MIKI PULLEY

High performance curved jaw couplings

MIKI PULLEY STARFLEX

FLEX series
STARFLEX®

MIKI PULLEY

General-purpose Coupling of Simple Construction

Motive power is transmitted by polyurethane elastomer with the elastic force of rubber. These not only excel in absorbing vibration and shock, they transmit more than double the torque of older jaw couplings. The line-up includes three types of hubs, two types of elements and two types of fit. They can provide the optimum combination for your transmission torque, response, and misalignment. Since you can combine different hubs, they can be used in a wide range of applications.

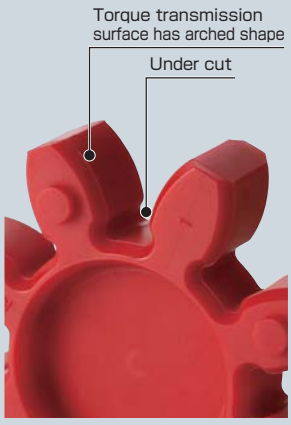
RoHS

Reduced Counterforce

Optimal design of the element shape reduces mounting error counterforfce to not damage the shaft. The R and Y types have no backlash and yet can absorb shock and vibration.

Torque transmission surface has linear shape

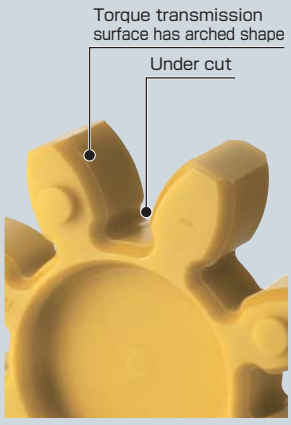
Shaped like older models



Torque transmission surface has arched shape

Under cut

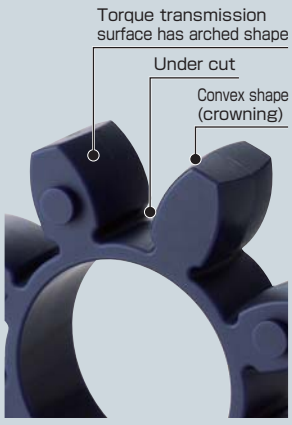
ALS (R)



Torque transmission surface has arched shape

Under cut

ALS (Y)



Torque transmission surface has arched shape

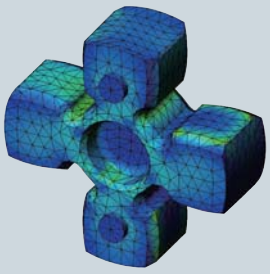
Under cut

Convex shape (crowning)

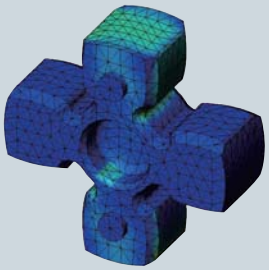
ALS (B)

Optimal design by 3D-CAD and FEM analysis

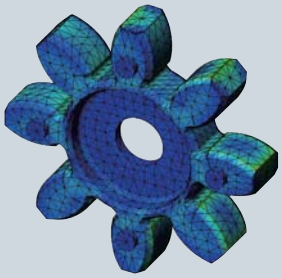
The advanced CAE system is utilized in the starting stage of design. Models are designed by using 3DCAD. Shapes and strength design are optimized by using the advanced FEM (finite element method) analysis software.



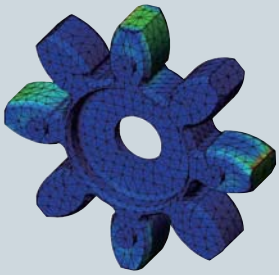
THRUST



TORQUE



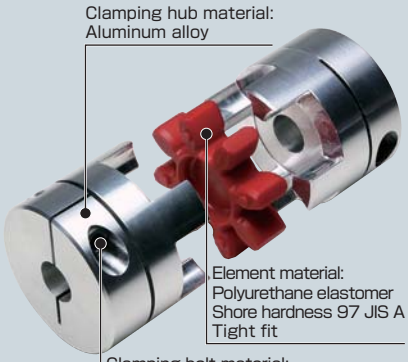
THRUST



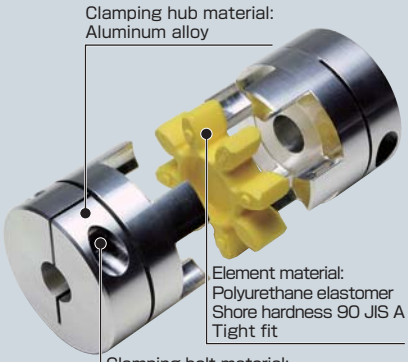
TORQUE

Three types of elements

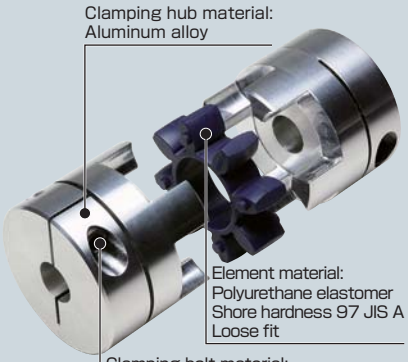
There are three MIKI PULLEY STARFLEX models. Each has a different type of element.



