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KTR Precision joints

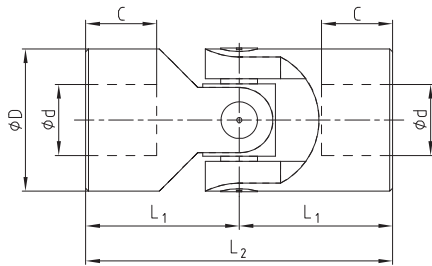
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Type G and GD according to DIN 808 with plain bearing

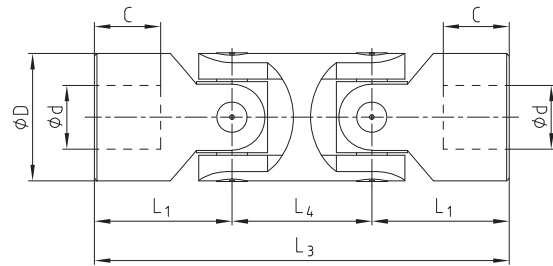


- Suitable for every application in the range of general engineering up to a maximum speed of 1000 rpm
- Type G precision single joint
- Type GD precision double joint
- Maximum articulation angle 45° for each joint
- Bearings designed as plain bearings
- Available with finish bore H7 – on request with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

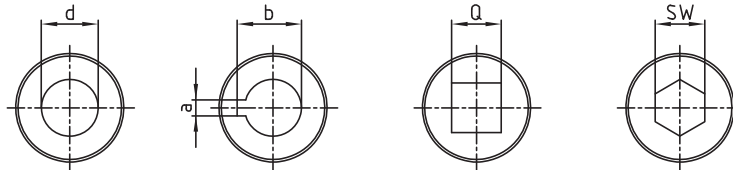
Precision single joint G



Precision double joint GD



Finish bores:



Type G and GD

Types and size				Dimensions [mm]										Weight		
Size G	DIN description G	Size GD	DIN description GD	d [H7]	D	L ₂	L ₁	C	L ₄	L ₃	a [JS9]	b	Q [H8]	SW [H8]	G [kg]	GD [kg]
01 G	E6 x 16-G	01 GD	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	02 GD	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	03 GD	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	04 GD	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	05 GD	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	1 GD	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	2 GD	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	3 GD	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	4 GD	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	5 GD	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	6 GD	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	6 GD1	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	7 GD	D35 x 70-G	35	70	140	70	35	72	212	10	38,3	-	-	3,15	4,75
8 G	E40 x 80-G	8 GD	D40 x 80-G	40	80	160	80	40	85	245	12	43,3	-	-	4,60	7,20
9 G	E50 x 95-G	9 GD	D50 x 95-G	50	95	190	95	50	100	290	14	53,8	-	-	7,60	12,0

Order form:

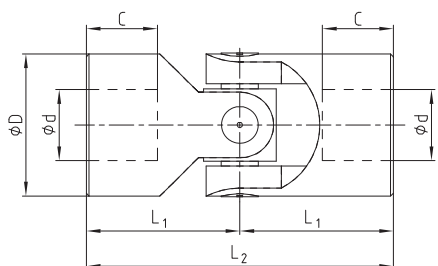
04 G	Ø 12	Ø 12 keyway DIN
Size/type of joint	Finish bore (H7)	Finish bore (H7) keyway to DIN 6885 sheet 1 (JS9)

Type H and HD according to DIN 808 with needle bearing

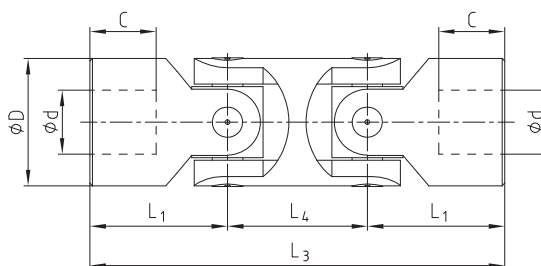


- Suitable for every application in the range of general engineering up to a maximum speed of 4000 rpm
- Type H precision single joint
- Type HD precision double joint
- Maximum articulation angle 45°
- High dynamic load - small bearing clearance
- Maintenance-free due to needle bearing
- Available with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

