 00	6	6	40	11,3	618 201 00	12	8	55	41,4					

Bright Key Steel DIN 6880

Material: C45K.

Standard length about 1000 mm.



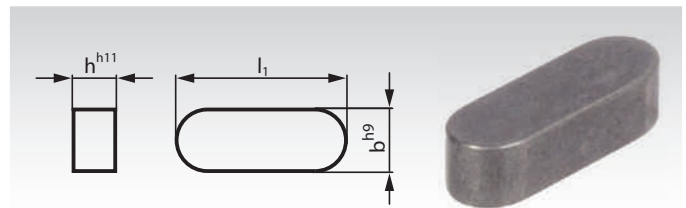
Ordering details: e.g.: Product No. 618 902 02, Bright Key Steel DIN 6880, 2x2x1000 mm

Product No.	b ^{h9} mm	h ^{h11} mm	Weight g	Product No.	b ^{h9} mm	h ^{h11} mm	Weight g
618 902 02	2	2	31	618 910 10	10	10	785
618 903 03	3	3	71	618 912 08	12	8	754
618 904 04	4	4	126	618 912 12	12	12	1130
618 905 05	5	5	196	618 914 09	14	9	989
618 906 06	6	6	283	618 916 10	16	10	1256
618 908 07	8	7	440	618 918 11	18	11	1554
618 908 08	8	8	502	618 920 12	20	12	1884
618 910 08	10	8	628				

Feather Keys According to DIN 6885, Stainless

Material: Stainless steel 1.4571

Version A.



Ordering Details: e.g.: Product No 618 990 30, Feather Keys, 3 x 3 x 8 mm, Stainless

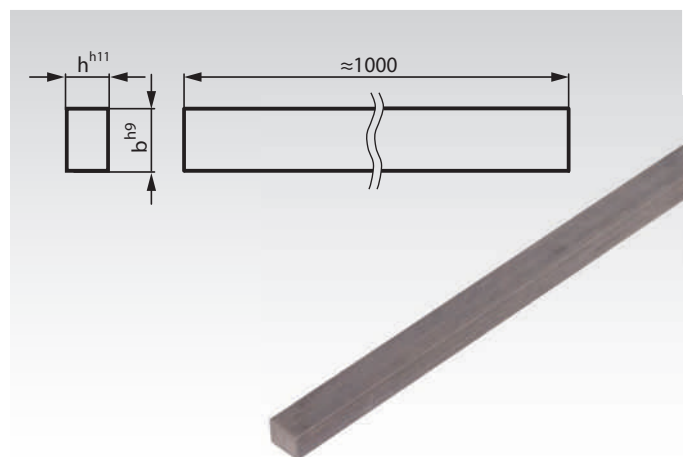
Product No.	b ^{h9} mm	h mm	l ₁ mm	Weight g
618 990 30	3	3	8	0,6
618 990 31	3	3	10	0,7
618 990 32	3	3	12	0,8
618 990 36	3	3	16	1,1
618 990 38	3	3	20	1,4
618 990 40	3	3	25	1,8
618 990 63	4	4	10	1,3
618 990 64	4	4	12	1,5
618 990 67	4	4	16	2,0
618 990 69	4	4	20	2,5
618 990 71	4	4	25	3,1
618 990 72	4	4	28	3,5
618 990 73	4	4	30	3,8
618 990 94	5	5	12	2,4
618 990 97	5	5	16	3,1
618 990 99	5	5	20	3,9
618 991 01	5	5	25	4,9
618 991 02	5	5	28	5,5
618 991 03	5	5	30	5,9
618 991 05	5	5	40	7,9
618 991 06	5	5	45	8,8
618 991 07	5	5	50	9,8
618 991 20	6	6	16	4,5

Product No.	b ^{h9} mm	h mm	l ₁ mm	Weight g
618 991 22	6	6	20	5,7
618 991 24	6	6	25	7,1
618 991 25	6	6	28	7,9
618 991 26	6	6	30	8,5
618 991 28	6	6	40	11,3
618 991 29	6	6	45	12,7
618 991 30	6	6	50	14,1
618 991 46	8	7	20	8,8
618 991 48	8	7	25	11,0
618 991 49	8	7	28	12,3
618 991 50	8	7	30	13,2
618 991 52	8	7	40	17,6
618 991 53	8	7	45	19,8
618 991 54	8	7	50	22,0
618 991 71	10	8	25	15,7
618 991 72	10	8	28	17,6
618 991 73	10	8	30	18,8
618 991 75	10	8	40	25,1
618 991 76	10	8	45	28,3
618 991 77	10	8	50	31,4
618 991 98	12	8	40	30,1
618 991 99	12	8	45	33,9
618 992 00	12	8	50	37,7

Bright Key Steel DIN 6880, Stainless

Material: Stainless steel 1.4571.

Standard length about 1000 mm.



Ordering Details: e.g.: Product No. 619 902 02, Key Steel DIN 6880, Stainless, 2 x 2 x 1000 mm

Product No.	b ^{h9} mm	h ^{h11} mm	Weight g
619 902 02	2	2	31
619 903 03	3	3	70
619 904 04	4	4	125
619 905 05	5	5	195
619 906 06	6	6	280
619 908 07	8	7	438

Product No.	b ^{h9} mm	h ^{h11} mm	Weight g
619 910 08	10	8	626
619 912 08	12	8	750
619 914 09	14	9	984
619 916 10	16	10	1250
619 918 11	18	11	1560
619 920 12	20	12	1880

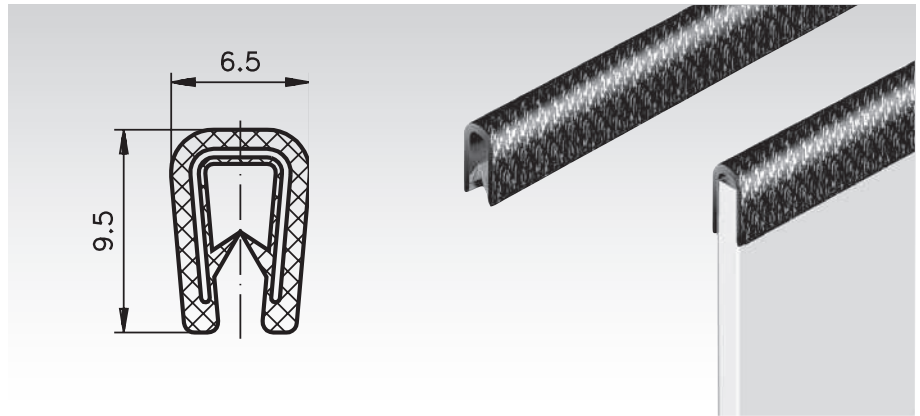
Edge Trims

Material: PVC/Steel.

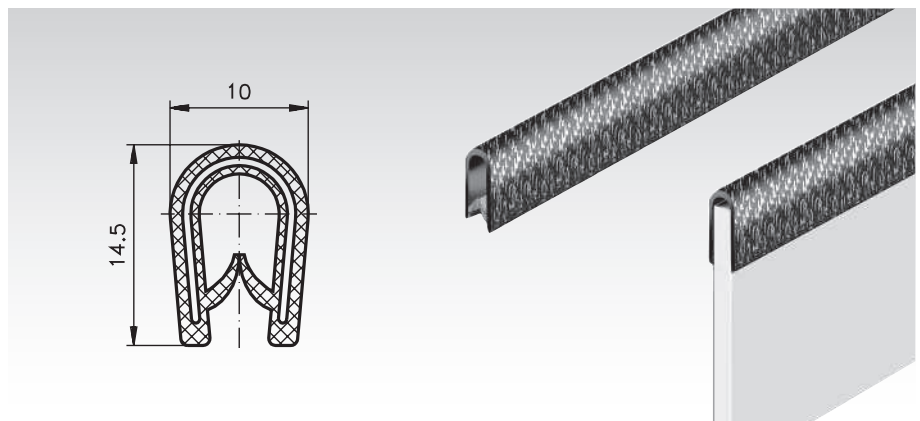
Edge trims simplify the protection of edges, save time in preparatory and subsequent work, and cover sharp edges. They also have a decorative effect.

The substructure of the edge trim contains steel metal clips or a wire construction. This means they have a strong hold even if there are radii or bent parts. Edge trims are mounted on the edges to be covered by hand or with a plastic mallet. Glues or special mounting parts are not required.

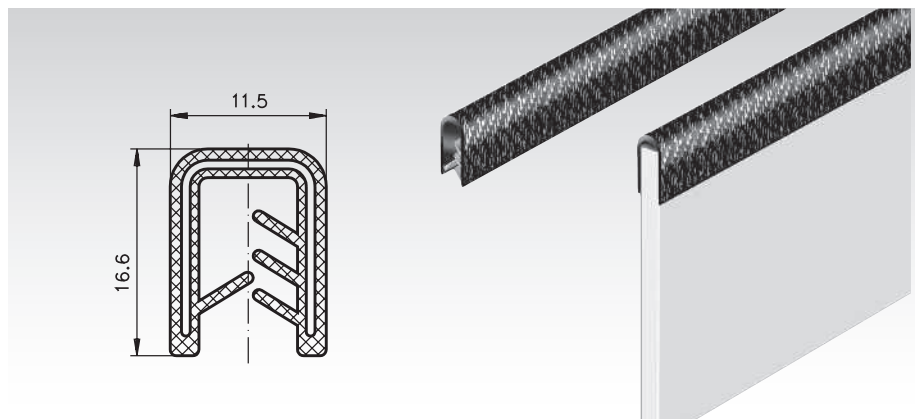
Ordering Details: e.g.: Product No. 687 010 00,
Edge Trim



Product No.	Clamp Range mm	Colour	Maximum Length m	Weight g/m
687 010 00	1,0 - 2,0	black	100	65



Product No.	Clamp Range mm	Colour	Maximum Length m	Weight g/m
687 020 00	1,0 - 4,0	black	50	140

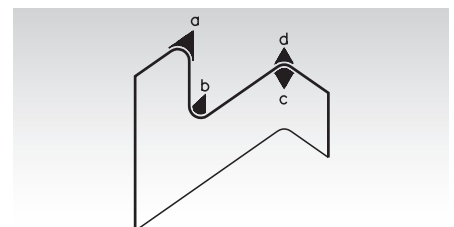


Product No.	Clamp Range mm	Colour	Maximum Length m	Weight g/m
687 030 00	4,0 - 6,0	black	100	160

Minimum Bending Radii

Please note that the stated minimum bending radii are only reference values that can vary depending on the material, the clamp range and the application in which the profile is used.

Product No.	a mm	b mm	c mm	d mm
687 010 00	15	15	10	10
687 020 00	30	20	20	20
687 030 00	50	40	30	30



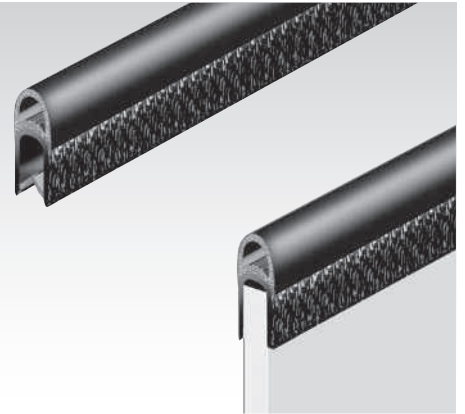
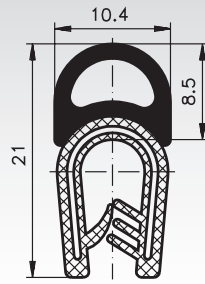
Trim Seals

Material: PVC/EPDM/Steel.

Trim seals are a combination of edge trims made from PVC with a substructure of metal clips and sealed on EPDM-foam rubber.

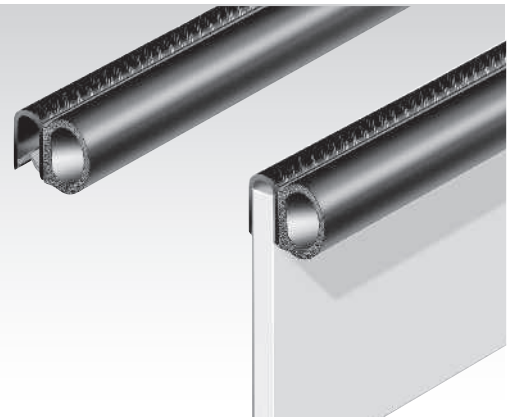
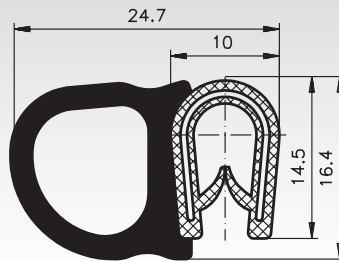
These profiles serve a double function:

1. Easy covering of construction-conditioned sharp edges.
2. The sealing effect. The foam rubber strips or hollow section are highly flexible and can seal doors and lids. The mounting is done as with edge trims.

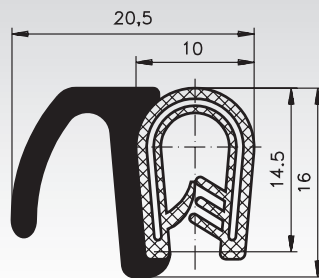


Ordering Details: e.g.: Product No. 687 140 00, Trim Seal

Product No.	Clamp Range mm	Colour	Maximum Length m	Weight g/m
687 140 00	1,0 - 4,0	black	100	175



Product No.	Clamp Range mm	Colour	Maximum Length m	Weight g/m
687 150 00	1,0 - 4,0	black	100	180

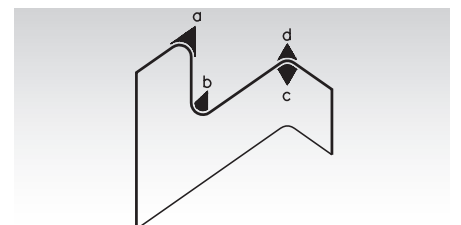


Product No.	Clamp Range mm	Colour	Maximum Length m	Weight g/m
687 160 00	1,0 - 4,0	black	100	170

Minimum Bending Radii

Please note that the stated minimum bending radii are only reference values that can vary depending on the material, the clamp range and the application in which the profile is used.

Product No.	a mm	b mm	c mm	d mm
687 140 00	70	80	15	15
687 150 00	50	30	100	120
687 160 00	40	40	150	150



Automatic Lubricators perma® (Housing Made from Steel Sheet)

Function

Tightening the activating screw makes the gas generator drop into the electrolyte fluid, where it starts a chemical reaction that builds up pressure and causes the piston to move forward. The lubricant is continuously injected into the lubrication point. When the lubrication cartridge is empty, the coloured piston becomes clearly visible. The initial delay between activation and the first discharge of lubricant depends on the perma® type. Lubricant volume 120 cm³. The activator screw and the lubricator have to be ordered separately.

perma® Activator Screws

Material: Body of screw from plastic.

