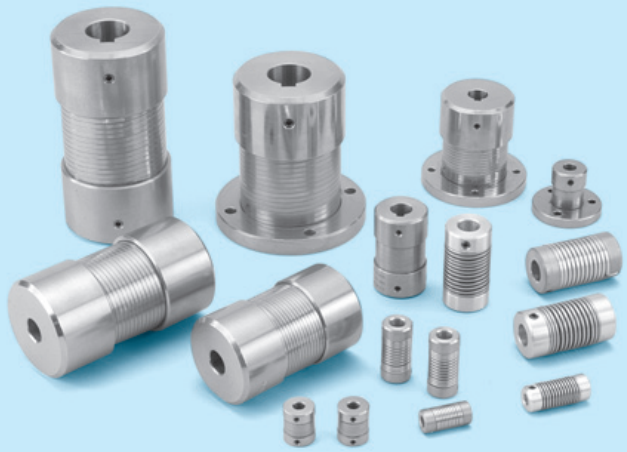
Baumannflex coupling



Compactness, high torque (MM/MF Model)

A trilaminar coil structure is used to achieve compactness and high torque transmission.

Excellent flexibility (LM Model)

Maximum parallel offset 4.5mm and maximum angular misalignment 14° are allowed.

High-corrosion resistance (MM-K-S type)

The stainless-steel MM-K-S type can be used in a wide range of operating environment.

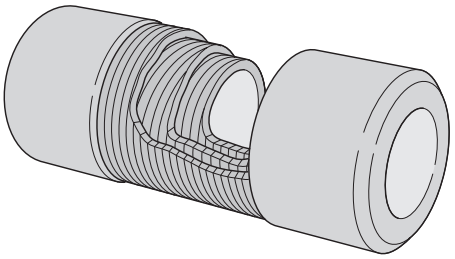
Normal operating torque [N·m]		0.15 ～ 220
Pilot bore/Additional machining range [mm]		φ3 ～ 35
Operational temp. [℃]		ZG・LM : −40 ～ +120 MM・MF: −30 ～ +100
Backlash		Little
Max. permissible misalignment	Parallel offset [mm]	0.3 ～ 4.5
	Angular misalignment [°]	3 ～ 14
	Axial displacement [mm]	ZG・LM : ±0.5 ～±1.5 MM・MF: +0.6 ～+3.2

Excellent flexibility

Permit maximally 14° of parallel offset (LM Model)

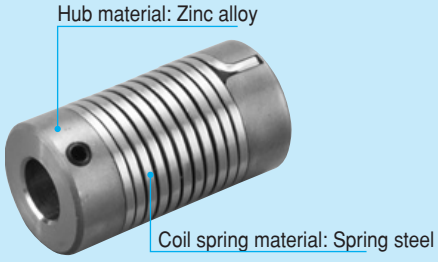
Compactness, h torque

A trilaminar coil structure is used to achieve compactness and high torque transmission. (MM・MF model)

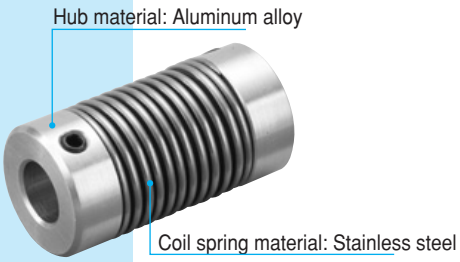


Structure and Material

ZG

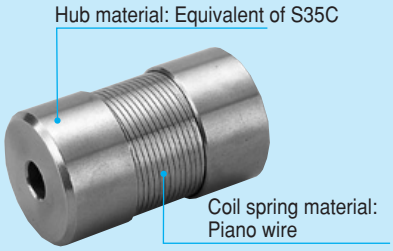


LM

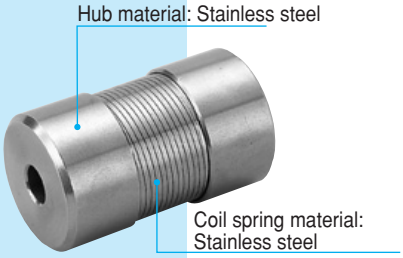


● ZG・LM model with high flexibility and low inertia

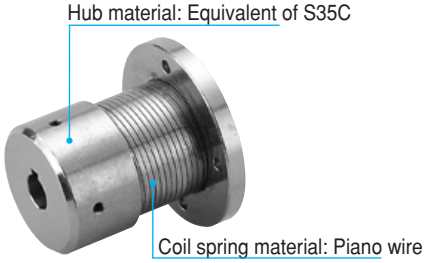
MM-K



MM-K-S



MF-K



● Compact MM-K type with high torque transmission and corrosion resistance

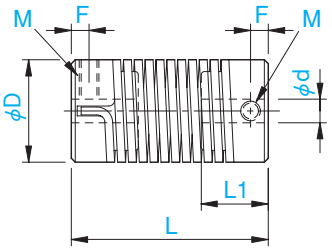
● The MF-K type for wider application needs

