KTR Precision joints
with plain or needle bearing

KTR universal joints are connection elements of highest quality and accuracy to connect two shafts. A maximum articulation angle of up to 45° for each joint is admissible.

The precision joints type G with plain bearing are suitable for speeds up to 1000 1/min, precision joints type H with maintenance-free needle bearing for speeds up to 4000 1/min.

This production procedure allows a high precision with positive effects on the bearing clearance, concentric running and a long service life. The KTR precision joints are available as single, double and extendable joints.

Included in our delivery programme are furthermore quick locking joints with plain and needle bearing as single joints.

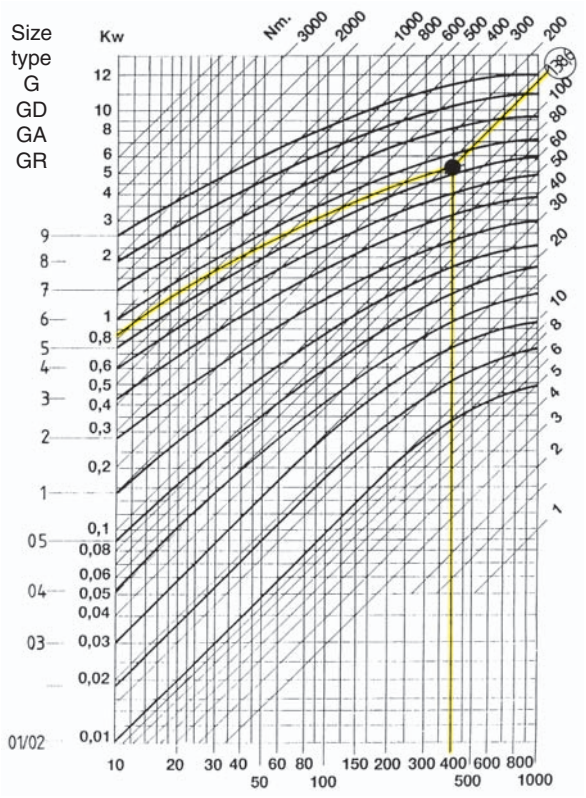
KTR Precision joints

according to DIN 808 with plain bearing/needle bearing

Selection and determination of sizes

For advanced drive technology KTR

For plain bearing n_{max} = 1000 min^{-1}



Selection of precision joints type G, GD, GA, GR (max. 1000 min^{-1})

Articulation angle [α]	Correction value
45°	4,0
40°	3,3
35°	2,6
30°	2,2
25°	1,8
20°	1,5
15°	1,25
10°	1,00
5°	0,8

The selection of the precision joints with plain bearing is based on the driving torque, taking into account a correction value which depends on the articulation angle α and the operating speed. For the extendable joints in addition the overall length and the speed have to be considered to determine the size (please consult with KTR engineering department).

Torque x correction value = selected torque

Example of selection:

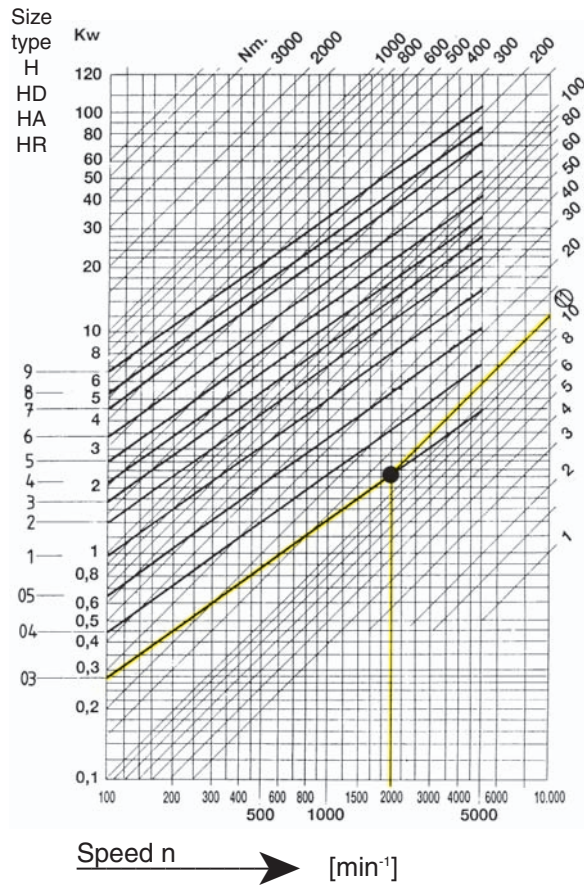
Driving torque [Nm]	Correction value for articulation angle [α]	Selected torque Selection of size acc. to table
63 Nm	30°	
63 Nm	2,2	63 Nm x 2,2 = 138,6 Nm
Operating speed = 400 min^{-1}		

