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Torsion Proof Multi-Disk Coupling

Type 2300A...

for Torque Measurement Flange Type 4551A...

Torsion proof multi-disk coupling for efficient, space-saving connection of torque sensor Type 4551A... into the shaft assembly.

- High torsion resistance
- Absolutely free of wear and maintenance
- Non-sensitive to alternating loads
- Low moment of inertia due to high performance density
- Completely backlash-free up to the nominal torque
- High misalignment compensation capability at low restoring forces

Description

The steel multi-disk coupling Type 2300A... is especially designed for use with the Type 4551A... torque sensors. The coupling can be screwed directly onto the torque sensor. For additional connection of the shaft assembly, there is a choice of tension ring hub or a standard flange.

Application

The multi-disk coupling is used to compensate for axial, radial, and angle misalignment when incorporating the torque sensor into the shaft assembly. Compensation of these misalignments is always needed to avoid measurement error and damage to the sensor.
Different variants eliminate most problems integrating the torque sensor into nearly any application.

General Technical Data

Type 2300A...			10...	25...	40...	100...	300...	500...	850...
for sensors Type 4551A...		N·m	50/100	200...	500...	1K...	2K...	3K...	5K...
Nominal torque	T_{KN}	N·m	100	420	650	1 600	3 500	5 800	9 500
Peak transient torque	T_{KS}	N·m	150	630	975	2 400	5 250	8 700	14 250
Coupling outer diameter	D	mm	69	89	104	143	167	198	234
Torsion resistance (per assembly)	C_L	10^3 · N·m/rad	60	290	320	1 900	3 480	11 900	20 600
Torsion resistance overall	C_{ges}	10^3 · N·m/rad	30	145	160	950	1 740	5 950	10 300

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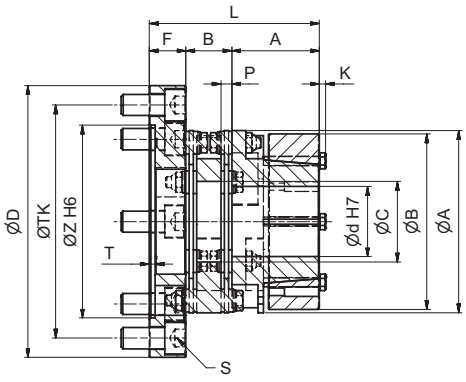
Coupling Type 2300A... with Tension Ring Hub (Variant S)

- for adapting a specimen with straight shaft end to the sensor Type 4551A... on the measurement side
- for high speed applications with low axial misalignment

Type 2300A...			10...	25...	40...	100...	300...	500...	850...
f0r sensors Type 4551A...		N·m	50/100	200...	500...	1K...	2K...	3K...	5K...
Hole diameter (min. ... max.)		mm	19 ... 38	32 ... 52	40 ... 60	55 ... 90	50 ... 85	60 ... 100	70 ... 120
Permitted axial offset	ΔK_a	mm	0,25	0,25	0,3	0,45	0,35	0,4	0,45
Permitted radial offset	ΔK_r	mm	0,05	0,05	0,06	0,07	0,07	0,1	0,12
Perm. angle offset (1 package)	ΔK_w	°	0,3	0,2	0,2	0,2	0,15	0,15	0,15
Max. speed	n_{max}	1/min	15 000	15 000	12 000	12 000	10 000	10 000	8 000
Balance quality	G		2,5 / 3 000						
Moment of inertia [1]	J	$kgm^2 \cdot 10^{-3}$	0,81	3,38	11,6	46,65	81,96	166,38	408,7
Mass [1]	m	kg	0,85	2,05	4,1	9,92	14,69	23,75	40
Clamping screw torque		N·m	6	6,5	8,5	25	35	56	93

[1] Moment of inertia and mass relate to hubs with maximum hole size.