Specification

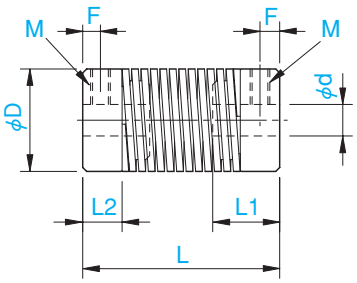
Model	Torque		Max. permissible misalignment			Max. rotation speed [min⁻¹]	Torsional spring constant [N·m/rad]	Moment of inertia [kg·m²]	Mass [kg]	Price
	Normal [N·m]	Max. [N·m]	Parallel offset [mm]	Angular misalignment [°]	Axial displacement [mm]					
ZG-6	0.15	0.3	0.5	5	±0.5	3000	0.17	1.95×10^{-7}	0.020	—
ZG-8	0.5	1.0	1.0	8	±1.0	3000	0.48	1.02×10^{-6}	0.070	—
ZG-14	1.5	3.0	1.2	8	±1.0	3000	1.70	1.15×10^{-5}	0.130	—
LM-6	0.5	1.0	1.0	8	±1.0	6000	0.77	5.10×10^{-7}	0.020	—
LM-6-1	0.5	1.0	3.0	14	±1.5	6000	0.40	7.65×10^{-7}	0.030	—
LM-9	1.0	2.0	2.5	8	±1.0	6000	1.55	2.55×10^{-6}	0.050	—
LM-9-1	1.0	2.0	4.0	14	±1.5	6000	0.80	3.06×10^{-6}	0.060	—
LM-14	2.0	4.0	3.0	8	±1.0	6000	3.10	7.65×10^{-6}	0.090	—
LM-14-1	2.0	4.0	4.5	14	±1.5	6000	1.60	9.44×10^{-6}	0.110	—

* The indicated values in the moment of inertia and mass are measured with the maximum bore diameter.
* The table indicates the prices based on prepared bores.

Dimensions



ZG



LM

Unit [mm]

Model	d			D	L	L1	L2	F	M	CAD file No.
	Pilot bore	Min.	Max.							
ZG-6	2	3	6	12	25	9.0	—	2.4	M3	ZGLM9
ZG-8	3	4	8	16	35	12.5	—	3.5	M4	ZGLM1
ZG-14	6	7	14	26	50	17.0	—	4.5	M5	ZGLM2
LM-6	4	5	6	14	35	12.0	6.5	3.5	M4	ZGLM3
LM-6-1	4	5	6	14	50	12.0	6.5	3.5	M4	ZGLM4
LM-9	5	6	9	20	40	14.0	7.5	4.0	M4	ZGLM5
LM-9-1	5	6	9	20	60	14.0	7.5	4.0	M4	ZGLM6
LM-14	8	9	14	26	50	17.0	10.0	5.0	M5	ZGLM7
LM-14-1	8	9	14	26	70	17.0	10.0	5.0	M5	ZGLM8

* Pilot bores are drilled bores.
* The left and right tapping positions of ZG and LM may slightly move.

Design check items

- More than necessary bending, compression or pulling applied during mounting or dismounting may result in coupling damage. Do not apply excessive load.
- The element excels in resistance to water, oil and chemicals. However, excessive water, oil and chemicals could cause a malfunction. Consult Miki Pulley beforehand if couplings are to be operated in such environment.
- If the rotation speed exceeds (2000min⁻¹), misalignment must be less than 50% of the tolerance.

Ordering Information

ZG - 14 10 - 14

Size
d1: Bore diameter 1
d2: Bore diameter 2

LM - 14 - 1 12 - 12

Size
Entire length
1: Long type
Blank: Short type
d1: Bore diameter 1
d2: Bore diameter 2

- Products are stored with prepared bores.
- Bore processing is available upon request.
- There is no keyway in the bore processing finished product. Keyway processing is available depending on conditions.

