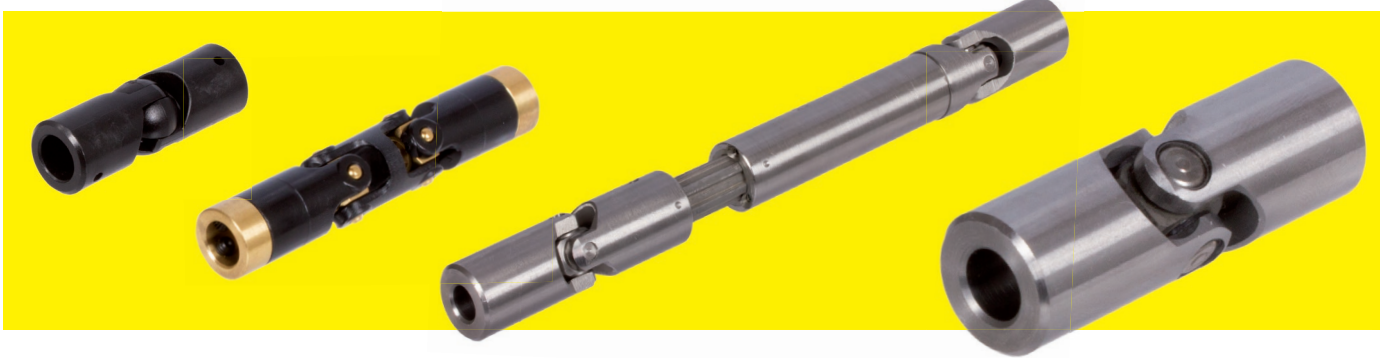
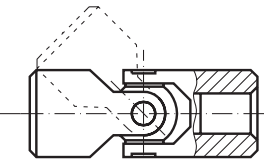



Overview Universal Joints

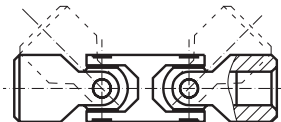



Single Universal Joints



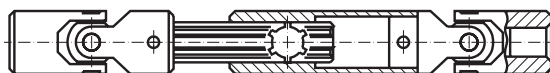
Type	Material	Bearings	Bores mm	Torques* max. Nm	Speeds* max. min ⁻¹	Page
UKM	Plastic	Plain bearings	2 - 10	0,11 - 1,6	1000	406
GF	Plastic	Plain bearings	8 - 16	5 - 22	1000	405
KE	Steel	Plain bearings	0 - 40	2 - 550	1000	412
WEL	Steel	Plain bearings	6 - 30	6,6 - 430	800	408
RW	Steel	Plain bearings	6 - 45	6 - 820	500	413
AR	Steel	Plain bearings , hardened	6 - 30	7 - 360	800	412
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	15,9 - 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.

Bellocs Page 415



Universal Joints, General Information

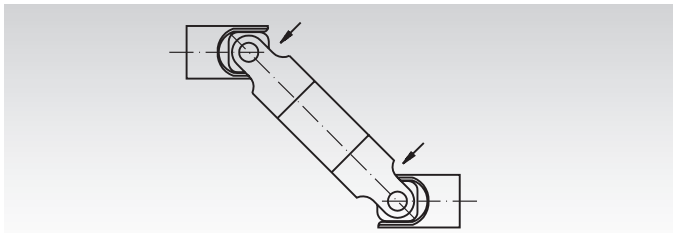
Universal joints and universal shafts are today, and will be in future, absolutely essential and versatile components for transferring rotary motion and transmitting torque from the driving to the driven unit.

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-

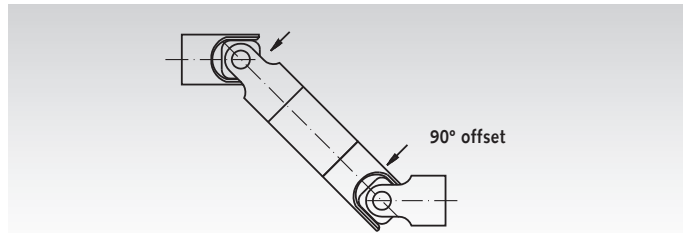
ating angle α , the greater the non-uniformity in motion of the second shaft.