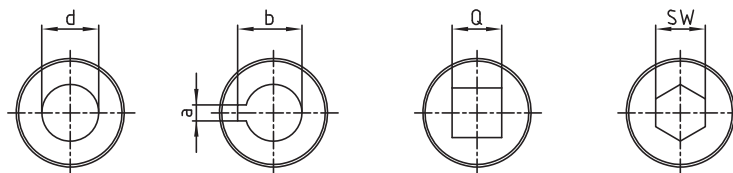
Precision single joint H



Precision double joint HD



Finish bores:



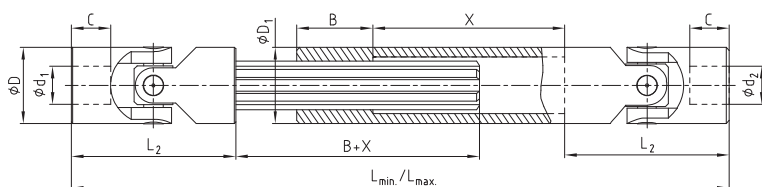
Type H and HD																
Types and size				Dimensions [mm]											Weight	
Size H	DIN description H	Size HD	DIN description HD	d [H7]	D	L ₂	L ₁	C	L ₄	L ₃	a [JS9]	b	Q [H8]	SW [H8]	H [kg]	HD [kg]
03 H	E10 x 22-W	03 HD	D10 x 22-W	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15
04 H	E12 x 25-W	04 HD	D12 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	05 HD	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	1 HD	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	2 HD	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	3 HD	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	4 HD	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	5 HD	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	6 HD	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	6 HD1	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	7 HD	D35 x 70-W	35	70	140	70	35	72	212	10	38,3	-	-	3,15	4,75
8 H	E40 x 80-W	8 HD	D40 x 80-W	40	80	160	80	40	85	245	12	43,3	-	-	4,60	7,20
9 H	E50 x 95-W	9 HD	D50 x 95-W	50	95	190	95	50	100	290	14	53,8	-	-	7,60	12,0

Order form:	1 H	Ø 16	Ø 16 keyway DIN
	Size/type of joint	Finish bore (H7)	Finish bore (H7) keyway to DIN 6885 sheet 1 (JS9)

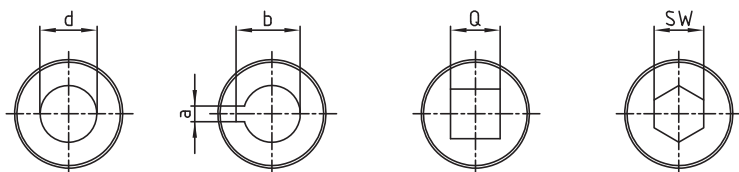
Type GA and HA acc. to DIN 808 with plain and needle bearing (extendable)



- Precision double joint - extendable, maximum articulation angle 45° for each joint
- Bridging of bigger shaft distances
- Type GA (plain bearing) $n_{max.} = 1000$ rpm
- Type HA (needle bearing) $n_{max.} = 4000$ rpm
- 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:



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

Type GA with plain bearing $n_{max.} = 1000$ rpm and type HA with needle bearing $n_{max.} = 4000$ rpm														
Size		Dimensions [mm]											Spline shaft	D_1
GA	HA	d_1, d_2 [H7]	D	L_2	C	$L_{min.} / L_{max.} / X$	B	a [JS9]	b	Q [H8]	SW [H8]			
01 GA	-	6	16	34	8	← →	25	2	7,0	6	6	SW8	16	
02 GA	-	8	16	40	11	← →	25	2	9,0	8	8	SW8	16	
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	← →	40	5	16,3	14	14	13 x 16 Z6	29	
1 GA	1 HA	16	32	68	16	← →	40	5	18,3	16	16	16 x 20 Z6	32	
2 GA	2 HA	18	36	74	17	← →	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	← →	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	-	-	36 x 42 Z8	70	
8 GA	8 HA	40	80	160	40	← →	80	12	43,3	-	-	42 x 48 Z8	80	
9 GA	9 HA	50	95	190	50	← →	90	14	53,8	-	-	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 $L_{min.}$
 $L_{min.} = L_2 + B + X + L_2$

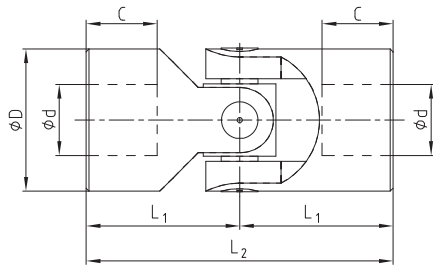
Order form:	3 GA	$d_1 = \emptyset 20$	$d_2 = \emptyset 20$ keyway DIN	550/650
	Size/type of joint	Finish bore (H7)	Finish bore (H7), keyway to DIN 6885 sheet 1 (JS9)	Mounting length $L_{min.} / L_{max.}$