Dimensions



Type 2300A...		10...	25...	40...	100...	300...	500...	850...
for sensors Type 4551A...		50/100	200...	500...	1K...	2K...	3K...	5K...
øA	mm	69	89	104	143	167	198	234
øB	mm	68	82	100	143	164	198	234
øC	mm	35,5	41	46	66	61	66	76
ød H7 *	mm	19 ... 38	32 ... 52	40 ... 60	55 ... 90	50 ... 85	60 ... 100	70 ... 120
øD	mm	100	120	155	185	210	232	284
øTK	mm	87	105	133	133	165	165	206
øZ H6	mm	75	90	110	110	140	140	174
A	mm	32	45	50	60	75	95	115
B	mm	15,5	22	26,2	35,2	44,4	52	65
F	mm	15	17	21	42	39	45	51
K	mm	3,5	3,5	3,5	5,3	5,3	6,4	7,5
L	mm	62,5	84	97,2	137,2	158,4	192	231
P	mm	3	5	6,1	8,6	11,2	12	14
S	8x45 °	M6	M8	M12	M12	M14	M14	M18
T	mm	3,5	3,5	3,5	4	4	4	4

* shaft tolerance g6

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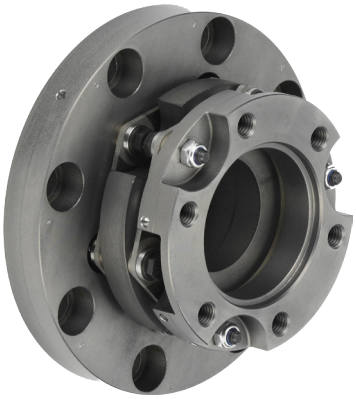
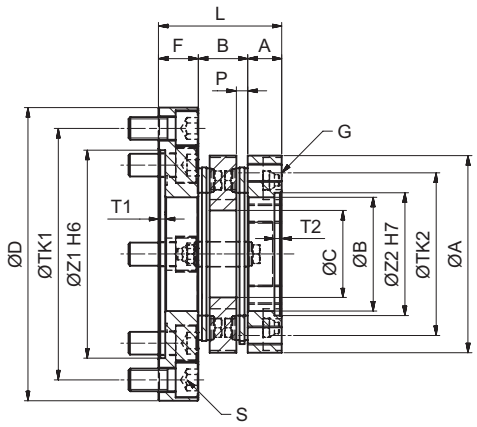
Coupling Type 2300A... with Flange (Variant F)

- for adapting a specimen with flange connection to the sensor Type 4551A... on the measurement side
- for high speed applications with low axial misalignment



Type 2300A...			10...	25...	40...	100...	300...	500...	850...
for sensors Type 4551A...		N·m	**50/100**	**200...**	**500...**	**1K...**	**2K...**	**3K...**	**5K...**
Screws			8xM6	6xM8	6xM10	6xM12	8xM16	8xM16	8xM20
Permitted axial offset	ΔK_a	mm	0,25	0,25	0,3	0,45	0,35	0,4	0,45
Permitted radial offset	ΔK_r	mm	0,05	0,05	0,06	0,07	0,07	0,1	0,12
Perm. angle offset (per assembly)	ΔK_w	°	0,3	0,2	0,2	0,2	0,15	0,15	0,15
Max. speed	n_{max}	1/min	15 000	15 000	12 000	12 000	10 000	10 000	8 000
Balance quality	G		2,5 / 3 000						
Moment of inertia	J	$kgm^2 \cdot 10^{-3}$	0,56	2,97	9,61	36,75	63,4	116,6	295,86
Mass	m	kg	0,54	1,37	2,9	7,16	9,69	14,42	24,88
Clamping screw torque		N·m	10	42	71	143	200	300	590

Dimensions



Type 2300A...		10...	25...	40...	100...	300...	500...	850...
for sensors Type 4551A...		**50/100**	**200...**	**500...**	**1K...**	**2K...**	**3K...**	**5K...**
øA	mm	69	89	104	143	178	210	250
øB	mm	30	50	60	85	92	112	132
øC	mm	35,5	41	46	66	61	66	76
øD	mm	100	120	155	185	210	232	284
øTK1	mm	87	105	133	133	165	165	206
øTK2	mm	55	75	86	116	150	175	210
øZ1 H6	mm	75	90	110	110	140	140	174
øZ2 H7	mm	35	55	65	92	100	120	140
A	mm	11	15	18	20	27	36	44
B	mm	15,5	22	26,2	35,2	44,4	52	65
F	mm	15	17	21	42	39	45	51
G		8xM6	6xM8	6xM10	6xM12	8xM16	8xM16	8xM20
L	mm	41,5	54	65,2	97,2	110,4	133	160
P	mm	3	5	6,1	8,6	11,2	12	14
S	8x45 °	M6	M8	M12	M12	M14	M14	M18
T1	mm	3,5	3,5	3,5	4	4	4	4
T2	mm	3	4	4	5	6	6	6

