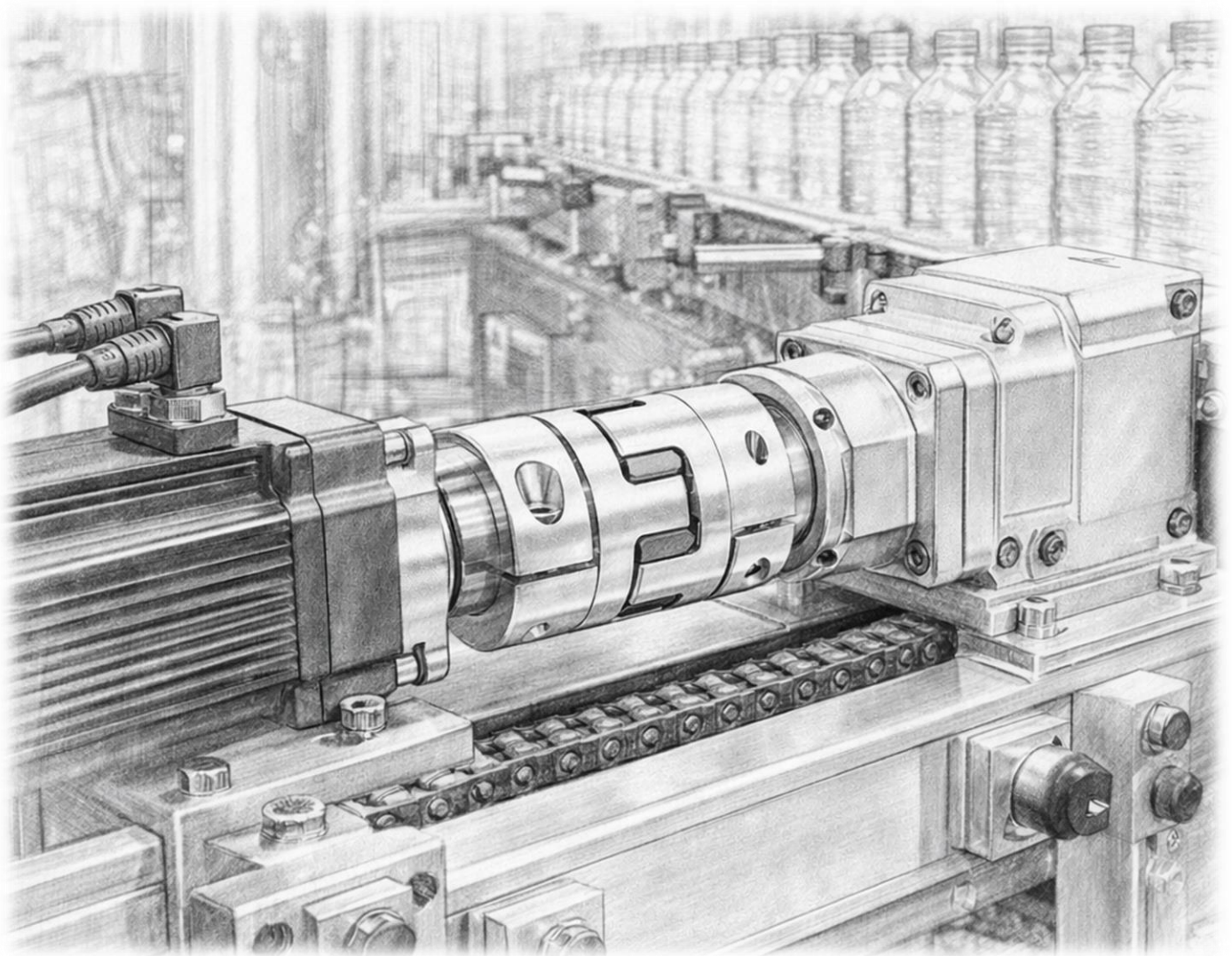
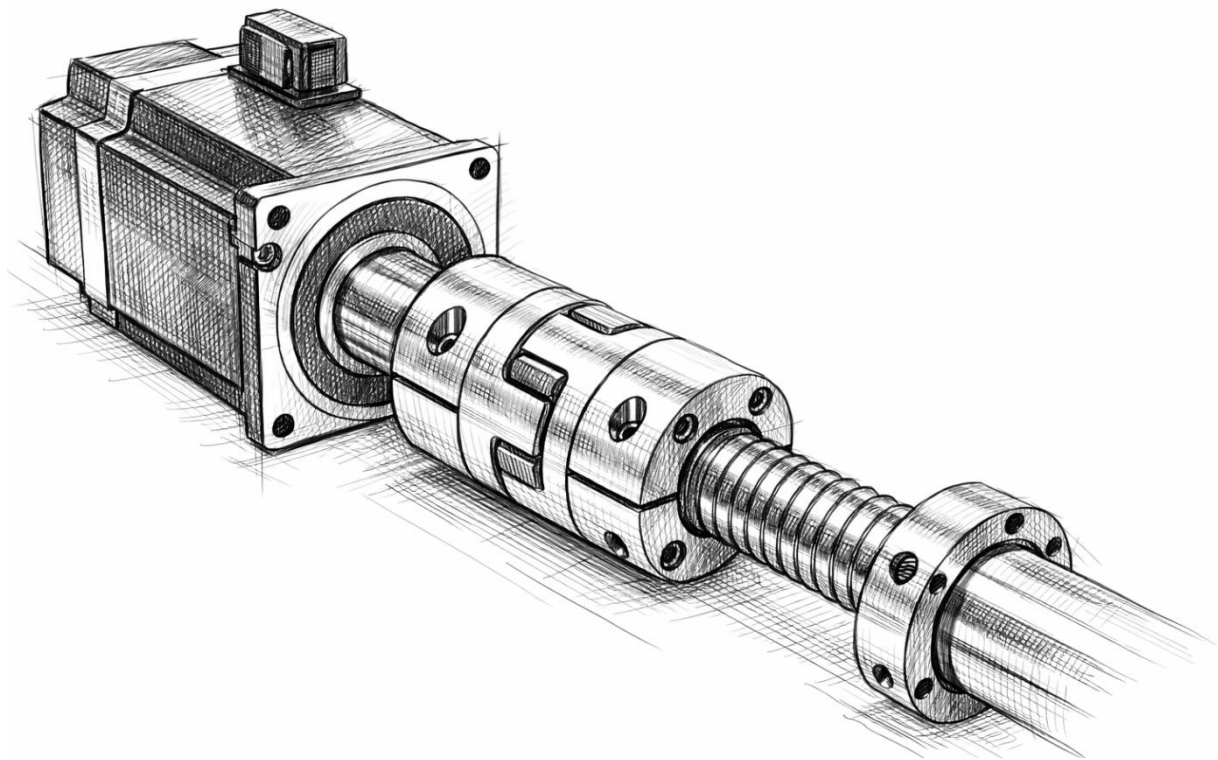