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.

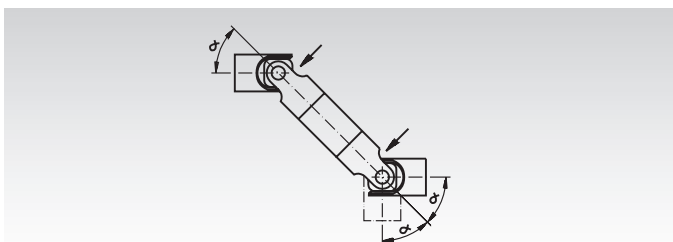


CORRECT: yoke orientation properly aligned

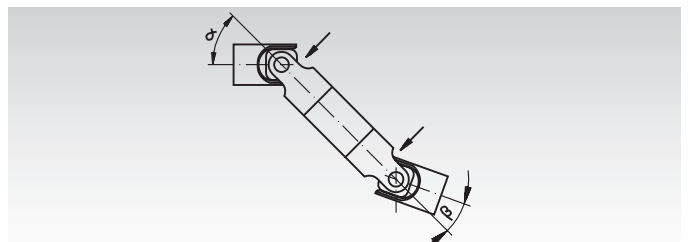


INCORRECT: yoke orientation offset by 90°

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

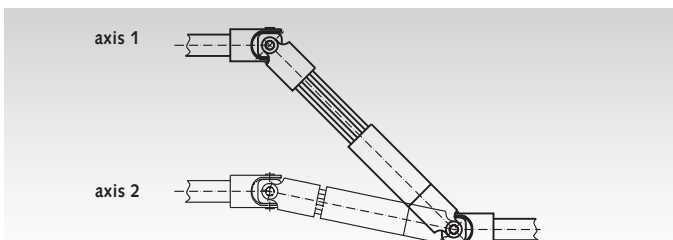


CORRECT : angle α is the same everywhere

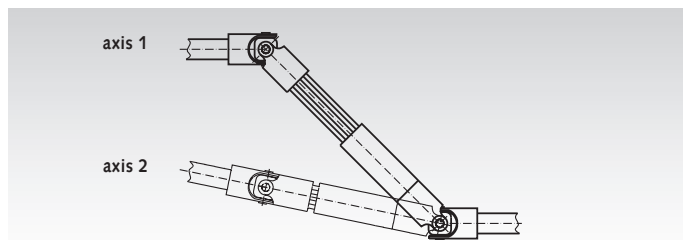


INCORRECT: angle α and β are different

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

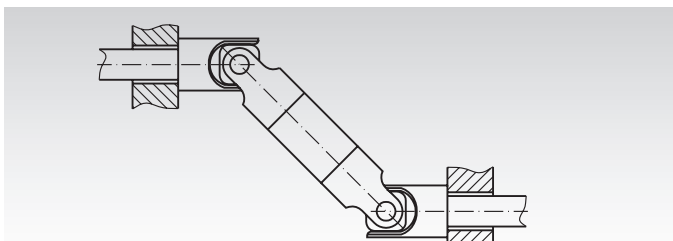


CORRECT : axis 1 is parallel to axis 2

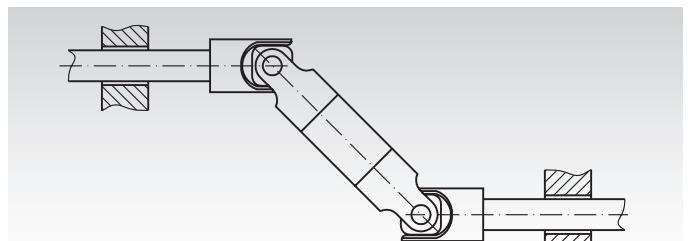


INCORRECT: axis 1 is not parallel to axis 2

- 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.

