MOTION & CONTROL™

NSK

Monocarrier™

NSK's Monocarriers offer an all-in-one structure, maintenance-free operation and a lightweight, compact design for use in a wide range of applications including assembly, inspection and transporting equipment.

It is the principal policy of NSK Ltd. not to export products or technologies which are subject to export prohibition under the Foreign Exchange Law, Foreign Trade Control Law, and other export-related regulations. Please consult your local NSK representative prior to exporting our product by the unit.

Please inquire with your local NSK representative for specifications and dimensions of the product shown in this catalog to avoid mistakes caused by the reasons below.

* Specifications and dimensions are subject to change without notice.
* Though every care has been taken to ensure accuracy of the data contained in this catalogue, some errors or omissions may be involved.

Monocarrier

1 Monocarrier

2 MCM Series

3 MCH Series

1 Monocarrier

1.1 Features

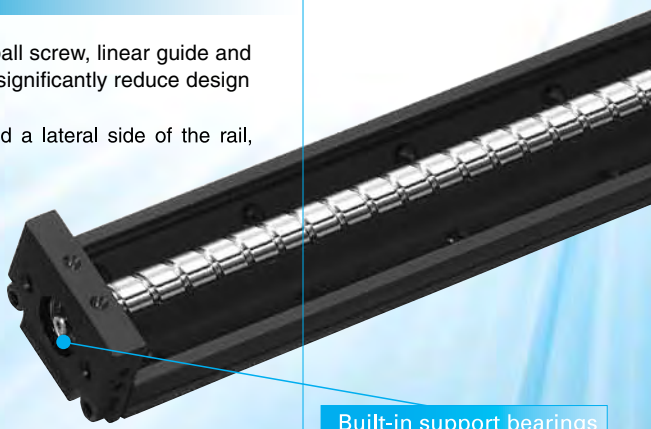
NSK's Monocarrier is the culmination of technology and innovation in linear motion.
This lightweight, compact, single-axis linear actuator integrates multiple highly reliable NSK products such as ball screws, linear guides and support bearings.

1 Long-term, maintenance-free operation

- Use of NSK K1™ Lubrication Unit and grease maintains smooth lubricating performance for long periods in mechanical environments where lubrication is difficult to apply, where use of oil is not permitted because of hygienic issues or where the mechanical equipment requires a high degree of washing out.
- NSK K1™ Lubrication Unit is available for food processing machines and medical equipment.
- Grease for clean environments and for general machinery is available.

2 All -in-one structure

- The all-in-one structure integrates a ball screw, linear guide and support bearings into a single unit to significantly reduce design and installation workload.
- Multiple datum planes, the bottom and a lateral side of the rail, facilitate highly accurate installation.
- A wide selection of fine to high helix leads is available.



MONOC

3 Lightweight, compact design

- Available in two different shapes of cross-section, depending on application.
  Lightweight type: MCM Series
  Rigid type: MCH Series
  The compact design has minimal space requirements.

4 Superb anti-rust capability

- Rust-resistant, low temperature chrome plating used on bodies and sliders is a standard feature.
- Low temperature fluoride chrome plating provides increased rust prevention.

Built-in support bearings

Linear guide (Ball groove)

Slider

A ball nut and a slider are integrated into one component.

Ball screw

A wide selection of fine to high helix leads is available.

ARRIER™

1. 2 Classification and Series

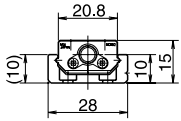
Table 1-1

	Lightweight	Beam Rigidity	Moment Rigidity
MCM Series	◎	○	○
MCH Series	○	◎	○

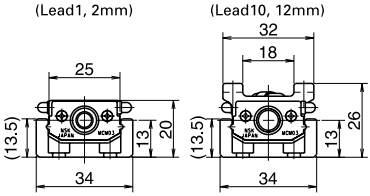
◎ = Excellent Performance ○ = Good Performance

(MCM Series Cross-sections)

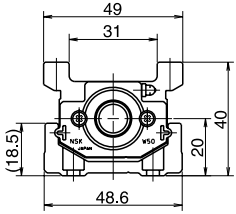
MCM02



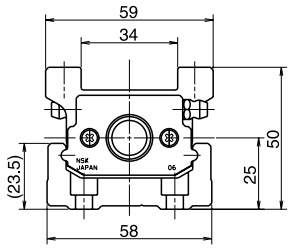
MCM03



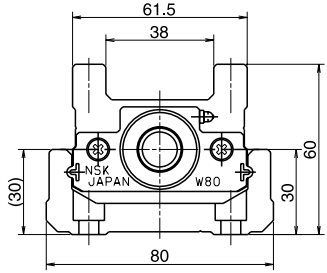
MCM05



MCM06



MCM08



MCM10

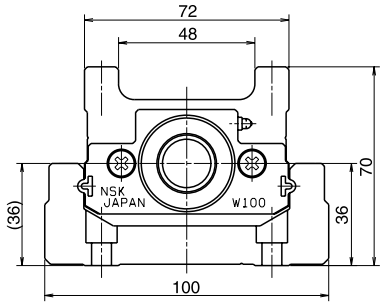


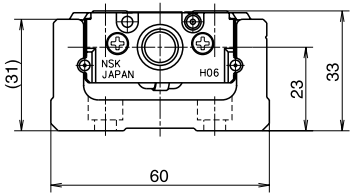
Fig. 1-1

Accuracy	Long Stroke	Size Variation
◎	○	◎
◎	◎	○

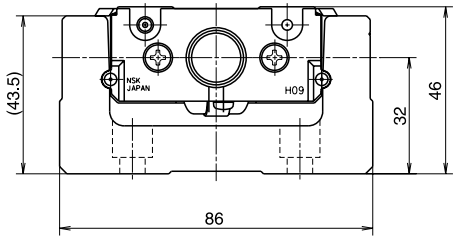
◎ = Excellent Performance ○ = Good Performance

(MCH Series Cross-sections)

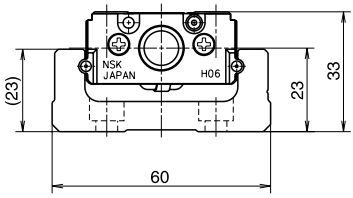
MCH06



MCH09



MCL06



MCH10

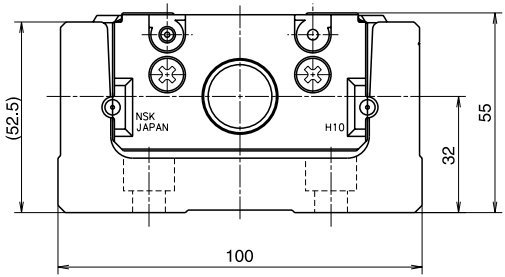


Fig. 1-2

1. 3 Optional components

MCM Series

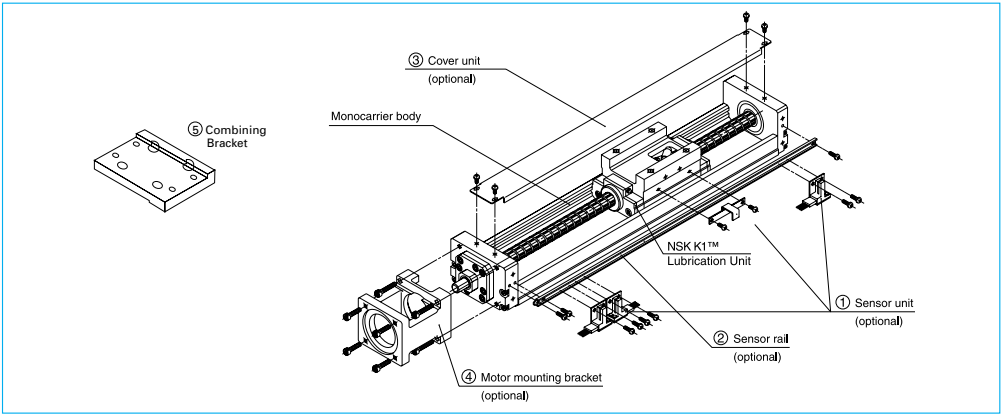


Fig.1-3 Assembly – Optional components for MCM10 (example)

① Sensor unit: Sensors, sensor mounting parts and a sensor unit are available in a set.
※When a sensor unit is used, the full cover unit cannot be used.
② Sensor rail: Rail for sensor mounting is available.
③ Cover unit: Top cover or full cover (includes top cover and side cover) is available.
④ Motor mounting brackets are available to mount a variety of motor brands to the Monocarrier.
⑤ Bracket for combining actuators into 2-axis mechanism. When bracket is used, the full cover unit cannot be used.
☆ NSK can assemble optional components upon request.

MCH Series

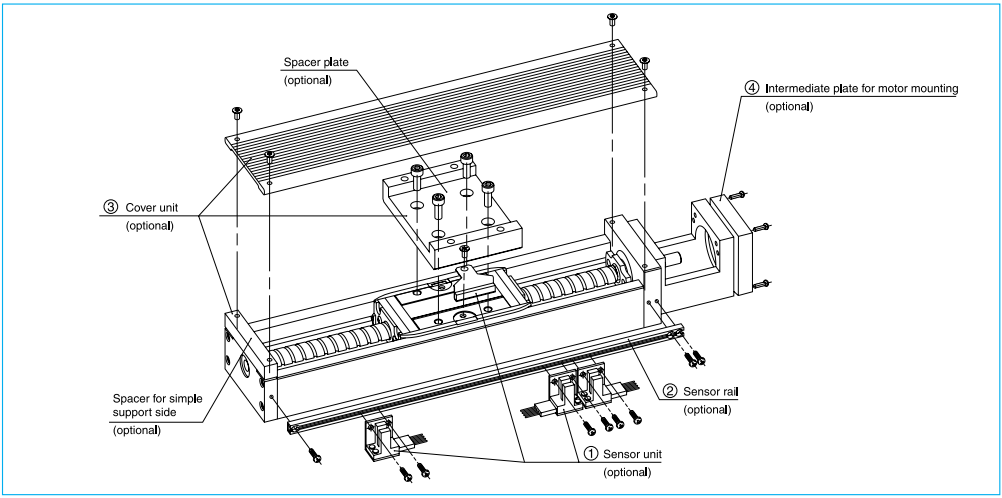


Fig. 1-4 Assembly – Optional components for MCH10 (example)

① Sensor unit: Sensors, sensor mounting parts and a sensor unit are available in a set.
② Sensor rail: Rail for sensor mounting is available.
③ Cover unit: Top cover (includes spacer plate and spacer for simple support side) is available.
④ Motor mounting brackets are available to mount a variety of motor brands to the Monocarrier.
☆ NSK can assemble optional components upon request.

1.4 Selection of Monocarrier

1.4.1 Procedures for selecting Monocarrier

Select a reference type of Monocarrier based on stroke and rigidity (Refer to Fig. 1-6, 1-7).

Select a ball screw lead referring to "1.4.3 Maximum Rotational Speed" so that the rotational speed does not exceed the limit.

Study the loads to be applied to the linear guide and obtain the equivalent load (Fe), substituting them for equation ① or ② on Page 13. Obtain the mean effective load (Fm), substituting them for equation ③ on Page 14, then calculate the life.

Study the loads to be applied to the ball screw and support unit. Obtain the mean effective load (Fm), substituting them for equation ③ on Page 14, then calculate the life.

1. 4. 2. Rigidity

Rigidity of rail

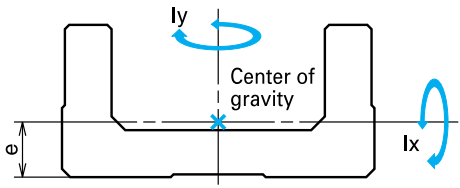


Fig. 1-5

Table 1-2 Rigidity of rail

Nominal size	Geometrical moment of inertia ×10⁴ (mm⁴)		Center of gravity (mm)	Mass (kg/ 100mm)
	Ix	Iy	e	w
MCM02	0.097	1.32	3.3	0.11
MCM03	0.30	3.3	4.5	0.18
MCM05	0.78	11.4	6.0	0.31
MCM06	2.14	26.1	7.0	0.57
MCM08	5.90	81.0	9.2	0.88
MCM10	15.6	219	12.2	1.52
MCH06	6.5	38.2	10.8	0.67
MCL06	2.58	29.6	7.8	0.56
MCH09	28.7	172	15.5	1.48
MCH10	54.0	307	18	1.93

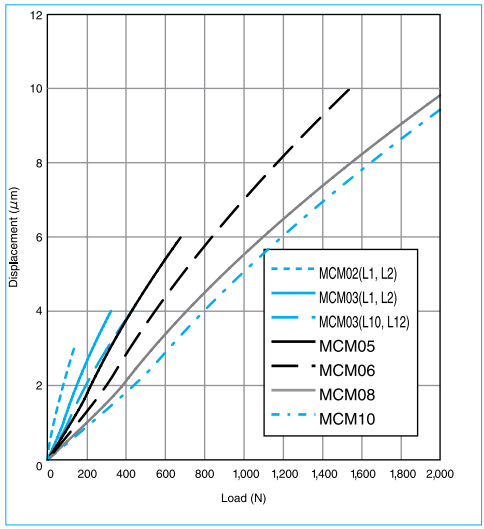


Fig. 1-6 MCM Series Rigidity in radial direction

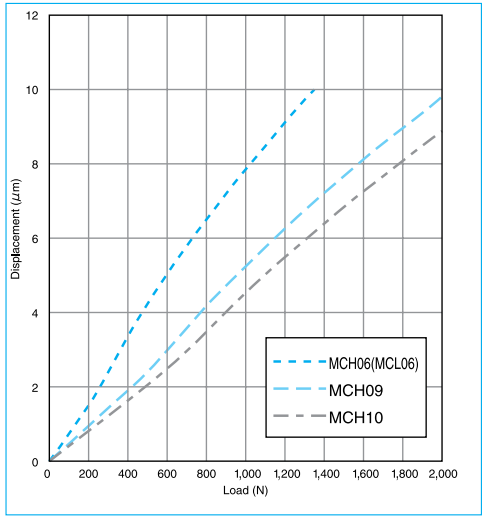


Fig. 1-7 MCH Series Rigidity in radial direction

1.4.3 Maximum Rotational Speed

● Maximum Rotational Speed of MCM Series

Maximum rotational speed of Monocarrier is determined by the critical speed of ball screw shaft and the d • n value.

Do not exceed the maximum rotational speeds in the table below.

Table 1-3

	Ball screw lead	Stroke (mm)	Rail length L_2 (mm)	Maximum rotational speed (mm/s)
MCM02 Single slider	1	50	100	50
		100	150	
		150	200	
	2	50	100	100
		100	150	
		150	200	
MCM03 Single slider	1	50	115	50
		100	190	
		150	240	
	2	50	115	100
		100	190	
		150	240	
	10	100 ~ 250	190 ~ 340	500
	12	100 ~ 250	190 ~ 340	600
MCM05 Single slider	5	50 ~ 200	180 ~ 330	250
	10	50 ~ 600	180 ~ 730	500
	20	300 ~ 600	430 ~ 730	1,000
MCM05 Double slider	10	60 ~ 510	280 ~ 730	500
	20	210 ~ 510	430 ~ 730	1,000
MCM06 Single slider	5	50 ~ 500	190 ~ 640	250
	10	50 ~ 600	190 ~ 740	500
		700	840	490
		800	940	390
	20	300 ~ 600	440 ~ 740	1,000
		700	840	980
		800	940	770
MCM06 Double slider	5	110 ~ 410	340 ~ 640	250
	10	110 ~ 610	340 ~ 840	500
		710	940	490
	20	210 ~ 610	440 ~ 840	1,000
		710	940	980

	Ball screw lead	Stroke (mm)	Rail length L_2 (mm)	Maximum rotational speed (mm/s)
MCM08 Single slider	5	50 ~ 200	220 ~ 370	250
	10	100 ~ 700	270 ~ 870	500
		800	970	390
	20	300 ~ 700	470 ~ 870	1,000
		800	970	780
MCM08 Double slider	10	80 ~ 680	370 ~ 970	500
	20	180 ~ 680	470 ~ 970	1,000
MCM10 Single slider	10	200 ~ 800	380 ~ 980	500
		900	1,080	440
		1,000	1,180	360
	20	300 ~ 800	480 ~ 980	1,000
		900	1,080	880
		1,000	1,180	720
MCM10 Double slider	10	70 ~ 670	380 ~ 980	500
		870	1,180	440
	20	170 ~ 670	480 ~ 980	1,000
		870	1,180	880

● Maximum Rotational Speed of MCH Series

Maximum rotational speed of Monocarrier is determined by the critical speed of ball screw shaft and the d • n value.

Do not exceed the maximum rotational speeds on the table below.

Table 1-4

	Ball screw lead	Stroke (mm)	Rail length L_2 (mm)	Maximum rotational speed (mm/s)
MCH06 MCL06 Single slider	5	50 ≀ 500	150 ≀ 600	250
	10	50 ≀ 500	150 ≀ 600	500
	20	50 ≀ 500	150 ≀ 600	1,000
MCH06 Double slider	5	100 ≀ 400	300 ≀ 600	250
	10	100 ≀ 400	300 ≀ 600	500
	20	100 ≀ 400	300 ≀ 600	1,000
MCH09 Single slider	5	200 ≀ 600	340 ≀ 740	250
		800	940	210
	10	200 ≀ 600	340 ≀ 740	500
		800	940	410
	20	200 ≀ 600	340 ≀ 740	1,000
		800	940	830
MCH09 Double slider	5	150 ≀ 650	440 ≀ 940	250
	10	150 ≀ 650	440 ≀ 940	500
	20	150 ≀ 650	440 ≀ 940	1,000

	Ball screw lead	Stroke (mm)	Rail length L_2 (mm)	Maximum rotational speed (mm/s)
MCH10 Single slider	10	400 ≀ 800	580 ≀ 980	500
		900	1,080	440
		1,000	1,180	360
		1,100	1,280	300
		1,200	1,380	250
	20	400 ≀ 800	580 ≀ 980	1,000
		900	1,080	870
		1,000	1,180	720
		1,100	1,280	600
		1,200	1,380	510
MCH10 Double slider	10	250 ≀ 750	580 ≀ 1,080	500
		850	1,180	480
		950	1,280	390
		1,050	1,380	320
	20	250 ≀ 750	580 ≀ 1,080	1,000
		850	1,180	950
		950	1,280	780
		1,050	1,380	650

1.4.4 Accuracy Grade

The accuracy grade of Monocarrier standard inventories is high grade (H), except for lead 1 and 2 of MCM02 and 03.

When you require strokes longer than 1,200mm, please consult NSK about the accuracy grade.

Table 1-5 (Unit: μm)

Grade	High grade			Precision			
Stroke (mm)	Repeatability	Running Parallelism (vertical)	Backlash	Repeatability	Positioning accuracy	Running Parallelism (vertical)	Backlash
~200	±10	14	20 or less	±3	20	8	3 or less
~400		16			25	10	
~600		20			30	12	
~700		23			30	15	
~1,000		23			35	15	
~1,200		30			40	20	

1. 4. 5 Stroke and Ball Screw Lead

1. 4. 5. 1 MCM Series standard combinations of Stroke and Ball Screw Lead

Table 1-6 Single slider

(●mark: Standard product) (Unit: mm)

Nominal size	MCM02		MCM03				MCM05			MCM06			MCM08			MCM10	
lead / stroke	1	2	1	2	10	12	5	10	20	5	10	20	5	10	20	10	20
50		●	●	●	●	●	●	●	●	●	●	●	●	●			
100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
150	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
200					●	●	●	●	●	●	●	●	●	●	●	●	●
250					●	●	●	●	●	●	●	●	●	●	●	●	●
300							●	●	●	●	●	●	●	●	●	●	●
400							●	●	●	●	●	●	●	●	●	●	●
500							●	●	●	●	●	●	●	●	●	●	●
600							●	●	●	●	●	●	●	●	●	●	●
700										●	●	●	●	●	●	●	●
800										●	●	●	●	●	●	●	●
900																●	●
1,000																●	●

Table 1-7 Double slider

(●mark: Standard product) (Unit: mm)

Nominal size	MCM05		MCM06			MCM08		MCM10	
lead / stroke	10	20	5	10	20	10	20	10	20
60	●								
70								●	
80						●			
110	●		●	●					
160	●								
170								●	●
180						●	●		
210	●	●	●	●	●				
270								●	●
280						●	●		
310	●	●	●	●	●				
370								●	●
380						●	●		
410	●	●	●	●	●				
470								●	●
480						●	●		
510	●	●		●	●				
570								●	●
580						●	●		
610				●	●				
670								●	●
680						●	●		
710				●	●				
870								●	●

Please consult NSK about double slider of MCM 02 and 03.

1. 4. 5. 2 MCH Series Standard Combinations of Stroke and Ball Screw Lead

Table 1-8 Single slider

(●mark: Standard product) (Unit: mm)

Nominal size	MCH06			MCH09			MCH10	
lead / stroke	5	10	20	5	10	20	10	20
50	●	●	●					
100	●	●	●	●	●	●	●	●
200	●	●	●	●	●	●	●	●
300	●	●	●	●	●	●	●	●
400	●	●	●	●	●	●	●	●
500	●	●	●	●	●	●	●	●
600				●	●	●	●	●
700				●	●	●	●	●
800				●	●	●	●	●
900							●	●
1,000							●	●
1,100							●	●
1,200							●	●

Table 1-9 Double slider

(●mark: Standard product) (Unit: mm)

Nominal size	MCH06			MCH09			MCH10	
lead / stroke	5	10	20	5	10	20	10	20
100	●	●						
150				●	●			
200	●	●						
250				●	●		●	●
300	●	●						
350				●	●		●	●
400		●	●					
450					●	●	●	●
550							●	●
650					●	●	●	●
750								●
850								●
950								●
1,050								●

Table 1-10 Limitations

	Nominal size	Lead (mm)	Slider	Stroke (mm)
MCM Series	MCM02	1,2	Single	150
	MCM03	1,2	Single	150
		10,12	Single	350
	MCM05	5,10,20	Single	900
			Double	810
	MCM06	5,10,20	Single	1,000
			Double	910
	MCM08	5,10,20	Single	1,000
			Double	880
	MCM10	10,20	Single	1,800
			Double	1,670
MCH Series	MCH06	5,10,20	Single	600
			Double	500
	MCH09	5,10,20	Single	1,000
			Double	850
	MCH10	10,20	Single	1,800
			Double	1,650
	MCL06	5,10,20	Single	500

1. 4. 6 Basic Load Rating

1. 4. 6. 1 MCM Series Basic Load Rating

Table 1-11 Basic Load Rating

Nominal size	Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N)				Basic static load rating (N)		Support unit Limit load (N)
			Ball screw C_a	Linear guide C	Support unit C_a	Rated running distance L_a (km)	Ball screw C_{0a}	Linear guide C_0	
MCM02	1	ø6	340 (High grade) 405 (Precision)	4,910	615	1	555 (High grade) 615 (Precision)	2,120	490
	2		340 (High grade) 405 (Precision)	3,900		2	555 (High grade) 615 (Precision)		
MCM03	1	ø6	735	10,900	2,670	1	1,230	4,900	1,040
	2		735	8,650		2			
	10	ø8	1,230	6,250		10	1,690	6,620	
	12		1,230	5,880		12			
MCM05	5	ø12	3,760	15,600	4,400	5	6,310	10,900	1,450
	10		2,260	12,400		10	3,780		
	20		2,260	9,850		20	3,780		
MCM06	5	ø16	7,310	25,200	6,550	5	13,500	17,000	2,730
	10	ø15	7,060	20,000		10	12,700		
	20		4,560	15,900		20	7,750		
MCM08	5	ø16	7,310	30,800	7,100	5	13,500	22,800	3,040
	10	ø15	7,060	24,400		10	12,700		
	20		4,560	19,400		20	7,750		
MCM10	10	ø20	10,900	33,500	7,600	10	21,700	29,400	3,380
	20		7,060	26,600		20	12,700		

Notes • Basic dynamic and static load ratings indicate the values for one slider. • Basic dynamic load rating of the linear guide is the load of perpendicular direction to the axis that allows 90% of a group of the same Monocarriers to operate, "Rated running distance" in the table, that is equivalent to 1 million revolutions of the ball screw and the support unit under the same condition without causing flaking by rolling contact fatigue. • Basic dynamic load rating of the ball screw is a load-to-axial direction that allows 90% of ball screws of a group of the same Monocarriers to rotate 1 million revolutions under the same condition without causing flaking by rolling contact fatigue. • Basic dynamic load rating of the support unit is a constant load-to-axial direction that allows 90% of support units of the same group of Monocarriers to rotate 1 million revolutions under the same condition without causing flaking by rolling contact fatigue. • Basic static load rating is a load that results in combined permanent deformations at the contact points of balls and ball grooves of respective part, which is 0.01% of the diameter.

Table 1-12 Basic static moment load of linear guide

Nominal size	Lead (mm)	Slider	Basic static moment (N • m)		
			Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
MCM02	1,2	Single	24	8	8
MCM03	1,2		68	28	28
	10,12		92	51	51
MCM05	5,10,20	Single	229	89	89
		Double	455	765	765
MCM06	5,10,20	Single	415	174	174
		Double	825	1,220	1,220
MCM08	5,10,20	Single	770	300	300
		Double	1,540	2,050	2,050
MCM10	10,20	Single	1,170	425	425
		Double	2,340	2,940	2,940

• Basic static moment of double slider is a value when two sliders equipped with NSK K1™ Lubrication Units are butted against each other.
• The basic static moment is the value when a rolling contact pressure of balls exceeds 4,000N/mm².
• If operating under extreme load conditions, please consult NSK for estimation of fatigue life.