The selection of the size according to the table is based on the driving torque (63 Nm) x correction value (30° = 2,2) = 138,6 Nm and the operating speed of 400 min -1.

Selected: Joint size 6

$$\text{Torque [Nm]} = 9550 \cdot \frac{\text{Power [kW]}}{\text{Speed [min}^{-1}\text{]}}$$

For needle bearing n_{max} = 4000 min^{-1}



Selection of precision joints type H, HD, HA, HR (max. 4000 min^{-1})

Articulation angle [α]	Correction value
45°	4,0
40°	3,3
35°	2,5
30°	2,0
25°	1,4
20°	1,25
15°	1,1
10°	1,00
5°	0,8

The selection of the precision joints with needle bearing is based on the driving torque, taking into account a correction value which depends on the articulation angle α and the operating speed. For the extendable joints in addition the overall length and the speed have to be considered to determine the size (please consult with KTR engineering department).

Torque x correction value = selected torque

Example of selection:

Driving torque [Nm]	Correction value for articulation angle [α]	Selected torque Selection of size acc. to table
8,8 Nm	20°	
8,8 Nm	1,25	8,8 Nm x 1,25 = 11 Nm
Operating speed = 2000 min^{-1}		

The selection of the size according to the table is based on the driving torque (8,8 Nm) x correction value (20° = 1,25) = 11 Nm and the operating speed of 2000 min -1.

Selected: Joint size 03

$$\text{Torque [Nm]} = 9550 \cdot \frac{\text{Power [kW]}}{\text{Speed [min}^{-1}\text{]}}$$

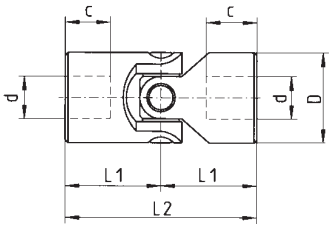
KTR Precision joints

according to DIN 808 with plain bearing

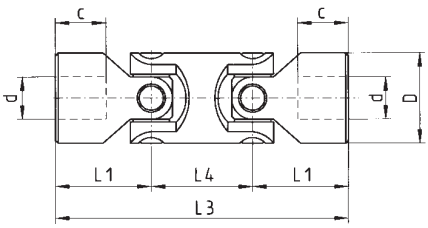
Type G and GD

- Suitable for every application in the range of general engineering up to a maximum speed of 1000 min^{-1}
- Type G precision single joint
- Type GD precision double joint
- Maximum articulation angle 45° for each joint
- Bearings designed as plain bearings
- Available with finish bore H7 - on request with keyway, hexagon bore or square bore

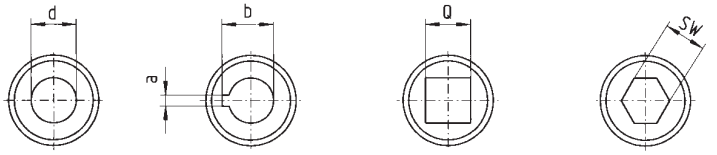
Precision single joint G



Precision double joint GD



Finish bores:



Types and size				d [H7]	D	L_2	L_1	C	L4	L3	a [JS9]	b	Q [H8]	SW [H8]	Weight	
Size G	DIN description G	Size GD	DIN description GD												G [kg]	GD [kg]
01 G	E6 x 16-G	**01GD**	D6 x 16-G	6	16	34	17	8	22	56	2	7,0	6	6	0,05	0,08
02 G	E8 x 16-G	**02GD**	D8 x 16-G	8	16	40	20	11	22	62	2	9,0	8	8	0,05	0,08
03 G	E10 x 22-G	**03GD**	D10 x 22-G	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15
04 G	E12 x 25-G	**04GD**	D12 x 25-G	12	25	56	28	13	30	86	4	13,8	12	12	0,16	0,25
05 G	E14 x 28-G	**05GD**	D14 x 28-G	14	28	60	30	13	36	96	5	16,3	14	14	0,20	0,40
1 G	E16 x 32-G	**1GD**	D16 x 32-G	16	32	68	34	16	36	104	5	18,3	16	16	0,30	0,45
2 G	E18 x 36-G	**2GD**	D18 x 36-G	18	36	74	37	17	40	114	6	20,8	18	18	0,45	0,70
3 G	E20 x 42-G	**3GD**	D20 x 42-G	20	42	82	41	18	46	128	6	22,8	20	20	0,60	1,00
4 G	E22 x 45-G	**4GD**	D22 x 45-G	22	45	95	47,5	22	50	145	6	24,8	22	22	0,95	1,55
5 G	E25 x 50-G	**5GD**	D25 x 50-G	25	50	108	54	26	55	163	8	28,3	25	25	1,20	2,00
6 G	E30 x 58-G	**6GD**	D30 x 58-G	30	58	122	61	29	68	190	8	33,3	30	30	1,85	2,90
6 G1	E32 x 58-G	**6GD1**	D32 x 58-G	32	58	130	65	33	68	198	10	35,3	30	30	2,00	3,00
7 G	E35 x 70-G	**7GD**	D35 x 70-G	35	70	140	70	35	72	212	10	38,3	35	–	3,15	4,75
8 G	E40 x 80-G	**8GD**	D40 x 80-G	40	80	160	80	40	85	245	12	43,3	40	–	4,60	7,20
9 G	E50 x 95-G	**9GD**	D50 x 95-G	50	95	190	95	50	100	290	14	53,8	50	–	7,60	12,0

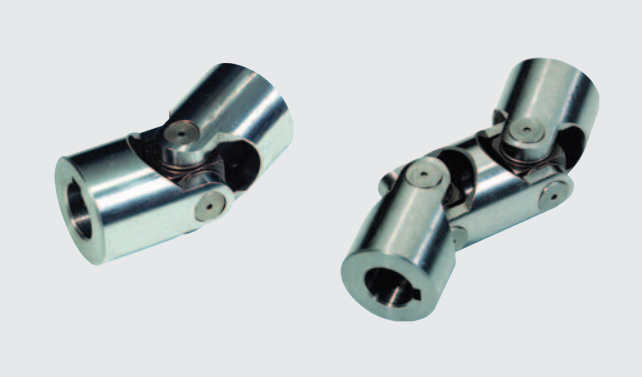
Order form:

04 G	Ø 12	Ø 12 keyway DIN
Size/type of joint	Finish bore (H7)	Finish bore (H7) keyway to DIN 6885 sheet 1 (JS9)

KTR Precision joints

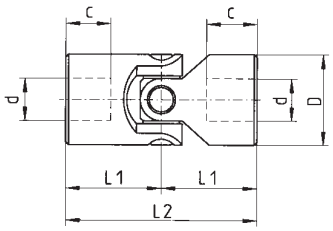
according to DIN 808 with needle bearing

Type H and HD

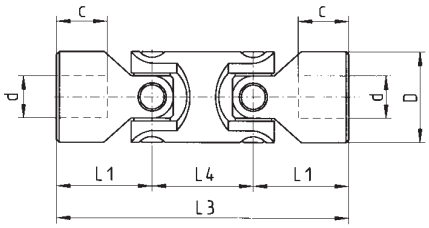


- Suitable for every application in the range of general engineering up to a maximum speed of 4000 min^{-1}
- Type H precision single joint
- Type HD precision double joint
- Maximum articulation angle 45°
- High dynamic load - small bearing clearance
- Maintenance-free due to needle bearing
- Available with finish bore H7 - on request with keyway, hexagon bore or square bore