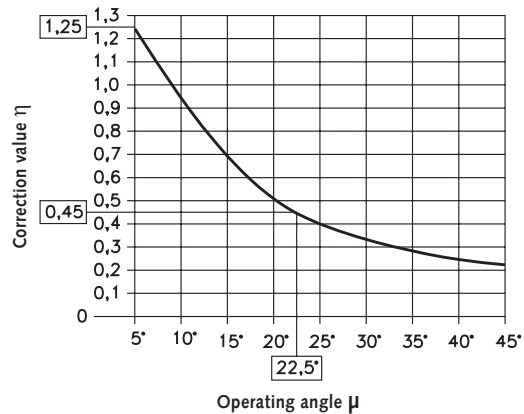
Bore Ø	6	8	10	12	16	20	25	32	40	50
Pin Ø	2	3	4	5	6	8	10	12	14	16

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
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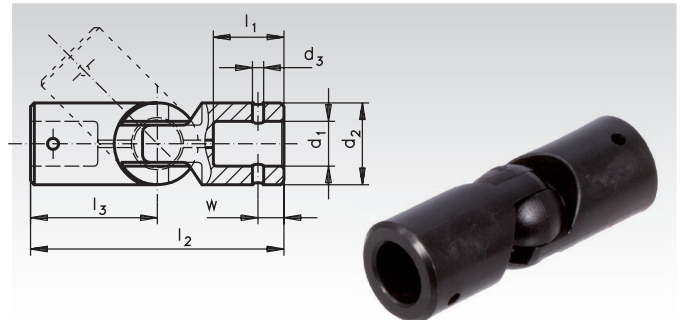
Ball Joints GF made from Plastic

Material: Acetal, glass-fibre reinforced.

Temperature range: -30°C to +50°C.

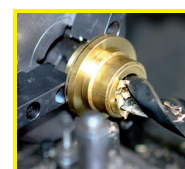
Max. operating angle 35°. Dimensions according to DIN 808.

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



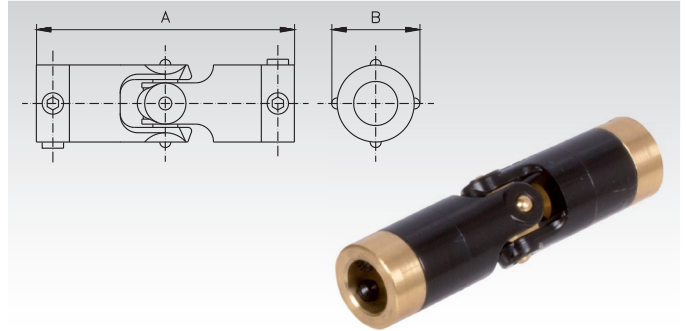
Reworking within 24h-service possible. Custom made parts on request.

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

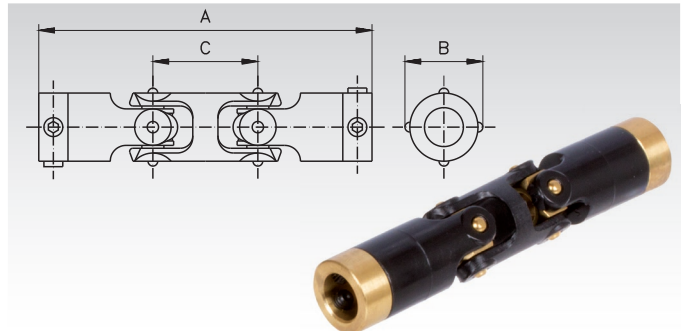
Product No.	Torque Nm	Bore ^{+0,03} mm	Bore depth mm	A mm	B mm	Weight g
630 230 00	0,11	2	9,3	27,2	7,1	3
630 231 00	0,11	3	9,3	27,2	7,1	3
630 234 00	0,36	3	13,1	37,6	11,1	8,5
630 235 00	0,36	4	13,1	37,6	11,1	8,5
630 239 00	0,85	4	15,7	46,2	14,3	17
630 240 00	0,85	6	15,7	46,2	14,3	17
630 243 00	1,6	6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

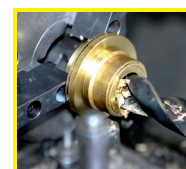
Max. operating angle 45°.

