

# Miniature Monocarrier® MCM02, MCM03



Supports small conveyors and test equipment in a wide range of applications.  
Compact, lightweight design saves space and delivers high performance.



Patent Pending



# Lightweight, space-saving structure made possible through compact design. These all-in-one Monocarriers are easy to use and provide high accuracy and rigidity.

Monocarriers are used in a variety of applications, including production, inspection, packaging and conveyance systems. Already recognized in the industry for improving efficiency and reducing labor, Monocarriers have been increasingly in demand to meet a growing range of needs.

NSK has been developing a wide range of Monocarriers, making full use of its world-class technologies in ball screws and linear guides. To meet demand for smaller, lighter Monocarriers, NSK developed the MCM02 and MCM03, a series of compact Monocarriers that realizes unprecedented lightweight and space-saving features.

In addition, these Monocarriers feature NSK's state-of-the-art technologies, such as a long life, maintenance-free NSK K1™ lubrication unit, an all-in-one structure for easy use, and high accuracy and rigidity, earning the product line a reputation for outstanding reliability.

These small and lightweight Monocarriers are consequently well equipped to meet specific needs.

## Monocarrier® MCM02, MCM03

Stroke and lead of products with standard specification

(● mark: standard inventory, ○ mark: made to order)

Unit: mm

Reference number	MCM02				MCM03					
	1		2		1	2	10		12	
	High grade	Precision grade	High grade	Precision grade	Precision grade		High grade	Precision grade	High grade	Precision grade
50	●		●		●	●	—	—	—	—
100	●		●		●	●	●		●	
150	●		●							
200	—	—	—	—	—	—	●			
250	—	—	—	—	—	—				

### Features

#### 1. Lightweight, compact design

Integration of components minimizes cross-sectional dimensions, while reducing weight by one-half compared to existing combination units (single-axis tables). This compact design meets the demand for lighter weight and saving more space.

#### 2. All-in-one structure

The all-in-one structure, integrating ball screw and linear guide into a single unit, significantly reduces workload for design and installation.

#### 3. Long-term, maintenance-free operation

The NSK K1™ lubrication unit is incorporated into the guide and ball screw parts for the Monocarrier MCM02 and MCM03.

The use of the NSK K1™ lubrication unit maintains smooth lubrication performance for long periods in mechanical environments where lubrication is difficult to apply, such as machinery and equipment for food processing and medical applications requiring a highly clean environment, thus enabling maintenance-free operation over an extended period of time.

#### 4. Available in small and large ball screw leads

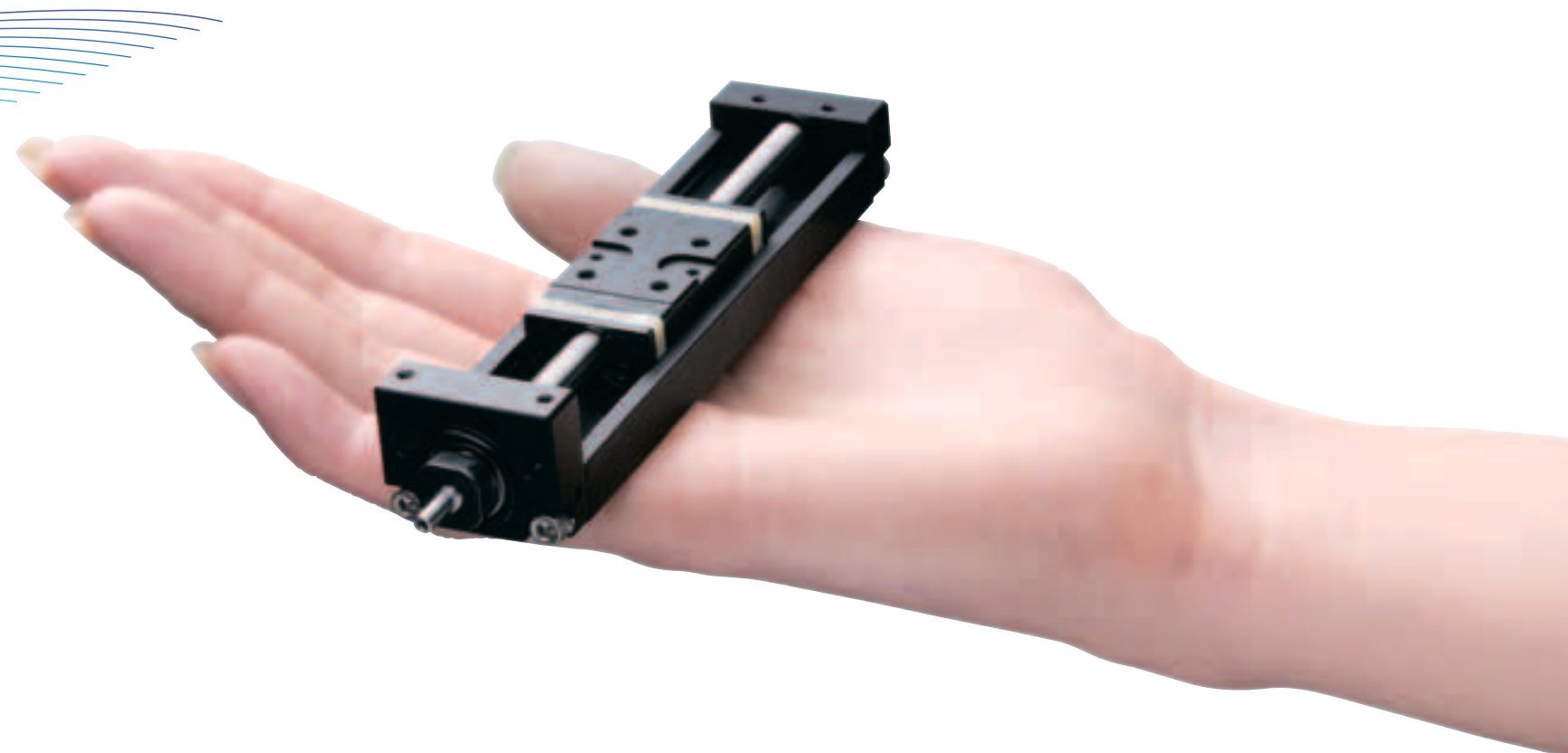
A range of standard sizes is available between 1 millimeter small lead to 12 millimeter large lead.