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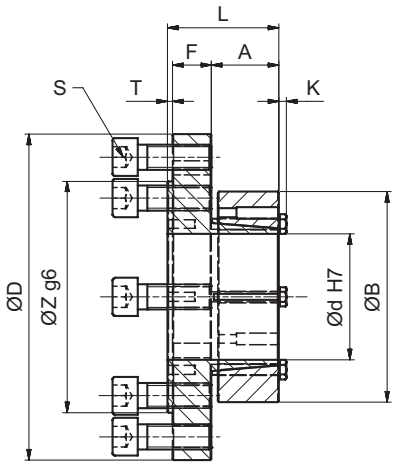
Adapter Flange Type 2300A... with Tension Ring Hub (Variant A)

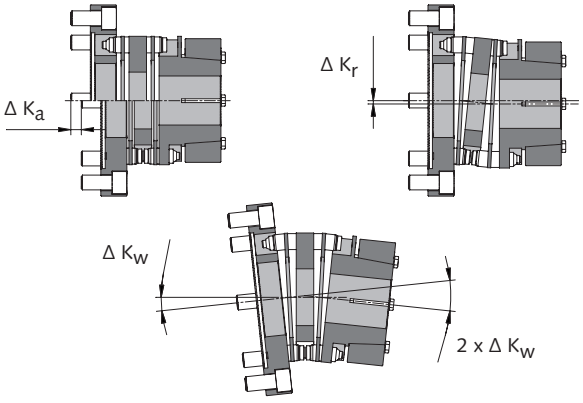
- for rigid drive-side adaptation of the sensor Type 4551A... to a drive or loading machine



Type 2300A...		10...	25...	40...	100...	300...	500...	850...
for sensors Type 4551A...		50/100	200...	500...	1K...	2K...	3K...	5K...
øB	mm	68	82	100	143	164	198	234
ød H7 *	mm	19 ... 38	32 ... 52	40 ... 60	55 ... 90	50 ... 85	60 ... 100	70 ... 120
øD	mm	100	120	155	155	190	190	238
øZ g6	mm	75	90	110	110	140	140	174
A	mm	20,5	30	32	40	48	55	68
F	mm	11,5	13	18,5	18,5	21	21	26,5
K	mm	3,5	3,5	3,5	5,3	5,3	6,4	7,5
L	mm	34	45	53	61	72	79	98
S	8x45 °	M6	M8	M12	M12	M14	M14	M18
T	mm	2	2	2,5	2,5	3	3	3,5

* shaft tolerance g6

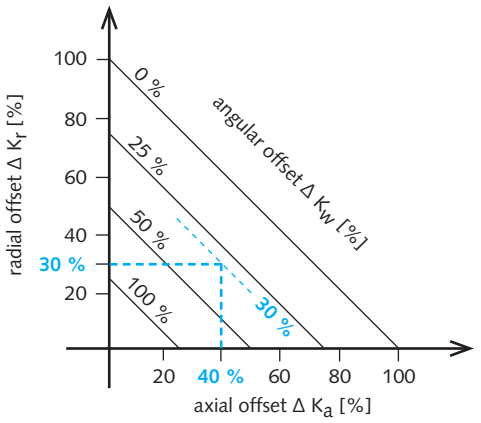
Permissible Shaft Displacements



The multi-disc coupling uses a two disc assembly to compensate for angular, axial, and radial shaft offsets. If multiple offsets occur simultaneously, they influence one another. The permissible values for displacement are therefore depending on each other. The sum of the actual displacements – in percent of the maximum values – may not exceed 100 %.

Example Calculation for Type 2300A40...