ALS (ARN)



ALS (AYN)



ALS (ABN)

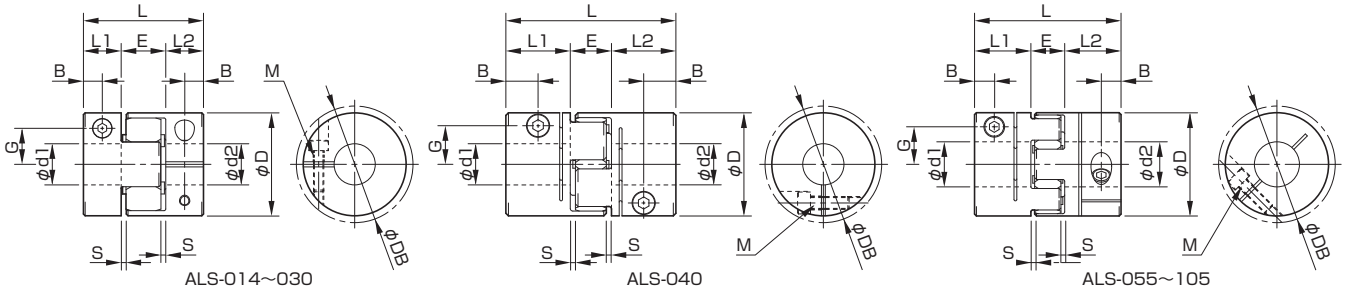
ALS (ARN) Type

Specifications

Model	Torque		Misalignment			Max. rotation speed [min^{-1}]	Static torsional stiffness [N · m/rad]	Radial stiffness [N/mm]	Moment of inertia [kg · m^2]	Mass [kg]
	Nominal [N · m]	Max. [N · m]	Parallel [mm]	Angular [°]	Axial [mm]					
ALS-014ARN	(2)	(4)	0.10	1	0 ~ +0.6	10000	21	380	1.98×10^{-7}	0.007
ALS-020ARN	(5)	(10)	0.10	1	0 ~ +0.8	10000	43	400	1.09×10^{-6}	0.019
ALS-030ARN	(12.5)	(25)	0.10	1	0 ~ +1.0	10000	136	650	6.19×10^{-6}	0.045
ALS-040ARN	(17)	(34)	0.10	1	0 ~ +1.2	10000	1550	1700	4.01×10^{-5}	0.16
ALS-055ARN	(60)	(120)	0.10	1	0 ~ +1.4	7000	2000	1350	1.63×10^{-4}	0.34
ALS-065ARN	(160)	(320)	0.10	1	0 ~ +1.5	5900	3100	1400	3.69×10^{-4}	0.54
ALS-080ARN	(325)	(650)	0.10	1	0 ~ +1.8	4800	6000	1710	1.04×10^{-3}	1.00
ALS-095ARN	(450)	(900)	0.10	1	−0.5 ~ +2.0	4000	10000	4200	2.25×10^{-3}	1.50
ALS-105ARN	(525)	(1050)	0.15	1	−0.9 ~ +2.0	3700	12000	5000	3.75×10^{-3}	2.05

* Check the Standard Bore Diameter and Rated Transmission Torque list as there maybe limitations on the nominal and max. torque cased by the holding power of the coupling shaft section.
* Axial displacement is not allowed in the negative direction. * Max. rotation speed does not take into account dynamic balance. * Stiffness values given are from measurements taken at 20℃.
* The moment of inertia and mass are measured for the maximum bore diameter.

Dimensions



ALS-014~030　　ALS-040　　ALS-055~105

Model	d1 · d2 [mm]		D	DB	L	L1 · L2	E	S	B	G	M Quantity - Nominal dia.	Tightening torque [N · m]
	Min.	Max.	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		
ALS-014ARN	3	7	14	16.4	22	7	8	1	3.5	5	1-M2	0.4
ALS-020ARN	4	10	20	21.7	30	10	10	1	5	7.5	1-M2.5	1
ALS-030ARN	6	16	30	30	35	11	13	1.5	5.5	10.5	1-M3	1.5
ALS-040ARN	8	24	40	47(45.1)	66	25	16	2	8 (6.5)	15	1-M6 (1-M5)	14 (7)
ALS-055ARN	10	30	55	56	78	30	18	2	8	20.5	1-M6	14
ALS-065ARN	14	38	65	70.7	90	35	20	2.5	11.5	25	1-M8	30
ALS-080ARN	19	45	80	80	114	45	24	3	11.5	30	1-M8	30
ALS-095ARN	20	55	95	98.5	126	50	26	3	12.5	37	1-M10	68
ALS-105ARN	25	60	105	105	140	56	28	3.5	12.5	40	1-M10	68

* The φDB value is measured assuming that the head of the clamping bolt is larger than the external diameter of the hub. * The nominal diameter for the clamping bolt M is equal to the quantity - the nominal diameter of the screw threads, where the quantity is for a hub on one side. The values in ( ) in the above table are for ALS-040 hole diameters φ22 and φ24, φDB : 45.1 mm, B : 6.5 mm, M : 1-M5, clamping bolt tightening torque : 7 N · m.