#### 5. Anticorrosion feature

Special surface treatment is provided as a standard feature to prevent corrosion under various operating conditions.

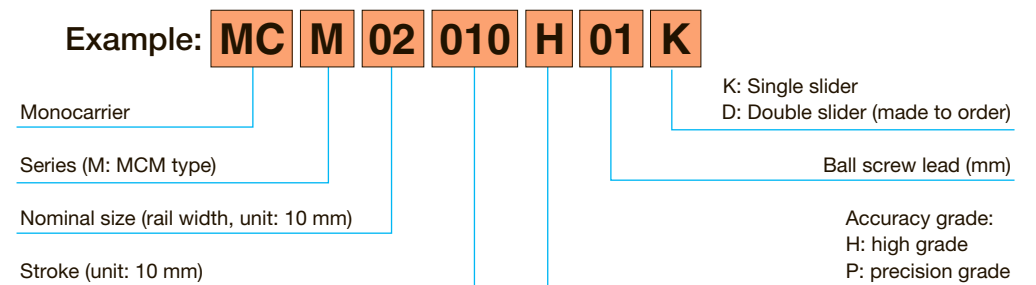
#### 6. High accuracy and rigidity

The concave main base, although lightweight, resists bending and can be used as cantilever beams. The structure, composed of several rolling elements, reduces friction and provides higher positioning accuracy.



#### Reference number coding

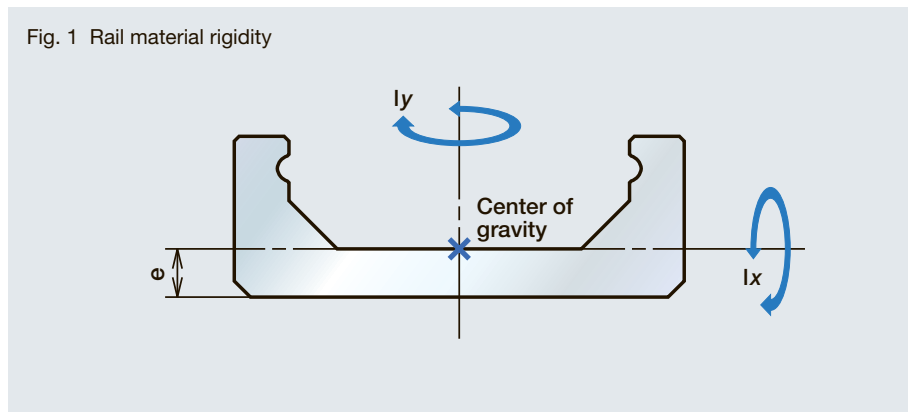
The Monocarrier reference number is composed of the main basic specifications.



