



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.

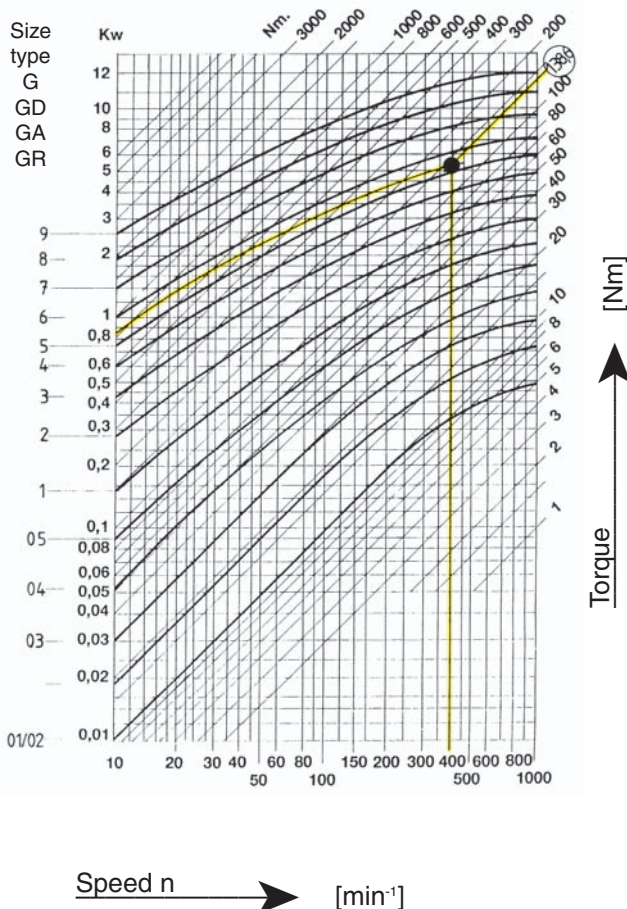
KTR Precision joints

according to DIN 808 with plain bearing/needle bearing

Selection and determination of sizes



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



Selection of precision joints type G, GD, GA, GR (max. 1000 min⁻¹)

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
Articulation angle [α]	Correction value

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:

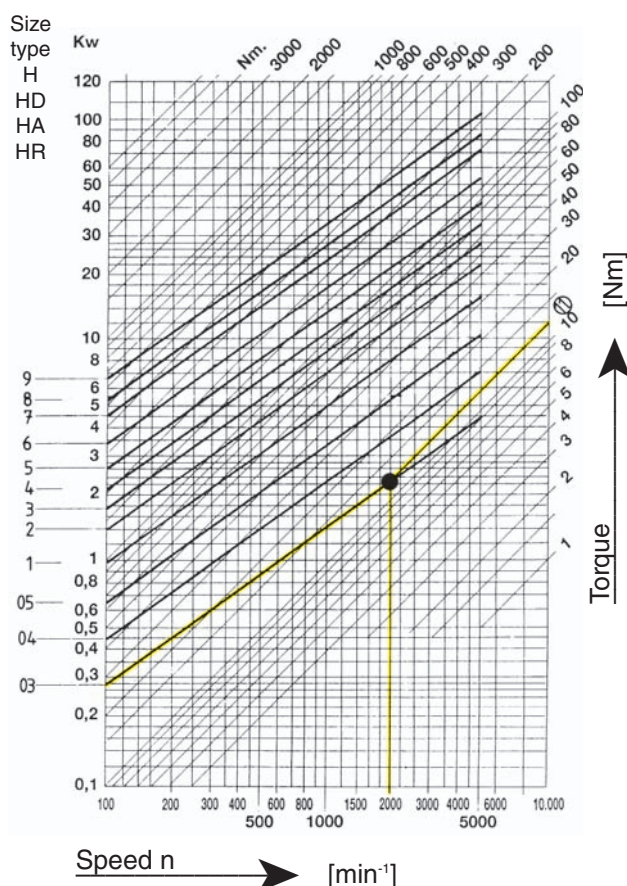
Driving torque [Nm]	Correction value for articulation angle [α]	Selected torque Selection of size acc. to table
63 Nm	30°	
63 Nm	2,2	63 Nm x 2,2 = 138,6 Nm
Operating speed = 400 min ⁻¹		

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 $n_{\max} = 4000 \text{ min}^{-1}$



Selection of precision joints type H, HD, HA, HR (max. 4000 min⁻¹)

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
Articulation angle [α]	Correction value