The lubrication period is determined by the different coloured activator screws. The lubricator has to be ordered separately.

Ordering Details: e.g.: Product No. 680 510 01, Perma Activator Screw Type 1

Product No.	Type	Period of Lubrication	Colour
680 510 01	1	1 Month	yellow
680 510 03	3	3 Months	green
680 510 06	6	6 Months	red
680 510 12	12	12 Months	grey

perma® Lubricators

Material: Housing made from steel sheet.

The code for the lubricant contained is stamped into the bottom of the housing (e.g. SF 01 = all-purpose grease). The activator screw has to be ordered separately. Weight 265 g.

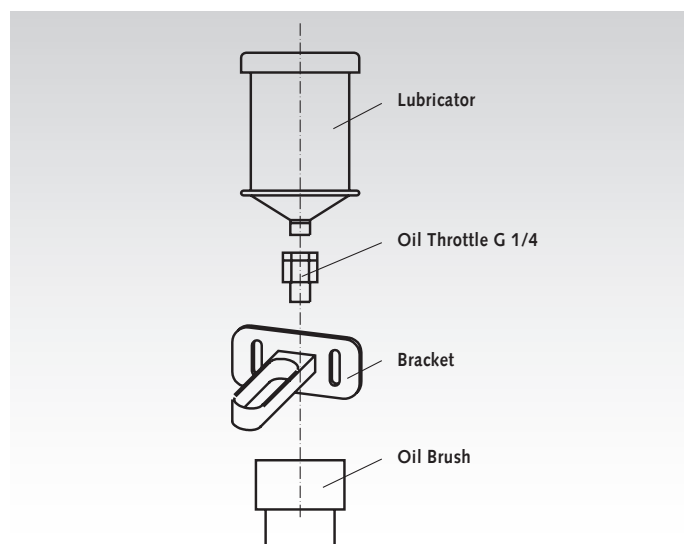
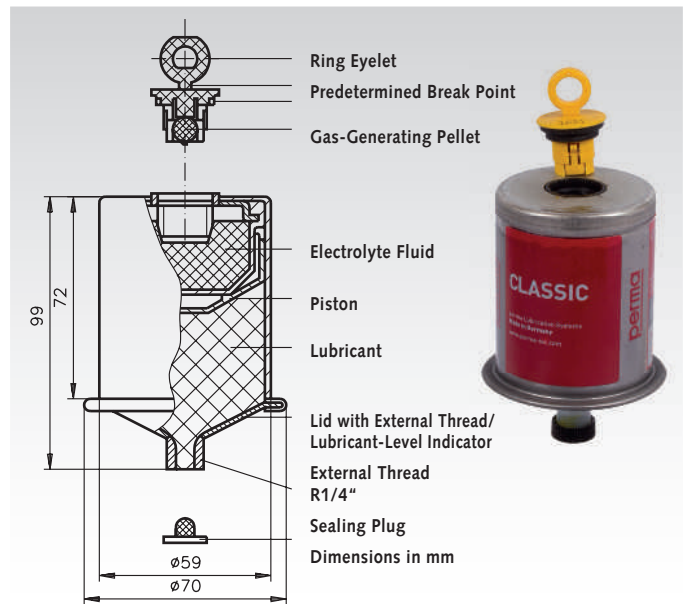
Ordering Details: e.g.: Product No. 680 500 01, Perma Lubricator Type SF01

Product No.	Type	Lubricant	DIN 51 502	NLGI-Grade	Thickener	Basis Oil	Temperature Range	Viscosity at +40°C	Recommendation of Application					
									Roller Bearings	Plain Bearings	Linear Motion	Gears and Racks	Spindle Drives	Sealings
680 500 01	SF01	Multipurpose Grease	KP2K-30	2	Li / Ca	Mineral	-30° / +130°C	220	X	X	X		X	X
680 500 02	SF02	Extreme Pressure Grease	KPF2K-30	2	Li + MoS ₂	Mineral	-30° / +120°C	105		X		X		
680 500 03	SF03	High Temperature Grease	KE1T-20	2	PHS + solids	Ester + PFPE	-20° / +220°C	420	X	X				
680 500 04	SF04	High Performance Grease	K1S-20	0/1	PHS	Mineral + PAO	-20° / +160°C	500	X	X	X		X	
680 500 05	SF05	High Temp./High Pressure	KPF1S-20	0/1	PHS + MoS ₂	Mineral + PAO	-20° / +160°C	500	X	X		X		
680 500 06	SF06	Liquid Grease	K0G-20	0	Al.-Kom.	Mineral	-20° / +130°C	220	X	X	X			X
680 500 08	SF08	High Speed Grease	KHC2N-50	2	Ca-Kom.	PAO	-40° / +140°C	100	X	X				
680 500 10	SF10	Food Grade Grease	K1K-40	1	Al.-Kom.	PAO	-20° / +220°C	150	X	X	X	X		
680 500 14	SO14	High Performance Oil	CLPE320	Oil	-	PAO + Ester	-20° / +250°C	320						X

Accessories

Product No.	Description Accessory	Weight g
680 540 00	Bracket	16
680 547 00	Oil throttle G 1/4	27
680 543 00	Extension G 1/4, 30 mm long	25
680 545 00	Oil brush Ø 20 mm, R 1/4 internal thread	34
680 546 00	Oil brush of horsehair, Width 30 x 40 mm long, R 1/4 internal thread	38

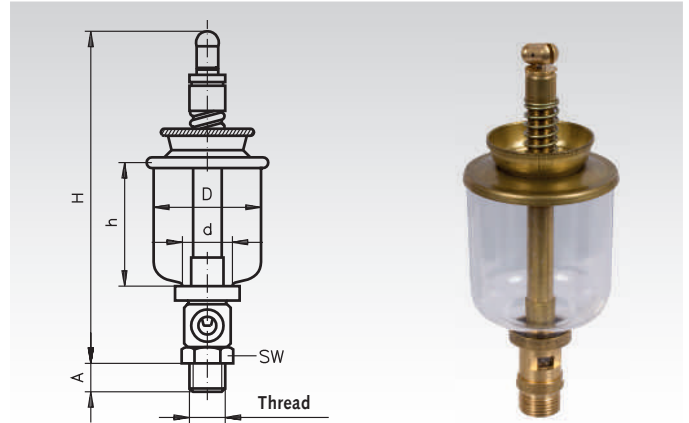
On request, the lubricator can also be supplied with transparent plastic housing.



Drip-Feed Oilers System Unikum with Adjustment from Top

Material: pickled brass. Vase glasses up to Ø 80 mm made from acrylic glass, above made from natural glass.

With instantaneous shutting off, with turnable replenishing bowl, easy visual inspection of drop fall.



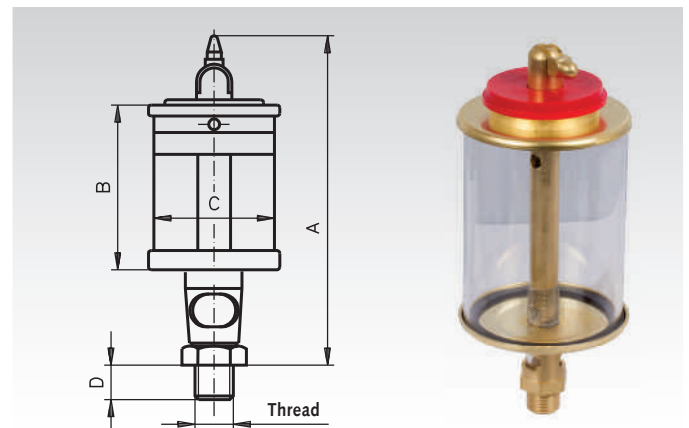
Ordering Details: e.g.: Product No. 680 401 00, Drip-Feed Oiler Unikum, R 1/4"

Product No. Complete Unit	Capacity cm ³	Thread Inch	A mm	D mm	d mm	H mm	h mm	Weight g	Product No. Spare glass	Weight g
680 401 00	20	R 1/4"	11	32	20	120	42	100	680 421 00	6
680 402 00	20	R 1/8"	11	32	20	120	42	100	680 422 00	6
680 403 00	35	R 1/4"	11	40	20	125	48	120	680 423 00	10
680 404 00	35	R 3/8"	11	40	20	130	48	120	680 424 00	10
680 405 00	65	R 3/8"	12	50	20	135	55	125	680 425 00	15
680 406 00	115	R 1/2"	14	60	28	165	72	200	680 426 00	35
680 407 00	200	R 1/2"	14	70	28	190	85	260	680 427 00	50
680 408 00	280	R 1/2"	14	80	28	190	95	420	680 428 00	70
680 409 00	450	R 3/4"	16	90	28	210	110	630	680 429 00	270
680 410 00	600	R 3/4"	16	100	28	225	120	730	680 430 00	400
680 411 00	880	R 3/4"	16	110	28	250	140	850	680 431 00	500

Drip-Feed Oilers UNI with Adjustment at Top

Material: Brass, nickel-plated. Glass cylinder made from acryl.

Advantages of these drip-feed oilers: drip rate can be precisely adjusted, instantaneous shutting off, stainless valve needle (brass), large filler spout with dust cover.



Ordering Details: e.g.: Product No. 680 202 00, Drip-Feed Oiler UNI, R 1/8"

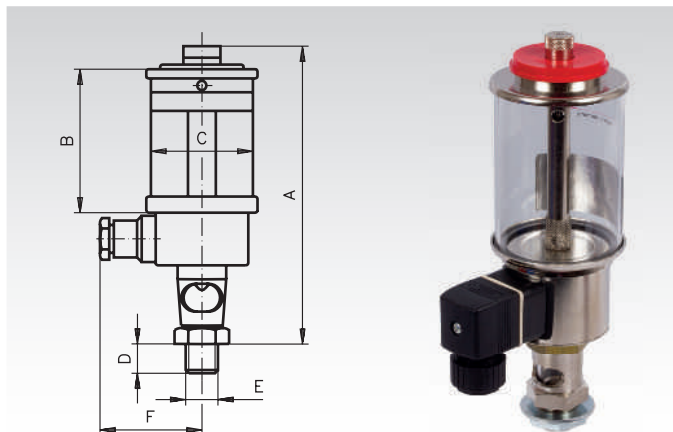
Product No. Complete Unit	Capacity cm ³	Thread Inch	A mm	B mm	C mm	D mm	Weight g	Product No. Spare Glass	Weight g
680 202 00	10	R 1/8"	80	39	25	9	100	680 212 00	3
680 203 00	20	R 1/8"	85	42	30	9	100	680 213 00	5
680 204 00	36	R 1/4"	120	54	40	11	160	680 113 00	9
680 205 00	84	R 1/4"	120	55	50	11	200	680 115 00	17
680 206 00	140	R 1/4"	130	65	60	11	240	680 117 00	40
680 207 00	200	R 1/4"	150	85	60	11	260	680 118 00	40
680 208 00	500	R 1/2"	185	110	80	13	500	680 219 00	80
680 209 00	1000	R 1/2"	210	135	100	13	620	680 220 00	120

Electric Drip-Feed Oilers ELO

Material: Brass nickel-plated. Glass cylinder made from acryl.

Voltage and frequency of the electromagnetic valve:
230V, 50Hz or 24V DC.

Drip rate normal: about 45 drops per 1 ml.



Ordering Details: e.g.: Product No. 680 301 00, Oiler ELO, 230 V, 50Hz, G 1/2"

Product No. 230V, 50Hz	Product No. 24V DC	Capacity cm ³	E Inch	A mm	B mm	C mm	D mm	F mm	Weight g	Product No. Spare Glass	Weight g
680 301 00	680 331 00	140	G 1/2"	163	60	60	15	67	670	680 117 00	40
680 302 00	680 332 00	200	G 1/2"	180	80	60	15	67	680	680 118 00	40
680 304 00	680 334 00	500	G 1/2"	209	100	80	15	67	820	680 219 00	80
680 305 00	680 335 00	1000	G 1/2"	235	120	100	15	67	960	680 220 00	120
680 306 00	680 336 00	2000	G 1/2"	270	150	133	15	67	1320	680 321 00	220
680 307 00	680 337 00	3000	G 1/2"	310	180	150	15	67	1580	680 322 00	400

Other than the manual drip-feed oiler, which also drips when the machine has stopped, the electric drip-feed oiler only drips as long as the machine is running. When the machine stops, the electric drip-feed oiler is also automatically shut off, as the oiler is controlled via the machine programme. Finest dosing of drops is possible - by turning a knurled nut at the top part of the oiler.

Almost all liquids can be dosed drop by drop, provided they are not mixed with solid matters. It is also suited for other media, provided they do not thicken with heat. Attention must be paid to the compatibility with acrylic glass and buna N used as sealing material. (possibly natural glass and vitone sealings on request)

Rolling bearings are to find:

- in this catalog page 416
- on the internet at www.maedler.de



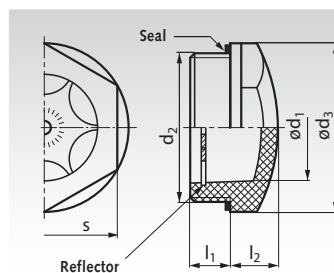
Oil-Level Sight Glasses 541, Plastic

Material: Housing: Polyamid (PA-T) non-ageing, highly transparent. Reflector: Aluminium, anodized in natural colour.
Seal: Rubber NBR (Perbunan®).

Temperature resistant up to 100°C.

High strength. Resistant against oil, diesel and solvents.

Not resistant against alcohol. At mounting wall thickness below 4mm, a nut is required.



Ordering Details: e.g.: Product No. 681 835 01, Oil-Level Sight Glass 541, G 1/4"

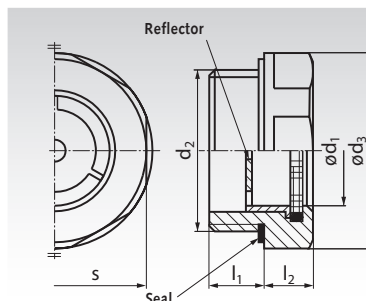
Product No.	d ₁ mm	d ₂ Thread	d ₃ ≈ mm	l ₁ mm	l ₂ mm	s mm	T _A * Nm	Weight g
681 835 01	9	G 1/4"	18	10	6	15	2 - 3	1,8
681 835 02	11	G 3/8"	22	8	7	19	3 - 5	4
681 835 03	11	M16 x 1,5	22	8	7	19	2 - 3	3
681 835 04	14	G 1/2"	26	10	8	22	4 - 6	5
681 835 05	14	M20 x 1,5	26	10	8	22	8 - 10	4
681 835 06	18	M25 x 1,5	31	8	10	27	8 - 10	9
681 835 07	19	M26 x 1,5	31	13	9	27	8 - 10	8
681 835 08	20	G 3/4"	31	10	10	27	6 - 8	6
681 835 09	20	M27 x 1,5	31	10	10	27	8 - 10	10
681 835 10	22	M30 x 1,5	35	9	10	30	8 - 10	6
681 835 11	25	G 1"	40	11	10	34	8 - 10	12
681 835 12	25	M35 x 1,5	40	11	10	34	8 - 10	13
681 835 13	30	G 1 1/4"	47	12	13	41	8 - 10	20
681 835 14	30	M40 x 1,5	47	12	13	41	8 - 10	20

* Fastening torque.

