XY MOTION SYSTEM
MAX

INTENDED USE

The MAX air bearing linear motion system is featured by a cross X-Y axes with direct drive linear motors. The MAX system is ideal for applications in machining and measuring fields where high precision and dynamics are requested: **optical tests**, **laser micromachining**, **wafer handling** and more. The MAX series use flat air bearings with protected guideways, antifriction skins avoid scraping and limit the damages due to temporary and unexpected overloading contacts between aerostatic guide surfaces.
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 & Measuring 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

rel.22/09/2022

MAIN FEATURES

The MAX system is designed with a main aluminum structure in order to guarantee a stiff and light complete frame. Both X stage and Y carriage are provided with large size air bearings designed to increase the complete stiffness of the coupled stages with the Mager's magnet preload concept.
The guides are protected with overlay of Turcite to minimize possible damages due to high acceleration profiles in motion control or in case of drop air pressure.
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	-	aluminium alloy black oxid.	
bearing technology	-	air bearing	
environment temperature	-	+20°C +/-1°C	
environment humidity	-	24% ÷ 50%	
total mass	kg	330 – 390 Kg	
moving parts total mass (*)	kg	50 (1)	10 (1)
optional	-	protection bellows	
stroke	mm	400 / 600	400
air consumption	l/min ANR	75	
air supply pressure	MPa	0.5 (5 bar)	

MOTOR	UM	X axis	Y axis
linear motor technology	N	ironless	ironless
nominal input voltage U	VDC	300	300
force constant K_t	N/Arms	19.9	19.9
back EMF constant K_u	V/(m/s)	16	16
electrical resistance $R20$	Ω	1.4	2.8
inductance L_1	mH	0.4	0.9
peak current I_p	Arms	20	10
continuous current @ 110°C I_c	Arms	5.8	2.9
		UM12S	UM6S

PERFORMANCES	UM	X axis	Y axis
linear motor	N	ironless	ironless
peak force F_p	N	400	200
continuous force F_c	N	116 @110°C	58 @110°C
maximum payload M	kg	10	
maximum speed V_{mx} (2)	m/s	2.0	
maximum acceleration a_{mx} (1)	m/s²	8	20
positioning repeatability	µm	±0.1	
positioning stability	µm	±0.05	
accuracy (3)	µm/m	±5	
orthogonality	µrad	<20 (<4 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	20 (4 arcsec)	
X-Y roll	µrad	10 (2 arcsec)	

LINEAR ENCODER SPECIFICATIONS	UM	X axis	Y axis
technology	-	optical	
type	-	incremental with zero	
period	µm	20	
supply voltage	V	5 V ±5%	
signal	-	1 Vpp or TTL	
		µE MII 1905S	