Type X and XD acc. to DIN 808 with plain bearing (stainless steel 1.4301)

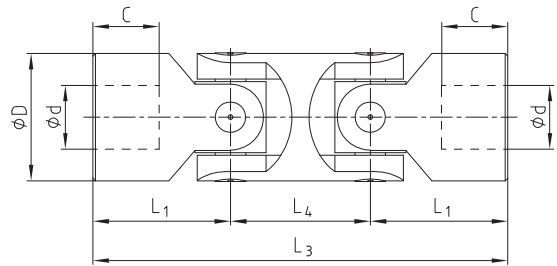


- Suitable for every application in the range of general engineering up to a maximum speed of 300 rpm
- Type X precision single joint
- Type XD precision double joint
- Maximum articulation angle 45° for each joint
- Available with finish bore H7 – on request with keyway, hexagon bore or square bore

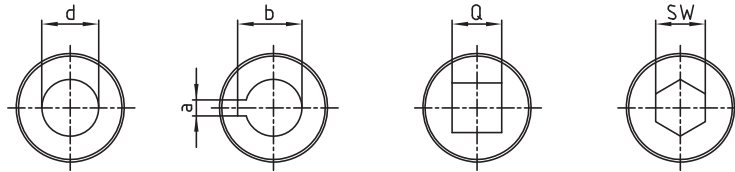
Precision single joint X



Precision double joint XD



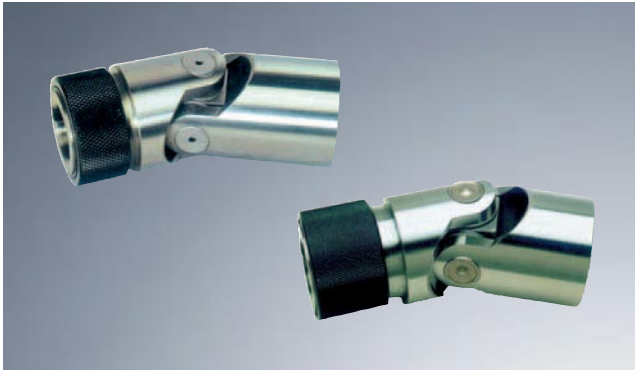
Finish bores:



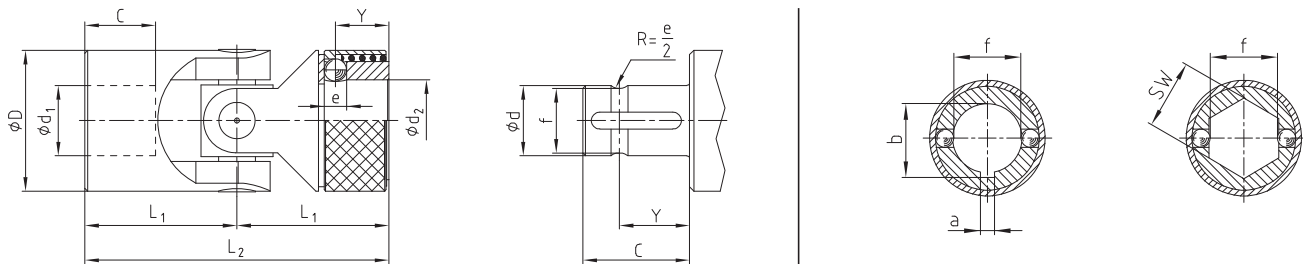
Type X and XD																
Types and size				Dimensions [mm]										Weight		
Size X	DIN description X	Size XD	DIN description XD	d [H7]	D	L ₂	L ₁	C	L ₄	L ₃	a [JS9]	b	Q [H8]	SW [H8]	X [kg]	XD [kg]
01 X	E6 x 16-G	01 XD	D6 x 16-G	6	16	34	17	8	22	56	2	7,0	6	6	0,05	0,08
02 X	E8 x 16-G	02 XD	D8 x 16-G	8	16	40	20	11	22	62	2	9,0	8	8	0,05	0,08
03 X	E10 x 22-G	03 XD	D10 x 22-G	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15
04 X	E12 x 25-G	04 XD	D12 x 25-G	12	25	56	28	13	30	86	4	13,8	12	12	0,16	0,25
1 X	E16 x 32-G	1 XD	D16 x 32-G	16	32	68	34	16	36	104	5	18,3	16	16	0,30	0,45
3 X	E20 x 42-G	3 XD	D20 x 42-G	20	42	82	41	18	46	128	6	22,8	20	20	0,60	1,00
5 X	E25 x 50-G	5 XD	D25 x 50-G	25	50	108	54	26	55	163	8	28,3	25	25	1,20	2,00
6 X	E30 x 58-G	6 XD	D30 x 58-G	30	58	122	61	29	68	190	8	33,3	30	30	1,85	2,90