Oil-Level Sight Glasses 743 and 743.1, Aluminium

Material oil-level sight glass 743: Housing: Aluminium, polished. Reflector: Thermoplast. Temperature resistant up to 100°C. Sight glass: Float-Glass. Seals: Rubber NBR (Perbunan®).

Material oil-level sight glass 743.1: as oil-level sight glass 743, but temperature resistant up to 180°C. Sight glass: tempered glass. Seals: Synthetic rubber FPM (Viton®), identification by non-black finish.



Ordering Details: e.g.: Product No. 681 801 00, Oil-Level Sight Glass 743, G 3/8"

Product No. 743	Product No. 743.1	d ₁ mm	d ₂ Thread	d ₃ ≈ mm	l ₁ mm	l ₂ mm	s mm	Weight g
681 801 00	681 821 00	11	G 3/8"	22	8	7,5	20	9
681 802 00	681 822 00	11	M16 x 1,5	22	8	7,5	20	8
681 803 00	681 823 00	14	G 1/2"	26	8,5	7,5	23	11
681 804 00	681 824 00	14	M20 x 1,5	26	8,5	7,5	23	10
681 805 00	681 825 00	18	G 3/4"	32	9	8	30	18
681 806 00	681 826 00	18	M26 x 1,5	32	9	8	30	18
681 807 00	681 827 00	24	G 1"	40	11	8,5	36	26
681 808 00	681 828 00	24	M33 x 1,5	40	11	8,5	36	26
681 809 00	681 829 00	32	G 1 1/4"	50	12	9	46	42
681 810 00	681 830 00	32	M40 x 1,5	50	12	9	46	39

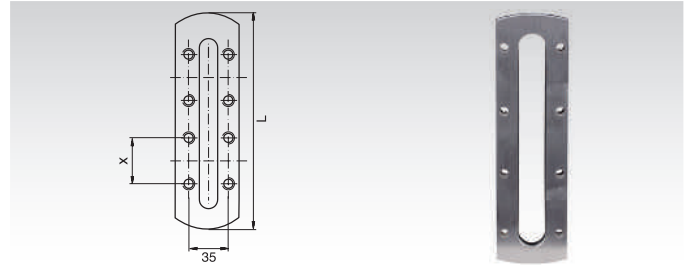
Oil-Level Windows SR

Material: Aluminium with inserted disk of natural glass and Perbunan® seal.

Rectangular shape, clear readability.

Also diesel-oil resistant.

Temperature resistant up to +120°C.

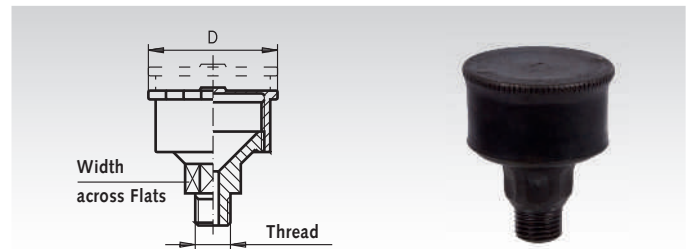


Ordering Details: e.g.: Product No. 681 130 00, Oil-Level Window SR 60, 39 x 18 mm

Product No.	Type	Sight mm	L x Width mm	Mounting Holes Quantity x mm	X mm	Weight g
681 130 00	SR 60	39 x 18	60 x 45	4 x Ø 5,5	28	55
681 131 00	SR 80	59 x 18	80 x 45	4 x Ø 5,5	45	84
681 132 00	SR 100	79 x 18	100 x 45	6 x Ø 5,5	35	108
681 133 00	SR 125	104 x 18	125 x 45	6 x Ø 5,5	45	135
681 134 00	SR 160	139 x 18	160 x 45	8 x Ø 5,5	40	170
681 135 00	SR 200	179 x 18	200 x 45	10 x Ø 5,5	40	210
681 136 00	SR 250	229 x 18	250 x 45	12 x Ø 5,5	40	270

Stauffer Grease Boxes DIN 3411

Material: Steel, blued. Top and bottom part drawn, with rolled spigot screw thread.



Ordering Details: e.g.: Product No. 680 001 00, Stauffer Grease Box DIN 3411, Gr. 1

Product No.	Size	Thread Inch	Width Across Flats mm	Outer Ø D mm	Weight g
680 001 00	1	R 1/8"	12	17,5	15
680 002 00	2	R 1/4"	17	24	30
680 003 00	3	R 1/4"	17	32,5	45
680 004 00	4	R 1/4"	17	38	55
680 005 00	5	R 1/4"	17	49,5	85
680 006 00	6	R 1/4"	17	58	115

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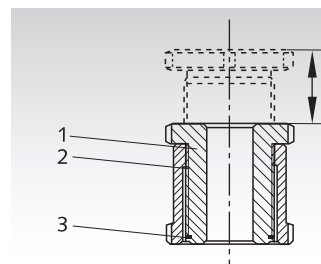
Precision Levelling Adjusters

The precision levelling adjusters consist of a threaded mounting bolt (1) and a nut base (2). The fine thread design permits a precise adjustment as well as easy readjustment using the wrench spanner HS (page 594).

Under static load, the adjusted level is firmly fixed by tightening the mounting bolt. The Levellers with Locking Nut are recommended for dynamic loads or when no bolts are used for the mounting.

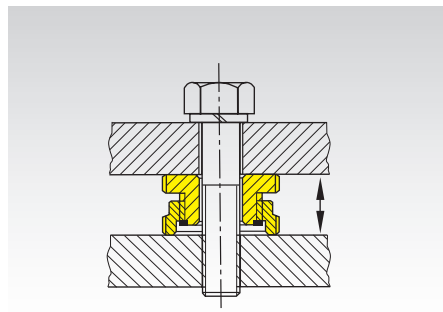
The safety screw features (3) serves as an end stop for maximum adjustment.

The use of Precision Adjusters KAE/KAKE, KVS/KVSK and KAS facilitates precise adjustment of non-parallel surfaces.



Precision Adjuster NAE and NAEK

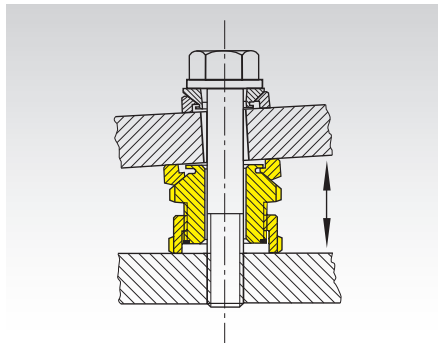
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- For parallel surfaces.
- Low overall height with short adjustment travel.
- Type NAE (without lock nut):
From 15mm (plus 4mm adjustment travel) to 48mm (plus 14mm adjustment travel).
- Type NAEK (with lock nut):
From 20mm (plus 4mm adjustment travel) to 63mm (plus 14mm adjustment travel).

Ball Head Precision Adjuster KAE and KAEK

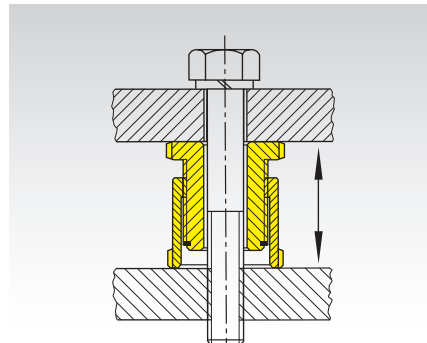
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- For non-parallel surfaces up to 4° slope.
- Low overall height with short adjustment travel.
- Type KAE (without lock nut):
From 22mm (plus 4mm adjustment travel) to 72mm (plus 14mm adjustment travel).
- Type KAEK (with lock nut):
From 27mm (plus 4mm adjustment travel) to 87mm (plus 14mm adjustment travel).

Precision Leveller HVS and HVSK

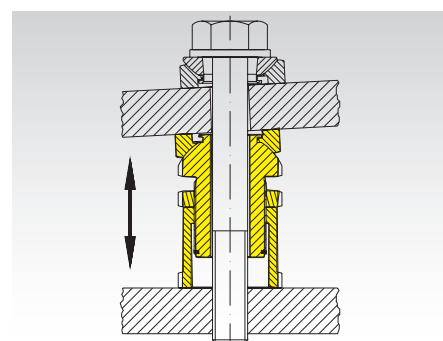
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- For parallel surfaces.
- Larger overall height with more adjustment travel.
- Type HVS (without lock nut):
From 28mm (plus 15mm adjustment travel) to 95 mm (plus 55mm adjustment travel).
- Type HVSK (with lock nut):
From 33mm (plus 10mm adjustment travel) to 110mm (plus 40mm adjustment travel).

Ball Head Precision Adjuster KVS and KVSK

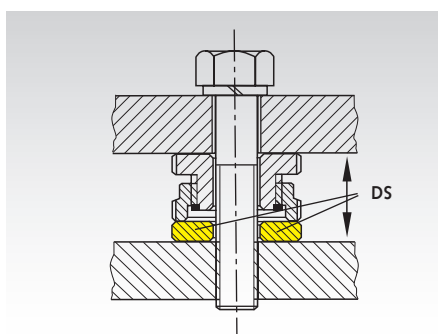
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- For non-parallel surfaces up to 4° slope.
- Larger overall height with more adjustment travel.
- Type KVS (without lock nut):
From 35mm (plus 15mm adjustment travel) to 119mm (plus 55mm adjustment travel).
- Type KVSK (with lock nut):
From 40mm (plus 10mm adjustment travel) to 134mm (plus 40mm adjustment travel).

Spacer DS

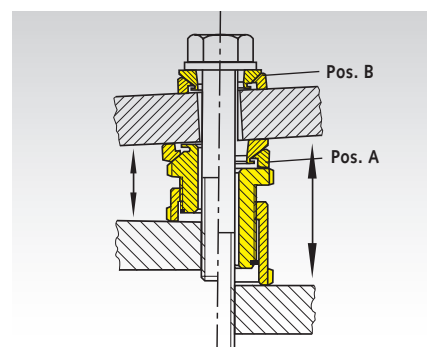
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The Spacer **DS** is used to bridge gaps between the levelling adjuster and the bearing surface when the adjustment travel Δh is insufficient.

Ball Shim KAS

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Like the ball head precision adjusters KAE the ball shim **KAS** (Pos. A) facilitates adjustment of non-parallel surfaces with an angle of inclination of up to 4°. If the angle of inclination $\alpha > 1^\circ$, the use of an additional ball shim (Pos. B) is recommended to assure a stable support of the bolt head.

Notes on Mounting

All models can be assembled with a normal mounting screw, to prevent a change of position. Suitable screw sizes are provided in the dimensions tables. The screw length depends on the customers components. That's why the

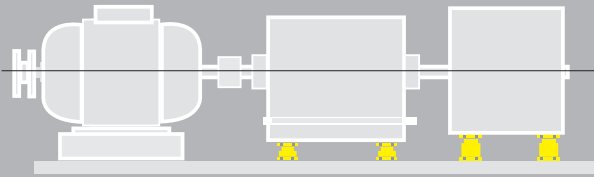
screw is not included. The adjustment thread is greased on all models (with high quality long-life grease), to prevent seizing. This means that loosening / adjustment is possible even after prolonged use.

All precision levelling adjusters have a safety screw to keep them from falling apart.

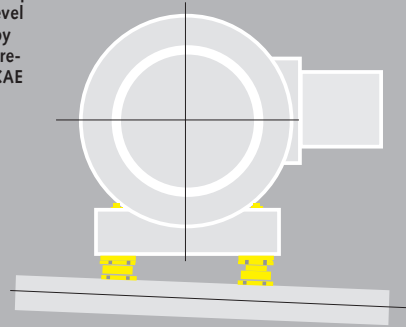
Precision levelling adjusters

Examples

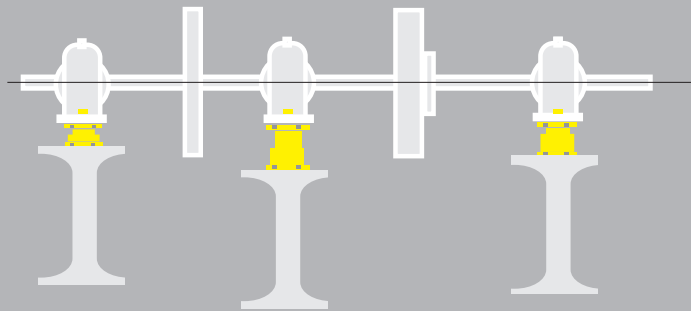
Precise fixation of components at an exact level using the Precision Levelling Adjusters NAE or HVS



With an incline of up to about 4° the level can be adjusted by using ball head precision adjusters KAE or KVS.



Level adjustment if there are various substructures.



Load Table (static)

Type (Size)	Mounting Screw	s t a n d a r d				s t a i n l e s s			
		Torque ¹⁾ kN	Preload ²⁾ kN	F _{add.} ³⁾ kN	F _{tot.} ⁴⁾ kN	Torque ¹⁾ kN	Preload ²⁾ kN	F _{add.} ³⁾ kN	F _{tot.} ⁴⁾ kN
15-6,6	M6	10,1	9,3	30,7	40	7,5	6,84	20,30	27,1
20-6,6	M6	10,1	9,3	55,7	65	7,5	6,84	36,56	43,4
20-9,0	M8	24,6	17,0	48,0	65	18,2	12,5	30,90	43,4
20-11	M10	48	27,1	37,9	65	36,5	20	23,41	43,4
30-11	M10	48	27,1	92,9	120	36,5	20	64,01	84
30-13,5	M12	84	39,6	80,4	120	62	29	54,82	84
30-17,5	M16	206	74,5	45,5	120	153	55	28,90	84
40-17,5	M16	206	74	136	210	153	55	92,90	148
40-22	M20	415	120	90	210	300	89	59,10	148
40-26	M24	714	173	37	210	515	128	20,30	148
50-22	M20	415	120	210	330	300	89	136	225
50-26	M24	714	173	157	330	515	128	97	225
50-33	M30	1420	277	53	330	1031	204	20,60	225
60-26	M24	714	173	322	495	515	128	195	323
60-33	M30	1420	277	218	495	1031	204	118	323
60-39	M36	2482	394	101	495	1793	285	38	323
80-39	M36	2482	394	466 (526) ⁵⁾	860 (920) ⁵⁾	1793	285	261	546

¹⁾ Fastening torque (for screw strength 8.8 for standard versions or 6.8 for stainless version).