Standard bore diameter and rated transmission torque

Model	Torque	Standard bore diameter d1, d2 [mm] and rated transmission torque [N · m]																														
		3	4	5	6	6.35	7	8	10	11	12	14	15	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60
ALS-014ARN	Nominal	0.5	0.9	1.3	1.5	1.7	1.9																									
	Max.	0.5	0.9	1.3	1.5	1.7	1.9																									
ALS-020ARN	Nominal		2.1	2.2	2.7	2.7	3.0	3.5	4.5																							
	Max.		2.1	2.2	2.7	2.7	3.0	3.5	4.5																							
ALS-030ARN	Nominal				3.6	3.6	4.1	4.9	7.0	7.5	8.2	9.7	10	11																		
	Max.				3.6	3.6	4.1	4.9	7.0	7.5	8.2	9.7	10	11																		
ALS-040ARN	Nominal							17	17	17	17	17	17	17	17	17	17	17	17													
	Max.							22	27	29	31	34	34	34	34	34	34	30	32													
ALS-055ARN	Nominal								34	38	41	49	53	57	60	60	60	60	60	60	60	60										
	Max.								34	38	41	49	53	57	65	69	72	80	88	92	104	111										
ALS-065ARN	Nominal											54	61	68	82	89	96	109	123	130	151	160	160	160	160							
	Max.											54	61	68	82	89	96	109	123	130	151	165	179	199	220							
ALS-080ARN	Nominal															105	111	124	137	143	162	175	188	207	226	238	251	270				
	Max.															105	111	124	137	143	162	175	188	207	226	238	251	270				
ALS-095ARN	Nominal																215	295	365	400	450	450	450	450	450	450	450	450	450	450	450	
	Max.																215	295	365	400	506	575	646	716	786	856	900	900	900	900	900	
ALS-105ARN	Nominal																			525	525	525	525	525	525	525	525	525	525	525	525	525
	Max.																			590	630	660	689	733	800	870	950	1050	1050	1050	1050	1050

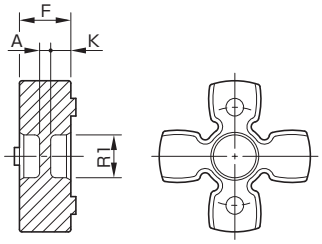
* Bore diameters whose fields contain numbers are supported as the standard bore diameters. * Bore diameters whose fields contain numbers are restricted in their rated transmission torque by the holding power of the shaft connection component. The numbers indicate the rated transmission torque value [N · m]. * The recommended processing tolerance for paired mounting shafts is the h7 (HA) class. However, for a shaft diameter of ϕ35 (HA), the tolerance is $^{+0.010}_{-0.025}$. * Bore diameters between the minimum and maximums shown in the dimensions table are compatible, but bore diameters other than those shown in the above table require other arrangements. Contact Miki Pulley for details.

How to Place an Order

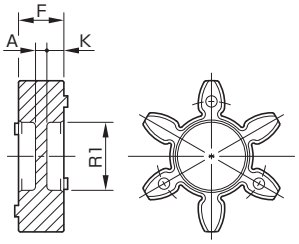
ALS-055-ARN-24BHA-28BHA

- Size
- Element type
  R: Hardness, 97 JIS A
  Tight-fit type
- Bore dia. d1 (Small dia.)
- Supported shaft tolerance
  HA: h7(h6,g6) shaft ($^{+0.010}_{-0.025}$ for ϕ35)
  (KA: k6 shaft Option)
- Bore specifications
  B: Clamp type
- Bore dia. d2 (Large dia.)

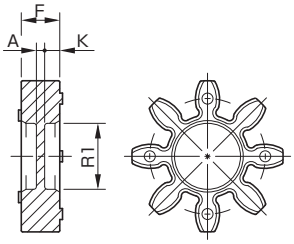
Dimensions (Element)



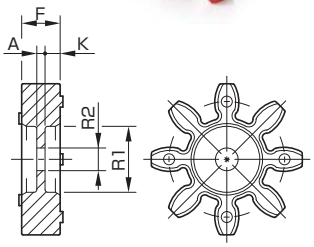
ALS-014 ~ 030-R-EL



ALS-040-R-EL



ALS-055 ~ 065-R-EL



ALS-080 ~ 105-R-EL

Model	F [mm]	R1 [mm]	R2 [mm]	K [mm]	A [mm]
ALS-014-R-EL	6.2	3.5	-	2.5	1.2
ALS-020-R-EL	8.2	6.2	-	3.4	1.4
ALS-030-R-EL	10.2	8.5	-	4	2.2
ALS-040-R-EL	12	18	-	4.5	3
ALS-055-R-EL	14	24	-	5.5	3
ALS-065-R-EL	15	30	-	5.5	4
ALS-080-R-EL	18	37	15	7	4
ALS-095-R-EL	20	43	20	8	4
ALS-105-R-EL	21	50	20	8.5	4