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.**

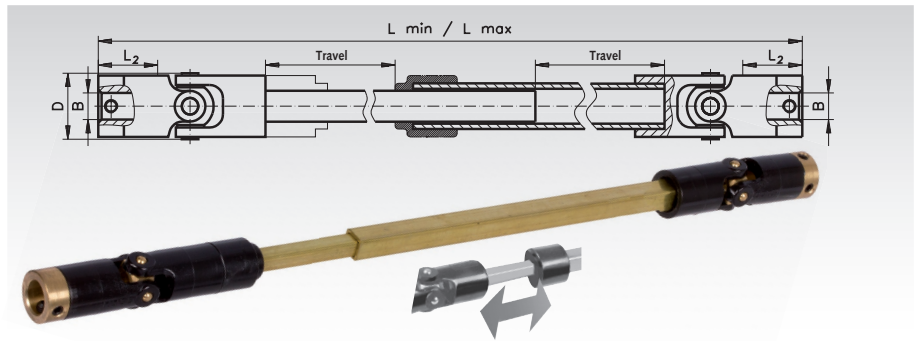
Telescopic Universal-Joint Shafts UW Made from Plastic and Brass

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.

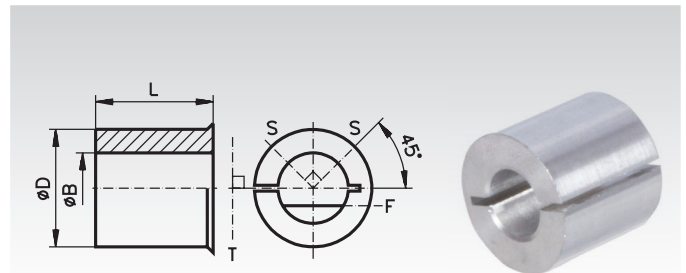
Product No. 622 303 05 up to 622 318 20 made from aluminium.

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

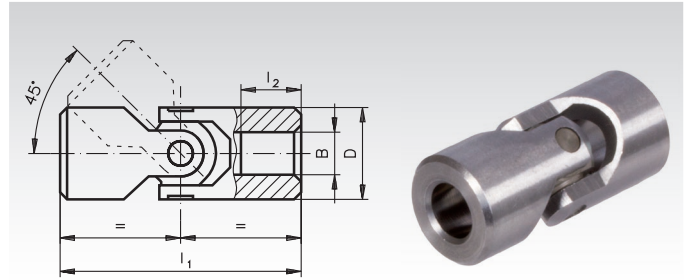
not recommend using flattened shafts with more than 1/4 of the diameter removed.

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.

Belows

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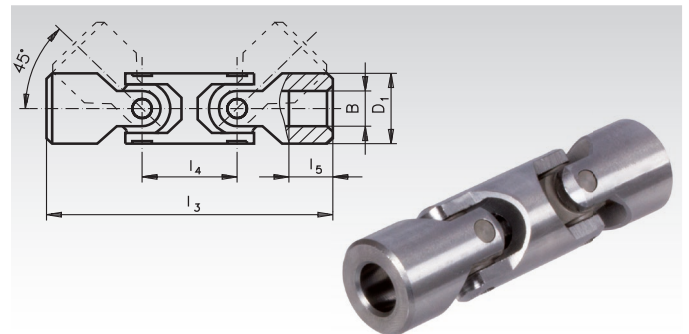


Double Universal Joints WDL Similar to DIN 808

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.**

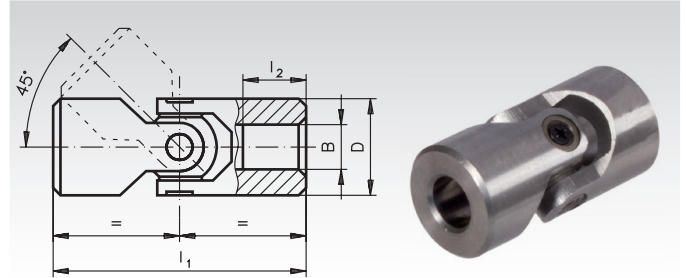
Precision Universal Joints Similar to DIN 808

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.
Max. Operating Angle 45°.