TrueTorq Private Limited



TT Servo Couplings





INDEX OF SUBJECTS

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TT SERVO COUPLINGS

Properties of servo backlash free couplings

Parameters	
Product	TT Servo Couplings
Type	Jaw coupling
Properties	
Backlash-free	•
Torsionally stiff	•
Damping vibrations	•
Maintenance-free	•
Axial plug-in	•
Compensating for misalignment	•
Electrical insulation	•
Fail-safe	•
Performance data	
Max. rated torque [Nm]	655
Max. speed n [rpm]	13000
Max. operating temperature T [°C]	-40 °C to +120 °C
Standard materials	
Hub materials available	
Steel	EN8
Aluminium	T6-6061
Spiders / elastomers	
Material	Polyurethane PU
Hardness	98Sh-A 64Sh-D
Degree of hardness	flexible to torsionally stiff
Temperature range in °C, min. / max. (standard)	-40 / +120
Surface coating	
Surface finishing	As per customer requirement
Types (extract)	
Elastomers can be radially disassembled >> without displacing driving/driven side	AH,SH
Intermediate shaft types	•
Standard spacers 100 mm to 250 mm	•
Double-cardanic >> compensating for big displacements, lower restoring forces	•

• : Standard

DIN 740 Part II – Coupling Selection Method

Standards used	
Standard	Purpose
DIN 740	Coupling selection & rating (torque, service factor, misalignment)
DIN 69002	Coupling interface & geometry accuracy (precision mounting)

TT SERVO COUPLINGS

Properties of standard spiders

Spider

Spider type (Shore hardness)	98 Shore A	64 Shore D
		
Size	9-48	9-48
Material	Polyurethane (PUR)	Polyurethane (PUR)
Permissible temperature range	-40 °C to +120 °C	-40 °C to +120 °C
Permanent temperature	-40 °C to +120 °C	-40 °C to +120 °C

Features of spider

- Significantly higher service life expectancy
- Very good temperature resistance
- Provides superior shock absorption and vibration damping
- Good resistance to oil, grease, and wear
- Transmission of high torques with medium damping
- Hub Material suitable for Spider shore hardness 98Sh-A and 64Sh-D
 - Aluminium (Al)
 - Steel
- High-quality Polyurethane (PUR) spider for excellent elasticity
- Ensures long service life under cyclic loads
- Accommodates angular, parallel, and axial misalignment
- Polyurethane spider provides electrical isolation between shafts
- Even if the spider fails, jaws maintain engagement to prevent complete disconnection

Spider Material	Polyurethane	
Degree of Hardness	98 Shore A	64 Shore D
Relative damping ϕ	0.8	0.75
Resonance factor VR	7.9	8.5

