Sprflex coupling

General-purpose motor | Stepping motor | Servo motor | Detector | Engine

Simple and lightweight construction
The simple construction consists of two hubs and cushioning material (spider). Lightweight aluminum alloy is used for the AL model.

Easy handling
Engaging and disengaging can be easily performed by moving the device in axial direction.

Low price
A simple construction achieves a low price.

Normal operating torque [N·m]		0.5 ~ 50
Pilot bore/Additional machining range [mm]		φ4 ~ 48
Operational temp. [℃]		−20 ~ +80
Backlash		Yes
Max. permissible misalignment	Parallel offset [mm]	0.1 ~ 0.3
	Angular misalignment [°]	0.5 ~ 1
	Axial displacement [mm]	±0.5 ~ ±0.7 AL-035 : +0.3

Structure and Material

AL model
(Normal operating torque 0.5~50N · m)

A lightweight and low inertial model using aluminum alloy for the hub material

L model
L Model (Spider only)

The NBR spider used for the AL model

Ordering Information

Coupling

AL - 075 - □ - □

- d2: Bore diameter 2
- d1: Bore diameter 1
- Size

* For the product with prepared bores, enter the size only.
* If bore processing is required, refer to the page 66.

Spider only

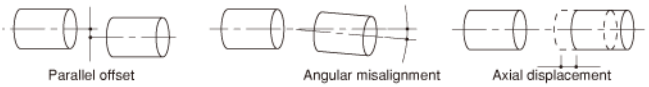
L - 090

- Size

Specification

Model	Torque		Max. permissible misalignment			Max. rotation speed [min⁻¹]	Moment of inertia [kg·m²]	Mass [kg]	Price
	Normal [N·m]	Max. [N·m]	Parallel offset [mm]	Angular misalignment [°]	Axial displacement [mm]				
AL-035	0.5	1.5	0.1	0.5	+0.3	18000	0.38×10^{-6}	0.01	—
AL-050	1.5	4.5	0.2	1.0	±0.5	12000	5.10×10^{-6}	0.06	—
AL-070	3	9	0.2	1.0	±0.5	9000	1.79×10^{-5}	0.12	—
AL-075	5	15	0.2	1.0	±0.5	7000	5.36×10^{-5}	0.21	—
AL-090	8	24	0.3	1.0	±0.5	6000	1.15×10^{-4}	0.31	—
AL-095	10	30	0.3	1.0	±0.5	6000	1.40×10^{-4}	0.36	—
AL-100	25	75	0.3	1.0	±0.7	5000	4.34×10^{-4}	0.78	—
AL-110	50	150	0.3	1.0	±0.7	4000	1.43×10^{-3}	1.56	—

* If exposed to direct sunshine, the life of the spider may be shortened. Provide a suitable cover.
* Oil or chemical attached to couplings degrades its performance. Avoid having couplings contact oil or chemicals.
* The Max. rotation speed does not take a dynamic balance or misalignment into consideration. If operated faster than (3600min⁻¹), consider a dynamic balance and misalignment. Specially, if the rotation speed exceeds (2000min⁻¹), misalignment must be less than 50% of the specification.
* Check centering at two points, which are about 90° apart from each other, by applying a straight edge onto the outer periphery of a coupling. Centering must satisfy the Max. permissible misalignment. The life of the spider will be greatly affected by centering accuracy.
* The prices in the table are for pilot bore.



