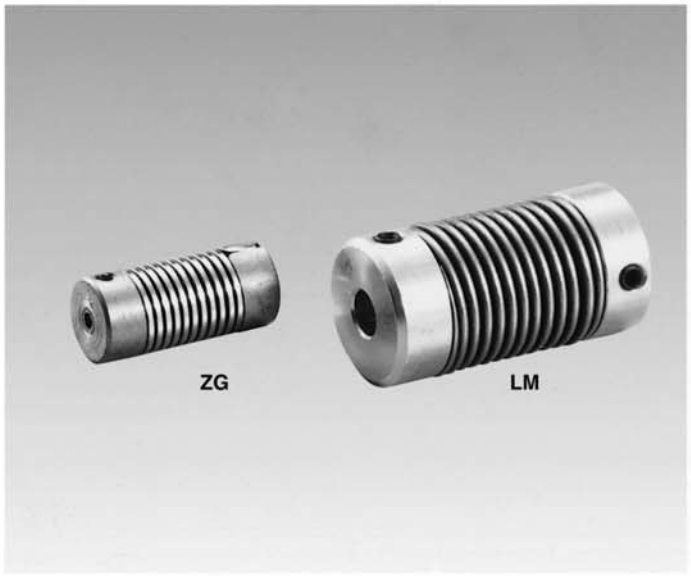


■ Excellent flexibility

Maximum parallel offset 4.5mm, maximum angular misalignment 14° for LM-14-1.

■ Low inertia

Compact, light-weight and low inertia.

■ Resistance to operating atmospheres

The couplings excel in resistance to oil and chemicals and can be used in a wide range of operating environments. The hub and coil spring of ZG are made of Zn and SUP materials. Those of LM are made of Al and SUS materials.

Specification

Model		ZG-6	ZG-8	ZG-14	LM-6	LM-6-1	LM-9	LM-9-1	LM-14	LM-14-1
Nominal Torque	[N·m]	0.15	0.5	1.5	0.5	0.5	1.0	1.0	2.0	2.0
	{kgf·cm}	1.5	5	15	5	5	10	10	20	20
Maximum Torque	[N·m]	0.3	1.0	3.0	1.0	1.0	2.0	2.0	4.0	4.0
	{kgf·cm}	3	10	30	10	10	20	20	40	40
Maximum Speed	[r/min]	3000	3000	3000	6000	6000	6000	6000	6000	6000
Torsional Spring Constant	[N·m/rad]	0.17	0.48	1.7	0.77	0.4	1.55	0.8	3.1	1.6
	{kgf·cm/rad}	1.7	4.8	17	7.7	4.0	15.5	8.0	31	16
Inertia	[kg·m^2]	1.95×10^{-7}	1.02×10^{-6}	1.15×10^{-5}	5.10×10^{-7}	7.65×10^{-7}	2.55×10^{-6}	3.06×10^{-6}	7.65×10^{-6}	9.44×10^{-6}
	{kgf·cm·s^2}	1.95×10^{-6}	1.02×10^{-5}	1.15×10^{-4}	5.10×10^{-6}	7.65×10^{-6}	2.55×10^{-5}	3.06×10^{-5}	7.65×10^{-5}	9.44×10^{-5}
Maximum permissible misalignment	Parallel offset [mm]	0.5	1.0	1.2	1.0	3.0	2.5	4.0	3.0	4.5
	Angular misalignment [°]	5	8	8	8	14	8	14	8	14
	Axial Displacement [mm]	±0.5	±1.0	±1.0	±1.0	±1.5	±1.0	±1.5	±1.0	±1.5
Mass	[g]	20	70	130	20	30	50	60	90	110

※Avoid operating couplings beyond maximum torque.

