

CHAPTER 4

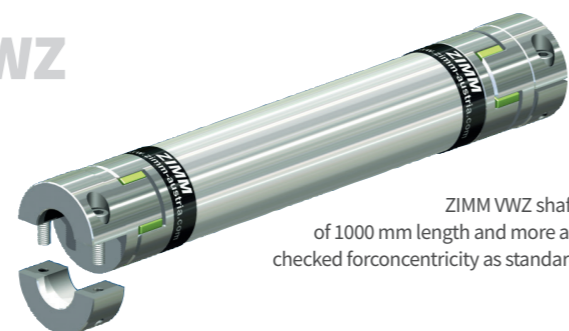
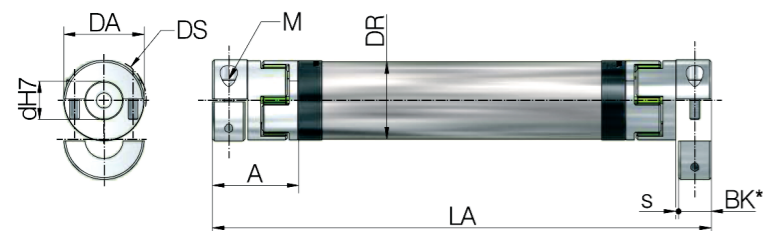
Connection technology

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Connecting shaft VWZ

Split shells



ZIMM VWZ shafts of 1000 mm length and more are checked for concentricity as standard!

Standard bores „d“ mm

VWZ-30: 8, 9, 10, 11, 12, 14, 15, 16
 VWZ-40: 9, 10, 11, 12, 14, 15, 16, 18, 19, 20, 22, 24
 VWZ-60: 10, 11, 12, 14, 15, 16, 18, 19, 20, 22, 24, 25, 28, 30, 32
 VWZ-60V: 12, 15, 16, 18, 20, 22, 24, 25, 28, 30, 32, 35
 VWZ-80: 16, 19, 20, 22, 24, 25, 28, 30, 32, 35, 38, 40, 42, 45
 VWZ-100: 25, 28, 32, 38, 40, 42, 45, 48, 50, 55

Other diameters on request

Shafts with split shells

- Material: High-tensile aluminium (stainless steel on request)
- Insertion: Split shells permit easy radial insertion
- Moment of inertia: Low
- Drive key: None. Stepless adjustment facility thanks to the clamp hub. Drive keyway available on request
- Other features: High concentricity and clamping forces

Elastomer star

- Features: Permanently free of play, dampens vibration
- Shore hardness: 64D
- Colour: ZIMM-green
- Temperature range: 0°C to +70°C reduced to -20°C, to +100°C (Mx0,55)

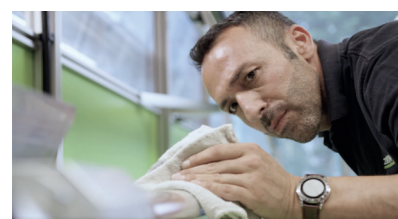
Dimensions & technical data

Code	Dimensions						Clamping screw		Moment of inertia		Torsional stiffness		Weight		
	DA	DS	DR	BK*	s	A	LA min	M	Tightening torque	per coupling	tube/m	per star	per tube/m	both couplings	tube/m
	mm	mm	mm	mm	mm	mm	mm	10,9	Nm	10 ⁻³ kgm ²	10 ⁻³ kgm ²	Nm/rad	Nm/rad	kg	kg
VWZ-30	32	32	30	15	1,5	34	99	M4	4	0,01	0,11	1375	1104	0,14	0,58
VWZ-40	42	44,5	40	17	1,5	46	133	M5	8	0,08	0,2	3700	2332	0,36	0,76
VWZ-60	56	57	60	30	2	63	177	M6	15	0,24	0,8	9917	8292	0,94	0,97
VWZ-60V	67	68	60	35	2	73	205	M8	35	0,46	0,8	24417	8292	1,42	0,97
VWZ-80	82	85	80	40	2	84	249	M10	70	2,4	3	33667	29102	2,98	2
VWZ-100	102	105	100	50	2	97	283	M12	120	6	5,8	67667	58178	4,62	2,47