How to Place an Order

ALS-055-R-EL

- Size
- Element only
- Element type
  R: Hardness 97 JIS A; Tight-fit type

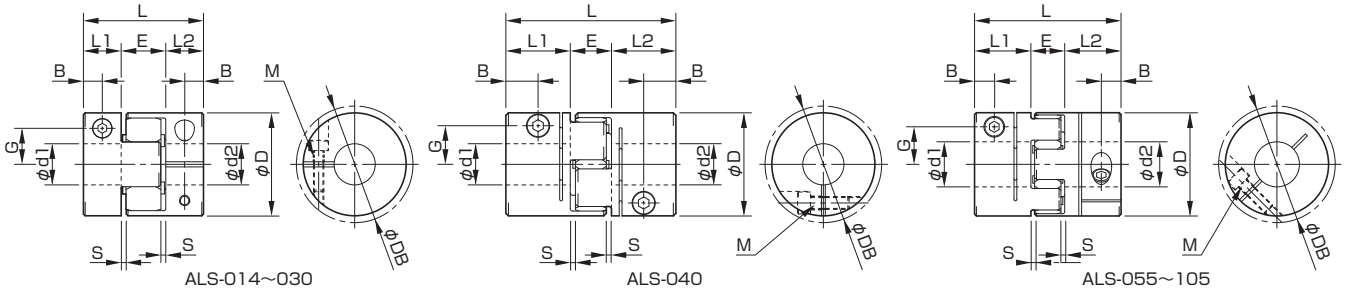
ALS (AYN) Type

Specifications

Model	Torque		Misalignment			Max. rotation speed [min^{-1}]	Static torsional stiffness [N · m/rad]	Radial stiffness [N/mm]	Moment of inertia [kg · m^2]	Mass [kg]
	Nominal [N · m]	Max. [N · m]	Parallel [mm]	Angular [°]	Axial [mm]					
ALS-014AYN	(1.2)	(2.4)	0.10	1	0 ~ +0.6	10000	12	200	1.98×10^{-7}	0.007
ALS-020AYN	(3)	(6)	0.15	1	0 ~ +0.8	10000	24	210	1.09×10^{-6}	0.019
ALS-030AYN	(7.5)	(15)	0.15	1	0 ~ +1.0	10000	73	330	6.19×10^{-6}	0.045
ALS-040AYN	(10)	(20)	0.10	1	0 ~ +1.2	10000	760	940	4.01×10^{-5}	0.16
ALS-055AYN	(35)	(70)	0.15	1	0 ~ +1.4	7000	1400	1160	1.63×10^{-4}	0.34
ALS-065AYN	(95)	(190)	0.15	1	0 ~ +1.5	5900	2100	1200	3.69×10^{-4}	0.54
ALS-080AYN	(190)	(380)	0.15	1	0 ~ +1.8	4800	4000	1430	1.04×10^{-3}	1.00
ALS-095AYN	(265)	(530)	0.15	1	−0.5 ~ +2.0	4000	6000	2400	2.25×10^{-3}	1.50
ALS-105AYN	(310)	(620)	0.20	1	−0.9 ~ +2.0	3700	7000	4000	3.75×10^{-3}	2.05

* Check the Standard Bore Diameter and Rated Transmission Torque list as there maybe limitations on the nominal and max. torque cased by the holding power of the coupling shaft section.
* Axial displacement is not allowed in the negative direction. * Max. rotation speed does not take into account dynamic balance. * Stiffness values given are from measurements taken at 20℃.
* The moment of inertia and mass are measured for the maximum bore diameter.

Dimensions



ALS-014~030　　ALS-040　　ALS-055~105

Model	d1 · d2 [mm]		D	DB	L	L1 · L2	E	S	B	G	M Quantity - Nominal dia.	Tightening torque [N · m]
	Min.	Max.	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		
ALS-014AYN	3	7	14	16.4	22	7	8	1	3.5	5	1-M2	0.4
ALS-020AYN	4	10	20	21.7	30	10	10	1	5	7.5	1-M2.5	1
ALS-030AYN	6	16	30	30	35	11	13	1.5	5.5	10.5	1-M3	1.5
ALS-040AYN	8	24	40	47(45.1)	66	25	16	2	8 (6.5)	15	1-M6 (1-M5)	14 (7)
ALS-055AYN	10	30	55	56	78	30	18	2	8	20.5	1-M6	14
ALS-065AYN	14	38	65	70.7	90	35	20	2.5	11.5	25	1-M8	30
ALS-080AYN	19	45	80	80	114	45	24	3	11.5	30	1-M8	30
ALS-095AYN	20	55	95	98.5	126	50	26	3	12.5	37	1-M10	68
ALS-105AYN	25	60	105	105	140	56	28	3.5	12.5	40	1-M10	68

* The φDB value is measured assuming that the head of the clamping bolt is larger than the external diameter of the hub. * The nominal diameter for the clamping bolt M is equal to the quantity - the nominal diameter of the screw threads, where the quantity is for a hub on one side. The values in ( ) in the above table are for ALS-040 hole diameters φ22 and φ24, φDB : 45.1 mm, B : 6.5 mm, M : 1-M5, clamping bolt tightening torque : 7 N · m.

Standard bore diameter and rated transmission torque

Model	Torque	Standard bore diameter d1, d2 [mm] and rated transmission torque [N · m]																														
		3	4	5	6	6.35	7	8	10	11	12	14	15	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60
ALS-014AYN	Nominal	0.5	0.9	1.2	1.2	1.2	1.2																									
	Max.	0.5	0.9	1.3	1.5	1.7	1.9																									
ALS-020AYN	Nominal		2.1	2.2	2.7	2.7	3.0	3.0	3.0																							
	Max.		2.1	2.2	2.7	2.7	3.0	3.5	4.5																							
ALS-030AYN	Nominal				3.6	3.6	4.1	4.9	7.0	7.5	7.5	7.5	7.5	7.5																		
	Max.				3.6	3.6	4.1	4.9	7.0	7.5	8.2	9.7	10	11																		
ALS-040AYN	Nominal							10	10	10	10	10	10	10	10	10	10	10	10													
	Max.							20	20	20	20	20	20	20	20	20	20	20	20													
ALS-055AYN	Nominal								34	35	35	35	35	35	35	35	35	35	35	35	35	35										
	Max.								34	38	41	49	53	57	65	69	70	70	70	70	70	70										
ALS-065AYN	Nominal											54	61	68	82	89	95	95	95	95	95	95	95	95	95							
	Max.											54	61	68	82	89	96	109	123	130	151	165	179	190	190							
ALS-080AYN	Nominal															105	111	124	137	143	162	175	188	190	190	190	190	190				
	Max.															105	111	124	137	143	162	175	188	207	226	238	251	270				
ALS-095AYN	Nominal																215	265	265	265	265	265	265	265	265	265	265	265	265	265	265	
	Max.																215	295	365	400	506	530	530	530	530	530	530	530	530	530	530	
ALS-105AYN	Nominal																			310	310	310	310	310	310	310	310	310	310	310	310	310
	Max.																			590	620	620	620	620	620	620	620	620	620	620	620	620