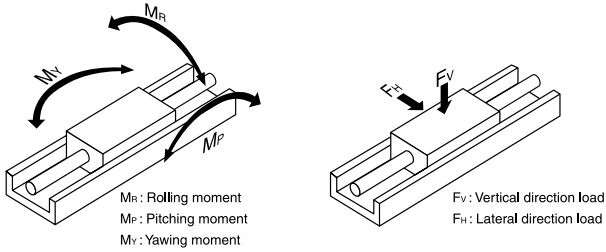


Fig. 1-8

1. 4. 6. 2 MCH Series Basic Load Rating

Table 1-13 Basic Load Rating

Nominal size	Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N)				Basic static load rating (N)		Support unit
			Ball screw C_a	Linear guide C	Support unit C_a	Rated running distance L_a (km)	Ball screw C_{0a}	Linear guide C_0	Limit load (N)
MCH06 (MCL06)	5	ø12	3,000 (High grade) 3,760 (Precision)	22,800	4,400	5	5,410 (High grade) 6,310 (Precision)	16,300	1,450
	10		1,930 (High grade) 2,260 (Precision)	18,100		10	3,160 (High grade) 3,780 (Precision)		
	20		1,930 (High grade) 2,260 (Precision)	14,400		20	3,160 (High grade) 3,780 (Precision)		
MCH09	5	ø15	6,820 (High grade) 7,100 (Precision)	40,600	7,100	5	13,200 (High grade) 13,000 (Precision)	30,500	3,040
	10		5,110 (High grade) 7,060 (Precision)	32,200		10	9,290 (High grade) 12,700 (Precision)		
	20		3,290 (High grade) 4,560 (Precision)	25,500		20	5,620 (High grade) 7,750 (Precision)		
MCH10	10	ø20	8,230 (High grade) 10,900 (Precision)	44,600	7,600	10	17,100 (High grade) 21,700 (Precision)	42,000	3,380
	20		5,300 (High grade) 7,060 (Precision)	35,400		20	10,300 (High grade) 12,700 (Precision)		

Notes • Basic dynamic and static load ratings indicate the values for one slider. • Basic dynamic load rating of the linear guide is the load of perpendicular direction to the axis that allows 90% of a group of the same Monocarriers to operate, "Rated running distance" in the table, that is equivalent to 1 million revolutions of the ball screw and the support unit under the same condition without causing flaking by rolling contact fatigue. • Basic dynamic load rating of the ball screw is a load-to-axial direction that allows 90% of ball screws of a group of the same Monocarriers to rotate 1 million revolutions under the same condition without causing flaking by rolling contact fatigue. • Basic dynamic load rating of the support unit is a constant load-to-axial direction that allows 90% of support units of the same group of Monocarriers to rotate 1 million revolutions under the same condition without causing flaking by rolling contact fatigue. • Basic static load rating is a load that results in combined permanent deformations at the contact points of balls and ball grooves of respective part, which is 0.01% of the diameter.

Table 1-14 Basic static moment load of linear guide

Nominal size	Slider	Basic static moment (N • m)		
		Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
MCH06 (MCL06)	Single	335	133	133
	Double	770	730	730
MCH09	Single	890	385	385
	Double	1,780	2,070	2,070
MCH10	Single	1,460	610	610
	Double	2,920	3,430	3,430

• Basic static moment of double slider is a value when two sliders equipped with NSK K1™ Lubrication Units are butted against each other.
• The basic static moment is the value when a rolling contact pressure of balls exceeds 4,000N/mm^2.
• If operating under extreme load conditions, please consult NSK for estimation of fatigue life.

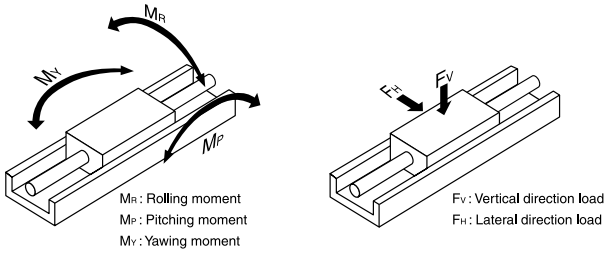


Fig. 1-9

1.4.7 Estimation of Life Expectancy

1.4.7.1 Life of Linear Guide

Study the load to be applied to the linear guide of Monocarrier (Fig. 1-10). The equivalent load (Fe) is determined by substituting equation ① or ② depending on the number of sliders.

• Single Slider

$$① \quad Fe = Y_H F_H + Y_V F_V + Y_R \varepsilon_R M_R + Y_P \varepsilon_P M_P + Y_Y \varepsilon_Y M_Y \cdots$$

• Double Slider

$$② \quad Fe = \frac{Y_H F_H}{2} + \frac{Y_V F_V}{2} + Y_R \varepsilon_{Rd} M_R + \overline{Y_P \varepsilon_{Pd} M_P} + \overline{Y_Y \varepsilon_{Yd} M_Y} \cdots$$

F_H : Lateral direction load acting on the slider (N)
F_V : Vertical direction load acting on the slider (N)
M_R : Rolling moment acting on the slider (N • m)
M_P : Pitching moment acting on the slider (N • m)
M_Y : Yawing moment acting on the slider (N • m)

ε_R, ε_{Rd}
: Dynamic equivalent coefficient to rolling moment

ε_P, ε_{Pd}
: Dynamic equivalent coefficient to pitching moment

ε_Y, ε_{Yd}
: Dynamic equivalent coefficient to yawing moment

Refer to Table 1-15 about Dynamic equivalent coefficient.

Y_H, Y_V, Y_R, Y_P, Y_Y
: 1.0 or 0.5

In equations ① and ② for obtaining equivalent load (Fe), among F_H, F_V, $\varepsilon_P M_P$, $\varepsilon_R M_R$, $\varepsilon_Y M_Y$, the maximum load is assumed to be 1.0 and others are to be 0.5.

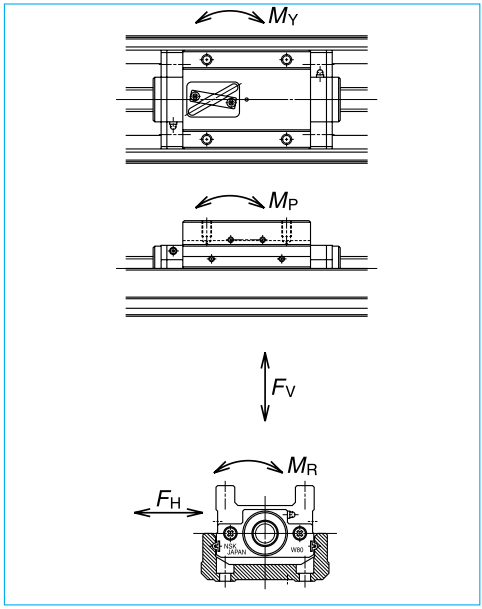


Fig. 1-10 Direction of load

Table 1-15 Dynamic equivalent coefficient

Figures in parentheses ( ) are dynamic equivalent coefficient in the case of the Monocarrier without NSK K1™ Lubrication Unit.

Nominal size	MCM02	MCM03		MCM05	MCM06	MCM08	MCM10	MCH06 MCL06	MCH09	MCH10
		lead 1, 2	lead 10, 12							
ε_R	95.2	79.4	79.4	52.6	45.5	32.5	27.8	48.3	34.5	28.6
ε_P	174	113.9	84.2	81.3	65.1	48.8	45.2	75.1	47.9	41.0
ε_Y	174	113.9	84.2	81.3	65.1	48.8	45.2	75.1	47.9	41.0
ε_{Rd}	–	–	–	26.3	22.7	16.3	13.9	24.2	17.2	14.3
ε_{Pd}	–	–	–	10.4(12.2)	9.7(11.5)	7.6(8.6)	7.1(8.0)	11.4(13.2)	8.11(9.10)	6.98(7.82)
ε_{Yd}	–	–	–	10.4(12.2)	9.7(11.5)	7.6(8.6)	7.1(8.0)	11.4(13.2)	8.11(9.10)	6.98(7.82

In a case when the load acting on the slider may fluctuate (in general, M_P, M_Y may fluctuate with the acceleration/deceleration of the slider), the mean effective load is determined by Eq. ③ .

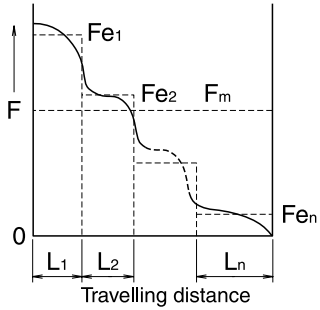


Fig. 1-11 Stepwise Fluctuating Load

Travelling distance under the equivalent load Fe_1: L_1
Travelling distance under the equivalent load Fe_2: L_2
• • • • • • • • • •
Travelling distance under the equivalent load Fe_n: L_n

$$Fm = \sqrt[3]{\frac{1}{L}(Fe_1^3L_1 + Fe_2^3L_2 + \cdots Fe_n^3L_n)} \cdots ③$$

Fm: Mean effective load of fluctuating loads
L: Total travelling distance

The life of the linear guide is calculated by Eq. ④

$$L = L_a \times \left\{\frac{C}{f_w \cdot Fm}\right\}^3 \cdots\cdots ④$$

L: Life of the linear guide (km)
Fm: Mean effective load acting on the linear guide (N)
C: Basic dynamic load rating of the linear guide (N)
L_a: Travelling distance (km)
f_w: Load factor (Refer to Table 1-16)

When the estimated life does not meet the required life, the life of the linear guide is to be calculated again after the following measures are taken:

1. Change from the single slider type to double slider type.
2. Use a larger size Monocarrier.

1. 4. 7. 2 Life of Ball Screw (Support unit)

The mean effective load is determined from the axial loads.

For calculation of the mean effective load, use Eq. ③. The life of the ball screw is calculated by Eq. ⑤.

$$L = \ell \times \left\{\frac{C_a}{f_w \cdot Fm}\right\}^3 \times 10_6 \cdots\cdots ⑤$$

ℓ: Lead of ball screw (mm)
L: Life of ball screw (mm)
C_a: Basic dynamic load rating of the ball screw (N)
Fm: Mean effective load acting on the ball screw (N)
f_w: Load factor (Refer to Table 1-16)

The life of the support unit is calculated by Eq. ⑤.

If the life of the ball screw/support unit does not meet the required life, use a larger size Monocarrier.

Upon calculations as mentioned above, the selection of the Monocarrier is completed.

Table 1-16 Values of load factor f_w

Operating conditions	Load factor f_w
At smooth operation with no mechanical shock	1.0~1.2
At normal operation	1.2~1.5
At operation with mechanical shock and vibrations	1.5~3.0

1. 4. 8 Example of Life Estimation

This section offers an example of how to estimate the life of the Monocarrier based on the life of each component.

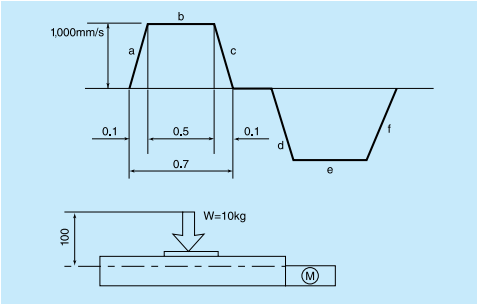


Fig. 1-12

1. Use condition

Stroke	: 600mm
Maximum Speed	: 1,000mm/s
Load Mass	: W=10kg
Acceleration	: g=9.8m/s²
Setting Position	: Horizontal
Operating Profile	: See above figure

2. Selection of Nominal size

2-1. Interim Selection

First, select a greater ball screw lead since the maximum speed is 1,000mm/s. The interim selection is MCM06060H20K00, a single slider specification MCM06 that has a 600mm stroke, since the stroke is 600mm.

3. Calculation

3-1. Linear guide

3-1-1. Fatigue life

Multiply the result of the Eq. ① by the dynamic equivalent coefficient (Table 1-15 single slider) to convert the load volume. From the above operation profile,

i) Constant speed $Fe_1=Y_VF_V=Y_VW_g=1 \cdot 10 \cdot 9.8=98N$

ii) Accelerating $Fe_2=Y_VF_V+Y_P\varepsilon_PM_P=0.5 \cdot 10 \cdot 9.8+1 \cdot 65.1 \cdot 0.1 \cdot 100=700N$

iii) Decelerating $Fe_3=Y_VF_V+Y_P\varepsilon_PM_P=0.5 \cdot 10 \cdot 9.8+1 \cdot 65.1 \cdot 0.1 \cdot 100=700N$

Mean effective load *Fm*

$$Fm=\sqrt[3]{\frac{1}{L}\left(Fe_1^3 \cdot L_1+Fe_2^3 \cdot L_2+Fe_3^3 \cdot L_3\right)}$$

$$=\sqrt[3]{\frac{1}{600}\left(98^3 \cdot 500+700^3 \cdot 50+700^3 \cdot 50\right)}$$

$$=387\ N$$

$$L=\left(\frac{C}{f_w \cdot F_m}\right)^3 \times L_a$$

$$=\left(\frac{15{,}900}{1.2 \cdot 387}\right)^3 \times 20$$

$$=8.02 \times 10^5 km$$

3-1-2. Static safety factor: Divide the basic static load rating by the maximum load.

$$F_S=\frac{C_0}{Fe}=\frac{C_0}{Fe_2}=\frac{17{,}000}{700}=24.2$$

3-2. Ball screw

3-2-1. Fatigue life: Obtain the axial load of each stage of operation, referring to the operation profile, and then calculate the mean load.

By the process above,

i) Constant speed
$Fe_1=\mu \cdot W \cdot g=0.01 \cdot 10 \cdot 9.8=0.98$

ii) Accelerating
$Fe_2=Fe_1+W\alpha=101N$

iii) Decelerating
$Fe_3=Fe_1-W\alpha=99N$

Axial mean effective load *Fm*

$$Fm=\sqrt[3]{\frac{1}{L}\left(Fe_1^3 \cdot L_1+Fe_2^3 \cdot L_2+Fe_3^3 \cdot L_3\right)}$$

$$=\sqrt[3]{\frac{1}{600}\left(0.98^3 \cdot 500+101^3 \cdot 50+99^3 \cdot 50\right)}$$

$$=55N$$

$$L=\left(\frac{C_a}{f_w \cdot F_m}\right)^3 \times \ell \times 10^6$$

$$=\left(\frac{4{,}560}{1.2 \cdot 55}\right)^3 \times 20 \times 10^6 (mm)$$

$$=6.5 \times 10^6 km$$

3-2-2. Static safety factor: Divide the basic static load rating by the maximum axial load.

$$F_S=\frac{C_{0a}}{Fe}=\frac{C_{0a}}{Fe_2}=\frac{7{,}750}{101}=76.7$$

3-2-3. Maximum rotational speed: According to the table of maximum rotational speed on page C7, MCM06 with 20mm lead and 600mm stroke is possible to operate under the maximum speed of 1,000mm/s.

3-3. Support unit

3-3-1. Fatigue life: Use the axial load Fm = 55 N, resulting from the calculation 3-2-1 (above).

$$L=\left(\frac{C_a}{fw \cdot Fm}\right)^3 \times \ell \times 10^6=\left(\frac{6{,}550}{1.2 \times 55}\right)^3 \times 20 \times 10^6 (mm)$$

$$=1.95 \times 10^7 km$$

3-3-2. Static safety factor: Divide the limit load by the maximum axial load.

$$F_S = \frac{C_{0a}}{Fe} = \frac{C_{0a}}{Fe_2} = \frac{2{,}730}{101} = 27.0$$

3.4. Result

MCM06060H20K00	Linear guide	Ball screw	Support unit
Fatigue life	8.02 × 10^5km	6.5 × 10^6km	1.95 × 10^7km
Static safety factor	24.2	76.7	27.0

The shortest fatigue life of the linear guide among the components must be taken as the life of the Monocarrier. The interim selection of MCM06060H20K00, chosen based on the conditions of use, satisfies the required life.

1.5 Maintenance

1.5.1 Maintenance Method

1. For a standard Monocarrier, we pack grease in the slider, linear guides and ball screw.

2. The Monocarriers are equipped with NSK K1™ Lubrication Unit as a standard feature, allowing it to operate for 5 years or 10,000km (whichever comes first) without any maintenance. However, replenishing the grease may extend its life substantially.

3. NSK K1™ Lubrication Unit demonstrates its capabilities in environments where oily dust exists. However, the life may be shorter than the case described in section 2 (above). In this case, it may be necessary to replenish the grease more frequently.

4. Nozzle for NSK grease gun exclusive for the MCH Monocarrier is available as an option.
NSK reference number: NSK HGP NZ8

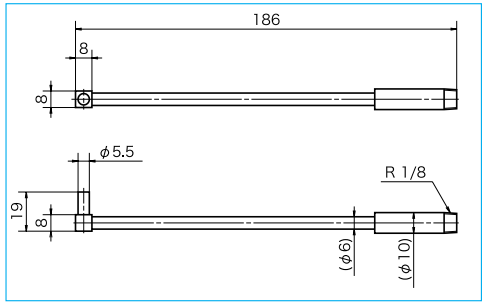


Fig. 1-13 NSK HGP NZ8

Precautions for handling

1. Please consult with NSK if the motor is coupled to the ball screw using a pulley as there is a restriction on the allowable torque to the end of the ball screw shaft.
2. To extend the high performance of NSK K1™ Lubrication Unit, please observe the following:

1. Temperature range	Ambient temperature:	50˚C
	Max. instantaneous temperature:	80˚C
2. Use of chemicals	Never leave a Monocarrier in close proximity to grease-removing organic solvents such as hexane or thinner. Never immerse it in an anti-rust solvent that contains kerosene.	

Note: Other oils, such as water-based and oil-based cutting oil and grease, do not cause any problems.

1. 5. 2 NSK K1™ Lubrication Unit

NSK K1™ Lubrication Unit exhibits outstanding features, confirmed by abundant experimental data, along with the proven performance of linear guides and ball screws that are equipped with NSK K1™ Lubrication Unit.

(1) High-Speed Durability Test of Linear Guides Without Lubricant

Results of high-speed durability testing of linear guide without lubricant are shown in Fig. 1-14. While the linear guide cannot be operated without lubricant for even short periods without damage, the installation of the NSK K1™ Lubrication Unit permits the linear guide to run over 25,000km without any problem.

Conditions	Test piece: LH30AN (Preload Z1)
	Speed: 3.3m/s
	Stroke: 1,800mm
No lubricant	All grease removed
NSK K1™ Lubrication Unit	All grease removed + NSK K1™ Lubrication Unit

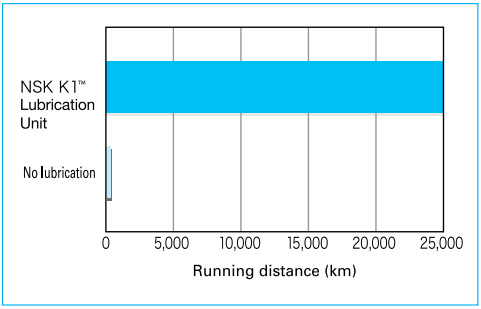


Fig. 1-14 Results of high-speed durability test of linear guides without lubricant

(2) High-Speed Durability Test of Ball Screws Without Lubricant

Results of high-speed durability testing of ball screw without lubrication are shown in Fig.1-15. While the ball screw cannot be operated without a lubricant at 8.5km without damage, the installation of the NSK K1™ Lubrication Unit permits the ball screw to run over 21,000km without any problem.

Conditions	Test piece: BS2020 (ball screw)
	Shaft diameter: 20mm
	Lead: 20mm
	Load: N/A
	Speed: 1.3m/s (4,000 min^{-1})
	Stroke: 600mm
No lubricant	All grease removed
NSK K1™ Lubrication Unit	All grease removed + NSK K1™ Lubrication Unit

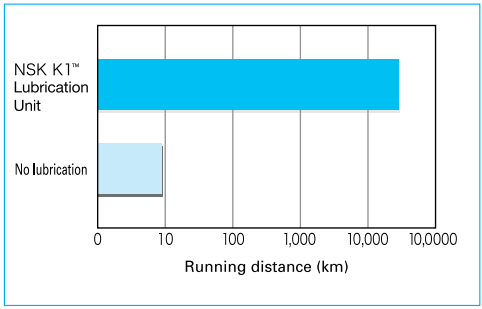


Fig. 1-15 Results of high-speed durability test of ball screws without lubricant

- **NSK K1™ Lubrication Unit for food processing is available.**

For safety equipment of food processing and medical care, NSK provides the Monocarrier equipped with special NSK K1™ Lubrication Unit that is made of compatible material under FDA regulations.
Dimensions are the same as the standard NSK K1™ Lubrication Unit and special handling care is not required.

1.6 NSK Clean Grease LG2 Specification

● **Features**

This grease was developed by NSK to be exclusively used for linear guides and ball screws in clean rooms. Compared to the fluoride grease that is commonly used in clean rooms, LG2 has several advantages such as: higher in lubrication function, longer lubrication life, more stable torque (resistant to wear) and higher rust prevention.

In dust generation, LG2 is more than equal to fluoride grease in keeping dust volume low. Since the base oil is not a special oil but a mineral oil, LG2 can be handled in the same manner as general grease.

● **Applications**

LG2 is lubrication grease for rolling contact machine components such as linear guides and ball screws for processing equipment for semiconductors and LCD which require a highly clean environment at normal pressures at normal temperatures. It cannot be used in a vacuum environment.

● **Nature**

Thickener	Lithium soap base
Base oil	Mineral oil + Synthetic hydrocarbon oil
Consistency	207
Dropping point	200˚C
Volume of evaporation	1.40% (99˚C, 22hr)
Copper plate corrosion test	Satisfactory (Method B, 100˚C, 24hr)
Oil separation	0.8% (100˚C, 24hr)
Base oil kinematic viscosity	30mm²/s (40˚C)

1. 7 Characteristics and Evaluation Method

1. 7. 1 Positioning Accuracy

Perform positioning successively from the reference position in a specific direction. Measure the difference between the actual and desired travel distances for each point from the reference position. Repeat this measurement seven times to determine the average value. Measure the average value over the entire travel distance at the intervals specified for each model and take the maximum difference of the average values determined at respective positions as the measured value.

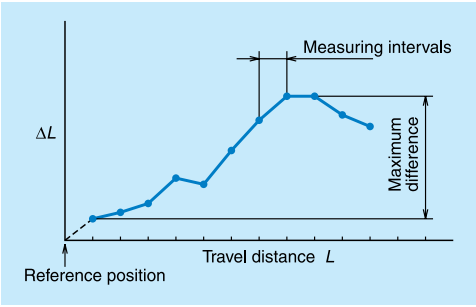


Fig. 1-16

1. 7. 2 Repeatability

Repeat positioning at any point seven times from the same direction to measure the stopping position and determine one half of the maximum difference of readings. Repeat this measurement over the entire travel distance at the intervals specified for each model. Take the maximum difference of the determined values as the measured value. Express one half of the maximum difference with a plus or minus ± sign.

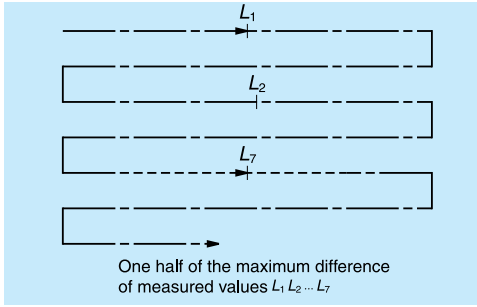


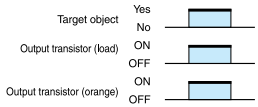
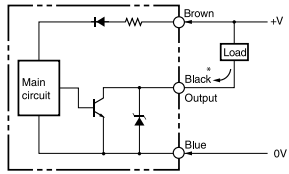
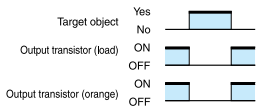
Fig. 1-17

1. 8 Sensor specification

1. 8. 1 Proximity switch

Use of OMRON E2S-W13, E2S-W14

Item	E2S-W13 type	E2S-W14 type
Setting surface	Front face	
Sensing distance	1.6mm ± 15%	
Setting distance	0 to 1.2mm	
Differential travel	10% max. of sensing distance	
Detectable object type	Ferrous metal	
Standard sensing object	Iron,12 x 12 x 1mm	
Response frequency	1 kHz min.	
Power supply voltage (operating voltage range)	12 to 24 V DC, ripple (p–p): 10% max. (10 to 30 V DC)	
Current consumption	13 mA max. at 24 V DC with no load	
Control output (Switching capacity)	NPN open collector output 50 mA max. (30 V DC max.)	
Control output (Residual voltage)	1.0 V max. with a load current of 50 mA and a cable length of 1 m	
Indicator	Operation indicator (orange)	
Operating status (with sensing object approaching)	NO	NC

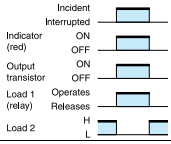
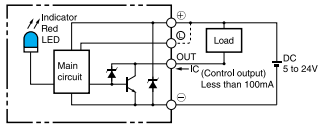
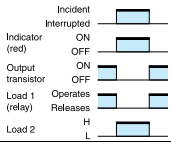
Movement mode	Output type	Type	Time chart	Output circuit
NO	NPN	E2S-W13 type		
NC		E2S-W14 type		

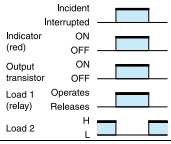
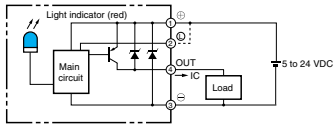
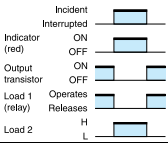
*(Maximum load current: 50mA)

1. 8. 2 Photo sensor

Use of OMRON EE-SX674 and EE-SX674P

Item	EE-SX674 type EE-SX674P type
Slot width	5mm
Standard reference object	Opaque: 2 x 0.8mm
Differential distance	0.025mm
Light source	GaAs infrared LED with a peak wavelength of 940nm
Indicator (without detecting object)	ON GaP red LED (peak emission wavelength: 690nm)
Supply voltage	5 to 24VDC ±10%, ripple: (p-p) 10% max.
Current consumption	35mA max.
Control output	NPN open collector output models: At 5 to 24 VDC: 100 mA load current
Response frequency	1kHz max. (3kHz typ.)
Ambient illumination	Fluorescent light: 1,000 ℓx max.
Ambient temperature	Operating: -25°C to 55°C (-13°F to 131°F) Storage: -30°C to 80°C (-22°F to 176°F)
Ambient humidity	Operating: 5 to 85%RH Storage: 5 to 95%RH
Connecting method	EE-1001/1006 Connectors; soldering terminals

Type	Movement mode	Time chart	Connection terminal	Output circuit
EE-SX674 type	Light-ON		When terminals L and ⊕ are short-circuited	
	Dark-ON		When terminals L and ⊕ are open-circuited	

Type	Movement mode	Time chart	Connection terminal	Output circuit
EE-SX674P type	Light-ON		When terminals L and ⊕ are short-circuited	
	Dark-ON		When terminals L and ⊕ are open-circuited	

MCM Series

2 MCM Series

2. 1 MCM Series Reference Number Coding

[Body]

Reference number : MC M 08 040 H 10 K 0 0

- MC: Monocarrier
- M: M type: MCM Series
- 08: Nominal size (rail width, Unit: 10mm)
- 040: Stroke (Unit: 10mm)
- H: Accuracy grade (H: High grade, P: Precision grade)
- 10: Ball screw lead (mm)
- K: Slider specification K: Single slider (See page C9) D: Double slider
- 0: Grease specification: 0 (standard AS2)
- 0: NSK management number

[With Optional Accessories]

Reference number: MC E 08 040 H 10 K 0 0 K 0 0 0

- E: With Optional Accessories
- K: NSK management number
- 0: Sensor unit
- 0: Cover unit
- 0: Motor bracket

Note: Optional components are available separately.