*BK = shaft extension clamping length

Drehmomente

Size	Elastomer star		Maxium transmittable torque by clamp hub depending on the bore diameter																Coupling type			
	Rated torque Nm	Max. torque Nm	Ø9	Ø11	Ø14	Ø16	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø38	Ø40	Ø42	Ø45		Ø48	Ø55	
VWZ-30	16	32	21	26	33	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	KUZ-KK-16	
VWZ-40	21	42	-	41	52	60	70	74	81	89	-	-	-	-	-	-	-	-	-	-	-	KUZ-KK-24
VWZ-60	75	150	-	60	76	87	104	109	120	131	136	153	164	175	-	-	-	-	-	-	-	KUZ-KK-32
VWZ-60V	200	400	-	-	-	120	-	188	206	-	235	-	-	301	-	-	-	-	-	-	-	KUZ-KK-35
VWZ-80	405	810	-	-	-	325	386	406	447	488	508	568	610	650	772	-	854	915	-	-	-	KUZ-KK-45
VWZ-100	660	1350	-	-	-	-	-	-	-	-	570	638	-	730	866	914	960	1029	1097	1250	-	KUZ-KK-60



Concentricity test
 ZIMM VWZ shafts of 1000 mm length and more are checked for concentricity as standard!

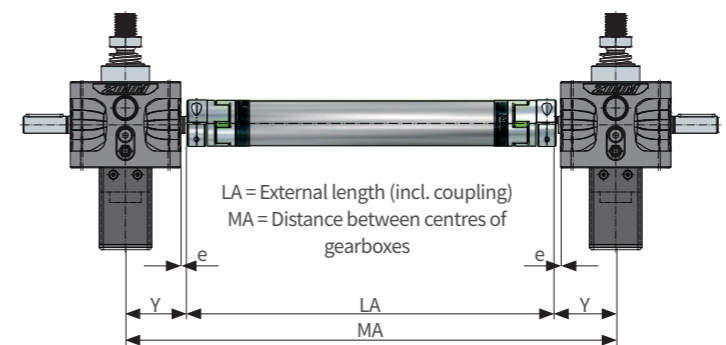
Ordering example: **VWZ-60-LA 1800-20/25**

Size _____
 Length _____
 Bores of couplings _____

n=1500 min⁻¹ (specify the speed)

ZE Accessories

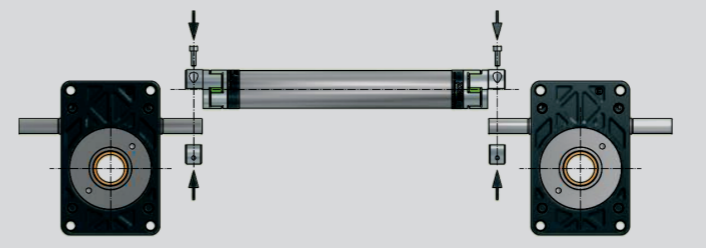
VWZ length calculation



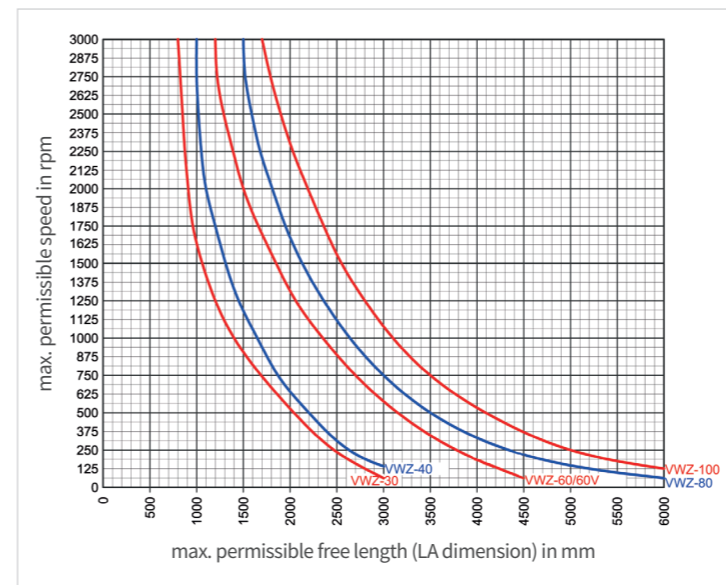
Installation of the connecting shaft

By using split shell couplings, the connecting shafts can be mounted after the drive shafts have been installed. Simply place the connecting shaft on the spigot and fix the couplings with torque wrench according to the table (feather key not required).