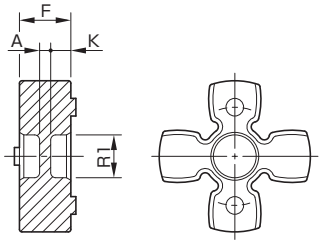
* Bore diameters whose fields contain numbers are supported as the standard bore diameters. * Bore diameters whose fields contain numbers are restricted in their rated transmission torque by the holding power of the shaft connection component. The numbers indicate the rated transmission torque value [N · m]. * The recommended processing tolerance for paired mounting shafts is the h7 (HA) class. However, for a shaft diameter of ϕ35 (HA), the tolerance is $^{+0.010}_{-0.025}$. * Bore diameters between the minimum and maximums shown in the dimensions table are compatible, but bore diameters other than those shown in the above table require other arrangements. Contact Miki Pulley for details.

How to Place an Order

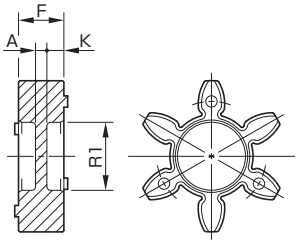
ALS-055-AYN-24BHA-28BHA

- Size
- Element type
  Y: Hardness, 90 JIS A
  Tight-fit type
- Bore dia. d1 (Small dia.)
- Supported shaft tolerance
  HA: h7(h6,g6) shaft ($^{+0.010}_{-0.025}$ for ϕ35)
  (KA: k6 shaft Option)
- Bore specifications
  B: Clamp type
- Bore dia. d2 (Large dia.)

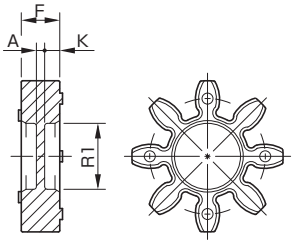
Dimensions (Element)



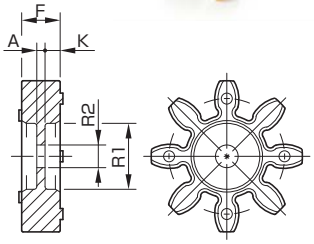
ALS-014 ~ 030-Y-EL



ALS-040-Y-EL



ALS-055 ~ 065-Y-EL



ALS-080 ~ 105-Y-EL

Model	F [mm]	R1 [mm]	R2 [mm]	K [mm]	A [mm]
ALS-014-Y-EL	6.2	3.5	-	2.5	1.2
ALS-020-Y-EL	8.2	6.2	-	3.4	1.4
ALS-030-Y-EL	10.2	8.5	-	4	2.2
ALS-040-Y-EL	12	18	-	4.5	3
ALS-055-Y-EL	14	24	-	5.5	3
ALS-065-Y-EL	15	30	-	5.5	4
ALS-080-Y-EL	18	37	15	7	4
ALS-095-Y-EL	20	43	20	8	4
ALS-105-Y-EL	21	50	20	8.5	4

How to Place an Order

ALS-055-Y-EL

- Size
- Element only
- Element type
  Y: Hardness 90 JIS A; Tight-fit type

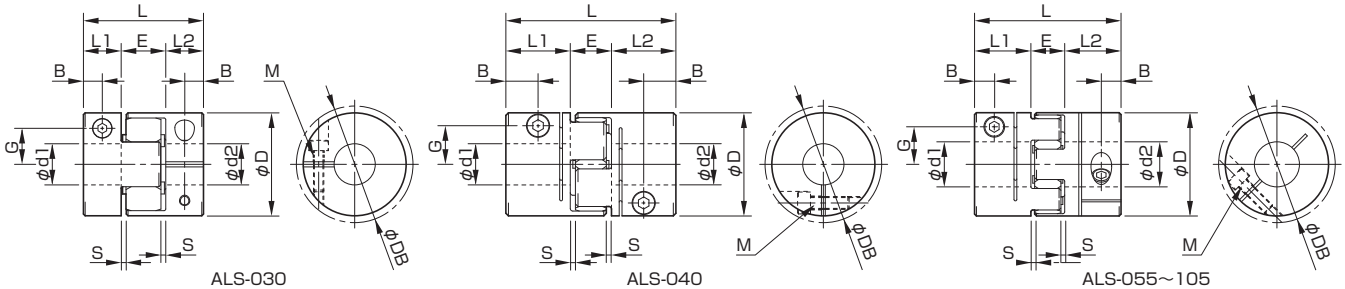
ALS (ABN) Type

Specifications

Model	Torque		Misalignment			Max. rotation speed [min^{-1}]	Static torsional stiffness [N · m/rad]	Radial stiffness [N/mm]	Moment of inertia [kg · m^2]	Mass [kg]
	Nominal [N · m]	Max. [N · m]	Parallel [mm]	Angular [°]	Axial [mm]					
ALS-030ABN	(12.5)	(25)	0.17	1	−0.2 ～ +1.0	10000	90	460	6.07×10^{-6}	0.043
ALS-040ABN	(17)	(34)	0.20	1	−0.5 ～ +1.2	10000	400	640	4.00×10^{-5}	0.16
ALS-055ABN	(60)	(120)	0.22	1	−0.2 ～ +1.4	7000	1150	400	1.63×10^{-4}	0.34
ALS-065ABN	(160)	(320)	0.25	1	−0.6 ～ +1.5	5900	2000	800	3.69×10^{-4}	0.54
ALS-080ABN	(325)	(650)	0.28	1	−0.9 ～ +1.8	4800	4550	600	1.04×10^{-3}	1.00
ALS-095ABN	(450)	(900)	0.32	1	−0.5 ～ +2.0	4000	12000	800	2.25×10^{-3}	1.50
ALS-105ABN	(525)	(1050)	0.36	1	−0.9 ～ +2.0	3700	15000	2000	3.75×10^{-3}	2.05

* Check the Standard Bore Diameter and Rated Transmission Torque list as there maybe limitations on the nominal and max. torque cased by the holding power of the coupling shaft section.
* Axial displacement is not allowed in the negative direction. * Max. rotation speed does not take into account dynamic balance. * Stiffness values given are from measurements taken at 20℃.
* The moment of inertia and mass are measured for the maximum bore diameter.