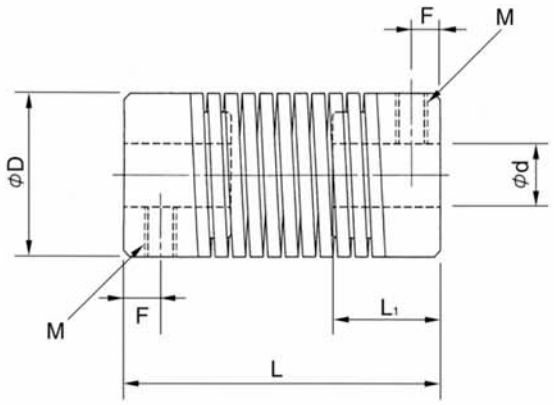
■ Ordering Information: Specify

ZG-□
Model

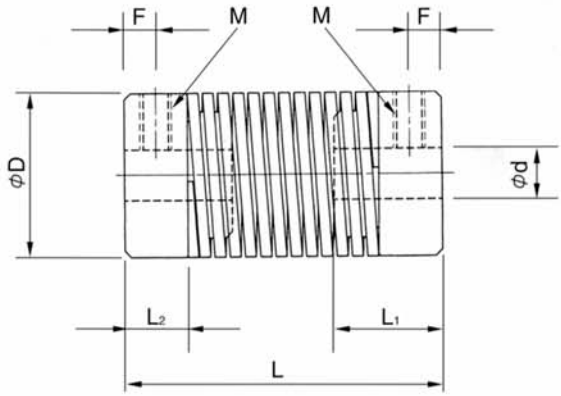
LM-□
Model

Design Types and Dimensions

■ ZG-□



■ LM-□

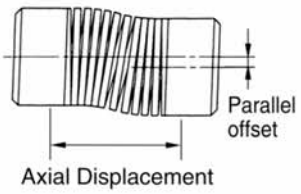


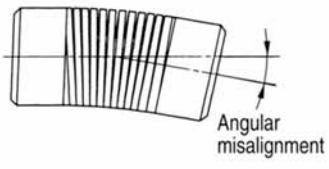
Model		ZG-6	ZG-8	ZG-14	LM-6	LM-6-1	LM-9	LM-9-1	LM-14	LM-14-1
d	Pilot Bore	2	3	6	4	4	5	5	8	8
	Min.	3	4	7	5	5	6	6	9	9
	Max.	6	8	14	6	6	9	9	14	14
D		12	16	26	14	14	20	20	26	26
L		25	35	50	35	50	40	60	50	70
L_1		9	12.5	17	12	12	14	14	17	17
L_2		—	—	—	6.5	6.5	7.5	7.5	10	10
F		2.4	3.5	4.5	3.5	3.5	4	4	5	5
M		M3	M4	M5	M4	M4	M4	M4	M5	M5
CAD File No.		ZGLM9	ZGLM1	ZGLM2	ZGLM3	ZGLM4	ZGLM5	ZGLM6	ZGLM7	ZGLM8

※Prepared bores are drilled bores.
※Left and right tapping positions of ZG and LM may slightly

Design Check Items

1. More than necessary bending, compression or pulling applied during mounting or dismounting may result in coupling damage. Avoid excessive machining wherever possible.
2. The element excels in resistance to oil and chemicals. However, excessive oil or chemicals used in the atmosphere may result in a fault. Consult Miki Pulley or its agent in your country beforehand if couplings are to be operated in such atmosphere.
3. Recommended operating ambient temperature is −40℃ to + 120℃.
4. If the rotation speed exceeds 2000r/min, misalignment must be less than 50% of the tolerance.
5. After mounting a coupling, check abnormal deformation as shown below.





■ Excellent flexibility

Maximums 3% of maximum bore diameter (hub bore diameter) in parallel offset and 3° in angular misalignment are allowed in mounting.

■ Compactness, high torque

Compact and high torque transmission.

■ Material selected to suit application

Standard products use S35C material in the hub and SWP material in the coil spring. Stainless steel (MM-K-S) parts can also be supplied on request.