Set the screw tightening torque according to the table.



Maximum length - dependent on speed

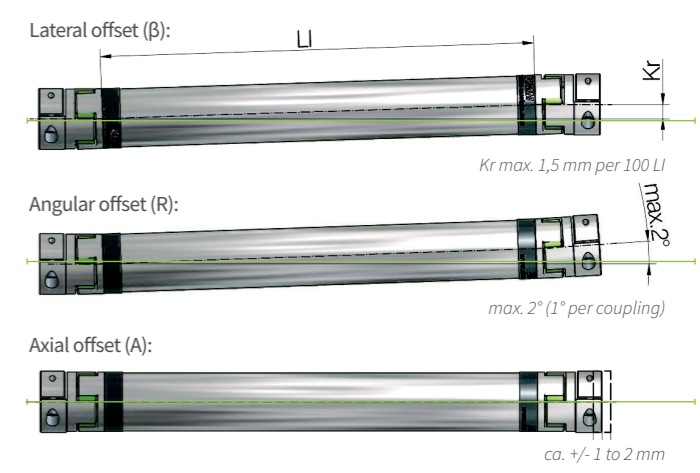


Length calculation

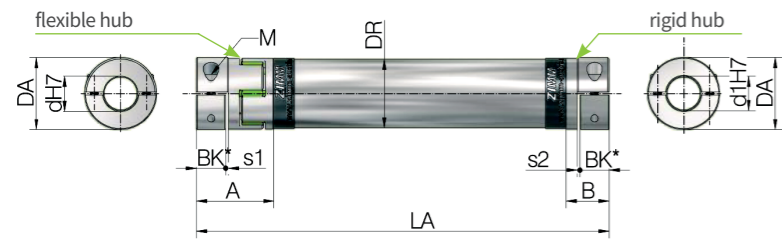
Screw jack	Connecting shaft	e	Y	A
GSZ-2	VWZ-30	6	31	34
ZE-5	VWZ-30	9	45	34
ZE-5	VWZ-40	7	43	46
ZE-5	VWZ-60 ³⁾	2	38	63
ZE-10	VWZ-30	12,5	55	34
ZE-10	VWZ-40	10,5	53	46
ZE-10	VWZ-60	2,5	45	63
ZE-25	VWZ-40	28	80,5	46
ZE-25	VWZ-60	15	67,5	63
ZE-25	VWZ-80 ^{2), 3)}	5	57,5	84
ZE-35	VWZ-40	28	84	46
ZE-35	VWZ-60	15	71	63
ZE-35	VWZ-60V ¹⁾	10	66	73
ZE-35	VWZ-80 ¹⁾	5	61	84
ZE-50	VWZ-60	17,5	90	63
ZE-50	VWZ-60V	12,5	85	73
ZE-50	VWZ-80 ¹⁾	7,5	80	84
ZE-100	VWZ-60	30	124	63
ZE-100	VWZ-60V	25	119	73
ZE-100	VWZ-80	20	114	84
ZE-150	VWZ-60	30	130	63
ZE-150	VWZ-60V	25	125	73
ZE-150	VWZ-80	20	120	84
ZE-200	VWZ-60	34	146,5	63
ZE-200	VWZ-60V	29	141,5	73
ZE-200	VWZ-80	24	136,5	84
ZE-200	VWZ-100	14	126,5	97
ZE-250	VWZ-80	24	144	84
ZE-250	VWZ-100	14	134	97
ZE-350	VWZ-80	35	175	84
ZE-350	VWZ-100	25	165	97
Z-500	VWZ-80	75	240	84
Z-500	VWZ-100	65	230	97