MM-K · MM-K-S

Baumannflex-MM model

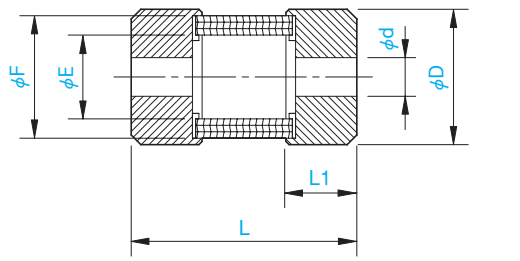
Specification

Model	Torque		Max. permissible misalignment			Max. rotation speed [min⁻¹]	Torsional spring constant [N·m/rad]	Moment of inertia [kg·m²]	Mass [kg]	Price
	Normal [N·m]	Max. [N·m]	Parallel offset [mm]	Angular misalignment [°]	Axial displacement [mm]					
MM-6K(-S)	2.5	5	0.3	3	±0.6	20000	143	7.65×10^{-7}	0.03	—
MM-8K(-S)	5	10	0.3	3	±0.8	15000	286.5	4.08×10^{-6}	0.07	—
MM-12K(-S)	10	20	0.4	3	±1.0	12000	573	1.43×10^{-5}	0.14	—
MM-14K	10	20	0.5	3	±1.0	10000	573	2.47×10^{-5}	0.15	—
MM-16K(-S)	20	40	0.6	3	±1.2	9000	1146	6.12×10^{-5}	0.30	—
MM-19K	20	40	0.7	3	±1.2	8000	1146	8.42×10^{-5}	0.32	—
MM-20K(-S)	40	80	0.7	3	±1.6	7000	2292	1.99×10^{-4}	0.70	—
MM-24K	40	80	0.9	3	±1.6	7000	2292	2.63×10^{-4}	0.75	—
MM-25K(-S)	90	180	0.9	3	±2.0	6000	3438	5.66×10^{-4}	1.25	—
MM-28K	90	180	1.0	3	±2.0	6000	2865	5.77×10^{-4}	1.35	—
MM-30K	150	300	1.1	3	±2.5	5000	4297.5	1.39×10^{-3}	2.10	—
MM-35K	220	440	1.2	3	±3.2	4500	6303	3.01×10^{-3}	3.50	—

* The indicated values in the moment of inertia and mass are measured with the maximum bore diameter.
* The table indicates the prices based on prepared bores.
* ( ) indicates the prices for -S (Stainless steel).

Dimensions

CAD



Unit [mm]

Model	d			D	L	L1	E	F	CAD file No.
	Pilot bore	Min.	Max.						
MM-6K	2.5	3	8	16	20	6	11	15.5	MM-K1
MM-6K-S	2.5	3	8	17	25	9	11	15.5	MM-KS1
MM-8K(-S)	3.5	4	8	21	35	11	11.3	19	MM-K2
MM-12K(-S)	5.5	6	11	26	50	16.5	14.8	24	MM-K3
MM-14K	5.5	7	14	30	50	16.5	19.5	28	MM-K4
MM-16K(-S)	5.5	10	16	35	65	22	20.7	32	MM-K5
MM-19K	5.5	10	19	38	65	22	25.5	36	MM-K6
MM-20K(-S)	5.5	10	20	45	80	27	25.3	40	MM-K7
MM-24K	5.5	14	24	48	80	27	31.5	45	MM-K8
MM-25K	5.5	14	25	55	100	33.5	32.3	50	MM-K9
MM-25K-S	5.5	14	25	55	100	32.5	32.3	50	MM-KS2
MM-28K	5.5	14	28	55	100	33.5	35.5	52	MM-K10
MM-30K	5.5	16	30	65	125	40	37	60	MM-K11
MM-35K	5.5	20	35	75	150	48	42	70	MM-K12

* Prepared bores are drilled bores.

Design check items

- More than necessary bending, compression or pulling applied during mounting or dismounting may result in coupling damage. Do not apply excessive load.
- If the rotation speed exceeds (2000min⁻¹), misalignment must be less than 50% of the tolerance.
- Lubricating oil is thinly applied on the coil spring part. Do not remove the lubricant. .