TT SERVO COUPLINGS

Technical data Speed + Weight

Speed

TTS Size	Spider GS Shore hardness	Shore scale	Max speed [rpm] for type					Torque[NM]		Static torsion Spring Stiffness [Nm/rad]	Dynamic torsion Spring Stiffness [Nm/rad]	Radial torsion Spring Stiffness Cr [N/mm]
			2.0/2.1 2.5/2.6	2.8 2.9	1.0 1.1	6.0	DKM	Tq	Tq max			
9	98	A	19000	19000	23800		28600	5	10	51.6	155	518
	64	D						6	12	74.6	224	739
12	98	A	15200	15200	19100		22900	9	18	240.7	718	846
	64	D						12	24	327.9	982	1198
14	98	A	12700	12700	15900	32000	19100	12.5	25	171.9	513	654
	64	D						16	32	234.2	702	856
19	98	A	9550	9550	11900	24000 19000	14300	21	42	1512	2540	2010
	64	D						26	52	2560	3810	2930
24	98	A	6950	10400	8650	17000 14000	10400	60	120	3640	5980	2560
	64	D						75	150	5030	10896	3696
28	98	A	5850	8800	7350	15000 12000	8800	160	320	6410	9920	3200
	64	D						200	400	10260	20177	4348
38	98	A	4750	7150	5950	12000 9600	7150	325	650	11800	17160	4400
	64	D						405	810	26300	40335	6474
42	98	A	4000		5000	10000 8050	6000	450	900	21594	37692	5570
	64	D						560	1120	36860	69825	7270
48	98	A	3600		4550	9100 7200	5450	525	1050	25759	45620	5930
	64	D						655	1310	75630	99750	8274

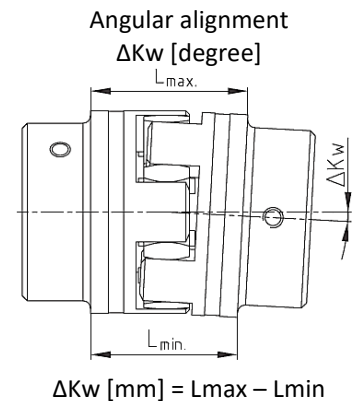
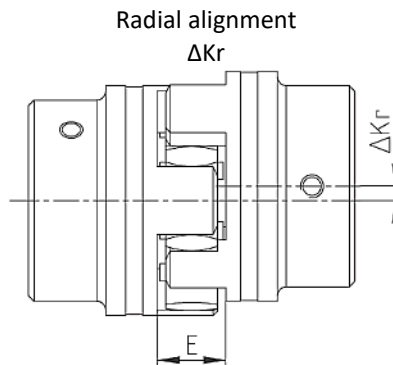
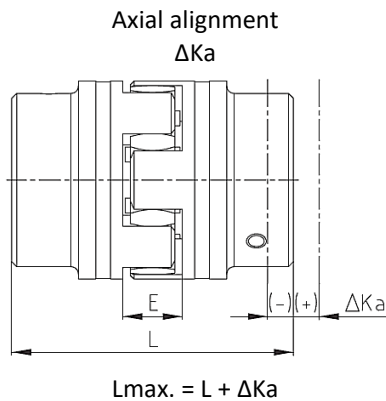
Speed

TTS Size	Weight [kg]		Mass moment of inertia J [kgm]	
	Per hub	Spider	Per hub	Spider
9	0.01	1.7×10^{-3}	0.48×10^{-6}	0.085×10^{-6}
12	0.02	2.3×10^{-3}	1.5×10^{-6}	0.139×10^{-6}
14	0.02	4.7×10^{-3}	2.8×10^{-6}	0.509×10^{-6}
19	0.09	7.6×10^{-3}	19.5×10^{-6}	1.35×10^{-6}
24	0.2	0.02	81.9×10^{-6}	6.7×10^{-6}
28	0.3	0.03	184.2×10^{-6}	14.85×10^{-6}
38	0.6	0.05	542.7×10^{-6}	39.4×10^{-6}
42	2.4	0.08	2802×10^{-6}	85×10^{-6}
48	3.3	0.09	4709×10^{-6}	135×10^{-6}

TT SERVO COUPLINGS

Alignments

Alignments



Size	Spider TTS	Standard displacements			DKM displacements		
		Axial ΔK_a [mm]	Radial ΔK_r [mm]	Angular ΔK_w [Degree]	Axial ΔK_a [mm]	Radial ΔK_r [mm]	Angular ΔK_w [Degree]
9	98ShA	+0.8	0.08	0.9	0.8	0.24	0.9
	64ShD	-0.4	0.05	0.8	-0.8	0.21	0.8
12	98ShA	+0.9	0.08	0.9	+0.9	0.29	0.9
	64ShD	-0.4	0.05	0.8	-0.9	0.25	0.8
14	98ShA	+1.0	0.09	0.9	+1.0	0.33	0.9
	64ShD	-0.5	0.06	0.8	-1.0	0.29	0.8
19	98ShA	+1.2	0.06	0.9	+1.2	0.41	0.9
	64ShD	-0.5	0.04	0.8	-1.0	0.36	0.8
24	98ShA	+1.4	0.1	0.9	+1.4	0.53	0.9
	64ShD	-0.5	0.07	0.8	-1.0	0.47	0.8
28	98ShA	+1.5	0.11	0.9	+1.5	0.6	0.9
	64ShD	-0.7	0.08	0.8	-1.4	0.53	0.8
38	98ShA	+1.8	0.12	0.9	+1.8	0.69	0.9
	64ShD	-0.7	0.09	0.8	-1.4	0.61	0.8
42	98ShA	+2.0	0.14	0.9	+2.0	0.75	0.9
	64ShD	-1.0	0.1	0.8	-2.0	0.67	0.8
48	98ShA	+2.1	0.16	0.9	+2.1	0.82	0.9
	64ShD	-1.0	0.11	0.08	-2.0	0.73	0.8

- The alignment figures may only be used one by one
- Care should be taken to maintain the distance dimension E accurately in order to allow for axial clearance of the coupling while in operation.