1) can not be fitted with pivot mounts LB 2) Outer diameter DS > Gearbox height
 3) When used on bevel gearboxes, an SO coupling with shaft adapter is required

max. permissible offset

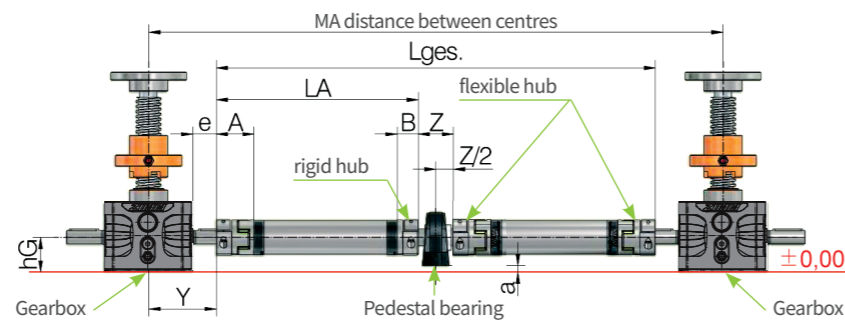


Connecting shaft for pedestal bearing use | with flexible / rigid hub



For pedestal bearing

The installation situation is very important when selecting shaft dimensions. For example, the cost of a larger diameter connecting shaft not requiring additional pedestal bearing support can be considerably less than the cost of a smaller connecting shaft requiring costly sub-structures for the additional pedestal bearing. For this version we use the rigid hub version so that no radial misalignment can occur in the pedestal bearing.



Size	A	B	s1	s2	Bk*	d1	LA min
VWZ-30	34	20	2	1,2	15	15	85
VWZ-40	46	25	2	1,6	17	20	112
VWZ-60	63	40	2	2	30	20	154
VWZ-60V	73	42	2	2	35	30	175
VWZ-80	84	55	2	2	40	30	220
VWZ-100	97	65	2	2	50	50	251

*BK = shaft extension clamping length

Gearbox	Connecting shaft	e	Y	A	B	Z	Lwz	d1	hG	hL	a
ZE-5	VWZ-30	9	45	34	20	44	74	15	31	30,2	0,8
ZE-5	VWZ-40	7	43	46	25	42	76	20	31	33,3	-2,3
ZE-5	VWZ-60	2	38	63	40	42	102	20	31	33,3	-2,3
ZE-10	VWZ-30	12,5	55	34	20	44	74	15	37	30,2	6,8
ZE-10	VWZ-40	10,5	53	46	25	42	76	20	37	33,2	3,8
ZE-10	VWZ-60	2,5	45	63	40	42	102	20	37	33,2	3,8
ZE-25	VWZ-40	28	80,5	46	25	42	76	20	41	33,2	7,8
ZE-25	VWZ-60	15	67,5	63	40	42	102	20	41	33,2	7,8
ZE-25	VWZ-80	5	57,5	84	55	50	130	30	41	42,9	-1,9
ZE-35	VWZ-40	28	84	46	25	42	76	20	50	33,2	16,8
ZE-35	VWZ-60	15	71	63	40	42	102	20	50	33,2	16,8
ZE-35	VWZ-60V*	10	66	73	42	60	130	30	50	42,9	7,1
ZE-35	VWZ-80*	5	61	84	55	50	130	30	50	42,9	7,1
ZE-50	VWZ-60	17,5	90	63	40	42	102	20	58	33,3	24,7
ZE-50	VWZ-60V	12,5	85	73	42	60	130	30	58	42,9	15,1
ZE-50	VWZ-80*	7,5	80	84	55	50	130	30	58	42,9	15,1
ZE-100	VWZ-60	30	124	63	40	42	102	20	80	33,2	46,8
ZE-100	VWZ-60V	25	119	73	42	60	130	30	80	42,9	37,1
ZE-100	VWZ-80	20	114	84	55	50	130	30	80	42,9	37,1
ZE-150	VWZ-60	30	130	63	40	42	102	20	92,5	33,2	59,3
ZE-150	VWZ-60V	25	125	73	42	60	130	30	92,5	42,9	49,6
ZE-150	VWZ-80	20	120	84	55	50	130	30	92,5	42,9	49,6
ZE-200	VWZ-60	34	146,5	63	40	42	102	20	88	54	34
ZE-200	VWZ-60V	29	141,5	73	42	60	130	30	88	42,9	45,1
ZE-200	VWZ-80	24	136,5	84	55	50	130	30	88	42,9	45,1
ZE-200	VWZ-100	14	126,5	97	65	70	170	50	88	57,2	30,8
ZE-250	VWZ-80	24	144	84	55	50	130	30	105	42,9	62,1
ZE-250	VWZ-100	14	134	97	65	70	170	50	102	57,2	44,8
ZE-350	VWZ-80	35	175	84	55	50	130	30	115	42,9	72,1
ZE-350	VWZ-100	25	165	97	65	70	170	50	115	57,3	57,8
Z-500	VWZ-80	75	240	84	55	50	130	30	130	42,9	87,1
Z-500	VWZ-100	65	230	97	65	70	170	50	130	57,2	72,8