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

OPTIONAL VERSIONS

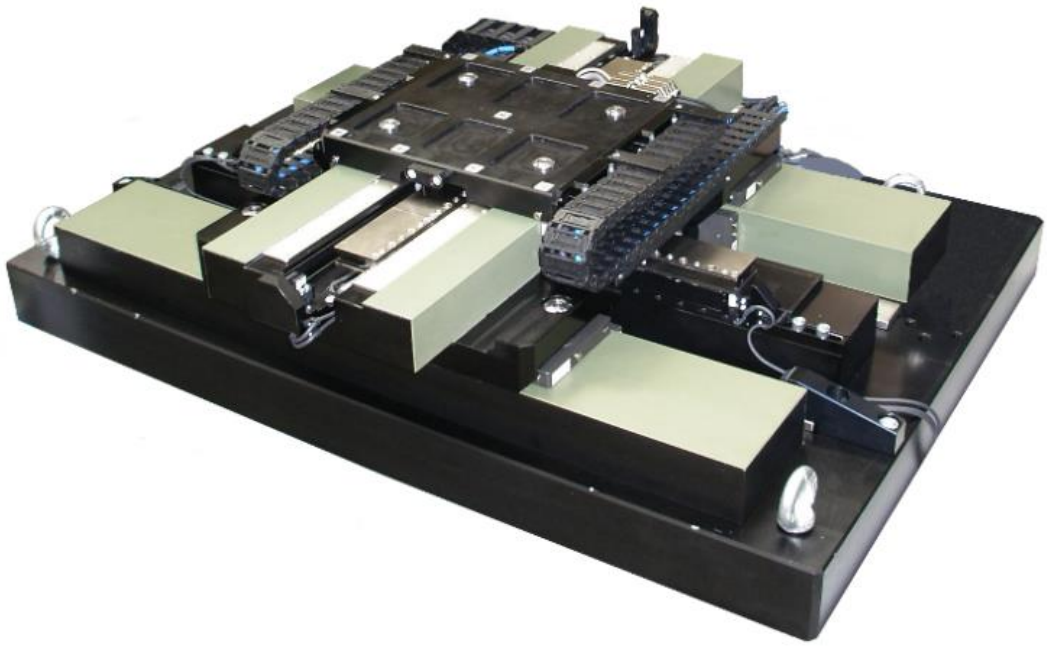


Figure 1:MAX system version without bridge

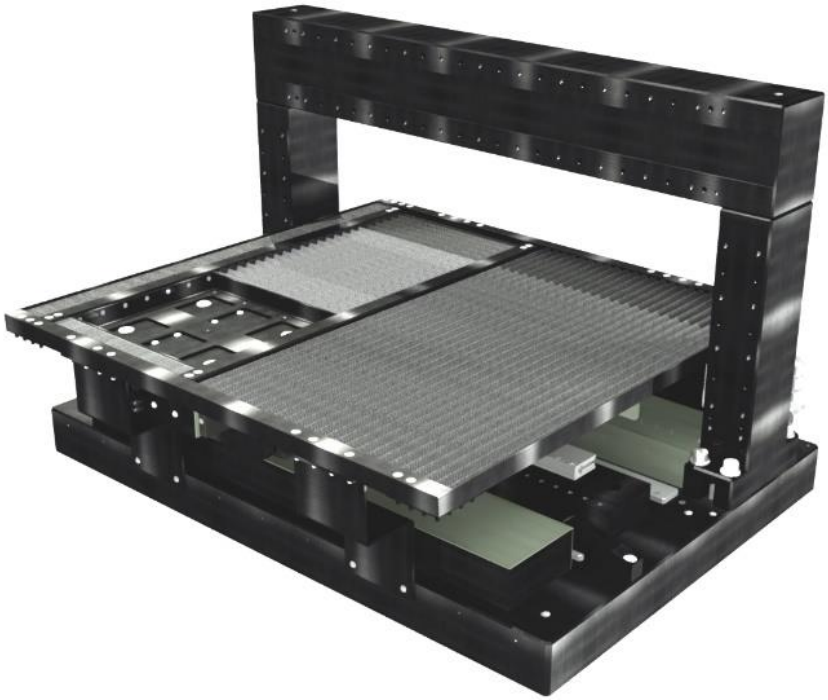
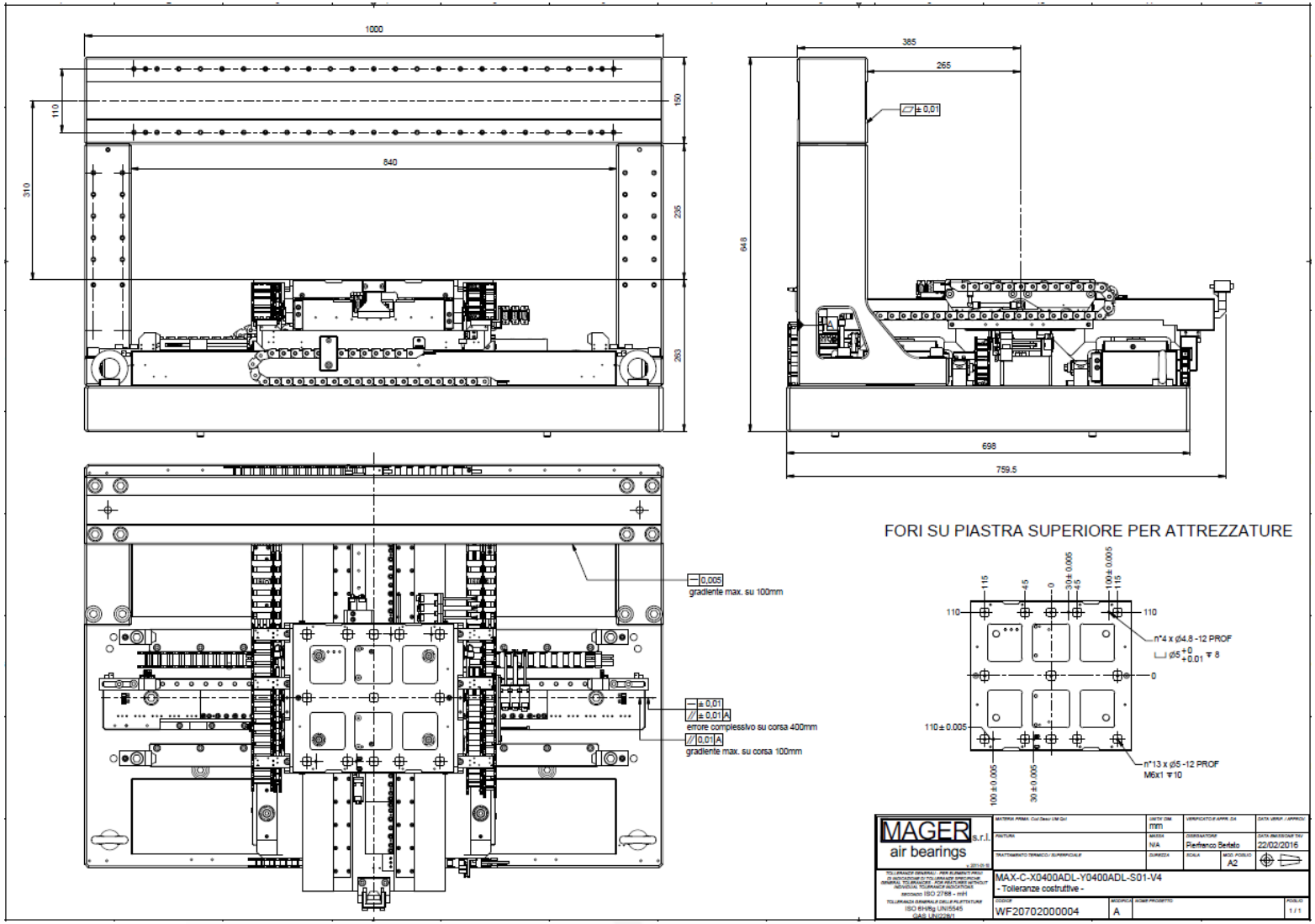


Figure 2:MAX system version with protection bellows

OUTLINE DRAWING MAX X400 – Y400



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

rel.22/09/2022