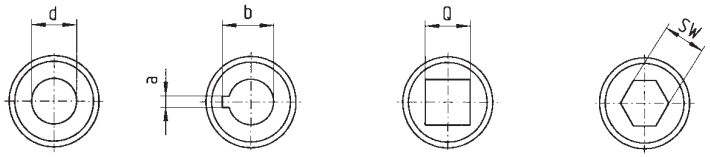
Precision single joint H



Precision double joint HD



Finish bores:



Types and size				d [H7]	D	L_2	L_1	C	L4	L3	a [JS9]	b	Q [H8]	SW [H8]	Weight	
Size H	DIN description H	Size HD	DIN description HD												H	HD
03 H	E10 x 22-W	**03HD**	D10 x 22-W	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15
04 H	E12 x 25-W	**04HD**	D12 x 25-W	12	25	56	28	13	30	86	4	13,8	12	12	0,16	0,25
05 H	E14 x 28-W	**05HD**	D14 x 28-W	14	28	60	30	13	36	96	5	16,3	14	14	0,20	0,40
1 H	E16 x 32-W	**1HD**	D16 x 32-W	16	32	68	34	16	36	104	5	18,3	16	16	0,30	0,45
2 H	E18 x 36-W	**2HD**	D18 x 36-W	18	36	74	37	17	40	114	6	20,8	18	18	0,45	0,70
3 H	E20 x 42-W	**3HD**	D20 x 42-W	20	42	82	41	18	46	128	6	22,8	20	20	0,60	1,00
4 H	E22 x 45-W	**4HD**	D22 x 45-W	22	45	95	47,5	22	50	145	6	24,8	22	22	0,95	1,55
5 H	E25 x 50-W	**5HD**	D25 x 50-W	25	50	108	54	26	55	163	8	28,3	25	25	1,20	2,00
6 H	E30 x 58-W	**6HD**	D30 x 58-W	30	58	122	61	29	68	190	8	33,3	30	30	1,85	2,90
6 H1	E32 x 58-W	**6HD1**	D32 x 58-W	32	58	130	65	33	68	198	10	35,3	30	30	2,00	3,00
7 H	E35 x 70-W	**7HD**	D35 x 70-W	35	70	140	70	35	72	212	10	38,3	35	–	3,15	4,75
8 H	E40 x 80-W	**8HD**	D40 x 80-W	40	80	160	80	40	85	245	12	43,3	40	–	4,60	7,20
9 H	E50 x 95-W	**9HD**	D50 x 95-W	50	95	190	95	50	100	290	14	53,8	50	–	7,60	12,0

Order form:

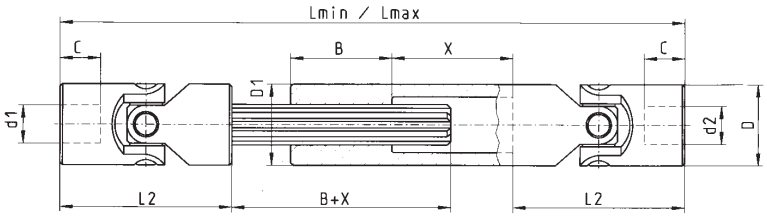
1H	Ø 16	Ø 16 keyway to DIN
Size/type of joint	Finish bore (H7)	Finish bore (H7) keyway to DIN 6885 sheet 1 (JS 9)

KTR Precision joints

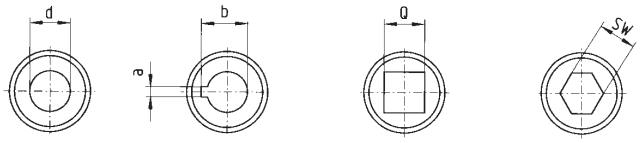
according to DIN 808 with plain and needle bearing