- **Axial offset** occurring: ΔK_a = 0,44 mm (e.g. corresponds to **40 %** of permissible maximum value ΔK_a = 1,1 mm
- **Angular offset** occurring: ΔK_w = 0,21 °
  (e.g. corresponds to **30 %** of maximum value ΔK_w = 0,7 °)
- Yields a **permissible radial offset** (see diagram below):
  ΔK_r = **30 %** of maximum value ΔK_r = 0,25 mm
  => **ΔK_r = 0,08 mm**



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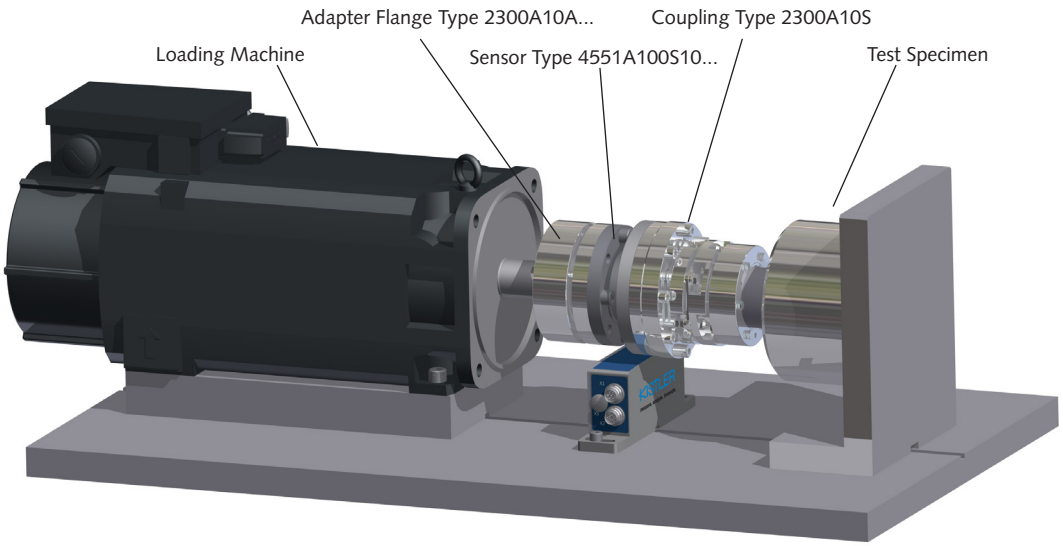
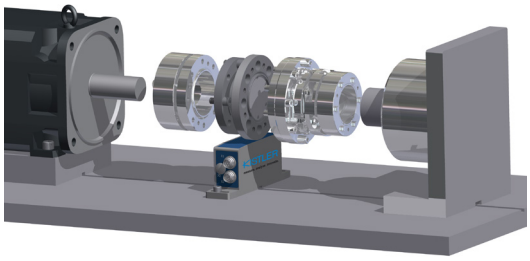
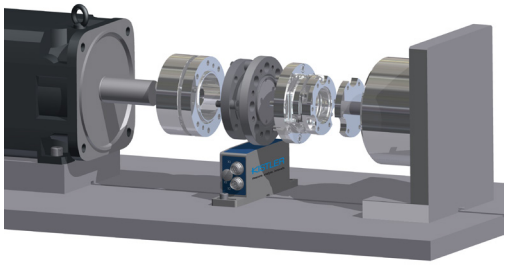
Example of Application



Possible Adaptations



Adapter Flange + Coupling Type 2300A... Variant S: Tension Ring Hub



Adapter Flange + Coupling Type 2300A... Variant F: Flange

Included Accessories

- Necessary bolts for the coupling assembly of the sensor Type 4551A...

Ordering Key

Type 2300A □ □ □ **sp**

Coupling Size

for sensor Type 4551A..., 50/100	**10**
for sensor Type 4551A..., 200	**25**
for sensor Type 4551A..., 500	**40**
for sensor Type 4551A..., 1K	**100**
for sensor Type 4551A..., 2K	**300**
for sensor Type 4551A..., 3K	**500**
for sensor Type 4551A..., 5K	**850**

Variant

Coupling with tension ring hub	**S**
Coupling with flange	**F**
Adapter flange with tension ring hub	**A**

Please specify desired hole diameter ød with order (additional plain-text). Observe min. and max. diameters (see dimensions table).

Ordering Example: **Type 2300A25Ssp**

Torsion proof multi-disk coupling Type 2300A..., size 25, variant S: tension ring hub, **Hole diameter ød = 35 mm.**

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