Specification

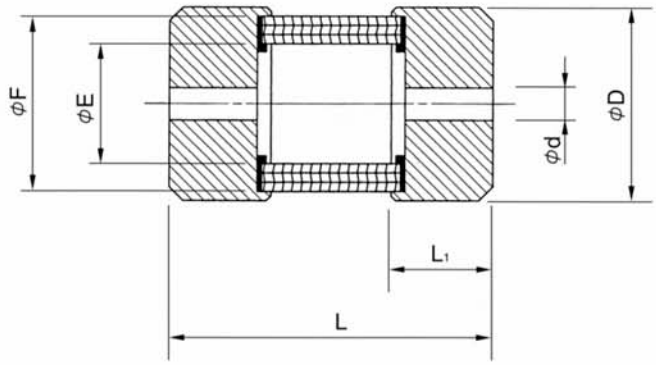
Model		MM-6K	MM-8K	MM-12K	MM-14K	MM-16K	MM-19K	MM-20K	MM-24K	MM-25K	MM-28K	MM-30K	MM-35K
Nominal Torque	[N·m]	2.5	5	10	10	20	20	40	40	90	90	150	220
	{kgf·m}	0.25	0.5	1	1	2	2	4	4	9	9	15	22
Maximum Torque	[N·m]	5	10	20	20	40	40	80	80	180	180	300	440
	{kgf·m}	0.5	1	2	2	4	4	8	8	18	18	30	44
Maximum Speed	[r/min]	20000	15000	12000	10000	9000	8000	7000	7000	6000	6000	5000	4500
Torsional Spring Constant	[N·m/rad]	143	286.5	573	573	1146	1146	2292	2292	3438	2865	4297.5	6303
	{kgf·cm/rad}	1430	2865	5730	5730	11460	11460	22920	22920	34380	28650	42975	63030
Inertia	[kg·m²]	7.65×10^{-7}	4.08×10^{-6}	1.43×10^{-5}	2.47×10^{-5}	6.12×10^{-5}	8.42×10^{-5}	1.99×10^{-4}	2.63×10^{-4}	5.66×10^{-4}	5.77×10^{-4}	1.39×10^{-3}	3.01×10^{-3}
	{kgf·cm·s²}	7.65×10^{-6}	4.08×10^{-5}	1.43×10^{-4}	2.47×10^{-4}	6.12×10^{-4}	8.42×10^{-4}	1.99×10^{-3}	2.63×10^{-3}	5.66×10^{-3}	5.77×10^{-3}	1.39×10^{-2}	3.01×10^{-2}
Maximum permissible misalignment	Parallel offset (mm)	0.3	0.3	0.4	0.5	0.6	0.7	0.7	0.9	0.9	1.0	1.1	1.2
	Angular misalignment (°)	3	3	3	3	3	3	3	3	3	3	3	3
	Axial Displacement (mm)	+0.6	+0.8	+1.0	+1.0	+1.2	+1.2	+1.6	+1.6	+2.0	+2.0	+2.5	+3.2
Mass	[kg]	0.03	0.07	0.14	0.15	0.30	0.32	0.70	0.75	1.25	1.35	2.1	3.5

■ Ordering Information: Specify

MM-□K

Model

Design Types and Dimensions

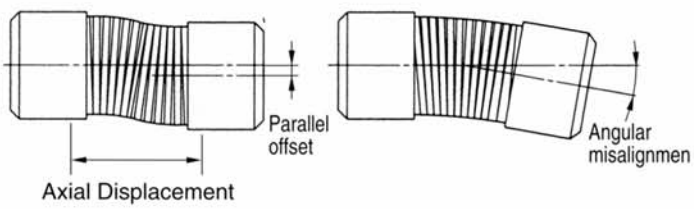


Model		MM-6K	MM-8K	MM-12K	MM-14K	MM-16K	MM-19K	MM-20K	MM-24K	MM-25K	MM-28K	MM-30K	MM-35K
d	Pilot Bore	2.5	3.5	5.5	6	9	9	9	13	13	13	15	19
	Min.	3	4	6	7	10	10	10	14	14	14	16	20
	Max.	8	8	11	14	16	19	20	24	25	28	30	35
D		16	21	26	30	35	38	45	48	55	55	65	75
L		20	35	50	50	65	65	80	80	100	100	125	150
L_1		6	11	16.5	16.5	22	22	27	27	33.5	33.5	40	48
E		11	11.3	14.8	19.5	20.7	25.5	25.3	31.5	32.3	35.5	37	42
F		15.5	19	24	28	32	36	40	45	50	52	60	70
CAD File No.		MM-K1	MM-K2	MM-K3	MM-K4	MM-K5	MM-K6	MM-K7	MM-K8	MM-K9	MM-K10	MM-K11	MM-K12

※Prepared bores are drilled bores.

Design Check Items

1. More than necessary bending, compression or pulling applied during mounting or dismounting may result in coupling damage. Avoid excessive machining wherever possible.
2. The element excels in resistance to oil and chemicals. However, excessive oil or chemicals used in the atmosphere may result in a fault. Consult Miki Pulley or its agent in your country beforehand if couplings are to be operated in such atmosphere.
3. As a rule, additional bore machining beyond maximum bore diameter is not allowed. Consult Miki Pulley or its agent in your country beforehand if additional machining is unavoidably required.
4. Recommended operating ambient temperature is −30℃ to + 100℃.
5. Slight backlash is caused.
6. If the rotation speed exceeds 2000r/min, misalignment must be less than 50% of the tolerance.
7. After mounting a coupling, check abnormal deformation as shown below.