Table 2-1 Sensor unit (See page 35-38)

Reference number code	Specification	Reference number
0	N/A	—
1	Proximity switch (b-contact 3 pieces)	MC – SRxx – 10
2	Proximity switch (a-contact 3 pieces)	MC – SRxx – 11
3	Proximity switch (a-contact 1 piece, b-contact 2 pieces)	MC – SRxx – 12
4	Photo sensor 3 piece	MC – SRxx – 13

Note xx: Reference number

Table 2-2 Cover unit (See page 39-40)

Reference number code	Specification	Reference number
0	N/A	—
1	With top cover	MC – CVxxxxx – 01 (02) ※
2	Full cover	MC – CVxxxxx – 00

Note ※: Monocarrier "-02" is only used for MCM03

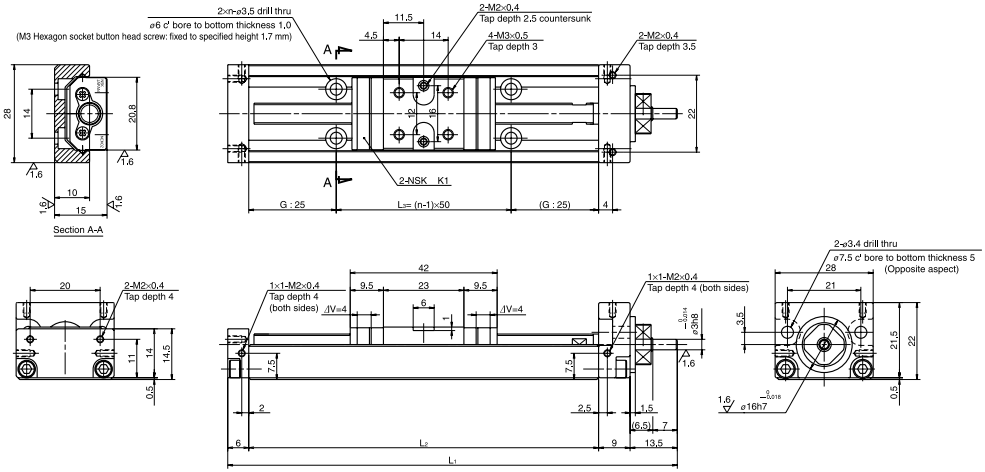
Note xxxxx: Reference number and stroke number

Table 2-3 The reference number of motor bracket (See page 41-56)

Reference number code	Reference number				
	MCM03	MCM05	MCM06	MCM08	MCM10
0	N/A	N/A	N/A	N/A	N/A
1	**MC-BK03-146-00**	**MC-BK05-145-00**	**MC-BK06-145-00**	**MC-BK08-145-00**	**MC-BK10-170-00**
2	**MC-BK03-148-01**	**MC-BK05-146-00**	**MC-BK06-146-00**	**MC-BK08-146-00**	**MC-BK10-170-01**
3	**MC-BK03-231-00**	**MC-BK05-148-00**	**MC-BK06-148-00**	**MC-BK08-160-00**	**MC-BK10-190-00**
4	—	**MC-BK05-160-00**	**MC-BK06-160-00**	**MC-BK08-170-00**	**MC-BK10-270-00**
5	—	**MC-BK05-250-00**	**MC-BK06-170-00**	**MC-BK08-170-01**	—
6	—	—	**MC-BK06-170-01**	**MC-BK08-190-00**	—
7	—	—	**MC-BK06-250-00**	**MC-BK08-250-00**	—
8	—	—	—	**MC-BK08-270-00**	—

2. 2 MCM Series dimension table of standard products

MCM02



ΔV is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit (mm)	Ball screw lead (mm)	Body length (mm)			No. of mounting holes	Inertia	Mass
				L_1	L_2	L_3	n	$\times 10^{-7}$ (kg • m^2)	(kg)
MCM02005H01K	50	58	1	128.5	100	50	2	0.93	0.26
MCM02005P01K									
MCM02005H02K			2						
MCM02005P02K									
MCM02010H01K	100	108	1	178.5	150	100	3	1.36	0.32
MCM02010P01K									
MCM02010H02K			2						
MCM02010P02K									
MCM02015H01K	150	158	1	228.5	200	150	4	1.81	0.39
MCM02015P01K									
MCM02015H02K			2						
MCM02015P02K									

Monocarrier dynamic torque specification (N • cm)

		High grade	Precision
Ball screw lead (mm)	1	0.1~1.3	0.2~1.6
	2		

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (4[margin]×2)

Basic load rating

Lead	Shaft dia	Basic dynamic load rating (N)				Basic static load rating (N)		Support unit Load limit (N)
ℓ (mm)	d (mm)	Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Ball screw C_{0a}	Linear guides C_0	
1	ø6	340 (High grade) 405 (Precision)	4,910	615	1	555 (High grade) 615 (Precision)	2,120	490
2		340 (High grade) 405 (Precision)	3,900		2	555 (High grade) 615 (Precision)		

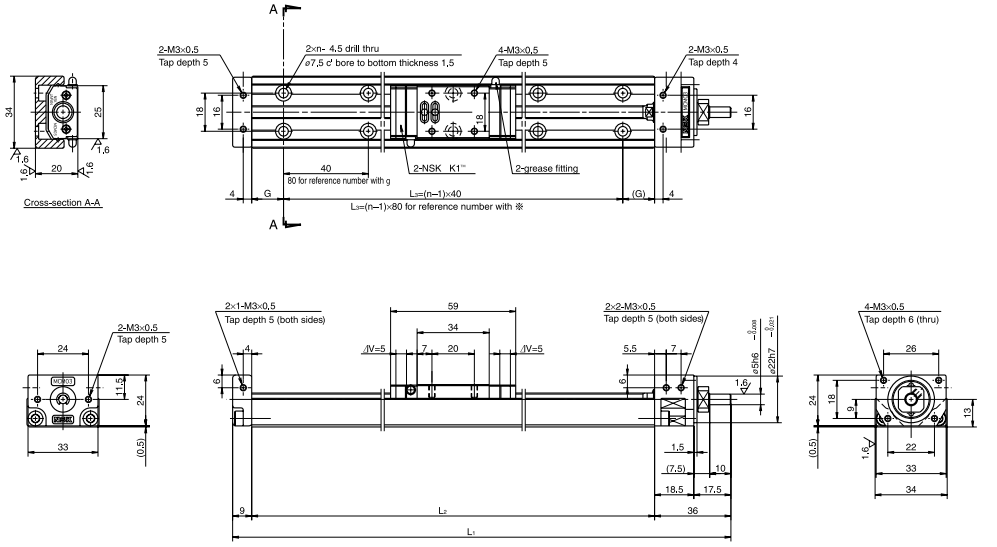
Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	24	8	8

MCM03

Accuracy grade: Precision (P)

Ball screw lead 1 and 2



Dimension of MCM03 (Single slider) — ⊿V is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	G	L_3	No. of mounting holes n	Inertia ×10⁻⁵ (kg • m²)	Mass (kg)
※MCM03005P01K00	50	56	1	160	115	17.5	80	2	0.015	0.6
※MCM03005P02K00		(66)	2						0.016	
MCM03010P01K00	100	131	1	235	190	15	160	5	0.021	0.7
MCM03010P02K00		(141)	2						0.022	
MCM03015P01K00	150	181	1	285	240	20	200	6	0.025	0.8
MCM03015P02K00		(191)	2						0.026	

Bolt hole pitch L_3 on the items marked with ※ is 80 mm.

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	1	0.2~1.7
	2	

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Optional spacer is required when cover unit, sensor unit or both are put together in ball screw lead of 1 and 2mm (See page C39).
5. Stroke limit = stroke + (3[margin] ×2)

Basic load rating

Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
1	ø6	735	10,900	2,670	1	1,230	4,900	1,040
2		735	8,650		2			

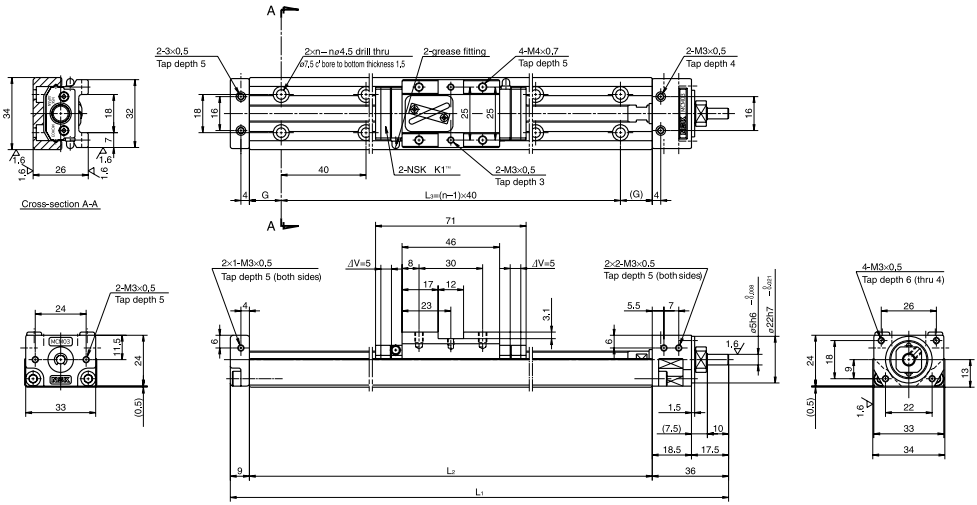
Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	68	28	28

MCM03

Accuracy grade: High grade (H)

Ball screw lead 10 and 12



Dimension of MCM03 (Single slider)

⊿V is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	G	L_3	No. of mounting holes n	Inertia ×10^{-5} (kg • m^2)	Mass (kg)
MCM03010H10K00	100	119	10	235	190	15	160	5	0.092	0.7
MCM03010H12K00		(129)	12						0.109	
MCM03015H10K00	150	169	10	285	240	20	200	6	0.105	0.8
MCM03015H12K00		(179)	12						0.122	
MCM03020H10K00	200	219	10	335	290	25	240	7	0.118	0.9
MCM03020H12K00		(229)	12						0.135	
MCM03025H10K00	250	269	10	385	340	30	280	8	0.131	1.0
MCM03025H12K00		(279)	12						0.147	

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	10	0.3~3.0
	12	

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (9.5[margin] ×2)

Basic load rating

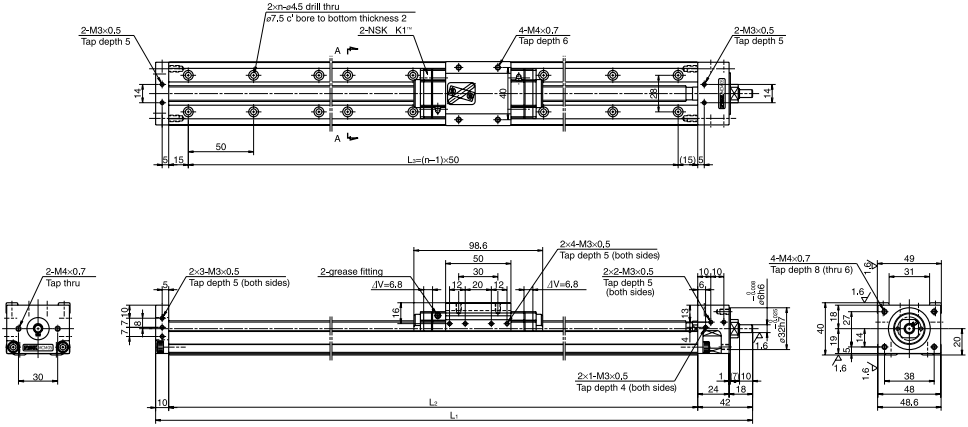
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
10	⌀8	1,230	6,250	2,670	10	1,690	6,620	1,040
12		1,230	5,880		12			

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	92	51	51

MCM05

Accuracy grade: High grade (H)



Dimension of MCM05 (Single slider)

ΔV is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	L_3	No. of mounting holes n	Inertia $\times 10^{-4}$ (kg • m^2)	Mass (kg)
MCM05005H05K00	50	80	5	232	180	150	4	0.025	1.4
MCM05005H10K00		(95)	10					0.035	
MCM05010H05K00	100	130	5	282	230	200	5	0.031	1.6
MCM05010H10K00		(145)	10					0.040	
MCM05015H05K00	150	180	5	332	280	250	6	0.036	1.8
MCM05015H10K00		(195)	10					0.046	
MCM05020H05K00	200	230	5	382	330	300	7	0.042	2.0
MCM05020H10K00		(245)	10					0.051	
MCM05025H10K00	250	280 (295)	10	432	380	350	8	0.057	2.2
MCM05030H10K00	300	330	10	482	430	400	9	0.063	2.3
MCM05030H20K00		(345)	20					0.101	
MCM05040H10K00	400	430	10	582	530	500	11	0.074	2.7
MCM05040H20K00		(445)	20					0.112	
MCM05050H10K00	500	530	10	682	630	600	13	0.085	3.1
MCM05050H20K00		(545)	20					0.123	
MCM05060H10K00	600	630	10	782	730	700	15	0.096	3.5
MCM05060H20K00		(645)	20					0.134	

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	5	1.0~4.8
	10	1.1~5.8
	20	1.6~7.9

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (15[margin] ×2)

Basic load rating

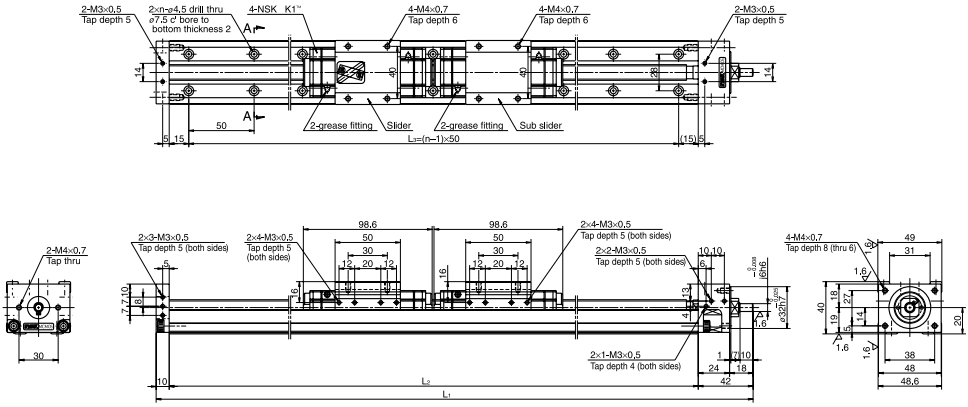
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
5	ø12	3,760	15,600	4,400	5	6,310	10,900	1,450
10		2,260	12,400		10	3,780		
20		2,260	9,850		20	3,780		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	229	89	89

MCM05 (Double slider)

Accuracy grade: High grade (H)



Dimension of MCM05 (Double slider)

△V is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	L_3	No. of mounting holes n	Inertia $\times10^{-4}$ (kg • m^2)	Mass (kg)
MCM05006H10D00	60	83 (110)	10	332	280	250	6	0.058	2.3
MCM05011H10D00	110	133 (160)	10	382	330	300	7	0.064	2.5
MCM05016H10D00	160	183 (210)	10	432	380	350	8	0.070	2.7
MCM05021H10D00	210	233	10	482	430	400	9	0.075	2.8
MCM05021H20D00		(260)	20					0.151	
MCM05031H10D00	310	333	10	582	530	500	11	0.086	3.2
MCM05031H20D00		(360)	20					0.162	
MCM05041H10D00	410	433	10	682	630	600	13	0.098	3.6
MCM05041H20D00		(460)	20					0.174	
MCM05051H10D00	510	533	10	782	730	700	15	0.109	4.2
MCM05051H20D00		(560)	20					0.185	

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	10	1.5~7.6
	20	2.3~11.8

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (11.4[margin] ×2)

Basic load rating

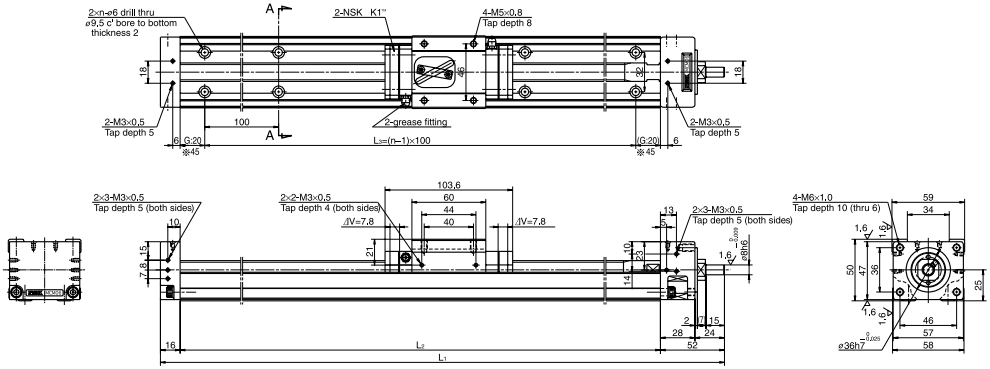
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
5	ø12	3,760	15,600	4,400	5	6,310	10,900	1,450
10		2,260	12,400		10	3,780		
20		2,260	9,850		20	3,780		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Double	455	765	765

MCM06

Accuracy grade: High grade (H)



Dimension of MCM06 (Single slider)

ΔV is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	L_3	No. of mounting holes n	Inertia ×10⁻⁴ (kg • m²)	Mass (kg)
※MCM06005H05K00	50	85	5	258	190	100	2	0.083	2.7
※MCM06005H10K00		(102)	10					0.077	
MCM06010H05K00	100	135	5	308	240	200	3	0.103	3.0
MCM06010H10K00		(152)	10					0.092	
MCM06020H05K00	200	235	5	408	340	300	4	0.142	3.8
MCM06020H10K00		(252)	10					0.121	
MCM06030H05K00	300	335	5	508	440	400	5	0.180	4.5
MCM06030H10K00		(352)	10					0.150	
MCM06030H20K00			20					0.196	
MCM06040H05K00	400	435	5	608	540	500	6	0.219	5.2
MCM06040H10K00		(452)	10					0.180	
MCM06040H20K00			20					0.225	
MCM06050H05K00	500	535	5	708	640	600	7	0.258	6.0
MCM06050H10K00		(552)	10					0.209	
MCM06050H20K00			20					0.255	
MCM06060H10K00	600	635	10	808	740	700	8	0.239	6.7
MCM06060H20K00		(652)	20					0.284	
MCM06070H10K00	700	735	10	908	840	800	9	0.268	7.4
MCM06070H20K00		(752)	20					0.314	
MCM06080H10K00	800	835	10	1,008	940	900	10	0.298	8.1
MCM06080H20K00		(852)	20					0.343	

Dimension G is 45 for those marked with※

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	5	1.9~7.4
	10	2.2~8.6
	20	2.8~11.0

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (17.5[margin] ×2)

Basic load rating

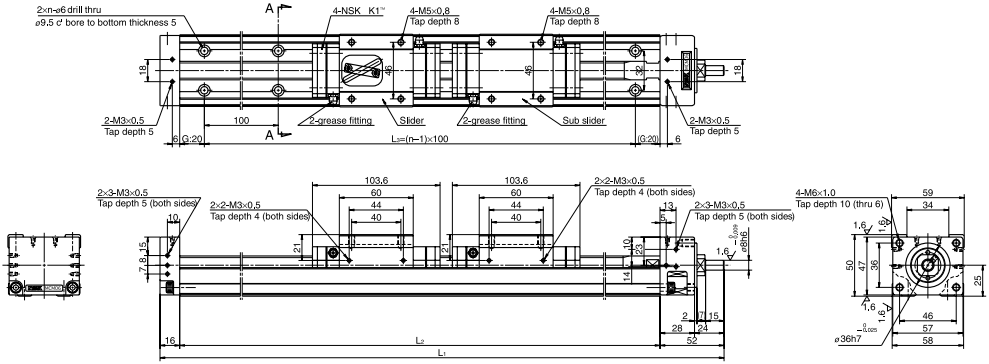
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
5	ø16	7,310	25,200	6,550	5	13,500	17,000	2,730
10	ø15	7,060	20,000		10	12,700		
20		4,560	15,900		20	7,750		

Basic static moment load of linear guide

Slider	Basic static moment load (N •m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	415	174	174

MCM06 (Double slider)

Accuracy grade: High grade (H)



Dimension of MCM06 (Double slider)

⊿V is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	L_3	No. of mounting holes n	Inertia ×10⁻⁴ (kg m²)	Mass (kg)
MCM06011H05D00	110	133 (164)	5	408	340	300	4	0.145	4.4
MCM06011H10D00			10					0.136	
MCM06021H05D00	210	233 (264)	5	508	440	400	5	0.184	5.1
MCM06021H10D00			10					0.166	
MCM06021H20D00			20					0.257	
MCM06031H05D00	310	333 (364)	5	608	540	500	6	0.223	5.8
MCM06031H10D00			10					0.195	
MCM06031H20D00			20					0.286	
MCM06041H05D00	410	433 (464)	5	708	640	600	7	0.262	6.6
MCM06041H10D00			10					0.224	
MCM06041H20D00			20					0.316	
MCM06051H10D00	510	533 (564)	10	808	740	700	8	0.254	7.3
MCM06051H20D00			20					0.345	
MCM06061H10D00	610	633 (664)	10	908	840	800	9	0.283	8.0
MCM06061H20D00			20					0.375	
MCM06071H10D00	710	733 (764)	10	1,008	940	900	10	0.313	8.7
MCM06071H20D00			20					0.404	

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	5	2.3~8.5
	10	2.7~10.9
	20	4.0~15.9

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (11.4[margin] ×2)

Basic load rating

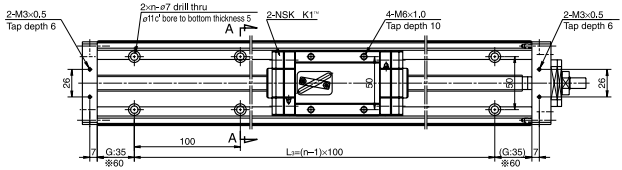
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
5	ø16	7,310	25,200	6,550	5	13,500	17,000	2,730
10	ø15	7,060	20,000		10	12,700		
20		4,560	15,900		20	7,750		

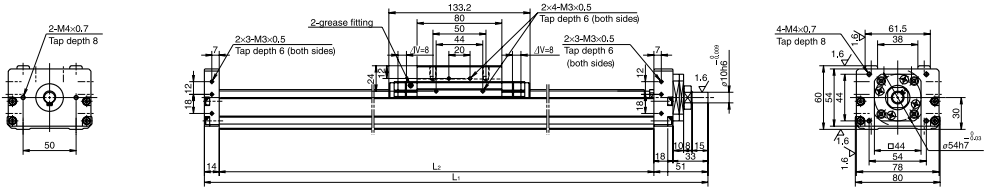
Basic static moment load of linear guide

Slider	Basic static moment load (N • m) Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Double	825	1,220	1,220

MCM08

Accuracy grade: High grade (H)





Dimension of MCM08 (Single slider)

ΔV is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	L_3	No. of mounting holes n	Inertia ×10⁻⁴ (kg • m²)	Mass (kg)
※**MCM08005H05K00**	50	85 (101)	5	285	220	100	2	0.101	4.1
MCM08010H05K00	100	135	5	335	270	200	3	0.120	4.6
MCM08010H10K00		(151)	10					0.114	
※**MCM08015H05K00**	150	185 (201)	5	385	320	200	3	0.139	5.1
MCM08020H05K00	200	235	5	435	370	300	4	0.159	5.5
MCM08020H10K00		(251)	10					0.144	
MCM08030H10K00	300	335	10	535	470	400	5	0.173	6.5
MCM08030H20K00		(351)	20					0.249	
MCM08040H10K00	400	435	10	635	570	500	6	0.203	7.4
MCM08040H20K00		(451)	20					0.279	
MCM08050H10K00	500	535	10	735	670	600	7	0.232	8.4
MCM08050H20K00		(551)	20					0.308	
MCM08060H10K00	600	635	10	835	770	700	8	0.262	9.3
MCM08060H20K00		(651)	20					0.338	
MCM08070H10K00	700	735	10	935	870	800	9	0.291	10.5
MCM08070H20K00		(751)	20					0.367	
MCM08080H10K00	800	835	10	1,035	970	900	10	0.320	11.2
MCM08080H20K00		(851)	20					0.396	

Dimension G is 60 for those marked with※.

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	5	1.0~5.9
	10	2.0~7.8
	20	2.5~10.8

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (17.5[margin] ×2)

Basic load rating

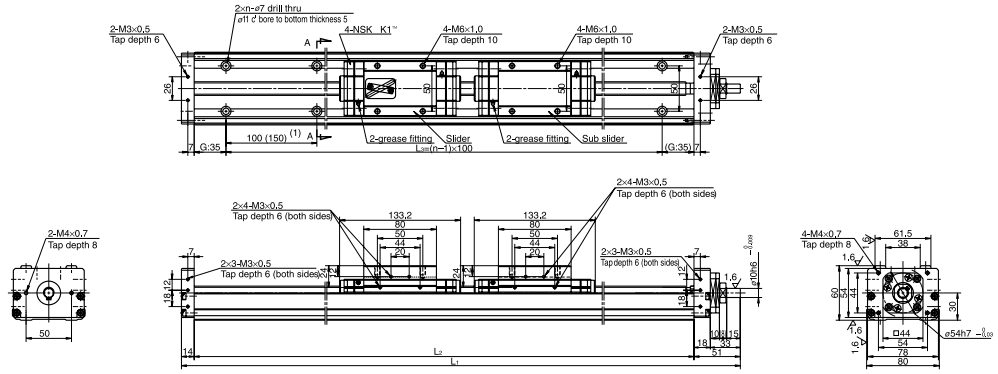
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
5	ø16	7,310	30,800	7,100	5	13,500	22,800	3,040
10	ø15	7,060	24,400		10	12,700		
20		4,560	19,400		20	7,750		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	770	300	300

MCM08 (Double slider)

Accuracy grade: High grade (H)



Dimension of MCM08 (Double slider)

△V is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	L_3	No. of mounting holes n	Inertia ×10⁻⁴ (kg • m²)	Mass (kg)
● **MCM08008H10D00**	80	104 (136)	10	435	370	300	3	0.169	6.5
MCM08018H10D00	180	204	10	535	470	400	5	0.199	7.5
MCM08018H20D00		(236)	20					0.351	
MCM08028H10D00	280	304	10	635	570	500	6	0.228	8.4
MCM08028H20D00		(336)	20					0.380	
MCM08038H10D00	380	404	10	735	670	600	7	0.257	9.4
MCM08038H20D00		(436)	20					0.409	
MCM08048H10D00	480	504	10	835	770	700	8	0.287	10.3
MCM08048H20D00		(536)	20					0.439	
MCM08058H10D00	580	604	10	935	870	800	9	0.316	11.5
MCM08058H20D00		(636)	20					0.468	
MCM08068H10D00	680	704	10	1,035	970	900	10	0.346	12.2
MCM08068H20D00		(736)	20					0.498	

Dimension (1) is 150mm for those marked with ●.