²⁾ The preload of any mounting screw used (tensile strength 8.8 for standard versions or 6.8 for stainless version).

³⁾ F_{add.} = max. permissible static load, in addition to the preload of a mounting screw.

⁴⁾ F_{tot.} = max. permissible total static load.

⁵⁾ Bracketed values apply to HVS / HVS-K and KVS / KVS-K.

Precision Levelling Adjusters

Precision Adjusters NAE

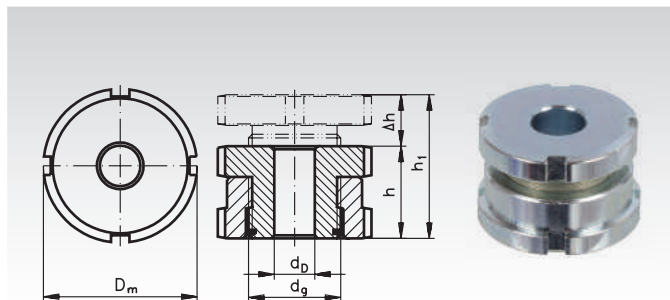
Material:

Standard version: 42CrMo4V, No. 1.7225,
Surface zinc plated and chromated.

Stainless version: X10CrNiS18.9, No. 1.4305.



- For parallel surfaces.
- Low overall height with short adjustment travel.
- Without lock nut.



Ordering Details: e.g.: Product No. 686 305 00, NAE 15-6.6 standard

Product No. standard	Product No. stainless	Type	matching screw	h mm	h ₁ mm	Δh mm	D _m mm	d _g mm	d _D mm	F _{tot.} * kN	F _{add.} * kN	Weight g
686 305 00	686 993 05	NAE 15- 6,6	M6	15	19	4	25	M15x1,0	6,6	40	30,7	43
686 310 00	686 993 10	NAE 20- 6,6	M6	18	23	5	32	M20x1,0	6,6	65	55,7	92
686 315 00	686 993 15	NAE 20- 9,0	M8	18	23	5	32	M20x1,0	9,0	65	48,0	90
686 320 00	686 993 20	NAE 20-11,0	M10	18	23	5	32	M20x1,0	11,0	65	37,9	84
686 325 00	686 993 25	NAE 30-11,0	M10	22	29	7	45	M30x1,5	11,0	120	92,9	219
686 330 00	686 993 30	NAE 30-13,5	M12	22	29	7	45	M30x1,5	13,5	120	80,4	210
686 335 00	686 993 35	NAE 30-17,5	M16	22	29	7	45	M30x1,5	17,5	120	45,5	196
686 340 00	686 993 40	NAE 40-17,5	M16	28	37	9	58	M40x1,5	17,5	210	136,0	457
686 345 00	686 993 45	NAE 40-22,0	M20	28	37	9	58	M40x1,5	22,0	210	90,0	425
686 350 00	686 993 50	NAE 40-26,0	M24	28	37	9	58	M40x1,5	26,0	210	37,0	387
686 355 00	686 993 55	NAE 50-22,0	M20	33	43	10	70	M50x1,5	22,0	330	210,0	780
686 360 00	686 993 60	NAE 50-26,0	M24	33	43	10	70	M50x1,5	26,0	330	157,0	741
686 365 00	686 993 65	NAE 50-33,0	M30	33	43	10	70	M50x1,5	33,0	330	53,0	656
686 370 00	686 993 70	NAE 60-26,0	M24	38	50	12	80	M60x2,0	26,0	495	322,0	1135
686 375 00	686 993 75	NAE 60-33,0	M30	38	50	12	80	M60x2,0	33,0	495	218,0	1060
686 380 00	686 993 80	NAE 60-39,0	M36	38	50	12	80	M60x2,0	39,0	495	101,0	965
686 385 00	686 993 85	NAE 80-39,0	M36	48	62	14	105	M80x2,0	39,0	860	466,0	2500

Other sizes on request.

Precision Adjusters NAEK

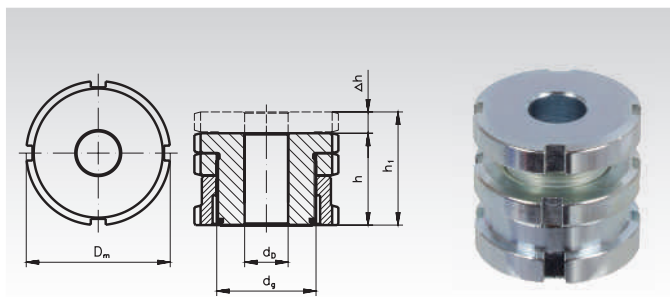
Material:

Standard version: 42CrMo4V, No. 1.7225,
Surface zinc plated and chromated.

Stainless version: X10CrNiS18.9, No. 1.4305.



- For parallel surfaces.
- Low overall height with short adjustment travel.
- With lock nut.



Ordering Details: e.g.: Product No. 686 605 00, NAEK 15-6.6 standard

Product No. standard	Product No. stainless	Type	matching screw	h mm	h ₁ mm	Δh mm	D _m mm	d _g mm	d _D mm	F _{tot.} * kN	F _{add.} * kN	Weight g
686 605 00	686 996 05	NAEK 15- 6,6	M6	20	24	4	25	M15x1,0	6,6	40	30,7	59
686 610 00	686 996 10	NAEK 20- 6,6	M6	24	29	5	32	M20x1,0	6,6	65	55,7	129
686 615 00	686 996 15	NAEK 20- 9,0	M8	24	29	5	32	M20x1,0	9,0	65	48,0	121
686 620 00	686 996 20	NAEK 20-11,0	M10	24	29	5	32	M20x1,0	11,0	65	37,9	116
686 625 00	686 996 25	NAEK 30-11,0	M10	29	36	7	45	M30x1,5	11,0	120	92,9	299
686 630 00	686 996 30	NAEK 30-13,5	M12	29	36	7	45	M30x1,5	13,5	120	80,4	287
686 635 00	686 996 35	NAEK 30-17,5	M16	29	36	7	45	M30x1,5	17,5	120	45,5	262
686 640 00	686 996 40	NAEK 40-17,5	M16	37	46	9	58	M40x1,5	17,5	210	136,0	628
686 645 00	686 996 45	NAEK 40-22,0	M20	32	46	9	58	M40x1,5	22,0	210	90,0	586
686 650 00	686 996 50	NAEK 40-26,0	M24	37	46	9	58	M40x1,5	26,0	210	37,0	543
686 655 00	686 996 55	NAEK 50-22,0	M20	44	54	10	70	M50x1,5	22,0	330	210,0	1096
686 660 00	686 996 60	NAEK 50-26,0	M24	44	54	10	70	M50x1,5	26,0	330	157,0	1038
686 665 00	686 996 65	NAEK 50-33,0	M30	44	54	10	70	M50x1,5	33,0	330	53,0	932
686 670 00	686 996 70	NAEK 60-26,0	M24	49	61	12	80	M60x2,0	26,0	495	322,0	1533
686 675 00	686 996 75	NAEK 60-33,0	M30	49	61	12	80	M60x2,0	33,0	495	218,0	1428
686 680 00	686 996 80	NAEK 60-39,0	M36	49	61	12	80	M60x2,0	39,0	495	101,0	1301
686 685 00	686 996 85	NAEK 80-39,0	M36	63	77	14	105	M80x2,0	39,0	860	466,0	3469

Other sizes on request.

* Values apply to standard version. Values for stainless version, see page 589.

F_{tot.} = max. load. (incl. preload from any mounting screw).

F_{add.} = Load after subtracting the preload of any mounting screw.

Precision Levelling Adjusters

Ball Head Precision Adjusters KAE

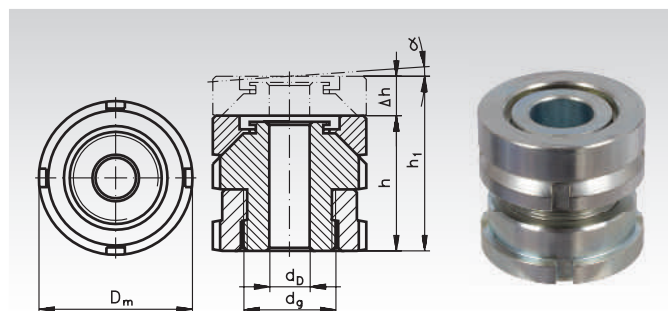
Material:

Standard version: 42CrMo4V, No. 1.7225,
Surface zinc plated and chromated.

Stainless version: X10CrNiS18.9, No. 1.4305.



- For non-parallel surfaces up to 4° slope.
- Low overall height with short adjustment travel.
- Without lock nut.



Ordering Details: e.g.: Product No. 686 405 00, KAE 15-6.6 standard

Product No. standard	Product No. stainless	Type	matching screw	h mm	h ₁ mm	Δh mm	D _m mm	d _g mm	d _D mm	α approx.	F _{tot.} * kN	F _{add.} * kN	Weight g
686 405 00	686 994 05	KAE 15- 6,6	M6	22	26	4	25	M15x1,0	6,6	4°	40	30,7	64
686 410 00	686 994 10	KAE 20- 6,6	M6	26	31	5	32	M20x1,0	6,6	4°	65	55,7	132
686 415 00	686 994 15	KAE 20- 9,0	M8	26	31	5	32	M20x1,0	9,0	4°	65	48,0	126
686 420 00	686 994 20	KAE 20-11,0	M10	26	31	5	32	M20x1,0	11,0	4°	65	37,9	120
686 425 00	686 994 25	KAE 30-11,0	M10	34	41	7	45	M30x1,5	11,0	4°	120	92,9	340
686 430 00	686 994 30	KAE 30-13,5	M12	34	41	7	45	M30x1,5	13,5	4°	120	80,4	324
686 435 00	686 994 35	KAE 30-17,5	M16	34	41	7	45	M30x1,5	17,5	4°	120	45,5	299
686 440 00	686 994 40	KAE 40-17,5	M16	44	53	9	58	M40x1,5	17,5	4°	210	136,0	720
686 445 00	686 994 45	KAE 40-22,0	M20	44	53	9	58	M40x1,5	22,0	4°	210	90,0	667
686 450 00	686 994 50	KAE 40-26,0	M24	44	53	9	58	M40x1,5	26,0	4°	210	37,0	622
686 455 00	686 994 55	KAE 50-22,0	M20	50	60	10	70	M50x1,5	22,0	4°	330	210,0	1225
686 460 00	686 994 60	KAE 50-26,0	M24	50	60	10	70	M50x1,5	26,0	4°	330	157,0	1170
686 465 00	686 994 65	KAE 50-33,0	M30	50	60	10	70	M50x1,5	33,0	4°	330	53,0	1043
686 470 00	686 994 70	KAE 60-26,0	M24	56	68	12	80	M60x2,0	26,0	4°	495	322,0	1666
686 475 00	686 994 75	KAE 60-33,0	M30	56	68	12	80	M60x2,0	33,0	4°	495	218,0	1000
686 480 00	686 994 80	KAE 60-39,0	M36	56	68	12	80	M60x2,0	39,0	4°	495	101,0	1181
686 485 00	686 994 85	KAE 80-39,0	M36	72	86	14	105	M80x2,0	39,0	4°	860	466,0	3400

Other sizes on request.

Ball Head Precision Adjusters KAEK

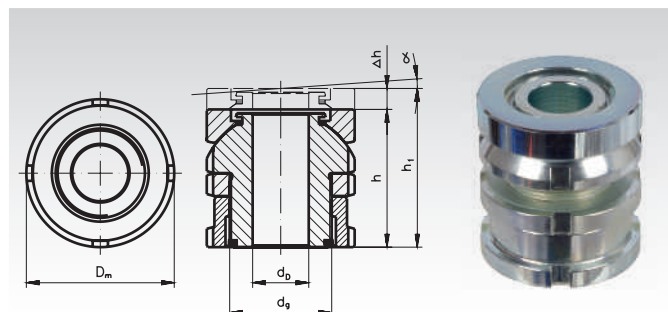
Material:

Standard version: 42CrMo4V, No. 1.7225,
Surface zinc plated and chromated.

Stainless version: X10CrNiS18.9, No. 1.4305.



- For non-parallel surfaces up to 4° slope.
- Low overall height with short adjustment travel.
- With lock nut.



Ordering Details: e.g.: Product No. 686 705 00, KAEK 15-6.6 standard

Product No. standard	Product No. stainless	Type	matching screw	h mm	h ₁ mm	Δh mm	D _m mm	d _g mm	d _D mm	α approx.	F _{tot.} * kN	F _{add.} * kN	Weight g
686 705 00	686 997 05	KAEK 15- 6,6	M6	27	31	4	25	M15x1,0	6,6	4°	40	30,7	84
686 710 00	686 997 10	KAEK 20- 6,6	M6	32	37	5	32	M20x1,0	6,6	4°	65	55,7	168
686 715 00	686 997 15	KAEK 20- 9,0	M8	32	37	5	32	M20x1,0	9,0	4°	65	48,0	166
686 720 00	686 997 20	KAEK 20-11,0	M10	32	37	5	32	M20x1,0	11,0	4°	65	37,9	153
686 725 00	686 997 25	KAEK 30-11,0	M10	41	48	7	45	M30x1,5	11,0	4°	120	92,9	421
686 730 00	686 997 30	KAEK 30-13,5	M12	41	48	7	45	M30x1,5	13,5	4°	120	80,4	389
686 735 00	686 997 35	KAEK 30-17,5	M16	41	48	7	45	M30x1,5	17,5	4°	120	45,5	356
686 740 00	686 997 40	KAEK 40-17,5	M16	53	62	9	58	M40x1,5	17,5	4°	210	136,0	847
686 745 00	686 997 45	KAEK 40-22,0	M20	53	62	9	58	M40x1,5	22,0	4°	210	90,0	782
686 750 00	686 997 50	KAEK 40-26,0	M24	53	62	9	58	M40x1,5	26,0	4°	210	37,0	720
686 755 00	686 997 55	KAEK 50-22,0	M20	61	71	10	70	M50x1,5	22,0	4°	330	210,0	1312
686 760 00	686 997 60	KAEK 50-26,0	M24	61	71	10	70	M50x1,5	26,0	4°	330	157,0	1238
686 765 00	686 997 65	KAEK 50-33,0	M30	61	71	10	70	M50x1,5	33,0	4°	330	53,0	1082
686 770 00	686 997 70	KAEK 60-26,0	M24	67	79	12	80	M60x2,0	26,0	4°	495	322,0	1538
686 775 00	686 997 75	KAEK 60-33,0	M30	67	79	12	80	M60x2,0	33,0	4°	495	218,0	1367
686 780 00	686 997 80	KAEK 60-39,0	M36	67	79	12	80	M60x2,0	39,0	4°	495	101,0	1194
686 785 00	686 997 85	KAEK 80-39,0	M36	87	101	14	105	M80x2,0	39,0	4°	860	466,0	4387

Other sizes on request.