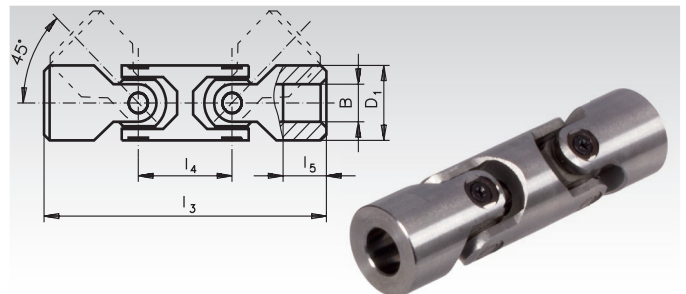


Ordering Details: e.g.: Product No. 631 215 00, Universal Joint WE, 6 mm Bore

Product No.	BH7 mm	D mm	l ₁ mm	l ₂ mm	100 min ⁻¹	permissible max. Torques in Nm at different Speeds						Weight kg
						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	5,5	5	-	-	0,04
631 216 00	8	16	40	11	14	10	9,5	8	7	6	5,4	0,04
631 220 00	10	22	45	10	25	17	14,5	13	12	11	7,5	0,09
631 226 00	12	25	50	11	43	25	20,5	17	15,5	13	12	0,20
631 229 00	14	29	56	13	68,5	43	39,5	36	33,5	28,5	26,5	0,18
631 232 00	16	32	65	15	86,5	84	72	57,5	51,5	41	36	0,33
631 237 00	18	37	72	17	156	120	96	72	60	48	-	0,39
631 240 00	20	40	82	19	240	168	120	96	84	60	-	0,54
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
631 258 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.
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	100 min ⁻¹	permissible max. Torques in Nm at different Speeds						Weight kg
							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.

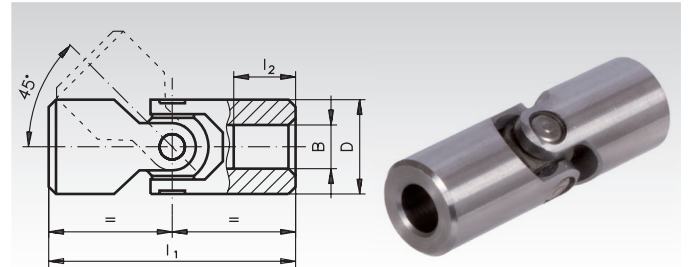
Precision Needle-Bearing Universal Joints DIN 808

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°.

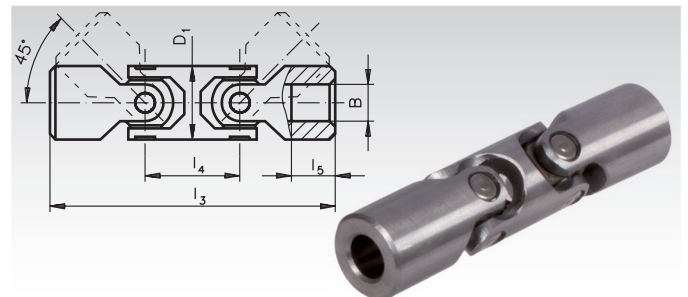


Ordering Details: e.g.: Product No. 631 116 00, Precision, Universal Joint WEN, 8 mm Bore

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

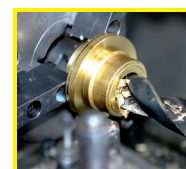
Double, Precision Universal Joints WDN with Needle-Roller Bearings, DIN 808

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)

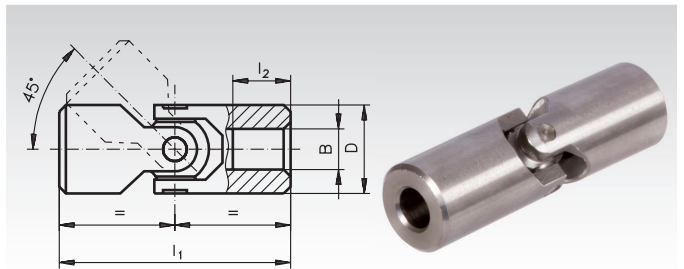
These single and double universal joints feature a simple design with very small tolerances and high precision and performance. These universal joints can be used at speeds up to max. 800 min⁻¹. The torques of the stainless precision universal joints amount less of the standard steel version.