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	10	2.5~10.8
	20	4.0~17.2

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (11.8[margin] ×2)

Basic load rating

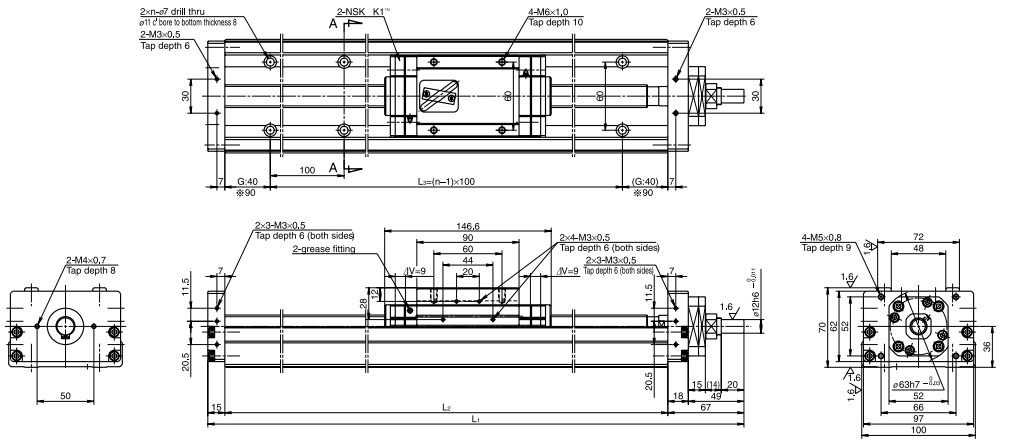
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
5	ø16	7,310	30,800	7,100	5	13,500	22,800	3,040
10	ø15	7,060	24,400		10	12,700		
20		4,560	19,400		20	7,750		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m) Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Double	1,540	2,050	2,050

MCM10

Accuracy grade: High grade (H)



Dimension of MCM10 (Single slider)

ΔV is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	Body length (mm) L_2	Body length (mm) L_3	No. of mounting holes n	Inertia $\times 10^{-4}$ (kg • m^2)	Mass (kg)
MCM10020H10K00	200	230 (251)	10	462	380	300	4	0.425	9.5
MCM10030H10K00	300	330 (351)	10	562	480	400	5	0.519	11.2
MCM10030H20K00			20					0.633	
MCM10040H10K00	400	430 (451)	10	662	580	500	6	0.612	13.0
MCM10040H20K00			20					0.726	
MCM10050H10K00	500	530 (551)	10	762	680	600	7	0.706	14.6
MCM10050H20K00			20					0.820	
MCM10060H10K00	600	630 (651)	10	862	780	700	8	0.800	16.3
MCM10060H20K00			20					0.914	
MCM10070H10K00	700	730 (751)	10	962	880	800	9	0.893	18.0
MCM10070H20K00			20					1.007	
MCM10080H10K00	800	830 (851)	10	1,062	980	900	10	0.987	19.7
MCM10080H20K00			20					1.101	
MCM10090H10K00	900	930 (951)	10	1,162	1,080	1,000	11	1.081	21.4
MCM10090H20K00			20					1.195	
※MCM10100H10K00	1,000	1,030 (1,051)	10	1,262	1,180	1,000	11	1.174	23.1
※MCM10100H20K00			20					1.288	

Dimension G is 90 for those marked with※.

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	10	2.7~10.8
	20	3.1~12.7

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (15[margin] ×2)

Basic load rating

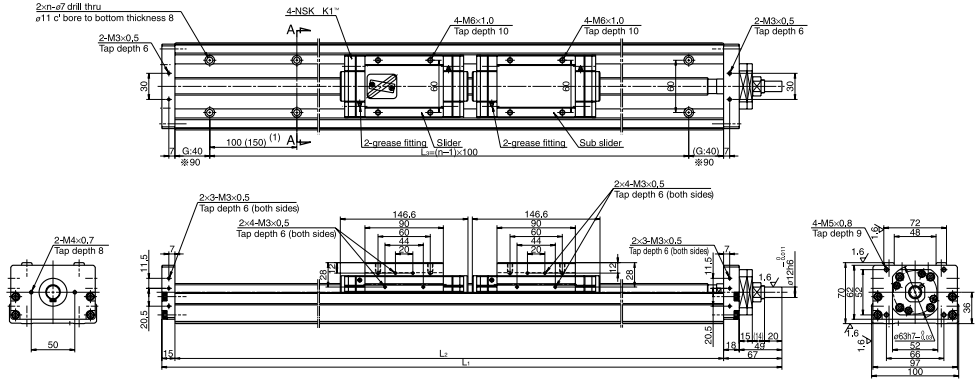
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
10	⌀20	10,900	33,500	7,600	10	21,700	29,400	3,380
20		7,060	26,600		20	12,700		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	1,170	425	425

MCM10 (Double slider)

Accuracy grade: High grade (H)



Dimension of MCM10 (Double slider)

ΔV is thickness of NSK K1™ Lubrication Unit

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	Body length (mm) L_2	Body length (mm) L_3	No. of mounting holes n	Inertia ×10⁻⁴ (kg • m²)	Mass (kg)
● **MCM10007H10D00**	70	86 (122)	10	462	380	300	3	0.463	11.0
MCM10017H10D00	170	186 (222)	10	562	480	400	5	0.557	12.7
MCM10017H20D00			20					0.785	
MCM10027H10D00	270	286 (322)	10	662	580	500	6	0.650	13.4
MCM10027H20D00			20					0.878	
MCM10037H10D00	370	386 (422)	10	762	680	600	7	0.744	15.1
MCM10037H20D00			20					0.972	
MCM10047H10D00	470	486 (522)	10	862	780	700	8	0.838	17.8
MCM10047H20D00			20					1.066	
MCM10057H10D00	570	586 (622)	10	962	880	800	9	0.931	19.5
MCM10057H20D00			20					1.159	
MCM10067H10D00	670	686 (722)	10	1,062	980	900	10	1.025	21.2
MCM10067H20D00			20					1.253	
※ **MCM10087H10D00**	870	886 (922)	10	1,262	1,180	1,000	11	1.212	23.6
※ **MCM10087H20D00**			20					1.440	

Dimension G is 90 for those marked with※.
Dimension (1) is 150mm for those marked with ●.

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	10	4.2~15.6
	20	5.0~19.6

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.
4. Stroke limit = stroke + (8.4[margin] ×2)

Basic load rating

Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
10	ø20	10,900	33,500	7,600	10	21,700	29,400	3,380
20		7,060	26,600		20	12,700		

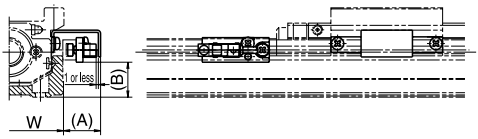
Basic static moment load of linear guide

Slider	Basic static moment load (N • m) Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Double	2,340	2,940	2,940

2. 3 MCM Series Optional Accessories

2. 3. 1 Sensor Unit

● Proximity switch



(Example of assembly)

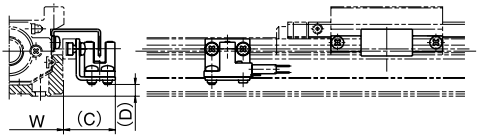
Type		Reference Number			Dimension (A) (mm)	Dimension (B) (mm)	Body width W (mm)
MCM02		MC-SR02-00	MC-SR02-01	MC-SR02-02	17	2	28
MCM03		MC-SR03-10	MC-SR03-11	MC-SR03-12	17	3	34
MCM05		MC-SR05-10	MC-SR05-11	MC-SR05-12	17	15	48.6
MCM06		MC-SR06-10	MC-SR06-11	MC-SR06-12	17	19	58
MCM08		MC-SR08-10	MC-SR08-11	MC-SR08-12	16	27	80
MCM10		MC-SR10-10	MC-SR10-11	MC-SR10-12	16	35	100
Quantity	Proximity switch (a-contact)	—	3	1	E2S-W13(OMRON Corp.)		
	Proximity switch (b-contact)	3	—	2	E2S-W14(OMRON Corp.)		

*See page 19 for specification of proximity switch

A sensor unit consists of sensors and sensor mounting parts.

A spacer plate is required when you use a cover unit or sensor unit for an MCM03 with a lead of 1 or 2 mm. (Refer to page 39.)

● Photo sensor



(Example of assembly)

Type	NPN Sensor* Reference Number	PNP Sensor** Reference Number	Dimension (C) (mm)	Dimension (D) (mm)	Body width W (mm)	Remarks
MCM03	MC-SR03-13	MC-SR03-40	24	0.5	34	* OMRON EE-SX674 ** OMRON EE-SX674P EE-1001 Connector 3 Sensors & 3 Connectors per Ref No.
MCM05	MC-SR05-13	MC-SR05-62	24	5	48.6	
MCM06	MC-SR06-13	MC-SR06-46	24	9	58	
MCM08	MC-SR08-13	MC-SR08-56	23	17	80	
MCM10	MC-SR10-13	MC-SR10-45	22	24	100	

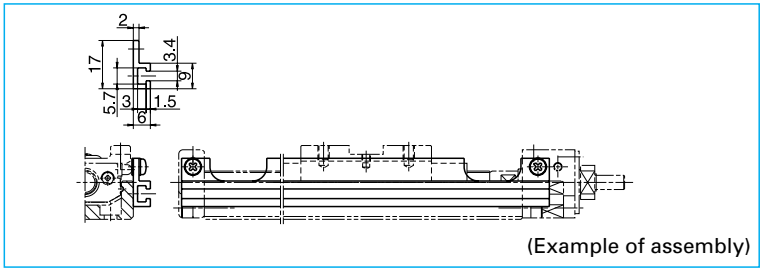
*See page 20 for specification of photo sensor

A sensor unit consists of sensors and sensor mounting parts.

A spacer plate is required when you use a cover unit or sensor unit for an MCM03 with a lead of 1 or 2 mm. (Refer to page 39.)

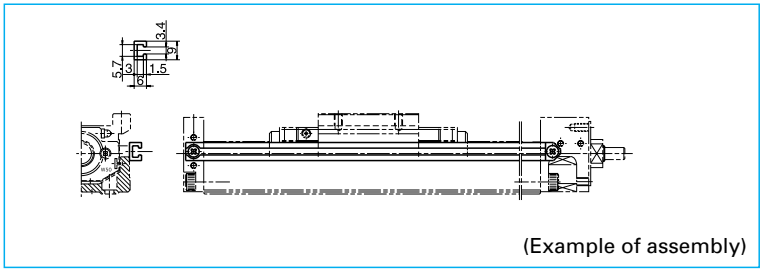
Sensor rail

Sensor rail for MCM03: MC-SRL3- * * * *



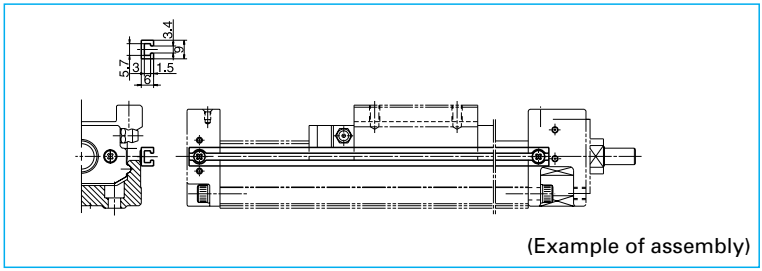
(Example of assembly)

Sensor rail for MCM05: MC-SRL5- * * * *



(Example of assembly)

Sensor rail for MCM02: MC-SRL2- * * * *
Sensor rail for MCM06: MC-SRL6- * * * *
Sensor rail for MCM08: MC-SRL8- * * * *
Sensor rail for MCM10: MC-SRL1- * * * *



(Example of assembly)

* * * * is the same as rail dimension L_2

Please install washer between sensor rail and support blocks for MCM03, MCM05, MCM06 and MCM08.

Body of MCM Series and sensor rail combination table

Table 2-4

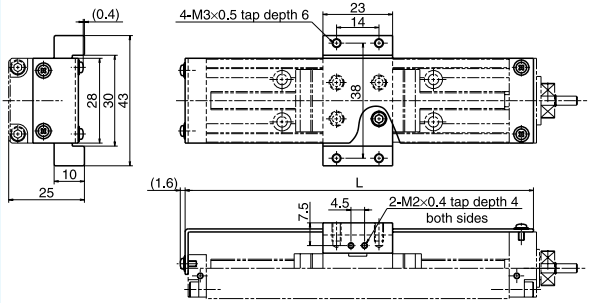
Nominal size	Body length L_2 (mm)	Reference number	Sensor rail reference number
MCM02	100	MCM02005H01K MCM02005P01K MCM02005H02K MCM02005P02K	MC-SRL2-0100
	150	MCM02010H01K MCM02010P01K MCM02010H02K MCM02010P02K	MC-SRL2-0150
	200	MCM02015H01K MCM02015P01K MCM02015H02K MCM02015P02K	MC-SRL2-0200
MCM03	115	MCM03005P01K00 MCM03005P02K00	MC-SRL3-0115
	190	MCM03010P01K00 MCM03010P02K00 MCM03010H10K00 MCM03010H12K00	MC-SRL3-0190
	240	MCM03015P01K00 MCM03015P02K00 MCM03015H10K00 MCM03015H12K00	MC-SRL3-0240
	290	MCM03020H10K00 MCM03020H12K00	MC-SRL3-0290
	340	MCM03025H10K00 MCM03025H12K00	MC-SRL3-0340
MCM05	180	MCM05005H05K00 MCM05005H10K00	MC-SRL5-0180
	230	MCM05010H05K00 MCM05010H10K00	MC-SRL5-0230
	280	MCM05015H05K00 MCM05015H10K00 MCM05006H10D00	MC-SRL5-0280
	330	MCM05020H05K00 MCM05020H10K00 MCM05011H10D00	MC-SRL5-0330
	380	MCM05025H10K00 MCM05016H10D00	MC-SRL5-0380
	430	MCM05030H10K00 MCM05030H20K00 MCM05021H10D00 MCM05021H20D00	MC-SRL5-0430
	530	MCM05040H10K00 MCM05040H20K00 MCM05031H10D00 MCM05031H20D00	MC-SRL5-0530
	630	MCM05050H10K00 MCM05050H20K00 MCM05041H10D00 MCM05041H20D00	MC-SRL5-0630
	730	MCM05060H10K00 MCM05060H20K00 MCM05051H10D00 MCM05051H20D00	MC-SRL5-0730

Nominal size	Body length L_2 (mm)	Reference number	Sensor rail reference number
MCM06	190	MCM06005H05K00 MCM06005H10K00	MC-SRL6-0190
	240	MCM06010H05K00 MCM06010H10K00	MC-SRL6-0240
	340	MCM06020H05K00 MCM06020H10K00 MCM06011H05D00 MCM06011H10D00	MC-SRL6-0340
	440	MCM06030H05K00 MCM06030H10K00 MCM06030H20K00 MCM06021H05D00 MCM06021H10D00 MCM06021H20D00	MC-SRL6-0440
	540	MCM06040H05K00 MCM06040H10K00 MCM06040H20K00 MCM06031H05D00 MCM06031H10D00 MCM06031H20D00	MC-SRL6-0540
	640	MCM06050H05K00 MCM06050H10K00 MCM06050H20K00 MCM06041H05D00 MCM06041H10D00 MCM06041H20D00	MC-SRL6-0640
	740	MCM06060H10K00 MCM06060H20K00 MCM06051H10D00 MCM06051H20D00	MC-SRL6-0740
	840	MCM06070H10K00 MCM06070H20K00 MCM06061H10D00 MCM06061H20D00	MC-SRL6-0840
	940	MCM06080H10K00 MCM06080H20K00 MCM06071H10D00 MCM06071H20D00	MC-SRL6-0940

Nominal size	Body length L_2 (mm)	Reference number	Sensor rail reference number
MCM08	220	MCM08005H05K00	MC-SRL8-0220
	270	MCM08010H05K00 MCM08010H10K00	MC-SRL8-0270
	320	MCM08015H05K00	MC-SRL8-0320
	370	MCM08020H05K00 MCM08020H10K00 MCM08008H10D00	MC-SRL8-0370
	470	MCM08030H10K00 MCM08030H20K00 MCM08018H10D00 MCM08018H20D00	MC-SRL8-0470
	570	MCM08040H10K00 MCM08040H20K00 MCM08028H10D00 MCM08028H20D00	MC-SRL8-0570
	670	MCM08050H10K00 MCM08050H20K00 MCM08038H10D00 MCM08038H20D00	MC-SRL8-0670
	770	MCM08060H10K00 MCM08060H20K00 MCM08048H10D00 MCM08048H20D00	MC-SRL8-0770
	870	MCM08070H10K00 MCM08070H20K00 MCM08058H10D00 MCM08058H20D00	MC-SRL8-0870
	970	MCM08080H10K00 MCM08080H20K00 MCM08068H10D00 MCM08068H20D00	MC-SRL8-0970
MCM10	380	MCM10020H10K00 MCM10007H10D00	MC-SRL1-0380
	480	MCM10030H10K00 MCM10030H20K00 MCM10017H10D00 MCM10017H20D00	MC-SRL1-0480
	580	MCM10040H10K00 MCM10040H20K00 MCM10027H10D00 MCM10027H20D00	MC-SRL1-0580
	680	MCM10050H10K00 MCM10050H20K00 MCM10037H10D00 MCM10037H20D00	MC-SRL1-0680
	780	MCM10060H10K00 MCM10060H20K00 MCM10047H10D00 MCM10047H20D00	MC-SRL1-0780
	880	MCM10070H10K00 MCM10070H20K00 MCM10057H10D00 MCM10057H20D00	MC-SRL1-0880
	980	MCM10080H10K00 MCM10080H20K00 MCM10067H10D00 MCM10067H20D00	MC-SRL1-0980
	1,080	MCM10090H10K00 MCM10090H20K00	MC-SRL1-1080
	1,180	MCM10100H10K00 MCM10100H20K00 MCM10087H10D00 MCM10087H20D00	MC-SRL1-1180

2. 3. 2 Cover Unit

Cover Unit for MCM02



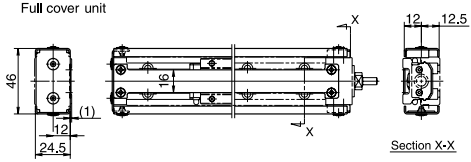
(Unit: mm)

Stroke	Reference number	Length (L)
50	**MC-CV02005-00**	115
100	**MC-CV02010-00**	165
150	**MC-CV02015-00**	215

Height of screw head is not included.

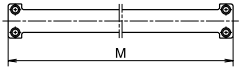
Cover Unit for MCM03

Full cover unit



Optional spacer (MC-SP03-00) is required for a main unit with ball screw lead of 1 and 2 mm.

Top cover unit

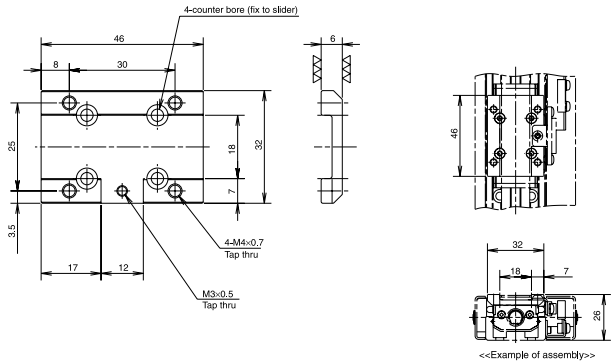


(Unit: mm)

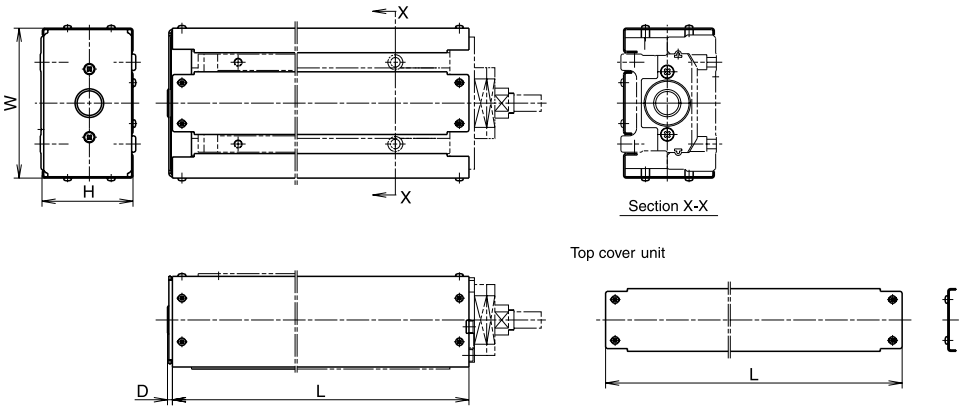
Stroke	Reference number		Cover length	
	Top cover unit	Full cover unit	Length (L)	Length (M)
50	**MC-CV03005-02**	***MC-CV03005-01**	139	133
100	**MC-CV03010-02**	***MC-CV03010-01**	214	208
150	**MC-CV03015-02**	***MC-CV03015-01**	264	258
200	**MC-CV03020-02**	***MC-CV03020-01**	314	308
250	**MC-CV03025-02**	***MC-CV03025-01**	364	358

*The full cover unit cannot be used when the sensor unit or combining bracket are used. Height of screw head is not included.

Spacer for MCM03 (Optional) MC-SP03-00 (for ball screw lead 1 and 2 mm)



Cover Unit for MCM05, 06, 08 and 10



(Unit: mm)

Reference number	Stroke		Cover unit reference number		Cover length			
	Single slider	Double slider	Top cover unit	Full cover unit	Length (L)	Height (H)	Width (W)	End part (D)
MCM05	50	—	MC-CV05005-01	MC-CV05005-00	200	38.5	65	2.6
	100	—	MC-CV05010-01	MC-CV05010-00	250			
	150	60	MC-CV05015-01	MC-CV05015-00	300			
	200	110	MC-CV05020-01	MC-CV05020-00	350			
	250	160	MC-CV05025-01	MC-CV05025-00	400			
	300	210	MC-CV05030-01	MC-CV05030-00	450			
	400	310	MC-CV05040-01	MC-CV05040-00	550			
	500	410	MC-CV05050-01	MC-CV05050-00	650			
	600	510	MC-CV05060-37	MC-CV05060-35	750			
MCM06	50	—	MC-CV06005-01	MC-CV06005-00	225	48.5	75	—
	100	—	MC-CV06010-01	MC-CV06010-00	275			
	200	110	MC-CV06020-01	MC-CV06020-00	375			
	300	210	MC-CV06030-01	MC-CV06030-00	475			
	400	310	MC-CV06040-01	MC-CV06040-00	575			
	500	410	MC-CV06050-01	MC-CV06050-00	675			
	600	510	MC-CV06060-01	MC-CV06060-00	775			
	700	610	MC-CV06070-01	MC-CV06070-00	875			
	800	710	MC-CV06080-36	MC-CV06080-35	975			
MCM08	50	—	MC-CV08005-01	MC-CV08005-00	248	56.5	90	2.6
	100	—	MC-CV08010-01	MC-CV08010-00	298			
	200	80	MC-CV08020-01	MC-CV08020-00	398			
	300	180	MC-CV08030-01	MC-CV08030-00	498			
	400	280	MC-CV08040-01	MC-CV08040-00	598			
	500	380	MC-CV08050-01	MC-CV08050-00	698			
	600	480	MC-CV08060-01	MC-CV08060-00	798			
	700	580	MC-CV08070-01	MC-CV08070-00	898			
	800	680	MC-CV08080-01	MC-CV08080-00	998			
MCM10	200	70	MC-CV10020-01	MC-CV10020-00	408	66.5	110	2.6
	300	170	MC-CV10030-01	MC-CV10030-00	508			
	400	270	MC-CV10040-01	MC-CV10040-00	608			
	500	370	MC-CV10050-01	MC-CV10050-00	708			
	600	470	MC-CV10060-01	MC-CV10060-00	808			
	700	570	MC-CV10070-01	MC-CV10070-00	908			
	800	670	MC-CV10080-01	MC-CV10080-00	1,008			
	900	—	MC-CV10090-01	MC-CV10090-00	1,108			
	1,000	870	MC-CV10100-36	MC-CV10100-35	1,208			

Height of screw head is not included.

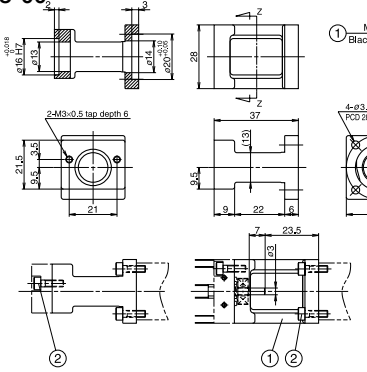
The dimensions of the cover shown above do not include the head height of fixing machine screws. Add approximately 2.5mm to the outer measurement of the cover unit to represent the height of the screw head. Set a margin for mechanical interference with surrounding components.

*When you use a sensor unit or combining bracket, the full cover unit cannot be used.

2. 3. 3 Motor Bracket

Motor Bracket for MCM02

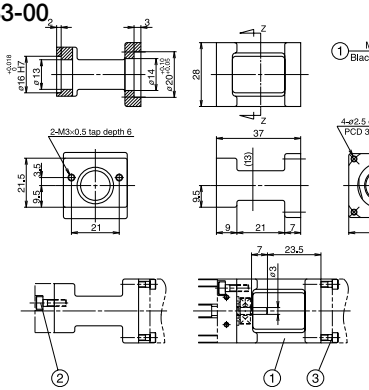
■ **Reference number**
MC-BK02-128-00



Note: Be sure to align the center lines when installing the motor.

Compatible motor	
Maker	Motor models
Yaskawa Electric Corp. (Σ-mini Series)	SGMM-A1(10W) SGMM-A2(20W)

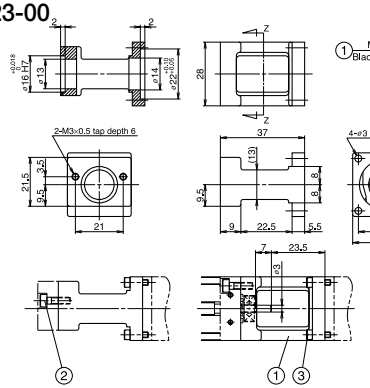
■ **Reference number**
MC-BK02-133-00



Note: Be sure to align the center lines when installing the motor.

Compatible motor	
Maker	Motor models
Mitsubishi Electric Corp. (Melservo series)	HC-AQ013(10W) HC-AQ023(20W)

■ **Reference number**
MC-BK02-223-00

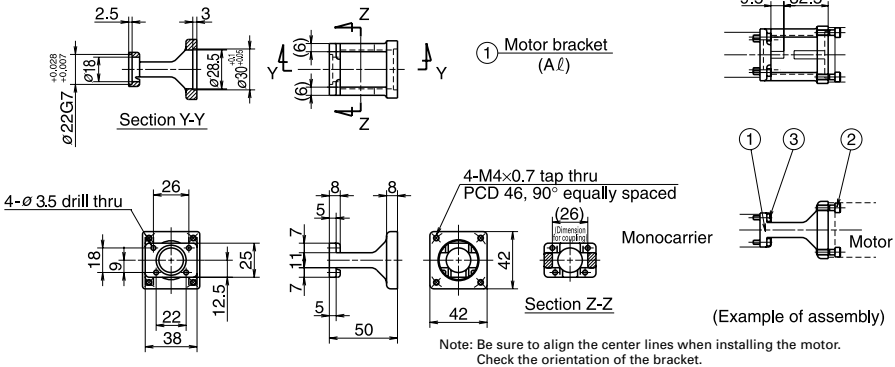


Note: Be sure to align the center lines when installing the motor.