*cannot be fitted with pivot mounts LB

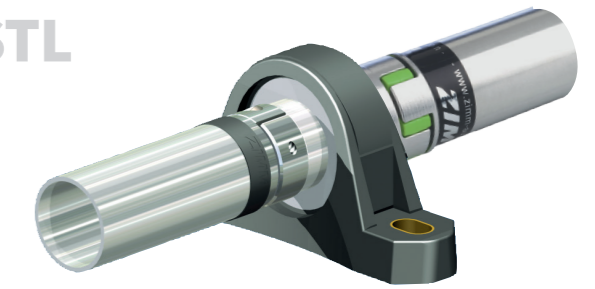
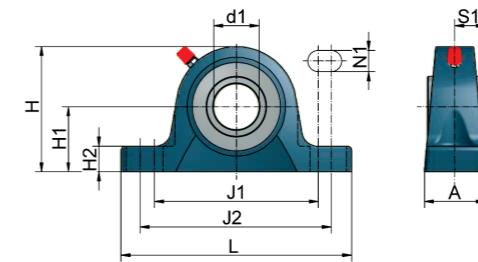
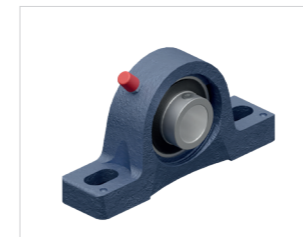
Ordering example: VWZ-60-LA1800-25/20S

Length _____ ↑ ↑ ↑

Bore 1st side / 2nd side (S = rigid hub) _____ ↑ ↑

n=1500 rpm (specify the speed)

Pedestal bearing STL for connecting shaft VWZ

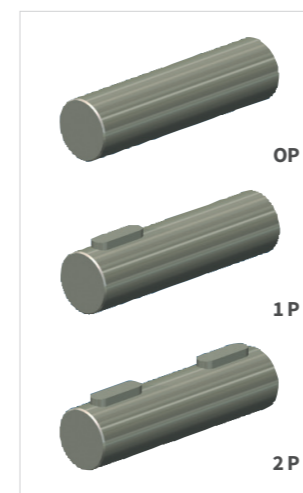


Technical data

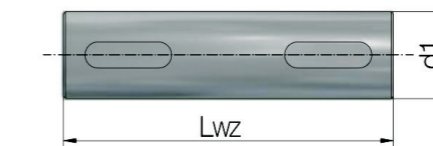
We use high-quality pedestal bearings.
Material:
Housing material: Grey cast iron, primed in blue
Bearing material: Roller bearing steel
Temperature range: -30°C to +120°C

Pedestal bearing STL

Code	d1	A	H	H1	H2	J1	J2	L	N1	S1	kg
STL-15-G	15	32	56	30,2	14	88	106	127	11,5	15,3	0,47
STL-20-G	20	32	65	33,3	14	88	106	127	11,5	18,3	0,59
STL-30-G	30	40	82,5	42,9	17	108	127	152	14	22,2	1,1
STL-50-G	50	54	114,5	57,2	22	149	165	203	18	32,6	2,7



Shaft extension WZ



A pedestal bearing is used for long connecting shafts that are operated at higher speeds. Please pay special attention to the installation height of the pedestal bearing.

