

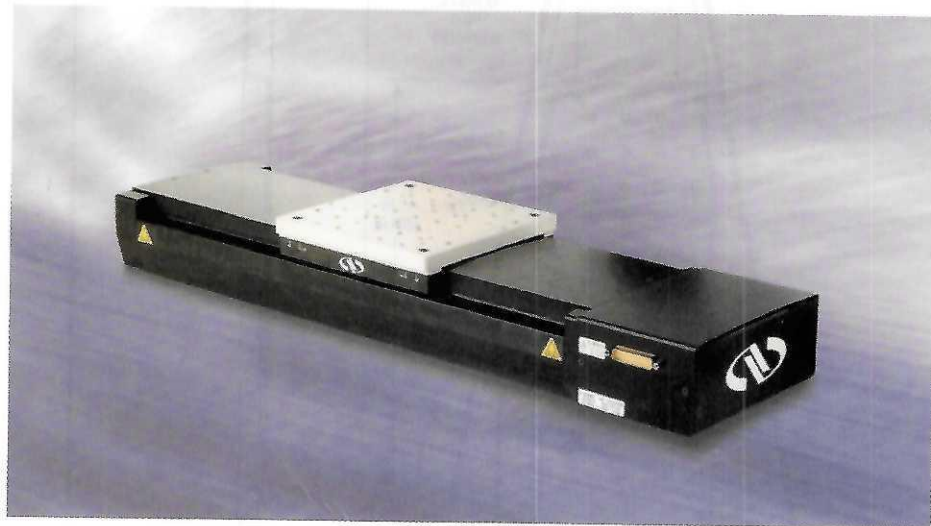
IMS Series



Key Features

- Stiff, FEM optimized extruded aluminum body avoids thermal bending effects
- Preloaded, backlash-free ballscrew drive allows for rapid movements with short step and settling time
- Precision recirculating ball bearing slides provide accurate linear motion without ball cage migration
- Rigid cover and flexible side bands protect the internal drive mechanism

High-Performance Long-Travel Linear Stages



The new IMS Series linear stage complements the ILS Series as it provides longer linear travel ranging from 300–600 mm. The stages have robust designs with high performance without high cost, making them cost-effective solutions for precision industrial and laboratory applications.

Using the same industry-proofed technology as the ILS Series, the IMS Series features a FEM optimized, aluminum extruded body that is highly stiff, while minimizing the bending effect caused by different thermal expansion coefficients of the aluminum body and the steel rails. Recirculating ball bearing slides provide accurate linear motion and avoid ball cage migration found on linear ball bearings or crossed roller bearings.

A highly-stiff, backlash-free, 5 mm pitch ball screw ensures rapid movements with fast step and settling times, while minimizing heating and extending the lifetime of the stage.

Position measurements are read on a 4000 pts/rev. rotary encoder, mounted directly on the ball screw to avoid screw/coupling errors. For more demanding precision positioning requirements, the IMS Series is available with a highly interpolated linear scale providing 0.1 μm resolution feedback.

The completely closed design of the IMS Series with an upper rigid cover and flexible side straps prevents damage to the drive train and protects from dust, debris and other pollutants, underlining its robustness and long lasting values. M-IMS stages also feature a motor side mounted origin for repeatable initialization, limit switches to prevent over travel, and elastomeric end-of-run dampers for smooth emergency braking.

Design Details

Base Material	Extruded Aluminum
Bearings	Recirculating ball bearings
Drive Mechanism	Backlash-free ball screw
Drive Screw Pitch	5 mm
Feedback	(M-)IMSCC, (M-)IMSPP: Screw mounted rotary encoder, 4,000 pts/rev, index pulse (M-)IMSCCHA: Linear steel scale, 20 μ m signal period, 0.1 μ m resolution
Limit Switches	Optical
Origin	Optical, approx. 8 mm from motor side limit
Motor	(M-)IMSCC, (M-)IMSCCHA: DC servo motor UE511S2 (M-)IMSPP: 2-phase stepper motor UE56UP, 1 Full-Step = 20 Encoder pulses; In order to close the loop on the encoder, it is needed to drive these motors in micro-step modus with at least 20 micro-steps per full-step. Brushless servo motor in preparations
Cable	5 m long motor cable included
Protection	Rigid cover and flexible side bands
MTBF	20,000 h

Specifications

	(M-)IMS		
	PP	CC	CCHA
Resolution	1.25 μ m	1.25 μ m	0.1 μ m
On-Axis Accuracy ⁽¹⁾	15 μ m	15 μ m	10 μ m
Uni-directional Repeatability	1.25 μ m	1.25 μ m	0.5 μ m
Reversal Value (Hysteresis)	1.25 μ m	1.25 μ m	0.5 μ m
Maximum Speed	100 mm/s ⁽²⁾	200 mm/s	200 mm/s
Pitch ⁽¹⁾	300 μ rad	300 μ rad	300 μ rad
Yaw ⁽¹⁾	300 μ rad	300 μ rad	300 μ rad

1) For 300 mm travel

2) At 100 mm/s for PP maximum speed

Ordering Information

The IMS Series linear stages are numbered as follows:

Model	Series	Travel (mm)	Drive
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M-	IMS	300	PP CC CCHA
		400	
		500	
		600	

Example

M-IMS500CCHA is an IMS linear stage, metric version, with 500 mm travel range and DC motor drive with linear scale (0.1 μ m resolution).