Dimensions



ALS-030　　ALS-040　　ALS-055～105

Model	d1 · d2 [mm]		D	DB	L	L1 · L2	E	S	B	G	M Quantity - Nominal dia.	Tightening torque [N · m]
	Min.	Max.	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		
ALS-030ABN	6	16	30	30	35	11	13	1.5	5.5	10.5	1-M3	1.5
ALS-040ABN	8	24	40	47(45.1)	66	25	16	2	8 (6.5)	15	1-M6 (1-M5)	14 (7)
ALS-055ABN	10	30	55	56	78	30	18	2	8	20.5	1-M6	14
ALS-065ABN	14	38	65	70.7	90	35	20	2.5	11.5	25	1-M8	30
ALS-080ABN	19	45	80	80	114	45	24	3	11.5	30	1-M8	30
ALS-095ABN	20	55	95	98.5	126	50	26	3	12.5	37	1-M10	68
ALS-105ABN	25	60	105	105	140	56	28	3.5	12.5	40	1-M10	68

* The φDB value is measured assuming that the head of the clamping bolt is larger than the external diameter of the hub. * The nominal diameter for the clamping bolt M is equal to the quantity - the nominal diameter of the screw threads, where the quantity is for a hub on one side. The values in ( ) in the above table are for ALS-040 hole diameters φ22 and φ24, φDB : 45.1 mm, B : 6.5 mm, M : 1-M5, clamping bolt tightening torque : 7 N · m.

Standard bore diameter and rated transmission torque

Model	Torque	Standard bore diameter d1, d2 [mm] and rated transmission torque [N · m]																														
		3	4	5	6	6.35	7	8	10	11	12	14	15	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60
ALS-030ABN	Nominal				3.6	3.6	4.1	4.9	7.0	7.5	8.2	9.7	10	11																		
	Max.				3.6	3.6	4.1	4.9	7.0	7.5	8.2	9.7	10	11																		
ALS-040ABN	Nominal							17	17	17	17	17	17	17	17	17	17	17	17												
	Max.							22	27	29	31	34	34	34	34	34	34	30	32												
ALS-055ABN	Nominal								34	38	41	49	53	57	60	60	60	60	60	60	60	60									
	Max.								34	38	41	49	53	57	65	69	72	80	88	92	104	111									
ALS-065ABN	Nominal											54	61	68	82	89	96	109	123	130	151	160	160	160	160						
	Max.											54	61	68	82	89	96	109	123	130	151	165	179	199	220						
ALS-080ABN	Nominal															105	111	124	137	143	162	175	188	207	226	238	251	270			
	Max.															105	111	124	137	143	162	175	188	207	226	238	251	270			
ALS-095ABN	Nominal																215	295	365	400	450	450	450	450	450	450	450	450	450	450	
	Max.																215	295	365	400	506	575	646	716	786	856	900	900	900	900	900
ALS-105ABN	Nominal																			525	525	525	525	525	525	525	525	525	525	525	525
	Max.																			590	630	660	689	733	800	870	950	1050	1050	1050	1050

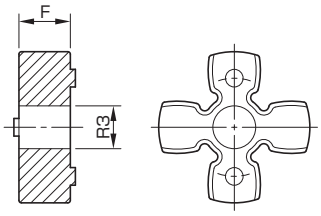
* Bore diameters whose fields contain numbers are supported as the standard bore diameters. * Bore diameters whose fields contain numbers are restricted in their rated transmission torque by the holding power of the shaft connection component. The numbers indicate the rated transmission torque value [N · m]. * The recommended processing tolerance for paired mounting shafts is the h7 (HA) class . However, for a shaft diameter of ϕ35 (HA), the tolerance is $^{+0.010}_{-0.025}$. * Bore diameters between the minimum and maximums shown in the dimensions table are compatible, but bore diameters other than those shown in the above table require other arrangements. Contact Miki Pulley for details.

How to Place an Order

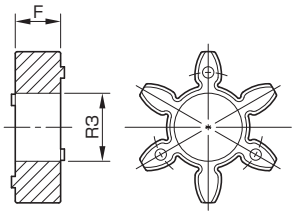
ALS-055-ABN-24BHA-28BHA

- Size
- Element type
  R: Hardness, 97 JIS A
  Loose-fit type
- Bore dia. d1 (Small dia.)
- Supported shaft tolerance
  HA: h7(h6,g6) shaft ($^{+0.010}_{-0.025}$ for ϕ35)
  (KA: k6 shaft Option)
- Bore specifications
  B: Clamp type
- Bore dia. d2 (Large dia.)