Code	d1	Lwz	kg
WZ-15/74-?P	15	74	0,1
WZ-20/76-?P	20	76	0,19
WZ-20/102-?P	20	102	0,25
WZ-30/130-?P	30	130	0,72
WZ-50/170-?P	50	170	2,61

Ordering example: WZ-20/102-1P

Diameter _____ ↑

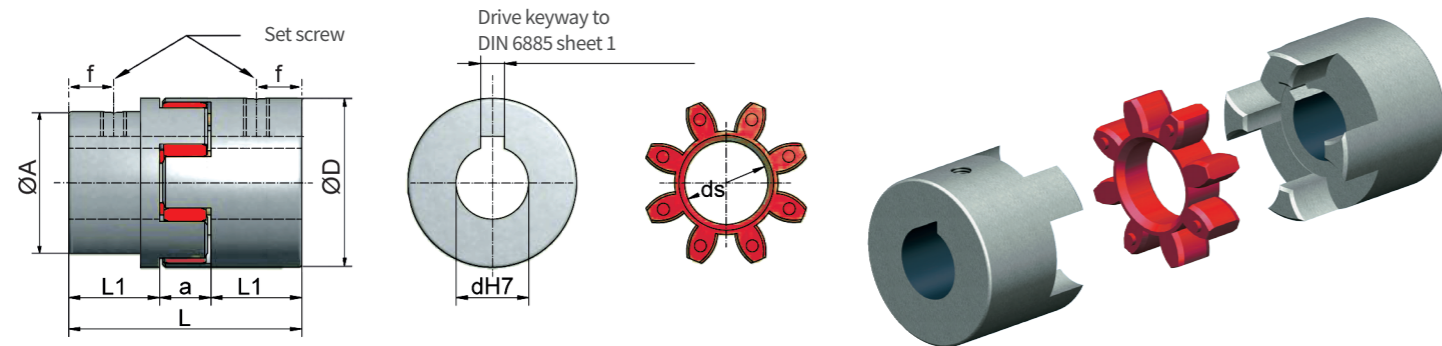
Length _____ ↑

Drive keys _____ ↑

OP, 1P, 2P

Standard coupling KUZ

Coupling with keyway and set screw



Dimensions

Size	D	A offset hub	L	L1	a	f	ds star	L1 long hub	Set screw	Tightening torque Nm
KUZ-09	20	-	30	10	10	5	-	-	M4	1,5
KUZ-14	27,5	-	44	15	14	7,8	-	-	M6 (M4)	4,8 (1,5)
KUZ-19	34,5	-	51	19	13	9,6	12	-	M6	4,8
KUZ-24	40	-	66	25	16	10	17	40	M5	2
KUZ-28	55	-	78	30	18	10	26	-	M5	2
KUZ-38	65	-	90	35	20	15	29	60	M6	4,8
KUZ-45	80	66	114	45	24	15	37	-	M8	10
KUZ-55	95	75	126	50	26	20	45	-	M8	10
KUZ-60	105	85	140	56	28	20	50	-	M8	10
KUZ-70	120	98	160	65	30	20	59	-	M10	17
KUZ-75	135	115	185	75	35	20	67	-	M10	17
KUZ-90	160	135	210	85	40	25	79	-	M10	17

Technical data

Size	Rated torque Nm	max. torque Nm	max. speed rpm	Shore hardness star	Material*	Weight drilled kg	Torsional stiffness C_{tdyn} Nm/rad	Moment of inertia $10^{-3}kgm^2$
KUZ-09	3	6	28000	92A	A	0,05	-	-
KUZ-14	4,2	4,2	20000	92A	S	0,14	254	0,02
KUZ-19	7,4	7,4	14000	92A	S	0,27	274	0,03
KUZ-24	17	34	14000	98A	S	0,34	2920	0,1
KUZ-28	60	120	10600	98A	S	0,9	9930	0,4
KUZ-38	160	320	8500	98A	S	1,5	26770	1,4
KUZ-45	325	650	7100	98A	G	2,35	48570	2,5
KUZ-55	450	900	6000	98A	G	3,55	54500	6,1
KUZ-60	625	1050	5600	98A	G	4,85	65290	10,2
KUZ-70	625	1250	4750	98A	G	7,4	94970	20,3
KUZ-75	900	1300	4250	98A	G	10,8	129510	37,1
KUZ-90	1500	3000	3550	98A	G	17,7	197500	84