TT SERVO COUPLINGS

Dimensional Data (design 1.0 / 1.1)

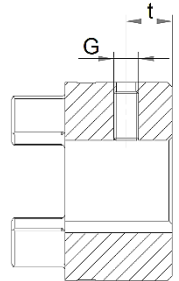
Standard Types



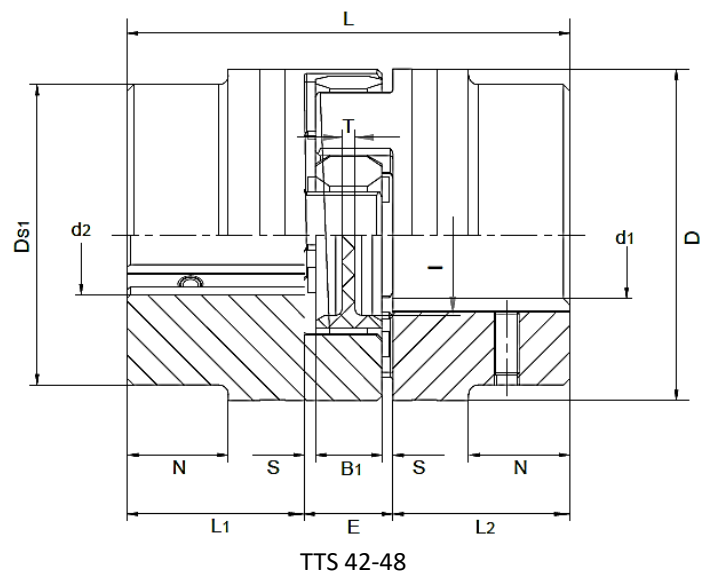
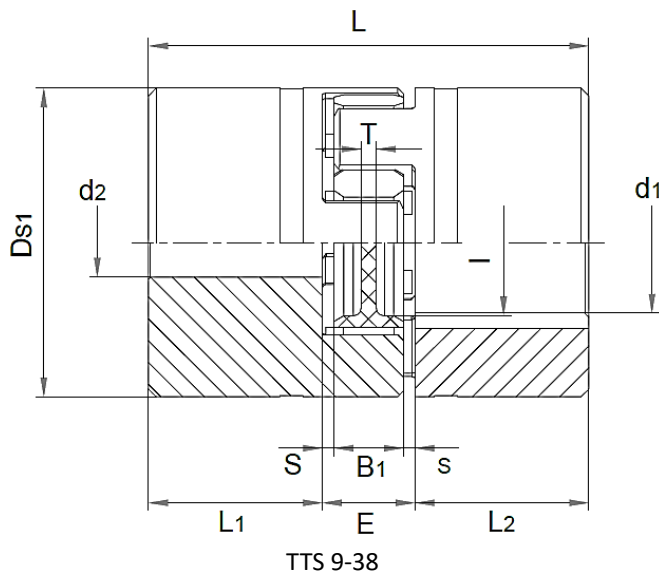
Hub designs

Type 1.0 Positive-locking power transmission, permissible torque depending on permissible surface pressure. Not suitable for backlash-free power transmission with heavily reversing operation.

Type 1.1 Non-positive torque transmission. Suitable for backlash-free transmission of very low torques.



Parameters



- Grub Screw thread opposite the keyway

TTS Size	Torque (Nm)		Max Bore (d1/d2)		Dimensions [mm]										Setscrew DIN EN ISO 4029		
	98ShA	64ShD	1.0	1.1	Ds1	D	I	L	L1,L2	N	E	B1	S	T	G	t	T _A [Nm]
9	5.0	6	10	11	—	20	7.2	30	10	—	10	8	1.0	1.5	M 4	5.0	1.5
12	9.0	12	12	12	—	25	8.5	34	11	—	12	10	1.0	3.5	M 4	5.0	1.5
14	12.5	16	16	16	—	30	10.5	35	11	—	13	10	1.5	2.0	M 4	5.0	1.5
19	21	26	24	—	—	40	18	66	25	—	16	12	2.0	3.0	M 5	10	2.0
24	60	75	32	—	—	55	27	78	30	—	18	14	2.0	3.0	M 5	10	2.0
28	160	200	38	—	—	65	30	90	35	—	20	15	2.5	4.0	M 8	15	10
38	325	405	45	—	—	80	38	114	45	—	24	18	3.0	4.0	M 8	15	10
42	450	560	55	—	85	95	46	126	50	28	26	20	3.0	4.0	M 8	20	10
48	525	655	62	—	95	105	51	140	56	32	28	21	3.5	4.0	M 8	20	10