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°.



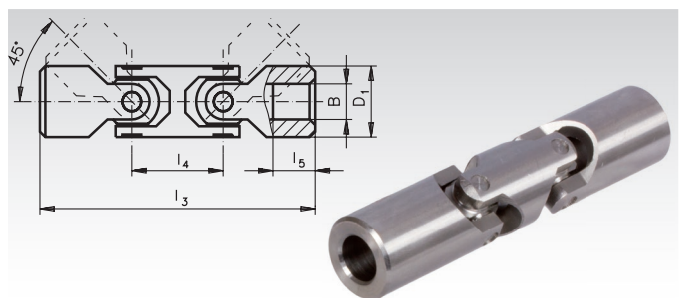
Ordering Details: e.g.: Product No. 631 992 15, Universal Joint WER, 6 mm Bore

Product-Nr.	BH7 mm	D mm	l ₁ mm	l ₂ mm	100 min ⁻¹	permissible max. Torques in Nm at different Speeds						Weight kg
						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.

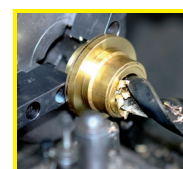
Max. Operating Angle 90°.



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

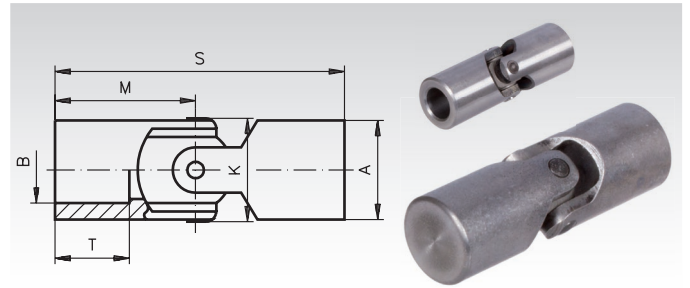
Bellows
page 415



**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.

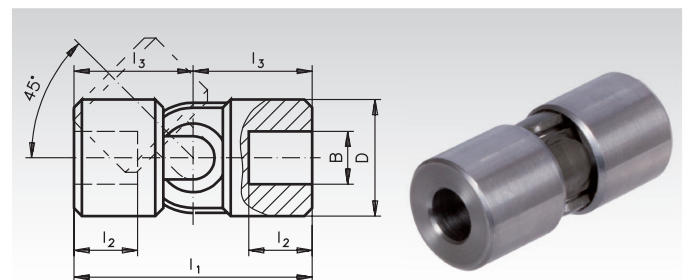
At continuous operation the cardan joints need to be sufficiently lubricated. If no drip-feed lubrication is possible (drip-feed lubricators see page 525-526), lubricate the joints at least once a day. Another possibility is to cover the joints with a bellow, filled with a suitable lubricant.

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	l ₁ mm	l ₂ mm	l ₃ mm	Weight kg	permissible max. Torques in Nm at different Speeds						
	BH7 mm	B 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	9	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	15*	29	60	17	30	0,21	57	36	33	30	28	23,5	22
631 032 00	16	17*	32	68	20	34	0,30	72	70	60	48	43	34	30
631 037 00	18	19*	37	74	21	37	0,42	130	100	80	60	50	40	-
631 042 00	20	22*	42	82	23	41	0,62	200	140	100	80	70	50	-
631 047 00	22	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.