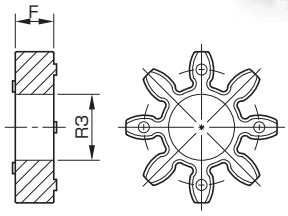
Dimensions (Element)



ALS-030-B-EL



ALS-040-B-EL



ALS-055 ~ 105-B-EL

Model	F [mm]	R3 [mm]
ALS-030-B-EL	10.2	10.5
ALS-040-B-EL	12	18.5
ALS-055-B-EL	14	27.5
ALS-065-B-EL	15	32
ALS-080-B-EL	18	41
ALS-095-B-EL	20	47
ALS-105-B-EL	21	50

How to Place an Order

ALS-055-B-EL

- Size
- Element only
- Element type
  B: Hardness 97 JIS A; Loose-fit type

Items Checked for Design Purposes

Special items to take note of

You should note the following to prevent any problems.

(1) Always be careful of parallel, angular, and axial misalignment.

(2) Always tighten bolts with the specified torque.

Precautions for handling

ALS models come with three different types of elements and two different types of mounting hubs. Be aware in their handling that their allowable values and points of caution are not the same.

(1) Couplings are designed for use within an operating temperature range of −30℃ to 80℃ .

(2) Although elements are designed to be oilproof, do not subject them to excessive amounts of oil as it may cause deterioration. Use and storage in direct sunlight may shorten element service life, so cover elements appropriately.

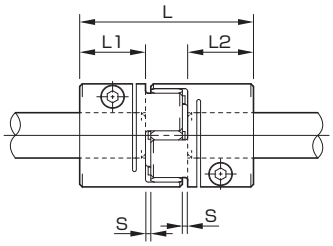
(3) Do not tighten up clamping bolts until after inserting the mounting shaft.

(4) Mounting shaft to a clamp-type coupling is assumed to be a round shaft.

Mounting

(1) Remove any rust, dust, oil residue, etc. from the inner diameter surfaces of the shaft and couplings. In particular, never allow oil or grease containing antifriction or other agent (molybdenum-, silicon-, or fluorine-based), which would dramatically affect the friction coefficient, to contact the surface.

(2) Insert and mount the shaft far enough so that the paired mounting shafts touch the entire length of the clamping hub of the coupling (dimensions chart L1, L2), and does not interfere with the elements or the other shaft.
After mounting the left and right hubs, check also that the total coupling length (L in the dimensions chart) does not exceed the permitted axial tolerance. If the total coupling length cannot be checked, use a feeler gauge or similar tool to check that the gap between the left and right hubs (S in the dimensions chart) does not exceed the permitted axial tolerance.

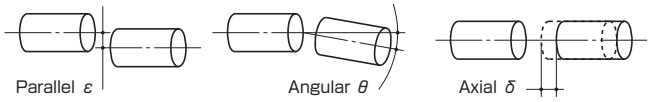


Model	L [mm]	L1 · L2 [mm]	S [mm]
ALS-014	22	7	1
ALS-020	30	10	1
ALS-030	35	11	1.5
ALS-040	66	25	2
ALS-055	78	30	2
ALS-065	90	35	2.5
ALS-080	114	45	3
ALS-095	126	50	3
ALS-105	140	56	3.5

(3) To get full coupling performance, mount couplings so that differences between coupling centers during operation are within the misalignment shown in the specifications table. However, this misalignment is the maximum value when each occurs independently, so make the allowable value when they combine 50% or less of this value.

(4) The centering precision has a major impact on the service life of the element. We recommend aligning the centering locations as the method for centering the two shafts.

Misalignment



Model	Parallel ε [mm]	Angular θ [mm]	Axial δ [mm]	Axial (total length) L [mm]
ALS-014-ARN	0.10	1	0～+0.6	22～22.6
ALS-020-ARN	0.10	1	0～+0.8	30～30.8
ALS-030-ARN	0.10	1	0～+1.0	35～36.0
ALS-040-ARN	0.10	1	0～+1.2	66～67.2
ALS-055-ARN	0.10	1	0～+1.4	78～79.4
ALS-065-ARN	0.10	1	0～+1.5	90～91.5
ALS-080-ARN	0.10	1	0～+1.8	114～115.8
ALS-095-ARN	0.10	1	−0.5～+2.0	125.5～128.0
ALS-105-ARN	0.15	1	−0.9～+2.0	139.1～142.0

Model	Parallel ε [mm]	Angular θ [mm]	Axial δ [mm]	Axial (total length) L [mm]
ALS-014-AYN	0.10	1	0～+0.6	22～22.6
ALS-020-AYN	0.15	1	0～+0.8	30～30.8
ALS-030-AYN	0.15	1	0～+1.0	35～36.0
ALS-040-AYN	0.10	1	0～+1.2	66～67.2
ALS-055-AYN	0.15	1	0～+1.4	78～79.4
ALS-065-AYN	0.15	1	0～+1.5	90～91.5
ALS-080-AYN	0.15	1	0～+1.8	114～115.8
ALS-095-AYN	0.15	1	−0.5～+2.0	125.5～128.0
ALS-105-AYN	0.20	1	−0.9～+2.0	139.1～142.0

Model	Parallel ε [mm]	Angular θ [mm]	Axial δ [mm]	Axial (total length) L [mm]
ALS-030-ABN	0.17	1	−0.2～+1.0	34.8～36.0
ALS-040-ABN	0.20	1	−0.5～+1.2	65.5～67.2
ALS-055-ABN	0.22	1	−0.2～+1.4	77.8～79.4
ALS-065-ABN	0.25	1	−0.6～+1.5	89.4～91.5
ALS-080-ABN	0.28	1	−0.9～+1.8	113.1～115.8
ALS-095-ABN	0.32	1	−0.5～+2.0	125.5～128.0
ALS-105-ABN	0.36	1	−0.9～+2.0	139.1～142.0

(5) Tighten clamping bolts to the tightening torques shown below using a calibrated torque screwdriver or torque wrench.