* Values apply to standard version. Values for stainless version, see page 589.

F_{tot.} = max. load. (incl. preload from any mounting screw).

F_{add.} = Load after subtracting the preload of any mounting screw.

Precision Levelling Adjusters

Precision Levellers HVS

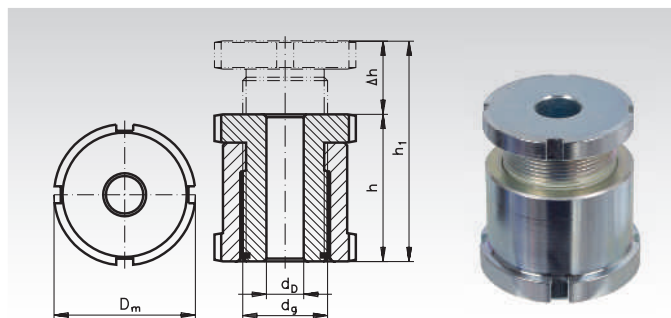
Material:

Standard Version: 42CrMo4V, Nr. 1.7225,
Surface zinc plated and chromated

Stainless Steel: X10CrNiS18.9, Nr. 1.4305.



- For parallel surfaces.
- Larger overall height with more adjustment travel.
- Without lock nut.



Ordering Details: e.g.: Product No. 686 105 00, HVS 15-6.6 Standard

Product No. standard	Product No. stainless	Type	Matching Screw	h mm	h ₁ mm	Δh mm	D _m mm	d _g mm	d _D mm	F _{tot.} * kN	F _{add.} * kN	Weight g
686 105 00	686 991 05	HVS 15- 6,6	M6	28	43	15	25	M15x1,0	6,6	40	30,7	68,1
686 110 00	686 991 10	HVS 20- 6,6	M6	35	55	20	32	M20x1,0	6,6	65	55,7	160,9
686 115 00	686 991 15	HVS 20- 9,0	M8	35	55	20	32	M20x1,0	9,0	65	48,0	151,6
686 120 00	686 991 20	HVS 20-11,0	M10	35	55	20	32	M20x1,0	11,0	65	37,9	143,5
686 125 00	686 991 25	HVS 30-11,0	M10	42	67	25	45	M30x1,5	11,0	120	92,9	372,0
686 130 00	686 991 30	HVS 30-13,5	M12	42	67	25	45	M30x1,5	13,5	120	80,4	349,3
686 135 00	686 991 35	HVS 30-17,5	M16	42	67	25	45	M30x1,5	17,5	120	45,5	318,4
686 140 00	686 991 40	HVS 40-17,5	M16	54	86	32	58	M40x1,5	17,5	210	136,0	782,0
686 145 00	686 991 45	HVS 40-22,0	M20	54	86	32	58	M40x1,5	22,0	210	90,0	730,0
686 150 00	686 991 50	HVS 40-26,0	M24	54	86	32	58	M40x1,5	26,0	210	37,0	666,4
686 155 00	686 991 55	HVS 50-22,0	M20	66	106	40	70	M50x1,5	22,0	330	210,0	1440,0
686 160 00	686 991 60	HVS 50-26,0	M24	66	106	40	70	M50x1,5	26,0	330	157,0	1360,0
686 165 00	686 991 65	HVS 50-33,0	M30	66	106	40	70	M50x1,5	33,0	330	53,0	1200,0
686 170 00	686 991 70	HVS 60-26,0	M24	76	126	50	80	M60x2,0	26,0	495	322,0	2167,0
686 175 00	686 991 75	HVS 60-33,0	M30	76	126	50	80	M60x2,0	33,0	495	218,0	1862,0
686 180 00	686 991 80	HVS 60-39,0	M36	76	126	50	80	M60x2,0	39,0	495	101,0	1671,0
686 185 00	686 991 85	HVS 80-39,0	M36	95	150	55	105	M80x2,0	39,0	920	526,0	4540,0

Other sizes available on request.

Precision Levellers with Lock Nut HVSK

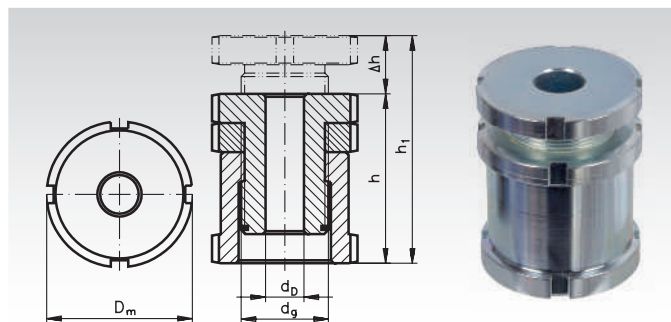
Material:

Standard Version: 42CrMo4V, Nr. 1.7225,
Surface zinc plated and chromated

Stainless Steel: X10CrNiS18.9, Nr. 1.4305.



- For parallel surfaces.
- Larger overall height with more adjustment travel.
- With lock nut.



Ordering Details: e.g.: Product No. 686 205 00, HVSK 15-6.6 standard

Product No. standard	Product No. stainless	Type	Matching Screw	h mm	h ₁ mm	Δh mm	D _m mm	d _g mm	d _D mm	F _{tot.} * kN	F _{add.} * kN	Weight g
686 205 00	686 992 05	HVSK 15- 6,6	M6	33	43	10	25	M15x1,0	6,6	40	30,7	78,0
686 210 00	686 992 10	HVSK 20- 6,6	M6	41	55	14	32	M20x1,0	6,6	65	55,7	179,2
686 215 00	686 992 15	HVSK 20- 9,0	M8	41	55	14	32	M20x1,0	9,0	65	48,0	172,3
686 220 00	686 992 20	HVSK 20-11,0	M10	41	55	14	32	M20x1,0	11,0	65	37,9	165,5
686 225 00	686 992 25	HVSK 30-11,0	M10	49	67	18	45	M30x1,5	11,0	120	92,9	409,1
686 230 00	686 992 30	HVSK 30-13,5	M12	49	67	18	45	M30x1,5	13,5	120	80,4	393,2
686 235 00	686 992 35	HVSK 30-17,5	M16	49	67	18	45	M30x1,5	17,5	120	45,5	365,0
686 240 00	686 992 40	HVSK 40-17,5	M16	63	86	23	58	M40x1,5	17,5	210	136,0	881,9
686 245 00	686 992 45	HVSK 40-22,0	M20	63	86	23	58	M40x1,5	22,0	210	90,0	822,9
686 250 00	686 992 50	HVSK 40-26,0	M24	63	86	23	58	M40x1,5	26,0	210	37,0	761,7
686 255 00	686 992 55	HVSK 50-22,0	M20	77	106	29	70	M50x1,5	22,0	330	210,0	1595,0
686 260 00	686 992 60	HVSK 50-26,0	M24	77	106	29	70	M50x1,5	26,0	330	157,0	1516,0
686 265 00	686 992 65	HVSK 50-33,0	M30	77	106	29	70	M50x1,5	33,0	330	53,0	1344,0
686 270 00	686 992 70	HVSK 60-26,0	M24	87	126	39	80	M60x2,0	26,0	495	322,0	2340,0
686 275 00	686 992 75	HVSK 60-33,0	M30	87	126	39	80	M60x2,0	33,0	495	218,0	2140,0
686 280 00	686 992 80	HVSK 60-39,0	M36	87	126	39	80	M60x2,0	39,0	495	101,0	1840,0
686 285 00	686 992 85	HVSK 80-39,0	M36	110	150	40	105	M80x2,0	39,0	920	526,0	4950,0

Other sizes on request.

* Values apply to standard version. Values for stainless version, see page 589.

F_{tot.} = max. load. (incl. preload from any mounting screw).

F_{add.} = Load after subtracting the preload of any mounting screw.

Precision Levelling Adjusters

Ball Head Precision Adjusters KVS

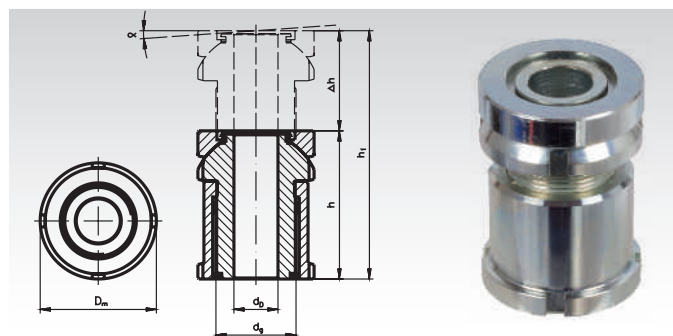
Material:

Standard version: 42CrMo4V, No. 1.7225,
Surface zinc plated and chromated.

Stainless version: X10CrNiS18.9, No. 1.4305.



- For non-parallel surfaces up to 4° slope.
- Larger overall height with more adjustment travel.
- Without lock nut.



Ordering Details: e.g.: Product No. 686 805 00, KVS 15-6.6 standard

Product No. standard	Product No. stainless	Type	matching screw	h mm	h ₁ mm	Δh mm	D _m mm	d _g mm	d _D mm	α approx.	F _{tot.} * kN	F _{add.} * kN	Weight g
686 805 00	686 998 05	KVS 15- 6,6	M6	35	50	15	25	M15x1,0	6,6	4°	40	30,7	100
686 810 00	686 998 10	KVS 20- 6,6	M6	43	63	20	32	M20x1,0	6,6	4°	65	55,7	205
686 815 00	686 998 15	KVS 20- 9,0	M8	43	63	20	32	M20x1,0	9,0	4°	65	48,0	195
686 820 00	686 998 20	KVS 20-11,0	M10	43	63	20	32	M20x1,0	11,0	4°	65	37,9	187
686 825 00	686 998 25	KVS 30-11,0	M10	54	79	25	45	M30x1,5	11,0	4°	120	92,9	492
686 830 00	686 998 30	KVS 30-13,5	M12	54	79	25	45	M30x1,5	13,5	4°	120	80,4	468
686 835 00	686 998 35	KVS 30-17,5	M16	54	79	25	45	M30x1,5	17,5	4°	120	45,5	437
686 840 00	686 998 40	KVS 40-17,5	M16	70	102	32	58	M40x1,5	17,5	4°	210	136,0	1042
686 845 00	686 998 45	KVS 40-22,0	M20	70	102	32	58	M40x1,5	22,0	4°	210	90,0	989
686 850 00	686 998 50	KVS 40-26,0	M24	70	102	32	58	M40x1,5	26,0	4°	210	37,0	925
686 855 00	686 998 55	KVS 50-22,0	M20	83	123	40	70	M50x1,5	22,0	4°	330	210,0	1897
686 860 00	686 998 60	KVS 50-26,0	M24	83	123	40	70	M50x1,5	26,0	4°	330	157,0	1816
686 865 00	686 998 65	KVS 50-33,0	M30	83	123	40	70	M50x1,5	33,0	4°	330	53,0	1652
686 870 00	686 998 70	KVS 60-26,0	M24	94	144	50	80	M60x2,0	26,0	4°	495	322,0	2771
686 875 00	686 998 75	KVS 60-33,0	M30	94	144	50	80	M60x2,0	33,0	4°	495	218,0	2460
686 880 00	686 998 80	KVS 60-39,0	M36	94	144	50	80	M60x2,0	39,0	4°	495	101,0	2265
686 885 00	686 998 85	KVS 80-39,0	M36	119	174	55	105	M80x2,0	39,0	4°	920	526,0	5549

Other sizes on request.

Ball Head Precision Adjuster KVSK

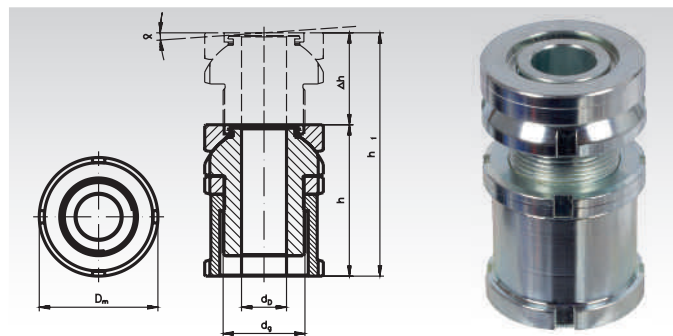
Material:

Standard version: 42CrMo4V, No. 1.7225,
Surface zinc plated and chromated.

Stainless version: X10CrNiS18.9, No. 1.4305.



- For non-parallel surfaces up to 4° slope.
- Larger overall height with more adjustment travel.
- With lock nut.



Ordering Details: e.g.: Product No. 686 905 00, KVSK 15-6.6 standard

Product No. standard	Product No. stainless	Type	matching screw	h mm	h ₁ mm	Δh mm	D _m mm	d _g mm	d _D mm	α approx.	F _{tot.} * kN	F _{add.} * kN	Weight g
686 905 00	686 999 05	KVSK 15- 6,6	M6	40	50	10	25	M15x1,0	6,6	4°	40	30,7	110
686 910 00	686 999 10	KVSK 20- 6,6	M6	49	63	14	32	M20x1,0	6,6	4°	65	55,7	225
686 915 00	686 999 15	KVSK 20- 9,0	M8	49	63	14	32	M20x1,0	9,0	4°	65	48,0	216
686 920 00	686 999 20	KVSK 20-11,0	M10	49	63	14	32	M20x1,0	11,0	4°	65	37,9	208
686 925 00	686 999 25	KVSK 30-11,0	M10	61	79	18	45	M30x1,5	11,0	4°	120	92,9	537
686 930 00	686 999 30	KVSK 30-13,5	M12	61	79	18	45	M30x1,5	13,5	4°	120	80,4	513
686 935 00	686 999 35	KVSK 30-17,5	M16	61	79	18	45	M30x1,5	17,5	4°	120	45,5	482
686 940 00	686 999 40	KVSK 40-17,5	M16	79	102	23	58	M40x1,5	17,5	4°	210	136,0	1139
686 945 00	686 999 45	KVSK 40-22,0	M20	79	102	23	58	M40x1,5	22,0	4°	210	90,0	1086
686 950 00	686 999 50	KVSK 40-26,0	M24	79	102	23	58	M40x1,5	26,0	4°	210	37,0	1021
686 955 00	686 999 55	KVSK 50-22,0	M20	94	123	29	70	M50x1,5	22,0	4°	330	210,0	2050
686 960 00	686 999 60	KVSK 50-26,0	M24	94	123	29	70	M50x1,5	26,0	4°	330	157,0	1969
686 965 00	686 999 65	KVSK 50-33,0	M30	94	123	29	70	M50x1,5	33,0	4°	330	53,0	1805
686 970 00	686 999 70	KVSK 60-26,0	M24	105	144	39	80	M60x2,0	26,0	4°	495	322,0	2945
686 975 00	686 999 75	KVSK 60-33,0	M30	105	144	39	80	M60x2,0	33,0	4°	495	218,0	2634
686 980 00	686 999 80	KVSK 60-39,0	M36	105	144	39	80	M60x2,0	39,0	4°	495	101,0	2439
686 985 00	686 999 85	KVSK 80-39,0	M36	134	174	40	105	M80x2,0	39,0	4°	920	526,0	6008

Other sizes on request.