Compatible motor	
Maker	Motor models
Oriental Motor Co., Ltd.	PMU33/35(5-phase stepping motor) PMC33/35(5-phase stepping motor)

Motor Bracket for MCM03

■ Reference number
MC-BK03-146-00



Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

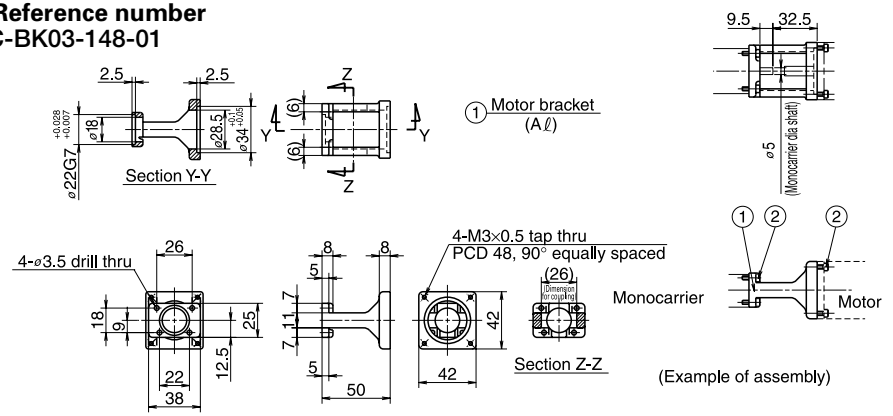
② Hexagon socket head cap screw (M4, length 12)

③ Hexagon socket head cap screw (M3, length 10)

Compatible motor	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-A3(30W), SGMAH-A5(50W), SGMAS-A5A(50W) SGMAH-01(100W), SGMAS-01A(100W)
Mitsubishi Electric Corp.	HF-KP053(50W), HF-MP053(50W), HC-KFS053(50W), HC-MFS053(50W) HF-KP13(100W), HF-MP13(100W), HC-KFS13(100W), HC-MFS13(100W)
OMRON Corp.	R88M-W03(30W), R88M-W05(50W), R88M-W10(100W)
Sanyo Denki Co., Ltd.	P30B04003(30W), P30B04005(50W), P30B04006(60W), P30B04010(100W)

Motor Bracket for MCM03

■ Reference number
MC-BK03-148-01



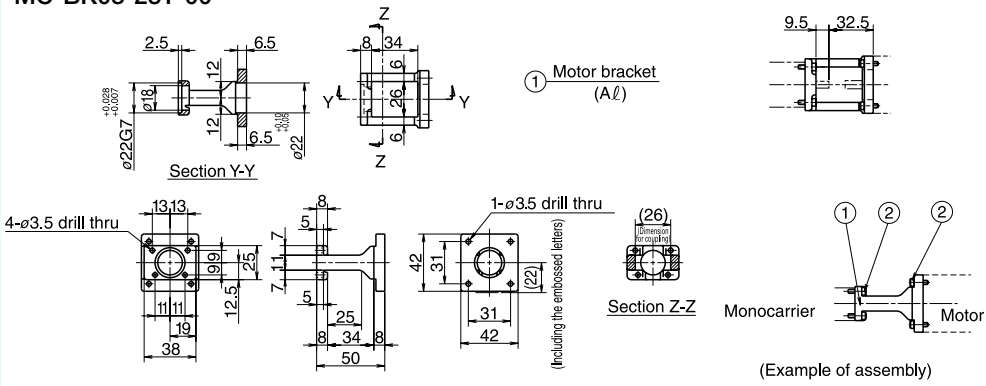
Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

② Hexagon socket head cap screw (M3, length 10)

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	P50B04040(60W), P50B04010(100W)

Motor Bracket for MCM03

■ **Reference number**
MC-BK03-231-00



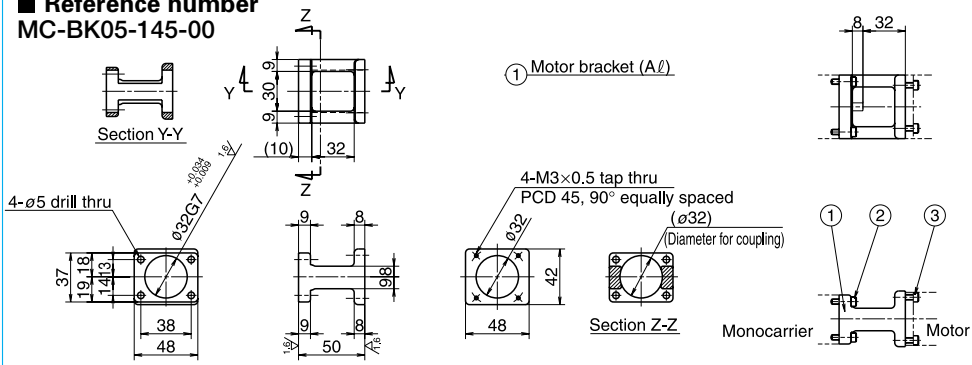
② Hexagon socket head cap screw (M3, length 10)

Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM423xxx, 103F55xx
Oriental Motor Co., Ltd.	AS46, ASC46, UPK54x, PK54x, CSK54x, CFK54x UMK24x, CSK24x, PK24x

Motor Bracket for MCM05

■ **Reference number**
MC-BK05-145-00



② Hexagon socket head cap screw (M4, length 15)

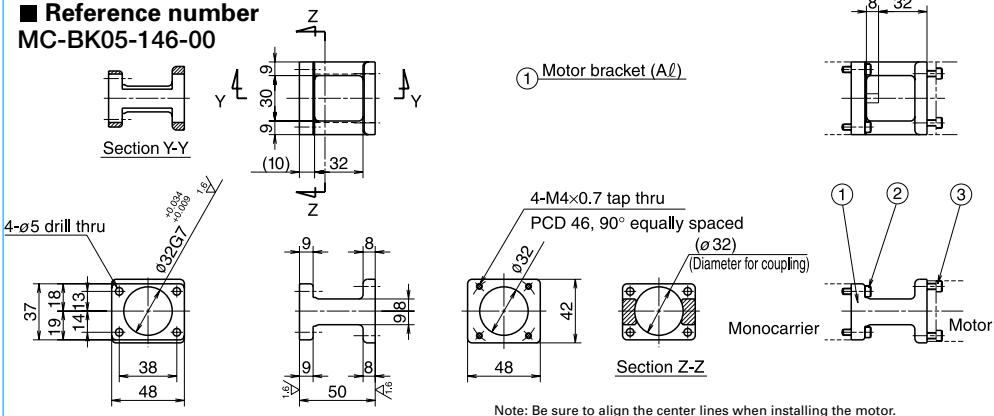
③ Hexagon socket head cap screw (M3, length 12)

Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Matsushita Electric Co., Ltd.	MSMD5A(50W), MSMD01(100W)

Motor Bracket for MCM05

■ **Reference number**
MC-BK05-146-00

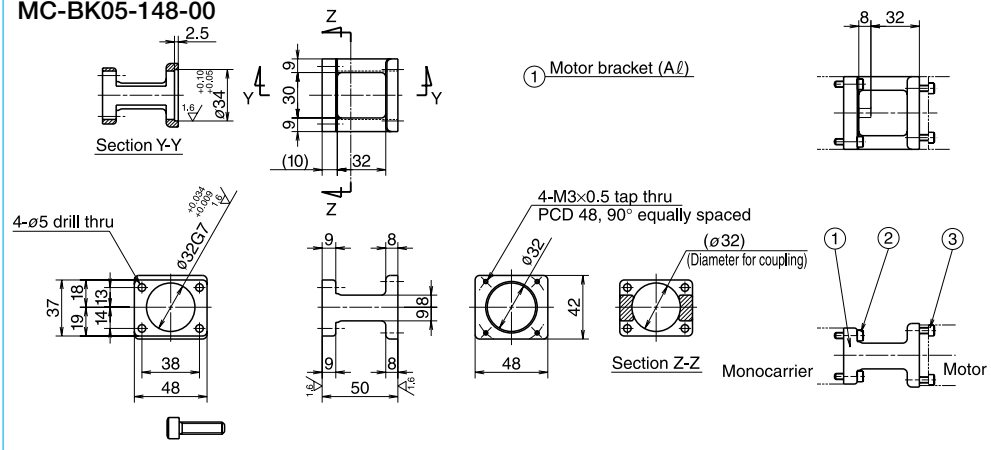


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-A3(30W), SGMAH-A5(50W), SGMAS-A5A(50W), SGMAH-01(100W), SGMAS-01A(100W)
Mitsubishi Electric Corp.	HF-KP053(50W), HF-MP053(50W), HC-KFS053(50W), HC-MFS053(50W) HF-KP13(100W), HF-MP13(100W), HC-KFS13(100W), HC-MFS13(100W)
OMRON Corp.	R88M-W03(30W), R88M-W05(50W), R88M-W10(100W)
Sanyo Denki Co., Ltd.	P30B04003(30W), P30B04005(50W), P30B04006(60W), P30B04010(100W)

Motor Bracket for MCM05

■ **Reference number**
MC-BK05-148-00

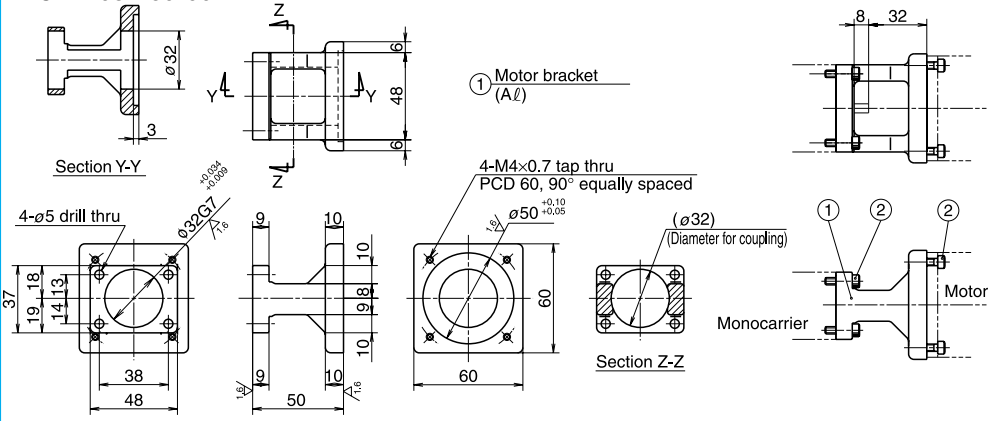


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Matsushita Electric Co., Ltd.	MAMA01(100W)

Motor Bracket for MCM05

■ Reference number
MC-BK05-160-00



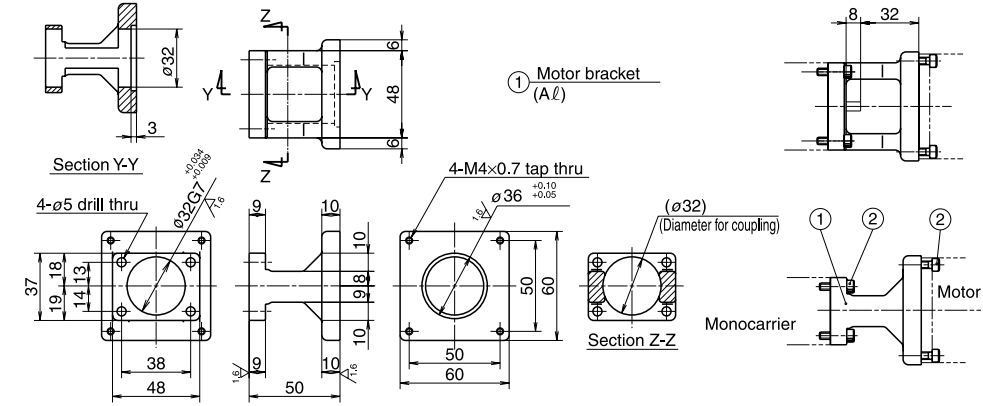
② Hexagon socket head cap screw
(M4, length 15)

Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	P50B05005(50W), P50B05010(100W), P50B05020(200W)

Motor Bracket for MCM05

■ Reference number
MC-BK05-250-00



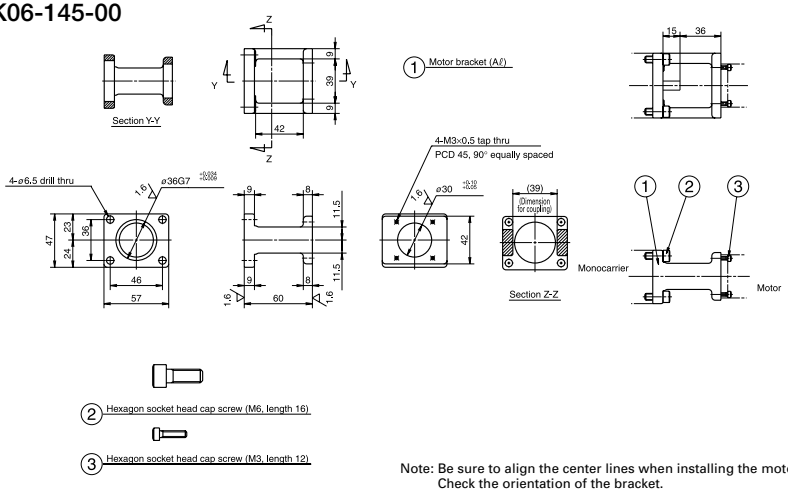
② Hexagon socket head cap screw
(M4, length 15)

Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM603xxx, PBM604xxx, 103F78xx
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56x, UFK56x PK56x, CSK56x, CFK56x

Motor Bracket for MCM06

■ Reference number
MC-BK06-145-00

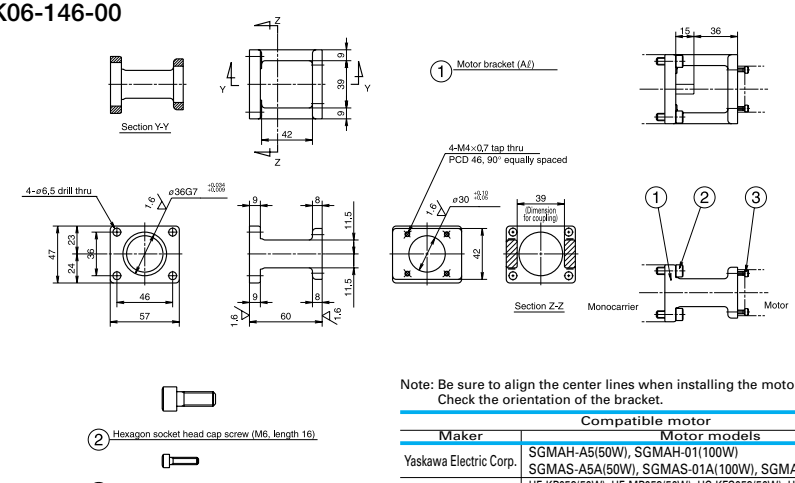


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD5A(50W), MSMD01(100W)

Motor Bracket for MCM06

■ Reference number
MC-BK06-146-00

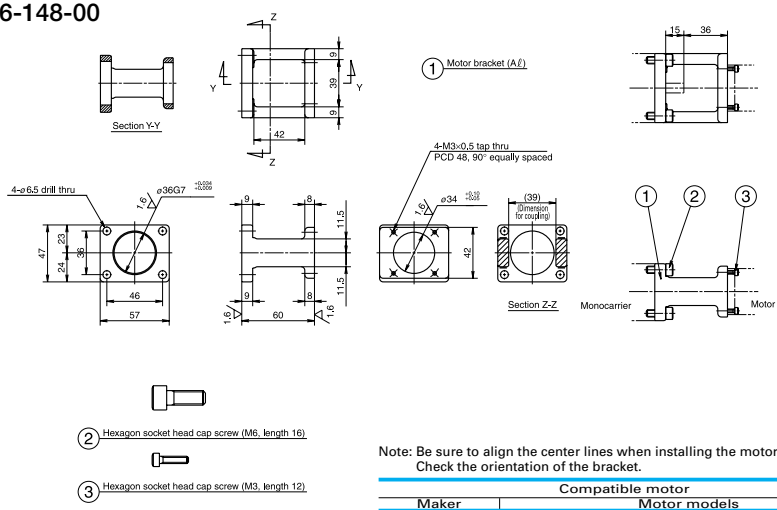


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-A5(50W), SGMAH-01(100W) SGMAS-A5A(50W), SGMAS-01A(100W), SGMAS-C2A(150W)
Mitsubishi Electric Corp.	HF-KP053(50W), HF-MP053(50W), HC-KFS053(50W), HC-MFS053(50W) HF-KP13(100W), HF-MP13(100W), HC-KFS13(100W), HC-MFS13(100W)
OMRON Corp.	R88M-W03(30W), R88M-W05(50W), R88M-W10(100W)
Sanyo Denki Co., Ltd.	P30B04003(30W), P30B04005(50W), P30B04006(60W), P30B04010(100W)

Motor Bracket for MCM06

■ Reference number
MC-BK06-148-00

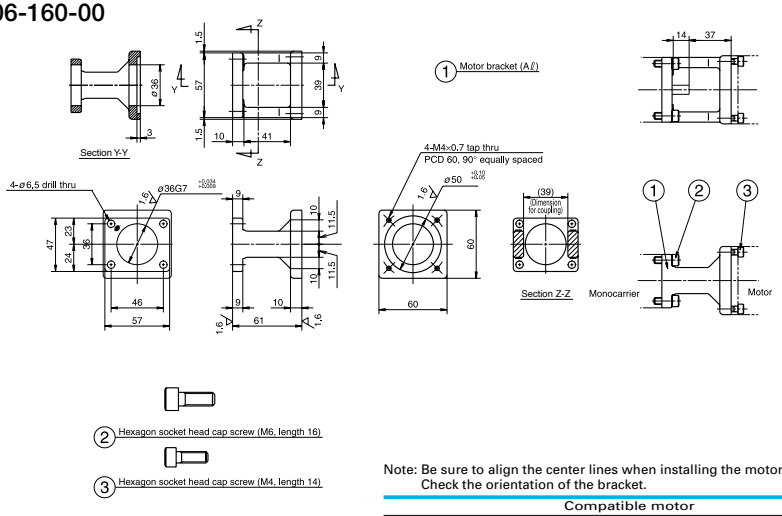


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Matsushita Electric Co., Ltd.	MAMA01(100W)
Sanyo Denki Co., Ltd.	P50B04040(60W), P50B04010(100W)

Motor Bracket for MCM06

■ Reference number
MC-BK06-160-00

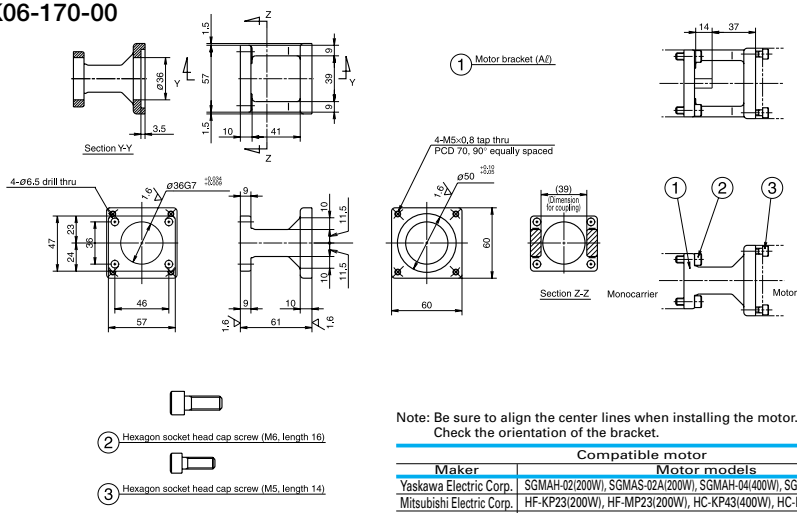


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	P50B05005(50W), P50B05010(100W), P50B05020(200W)

Motor Bracket for MCM06

■ Reference number
MC-BK06-170-00

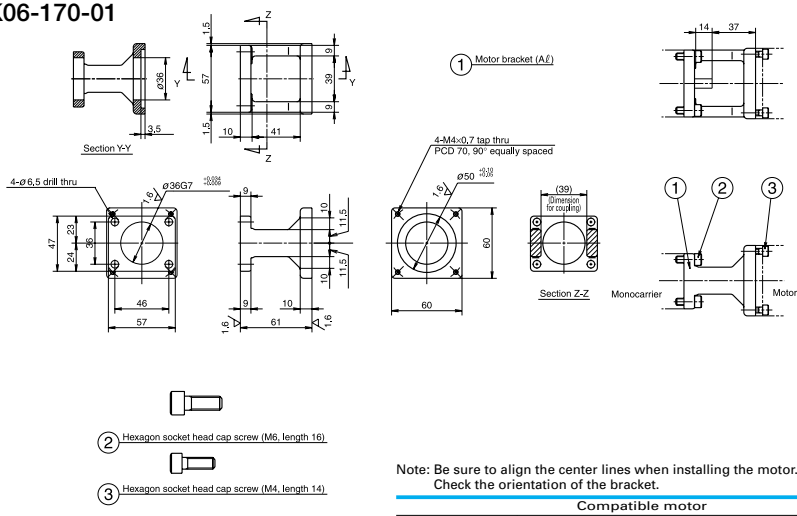


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-02(200W), SGMAS-02A(200W), SGMAH-04(400W), SGMAS-04A(400W)
Mitsubishi Electric Corp.	HF-KP23(200W), HF-MP23(200W), HC-KP43(400W), HC-MP43(400W)
OMRON Corp.	R88M-W20(200W), R88M-W40(400W)
Sanyo Denki Co., Ltd.	P30B06020(200W), P30B06040(400W)

Motor Bracket for MCM06

■ Reference number
MC-BK06-170-01

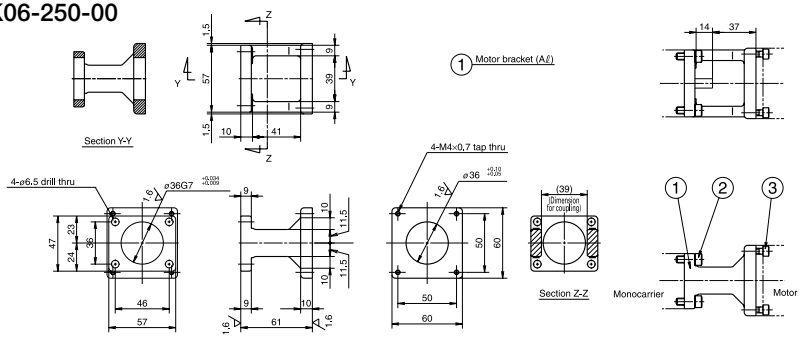


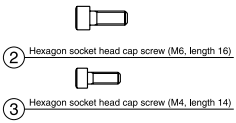
Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD02(200W), MAMA02(200W), MSMD04(400W), MAMA04(400W)

Motor Bracket for MCM06

■ Reference number
MC-BK06-250-00



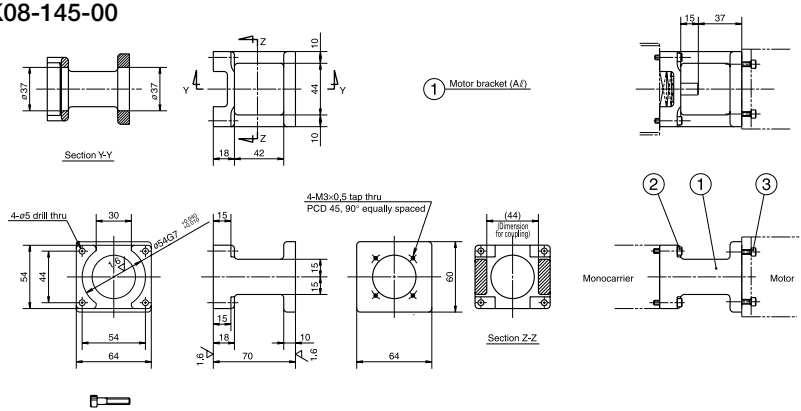


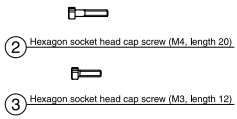
Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM603xxx, PBM604xxx, 103F78xx
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56x, PK56x, CSK56x CFK56x, UMK56x, UFK56x

Motor Bracket for MCM08

■ Reference number
MC-BK08-145-00



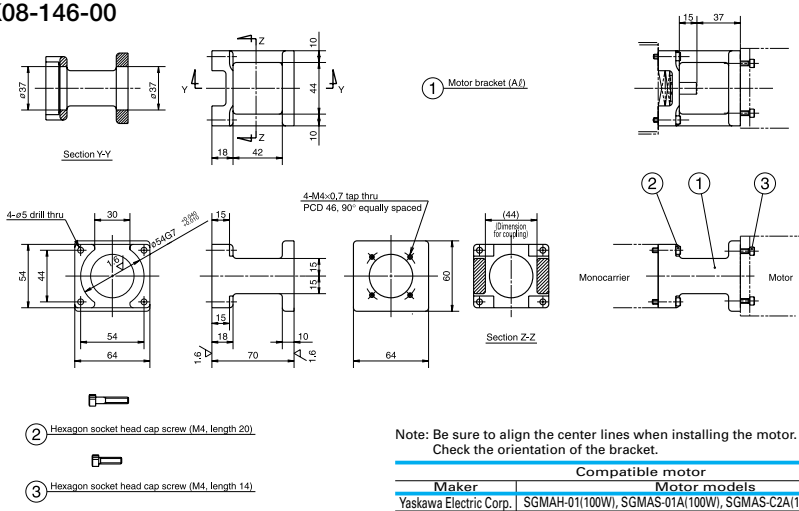


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD01(100W)

Motor Bracket for MCM08

■ Reference number
MC-BK08-146-00



② Hexagon socket head cap screw (M4, length 20)