Ordering Example:	Size	Hub Design	Spider	Finish bore d1	Finish bore d2
	TTS 28	Design 1.0	98Sh-A	1.0 - Ø25	1.0 - Ø24

TT SERVO COUPLINGS

Dimensional Data (design 2.0 / 2.1 / 2.5/2.6)

Clamping Hub Type

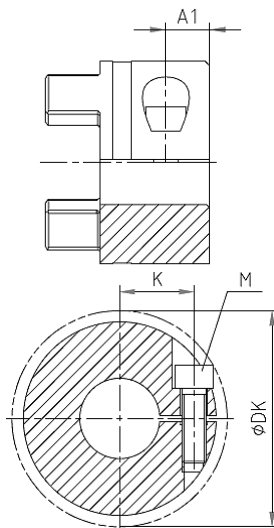


Hub designs

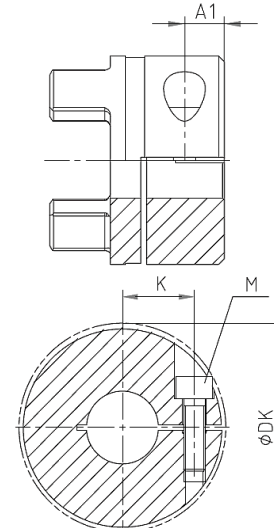
- **Type 2.0** clamping hub single slot without keyway
- **Type 2.1** clamping hub single slot with keyway
- **Type 2.5** clamping hub double slotted, without keyway
- **Type 2.6** clamping hub double slotted, with keyway

Parameters

Type 2.0 and Type 2.1 (TTS 9-14)



Type 2.5 and Type 2.6 (TTS 19-48)



TTS Size	Max Bore For hub type				Dimensions (mm)										Clamping Screw DIN EN ISO 4762				
	2	2.1	2.5	2.6	D _{S1}	D	I	L	L1,L2	N	E	B1	S	T	M	A1	K	DK	TA
9	11	11				20	7.2	30	10		10	8	1.0	1.5	M2.5	5	7.5	23.4	0.76
12	12	12				25	8.5	34	11		12	10	1.0	3.5	M3	5	9	27.5	1.34
14	16					30	10.5	35	11		13	10	1.5	2	M3	5	11.5	32.2	1.34
19	-	-	24	24		40	18	66	25		16	12	2.0	3	M6	11	14.5	46	10
24	-	-	28	28		55	27	78	30		18	14	2.0	3	M6	10.5	20	57.5	10
28	-	-	38	38		65	30	90	35		20	15	2.5	4	M8	11.5	25	73	25
38	-	-	45	45		80	38	114	45		24	18	3.0	4	M8	15.5	30	83.5	25
42	-	-	50	48	85	95	46	126	50	28	26	20	3.0	4	M10	18	32	93.5	69
48	-	-	55	55	95	105	51	140	56	32	28	21	3.5	4	M12	21	36	105	120

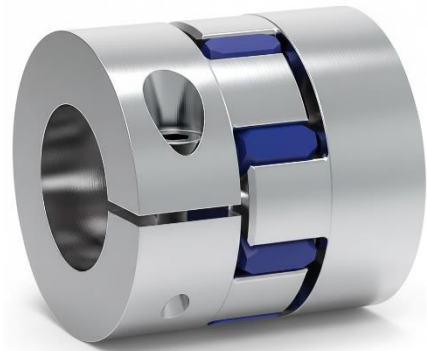
- TA (Nm): Clamping screw tightening torque

Ordering Example:	Size	Hub Design	Spider	Finish bore d1	Finish bore d2
	TTS 28	Design 2.5	98Sh-A	2.5 - Ø25	2.5 - Ø24

TT SERVO COUPLINGS

Dimensional Data – Compact (design 2.8)