■ Single-side flanged

Single side has a flange suitable to meet wider application needs. S35C is used in the hub and flange and SWP in the coil spring.

■ Excellent flexibility

Maximums 3% of maximum bore diameter (hub bore diameter) in parallel offset and 3° in angular misalignment are allowed in mounting.

■ Compactness, high torque

Compact and high torque transmission.

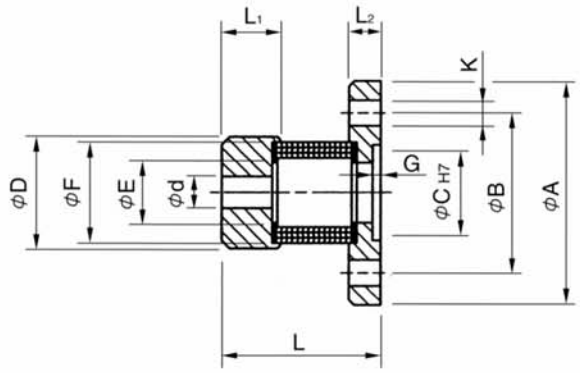
Specification

Model		MF-8K	MF-12K	MF-16K	MF-20K	MF-25K	MF-30K	MF-35K
Nominal Torque	〔N·m〕	5	10	20	40	90	150	220
	{kgf·m}	0.5	1	2	4	9	15	22
Maximum Torque	〔N·m〕	10	20	40	80	180	300	440
	{kgf·m}	1	2	4	8	18	30	44
Maximum Speed	〔r/min〕	15000	12000	9000	7000	6000	5000	4500
Torsional Spring Constant	〔N·m/rad〕	286.5	573	1146	2292	3438	4297.5	6303
	{kgf·cm/rad}	2865	5730	11460	22920	34380	42975	63030
Inertia	〔kg·m²〕	1.66×10^{-5}	3.32×10^{-5}	9.18×10^{-5}	2.12×10^{-4}	5.33×10^{-4}	1.35×10^{-3}	2.86×10^{-3}
	{kgf·cm·s²}	1.66×10^{-4}	3.32×10^{-4}	9.18×10^{-4}	2.12×10^{-3}	5.33×10^{-3}	1.35×10^{-2}	2.86×10^{-2}
Maximum permissible misalignment	Parallel offset (mm)	0.3	0.4	0.6	0.8	0.9	1.1	1.2
	Angular misalignment (°)	3	3	3	3	3	3	3
	Axial Displacement (mm)	+0.8	+1.0	+1.2	+1.6	+2.0	+2.5	+3.2
Mass	〔kg〕	0.10	0.16	0.31	0.5	0.9	1.7	2.8

■ Ordering Information: Specify

MF-□K
Model

Design Types and Dimensions

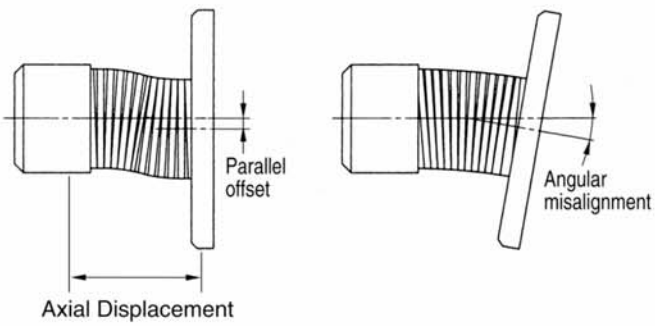


Model		MF-8K	MF-12K	MF-16K	MF-20K	MF-25K	MF-30K	MF-35K
d	Pilot Bore	3.5	5.5	9	11	13	15	19
	Min.	4	6	10	12	14	16	20
	Max.	8	11	16	20	25	30	35
D		21	26	35	45	55	65	75
L		30	40	50	60	75	95	115
L_1		11	16.5	16.5	27	33.5	40	48
L_2		6	6	6.5	7	8.5	10	13
A		42	48	58	65	75	90	100
B		30	37	47	52	62	74.5	84
C		18	22	30	35	42	47	57
E		11.3	14.8	20.7	25.3	32.3	37	42
F		19	24	32	40	50	60	70
G		1.5	1.5	1.5	1.5	1.5	2.5	2.5
K		3-φ4.8	3-φ4.8	4-φ4.8	4-φ4.8	6-φ5.8	4-φ7	6-φ7
CAD File No.		MF-K1	MF-K2	MF-K3	MF-K4	MF-K5	MF-K6	MF-K7

※Prepared bores are drilled bores.