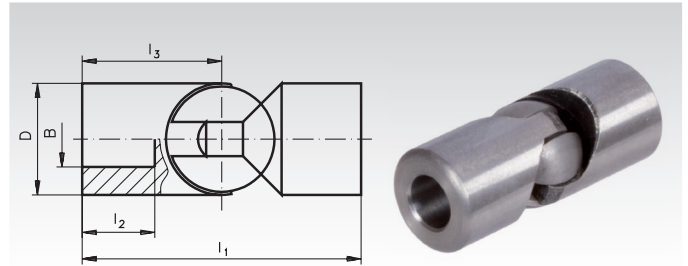
The joints must not be shortened. The outer part of the joints is a thin-walled sleeve, which is pressed onto the carrier and the brackets. This sleeve gives the brackets additional support.

Ball Joints RW

Material: Steel 11SMnPb37.

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 ±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

Bellocs
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 11SMnPb37.

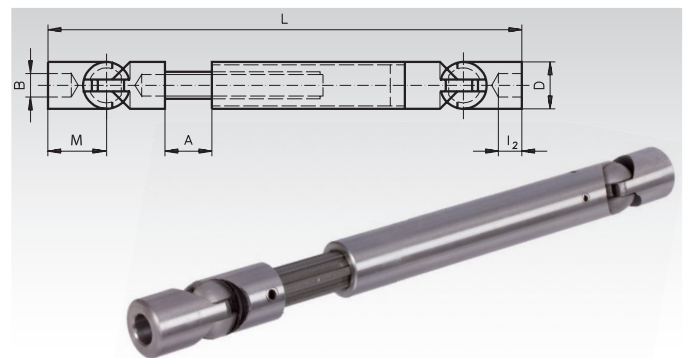
Max. operating angle per joint 35°.

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



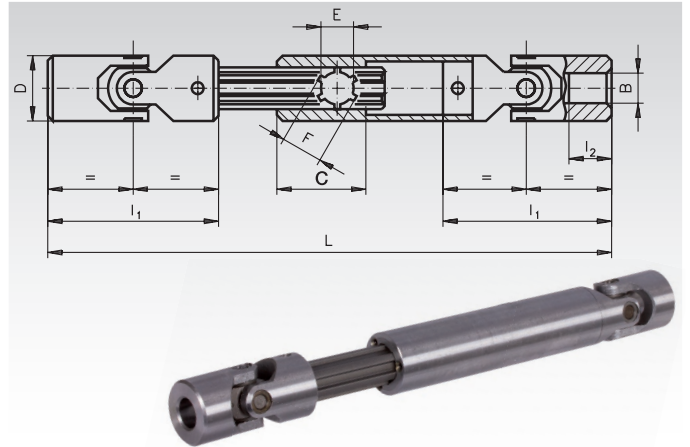
Product No.	Torque max. Nm	BH7 mm	l ₂ mm	D mm	L			Weight kg	Profile
					Retracted mm	A mm	M mm		similar DIN ISO 14 z x mm x mm
631 520 00	20	10	13	20	200	70	25	0,50	6 x 11 x 14
631 524 00	30	12	14	24	220	75	30	0,65	6 x 11 x 14
631 528 00	50	14	17	28	250	80	35	0,95	6 x 16 x 20
631 532 00	60	16	19	32	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

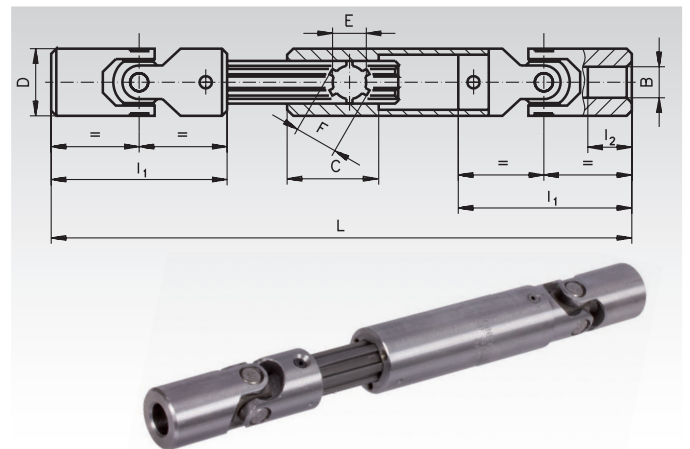
Product No.	BH7	D	l ₁	l ₂	C	E	F	Standard size		permissible max. Torques in Nm at different Speeds						Weight kg	
								L _{min}	L _{max}	100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹		800 min ⁻¹
631 820 00	10	22	45	10	40	11	14	170	230	25	17	14,5	13	12	11	7,5	0,37
631 826 00	12	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