Ordering Information

MM - 16 K -S 15H - 15H

Size
Material
-S: Stainless steel
Blank: Carbon steel + Spring steel
d2: Bore diameter 2
d1: Bore diameter 1

- Products are stored with prepared bores.
- Bore processing is available upon request.
- Refer to the page 85 for details on bore processing.

MF-K

Baumannflex-MF model

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

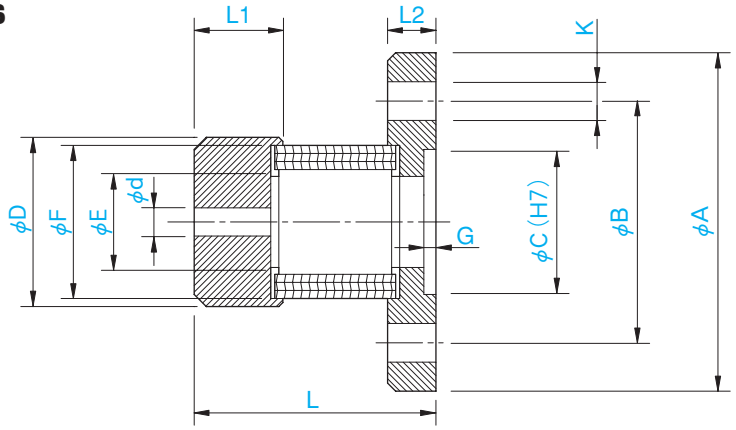
Specification

Model	Torque		Max. permissible misalignment			Max. rotation speed [min⁻¹]	Torsional spring constant [N·m/rad]	Moment of inertia [kg·m²]	Mass [kg]	Price
	Normal [N·m]	Max. [N·m]	Parallel offset [mm]	Angular misalignment [°]	Axial displacement [mm]					
MF-8K	5	10	0.3	3	±0.8	15000	286.5	1.66×10^{-5}	0.1	—
MF-12K	10	20	0.4	3	±1.0	12000	573	3.32×10^{-5}	0.16	—
MF-16K	20	40	0.6	3	±1.2	9000	1146	9.18×10^{-5}	0.31	—
MF-20K	40	80	0.8	3	±1.6	7000	2292	2.12×10^{-4}	0.5	—
MF-25K	90	180	0.9	3	±2.0	6000	3438	5.33×10^{-4}	0.9	—
MF-30K	150	300	1.1	3	±2.5	5000	4297.5	1.35×10^{-3}	1.7	—
MF-35K	220	440	1.2	3	±3.2	4500	6303	2.86×10^{-3}	2.8	—

* The indicated values in the moment of inertia and mass are measured with the maximum bore diameter.
* The table indicates the prices based on prepared bores.

Dimensions

CAD



Unit [mm]

Model	d			D	L	L1	L2	A	B	C	E	F	G	K	CAD file No.
	Pilot bore	Min.	Max.												
MF-8K	3.5	4	8	21	30	11.0	6.0	42	30.0	18	11.3	19	1.5	3-φ4.8	MF-K1
MF-12K	5.5	6	11	26	40	16.5	6.0	48	37.0	22	14.8	24	1.5	3-φ4.8	MF-K2
MF-16K	9.0	10	16	35	50	22.0	6.5	58	47.0	30	20.7	32	1.5	4-φ4.8	MF-K3
MF-20K	11.0	12	20	45	60	27.0	7.0	65	52.0	35	25.3	40	1.5	4-φ4.8	MF-K4
MF-25K	13.0	14	25	55	75	33.5	8.5	75	62.0	42	32.3	50	1.5	6-φ5.8	MF-K5
MF-30K	15.0	16	30	65	95	40.0	10.0	90	74.5	47	37.0	60	2.5	4-φ7.0	MF-K6
MF-35K	19.0	20	35	75	115	48.0	13.0	100	84.0	57	42.0	70	2.5	6-φ7.0	MF-K7

* Prepared bores are drilled bores.

Design check items

- More than necessary bending, compression or pulling applied during mounting or dismounting may result in coupling damage. Do not apply excessive load.
- If the rotation speed exceeds (2000min⁻¹), misalignment must be less than 50% of the tolerance.
- Lubricating oil is thinly applied on the coil spring part. Do not remove the lubricant. .

Ordering Information

MF - 16 K 15H

- 15H: d: Bore diameter
- 16: Size

- Products are stored with prepared bores.
- Bore processing is available upon request.
- Refer to the page 85 for details on bore processing.