Design Check Items

1. More than necessary bending, compression or pulling applied during mounting or dismounting may result in coupling damage. Avoid excessive machining wherever possible.
2. The element excels in resistance to oil and chemicals. However, excessive oil or chemicals used in the atmosphere may result in a fault. Consult Miki Pulley or its agent in your country beforehand if couplings are to be operated in such atmosphere.
3. As a rule, additional bore machining beyond maximum bore diameter is not allowed. Consult Miki Pulley or its agent in your country beforehand if additional machining is unavoidably required.
4. Recommended operating ambient temperature is −30℃ to + 100℃.
5. Slight backlash is caused.
6. If the rotation speed exceeds 2000r/min, misalignment must be less than 50% of the tolerance.
7. After mounting a coupling, check abnormal deformation as shown below.



■ Selection procedures

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

$$TA\ [N\cdot m] = 9550 \times \frac{P\ [kW]}{n\ [r/min]} \quad \cdots\cdots ①$$

$$TA\ \{kgf\cdot m\} = 973.5 \times \frac{P\ \{kW\}}{n\ \{rpm\}} \quad \cdots\cdots ①$$

Calculate corrected torque TD applied to the coupling after deciding the service factor dependent on operating conditions, operation conditions and other factors.

$$TD\ [N\cdot m] = TA \cdot K1 \cdot K2 \cdot K3 \quad \cdots\cdots ②$$

$$TD\ \{kgf\cdot m\} = TA \cdot K1 \cdot K2 \cdot K3 \quad \cdots\cdots ②$$

K1 : Operating coefficient by load character

K2 : Corrected coefficient by operating hours

K3 : Corrected coefficient by starting and braking

Select the size so that the normal torque TN of the coupling will become greater than the corrected torque TD.

$$TN \geqq TD \quad \cdots\cdots ③$$

$$TN \geqq TD \quad \cdots\cdots ③$$

2. Select the size so that the maximum torque TM of the coupling is greater than peak torque TS generated by the motor, the driven equipment, or both. Maximum torque is defined as torque which may be applied temporarily and about ten times maximum assuming that a coupling operates eight hours per day.

$$TM \geqq TS$$

$$TM \geqq TS$$

3. If the required shaft diameter exceeds the maximum bore diameter of the selected size, select a coupling suiting it.
When using with machines whose load torque periodically fluctuates drastically, a study of torsional vibration will be necessary in addition to the selection mentioned above. This procedure involves checking so that frequency of torque fluctuations does not correspond to the eigenfrequency of the shaft diameter. Generally, calculations of eigenfrequency fe of one node are made by approximating the shaft diameter as shown below.

$$fe = \frac{60}{2\pi}\sqrt{\kappa\left(\frac{1}{I_A}+\frac{1}{I_B}\right)}\ [cpm]$$

κ : Torsional spring constant of coupling [N·m/rad]

I_A : Inertial moment of driving side [kg·m²]

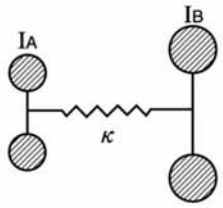
I_B : Inertial moment of driven side [kg·m²]

$$fe = \frac{60}{2\pi}\sqrt{\kappa\left(\frac{1}{I_A}+\frac{1}{I_B}\right)}\ \{cpm\}$$

κ : Torsional spring constant of coupling {kgf·cm/rad}

I_A : Inertial moment of driving side {kgf·cm·s²}

I_B : Inertial moment of driven side {kgf·cm·s²}



Service Factors

Operating coefficient by load character : K1

Load Character			
Constant	Small Fluctuations	Medium Fluctuations	Large Fluctuations
			
1.0	1.25	1.75	2.25

Operating hour coefficient : K2

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

Starting and braking frequency coefficient : K3

Operations/Hr	~10	~30	~60	~120	~240	240or more
K3	1.0	1.1	1.3	1.5	2.0	*

* Consultation needed