Dimensions

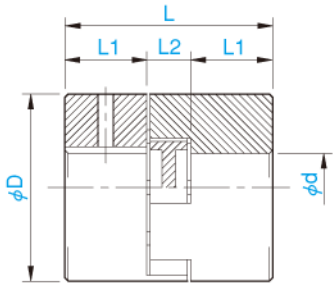
Coupling

Unit [mm]

Model	d		D	L	L1	L2	CAD file No.
	Pilot bore	Max.					
AL-035	3.5	8	16.1	20.5	6.5	7.5 *1	AL0
AL-050	5.0	16	27	43.2	15.5	12.2	AL1
AL-070	5.0	20	35	49.2	18.5	12.2	AL2
AL-075	7.0	26	45	54.4	21.0	12.4	AL3
AL-090	9.0	28	54	55.0	21.0	13.0	AL4
AL-095	9.0	28	55	61.0	24.0	13.0	AL5
AL-100	11.0	36	66	88.0	35.0	18.0	AL6
AL-110	11.0	48	85	110.0	44.0	22.0	AL7

* The values marked * provide a 1mm space to the thickness of a spider.
* "Prepared hole" indicates centering work.

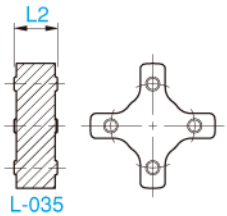
CAD

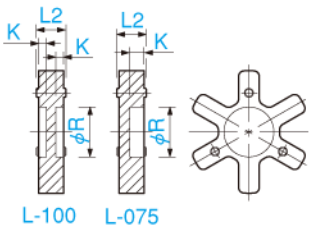


Spider only

Unit [mm]

Model	L2	R	K	CAD file No.
L-035	6.5	—	—	LS1
L-050	12.2	—	—	LS2
L-070	12.2	—	—	LS3
L-075	12.4	20	6.0	LS4
L-090	13.0	22	6.3	LS5
L-095	13.0	22	6.3	LS6
L-100	18.0	26	6.0	LS7
L-110	22.0	30	6.0	LS8





Standard bore processing specification

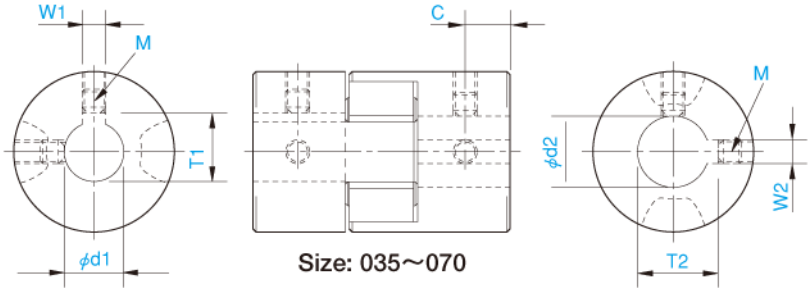
- Bore processing is available upon request. Products are stored with pilot bores.
- Bores are machined based on the following specification.
- The positions of setscrews will not be on the same plane.
- Assign as described below when ordering.

  Ex) AL-070-15H-14N

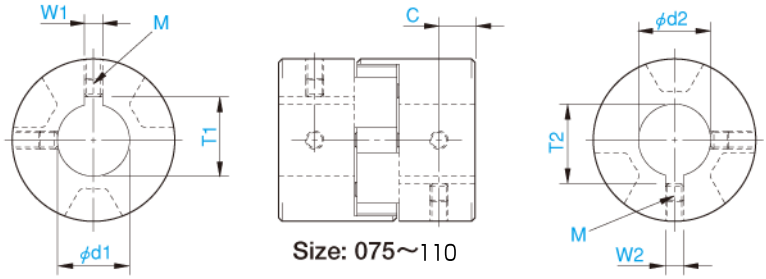
Distance from the edge surface of setscrew

Unit [mm]

Size	C	Size	C
035	3.5	090	12
050	7.5	095	12
070	9	100	12
075	10	110	15



Size: 035～070



Size: 075～110

Unit [mm]