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

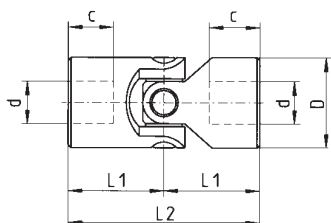
according to DIN 808 with plain bearing

Type G and GD

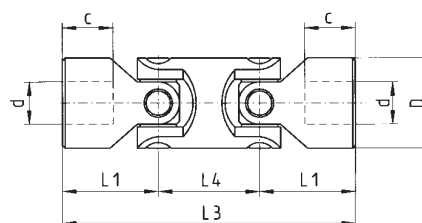


- Suitable for every application in the range of general engineering up to a maximum speed of 1000 min⁻¹
- Type G precision single joint
- Type GD precision double joint
- Maximum articulation angle 45° for each joint
- Bearings designed as plain bearings
- Available with finish bore H7 - on request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

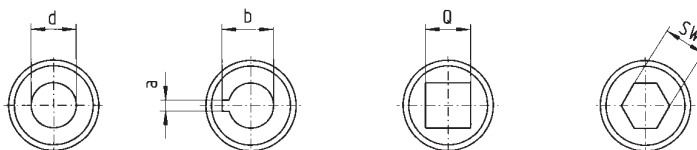
Precision single joint G



Precision double joint GD



Finish bores:



Types and size				d [H7]	D	L ₂	L ₁	C	L ₄	L ₃	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

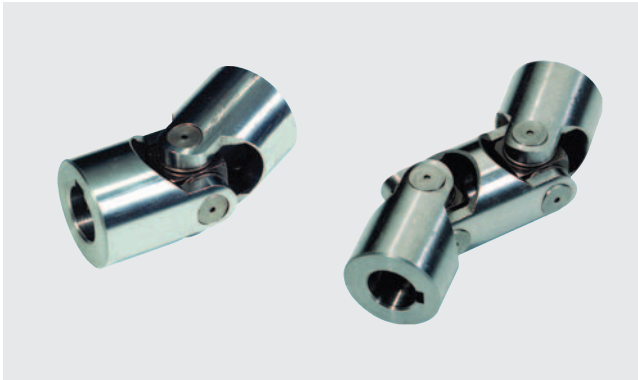
Order form:

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

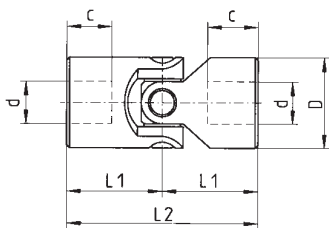
according to DIN 808 with needle bearing

Type H and HD

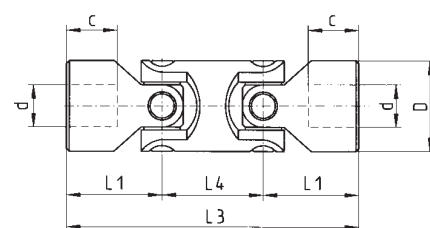


- Suitable for every application in the range of general engineering up to a maximum speed of 4000 min⁻¹
- Type H precision single joint
- Type HD precision double joint
- Maximum articulation angle 45°
- High dynamic load - small bearing clearance
- Maintenance-free due to needle bearing
- Available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

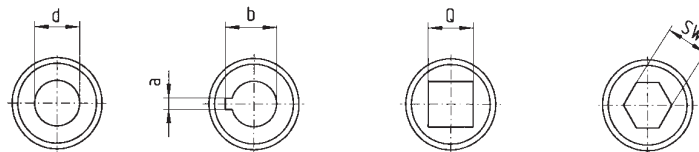
Precision single joint H



Precision double joint HD



Finish bores:



Types and size				d [H7]	D	L ₂	L ₁	C	L ₄	L ₃	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)