Clamping Hub Type

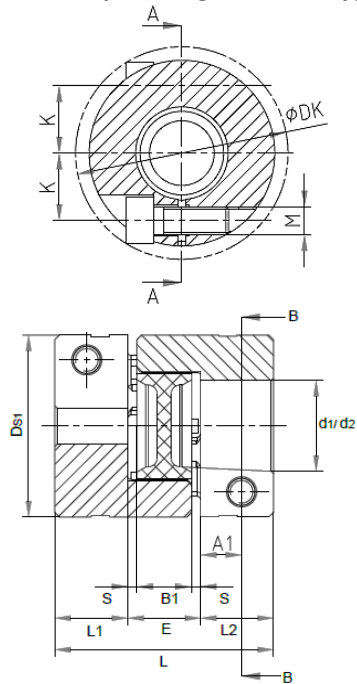


Hub designs

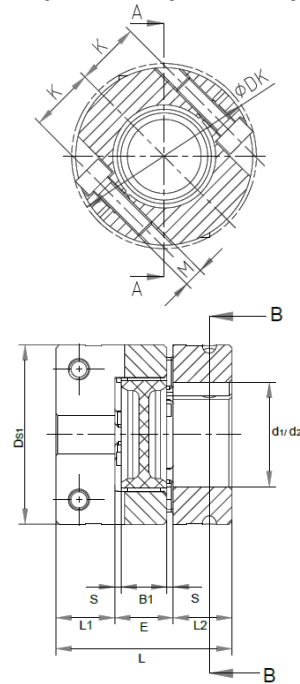
- **Type 2.8** compact type clamping hub C with axial slot, without feather keyway
- **Type 2.9** compact type clamping hub C with axial slot, with feather keyway

Parameters

TTS 9,12,14,19 Compact single slotted type 2.8



TTS 24-38 Compact axially slotted type 2.8



Size	Torque TKN [Nm]		Dimensions [mm]								Clamping Screws DIN EN ISO 4762			
	98ShA	64ShD	d max.	D _{S1}	DK	L	L1,L2	E	B1	S	A1	K	M	TA
Single slotted hub type 2.8/2.9														
9	5	6	9	20	21.3	24	7	10	8	1	3.5	6.7	M2.5	0.76
12	9	12	12	25	26.2	26	7	12	10	1	3.5	8.3	M3	1.34
14	12.5	16	16	30	31.6	32	9.5	13	10	1.5	4.5	10	M4	2.9
19	21	26	24	40	45.5	50	17	16	12	2	9	14	M6	10
Axially slotted hub type 2.8/2.9														
24	60	75	32	55	57.5	54	18	18	14	2	11	20	M6	10
28	160	200	35	65	69	62	21	20	15	2.5	12	23.8	M8	25
38	325	405	45	80	86	76	26	24	18	3	15	29.5	M10	49

- TA (Nm): Clamping screw tightening torque

Ordering	Size	Hub Design	Spider	Finish bore d1	Finish bore d2
Example:	TTS 28	Design 2.8	98Sh-A	2.8 - Ø25	2.8 - Ø24

TT SERVO COUPLINGS

Dimensional Data – Expansion hub

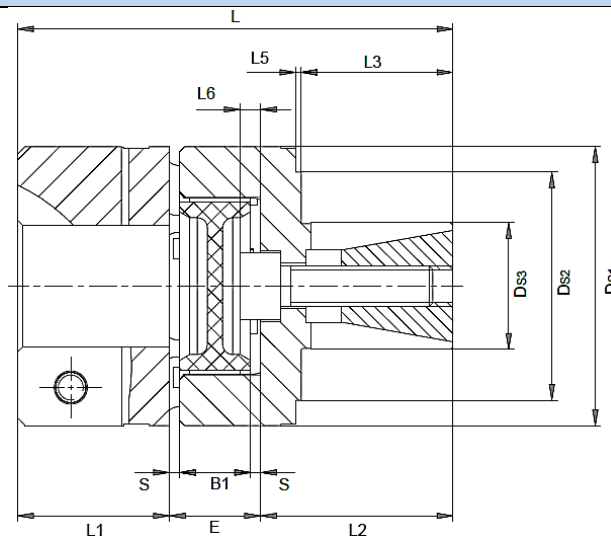
Standard Types



Features

- Clamping system for hollow shaft connection

Parameters



TTS Size	Torque TKN [Nm]		Dimensions [mm]												Friction Torque [Nm]
	98ShA	64ShD	D _{S3}	D _{S2}	D _{S1}	L2	L1	L3	L5	L6	L	E	B1	S	
9	5	6	10	-	20	20	10	11	-	0	40	10	8	1	6.4
12	9	12	10	20	25	19	11	14	1.5	2	42	12	10	1	7.7
14	12.5	16	12	24	30	18.5	11	12.5	3	2	42.5	13	10	1.5	7.7
19	21	26	20	35	40	28	25	20	1	0	69	16	12	2	35.7
24	60	75	25	45	55	38	30	30	1	4	86	18	14	2	82
28	160	200	35	55	65	44	35	36	1	5	99	20	15	2.5	182

Expansion hub for axis of belt



Ordering	Size	Hub Design	Spider	Finish bore d1	Finish bore d2
Example:	TTS 28	Design 2.8	98Sh-A	2.8 - Ø25	2.8 - Ø24

TT SERVO COUPLINGS

Dimensional Data – Aluminum - Clamping ring hubs (design 6.0)