Previous JIS (2nd class) correspondence					New JIS correspondence					New standard motor correspondence				
Nominal bore dia.	Bore dia. (d1-d2)	Keyway width (W1·W2)	Keyway height (T1·T2)	Set-screw bore (M)	Nominal bore dia.	Bore dia. (d1-d2)	Keyway width (W1·W2)	Keyway height (T1·T2)	Set-screw bore (M)	Nominal bore dia.	Bore dia. (d1-d2)	Keyway width (W1·W2)	Keyway height (T1·T2)	Set-screw bore (M)
Tolerance	H7, H8	E9	$^{+0.3}_{0}$	—	Tolerance	H7	H9	$^{+0.3}_{0}$	—	Tolerance	G7, F7	H9	$^{+0.3}_{0}$	—
6	6 $^{+0.018}_{0}$	—	—	2-M4	—	—	—	—	—	—	—	—	—	—
7	7 $^{+0.022}_{0}$	—	—	2-M4	—	—	—	—	—	—	—	—	—	—
8	8 $^{+0.022}_{0}$	—	—	2-M4	—	—	—	—	—	—	—	—	—	—
9	9 $^{+0.022}_{0}$	—	—	2-M4	—	—	—	—	—	—	—	—	—	—
10	10 $^{+0.022}_{0}$	—	—	2-M4	—	—	—	—	—	—	—	—	—	—
11	11 $^{+0.018}_{0}$	—	—	2-M4	—	—	—	—	—	—	—	—	—	—
12	12 $^{+0.018}_{0}$	4 $^{+0.050}_{+0.020}$	13.5	2-M4	12H	12 $^{+0.018}_{0}$	4 $^{+0.030}_{0}$	13.8	2-M4	—	—	—	—	—
14	14 $^{+0.018}_{0}$	5 $^{+0.050}_{+0.020}$	16.0	2-M4	14H	14 $^{+0.018}_{0}$	5 $^{+0.030}_{0}$	16.3	2-M4	14N	14 $^{+0.024}_{+0.006}$	5 $^{+0.030}_{0}$	16.3	2-M4
15	15 $^{+0.018}_{0}$	5 $^{+0.050}_{+0.020}$	17.0	2-M4	15H	15 $^{+0.018}_{0}$	5 $^{+0.030}_{0}$	17.3	2-M4	—	—	—	—	—
16	16 $^{+0.018}_{0}$	5 $^{+0.050}_{+0.020}$	18.0	2-M4	16H	16 $^{+0.018}_{0}$	5 $^{+0.030}_{0}$	18.3	2-M4	—	—	—	—	—
17	17 $^{+0.018}_{0}$	5 $^{+0.050}_{+0.020}$	19.0	2-M4	17H	17 $^{+0.018}_{0}$	5 $^{+0.030}_{0}$	19.3	2-M4	—	—	—	—	—
18	18 $^{+0.018}_{0}$	5 $^{+0.050}_{+0.020}$	20.0	2-M4	18H	18 $^{+0.018}_{0}$	6 $^{+0.030}_{0}$	20.8	2-M5	—	—	—	—	—
19	19 $^{+0.021}_{0}$	5 $^{+0.050}_{+0.020}$	21.0	2-M4	19H	19 $^{+0.021}_{0}$	6 $^{+0.030}_{0}$	21.8	2-M5	19N	19 $^{+0.028}_{+0.007}$	6 $^{+0.030}_{0}$	21.8	2-M5