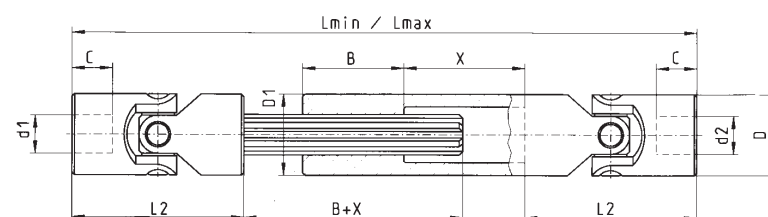
KTR Precision joints

according to DIN 808 with plain and needle bearing

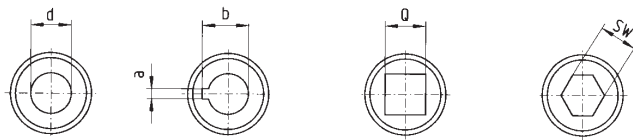
Type GA and HA; extendable



- Precision double joint - extendable, maximum articulation angle 45° for each joint
- Bridging of bigger shaft distances
- Type GA (plain bearing) $n_{\max.} = 1000 \text{ min}^{-1}$
- Type HA (needle bearing) $n_{\max.} = 4000 \text{ min}^{-1}$
- 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 lengths				
03	140	160	180	230						
	170	200	240	330						
04	160	180	200	220	250	280	300			
	190	225	270	300	355	420	450			
05	170	180	200	220	250	280	300	350	400	
	200	220	260	300	350	420	450	550	650	
1	190	210	240	250	275	300	380	400		
	220	250	320	350	390	430	590	630		
2	230	250	270	290	300	400	500			
	280	320	370	400	415	620	820			
3	250	270	290	320	380	420	500			
	300	340	380	440	560	640	800			
4	250	270	290	330	350	470				
	280	320	350	430	470	710				
5	295	310	350	380	420	460	500			
	345	375	450	500	590	660	745			
6	330	350	370	400	450	500	540			
	380	420	455	510	620	720	795			

Type GA with plain bearing $n_{\max} = 1000 \text{ min}^{-1}$

Type HA with needle bearing $n_{\max} = 4000 \text{ min}^{-1}$

Size		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
GA	HA												
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 lengths L and X (Stroke)

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

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

minimum dimension L_{min}

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

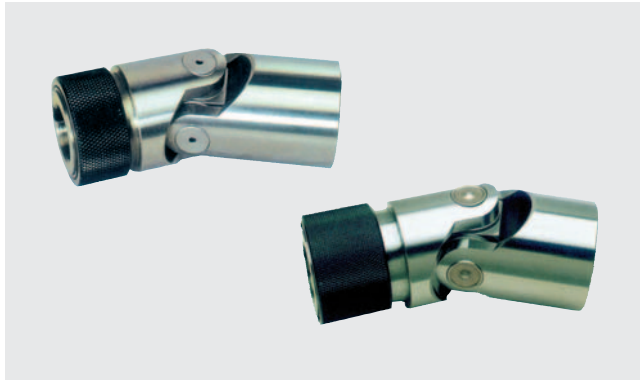
Order form:

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}

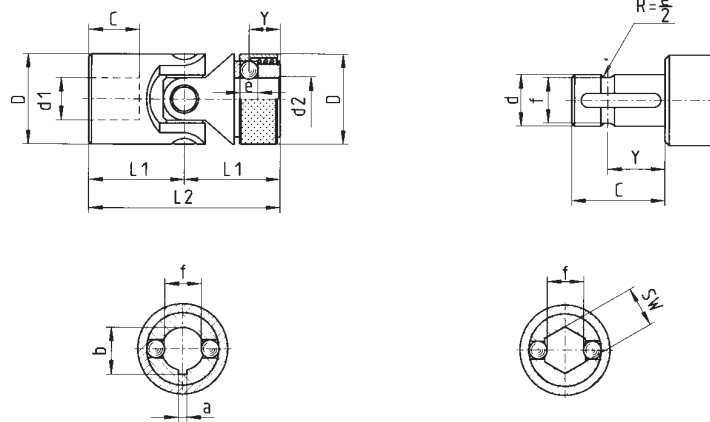
KTR Precision joints

with quick locking

Type GR and HR/Protection muffs

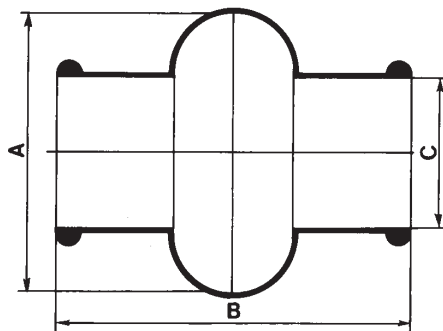


- Precision single joint with quick locking (separable)
- Type GR with plain bearing $n_{\max.} = 1000 \text{ min}^{-1}$
- Type HR with needle bearing $n_{\max.} = 4000 \text{ min}^{-1}$
- Maximum articulation angle 45°
- Quick locking (d_2) only available with H7 bore and keyway to DIN 6885 sheet 1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



Type GR with plain bearing $n_{\max} 1000 \text{ min}^{-1}$						Type HR with needle bearing $n_{\max} 4000 \text{ min}^{-1}$						
Size		d_1, d_2	D	L2	L1	C	Y	e	f	a [JS9]	b	SW [H8]
GR	HR											
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	$d_1 = \varnothing 10$	$d_2 = \varnothing 10$ 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 —