Type GA and HA; extendable

- Precision double joint - extendable, maximum articulation angle 45° for each joint
- Bridging of bigger shaft distances
- Type GA (plain bearing) $n_{max.}$ = 1000 min^{-1}
- Type HA (needle bearing) $n_{max.}$ = 4000 min^{-1}
- Available with quick locking GR; HR
- Available with finish bore H7 - on request available with keyway, thread for setscrews, square or hexagon bore



Finish bores:



Size	Dimensions $L_{min.}$ / $L_{max.}$ Standard lengthes								
03	140 170	160 200	180 240	230 330					
04	160 190	180 225	200 270	220 300	250 355	280 420	300 450		
05	170 200	180 220	200 260	220 300	250 350	280 420	300 450	350 550	400 650
1	190 220	210 250	240 320	250 350	275 390	300 430	380 590	400 630	
2	230 280	250 320	270 370	290 400	300 415	400 620	500 820		
3	250 300	270 340	290 380	320 440	380 560	420 640	500 800		
4	250 280	270 320	290 350	330 430	350 470	470 710			
5	295 345	310 375	350 450	380 500	420 590	460 660	500 745		
6	330 380	350 420	370 455	400 510	450 620	500 720	540 795		

Type **GA** with plain bearing n_{max} = 1000 min^{-1} — Type **HA** with needle bearing n_{max} = 4000 min^{-1}

Size GA	Size HA	d_1; d_2 [H7]	D	L_2	C	L_{min} / L_{max} / X	B	a [JS9]	b	Q [H8]	SW [H8]	Spline shaft	D_1
03 GA	**03 HA**	10	22	48	12	← →	30	3	11,4	10	10	11 x 14 Z6	22
04 GA	**04 HA**	12	25	56	13	← →	40	4	13,8	12	12	13 x 16 Z6	26
05 GA	**05 HA**	14	28	60	13	← as per →	40	5	16,3	14	14	13 x 16 Z6	29
1 GA	**1 HA**	16	32	68	16	← customers' →	40	5	18,3	16	16	16 x 20 Z6	32
2 GA	**2 HA**	18	36	74	17	← request →	40	6	20,8	18	18	18 x 22 Z6	37
3 GA	**3 HA**	20	42	82	18	← →	45	6	22,8	20	20	21 x 25 Z6	42
4 GA	**4 HA**	22	45	95	22	← L_{min} / L_{max} →	50	6	24,8	22	22	23 x 28 Z6	47
5 GA	**5 HA**	25	50	108	26	← →	50	8	28,3	25	25	26 x 32 Z6	52
6 GA	**6 HA**	30	58	122	29	← →	60	8	33,3	30	30	32 x 38 Z8	58
7 GA	**7 HA**	35	70	140	35	← →	70	10	38,3	35	–	36 x 42 Z8	70
8 GA	**8 HA**	40	80	160	40	← →	80	12	43,3	40	–	42 x 48 Z8	80
9 GA	**9 HA**	50	95	190	50	← →	90	14	53,8	50	–	46 x 54 Z8	95

Calculation of mounting lengthes L and X (Stroke)