## Monocarrier rigidity

### Rail material rigidity

The Monocarrier MCM02 and MCM03 rail features a special concave shape with a small space to maintain high resistance to deflection and distortion. The geometrical moment of inertia of rail area in each direction is shown in Fig. 1.

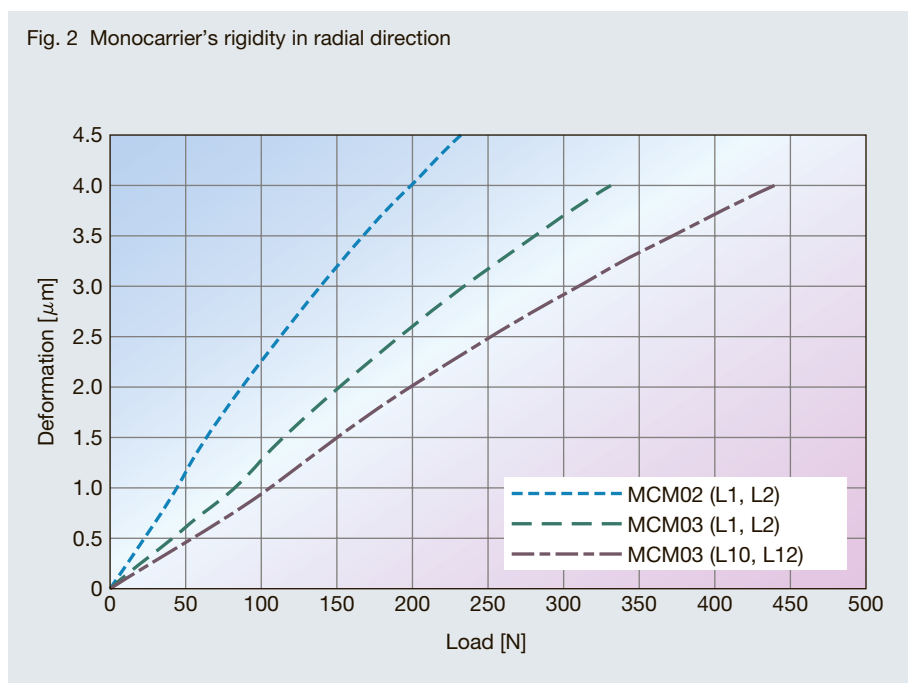


### ●Rail material rigidity

	Geometrical moment of inertia [mm <sup>4</sup> ]		Center of gravity [mm]
	lx	ly	e
MCM02	9.71×10 <sup>2</sup>	1.32×10 <sup>4</sup>	3.3
MCM03	0.30×10 <sup>4</sup>	3.30×10 <sup>4</sup>	4.5

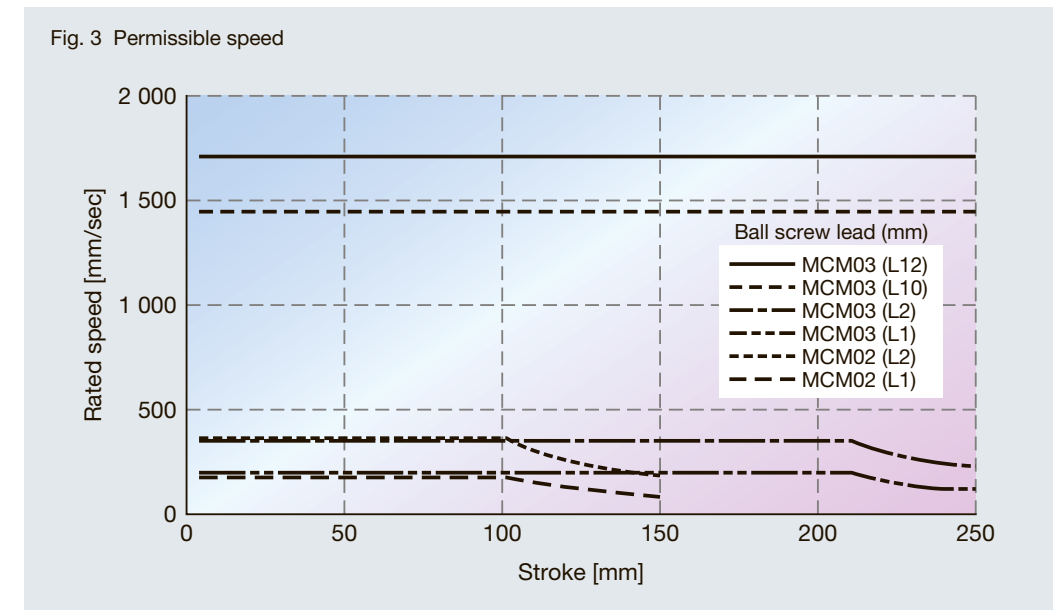
### Rigidity in radial direction

NSK has succeeded in fully eliminating clearance of the Monocarrier's linear guide at micron-meter processing accuracy through its own high-precision processing technique. The linear guide has virtually no clearance and exhibits the load/deformation characteristics shown in Fig. 2.



