XY MOTION SYSTEM
MAX PLANAR

INTENDED USE

The MAX PLANAR air bearing linear motion system is featured by a cross X-Y axes with direct drive linear motors. The X axis is provided with a dual linear ironless motor in gantry configuration, and a dual optical encoder. The MAX PLANAR system is ideal for applications in machining and measuring fields where high precision and dynamics are requested: **optical tests, probe cards test, laser micromachining, wafer handling** and more. The MAX PLANAR series use flat air bearings suitable to move on a granite guide way. Due to the planar architecture the Y carriage move directly on the granite surface to guarantee a very high precision movement.
The system is supplied with ironless linear motors and optical linear encoders.

BENEFITS
Zero Friction
No Wear
No Maintanance
Smooth and Silent Movement
No Vibrations
High Precision Movements
High Accelerations and Speeds

INDUSTRIAL SECTORS
OPTICS & MEASUREMENT
SEMICONDUCTORS
PRECISION MECHANICS
BIOMEDICAL
AUTOMOTIVE

APPLICATIONS
Wafer Handling
Optical & probe card inspection
Laser Micromachining
High Accuracy & High Dynamic Positioning
Handling of Semiconductor
Flat Panel Processing

MAGER S.r.l. Air Bearings via Luigi Cavaglià, 27 10020 CAMBIANO (TO) – ITALY
phone +39-011-9441974 web www.mager-ab.it info tech-comm@mager-ab.it

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MAGER reserves the right to change any specification without previous advice

MAIN FEATURES

The MAX PLANAR system is designed with a main granite basement to guarantee a stiff and stable frame. The X stage is provided with large size air bearings designed to increase the complete stiffness and with Mager's magnet preload concept.
The Y carriage moves along the X axis and the air bearing is completely integrated in its bottom plate. The Y carriage is preloaded with a vacuum chamber directly on the granite, the main benefit of this concept is to have a stiff carriage not influenced by the pay load.
The ironless linear motors are suitable for a cogging-free movement and the optical encoders can guarantee the proper feedback for a very high accuracy control.

PERFORMANCES

MAIN FEATURES	UM	X axis	Y axis
chassis	-	Granite+aluminium	
bearing technology	-	air bearing	
environment temperature	-	+20°C +/-1°C	
environment humidity	-	24% ÷ 50%	
total mass	kg	640 Kg	
stroke	mm	550	400
air consumption	l/min ANR	70	
air supply pressure	MPa	0.5 (5 bar)	
vacuum consumption	l/min ANR	15	
vacuum pressure	MPa	-0.06 (-0.6 bar)	

MOTOR	UM	X axis	Y axis
linear motor technology	-	2x ironless	1x ironless
nominal input voltage U	VDC	300	300
force constant K_t	N/Arms	27.5	19.9
back EMF constant K_u	V/(m/s)	22.5	16
electrical resistance $R20$	Ω	1.28	1.8
continuous current $_{@110°C}$ I_c	Arms	5.1	4.4
		ULBS	UMBS

PERFORMANCES	UM	X axis	Y axis
motors (x axis)	-	2x	1x
axis configuration	-	gantry	standard
linear motor	-	ironless	ironless
peak force F_p	N	2x 480	300
continuous force F_c	N	2x 140$_{@110°C}$	87$_{@110°C}$
maximum payload M	kg	10	
maximum speed V_{mx} (2)	m/s	1.5	
maximum acceleration a_{mx} (1)	m/s²	6	6
positioning repeatability	µm	<0.05	
positioning stability	µm	<0.05	
accuracy (3)	µm/m	±5	
orthogonality	µrad	<5 (<1 arcsec)	
X straightness	µm	±1	
Y straightness	µm	±1	
X yaw	µrad	<10 (2 arcsec)	
Y yaw	µrad	<10 (2 arcsec)	
X pitch	µrad	<10 (2 arcsec)	
Y pitch	µrad	<10 (2 arcsec)	
X-Y roll	µrad	<10 (2 arcsec)	

LINEAR ENCODER SPECIFICATIONS	UM	X axis	Y axis
encoders (x axis)	-	2x	1x
technology	-	optical	
type	-	incremental with zero	
period	µm	20	
supply voltage	V	5 V ±5%	
signal	-	1 Vpp or TTL	

NOTES: (1) without payload
(2) according to the real payload and to the drive and controller performances
(3) higher accuracy available with glass scale encoders
To ensure optimal system performance the support and frame design should be designed by or in collaboration with the Mager technical department.
Different performances and configurations are available, please contact tech-comm@mager-ab.it

Air quality requirement (according to ISO 8573-1:2010)
minimum requirement: class 2.4.1
recommended: class 1.3.0