Clamping bolt size	M2	M2.5	M3	M5	M6	M8
Tightening torque [N · m]	0.4	1.0	1.5	7.0	14.0	30.0

(6) Do not use any clamping bolt other than those specified by Miki Pulley. Do not apply oil, grease, or screw fixatives.

Selection procedures

ALS models can be selected in one of two ways depending on their mode of use: ordinary use or no-backlash use (exploiting their pre-compressed construction). When considering use of couplings in no-backlash mode, however, be sure that use will be at a torque that is low enough for the nominal torque of the coupling.

Ordinary use

(1) Find the torque, T_a, applied to the coupling using the output capacity, P, of the driver and the usage rotation speed, n.

$$T_a\ [N\cdot m] = 9550 \times \frac{P\ [kW]}{n\ [min^{-1}]}$$

(2) Determine the service factor K from the usage and operating conditions, and find the corrected torque, T_d, applied to the coupling.

$$T_d\ [N\cdot m] = T_a\ [N\cdot m] \times K1 \times K2 \times K3 \times K4$$

■ Service factor based on load property : K1

Load properties	Constant	Vibration : Small	Vibration : Medium	Vibration : Large
				
K1	1.0	1.25	1.75	2.25

■ Service factor based on operating time : K2

Hrs./day	~8	~16	~24
K2	1.0	1.12	1.25

■ Service factor based on starting/braking frequency : K3

Times/hr.	~10	~30	~60	~120	~240	Over 240
K3	1.0	1.1	1.3	1.5	2.0	2.5≦

■ Service factor based on operating temperature : K4

Temperature [℃]	−30~30	30~40	40~60	60~80
K4	1.0	1.2	1.4	1.8

(3) Set the size so that the nominal torque of the coupling T_n is at least equal to the corrected torque, T_d.

$$T_n\ [N\cdot m] \geqq T_d\ [N\cdot m]$$

(4) Select a size that results in a maximum torque, T_m, for the coupling that is at least equal to the peak torque, T_s, generated by the driver, follower or both. Maximum torque refers to the maximum amount of torque that can be applied for a set amount of time considering eight hours of operation per day and up to around ten instances.

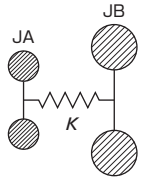
$$T_m\ [N\cdot m] \geqq T_s\ [N\cdot m] \times K4$$

(5) When the required shaft diameter exceeds the maximum bore diameter of the selected size, select a suitable coupling.

(6) When the coupling is used in machinery prone to periodic violent load-torque fluctuations, torsional vibration must also be considered in addition to the above selection criteria. In other words, check that the vibration frequency of the torque fluctuation does not match the natural frequency of the shafting. The natural frequency is generally calculated by finding the natural frequency, fe, of one section, approximating the shafting as shown in the diagram below.

$$f_e = \frac{1}{2\pi}\sqrt{K\left(\frac{1}{JA}+\frac{1}{JB}\right)}\ [Hz]$$

K : Static torsional stiffness of coupling [N・m/rad]
J1 : Moment of inertia of driving side [kg·m²]
J2 : Moment of inertia of driven side [kg·m²]



Note that selection criteria are different for ordinary use and use in no-backlash mode.
When considering use of couplings in no-backlash mode, select from among the ALS (ARN) and ALS (AYN) types. ALS (ABN) types cannot be used in no-backlash mode.

No-backlash use

(1) Find the torque, T_a, applied to the coupling using the output capacity, P, of the driver and the usage rotation speed, n.

$$T_a\ [N\cdot m] = 9550 \times \frac{P\ [kW]}{n\ [min^{-1}]}$$

(2) Determine the service factor K from the usage and operating conditions, and find the corrected torque, T_d, applied to the coupling.

$$T_d\ [N\cdot m] = T_a\ [N\cdot m] \times K1 \times K2 \times K3 \times K4$$

■ Service factor based on load property : K1

Load properties	Constant	Vibration : Small	Vibration : Medium	Vibration : Large
				
K1	1.0	1.25	1.75	2.25

* When using in no-backlash mode, be sure that K1 ≧ 4.

■ Service factor based on operating time : K2

Hrs./day	~8	~16	~24
K2	1.0	1.12	1.25

■ Service factor based on starting/braking frequency : K3

Times/hr.	~10	~30	~60	~120	~240	Over 240
K3	1.0	1.1	1.3	1.5	2.0	2.5≦

■ Service factor based on operating temperature : K4

Temperature [℃]	−30~30	30~40	40~60	60~80
K4	1.0	1.2	1.4	1.8

(3) Select a size that results in a peak torque T_s generated by the driver, follower or both that is no greater than the nominal torque Tn for the coupling.

$$T_n\ [N\cdot m] \geqq T_s\ [N\cdot m] \times K4$$

(4) When the required shaft diameter exceeds the maximum bore diameter of the selected size, select a suitable coupling. When using a clamping hub, the bore diameter may restrict the transmission torque. For that reason, check that the clamping-hub shaft holding force of the selected coupling size is at least equal to the peak torque, T_s, applied to the coupling.

Couplings can structurally be used in no-backlash mode while the element is pre-compressed, but backlash may start to occur with use. If you are considering using the coupling in no-backlash mode over a long period of time, we recommend setting the service factor K1 to a high value.
If you require higher precision control/positioning for a long period of time, we recommend our SERVOFLEX series of metal disc couplings.

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