Standard bore processing specification

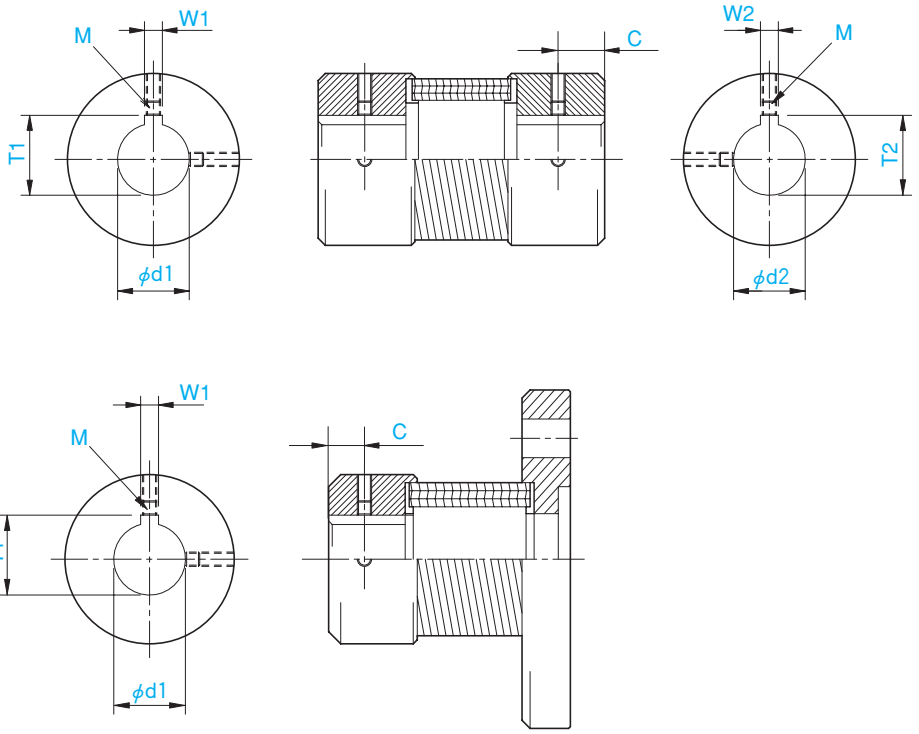
- Bore processing is available upon request. Products are stored with pilot bores.
- Bores are machined based on the following specification.
- The positions of setscrews will not be on the same plane.
- Setscrews are attached to the products.
- Assign as described below when ordering.

Ex) MM-16K-S 15H-15H

■Distance from the edge surface of setscrew (MM•MF)

Unit [mm]

Size	C	Size	C
6	3	20	10
8	5	24	10
12	7	25	15
14	7	28	15
16	10	30	15
19	10	35	15



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)	Sets-crew bore (M)	Nominal bore dia.	Bore dia. (d1-d2)	Keyway width (W1·W2)	Keyway height (T1·T2)	Sets-crew bore (M)	Nominal bore dia.	Bore dia. (d1-d2)	Keyway width (W1·W2)	Keyway height (T1·T2)	Sets-crew bore (M)
Tolerance	H7, H8	E9	$^{+0.3}_{0}$	—	Tolerance	H7	H9	$^{+0.3}_{0}$	—	Tolerance	G7	H9	$^{+0.3}_{0}$	—
4	4 $^{+0.018}_{0}$	—	—	2-M3	—	—	—	—	—	—	—	—	—	—
5	5 $^{+0.018}_{0}$	—	—	2-M3	—	—	—	—	—	—	—	—	—	—
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	—	—	—	—	—

* Below ϕ11 of New JIS correspondence and below ϕ11 of New standard motor correspondence have the same contents as Previous JIS correspondence (Second class).

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.

$$Tn \geqq Td$$

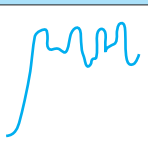
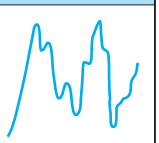
❹ Select the size in order that the maximum torque of the coupling Tm becomes greater than the peak torque Ts generated by the motor or driven machine, or both. Maximum torque is defined as torque which can be temporarily applied. For 8-hour operating time per day, it is about 10 times.

$$Tm \geqq Ts \cdot K4$$

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