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

Type GR and HR with quick locking

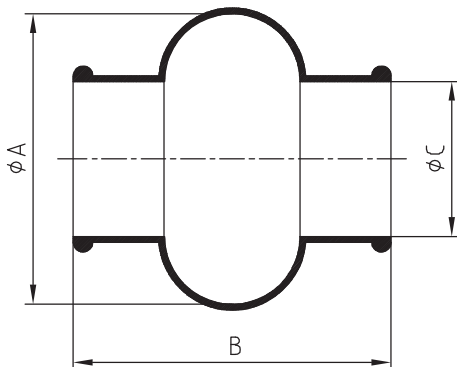


- Precision single joint with quick locking (separable)
- Type GR with plain bearing $n_{max.} = 1000$ giri/min
- Type HR with needle bearing $n_{max.} = 4000$ rpm
- Maximum articulation angle 45°
- Quick locking (d_2) available with H7 bore and keyway to DIN 6885 sheet 1 – JS9 or hexagon bore



Type GR with plain bearing $n_{max.} = 1000$ rpm and type HR with needle bearing $n_{max.} = 4000$ rpm												
Size		Dimensions [mm]										
GR	HR	d_1, d_2 [H7]	D	L_2	L_1	C	Y	e	f	a [JS9]	b	SW [H8]
02 GR	-	8	16	52	26	14	9,5	3,5	7,0	2	9,0	8
03 GR	03 HR	10	22	62	31	17	11,5	4,0	8,7	3	11,0	10
04 GR	04 HR	12	25	74	37	21	13,5	4,0	11,0	4	13,3	12
05 GR	05 HR	14	25	74	37	21	13,5	4,0	13,0	5	15,3	14
1 GR	1 HR	16	32	86	43	24	14,0	6,35	14,8	5	17,3	16
2 GR	2 HR	18	36	96	48	28	19,0	8,0	16,0	6	19,8	18
3 GR	3 HR	20	42	108	54	31	19,0	8,0	18,0	6	22,3	20
4 GR	4 HR	22	45	120	60	34	20,5	10,0	20,0	6	24,8	22
5 GR	5 HR	25	50	132	66	38	20,5	10,0	23,0	8	28,3	25
6 GR	6 HR	30	58	166	83	49	25,0	10,0	28,0	8	33,3	30

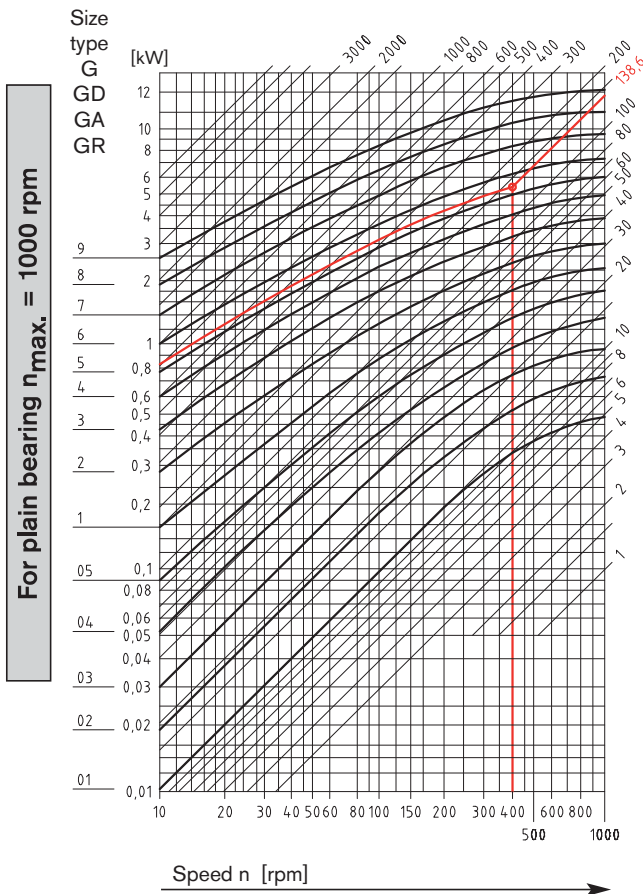
Protection muffs for joints type G, H, GA, HA and X