*A = Aluminium, S = Sintered steel, G = Cast iron

Standard coupling KUZ

Coupling with keyway and set screw



Standard bores „d“ mm

KUZ-09:	U, 8, 9
KUZ-14:	U, 9, 11, 14
KUZ-19:	U, 11, 14, 16, 19
KUZ-24:	U, 11, 14, 16, 19, 19L, 20, 24
KUZ-28:	U, 14, 16, 19, 20, 24, 25, 28
KUZ-38:	U, 25, 28, 28L, 32, 38
KUZ-45:	U, 25, 28, 32, 38, 42, 45
KUZ-55:	U, 28A, 38A, 40A, 42A, 48, 55
KUZ-60:	38A, 40A, 60
KUZ-70:	40A, 65

U = not drilled (KUZ-19 pre-drilled $\varnothing 6,3$ mm)
 L = long hub
 A = offset hub
 * = coupling with set screw, without keyway.
 Other diameters available on request.

Elastomer star

Material: polyurethane
Damping: medium to good damping
Strength: very good long-term strength
Temperature range: -20°C to +70°C
 reduced to -30°C,
 up to +100°C (Mx0,55)

Coupling with keyway and set screw

Material: as shown in the table
Keyway: DIN 6885/1-P9
Other features: Provides rotational resilience and maintenance-free

Permissible assembly errors

Size	A mm	R mm	β
KUZ-09	0,8	0,15	1,0°
KUZ-14	0,75	0,4	0,5°
KUZ-19	0,75	0,4	0,5°
KUZ-24	1,2	0,2	0,9°
KUZ-28	1,4	0,22	0,9°
KUZ-38	1,5	0,25	0,9°
KUZ-45	1,8	0,28	1,0°
KUZ-55	2	0,32	1,0°
KUZ-60	2,1	0,36	1,1°
KUZ-70	2,2	0,38	1,1°
KUZ-75	2,6	0,42	1,2°
KUZ-90	3	0,48	1,2°

Potential assembly errors (KUZ and KUZ-KK)

Assembly instruction	Axial displacement A	Axis offset R	Angular error β
	axial	lateral	angular

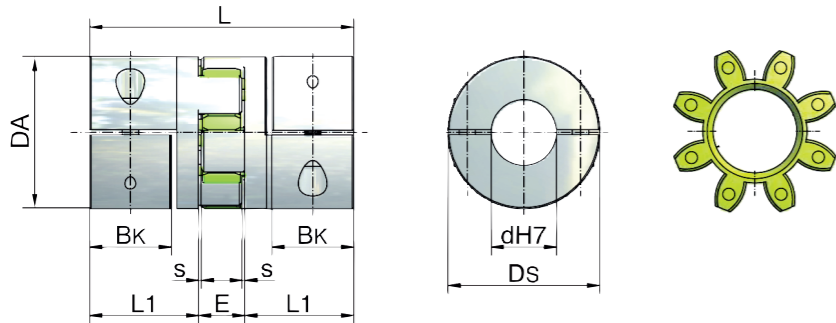
Ordering example:

KUZ-24-20/24

Size _____
 Bore 1st side _____
 bore 2nd side _____

Clamp coupling KUZ-KK

Coupling with split shells



Dimensions

Size	Dimensions							Clamping screw		Moment of inertia 10^{-3}kgm^2	Torsional stiffness C_{dyn}	Weight kg
	DA mm	DS mm	L mm	L1 mm	BK* mm	s mm	E mm	M 10,9	Tightening torque Nm			
KUZ-KK-16	32	32	54	21	15	1,5	12	M4	4	0,01	1375	0,1
KUZ-KK-24	42	44,5	66	25	17	1,5	16	M5	8	0,08	3700	0,2
KUZ-KK-32	56	57	98	40	30	2	18	M6	15	0,24	9917	0,55
KUZ-KK-35	67	68	114	47	35	2	20	M8	35	0,51	24417	0,9
KUZ-KK-45	82	85	134	55	40	2	24	M10	70	2,4	33667	1,6
KUZ-KK-60	102	105	156	65	50	2	26	M12	120	6	67667	2,7