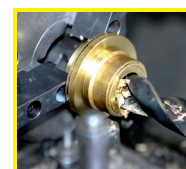
Max. Operating Angle per Joint 45°.

Other lengths on request.



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

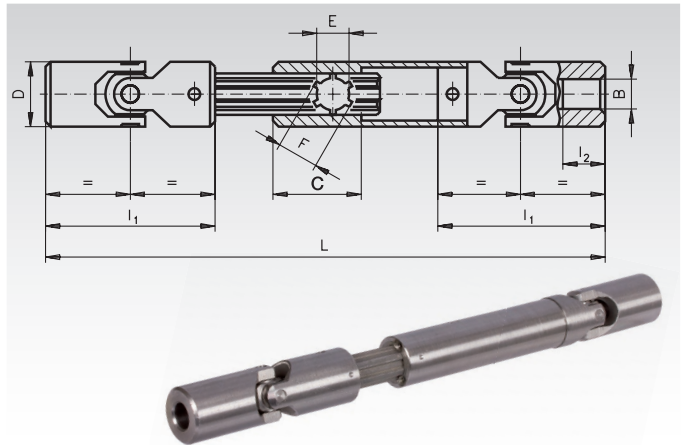
Product No.	BH7	D	l ₁	l ₂	C	E	F	Standard size		permissible max. Torques in Nm at different Speeds					Weight kg	
								L _{min}	L _{max}	250 min ⁻¹	500 min ⁻¹	1000 min ⁻¹	2000 min ⁻¹	3000 min ⁻¹		4000 min ⁻¹
631 920 00	10	20	62	18	40	11	14	170	200	20	15	13	10	9	8	0,33
631 925 00	14	25	74	20	45	13	16	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	95	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

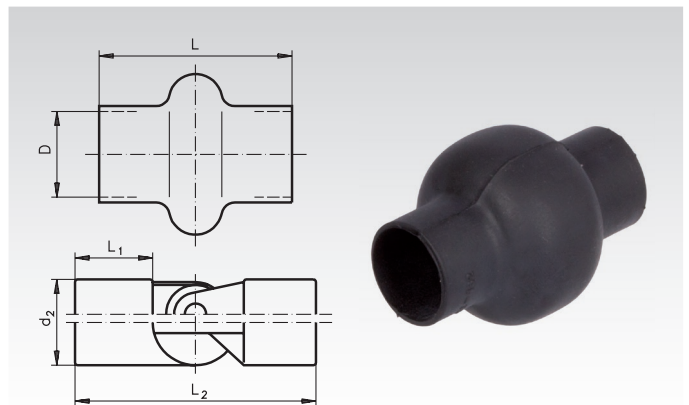
Product No.	BH7 mm	D mm	I ₁ mm	I ₂ mm	C mm	E mm	F mm	Standard size		permissible max torques in Nm at different Speeds							Weight kg
								L _{min} mm	L _{max} mm	100 min ⁻¹	200 min ⁻¹	300 min ⁻¹	400 min ⁻¹	500 min ⁻¹	700 min ⁻¹	800 min ⁻¹	
631 998 20	10	22	76	25	30	11	14	215	245	12,5	8,5	7	6,5	6	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.

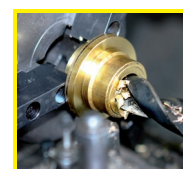
Single-fold bellows are used to protect ball and universal joints.
 The shaft lengths L₁ and L₂ are estimated dimensions.

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	65	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.**