20	20 $^{+0.021}_{0}$	5 $^{+0.050}_{+0.020}$	22.0	2-M4	20H	20 $^{+0.021}_{0}$	6 $^{+0.030}_{0}$	22.8	2-M5	—	—	—	—	—
22	22 $^{+0.021}_{0}$	7 $^{+0.061}_{+0.025}$	25.0	2-M6	22H	22 $^{+0.021}_{0}$	6 $^{+0.030}_{0}$	24.8	2-M5	—	—	—	—	—
24	24 $^{+0.021}_{0}$	7 $^{+0.061}_{+0.025}$	27.0	2-M6	24H	24 $^{+0.021}_{0}$	8 $^{+0.036}_{0}$	27.3	2-M6	24N	24 $^{+0.028}_{+0.007}$	8 $^{+0.036}_{0}$	27.3	2-M6
25	25 $^{+0.021}_{0}$	7 $^{+0.061}_{+0.025}$	28.0	2-M6	25H	25 $^{+0.021}_{0}$	8 $^{+0.036}_{0}$	28.3	2-M6	—	—	—	—	—
28	28 $^{+0.021}_{0}$	7 $^{+0.061}_{+0.025}$	31.0	2-M6	28H	28 $^{+0.021}_{0}$	8 $^{+0.036}_{0}$	31.3	2-M6	28N	28 $^{+0.028}_{+0.007}$	8 $^{+0.036}_{0}$	31.3	2-M6
30	30 $^{+0.021}_{0}$	7 $^{+0.061}_{+0.025}$	33.0	2-M6	30H	30 $^{+0.021}_{0}$	8 $^{+0.036}_{0}$	33.3	2-M6	—	—	—	—	—
32	32 $^{+0.025}_{0}$	10 $^{+0.061}_{+0.025}$	35.5	2-M8	32H	32 $^{+0.025}_{0}$	10 $^{+0.036}_{0}$	35.3	2-M8	—	—	—	—	—
35	35 $^{+0.025}_{0}$	10 $^{+0.061}_{+0.025}$	38.5	2-M8	35H	35 $^{+0.025}_{0}$	10 $^{+0.036}_{0}$	38.3	2-M8	—	—	—	—	—
38	38 $^{+0.025}_{0}$	10 $^{+0.061}_{+0.025}$	41.5	2-M8	38H	38 $^{+0.025}_{0}$	10 $^{+0.036}_{0}$	41.3	2-M8	38N	38 $^{+0.050}_{+0.025}$	10 $^{+0.036}_{0}$	41.3	2-M8
40	40 $^{+0.025}_{0}$	10 $^{+0.061}_{+0.025}$	43.5	2-M8	40H	40 $^{+0.025}_{0}$	12 $^{+0.043}_{0}$	43.3	2-M8	—	—	—	—	—
42	42 $^{+0.025}_{0}$	12 $^{+0.075}_{+0.032}$	45.5	2-M8	42H	42 $^{+0.025}_{0}$	12 $^{+0.043}_{0}$	45.3	2-M8	42N	42 $^{+0.050}_{+0.025}$	12 $^{+0.043}_{0}$	45.3	2-M8
45	45 $^{+0.025}_{0}$	12 $^{+0.075}_{+0.032}$	48.5	2-M8	45H	45 $^{+0.025}_{0}$	14 $^{+0.043}_{0}$	48.8	2-M10	—	—	—	—	—
48	48 $^{+0.025}_{0}$	12 $^{+0.075}_{+0.032}$	51.5	2-M8	48H	48 $^{+0.025}_{0}$	14 $^{+0.043}_{0}$	51.8	2-M10	48N	48 $^{+0.050}_{+0.025}$	14 $^{+0.043}_{0}$	51.8	2-M10