## Permissible speed

The relationship in permissible speed between rated speed and stroke is shown as follows:



## Accuracy standard

### MCM02

unit: μm

Stroke [mm]	High grade [H]			Precision grade [P]			
	Repeatability positioning accuracy	Running parallelism (vertical)	Backlash	Repeatability positioning accuracy	Running parallelism (vertical)	Backlash	Positioning accuracy
50	±10	14	20 or less	±3	8	3 or less	20
100							
150							

### MCM03

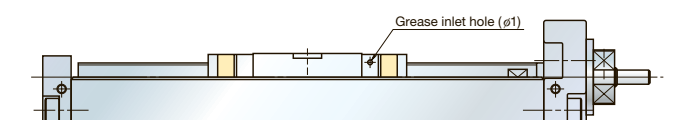
unit: μm

Stroke [mm]	High grade [H]			Precision grade [P]			
	Repeatability positioning accuracy	Running parallelism (vertical)	Backlash	Repeatability positioning accuracy	Running parallelism (vertical)	Backlash	Positioning accuracy
50	±10	14	20 or less	±3	8	3 or less	20
100							
150							
200							
250							

## Load factor

Model numbers	MCM02		MCM03			
	1	2	1	2	10	20
ε <sub>R</sub>	95.2		79.4		79.4	
ε <sub>P</sub>	174		113.9		84.2	
ε <sub>V</sub>	174		113.9		84.2	

## Guide for grease replenishment (for MCM02)



When packing grease into the unit, apply it directly to the rail groove or ball screw groove or use a grease gun or similar tool to pack it into the grease inlet hole located on the side of end cap (as shown above).

Generally, the applied area must be filled with grease to the point where a small amount of supplied grease is discharged around the area surrounding the ball slide.