* Values apply to standard version. Values for stainless version, see page 589

F_{tot.} = max. load. (incl. preload from any mounting screw).

F_{add.} = Load after subtracting the preload of any mounting screw.

Precision Levelling Adjusters

Ball Shims KAS

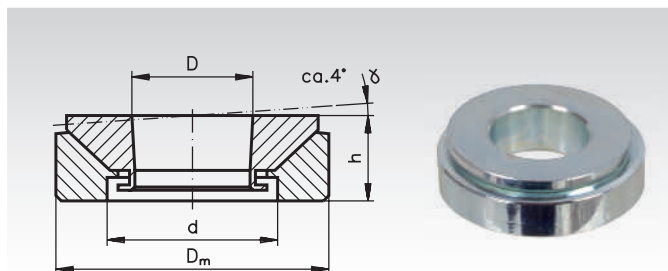
Material:

Standard Version: 42CrMo4V, Nr. 1.7225,
Surface zinc plated and chromated.

Stainless Steel: X10CrNiS18.9, Nr. 1.4305.



For an angle of inclination (alpha) of up to 4°. If the angle of inclination (alpha) exceeds > 1° out of parallel, the use of an additional KAS is recommended to assure a stable support of the bolt head. See also page 588.



Ordering Details: e.g.: Product No. 686 505 00, KAS 15 standard

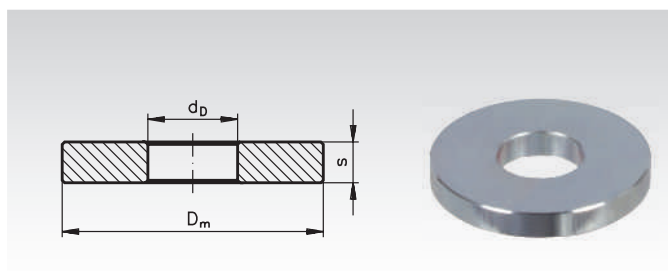
Product No. standard	Product No. stainless	Type	suitable for	h mm	D _m mm	d mm	D mm	Weight g
686 505 00	686 995 05	KAS 15	M6	8,0	25	15	8,5	22
686 510 00	686 995 10	KAS 20	M10	10,0	32	20	13,0	44
686 515 00	686 995 15	KAS 30	M16	12,5	45	30	20,0	104
686 520 00	686 995 20	KAS 40	M24	16,0	58	38	29,0	215
686 525 00	686 995 25	KAS 50	M30	20,0	70	48	36,0	366
686 530 00	686 995 30	KAS 60	M36	20,0	80	61	44,0	439
686 535 00	686 995 35	KAS 80	M48	25,0	105	78	58,0	944

Spacers DS

Material:

Standard Version: 42CrMo4V, Nr. 1.7225,
Surface zinc plated and chromated.

Stainless Steel Version: X10CrNiS18.9, Nr. 1.4305.



Ordering Details: e.g.: Product No. 686 555 00, DS 15 Standard

Product No. standard	Product No. stainless	Type	for Type NAE, KAE, HVS, HVSK	D _m mm	d _D mm	s mm	Weight g
686 555 00	686 995 55	DS 15	...15-...	25	6,6	4	14
686 560 00	686 995 60	DS 20	...20-...	32	11,0	5	27
686 565 00	686 995 65	DS 30	...30-...	45	17,5	6	62
686 570 00	686 995 70	DS 40	...40-...	58	26,0	8	128
686 575 00	686 995 75	DS 50	...50-...	70	33,0	10	222
686 580 00	686 995 80	DS 60	...60-...	80	39,0	12	342
686 585 00	686 995 85	DS 80	...80-...	105	52,0	16	775

Hook Wrenches DIN 1810 A

Material:

Special steel, hardened and burnished.

Important: two spanner wrenches are required for mounting the precision levelling adjusters.



Ordering Details: e.g.: 2 Pieces, Product No. 653 400 25, Hook Wrenches 25-28mm

Product No.	D _m Range mm	for Type (Size)	Length mm	Weight g
653 400 25	25 - 28	...15-...	136	45
653 400 30	30 - 32	...20-...	136	50
653 400 45	45 - 50	...30-...	206	155
653 400 58	58 - 62	...40-...	240	260
653 400 68	68 - 75	...50-...	240	255
653 400 80	80 - 90	...60-...	280	410
653 401 10	110 - 115 (105)	...80-...	335	745

More sizes page 517

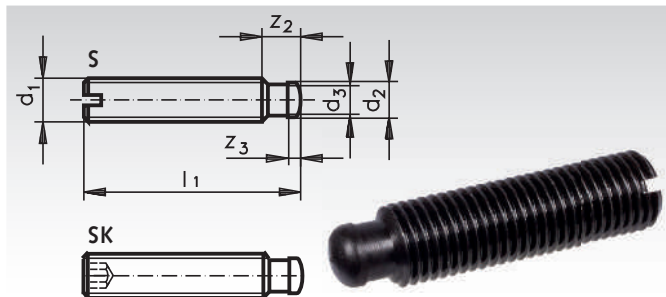
Grub Screws according to DIN 6332 with Thrust Point

Material: Steel quality 5.8, turned, thrust point hardened, burnished.

Type S: With slot.

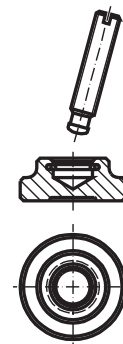
Type SK: With internal hexagon.

Assembly: Turn thrust screw into thrust pad. The thrust pad has to be held thus that the spring retainer lies in the recess with its open side at the bottom. Now tilt the grub screw as far as possible towards the open side of the ring and press it in. To be combined with the thrust pads DIN 6311 below on this page.



Ordering Details: e.g.: Product No. 654 006 00, Grub Screw DIN 6332, Type S, M6

Product No. Type S	Product No. Type SK	d ₁ mm	l ₁ mm	d ₂ ^{h11} mm	d ₃ mm	Z ₂ mm	Z ₃ mm	Weight g
654 006 00	654 006 01	M6	30	4,5	4	6	2,5	4,9
654 007 00	654 007 01	M6	50	4,5	4	6	2,5	8,4
654 009 00	654 009 01	M8	40	6	5,4	7,5	3	11,8
654 011 00	654 011 01	M8	60	6	5,4	7,5	3	18,1
654 013 00	654 013 01	M10	60	8	7,2	9	4,5	27,5
654 015 00	654 015 01	M10	80	8	7,2	9	4,5	37,5
654 017 00	654 017 01	M12	60	8	7,2	10	4,5	40
654 019 00	654 019 01	M12	80	8	7,2	10	4,5	55
654 020 00	654 020 01	M12	100	8	7,2	10	4,5	69
654 024 00	654 024 01	M16	80	12	11	12	5	100
654 025 00	654 025 01	M16	100	12	11	12	5	126
654 026 00	654 026 01	M16	125	12	11	12	5	160
654 030 00	654 030 01	M20	100	15,5	14,4	14	5,5	190
654 031 00	654 031 01	M20	125	15,5	14,4	14	5,5	240
654 032 00	654 032 01	M20	150	15,5	14,4	14	5,5	290

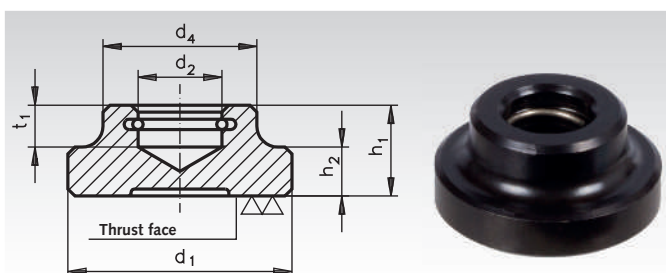


Thrust Pads with Spring Retainer according to DIN 6311 and Factory Standard

Material: Steel turned, case hardened, burnished.

Spring retainer included.

Up to size d₁ = 40 mm for grub screws according to DIN 6332.
from size d₁ = 48 mm for grub screws according to factory standard, manufactured according to measuring table below.

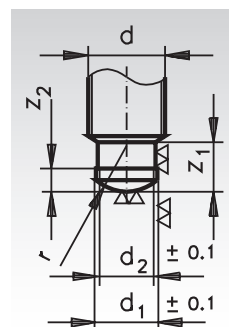


Ordering Details: e.g.: Product No. 654 106 00, Thrust Pad DIN 6311, d₁ = 12 mm

Product No.	d ₁ mm	d ₂ ^{h12} mm	d ₄ mm	h ₁ mm	h ₂ mm	t ₁ mm	f. Grub Screw/ Thrust Point	Weight g
654 106 00	12	4,6	10	7	2,5	4	DIN 6332/M6	4,4
654 108 00	16	6,1	12	9	4	5	DIN 6332/M8	9
654 110 00	20	8,1	15	11	5	6	DIN 6332/M10	17
654 112 00	25	8,1	18	13	6	7	DIN 6332/M12	33
654 116 00	32	12,1	22	15	7	7,5	DIN 6332/M16	57
654 120 00	40	15,6	28	16	9	8	DIN 6332/M20	103
654 124 00	48	17,7	32	24	12	12	Tr./M24	215
654 130 00	60	22	40	32	17	14	Tr./M28/30/32	465
654 140 00	80	30,3	60	45	25	17	Tr./M40	1287

Dimension Table for Thrust Points

For Thrust Pads d ₁	d mm	d ₁ mm	d ₂ mm	z ₁ mm	z ₂ mm	r mm
48	Tr. 24	17,5	16,5	16,5	6,5	11
60	Tr. 28/30/32	21,8	20	20	8	13
80	Tr. 40	30	28,5	25	10	22



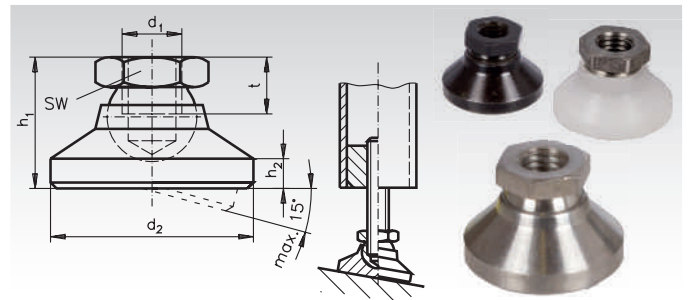
Levelling Pads 2259

Material Type A: Ball bearing: free cutting steel, induction hardened, burnished,
Pad: steel, heat-treated, burnished.

Material Type D: Ball bearing: stainless steel 1.4305.
Pad: Plastic POM, white,
Temperature range: -30°C to +80°C.

Material Type N: Completely from stainless steel 1.4305.

STAINLESS



Ordering Details: e.g.: Product No. 655 206 00, Levelling Pad 2259, Type A, M6

Product No. Typ A	Product No. Typ D	Product No. Typ N	d ₁ mm	d ₂ mm	h ₁ mm	h ₂ mm	t mm	SW mm	Static Load Capacity*			Weight Typ A g	Weight Typ D g	Weight Typ N g
									Typ A	Typ D**	Typ N			
655 206 00	655 226 00	655 992 06	M6	20	14	2,5	5	10	10	4	8	17,2	8,2	17,2
655 208 00	655 228 00	655 992 08	M8	25	18	4	7	13	18	7	14	36,7	17,2	36,7
655 210 00	655 230 00	655 992 10	M10	32	22	5	9	17	20	10	16	77,3	35,8	77,3
655 212 00	655 232 00	655 992 12	M12	40	26	6	11	19	35	18	28	125	54	125
655 216 00	655 236 00	655 992 16	M16	50	32	7	13,5	24	45	20	36	249	103	249
655 220 00	655 240 00	655 992 20	M20	60	42	8	17	30	55	22	44	478	205	478
655 224 00	655 244 00	655 992 24	M24	60	45	9,5	19	36	65	25	52	665	285	665

* Only suitable for compressive load.

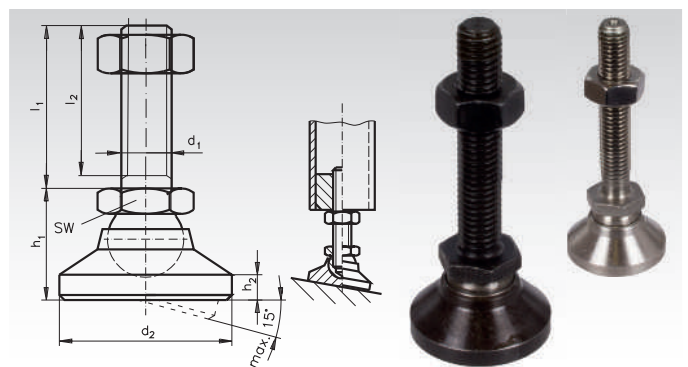
** Figures apply to room temperature only, at higher temperatures the load bearing capacity is reduced.

Levelling Pads 2259, with external Thread

Material Type AG: Ball with threaded bolt: free cutting steel, induction hardened, burnished.
Pad: steel, heat-treated, burnished.

Material Type NG: Stainless steel 1.4305.

STAINLESS



Ordering Details: e.g.: Product No. 655 206 01, Levelling Pad 2259, Type AG, M6 x 60

Product No. Typ AG	Product No. Typ NG	d ₁ mm	l ₁ mm	d ₂ mm	l ₂ mm	h ₁ mm	h ₂ mm	SW mm	Static Load Capacity*		Weight AG, NG g
									Typ AG	Typ NG	
655 206 01	655 206 91	M6	60	20	57	14	2,5	10	10	8	29
655 208 01	655 208 91	M8	80	25	76	18	4	13	18	14	66
655 210 01	655 210 91	M10	100	32	95,5	22	5	17	20	16	133
655 210 02	655 210 92	M10	150	32	145,5	22	5	17	20	16	159
655 212 01	655 212 91	M12	100	40	94,5	26	6	19	35	28	211
655 212 02	655 212 92	M12	150	40	144,5	26	6	19	35	28	247
655 216 01	655 216 91	M16	100	50	94	32	7	24	45	36	407
655 216 02	655 216 92	M16	200	50	194	32	7	24	45	36	540
655 220 01	655 220 91	M20	100	60	92,5	42	8	30	55	44	722
655 220 02	655 220 92	M20	200	60	192,5	42	8	30	55	44	924
655 224 01	655 224 91	M24	100	60	91	45	9,5	36	65	52	935
655 224 02	655 224 92	M24	200	60	191	45	9,5	36	65	52	1231

* Only suitable for compressive load.