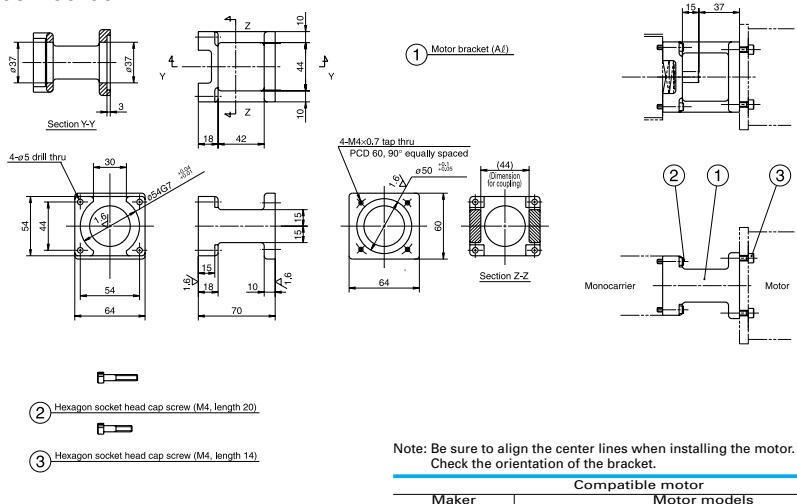
③ Hexagon socket head cap screw (M4, length 14)

Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-01(100W), SGMAS-01A(100W), SGMAS-C2A(150W)
Mitsubishi Electric Corp.	HF-KP13(100W), HF-MP13(100W), HC-KFS13(100W), HC-MFS13(100W)
Sanyo Denki Co., Ltd.	P30B04003(30W), P30B04005(50W), P30B04006(60W), P30B04010(100W)

Motor Bracket for MCM08

■ Reference number
MC-BK08-160-00



② Hexagon socket head cap screw (M4, length 20)

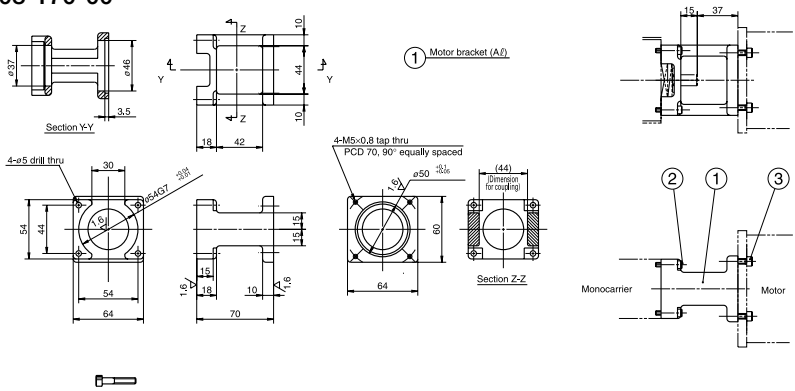
③ Hexagon socket head cap screw (M4, length 14)

Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	P50B050 05(50W), P50B05010(100W), P50B05020(200W)

Motor Bracket for MCM08

■ Reference number
MC-BK08-170-00

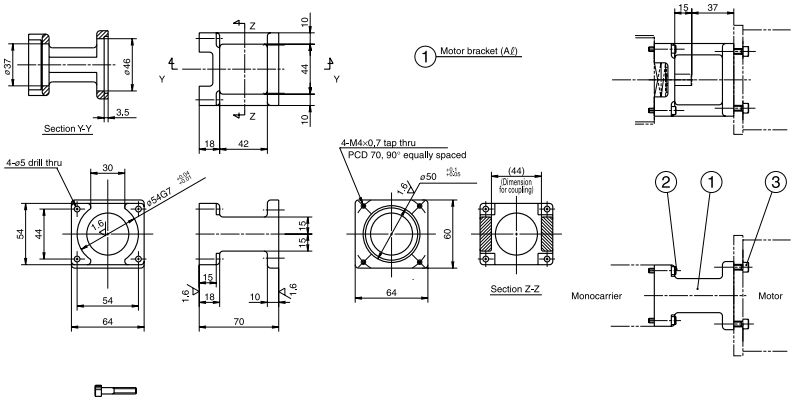


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-02(200W), SGMAS-02A(200W), SGMAH-04(400W), SGMAS-04A(400W)
Mitsubishi Electric Corp.	HF-KP23(200W), HF-MP23(200W), HF-KP43(400W), HF-MP43(400W)
OMRON Corp.	R88M-W20(200W), R88M-W40(400W)
Sanyo Denki Co., Ltd.	P30B06020(200W), P30B06040(400W)

Motor Bracket for MCM08

■ Reference number
MC-BK08-170-01

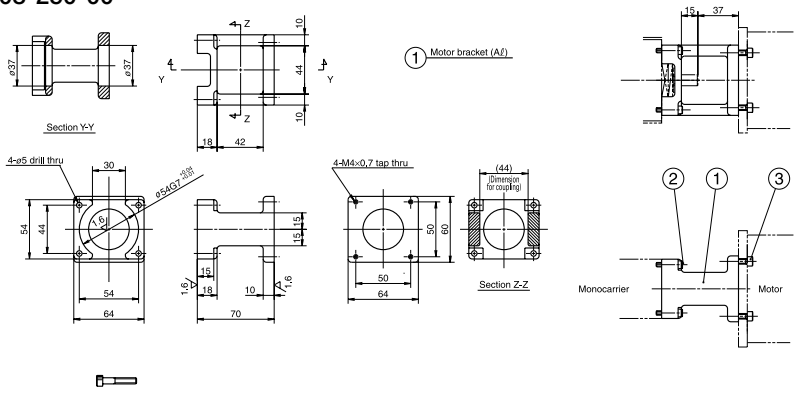


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD02(200W), MAMA02(200W), MSMD04(400W), MAMA04(400WW)

Motor Bracket for MCM08

■ Reference number
MC-BK08-250-00



Hexagon socket head cap screw (M4, length 20)

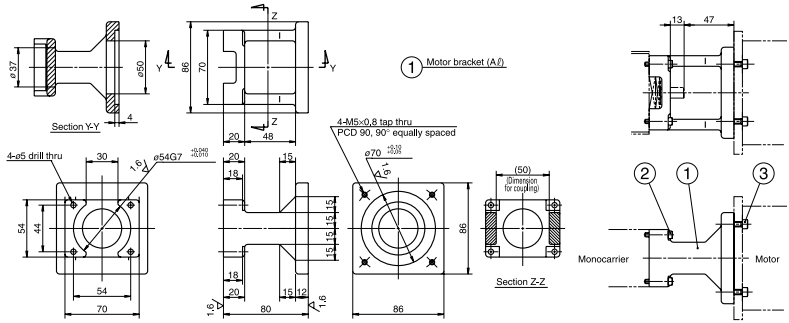
Hexagon socket head cap screw (M4, length 14)

Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM603xxx, PBM604xxx, 103F78xx
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56xx, PK56xx, CSK56x CFK56x, UMK56x, UFK56x

Motor Bracket for MCM08

■ Reference number
MC-BK08-190-00




Hexagon socket head cap screw (M4, length 22)

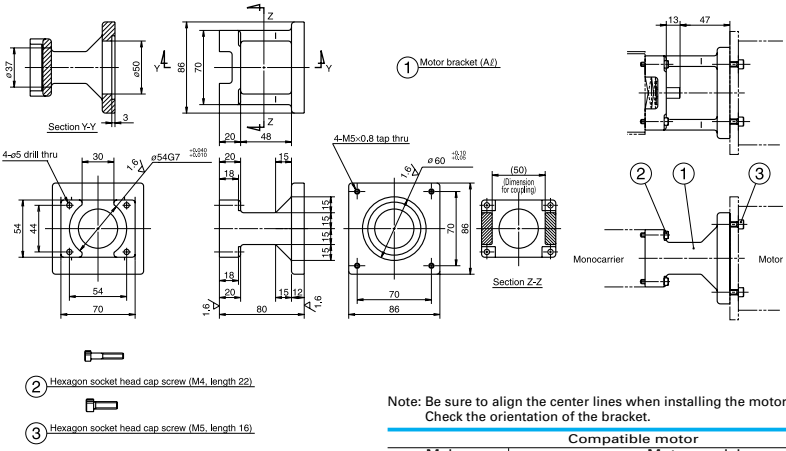
Hexagon socket head cap screw (M5, length 16)

Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	P50B07020(200W), P50B07030(300W), P50B07040(400W)

Motor Bracket for MCM08

■ Reference number
MC-BK08-270-00

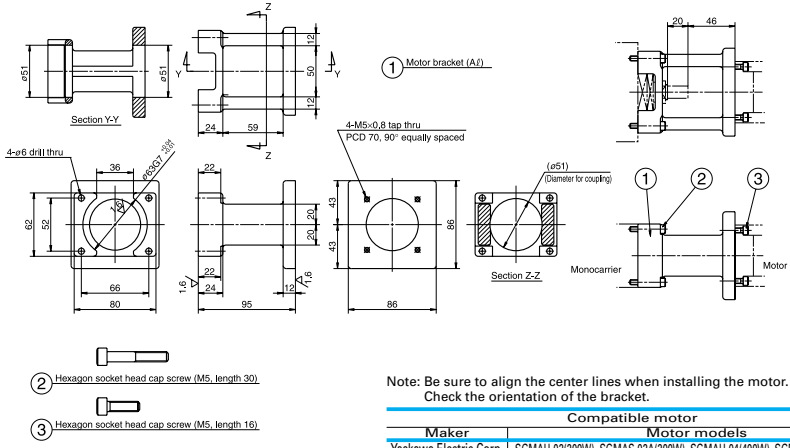


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Oriental Motor Co., Ltd.	AS98, ASC98, UPK59x, PK59x CSK59x, CFK59x, UMK59x, UFK59x
Sanyo Denki Co., Ltd.	103F85xx

Motor Bracket for MCM10

■ Reference number
MC-BK10-170-00

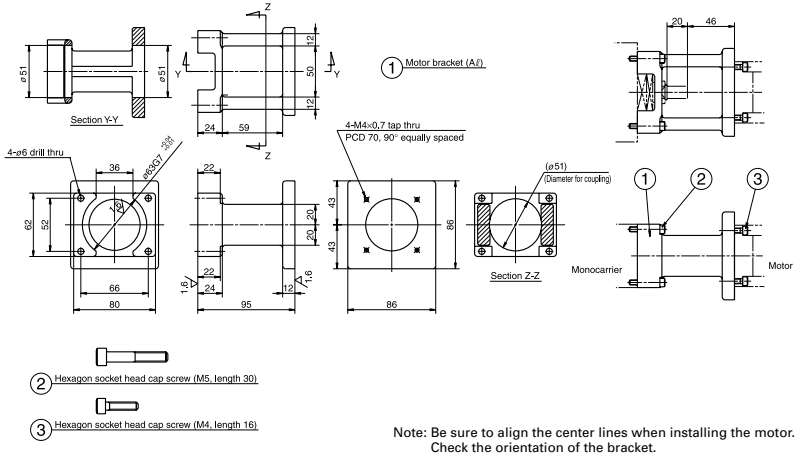


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-02(200W), SGMAS-02A(200W), SGMAH-04(400W), SGMAS-04A(400W)
Mitsubishi Electric Corp.	HF-KP23(200W), HF-MP23(200W), HF-KP43(400W), HF-MP43(400W)
OMRON Corp.	R88M-W20(200W), R88M-W40(400W)
Sanyo Denki Co., Ltd.	P30B06020(200W), P30B06040(400W)

Motor Bracket for MCM10

■ Reference number
MC-BK10-170-01

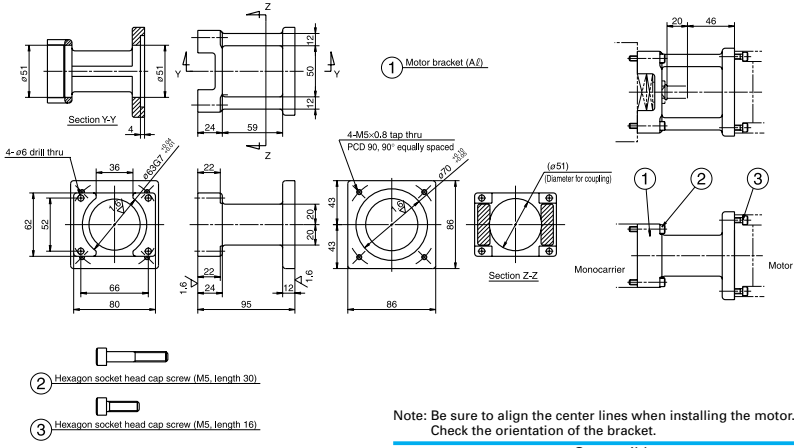


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD02(200W), MAMA02(200W), MSMD04(400W), MAMA04(400W)

Motor Bracket for MCM10

■ Reference number
MC-BK10-190-00

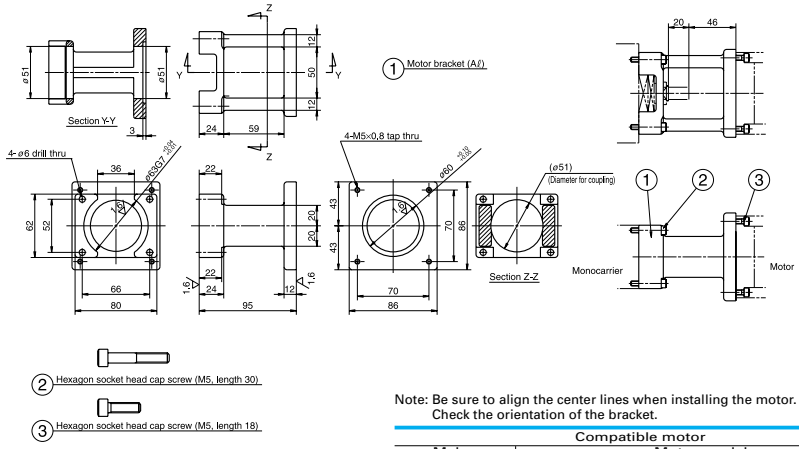


Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD08(750W), MAMA08(750W)
Sanyo Denki Co., Ltd.	P50B07020(200W), P50B07030(300W), P50B07040(400W)

Motor Bracket for MCM10

■ Reference number
MC-BK10-270-00



Note: Be sure to align the center lines when installing the motor.
Check the orientation of the bracket.

Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	103F85xx
Oriental Motor Co., Ltd.	AS98, ASC98, UPK59x, PK59x, CSK59x CFK59x, UMK59x, UFK59x

Motore Brackets for MCM Series By NEMA Size
Table 2-5

	NEMA 17		NEMA 23		NEMA 34	
	Blank Bracket	Finished Bracket	Blank Bracket	Finished Bracket	Blank Bracket	Finished Bracket
MCM02	N/A	MC-BK02-231-31	N/A	N/A	N/A	N/A
MCM03	MC-BK03-000-31	MC-BK03-231-31 or MC-BK03-231-00	N/A	MC-BK03-167-32	N/A	N/A
MCM05	N/A	N/A	MC-BK05-000-31	MC-BK05-167-31	N/A	MC-BK05-198-31
MCM06	N/A	N/A	N/A	MC-BK06-167-31	N/A	N/A
MCM08	N/A	N/A	N/A	MC-BK08-167-31	MC-BK08-000-31	MC-BK08-198-31
MCM10	N/A	N/A	N/A	MC-BK10-167-31	MC-BK10-000-31	MC-BK10-198-32

Motor Brackets for MCM Series by Manufacturer

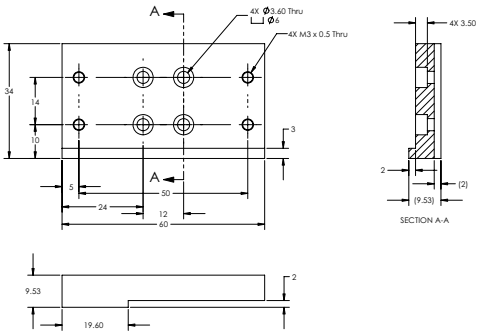
Table 2-5 2-6

Nominal size	Reference number code	Motor bracket reference number	Motor manufacturer	Stepping motor model number	Wattage of AC servo motor										
					10	20	30	50	60	100	150	200	300	400	750
MCM02	1	MC-BK02-128-00	Yaskawa Electric Corp.		SGMM-A1	SGMM-A20									
	2	MC-BK02-133-00	Mitsubishi Electric Corp.		HC-AQ013	HC-AQ023									
	3	MC-BK02-223-00	Oriental Motor Co., Ltd.	PMU33/35 (5-phase) PMC33/35 (5-phase)											
MCM03	1	MC-BK03-146-00	Yaskawa Electric Corp.				SGMAH-A3	SGMAH-A5 SGMAS-A5A		SGMAH-01 SGMAS-01A					
			Mitsubishi Electric Corp.					HF-KP053 HF-MP053 HC-KFS053 HC-MFS053		HF-KP13 HF-MP13 HC-KFS13 HC-MFS13					
			OMRON Corp.				R88M-W03	R88M-W05		R88M-W10					
			Sanyo Denki Co., Ltd.				P30B04003	P30B04005	P30B04006	P30B04010					
	2	MC-BK03-148-01	Sanyo Denki Co., Ltd.						P50B04040	P50B04010					
	3	MC-BK03-231-00	Sanyo Denki Co., Ltd.	PBM423xxx											
			Sanyo Denki Co., Ltd.	103F55xx											
			Oriental Motor Co., Ltd.	AS46, ASC46 UPK54x, PK54x CSK54x, CFK54x UMK24x, CSK24x PK24x											
MCM05	1	MC-BK05-145-00	Matsushita Electric Industrial Co., Ltd.					MSMD5A		MSMD01					
	2	MC-BK05-146-00	Yaskawa Electric Corp.				SGMAH-A3	SGMAH-A5 SGMAS-A5A		SGMAH-01 SGMAS-01A					
			Mitsubishi Electric Corp.					HF-KP053 HF-MP053 HC-KFS053 HC-MFS053		HF-KP13 HF-MP13 HC-KFS13 HC-MFS13					
			OMRON Corp.				R88M-W03	R88M-W05		R88M-W10					
			Sanyo Denki Co., Ltd.				P30B04003	P30B04005	P30B04006	P30B04010					
	3	MC-BK05-148-00	Matsushita Electric Industrial Co., Ltd.							MAMA01					
	4	MC-BK05-160-00	Sanyo Denki Co., Ltd.					P50B05005		P50B05010		P50B05020			
	5	MC-BK05-250-00	Sanyo Denki Co., Ltd.	PBM603xx, PBM604xx											
			Sanyo Denki Co., Ltd.	103F78xx											
			Oriental Motor Co., Ltd.	AS66, ASC66 UPK56x, UFK56x PK56x, CSK56x, CFK56x											
MCM06	1	MC-BK06-145-00	Matsushita Electric Industrial Co., Ltd.					MSMD5A		MSMD01					
	2	MC-BK06-146-00	Yaskawa Electric Corp.					SGMAH-A5 SGMAS-A5A		SGMAH-01 SGMAS-01A	SGMAS-C2A				
			Mitsubishi Electric Corp.					HF-KP053 HF-MP053 HC-KFS053 HC-MFS053		HF-KP13 HF-MP13 HC-KFS13 HC-MFS13					
			OMRON Corp.				R88M-W03	R88M-W05		R88M-W10					
			Sanyo Denki Co., Ltd.				P30B04003	P30B04005	P30B04006	P30B04010					
	3	MC-BK06-148-00	Sanyo Denki Co., Ltd.						P50B04040	P50B04010					
			Matsushita Electric Industrial Co., Ltd.							MAMA01					
	4	MC-BK06-160-00	Sanyo Denki Co., Ltd.					P50B05005		P50B05010		P50B05020			
	5	MC-BK06-170-00	Yaskawa Electric Corp.									SGMAH-02 SGMAS-02A		SGMAH-04 SGMAS-04A	
			Mitsubishi Electric Corp.									HF-KP23 HF-MP23		HF-KP43 HF-MP43	
			OMRON Corp.									R88M-W20		R88M-W40	
			Sanyo Denki Co., Ltd.									P30B06020		P30B06040	
	6	MC-BK06-170-01	Matsushita Electric Industrial Co., Ltd.									MSMD02 MAMA02		MSMD04 MAMA04	
	7	MC-BK06-250-00	Sanyo Denki Co., Ltd.	PBM603xxx, PBM604xxx											
			Sanyo Denki Co., Ltd.	103F78xx											
			Oriental Motor Co., Ltd.	AS66, ASC66 UPK56x, PK56x CSK56x, CFK56x UMK56x, UFK56x											
MCM08	1	MC-BK08-145-00	Matsushita Electric Industrial Co., Ltd.							MSMD01					
	2	MC-BK08-146-00	Yaskawa Electric Corp.							SGMAH-01 SGMAS-01A	SGMAS-C2A				
			Mitsubishi Electric Corp.							HF-KP13 HF-MP13 HC-KFS13 HC-MFS13					
			Sanyo Denki Co., Ltd.				P30B04003	P30B04005	P30B04006	P30B04010					
	3	MC-BK08-160-00	Sanyo Denki Co., Ltd.					P50B05005		P50B05010		P50B05020			
	4	MC-BK08-170-00	Yaskawa Electric Corp.									SGMAH-02 SGMAS-02A		SGMAH-04 SGMAS-04A	
			Mitsubishi Electric Corp.									HF-KP23 HF-MP23		HF-KP43 HF-MP43	
			OMRON Corp.									R88M-W20		R88M-W40	
			Sanyo Denki Co., Ltd.									P30B06020		P30B06040	
	5	MC-BK08-170-01	Matsushita Electric Industrial Co., Ltd.									MSMD02 MAMA02		MSMD04 MAMA04	
	6	MC-BK08-190-00	Sanyo Denki Co., Ltd.									P50B07020	P50B07030	P50B07040	
	7	MC-BK08-250-00	Sanyo Denki Co., Ltd.	PBM603xxx, PBM604xxx											
			Sanyo Denki Co., Ltd.	103F78xx											
			Oriental Motor Co., Ltd.	AS66, ASC66 UPK56x, PK56x CSK56x, CFK56x UMK56x, UFK56x											
	8	MC-BK08-270-00	Sanyo Denki Co., Ltd.	103F85xx											
			Oriental Motor Co., Ltd.	AS98, ASC98 UPK59x, PK59x CSK59x, CFK59x UMK59x, UFK59x											
MCM10	1	MC-BK10-170-00	Yaskawa Electric Corp.									SGMAH-02 SGMAS-02A		SGMAH-04 SGMAS-04A	
			Mitsubishi Electric Corp.									HF-KP23 HF-MP23		HF-KP43 HF-MP43	
			OMRON Corp.									R88M-W20		R88M-W40	
			Sanyo Denki Co., Ltd.									P30B06020		P30B06040	
	2	MC-BK10-170-01	Matsushita Electric Industrial Co., Ltd.									MSMD02 MAMA02		MSMD04 MAMA04	
	3	MC-BK10-190-00	Matsushita Electric Industrial Co., Ltd.												MSMD08 MAMA08
			Sanyo Denki Co., Ltd.									P50B07020	P50B07030	P50B07040	
	4	MC-BK10-270-00	Sanyo Denki Co., Ltd.	103F85xx											
			Oriental Motor Co., Ltd.	AS98, ASC98 UPK59x, PK59x CSK59x, CFK59x UMK59x, UFK59x											

2. 3. 4 Combining Brackets

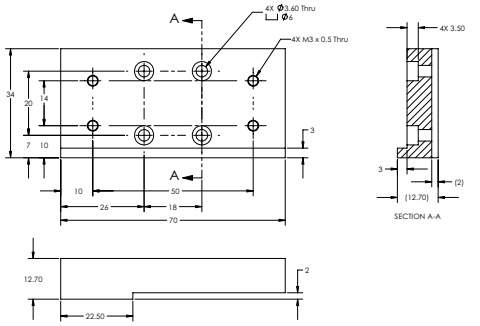
Please ask NSK for bracket not shown.

MCM02 to MCM02 Combining Bracket
Reference number: MC-IK0202-D-31



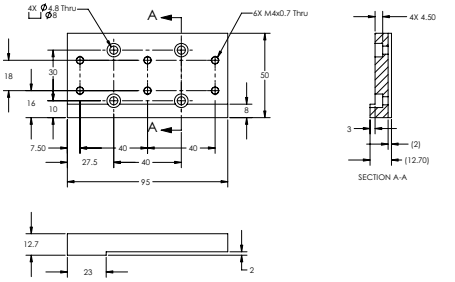
Description	Part Number	Qty
MCM02 to MCM02 Combining Bracket	UB890202D-301	1
M3x6 Socket Head Cap Screw	TAB3x6	4
M3x6 Button Head Cap Screw	GF4-91239A111	4

MCM03 to MCM02 Combining Bracket
Reference number: MC-IK0302-D-31



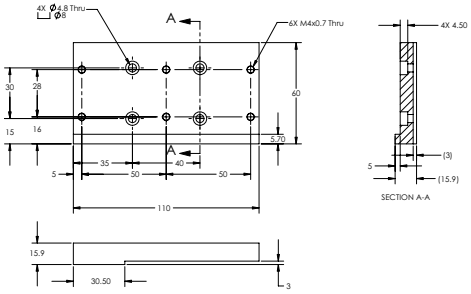
Description	Part Number	Qty
MCM03 to MCM02 Combining Bracket	UB890302D-301	1
M3x8 Socket Head Cap Screw	TAB3x8	4
M3x8 Button Head Cap Screw	GF4-91239A113	4

MCM05 to MCM03 Combining Bracket
Reference number: MC-IK0503-D-31



Description	Part Number	Qty
MCM05 to MCM03 Combining Bracket	UB890503D-301	1
M4x8 Socket Head Cap Screw	TAB4x8	10

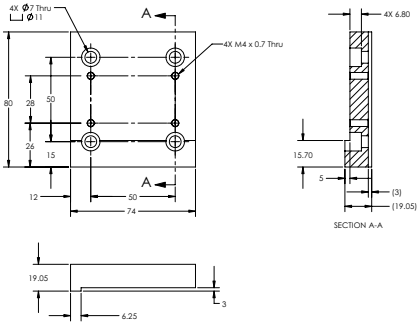
MCM05 to MCM05 Combining Bracket
Reference number: MC-IK0505-D-32



Description	Part Number	Qty
MCM05 to MCM05 Combining Bracket	UB890505D-30x	1
M4x8 Socket Head Cap Screw	TAB4x8	4
M4x12 Socket Head Cap Screw	TAB4x12	6

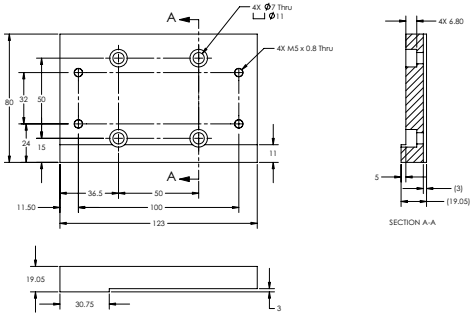
*When the combining bracket is used, only the top cover and one side cover can be used.