## Worldwide Sales Offices

<b>NSK Ltd. – Headquarters, Tokyo, Japan</b> www.nsk.com ASIA BUSINESS STRATEGIC DIVISION-HEADQUARTERS tel: 03-3779-7145 INDUSTRIAL MACHINERY BEARINGS DIVISION-HEADQUARTERS tel: 03-3779-7227 AUTOMOTIVE DIVISION-HEADQUARTERS tel: 03-3779-7189 NEEDLE ROLLER BEARINGS STRATEGIC DIVISION-HEADQUARTERS tel: 03-3779-2563 PRECISION MACHINERY & PARTS DIVISION-HEADQUARTERS tel: 03-3779-7219	<b>Africa</b> <b>South Africa:</b> NSK South Africa (Pty) Ltd. Johannesburg tel: 011-458-3600	<b>Asia and Oceania</b> <b>Australia:</b> NSK Australia Pty. Ltd. www.nskaustralia.com.au Melbourne tel: 03-9764-8302	<b>China:</b> NSK Hong Kong Ltd. Hong Kong tel: 2739-9933 Kunshan NSK Co., Ltd. Kunshan Plant tel: 0512-5771-5654 Changshu NSK Needle Bearing Co., Ltd. Jiangsu Plant tel: 0512-5283-2938 Guizhou HS NSK Bearings Co., Ltd. Anshun Plant tel: 0853-3521505 NSK Steering Systems Dongguan Co., Ltd. Dongguan Plant tel: 0769-262-0960 Zhangjiagang NSK Precision Machinery Co., Ltd. Jiangsu Plant tel: 0512-5867-6496 Timken-NSK Bearings (Suzhou) Co., Ltd. Jiangsu Plant tel: 0512-6665-5666 NSK China Technology Center Jiangsu tel: 0512-5771-5654 NSK (Shanghai) Trading Co., Ltd. Shanghai tel: 021-6235-0198 NSK Representative Offices Beijing tel: 010-6590-8161 Guangzhou tel: 020-3786-4833 Anshun tel: 0853-3522522 Chengdu tel: 028-8661-4200 Shenzhen tel: 0755-25904886 Changchun tel: 0431-8988682 NSK (China) Investment Co., Ltd. Shanghai tel: 021-6235-0198	<b>India:</b> Rane NSK Steering Systems Ltd. Chennai tel: 044-274-66002 NSK Ltd. India Blanch Office Chennai tel: 044-2446-6862	<b>Indonesia:</b> PT. NSK Bearings Manufacturing Indonesia Jakarta tel: 021-898-0155 PT. NSK Indonesia Jakarta tel: 021-252-3458	<b>Korea:</b> NSK Korea Co., Ltd. Seoul Changwon Plant <b>Malaysia:</b> NSK Bearings (Malaysia) Sdn. Bhd. Kuala Lumpur tel: 03-7722-3373 NSK Micro Precision (M) Sdn. Bhd. Malaysia Plant tel: 03-8961-6288 <b>New Zealand:</b> NSK New Zealand Ltd. Auckland www.nsk-rhp.co.nz Taipei tel: 09-276-4992	<b>Philippines:</b> NSK Representative Office Manila tel: 02-759-6246	<b>Singapore:</b> NSK International (Singapore) Pte Ltd. Singapore tel: 65-6278-1711 NSK Singapore (Pte) Ltd. www.nsk-singapore.com.sg Singapore tel: 65-6278-1711	<b>Taiwan:</b> Taiwan NSK Precision Co., Ltd. Taipei tel: 02-2509-3305	<b>Thailand:</b> NSK Bearings (Thailand) Co., Ltd. Bangkok tel: 02-6412-150 NSK Bearings Manufacturing (Thailand) Co., Ltd. Chonburi tel: 038-454010-454016 SIAM NSK Steering Systems Co., Ltd. Chachoengsao tel: 038-522-343-350 NSK Asia Pacific Technology Center (Thailand) Co., Ltd. Chonburi tel: 038-454631-454633	<b>Vietnam:</b> NSK Representative Office Hanoi tel: 04-935-1269	<b>Europe</b> <b>NSK Europe Ltd. (European Headquarters)</b> Maidenhead, U.K. www.eu.nsk.com tel: 01628-509800	<b>France:</b> NSK France S.A.S Paris tel: 01-30-57-39-39	<b>Germany:</b> NSK Deutschland GmbH Düsseldorf tel: 02102-481-0 NSK Precision Europe GmbH Düsseldorf tel: 02102-481-0 NSK Steering Systems Europe Ltd. Stuttgart tel: 0771-79082-277 Neueweg Fertigung GmbH Munderkingen tel: 07393-540	<b>Italy:</b> NSK Italia S.p.A. Milano tel: 02-995-19-1 Industria Cuscinetti S.p.A. Torino Plant tel: 0119824811	<b>Netherlands:</b> NSK European Distribution Centre B.V. Tilburg tel: 013-4647647	<b>Poland:</b> NSK Europe Ltd. Warsaw Liaison Office Warsaw Liaison Office tel: 022-645-1525, 1526 NSK Iskra S.A. Kielce tel: 041-367-0505 NSK European Technology Center, Kielce tel: 041-366-5812 NSK Steering Systems Europe (Polska) Sp.zo.o Walbrzych tel: 074-664-4101	<b>Spain:</b> NSK Spain S.A. Barcelona tel: 093-289-27-63	<b>Turkey:</b> NSK Bearings Middle East Trading Co., Ltd. Istanbul tel: 0216-442-7106	<b>United Kingdom:</b> NSK Bearings Europe Ltd. Peterlee Plant tel: 0191-586-6111 NSK European Technology Centre Newark tel: 01636-605123 NSK UK Ltd. Newark tel: 01636-605123 NSK Precision UK Ltd. Newark tel: 01636-605123 NSK Steering Systems Europe Ltd. Coventry tel: 024-76-588588	<b>North and South America</b> <b>NSK Americas, Inc. (American Headquarters)</b> Ann Arbor tel: 734-913-7500	<b>Argentina:</b> NSK Argentina SRL Buenos Aires tel: 11-4704-5100	<b>Brazil:</b> NSK Brasil Ltda. São Paulo www.br.nsk.com tel: 011-3269-4723	<b>Canada:</b> NSK Canada Inc. Toronto www.ca.nsk.com tel: 905-890-0740	<b>Mexico:</b> NSK Rodamientos Mexicana, S.A. de C.V. Mexico City www.mx.nsk.com tel: 55-5390-4312	<b>United States of America:</b> NSK Corporation Ann Arbor www.us.nsk.com tel: 734-913-7500 NSK American Technology Center Ann Arbor tel: 734-913-7500 NSK Precision America, Inc. www.npa.nsk.com Franklin tel: 317-738-5038 NSK Steering Systems America, Inc. www.nssa.nsk.com Bennington, Vermont tel: 802-442-5448 NSK Latin America, Inc. www.la.nsk.com Miami tel: 305-477-0605
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