* Below ϕ11 of New JIS correspondence and below ϕ11 of New standard motor correspondence have the same contents as Previous JIS correspondence (Second class).
* For AL-035, the tolerance is ($^{+0.05}_{0}$) regardless of the bore diameter. The setscrew size is M3.

Selection

Selection Procedure

❶ Calculate torque Ta applied to the coupling based on the motor output P and coupling operating rotation speed n.

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

❷ Calculate corrected torque Td applied to the coupling after deciding the service factor K (1, 2, 3 and 4).

$$Td\,[N\cdot m] = Ta \cdot K1 \cdot K2 \cdot K3 \cdot K4$$

K1: Operating coefficient by load character
K2: Corrected coefficient by operating hours
K3: Corrected coefficient by starting・breaking frequency
K4: Corrected coefficient by ambient temperature

❸ Select the size in order that the coupling permissible torque Tn becomes greater than the corrected torque Td.

$$Tn \geqq Td$$

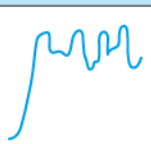
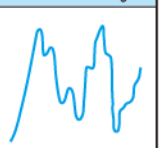
❹ Select the size in order that the maximum torque of the coupling Tm becomes greater than the peak torque Ts generated by the motor or driven machine, or both. Maximum torque is defined as torque which can be temporarily applied. For 8-hour operating time per day, it is about 10 times.

$$Tm \geqq Ts \cdot K4$$

❺ If the required shaft diameter is over the maximum bore diameter of the selected size, select a coupling suiting it.

Service Factor

●Operating coefficient by load character: K1

Load character			
Constant	Fluctuations: small	Fluctuations: medium	Fluctuations: large
			
1.0	1.25	1.75	2.25

●Corrected coefficient by operating hours: K2

Hours/ per day	~8	~16	~24
K2	1.0	1.12	1.25

●Corrected coefficient by starting/Breaking frequency: K3

Times/ per hour	~10	~30	~60	~120	~240	Over 240
K3	1.0	1.1	1.3	1.5	2.0	*

* Consult Miki Pulley for over 240 times.

●Corrected coefficient by ambient temperature: K4

Temp. [℃]	−20	0	+20	+40	+60	+80
K4	1.3	1.1	1.0		1.1	1.3

General-purpose motor specification and simplified selection

Motor		50Hz : 3000min⁻¹ / 60Hz : 3600min⁻¹				50Hz : 1500min⁻¹ / 60Hz : 1800min⁻¹				50Hz : 1000min⁻¹ / 60Hz : 1200min⁻¹			
		Bipolar (2-pole) motor		Sprflex		Quadrupolar (4-pole) motor		Sprflex		Sextupolar motor (6-pole)		Sprflex	
Output [kW]	Frequency [Hz]	Shaft dia. [mm]	Torque [N·m]	Model	Nominal bore dia.	Shaft dia. [mm]	Torque [N·m]	Model	Nominal bore dia.	Shaft dia. [mm]	Torque [N·m]	Model	Nominal bore dia.
0.1	50	—	—	—	—	11	0.7	AL-050	11	—	—	—	—
	60	—	—	—	—	11	0.5	AL-050	11	—	—	—	—
0.2	50	11	0.7	AL-050	11	11	1.3	AL-070	11	—	—	—	—
	60	11	0.5	AL-050	11	11	1.1	AL-070	11	—	—	—	—
0.4	50	14	1.3	AL-070	14N	14	2.6	AL-075	14N	19	3.9	AL-090	19N
	60	14	1.1	AL-070	14N	14	2.2	AL-075	14N	19	3.2	AL-090	19N
0.75	50	19	2.4	AL-075	19N	19	4.9	AL-095	19N	24	7.3	AL-100	24N
	60	19	2.0	AL-075	19N	19	4.1	AL-090	19N	24	6.1	AL-095	24N
1.5	50	24	4.9	AL-095	24N	24	9.7	AL-100	24N	28	15	AL-110	28N
	60	24	4.1	AL-095	24N	24	8.1	AL-100	24N	28	12	AL-100	28N
2.2	50	24	7.1	AL-100	24N	28	14	AL-110	28N	28	21	AL-110	28N
	60	24	6.0	AL-095	24N	28	12	AL-100	28N	28	18	AL-110	28N
3.7	50	28	12	AL-100	28N	28	24	AL-110	28N	38	36	—	38N
	60	28	10	AL-100	28N	28	20	AL-110	28N	38	30	AL-110	38N

* The above table indicates the adaptive sizes of couplings when used in general-purpose motor drives.
* The motor rotation speed and output torque indicate calculated values (reference values).
* For the sizes below 100, hubs with standard bore processing are available. (Contact us for further information.)