MCM08 to MCM05 Combining Bracket
Reference number: MC-IK0805-D-32



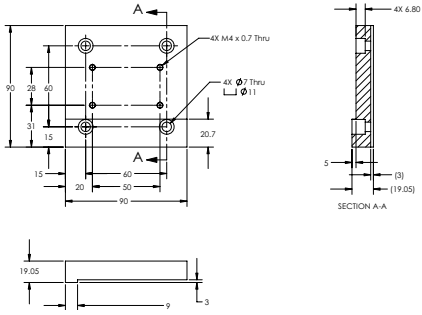
Description	Part Number	Qty
MCM08 to MCM05 Combining Bracket	UB890805D-302	1
M4x12 Socket Head Cap Screw	TAB4x12	4
M6x14 Socket Head Cap Screw	TAB6x14	4

MCM08 to MCM06 Combining Bracket
Reference number: MC-IK0806-D-31



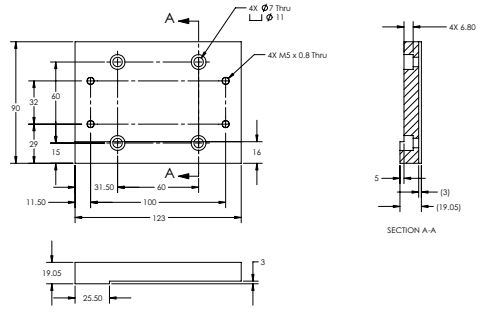
Description	Part Number	Qty
MCM08 to MCM06 Combining Bracket	UB890806D-301	1
M5x16 Socket Head Cap Screw	TAB5x16	4
M6x14 Socket Head Cap Screw	TAB6x14	4

MCM10 to MCM05 Combining Bracket
Reference number: MC-IK1005-D-31



Description	Part Number	Qty
MCM10 to MCM05 Combining Bracket	UB891005D-301	1
M4x12 Socket Head Cap Screw	TAB4x12	4
M6x14 Socket Head Cap Screw	TAB6x14	4

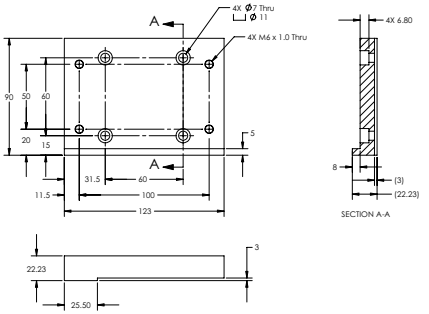
MCM10 to MCM06 Combining Bracket
Reference number: MC-IK1006-D-31



Description	Part Number	Qty
MCM10 to MCM06 Combining Bracket	UB891006D-302	1
M5x16 Socket Head Cap Screw	TAB5x16	4
M6x14 Socket Head Cap Screw	TAB6x14	4

*When the combining bracket is used, only the top cover and one side cover can be used.

MCM10 to MCM08 Combining Bracket
Reference number: MC-IK1008-D-35



Description	Part Number	Qty
MCM10 to MCM08 Combining Bracket	UB891008D-303	1
M6x14 Socket Head Cap Screw	TAB6x14	4
M6x16 Socket Head Cap Screw	TAB6x16	4

*When the combining bracket is used, only the top cover and one side cover can be used.

MCH Series

3 MCH Series

3. 1 MCH Series Reference Number Coding

[Body]

Reference number: MC H 06 040 H 10 K (B※1 0)

- MC: Monocarrier
- H: H Type: MCH Series
- 06: L Type: MCH Series low profile rail (only for 06 size)
- 040: Nominal size (rail width, Unit: 10mm)
- H: Stroke (Unit: 10mm)
- 10: Accuracy grade (H: High grade, P: Precision grade)
- K: Slider specification K: Single slider (See page C10) D: Double slider
- (B※1: Grease specification: B (LG2)(See page C18)
- 0): Special specification

※1 : These two code fields shall be added when non-standard grease is used. The coding of an MCH Monocarrier with standard grease shall have 12 characters as shown above.

[With Optional Accessories]

Reference number: MC S 06 040 H 10 K 0 0 K 0 0 0

- S: With MCH optional components
- R: With MCL optional components
- K: NSK management number
- 0: Sensor unit
- 0: Cover unit
- 0: Intermediate plate for motor bracket

Note: Optional components are available separately.

Table 3-1 Sensor unit (See page 71-72)

Reference number code	Specification	Reference number
0	N/A	—
1	Proximity switch (b-contact 3 pieces)	MC—SRHxx—10
2	Proximity switch (a-contact 3 pieces)	MC—SRHxx—11
3	Proximity switch (a-contact 1 piece, b-contact 2 pieces)	MC—SRHxx—12
4	Photo sensor 3 pieces	MC—SRHxx—13

Note xx: Reference number

Table 3-2 Cover unit (See page 73-74)

Reference number code	Specification	Reference number
0	N/A	—
1	For single slider	MC—HVxxxxx—00
	For double slider	MC—HVxxxxxD00

Note xxxxx: Reference number and stroke number

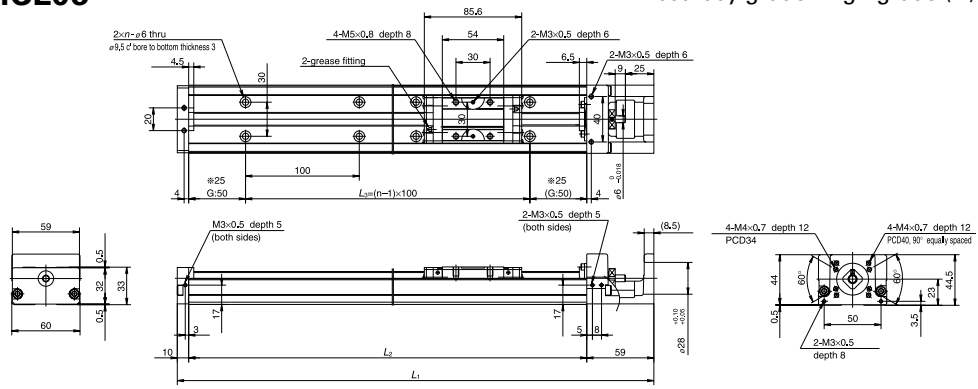
Table 3-3 Intermediate plate for motor bracket (See page 75-78)

Reference number code	Type		
	MCH06 (MCL06)	MCH09	MCH10
0	N/A	N/A	N/A
1	**MC-BKH06-145-00**	**MC-BKH09-145-00**	**MC-BKH10-170-00**
2	**MC-BKH06-146-00**	**MC-BKH09-146-00**	**MC-BKH10-170-01**
3	**MC-BKH06-231-00**	**MC-BKH09-170-00**	**MC-BKH10-190-00**
4	**MC-BKH06-250-00**	**MC-BKH09-170-01**	**MC-BKH10-190-01**
5	—	**MC-BKH09-231-00**	**MC-BKH10-250-00**
6	—	**MC-BKH09-250-00**	**MC-BKH10-270-00**

3. 2 MCH Series dimension table of standard products

MCL06

Accuracy grade: High grade (H)



- The rail of MCL 06 is made lighter than that of MCH 06 by lowering the rail height. The weight ratio between the MCH 06 and MCL 06 is 5 to 4.
- Double slider specification is also available for the MCL 06.
- Combinations of stroke and ball screw lead of the MCL 06 are the same as those of the MCH 06.

Dimension of MCL06 (Single slider)

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	L_3	n	Inertia ×10⁻⁶(kg • m²)	Mass (kg)
※ MCL06005H05K	50	53	5	219	150	100	2	2.38	1.0
※ MCL06005H10K		(65)	10					3.45	
MCL06010H05K	100	103	5	269	200	100	2	3.17	1.3
MCL06010H10K		(115)	10					4.12	
MCL06020H05K	200	203	5	369	300	200	3	4.51	1.9
MCL06020H10K		(215)	10					5.46	
MCL06030H10K	300	303	10	469	400	300	4	6.80	2.6
MCL06030H20K		(315)	20					10.6	
MCL06040H10K	400	403	10	569	500	400	5	8.13	3.2
MCL06040H20K		(415)	20					11.9	
MCL06050H10K	500	503	10	669	600	500	6	9.47	3.9
MCL06050H20K		(515)	20					13.3	

Dimension of G is 25 instead of 50 for those marked with ※.

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	5	1.0~4.8
	10	1.1~5.8
	20	1.6~7.9

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.

Basic load rating

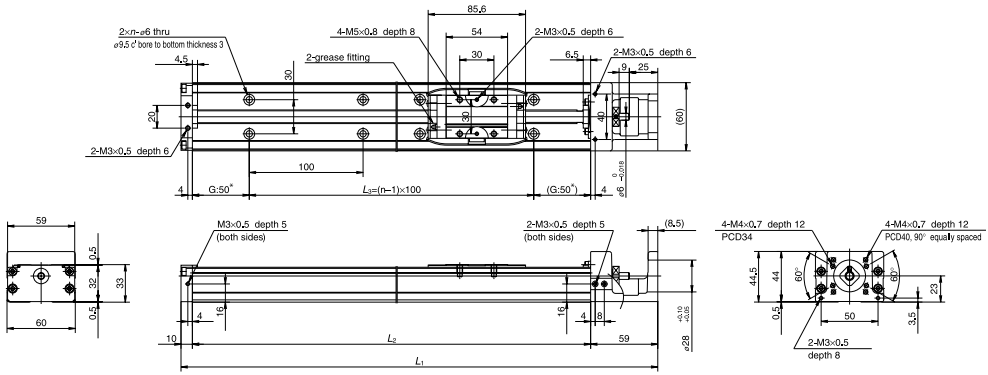
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
5	ø12	3,000 (High grade) 3,760 (Precision)	22,800	4,400	5	5,410 (High grade) 6,310 (Precision)	10,900	1,450
10		1,930 (High grade) 2,260 (Precision)	18,100		10	3,160 (High grade) 3,780 (Precision)		
20		1,930 (High grade) 2,260 (Precision)	14,400		20	3,160 (High grade) 3,780 (Precision)		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	335	133	133

MCH06

Accuracy grade: High grade (H)



Dimension of MCH06 (Single slider)

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	L_3	n	Inertia $\times10^{-6}$(kg • m^2)	Mass (kg)
※ **MCH06005H05K**	50	53 (65)	5	219	150	100	2	2.38	1.8
※ **MCH06005H10K**			10					3.45	
MCH06010H05K	100	103 (115)	5	269	200	100	2	3.17	2.2
MCH06010H10K			10					4.12	
MCH06020H05K	200	203 (215)	5	369	300	200	3	4.51	3.0
MCH06020H10K			10					5.46	
MCH06030H10K	300	303 (315)	10	469	400	300	4	6.80	3.7
MCH06030H20K			20					10.6	
MCH06040H10K	400	403 (415)	10	569	500	400	5	8.13	4.5
MCH06040H20K			20					11.9	
MCH06050H10K	500	503 (515)	10	669	600	500	6	9.47	5.2
MCH06050H20K			20					13.3	

Dimension of G is 25 instead of 50 for those marked with ※.

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	5	1.0~4.8
	10	1.1~5.8
	20	1.6~7.9

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.

Basic load rating

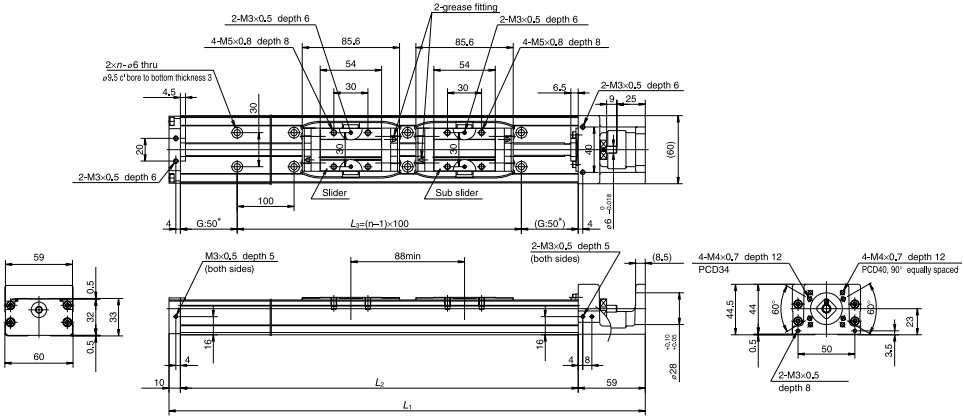
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
5	ø12	3,000 (High grade) 3,760 (Precision)	22,800	4,400	5	5,410 (High grade) 6,310 (Precision)	16,300	1,450
10		1,930 (High grade) 2,260 (Precision)	18,100		10	3,160 (High grade) 3,780 (Precision)		
20		1,930 (High grade) 2,260 (Precision)	14,400		20	3,160 (High grade) 3,780 (Precision)		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	335	133	133

MCH06 (Double slider)

Accuracy grade: High grade (H)



Dimension of MCH06 (Double slider)

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm)				Inertia ×10⁻⁶(kg • m²)	Mass (kg)
				L_1	L_2	L_3	n		
MCH06010H05D	100	115 (139)	5	369	300	200	3	4.82	3.5
MCH06010H10D			10					6.72	
MCH06020H05D	200	215 (239)	5	469	400	300	4	8.06	4.2
MCH06020H10D			10					15.7	
MCH06030H05D	300	315 (339)	5	569	500	400	5	9.40	5.0
MCH06030H10D			10					17.0	
MCH06040H10D	400	415 (439)	10	669	600	500	6	10.7	5.7
MCH06040H20D			20					18.3	

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	5	1.2~5.2
	10	1.5~9.6
	20	2.3~11.8

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.

Basic load rating

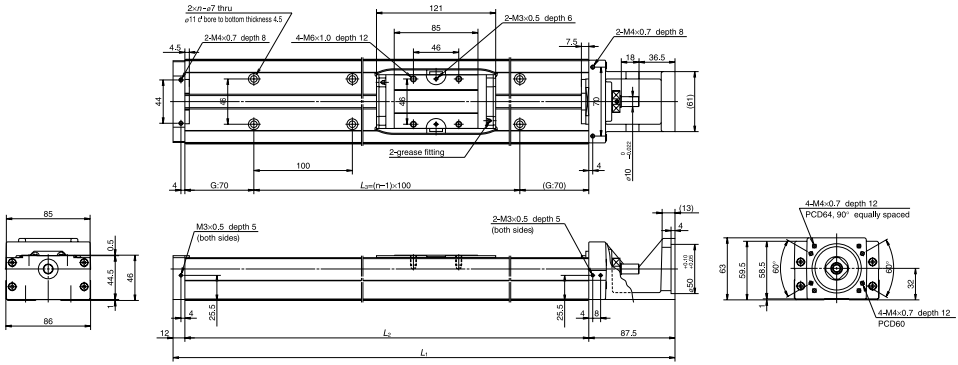
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N)				Basic static load rating (N)		Support unit Load limit (N)
		Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Ball screw C_{0a}	Linear guides C_0	
5	ø12	3,000 (High grade) 3,760 (Precision)	22,800	4,400	5	5,410 (High grade) 6,310 (Precision)	16,300	1,450
10		1,930 (High grade) 2,260 (Precision)	18,100		10	3,160 (High grade) 3,780 (Precision)		
20		1,930 (High grade) 2,260 (Precision)	14,400		20	3,160 (High grade) 3,780 (Precision)		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Double	770	730	730

MCH09

Accuracy grade: High grade (H)



Dimension of MCH09 (Single slider)

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm)				Inertia ×10⁻⁶(kg • m²)	Mass (kg)
				L_1	L_2	L_3	n		
MCH09020H05K	200	207 (221)	5	439.5	340	200	3	12.4	6.5
MCH09020H10K			10					13.9	
MCH09030H05K	300	307 (321)	5	539.5	440	300	4	15.6	8.1
MCH09030H10K			10					17.1	
MCH09040H05K	400	407 (421)	5	639.5	540	400	5	18.8	9.7
MCH09040H10K			10					20.3	
MCH09050H10K	500	507 (521)	10	739.5	640	500	6	23.5	11
MCH09050H20K			20					29.6	
MCH09060H10K	600	607 (621)	10	839.5	740	600	7	26.7	13
MCH09060H20K			20					32.8	
MCH09080H10K	800	807 (821)	10	1,039.5	940	800	9	33.2	16
MCH09080H20K			20					39.2	

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	5	1.0~5.9
	10	2.0~7.8
	20	2.0~10.8

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.

Basic load rating

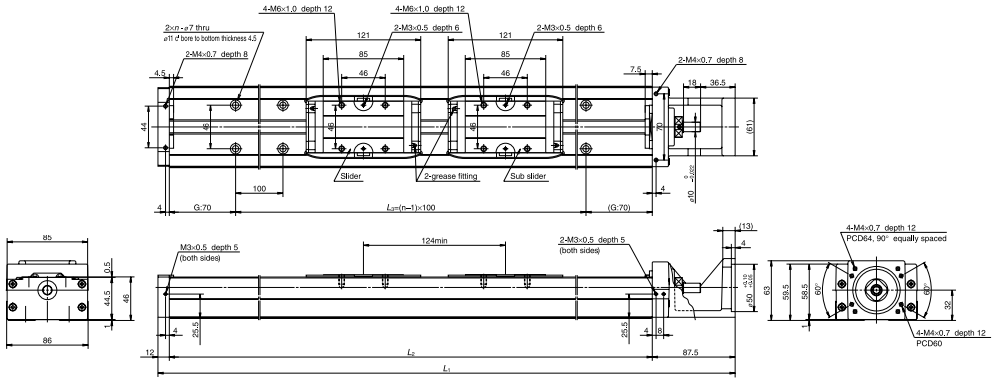
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N)				Basic static load rating (N)		Support unit Load limit (N)
		Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Ball screw C_{0a}	Linear guides C_0	
5	ø15	6,820 (High grade) 7,100 (Precision)	40,600	7,100	5	13,200 (High grade) 13,000 (Precision)	30,500	3,040
10		5,110 (High grade) 7,060 (Precision)	32,200		10	9,290 (High grade) 12,700 (Precision)		
20		3,290 (High grade) 4,560 (Precision)	25,500		20	5,620 (High grade) 7,750 (Precision)		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	890	385	385

MCH09 (Double slider)

Accuracy grade: High grade (H)



Dimension of MCH09 (Double slider)

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm)				Inertia ×10⁻⁶(kg • m²)	Mass (kg)
				L_1	L_2	L_3	n		
MCH09015H05D	150	183 (211)	5	539.5	440	300	4	16.1	8.9
MCH09015H10D			10					19.2	
MCH09025H05D	250	283 (311)	5	639.5	540	400	5	19.3	11
MCH09025H10D			10					22.4	
MCH09035H05D	350	383 (411)	5	739.5	640	500	6	22.5	12
MCH09035H10D			10					25.6	
MCH09045H10D	450	483 (511)	10	839.5	740	600	7	28.8	14
MCH09045H20D			20					40.9	
MCH09065H10D	650	683 (711)	10	1,039.5	940	800	9	35.2	17
MCH09065H20D			20					47.3	

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	5	1.5~7.0
	10	2.5~10.8
	20	4.0~17.2

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.

Basic load rating

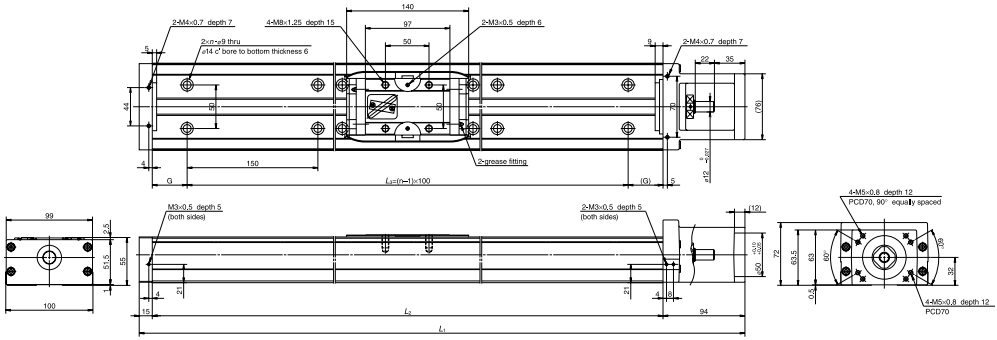
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N)				Basic static load rating (N)		Support unit Load limit (N)
		Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Ball screw C_{0a}	Linear guides C_0	
5	ø15	6,820 (High grade) 7,100 (Precision)	40,600	7,100	5	13,200 (High grade) 13,000 (Precision)	30,500	3,040
10		5,110 (High grade) 7,060 (Precision)	32,200		10	9,290 (High grade) 12,700 (Precision)		
20		3,290 (High grade) 4,560 (Precision)	25,500		20	5,620 (High grade) 7,750 (Precision)		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Double	1,780	2,070	2,070

MCH10

Accuracy grade: High grade (H)



Dimension of MCH10 (Single slider)

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm) L_1	L_2	G	L_3	n	Inertia $\times 10^{-6}$(kg • m^2)	Mass (kg)
MCH10040H10K	400	426	10	689	580	65	450	4	62.4	14
MCH10040H20K		(442)	20						71.8	
MCH10050H10K	500	526	10	789	680	40	600	5	74.7	16
MCH10050H20K		(542)	20						82.3	
MCH10060H10K	600	626	10	889	780	15	750	6	84.9	19
MCH10060H20K		(642)	20						92.5	
MCH10070H10K	700	726	10	989	880	65	750	6	95.1	21
MCH10070H20K		(742)	20						103	
MCH10080H10K	800	826	10	1,089	980	40	900	7	105	23
MCH10080H20K		(842)	20						113	
MCH10090H20K	900	926 (942)	20	1,189	1,080	15	1,050	8	123	25
MCH10100H20K	1,000	1,026 (1,042)	20	1,289	1,180	65	1,050	8	133	27
MCH10110H20K	1,100	1,126 (1,142)	20	1,389	1,280	40	1,200	9	143	29
MCH10120H20K	1,200	1,226 (1,242)	20	1,489	1,380	15	1,350	10	154	32

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	10	2.7~10.8
	20	3.1~12.7

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.

Basic load rating

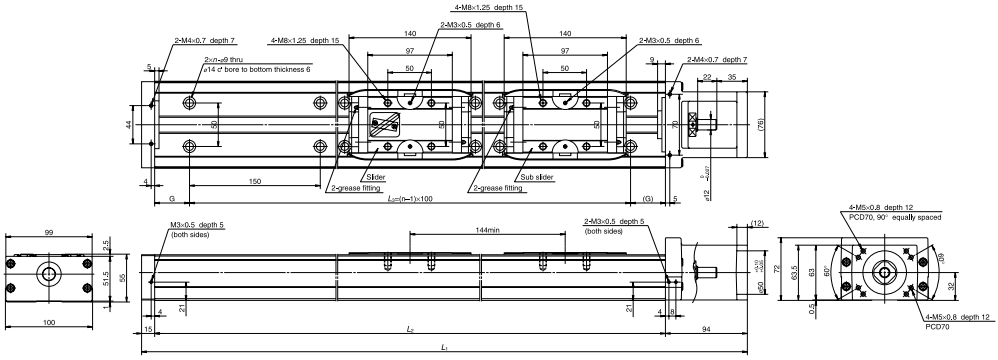
Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N) Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Basic static load rating (N) Ball screw C_{0a}	Linear guides C_0	Support unit Load limit (N)
10	ø20	8,230 (High grade) 10,900 (Precision)	44,600	7,600	10	17,100 (High grade) 21,700 (Precision)	42,000	3,380
20		5,300 (High grade) 7,060 (Precision)	35,400		20	10,300 (High grade) 12,700 (Precision)		

Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Single	1,460	610	610

MCH10 (Double slider)

Accuracy grade: High grade (H)



Dimension of MCH10 (Double slider)

Reference number	Nominal stroke (mm)	Stroke limit(mm) (K1™ is not equipped)	Ball screw lead (mm)	Body length (mm)					Inertia ×10⁻⁶(kg • m²)	Mass (kg)
				L_1	L_2	G	L_3	n		
MCH10025H10D	250	282 (314)	10	689	580	65	450	4	67.1	15
MCH10025H20D			20						82.4	
MCH10035H10D	350	382 (414)	10	789	680	40	600	5	77.3	17
MCH10035H20D			20						92.5	
MCH10045H10D	450	482 (514)	10	889	780	15	750	6	87.5	20
MCH10045H20D			20						103	
MCH10055H10D	550	582 (614)	10	989	880	65	750	6	97.7	22
MCH10055H20D			20						113	
MCH10065H10D	650	682 (714)	10	1,089	980	40	900	7	108	24
MCH10065H20D			20						123	
MCH10075H20D	750	782 (814)	20	1,189	1,080	15	1,050	8	133	26
MCH10085H20D	850	882 (914)	20	1,289	1,180	65	1,050	8	143	28
MCH10095H20D	950	982 (1,014)	20	1,389	1,280	40	1,200	9	154	30
MCH10105H20D	1,050	1,082 (1,114)	20	1,489	1,380	15	1,350	10	164	33

Monocarrier dynamic torque specification (N • cm)		
Ball screw lead (mm)	10	4.2~15.6
	20	5.0~19.6

1. Frictional resistance of NSK K1™ Lubrication Unit is included in the dynamic torque in the table.
2. Grease is packed into the ball screw, linear guide parts and support unit.
3. Consult NSK for life estimates under large moment loads.

Basic load rating

Lead ℓ (mm)	Shaft dia d (mm)	Basic dynamic load rating (N)				Basic static load rating (N)		Support unit Load limit (N)
		Ball screw C_a	Linear guides C	Support unit C_a	Rated running distance L_a (km)	Ball screw C_{0a}	Linear guides C_0	
10	ø20	8,230 (High grade) 10,900 (Precision)	44,600	7,600	10	17,100 (High grade) 21,700 (Precision)	42,000	3,380
20		5,300 (High grade) 7,060 (Precision)	35,400		20	10,300 (High grade) 12,700 (Precision)		

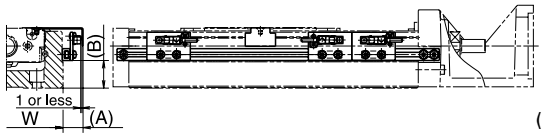
Basic static moment load of linear guide

Slider	Basic static moment load (N • m)		
	Rolling M_{RO}	Pitching M_{PO}	Yawing M_{YO}
Double	2,920	3,430	3,430

3. 3 MCH Series Optional Accessories

3. 3. 1 Sensor Unit

● Proximity switch



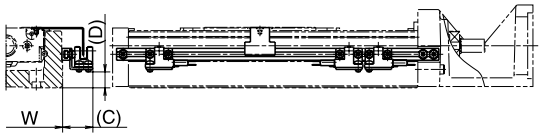
(Example of assembly)

Type		Reference number			Dimension(A) (mm)	Dimension(B) (mm)	Body width W (mm)
MCH06		MC-SRH06-10	MC-SRH06-11	MC-SRH06-12	17	10	60
MCH09		MC-SRH09-10	MC-SRH09-11	MC-SRH09-12	16	21	86
MCH10		MC-SRH10-10	MC-SRH10-11	MC-SRH10-12	16	16	100
Quantity	Proximity switch (a-contact)	—	3	1	E2S-W13 (OMRON Corp.)		
	Proximity switch (b-contact)	3	—	2	E2S-W14 (OMRON Corp.)		

*See page 19 for specification of proximity switch.