M-: Metric version PP: Micro-step CC: DC & rotary encoder CCHA: DC & linear scale

Motion Controller Options

For optimum performance and seamless compatibility, we recommend using one of the following Motion Controllers/Drivers:

ESP7000
(page 1084)



MM4006
(page 1088)



ESP6000 with
UNIDRIV6000
(page 1094)



ESP300 (page 1104)
Only IMSPP at
speeds up to 50 mm/s



ESP100 (page 1107)
Only IMSPP at
speeds up to 50 mm/s



MANUAL LINEAR
TRANSLATION STAGES

MOTORIZED LINEAR
TRANSLATION STAGES

MANUAL ROTATION
STAGES

MOTORIZED ROTATION
STAGES

FIBER POSITIONERS

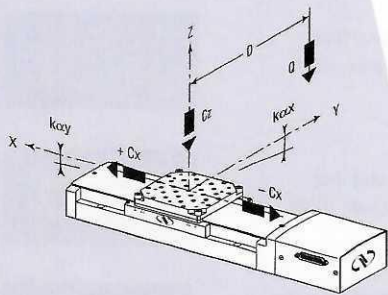
ACTUATORS

CONTROLLERS &
AMPLIFIERS

TECHNICAL REFERENCE

Load Characteristics and Stiffness

C_z	600 N
$-C_x; +C_x$	<100 N
$k_{\alpha x}$	1 $\mu\text{rad}/\text{N}\cdot\text{m}$
$k_{\alpha y}$	0.2 $\mu\text{rad}/\text{N}\cdot\text{m}$
$k_{\alpha z}$	1 $\mu\text{rad}/\text{N}\cdot\text{m}$



Normal Load Characteristics

Q Off-center load, $Q_x \leq C_z / (1 + D/90)$

D Cantilever distance in mm

C_z Normal center load capacity on bearings

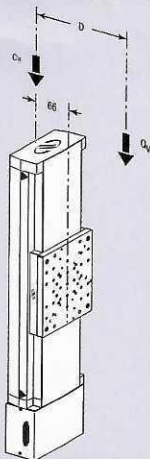
$+C_x$ Direct load capacity on X axis

$-C_x$ Inverse load capacity on X axis

$k_{\alpha x}$ Angular stiffness (Roll)

$k_{\alpha y}$ Angular stiffness (Pitch)

$k_{\alpha z}$ Angular stiffness (Yaw)



Axial Load Characteristics

Q_y Off-center load, $Q_y \leq C_z / (1 + D/90)$ and Q_y must be $\leq C_x$

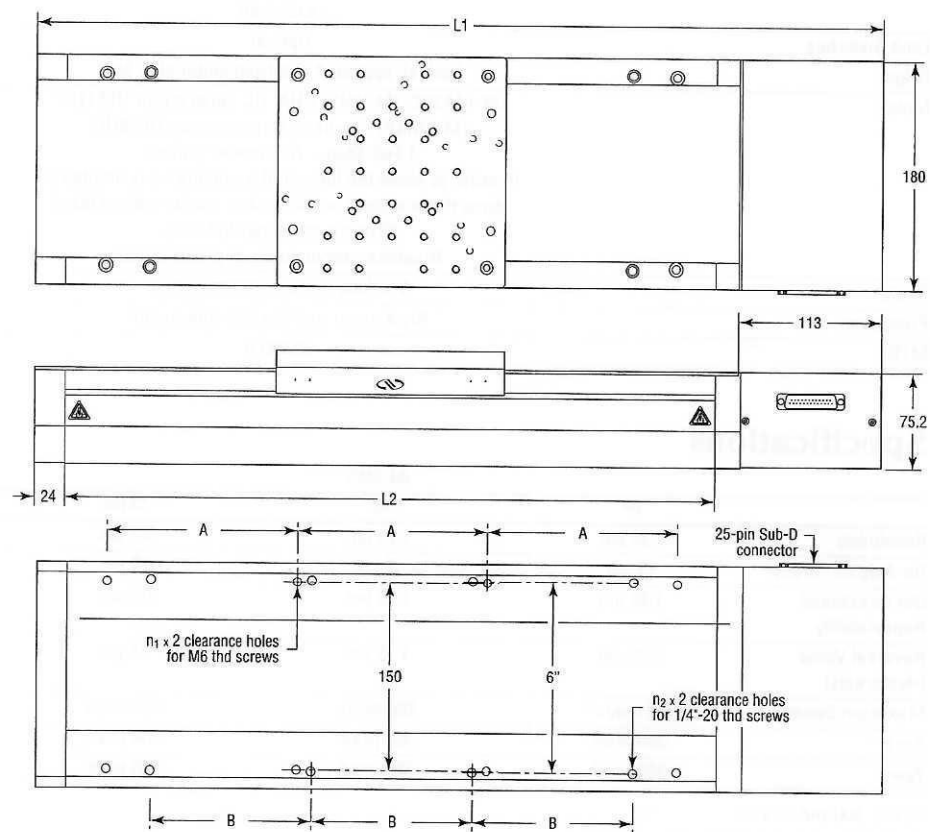
D Cantilever distance in mm between the center of mass of the load and the bearings center.

66 Distance between top surface and the bearings center in mm.

Dimensions

	A	n_1	B	n_2	Travel	L1	L2
(M-) IMS300	150	4	5 in.	4	300	668	513
(M-) IMS400	150	4	5 in.	4	400	768	613
(M-) IMS500	150	4	5 in.	6	500	868	713
(M-) IMS600	150	6	5 in.	6	600	968	813

Model M-IMS300



Dimension in mm, except where noted (1 inch = 25.4 mm)