Articulated Levelling Feet 344 and 344.5 Plastic with Steel or Stainless Steel Bolt

Material Version 344: base: plastic (polyamide), glass-fibre reinforced, matt finish black.

Bolt: steel, strength class 5.8., zinc plated, chromated.

Rubber pad: NBR (perbunan) 70° Shore hardness, black.

Type A: without nut, without rubber pad, bolt steel.

Type AG: without nut, with rubber pad, bolt steel.

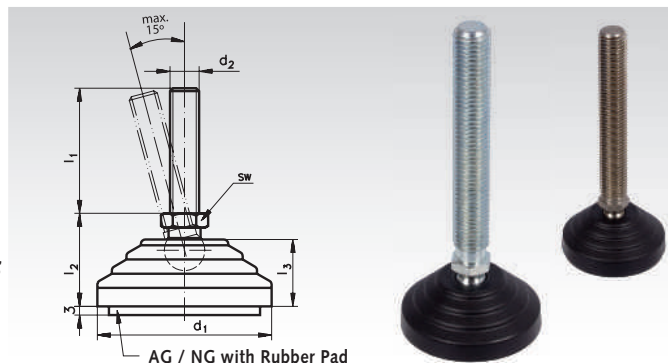
Material Version 344.5: Base: Plastic (polyamide), glass-fibre reinforced, matt finish black. Bolt M10, M12, M16 (SW16): 1.4305.

Bolt M20, M24: 1.4301.

Rubber pad: NBR (perbunan) 70° Shore hardness, black.

Type N: without nut, without rubber pad, bolt stainless steel.

Type NG: without nut, with rubber pad, bolt stainless steel.



Ordering Details: e.g.: Product No. 655 301 00 Foot 344, A, Ø 60 x 43 mm

Version 344, steel		Version 344.5, stainless		d ₁	d ₂	l ₁	l ₂	l ₃	sw	Ball Ø	Static Load N*	Weight kg
Product No. Type A	Product No. Type AG	Product No. Type N	Product No. Type NG	mm	mm	mm	mm	mm	mm	mm		
655 301 00	655 331 00	655 993 01	655 993 31	60	M10	43	32	23	14	14	14000	0,05
655 302 00	655 332 00	655 993 02	655 993 32	60	M10	68	32	23	14	14	14000	0,08
655 303 00	655 333 00	655 993 03	655 993 33	60	M10	98	32	23	14	14	14000	0,16
655 304 00	655 334 00	655 993 04	655 993 34	60	M12	43	32	23	14	14	14000	0,07
655 305 00	655 335 00	655 993 05	655 993 35	60	M12	68	32	23	14	14	14000	0,10
655 306 00	655 336 00	655 993 06	655 993 36	60	M12	98	32	23	14	14	14000	0,19
655 311 00	655 341 00	655 993 11	655 993 41	60	M16	68	32	23	16	14	14000	0,14
655 312 00	655 342 00	655 993 12	655 993 42	60	M16	108	32	23	16	14	14000	0,12
655 313 00	655 343 00	655 993 13	655 993 43	60	M16	148	32	23	16	14	14000	0,27
655 314 00	655 344 00	655 993 14	655 993 44	80	M16	68	32	23	16	14	16000	0,16
655 315 00	655 345 00	655 993 15	655 993 45	80	M16	108	32	23	16	14	16000	0,21
655 316 00	655 346 00	655 993 16	655 993 46	80	M16	148	32	23	16	14	16000	0,26
655 321 00	655 351 00	655 993 21	655 993 51	80	M20	98	42	23	24	24	18000	0,36
655 322 00	655 352 00	655 993 22	655 993 52	80	M20	138	42	23	24	24	18000	0,43
655 323 00	655 353 00	655 993 23	655 993 53	80	M20	158	42	23	24	24	18000	0,47
655 324 00	655 354 00	655 993 24	655 993 54	100	M20	98	42	23	24	24	25000	0,44
655 325 00	655 355 00	655 993 25	655 993 55	100	M20	138	42	23	24	24	25000	0,48
655 326 00	655 356 00	655 993 26	655 993 56	100	M20	158	42	23	24	24	25000	0,50
655 327 00	655 357 00	655 993 27	655 993 57	100	M24	98	42	23	24	24	25000	0,61
655 328 00	655 358 00	655 993 28	655 993 58	100	M24	158	42	23	24	24	25000	0,77
655 329 00	655 359 00	655 993 29	655 993 59	100	M24	198	42	23	24	24	25000	0,88

* Static Load

The load figures specified in the table above are guide line values. If these are exceeded, serious permanent deformation or breakage of the plastic base can occur.

These values were established through a series of tests, where with a certain number of levelling feet, a vertical force was applied on the disk for a certain time.

Dependend on the application and the load, a safety factor has to be taken into account, so that the permissable load may be below the guide line values stated in the table.

We cannot accept any liability for possible damages which could be caused by the incorrect use of the articulated feet.

General

Articulated Feet 344 and 344.5 are slightly stepped, this makes them look good and easy to clean.

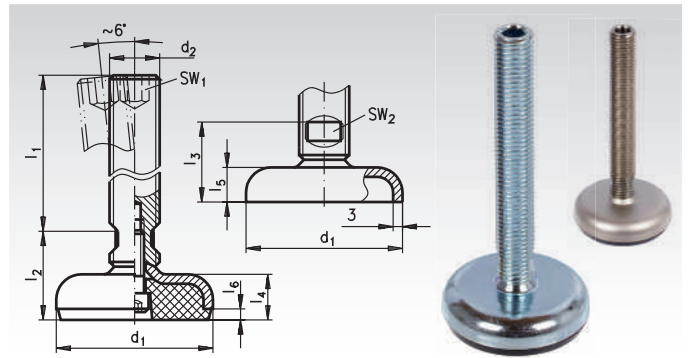
Due to the use of a high grade plastic material and their shape (ribbed base), that serves to spread the weight over a larger area, the feet have a high load bearing capacity.

The rubber pad is fixed to the base with four pins/bores. The rubber pad levels out slightly uneven ground and makes the foot non-slip.

Levelling Feets 340 of Steel and 340.5 of Stainless Steel

Material Version 340: Steel, zinc plated, chromated.
Rubber pad: NBR (perbunan) 80 - 85° Shore hardness, black.
Type AG: Steel, with rubber pad.

Material Version 340.5: Stainless steel 1.4301.
Rubber pad: NBR (perbunan) 70° Shore hardness, black.
Type NG: Stainless Steel, with rubber pad.



Ordering Details: e.g.: Product No. 655 741 00 Levelling Foot 340, Type AG, 50 x M16 x 75

Product No. Version 340 Zinc plated	Product No. Version 340.5 Stainless Steel	d ₁ mm	d ₂ mm	l ₁ mm	l ₂ mm	l ₃ mm	approx. l ₄ mm	l ₅ mm	l ₆ mm	sw ₁ mm	sw ₂ mm	Static Load*		
												Vers. 340 kN	Vers. 340.5 kN	Weight g
655 741 00	655 997 41	50	M16	75	29	25,5	14,5	11	3,5	8	12	16	28	193
655 742 00	655 997 42	50	M16	100	29	25,5	14,5	11	3,5	8	12	16	28	270
655 743 00	655 997 43	50	M16	125	29	25,5	14,5	11	3,5	8	12	16	28	290
655 744 00	655 997 44	50	M16	150	29	25,5	14,5	11	3,5	8	12	16	28	310
655 751 00	655 997 51	60	M16	75	30	26	16	12	4	8	12	16	28	280
655 752 00	655 997 52	60	M16	100	30	26	16	12	4	8	12	16	28	300
655 753 00	655 997 53	60	M16	125	30	26	16	12	4	8	12	16	28	320
655 754 00	655 997 54	60	M16	150	30	26	16	12	4	8	12	16	28	340
655 761 00	655 997 61	80	M16	75	32	27	18	13	5	8	12	12	19	400
655 762 00	655 997 62	80	M16	100	32	27	18	13	5	8	12	12	19	450
655 763 00	655 997 63	80	M16	125	32	27	18	13	5	8	12	12	19	470
655 764 00	655 997 64	80	M16	150	32	27	18	13	5	8	12	12	19	500
655 765 00	655 997 65	80	M20	75	33	28	18	13	5	10	15	12	19	490
655 766 00	655 997 66	80	M20	100	33	28	18	13	5	10	15	12	19	525
655 767 00	655 997 67	80	M20	125	33	28	18	13	5	10	15	12	19	570
655 768 00	655 997 68	80	M20	150	33	28	18	13	5	10	15	12	19	630
655 771 00	655 997 71	100	M20	75	35	29	20	14	6	10	15	11	17	610
655 772 00	655 997 72	100	M20	100	35	29	20	14	6	10	15	11	17	660
655 773 00	655 997 73	100	M20	125	35	29	20	14	6	10	15	11	17	680
655 774 00	655 997 74	100	M20	150	35	29	20	14	6	10	15	11	17	780
655 775 00	655 997 75	100	M24	100	38	32	20	14	6	12	19	11	17	840
655 776 00	655 997 76	100	M24	125	38	32	20	14	6	12	19	11	17	890
655 777 00	655 997 77	100	M24	150	38	32	20	14	6	12	19	11	17	940

* Static Load

The static load is limited by any deformation of the steel base (3 mm thick).

The load figures specified in the table above are based on a series of tests in which a vertical load was applied on the base. At the values stated in the table, a slight deformation of the base might occur.

General

A feature of the leveling feet is the firmly bonded rubber pad in the steel foot also fixed by a screw. The bolt can be adjusted either at the hexagon at the upper end or at the spanner flats at the bottom end.

Machine Mounts KA with Chromated Steel Plate and Vacuum Profile

Material:

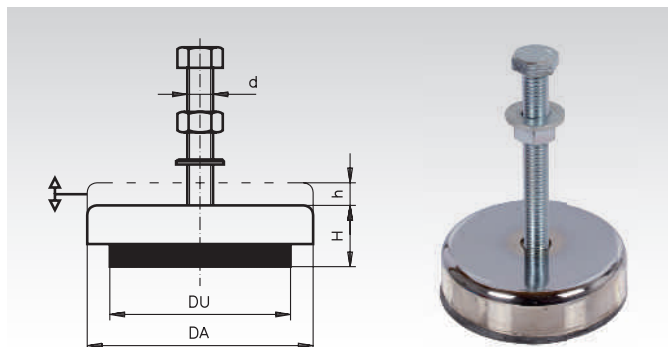
Elastomer: NBR (perbunan) 70° Shore, oil resistant.

Case: Steel, chromated.

Machine mount with vacuum profile, height adjustable without need for bolting down.

For a first, rough calculation:

$$\frac{\text{Overall weight to be supported}}{\text{Number of mounting points}} = \text{Load per machine mount}$$



Ordering Details: e.g.: Product No. 685 912 00, Machine Mount KA 010

Product No.	Size	DA Ø mm	DU Ø mm	Height H mm	Height Adjustment h mm	Thread d mm	Thread Length mm	Weight kg
685 912 00	KA 010	73	53	30	10	M10	60	0,27
685 913 00	KA 090	90	73	35	10	M12	100	0,60
685 915 00	KA 015	120	95	35	12	M12	100	0,94
685 918 00	KA 020	150	120	40	12	M16	100	2,24
685 921 00	KA 030	200	170	45	15	M20 x 1,5	120	4,90

Load Bearing Cap.per Element (in Newton)	KA 010	KA 090	KA 015	KA 020	KA 030
General Machines	1500	4200	6500	14000	34000
Milling Machines and Lathes		2100	3500	12000	28000
Presses, Stroke/min. up to					
100			4200	8000	25000
150			2400	4000	13500
170			1750	2500	9000
200			1400	2000	4500
Permiss. Stat. Max. Load		6300	11000	18000	40000

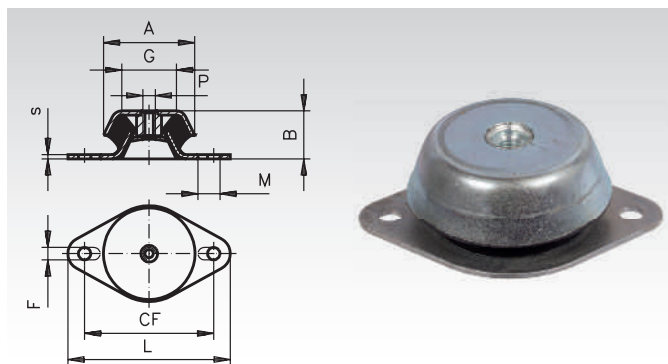
Machine Mounts (Failsafe)

Material:

Elastomer: Natural rubber 60° +/-5° Shore.

Metal parts: Steel, quality 5.6.

Failsafe machine mounts can be universally used as elastic mounts for all kind of machines. Especially if tensile forces can be expected, these failsafe mounts are the perfect choice of damping element.



Ordering Details: e.g.: Product No. 685 950 00, Machine Mount, 77 x 128

Product No.	A mm	B mm	P mm	F (xM) mm	CF mm	G mm	L mm	s mm	Weight kg
685 950 00	77	30	M10	9	110	59	128	2	0,30
685 955 00	92	45	M12	10,5	110	73,5	138	3	0,69
685 960 00	106	38	M12	14 x 18	138/146	81	172	3	0,75
685 965 00	108	50	M16	16,5	160	83	190	5	1,12
685 970 00	121	42	M16	13,5	158	92	188	3	0,97

Product No.	Permissible Permanent Static Load* N	Compression mm	Spring Load N/mm
685 950 00	2700	2,8	964
685 955 00	6000	3,3	1818
685 960 00	5500	2,8	1964
685 965 00	8100	2,9	2793
685 970 00	6800	3,5	1942

The stated values are guideline values for the static load at durometer of 60° Shore A (medium).

* Tensile / compressive load. No damping for tensile load.

Rubber-Metal Bump Stops MGS with Threaded Stud

Material: Elastomer: Natural rubber, hardness 55° Shore.

Metal parts: Steel, zinc plated or stainless steel 1.4301.



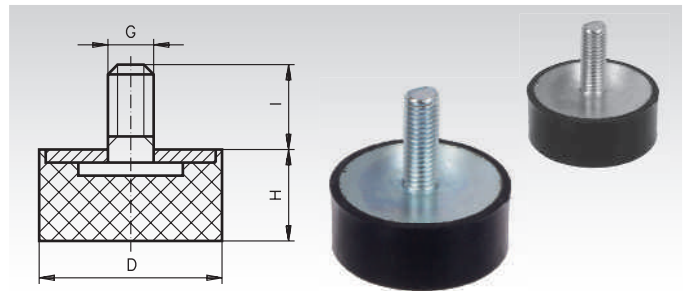
Metal on one side only.