A sensor unit consists of sensors and sensor mounting parts.

● Photo sensor



(Example of assembly)

Type	NPN Sensor Reference Number	PNP Sensor Reference Number	Dimension (C) (mm)	Dimension (D) (mm)	Body width W (mm)	Remarks
MCH06	MC-SRH06-13	MC-SRH06-36	24	2	60	EE-SX674 (OMRON Corp.)
MCH09	MC-SRH09-13	MC-SRH09-40	23	12	86	EE-SX674P (OMRON Corp.) 3 sets
MCH10	MC-SRH10-13	MC-SRH10-31	22	16	100	(EE-1001 connector attachment

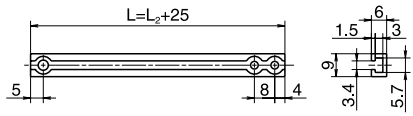
*See page 20 for specification of photo sensor.

A sensor unit consists of sensors and sensor mounting parts.

● Sensor rail

Reference number: MC-SRL- * * * *

● * * * * is the same as rail dimension L_2.



Body of MCH Series and sensor rail combination table

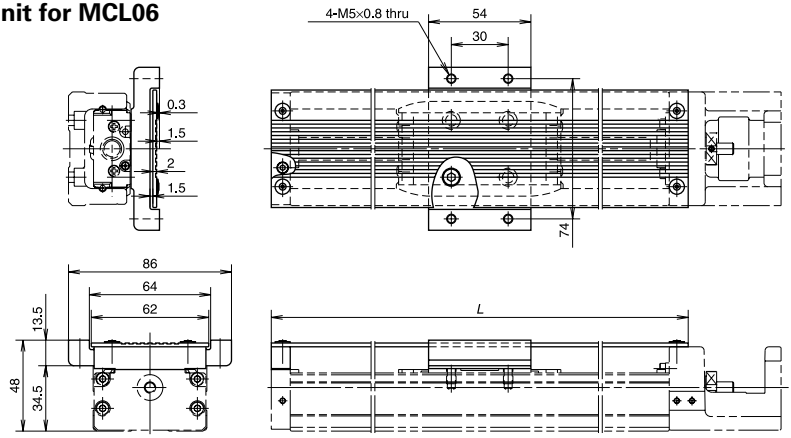
Table 3-4

Nominal size	Body length L_2 (mm)	Reference number	Sensor rail reference number
MCH06	150	MCH06005H05K MCH06005H10K	MC-SRL-0150
	200	MCH06010H05K MCH06010H10K	MC-SRL-0200
	300	MCH06020H05K MCH06020H10K MCH06010H05D MCH06010H10D	MC-SRL-0300
	400	MCH06030H10K MCH06030H20K MCH06020H05D MCH06020H10D	MC-SRL-0400
	500	MCH06040H10K MCH06040H20K MCH06030H05D MCH06030H10D	MC-SRL-0500
	600	MCH06050H10K MCH06050H20K MCH06040H10D MCH06040H20D	MC-SRL-0600
MCL06	150	MCL06005H05K MCL06005H10K	MC-SRL-0150
	200	MCL06010H05K MCL06010H10K	MC-SRL-0200
	300	MCL06020H05K MCL06020H10K	MC-SRL-0300
	400	MCL06030H10K MCL06030H20K	MC-SRL-0400
	500	MCL06040H10K MCL06040H20K	MC-SRL-0500
	600	MCL06050H10K MCL06050H20K	MC-SRL-0600
MCH09	340	MCH09020H05K MCH09020H10K	MC-SRL-0340
	440	MCH09030H05K MCH09030H10K MCH09015H05D MCH09015H10D	MC-SRL-0440
	540	MCH09040H05K MCH09040H10K MCH09025H05D MCH09025H10D	MC-SRL-0540
	640	MCH09050H10K MCH09050H20K MCH09035H05D MCH09035H10D	MC-SRL-0640
	740	MCH09060H10K MCH09060H20K MCH09045H10D MCH09045H20D	MC-SRL-0740
	940	MCH09080H10K MCH09080H20K MCH09065H10D MCH09065H20D	MC-SRL-0940

Nominal size	Body length L_2 (mm)	Reference number	Sensor rail reference number
MCH10	580	MCH10040H10K MCH10025H10D	MC-SRL-0580
	680	MCH10050H10K MCH10050H20K MCH10035H10D MCH10035H20D	MC-SRL-0680
	780	MCH10060H10K MCH10060H20K MCH10045H10D MCH10045H20D	MC-SRL-0780
	880	MCH10070H10K MCH10070H20K MCH10055H10D MCH10055H20D	MC-SRL-0880
	980	MCH10080H10K MCH10080H20K MCH10065H10D MCH10065H20D	MC-SRL-0980
	1,080	MCH10090H20K MCH10075H20D	MC-SRL-1080
	1,180	MCH10100H20K MCH10085H20D	MC-SRL-1180
	1,280	MCH10110H20K MCH10095H20D	MC-SRL-1280
	1,380	MCH10120H20K MCH10105H20D	MC-SRL-1380

3. 3. 2 Cover Unit

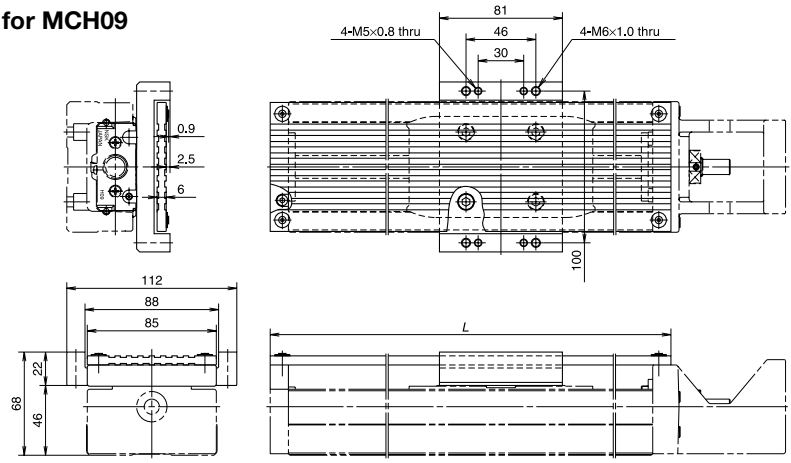
Cover unit for MCH06
Cover unit for MCL06



(Unit: mm)

Single slider		Double slider		Top cover length
Stroke	Reference number	Stroke	Reference number	L
50	MC-HV06005-00	—	—	170
100	MC-HV06010-00	—	—	220
200	MC-HV06020-00	100	MC-HV06010D00	320
300	MC-HV06030-00	200	MC-HV06020D00	420
400	MC-HV06040-00	300	MC-HV06030D00	520
500	MC-HV06050-00	400	MC-HV06040D00	620

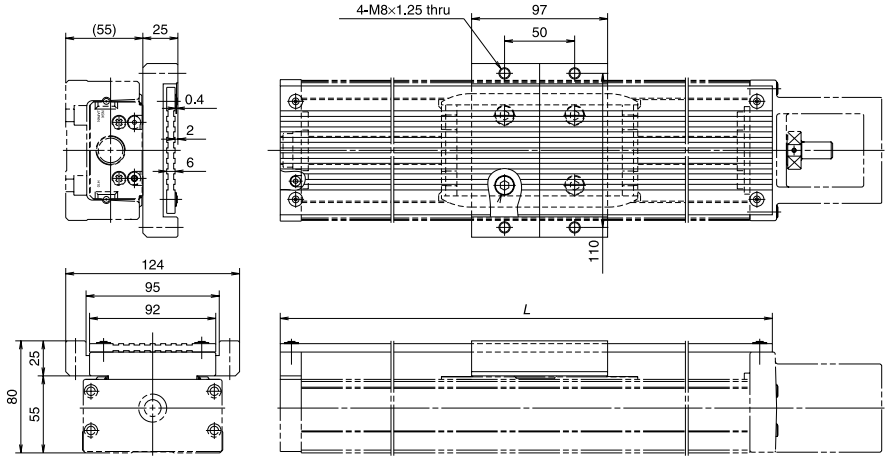
Cover unit for MCH09



(Unit: mm)

Single slider		Double slider		Top cover length
Stroke	Reference number	Stroke	Reference number	L
200	MC-HV09020-00	—	—	364
300	MC-HV09030-00	150	MC-HV09015D00	464
400	MC-HV09040-00	250	MC-HV09025D00	564
500	MC-HV09050-00	350	MC-HV09035D00	664
600	MC-HV09060-00	450	MC-HV09045D00	764
800	MC-HV09080-00	650	MC-HV09065D00	964

Cover unit for MCH10

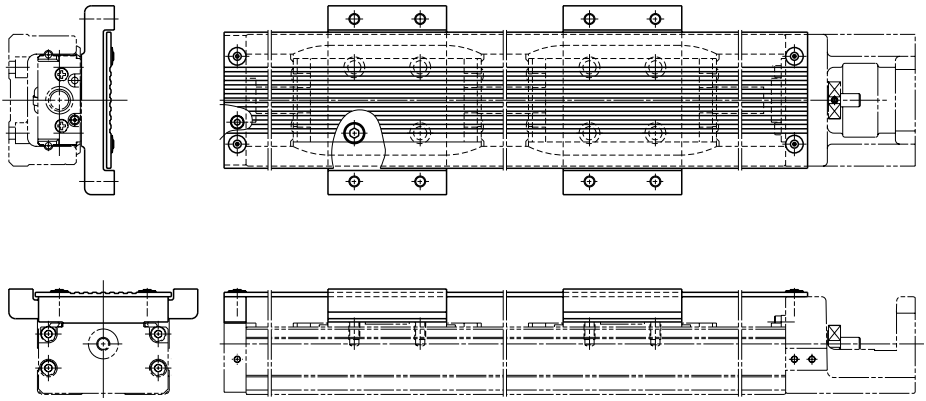


(Unit: mm)

Single slider		Double slider		Top cover length
Stroke	Reference number	Stroke	Reference number	L
400	MC-HV10040-00	250	MC-HV10025D00	610
500	MC-HV10050-00	350	MC-HV10035D00	710
600	MC-HV10060-00	450	MC-HV10045D00	810
700	MC-HV10070-00	550	MC-HV10055D00	910
800	MC-HV10080-00	650	MC-HV10065D00	1,010
900	MC-HV10090-00	750	MC-HV10075D00	1,110
1,000	MC-HV10100-00	850	MC-HV10085D00	1,210
1,100	MC-HV10110-00	950	MC-HV10095D00	1,310
1,200	MC-HV10120-00	1,050	MC-HV10105D00	1,410

● Cover unit for double sliders (reference drawing)

Two spacers are attached for the double slider.

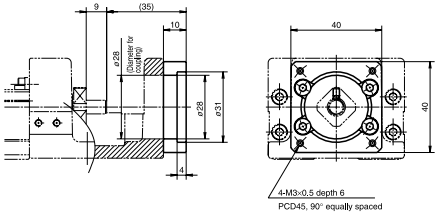


3. 3. 3 Intermediate Plate for Motor

- If you have a motor not listed below, please contact NSK.
- If you have an indirect motor mount, please contact NSK.
- Be sure to align the center lines when installing the motor.

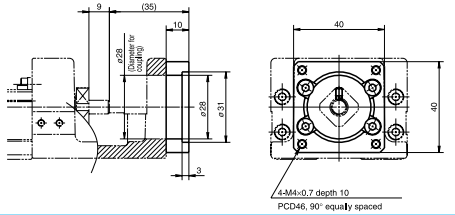
Motor Bracket for MCH06 and MCL06

Reference number: MC-BKH06-145-00



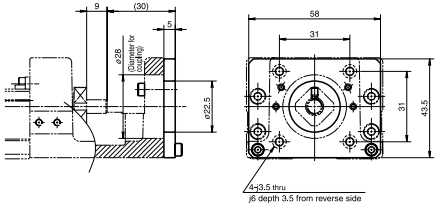
Compatible motor	
Maker	Motor models
Matsushita Electric Industrial Co., Ltd.	MSMD5A(50W), MSMD01(100W)

Reference number: MC-BKH06-146-00



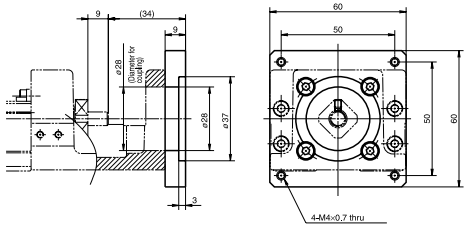
Compatible motor	
Maker	Motor models
Yaskawa Electric Corp.	SGMAH-A3(30W), SGMAH-A5(50W), SGMAS-A5A(50W) SGMAH-01(100W), SGMAS-01A(100W)
Mitsubishi Electric Corp.	HF-KP053(50W), HF-MP053(50W), HC-KFS053(50W) HC-MFS053(50W), HF-KP13(100W), HF-MP13(100W) HC-KFS13(100W), HC-MFS13(100W)
OMRON Corp.	R88M-W03(30W), R88M-W05(50W), R88M-W10(100W)
Sanyo Denki Co., Ltd.	P30B04xxx P Series

Reference number: MC-BKH06-231-00



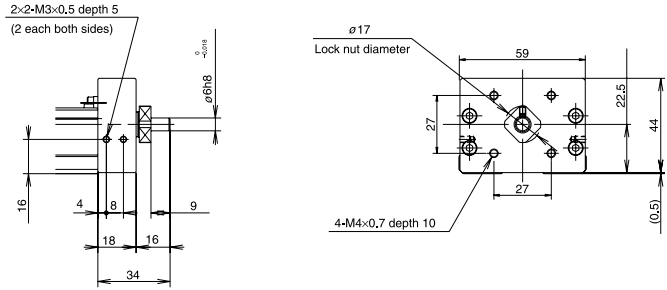
Compatible motor	
Maker	Motor models
Oriental Motor Co., Ltd.	AS46, ASC46, UPK54x, PK54x, CSK54x, CFK54x, UMK24x, CSK24x, PK24x
Sanyo Denki Co., Ltd.	PBM423xxx, 103F55xx

Reference number: MC-BKH06-250-00



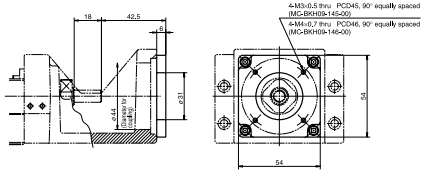
Compatible motor	
Maker	Motor models
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56x, UFK56x, PK56x, CSK56x, CFK56x MUMS02(200W), MUMS04(400W)
Sanyo Denki Co., Ltd.	PBM603xx, PBM604xx, 103F78xx

Diameter of ball screw shaft end to install a pulley for indirect motor mount of MCH06



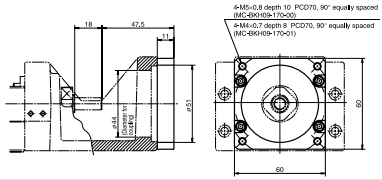
Motor Bracket for MCH09

Reference number: MC-BKH09-145-00 MC-BKH09-146-00



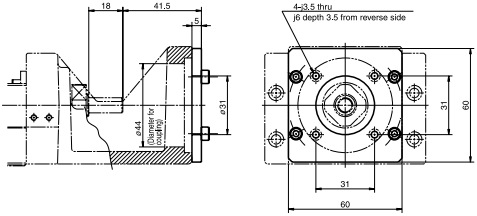
Reference number	Compatible motor	
	Maker	Motor models
MC-BKH09-145-00	Matsushita Electric Industrial Co., Ltd.	MSMD5A(50W), MSMD01(100W)
MC-BKH09-146-00	Yaskawa Electric Corp.	SGMAH-A5(50W), SGMAS-A5A(50W) SGMAH-01(100W), SGMAS-01A(100W)
	Mitsubishi Electric Corp.	HF-KP053(50W), HF-MP05(50W), HC-KFS053(50W) HC-MFS053(50W), HF-KP13(100W), HF-MP13(100W) HC-KFS13(100W), HC-MFS13(100W)
	OMRON Corp.	R88M-W05(50W), R88M-W10(100W)
	Sanyo Denki Co., Ltd.	P30B04xxx P Series

Reference number: MC-BKH09-170-00 MC-BKH09-170-01



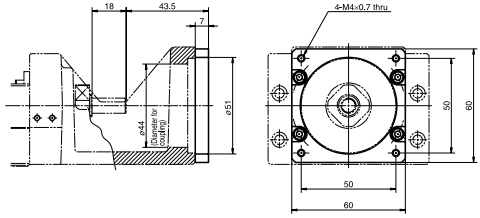
Reference number	Compatible motor	
	Maker	Motor models
MC-BKH09-170-00	Yaskawa Electric Corp.	SGMAH-02(200W), SGMAS-02A(200W) SGMAH-04(400W), SGMAS-04A(400W)
	Mitsubishi Electric Corp.	HF-KP23(200W), HF-MP23(200W) HF-KP43(400W), HF-MP43(400W)
	OMRON Corp.	R88M-W20(200W), R88M-W40(400W)
	Sanyo Denki Co., Ltd.	P30B06xxx P Series
MC-BKH09-171-01	Matsushita Electric Industrial Co., Ltd.	MSMD02(200W), MSMA02(200W) MSMA04(400W), MSMD04(400W)

Reference number: MC-BKH09-231-00



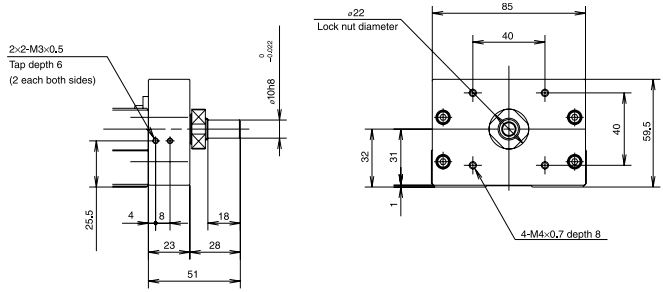
Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM423xxx, 103F55xx
Oriental Motor Co., Ltd.	AS46, ASC46, UPK54x, PK54x, CSK54x, CFK54x UMK24x, CSK24x, PK24x

Reference number: MC-BKH09-250-00



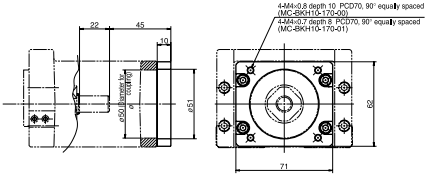
Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM603xx, PBM604xx, 103F78xx
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56x, UFK56x, PK56x CSK56x, CFK56x

Diameter of ball screw shaft end to install a pulley for indirect motor mount of MCH09



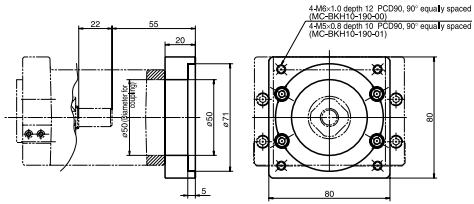
Motor Bracket for MCH10

Reference number: MC-BKH10-170-00 MC-BKH10-170-01



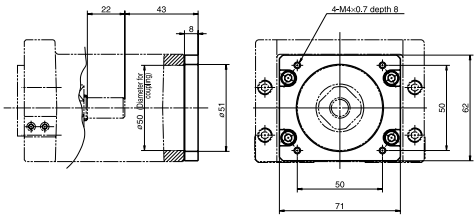
Reference number	Compatible motor	
	Maker	Motor models
MC-BKH10-170-00	Yaskawa Electric Corp.	SGMAH-02(200W), SGMAS-02A(200W) SGMAH-04(400W), SGMAS-04A(400W)
	Mitsubishi Electric Corp.	HF-KP23(200W), HF-MP23(200W) HF-KP43(400W), HF-MP43(400W)
	OMRON Corp.	R88M-W20(200W), R88M-W40(400W)
	Sanyo Denki Co., Ltd.	P30B06xxx P Series
MC-BKH10-170-01	Matsushita Electric Industrial Co., Ltd.	MSMD02(200W), MSMA02(200W) MSMD04(400W), MSMA04(400W)

Reference number: MC-BKH10-190-00 MC-BKH10-190-01



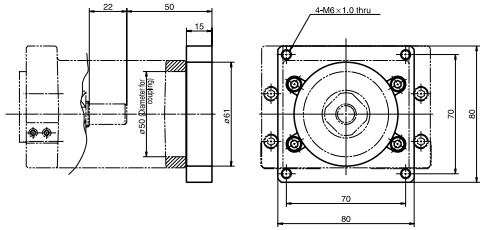
Reference number	Compatible motor	
	Maker	Motor models
MC-BKH10-190-00	Mitsubishi Electric Corp.	HC-KFS73(750W), HC-MFS73(750W) HF-KP73(750W), HF-MP73(750W)
MC-BKH10-190-01	Sanyo Denki Co., Ltd.	P50B07xxx P Series

Reference number: MC-BKH10-250-00



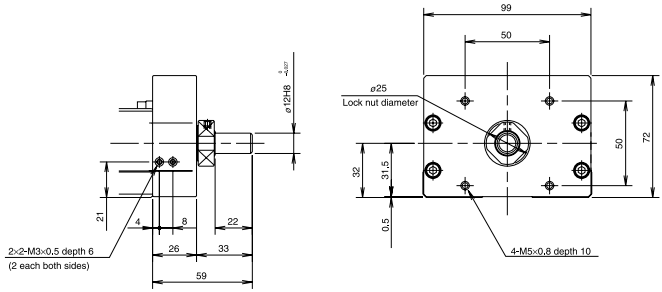
Compatible motor	
Maker	Motor models
Sanyo Denki Co., Ltd.	PBM603xx, PBM604xx, 103F78xx
Oriental Motor Co., Ltd.	AS66, ASC66, UPK56x, PK56x, CSK56x, CFK56x UMK56x, UFK56X

Reference number: MC-BKH10-270-00



Compatible motor	
Maker	Motor models
Oriental Motor Co., Ltd.	AS98, ASC98, UPK59x, PK59x, CSK59x, CFK59x UMK59x, UFK59x

Diameter of ball screw shaft end to install a pulley for indirect motor mount of MCH10



Intermediate Plates for MCH Series

Table 3-5

Nominal size	Reference number code	Motor bracket reference number	Motor manufacturer	Stepping motor model number	Wattage of AC servo motor					
					30	50	100	200	400	750
MCH06 MCL06	1	MC-BKH06-145-00	Matsushita Electric Industrial Co., Ltd.			MSMD5A	MSMD01			
	2	MC-BKH06-146-00	Yaskawa Electric Corp.		SGMAH-A3	SGMAH-A5 SGMAS-A5A	SGMAH-01 SGMAS-01A			
			Mitsubishi Electric Corp.			HF-KP053 HF-MP053 HC-KFS053 HC-MFS053	HF-KP13 HF-MP13 HC-KFS13 HC-MFS13			
			OMRON Corp.		R88M-W03	R88M-W05	R88M-W10			
			Sanyo Denki Co., Ltd.	P30B04xxx (P Series)						
	3	MC-BKH06-231-00	Sanyo Denki Co., Ltd.	PBM423xxx 103F55xx						
			Oriental Motor Co., Ltd.	AS46, ASC46 UPK54x, PK54x CSK54x, CFK54x UMK24x, CSK24x PK24x						
	4	MC-BKH06-250-00	Sanyo Denki Co., Ltd.	PBM603xx PBM604xx 103F78xx						
			Oriental Motor Co., Ltd.	AS66, ASC66 UPK56x, UFK56x PK56x, CSK56x CFK56x				MUMS02	MUMS04	
MCH09	1	MC-BKH09-145-00	Matsushita Electric Industrial Co., Ltd.			MSMD5A	MSMD01			
	2	MC-BKH09-146-00	Yaskawa Electric Corp.			SGMAH-A5 SGMAS-A5A	SGMAH-01 SGMAS-01A			
			Mitsubishi Electric Corp.			HF-KP053 HF-MP05 HC-KFS053 HC-MFS053	HF-KP13 HF-MP13 HC-KFS13 HC-MFS13			
			OMRON Corp.			R88M-W05	R88M-W10			
			Sanyo Denki Co., Ltd.	P30B04xxx (P Series)						
	3	MC-BKH09-170-00	Yaskawa Electric Corp.					SGMAH-02 SGMAS-02A	SGMAH-04 SGMAS-04A	
			Mitsubishi Electric Corp.					HF-KP23 HF-MP23	HF-KP43 HF-MP43	
			OMRON Corp.					R88M-W20	R88M-W40	
			Sanyo Denki Co., Ltd.	P30B06xxx (P Series)						
	4	MC-BKH09-170-01	Matsushita Electric Industrial Co., Ltd.					MSMD02 MSMA02	MSMD04 MSMA04	
	5	MC-BKH09-231-00	Sanyo Denki Co., Ltd.	PBM423xxx 103F55xx						
			Oriental Motor Co., Ltd.	AS46, ASC46 UPK54x, PK54x CSK54x, CFK54x UMK24x, CSK24x PK24x						
	6	MC-BKH09-250-00	Sanyo Denki Co., Ltd.	PBM603xx PBM604xx 103F78xx						
			Oriental Motor Co., Ltd.	AS66, ASC66 UPK56x, UFK56x PK56x, CSK56x CFK56x						
MCH10	1	MC-BKH10-170-00	Yaskawa Electric Corp.					SGMAH-02 SGMAS-02A	SGMAH-04 SGMAS-04A	
			Mitsubishi Electric Corp.					HF-KP23 HF-MP23	HF-KP43 HF-MP43	
			OMRON Corp.					R88M-W20	R88M-W40	
			Sanyo Denki Co., Ltd.	P30B06xxx (P Series)						
	2	MC-BKH10-170-01	Matsushita Electric Industrial Co., Ltd.					MSMD02 MSMA02	MSMD04 MSMA04	
	3	MC-BKH10-190-00	Mitsubishi Electric Corp.							HC-KFS73 HC-MFS73 HF-KP73 HF-MP73
	4	MC-BKH10-190-01	Sanyo Denki Co., Ltd.	P50B07xxx (P Series)						
	5	MC-BKH10-250-00	Sanyo Denki Co., Ltd.	PBM603xx PBM604xx 103F78xx						
			Oriental Motor Co., Ltd.	AS66, ASC66 UPK56x, PK56x CSK56x, CFK56x UMK56x, UFK56x						
	6	MC-BKH10-270-00	Oriental Motor Co., Ltd.	AS98, ASC98 UPK59x, PK59x CSK59x, CFK59x UMK59x, UFK59x						

Continued on next page.

Intermediate Plates for MCH Series by NEMA Size

Table 3-6

	NEMA 23	NEMA 34
MCH06	MC-BKH06-247-31	N/A
MCH09	MC-BKH09-247-31	MC-BKH09-269-31
MCH10	N/A	MC-BKH10-269-31

4 Notes

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Taiwan NSK Precision Co., Ltd.
Taipei tel: 02-2591-0656

Thailand:
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Bangkok tel: 02-6412150~58
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