Protection muffs				
Size	Joints	A	B	C
M 01	01 G, 01 X	28	34	15
M 02	02 G, 02 X	32	40	16,5
M 03	03 G, 03 H, 03 GA, 03 HA, 03 X	40	45	20,5
M 04	04 G, 04 H, 04 GA, 04 HA, 04 X	48	50	24,5
M 05	05 G, 05 H, 05 GA, 05 HA	52	56	27,5
M 1	1 G, 1 H, 1 GA, 1 HA, 1 X	56	65	30,5
M 2	2 G, 2 H, 2 GA, 2 HA	66	72	35,5
M 3	3 G, 3 H, 3 GA, 3 HA, 3 X	75	82	40,0
M 4	4 G, 4 H, 4 GA, 4 HA	84	95	45,0
M 5	5 G, 5 H, 5 GA, 5 HA, 5 X	92	108	50,0
M 6	6 G, 6 G1, 6 H, 6 H1, 6 GA, 6 HA, 6 X	100	122	56,0

Order form:	03 HR	$d_1 = \emptyset 10$	$d_2 = \emptyset 10$ keyway DIN
	Size/type of joint	Finish bore (H7)	Finish bore (H7) keyway to DIN 6885 sheet 1 (JS9)

Selection and determination of size acc. to DIN 808 with plain/needle bearing



Selection of precision joints type G, GD, GA, GR (max. 1000 rpm)

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 * correction value = selected torque

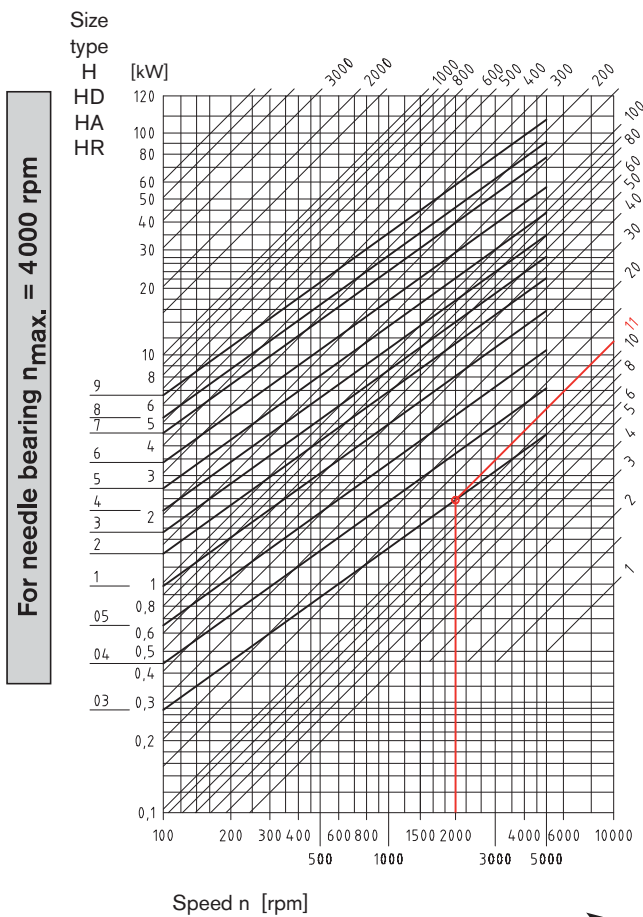
Example of selection

Driving torque	Correction value for articulation angle [α]	Selected torque Selection of size acc. to table
63 Nm	30°	
63 Nm	2,2	63 Nm * 2,2 = <u>138,6 Nm</u>
Operating speed = 400 rpm		

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 rpm.

Selected: Joint size 6

Torque [Nm] = 9550 * $\frac{\text{Power [kW]}}{\text{Speed [rpm]}}$



Selection of precision joints type H, HD, HA, HR (max. 4000 rpm)

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 * correction value = selected torque

Example of selection

Driving torque	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 * 1,25 = <u>11 Nm</u>
Operating speed = 2000 rpm		

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 rpm.

Selected: Joint size 03

Torque [Nm] = 9550 * $\frac{\text{Power [kW]}}{\text{Speed [rpm]}}$