For elastically mounting of power units or bump stops. Also to be used as machine feet for machines that cannot be fixed to the floor or are standing on floors with an easily damaged surface, e.g. office machines.

Temperature resistant up to 80°C.

Other sizes, Shore hardnesses or elastomer types on request.

Ordering Details: z.B.: Product No.. 685 781 00, Bump Stop MGS, 10 mm



Product No. Zinc plated	Product No. Stainless	Ø D mm	H mm	G mm	I mm	Pressure Load		Weight g
						Spring Load CD medium N/mm	Permiss. Load F _{perm.} * N	
685 781 00	689 781 00	10	10	M4	10	38	43	2,6
685 783 00	689 783 00	10	15	M4	10	13	43	2,9
685 786 00	689 786 00	15	7	M4	10	136	95	3,5
685 787 00	689 787 00	15	8	M4	10	122	95	3,6
685 788 00	689 788 00	15	10	M4	10	106	95	3,8
685 790 00	689 790 00	15	15	M4	10	74	95	7,3
685 791 00	689 791 00	20	5	M6	18	340	170	8,0
685 801 00	689 801 00	20	8	M6	18	330	170	7,9
685 801 11	689 801 11	20	11	M6	18	150	170	9,0
685 802 00	689 802 00	20	15	M6	18	138	170	10,3
685 802 20	689 802 20	20	20	M6	18	100	170	11
685 802 25	689 802 25	20	25	M6	18	80	170	14
685 803 08	689 803 08	25	8	M6	18	300	280	14
685 803 10	689 803 10	25	10	M6	18	270	280	14
685 803 00	689 803 00	25	15	M6	18	254	280	17
685 803 20	689 803 20	25	20	M6	18	128	280	20
685 803 25	689 803 25	25	25	M6	18	100	280	24
685 803 30	689 803 30	25	30	M6	18	80	280	30
685 804 15	689 804 15	30	15	M8	23	290	400	29
685 804 00	689 804 00	30	20	M8	20	200	400	27
685 804 25	689 804 25	30	25	M8	20	180	400	35
685 804 30	689 804 30	30	30	M8	20	120	400	35
685 804 40	689 804 40	30	40	M8	20	90	400	48
685 805 20	689 805 20	40	20	M8	23	340	650	52
685 805 00	689 805 00	40	30	M8	23	234	650	75
685 805 30	689 805 30	40	30	M10	28	240	650	74
685 805 40	689 805 40	40	40	M8	23	200	650	80
685 806 00	689 806 00	50	20	M10	28	680	1000	85
685 806 30	689 806 30	50	30	M10	28	425	1000	100
685 806 40	689 806 40	50	40	M10	28	390	1000	132
685 806 45	689 806 45	50	45	M10	28	350	1000	140
685 806 50	689 806 50	50	50	M10	28	310	1000	152
685 806 60	689 806 60	60	40	M10	28	470	1500	179
685 806 65	689 806 65	60	40	M12	33	460	1500	190
685 806 70	689 806 70	70	25	M10	28	650	1800	198
685 806 75	689 806 75	70	45	M10	28	800	1800	292
685 807 00	689 807 00	75	25	M12	37	2000	2300	241
685 807 40	689 807 40	75	40	M12	37	810	2300	320
685 807 50	689 807 50	75	50	M12	37	620	2300	357
685 807 55	689 807 55	75	55	M12	37	760	2300	384
685 808 00	689 808 00	100	40	M16	41	1578	4200	641
685 808 50	689 808 50	100	50	M16	41	900	4200	669
685 808 55	689 808 55	100	55	M16	41	860	4200	760
685 808 60	689 808 60	100	60	M16	41	800	4200	730
685 808 75	689 808 75	100	75	M16	41	540	4200	874

Note for Spring Load and Mounting

For a linear resilience characteristic the Spring Load C means, for any operating point, the constant relation of load F [N] to jounce travel f [mm].

$$C = \frac{F}{f} \quad [\text{N/mm}]$$

In the technical data, these constants are stated as CD for pure pressure load and as CS for pure shear load.

* F_{perm.} is the permissible static permanent load, which may be overlaid by a dynamic, alternating load. With shearing load please take care that no tension load in the rubber occurs at all during mounting. To achieve a sufficient fatigue strength provide some compressive prestressing.

The stated permissible loads are only approximate, guideline values for the static load for "medium" rubber hardness. With particularly high, dynamic, alternating loads or high frequencies, the load figures have to be accordingly reduced.

Rubber-Metal Bumpers MGK, Conical Design

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber hardness 55° Shore.

* $F_{perm.}$ is the permissible static permanent load, which may be overlaid by a dynamic, alternating load. With shearing load please take care that no tension load in the rubber occurs at all during mounting. To achieve a sufficient fatigue strength provide some compressive pre-stressing.

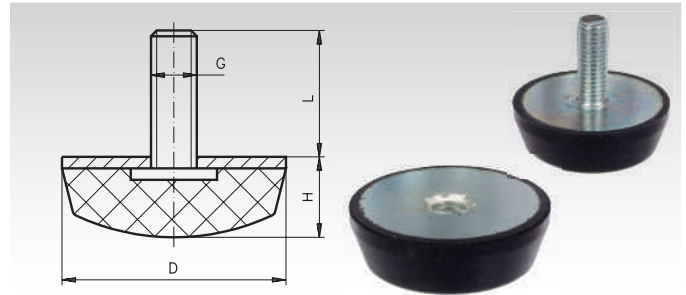
The stated permissible loads are only approximate, guideline values for the static load for "medium" rubber hardness.
With particularly high, dynamic, alternating loads or high frequencies, the load figures have to be reduced accordingly.

Temperature resistant up to 80°C.

Ordering Details: e.g.: Product No. 685 831 00, Rubber-Metal Bumpers MGK, 25 mm

Product No.	DØ mm	H mm	G x L mm	Spring Rate CD medium N/mm	Load $F_{perm.}$ * N	Weight g
685 831 00	25	17	M6 x 18 external thread	119	500	15
685 835 00	50	18	M10 x 28 external thread	670	2000	75
685 841 00	25	17	M6 x 6 internal thread	130	500	15
685 845 00	50	18	M10 x 10 internal thread	735	2000	75

* $F_{perm.}$: Note page 600 bottom.



Rubber-Metal Buffers KP

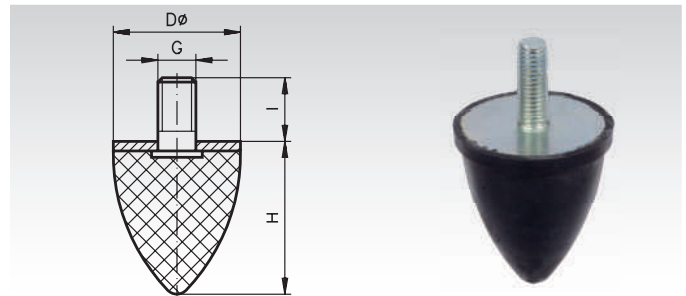
Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber hardness 55° Shore.

Simple, reasonably priced standard components used for elastic mounting. When shearing load occurs their load-bearing capacity is considerably lower than with pressure load. This has to be considered when horizontal mass forces or belt traction occur. The grade of rubber used has perfect physical properties.

Ordering Details: e.g.: Product No. 685 031 00, Rubber-Metal Buffers KP 20x24

Product No.	D Ø mm	H mm	G mm	I mm	Spring Rate CD medium N/mm	Perm. Pressure Load $F_{perm.}$ * N	Weight g
685 031 00	20	24	M6	18	15	60	11
685 035 00	30	36	M8	20	23	140	37
685 041 00	35	40	M8	20	27	150	45
685 045 00	50	58	M10	28	33	320	127
685 051 00	50	67	M8	36	40	400	136
685 055 00	75	89	M12	37	55	900	341
685 061 00	115	136	M16	43	75	1800	1042

* $F_{perm.}$: Note page 600 bottom.



Rubber-Metal Buffers KE

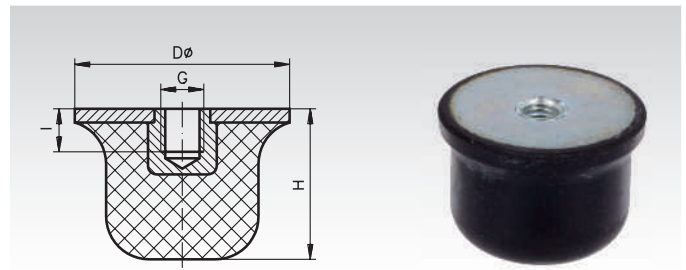
Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber Hardness 55° Shore.

Simple, reasonably priced standard components for elastic mounting. When shearing load occurs their load-bearing capacity is considerably lower than with pressure load. This has to be considered when horizontal mass forces or belt traction occur. The grade of rubber used has perfect physical properties.

Ordering Details: e.g.: Product No. 685 131 00, Rubber-Metal Buffers KE 50x35

Product No.	D Ø mm	H mm	G mm	I mm	Spring Rate CD medium N/mm	Perm. Pressure Load $F_{perm.}$ * N	Weight g
685 131 00	50	35	M10	10	100	400	88
685 135 00	80	60	M12	12	170	1200	308
685 141 00	125	90	M16	16	260	3000	830

* $F_{perm.}$: Note page 600 bottom.



Rubber-Metal Buffers MGP with Threaded Studs

Material: Elastomer: Natural rubber, hardness 55° Shore.
Metal parts: Steel, zinc plated or stainless steel 1.4301.



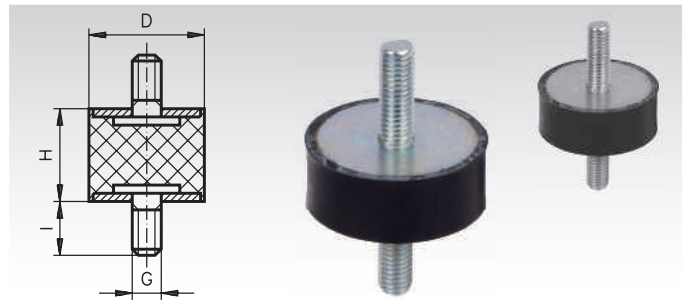
External threads on both sides.

Standard components for elastic mounting.

The grade of rubber used has perfect physical properties.

Temperature resistant up to 80°C.

Other sizes, Shore hardnesses or elastomer types on request.



Ordering Details: e.g.: Product No. 685 280 00, Rubber-Metal Buffers MGP, 8 mm

Product No. Zinc plated	Product No. Stainless	Ø D mm	H mm	G mm	I mm	Pressure Load		Shearing Load		Weight g
						Spring Load CD medium N/mm	Permiss. Load $F_{perm.}^*$ N	Spring Load CS medium N/mm	Permiss. Load $F_{perm.}^*$ N	
685 280 00	689 280 00	8	8	M3	6	30	35	9	10	1,0
685 281 00	689 281 00	10	10	M4	10	44	43	9	15	3,2
685 283 00	689 283 00	10	15	M4	10	29	43	5	15	3,9
685 286 00	689 286 00	15	7	M4	10	174	95	29	35	5,8
685 287 00	689 287 00	15	8	M4	10	160	95	27	35	6,0
685 288 00	689 288 00	15	10	M4	10	124	95	24	35	6,4
685 289 00	689 289 00	15	20	M4	13	54	95	10	35	7,0
685 290 00	689 290 00	15	15	M4	10	61	95	13	35	7,8
685 301 00	689 301 00	20	8	M6	18	307	170	36	60	15
685 302 00	689 302 00	20	10	M6	18	150	170	40	60	15
685 304 00	689 304 00	20	15	M6	18	130	170	24	60	20
685 304 20	689 304 20	20	20	M6	18	100	170	20	60	19
685 304 25	689 304 25	20	25	M6	18	70	170	13	60	20
685 305 00	689 305 00	25	20	M6	18	85	170	17	60	30
685 307 00	689 307 00	25	10	M6	18	750	280	74	95	20
685 307 15	689 307 15	25	15	M6	18	140	280	25	95	28
685 307 25	689 307 25	25	25	M6	18	600	280	37	95	32
685 307 30	689 307 30	25	30	M6	18	71	280	17	95	40
685 308 00	689 308 00	30	15	M8	20	525	400	58	140	37
685 309 00	689 309 00	30	20	M8	20	204	400	40	140	56
685 309 25	689 309 25	30	25	M8	20	180	400	33	140	58
685 311 00	689 311 00	30	30	M8	20	108	400	25	140	65
685 311 10	689 311 10	30	40	M8	20	85	400	18	140	64
685 311 20	689 311 20	40	15	M8	20	380	650	90	250	79
685 311 23	689 311 23	40	25	M8	23	270	650	60	250	84
685 311 28	689 311 28	40	25	M10	28	270	650	60	250	90
685 312 00	689 312 00	40	30	M8	23	213	650	43	250	102
685 312 30	689 312 30	40	30	M10	28	213	650	40	250	105
685 313 00	689 313 00	40	40	M8	23	140	650	22	250	115
685 315 00	689 315 00	50	20	M10	28	857	1000	110	400	141
685 314 00	689 314 00	50	25	M10	28	583	1000	84	400	155
685 316 00	689 316 00	50	30	M10	28	375	1000	66	400	163
685 317 00	689 317 00	50	40	M10	28	260	1000	53	400	178
685 324 00	689 324 00	50	45	M10	33	215	1000	43	400	208
685 317 50	689 317 50	50	50	M10	28	200	1000	39	400	199
685 317 60	689 317 60	60	40	M10	28	390	1500	60	550	231
685 317 70	689 317 70	70	45	M10	28	450	1800	70	750	401
685 318 00	689 318 00	75	25	M12	37	2710	2300	211	850	369
685 318 40	689 318 40	75	40	M12	37	734	2300	117	850	420
685 319 00	689 319 00	75	50	M12	37	506	2300	91	850	483
685 320 00	689 320 00	75	55	M12	37	417	2300	78	850	514
685 322 00	689 322 00	100	30	M16	41	3800	4200	310	1600	831
685 321 00	689 321 00	100	40	M16	41	1970	4200	257	1600	956
685 321 50	689 321 50	100	50	M16	41	900	4200	160	1600	1033
685 321 55	689 321 55	100	55	M16	41	892	4200	145	1600	980
685 323 00	689 323 00	100	60	M16	41	809	4200	136	1600	1177
685 325 00	689 325 00	100	75	M16	41	750	4200	110	1600	1124

* $F_{perm.}$: Note page 600 bottom.

Loctite thread locking and bonding products
page 811.