*BK = shaft extension clamping length

Technical data

Size	Elastomer star		Maximum transmittable torque of clamp hub depending on the bore diameter (clamp force)																	
	Rated torque Nm	max. torque Nm	Ø9 Nm	Ø11 Nm	Ø14 Nm	Ø16 Nm	Ø19 Nm	Ø20 Nm	Ø22 Nm	Ø24 Nm	Ø25 Nm	Ø28 Nm	Ø30 Nm	Ø32 Nm	Ø38 Nm	Ø40 Nm	Ø42 Nm	Ø45 Nm	Ø48 Nm	Ø55 Nm
KUZ-KK-16	16	32	21	26	33	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KUZ-KK-24	21	42	-	41	52	60	70	74	81	89	-	-	-	-	-	-	-	-	-	-
KUZ-KK-32	75	150	-	60	76	87	104	109	120	131	136	153	164	175	-	-	-	-	-	-
KUZ-KK-35	200	400	-	-	-	120	-	188	206	-	235	-	-	301	-	-	-	-	-	-
KUZ-KK-45	405	810	-	-	-	325	386	406	447	488	508	568	610	650	772	-	854	915	-	-
KUZ-KK-60	660	1350	-	-	-	-	-	-	-	570	638	-	730	866	914	960	1029	1097	1250	-

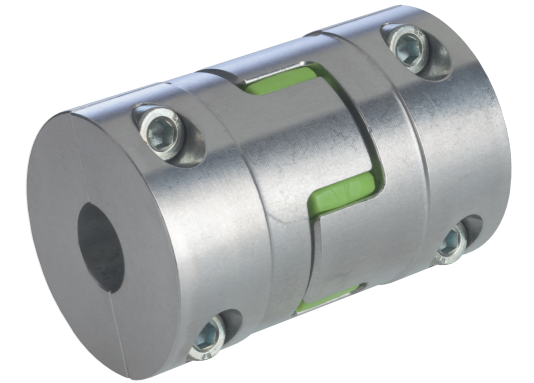
The max. torque is limited either by the star or by the clamping force

Clamp coupling KUZ-KK

Coupling with split shells

Standard bores „d“ mm	
KUZ-KK-16:	8, 9, 10, 11, 12, 14, 15, 16
KUZ-KK-24:	9, 10, 11, 12, 14, 15, 16, 18, 19, 20, 22, 24
KUZ-KK-32:	10, 11, 12, 14, 15, 16, 18, 19, 20, 22, 24, 25, 28, 30, 32
KUZ-KK-35:	12, 15, 16, 18, 20, 22, 24, 25, 28, 30, 32, 35
KUZ-KK-45:	16, 19, 20, 22, 24, 25, 28, 30, 32, 35, 38, 40, 42, 45
KUZ-KK-60:	25, 28, 32, 38, 40, 42, 45, 48, 50, 55

Other diameters available on request
Keyway available on request



Coupling with split shells

Material:	High-tensile aluminium
Keyway:	None, stepless adjustment facility thanks to the clamp hub rather than a fitted drive key Keyway available on request
Insertion:	Split shells permit easy radial insertion
Other features:	High concentricity High clamping forces Low moment of inertia

Elastomer star

Material:	Polyurethane
Shore-hardness:	64D
Colour:	ZIMM green
Other features:	Permanently free of play, dampens vibration Temperature range: -20°C to +70°C reduced to -30°C, to +100°C (Mx0,55)

Permissible assembly errors

Size	A mm	R mm	β
KUZ-KK-16	±1	0,08	1°
KUZ-KK-24	±2	0,08	1°
KUZ-KK-32	±2	0,1	1°
KUZ-KK-45	±2	0,12	1°
KUZ-KK-60	±2	0,14	1°

Figure "Potential assembly errors" see previous page.

Potential assembly errors (KUZ and KUZ-KK)

Assembly instruction	Axial displacement A	Axis offset R	Angular error β
<p>Check the angle and radial offset using straight edges in two planes</p>	<p>axial</p>	<p>lateral</p>	<p>angular</p>

Ordering example:

KUZ-KK-32-20/24

Size	→
Bore 1st side	→
Bore 2nd side	→