$$\text{Stroke } x \leq \frac{L_{max} - 2 \bullet L_2 - B}{2}$$

$$L_{min} \geq \frac{L_{max} + 2 \bullet L_2 + B}{2}$$

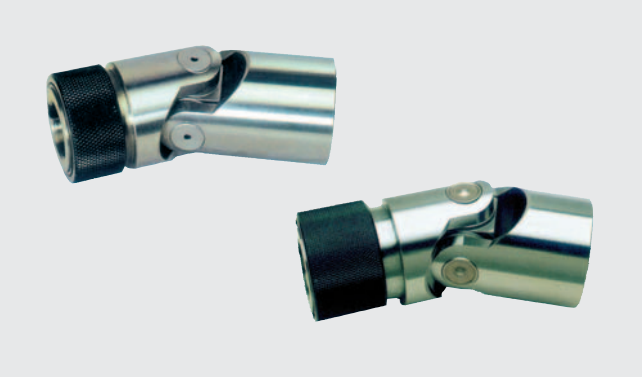
minimum dimension L_{min}

$$L_{min} = L_2 + B + X + L_2$$

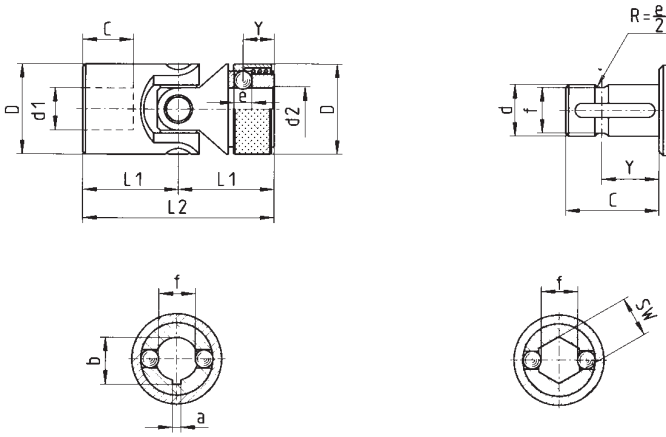
Order form:

3 GA	d_1 Ø 20	d_2 = Ø 20 keyway DIN	550/650
Size/type of joint	Finish bore (H7)	Finish bore (H7) Keyway to DIN 6885 sheet 1 (JS 9)	Mounting length L_{min} / L_{max}

KTR Precision joints
with quick locking
Type GR and HR/Protection muffs



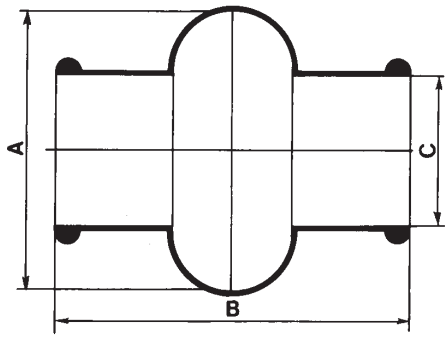
- Precision single joint with quick locking (separable)
- Type GR with plain bearing $n_{max.}$ = 1000 min^{-1}
- Type HR with needle bearing $n_{max.}$ = 4000 min^{-1}
- Maximum articulation angle 45°
- Quick locking (d_2) only available with H7 bore and keyway to DIN 6885 sheet 1 - JS9 or hexagon bore



Type **GR** with plain bearing n_{max} 1000 min^{-1} — Type **HR** with needle bearing n_{max} 4000 min^{-1}

Size GR	Size HR	d_1 d_2	D	L2	L1	C	Y	e	f	a [JS9]	b	SW [H8]
02GR	–	8	16	52	26	14	9,5	3,5	7	2	9	8
03GR	**03HR**	10	22	62	31	17	11,5	4	8,7	3	11	10
04GR	**04HR**	12	25	74	37	21	13,5	4	11	4	13,3	12
1GR	**1HR**	16	32	86	43	24	14	6,35	14,8	5	17,3	16
3GR	**3HR**	20	42	108	54	31	19	8	18	6	22,3	20
5GR	**5HR**	25	50	132	66	38	20,5	10	23	8	28,3	25
6GR	**6HR**	30	58	166	83	49	25	10	28	8	33,3	30

Protection muffs for joints type G; H; GA; HA



Size	Joints	A	B	C
M 01	01G; 02G	28	34	15
M 02	-	32	40	16,5
M 03	09G; 03H; GA; HA	40	45	20,5
M 04	04G; 04H; GA; HA	48	50	24,5
M 05	05G; 05H; GA; HA	52	56	27,5
M 1	1G; 1H; GA; HA	56	65	30,5
M 2	2G; 2H; GA; HA	66	72	35,5
M 3	3G; 3H; GA; HA	75	82	40
M 4	4G; 4H; GA; HA	84	95	45
M 5	5G; 5H; GA; HA	92	108	50
M 6	6G; 6G1; 6H; 6H1; GA; HA	100	122	56

Order form:

03 HR	d_1 = Ø 10	d_2 = Ø 10 keyway DIN
Size / type of joint	Finish bore (H7)	Finish bore (H7) Keyway to DIN 6885 sheet 1 (JS9) – only available with keyway or as hexagon bore –