Clamping ring hubs

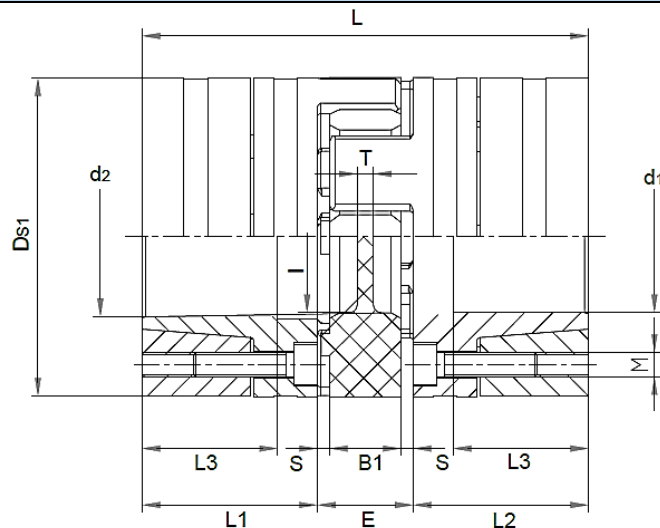


Features

Type 6.0

Integrated frictionally engaged shaft-hub-connection for the transmission of higher torques.
Screwing on elastomer side.

Parameters



TTS Size	Dimensions (mm)										Clamping Screws DIN EN ISO 4762			Weight per hub with max. bore(kg)	Mass Moment of inertia per hub with max. bore (kgm ²)
	d _{max}	D _{s1}	I	L	L1,L2	L3	E	B1	S	T	M	Z	TA (Nm)		
14	14	30	10.5	50	18.5	13.5	13	10	1.5	2	M3	4	1.34	0.032	0.04X10 ⁻⁴
19	20	40	18	66	25	18	16	12	2	3	M4	6	3	0.077	0.19X10 ⁻⁴
24	32	55	27	78	30	22	18	14	2	3	M5	4	6	0.162	0.78X10 ⁻⁴
28	38	65	30	90	35	27	20	15	2.5	4	M5	8	6	0.24	1.70X10 ⁻⁴
38	48	80	38	114	45	35	24	18	3	4	M6	8	10	0.49	5.17X10 ⁻⁴
42	51	95	46	126	50	35	26	20	3	4	M8	4	25	0.772	11.17X10 ⁻⁴
48	55	105	51	140	55	41	28	21	3.5	4	M10	4	49	1.066	18.81X10 ⁻⁴

- TA (Nm): Clamping screw tightening torque
- Z: Number of holes

Ordering Example:	Size	Material	Spider	Finish bore d1	Finish bore d2
	TTS 28	Alu	98Sh-A	6.0 - Ø25	6.0 - Ø24

TT SERVO COUPLINGS

Dimensional Data – Steel - Clamping ring hubs (design 6.0)

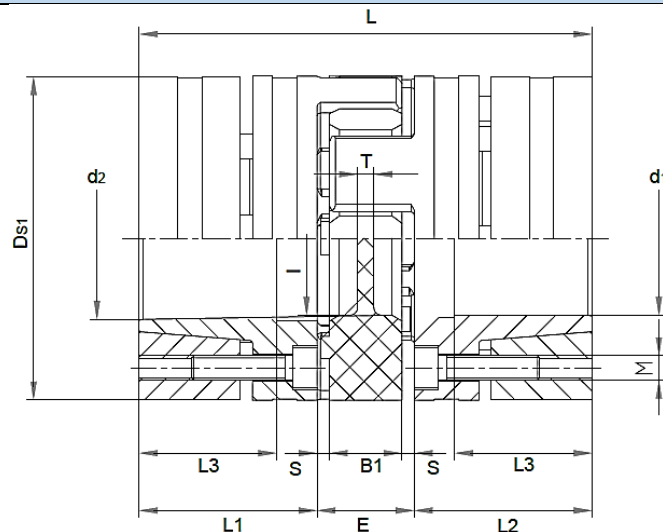
Standard Types



Features

- Excellent torque transmission capability
- Good machinability and toughness
- Suitable for high-load and industrial applications
- Can be surface-treated (black oxide / phosphate) for corrosion resistance

Parameters



TTS Size	Dimensions (mm)										Clamping Screws DIN EN ISO 4762			Weight per hub with max. bore(kg)	Mass Moment of inertia per hub with max. bore (kgm ²)
	d max.	DS1	I	L	L1,L2	L3	E	B1	S	T	M	Z	TA (Nm)		
19	20	40	18	66	25	18	16	12	2	3	M4	6	4.1	0.179	0.44x10 ⁻⁴
24	28	55	27	78	30	22	18	14	2	3	M5	4	8.5	0.399	1.91x10 ⁻⁴
28	38	65	30	90	35	27	20	15	2.5	4	M5	8	8.5	0.592	4.18x10 ⁻⁴
38	48	80	38	114	45	35	24	18	3	4	M6	8	14	0.225	12.9x10 ⁻⁴
42	51	95	46	126	50	35	26	20	3	4	M8	4	41	2.3	31.7x10 ⁻⁴
48	55	105	51	140	56	41	28	21	3.5	4	M10	4	69	3.08	52.0x10 ⁻⁴

- TA (Nm): Clamping screw tightening torque
- Z: Number of holes

Ordering	Size	Material	Spider	Finish bore d1	Finish bore d2
Example:	TTS 28	Steel	98Sh-A	6.0 - Ø25	6.0 - Ø24

TT SERVO COUPLINGS

Dimensional Data – Spacer (DKM)

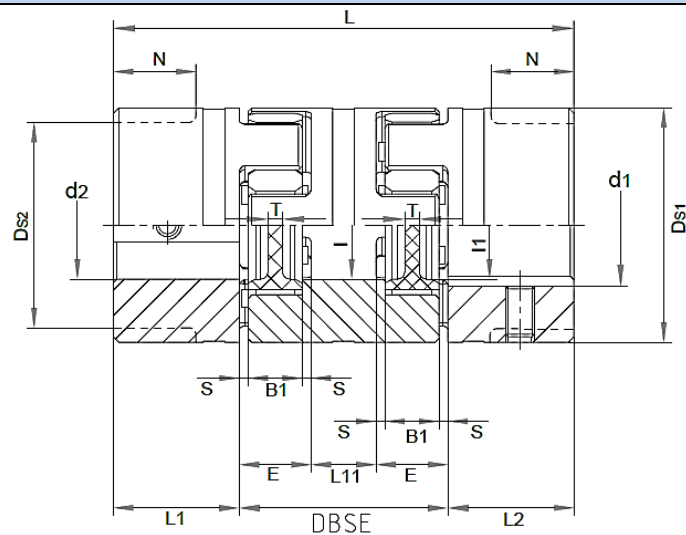
Standard Types



Features

- Double-cardanic jaw coupling.

Parameters



TTS Size	Torque [Nm]		Dimensions [mm]													
	98ShA	64ShD	d max.	DS2	DS1	I1	I	L1,L2	N	L11	DBSE	L	E	B1	S	T
9	5	6	11	-	20	7.2	-	10	-	5	25	45	10	8	1	1.5
12	9	12	12	-	25	8.5	-	11	-	6	30	52	12	10	1	3.5
14	12.5	16	16	-	30	10.5	-	11	-	8	34	56	13	10	1.5	2
19	21	26	24	-	40	18	18	25	-	10	42	92	16	12	2	3
24	60	75	30	-	55	27	27	30	-	16	52	112	18	14	2	3
28	160	200	38	-	65	30	30	35	-	18	58	128	20	15	2.5	4
38	325	405	45	-	80	38	38	45	-	20	68	158	24	18	3	4
42	450	560	55	85	95	46	46	50	28	22	74	174	26	20	3	4
48	525	655	62	95	105	51	51	56	32	24	80	192	28	21	3.5	4

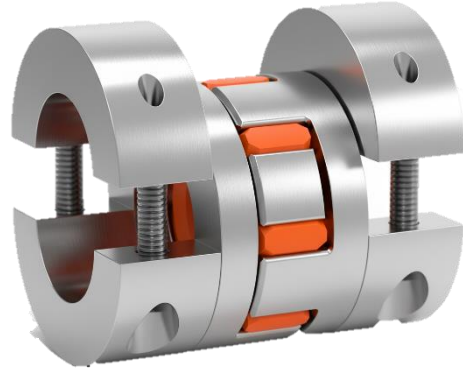
Ordering	Size	Type	Spider	DBSE	Finish bore d1	Finish bore d2
Example:	TTS 28	DKM	98Sh-A	Optional	2.5 - Ø25	2.6 - Ø24

TT COUPLINGS

Other types

Different Types

**Drop-out center design
coupling**



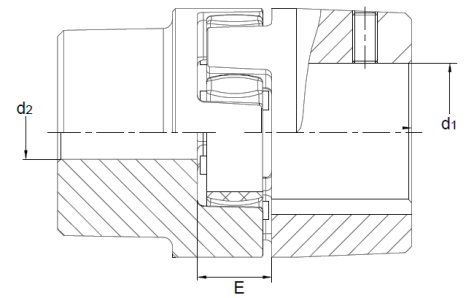
Intermediate shaft couplings with steel pipe/steel shaft



SELECTION PROCESS

Questionnaire – TT Servo Couplings

1. Application = _____
2. Position (Horizontal/Vertical) = _____
3. Power (P) = _____ kw
4. Speed (n) = _____ rpm
5. Shaft diameter of driver (d1) = _____ mm
6. Shaft diameter of driven (d2) = _____ mm
7. DBSE (distance between side ends) (E) = _____ mm
8. If coupling after gearbox (ratio) = _____
9. Temperature (degree Celsius) = _____ °C
10. Safety Factor (refer page no.4) = _____



Useful Formula's

Parameters	Formula	Unit
Calculated Torque (T)	$T = \frac{P \times 9550}{n}$	____ Nm
Rated Torque (Nm)	$\text{Rated Torque} = \text{Calculated Torque} \times \text{Service Factor}$	____ Nm
HP to kW conversion	$\text{kW} = \text{HP} \times 0.746$	____ kW

Note's

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Headquarters

TrueTorq Private Limited
C53, 6th Cross, KSSIDC
Industrial Area, Gamangatti
Hubballi, Karnataka
India-580025
Email: info@truetorq.com
Website: www.truetorq.com

